LITERATURE REVIEW

The research of "Appropriate Community Participation Process (ACPP) for Dispute Resolution in Kon Watershed Management, Nan Province, Northern Thailand" is suitable for a study-cased model in the management of other small watershed areas in similar. However, in accordance to the model objectives, the selected database is outlined as follows:

Concept for Watershed Management

1. Definition of Watershed Ecosystem

Watershed ecosystem consists of both natural and man-made environment. Watershed ecosystem management should be the management of natural structure in less changing to maintain the system flow.

Many people provide similar meaning of "Watershed." In their similarity, watershed is defined as an area of any shape, size and type for the flow of water to river or canal. More specifically, watershed can be of the forest, agriculture, grass, mineral, community, town and industrial area.

Chunkao (1983, 1996) stated that watershed resources meant all of biotic, abiotic, and man-made resources of the environment. In addition, it could be biophysical or social environment such as plant, man, soil, rock, water, climate, mineral, town, house, street, river, and culture. Watershed resources can be divided into three main groups: exhausting natural resources, non-exhausting natural resources, and renewable natural resources.

Watershed is the open ecosystem. The main factors of the natural environment are soil, rock, mineral, water, climate, forest, and wild animal that make up matters and energy. These further make the natural phenomena, where watershed brings the flow of water, foods and nutrients that make the natural degradation and balance.

Moreover, human activities according to agriculture, industry, transportation, settlement, water use, economy and population growth are all factors that make the difference between natural degradation and balance.

2. Principle of Watershed Management

The main concept for watershed management is to pinpoint an area for sustainable resource utilization for conservation in practice. In other words, the affected area within is zoned, considered by the suitable area of each activity which does not affect the environment in the watershed.

Some natural resources have to preserve for the balance control of the watershed ecosystem that should not get any use from the nature. In fact, the natural

resource utilization has to realize people who get the useful from the national resources, because the economy, culture, rule, law of community causes to quality of utilities.

Not only watershed management means to provide the area for having sufficient water, quality and flows, but also to be able to control soil stability and protect any loss from flood as well as manage the natural characteristics of watershed in efficiency and usefulness to the people in area to have more better living and sustain resource utilization as in principle of conservation.

Watershed ecosystem has related to environment by nature. Though the nature has been changed in any way, it is capable for self-recovery without human management. Nonetheless, nature of these days has been influenced by various factors that can result to change the watershed ecosystem. As a result, it is necessarily for the nature to manage the watershed and provide for resources utilization.

Chunkao (1996) reasoned that the necessity of watershed management comes from the results of: (1) an increase of population (2) a need for water utilization (3) an irrigation of land (4) an over-usage of land, and (5) an economic and social development to cause people to take their rights for agricultural conducts in national preservation forest areas.

It is believed that only knowledge in watershed itself is not enough for the watershed management. Nevertheless, knowledge in interdisciplinary science should be included. Chunkao (1996) stated that watershed management was science because of a learning of relationship of system among soil, water and forest. For example, soil needs water to grow plants. To destroy soil means to destroy water and forest, and vice versa. Destroyed forest can cause a change of soil qualification, especially for its infiltration and percolation. When the rain heavily falls, flood and landslide may occur.

There are three principles of the watershed management as follow.

1. Plan a land use: Soil property is based on chemical, physical and biological elements that make each area to have different soil characteristics. Therefore, a land use planning classification is needed for the watershed management. In general, a practice of the land use planning includes an elevation and slope of land. Also, a technology is introduced to area productivity for the land use.

2. Determine a plan for resource utilization and conservation: Natural resource utilization should be in harmony with conservation in order to keep the balance of variety, quantity, proportion and distribution. Since natural resource management changes all the time so the resource planning should be appropriate to any circumstances and needs. More importantly, exhausting natural resources should be used carefully. Having brought a high and effective technology for waste minimization, benefit maximization, and environmental impact control can be advantageous.

On the other hand, the usage of renewable natural resources including forests, wildlife, soil, and agricultural resources should be minimized. In addition, the capacity of the said resources should be preserved.

3. Control environmental pollution: Boonyawat (1996) described there are three methods to control the environmental pollution. They are

3.1) Biological controlling. This includes the control of vegetative soil erosion and wastewater treatment caused by activated sludge.

3.2) Mechanical controlling. This method involves the application of tools such as rock check dam or facilities, such as wastewater treatment plants.

3.3) Legal controlling. This method is dealt with the enforcement of wastewater standard regulation, national park regulation and city planning regulation to control environmental pollution caused by industries, constructions.

Period Activities on National Watershed Management

1. History of Head Water Supply Management in Thailand

The Royal Forestry Department (RFD) has been preserved and developed head water supply areas since 1953. The RFD established a research team to preserve the head water supply in 1965. In 1973, the RFD was sponsored by UNDP and FAO to develop a pilot project of Mae Sa watershed management in Chiang Mai Province. In 1975, the division of head water supply has been established. This division has been strongly implemented in watershed management by forest rehabilitation in upper watershed to increase the potentiality of water yields.

The rehabilitation in watershed area in class 1 started in 58.18 million rai. It is approximately 18 percent of 25 watershed areas of the country (320 million rai). The interpretation from LANDSAT-5 satellite in 1993 found the head water supply was disturbed to approximately 2.76 million rai, which is resulted from the increment of highland population. The surveying of master plan for environmental community development and habit forming plant control in highland vol.2 found the highland are approximately 853,274 people of the country. (Table 1)

The rehabilitation of the upper watershed was developed under a several measurement such as reforestation in the head water supply, forest disturbance protection, land use planning, and soil and water conservation.

The plan for highland community development aims to encourage people, governmental agencies and private sectors to realize the effect of head water forest disturbance, as well as to promote community organization to determine regulator of an appropriate land use control.

Table 1 Head water supply area in Thailand

Watershed	Cabinet Agreement	Watershed area (rai)	Head water supply area (rai)	Disturbed head water supply (rai)
Ping-Wang	May 28, 1985	29,650,862.50	10,583,975.00	467,968.75
Yom-Nan	Oct 21, 1986	36,573,043.75	7,296,481.25	830,950.00
Moon-Chee	Jul 12, 1988	73,952,700.00	4,326,237.50	854,375.00
Southern region	Nov 7, 1989	48,008,325.00	8,050,993.75	604,531.25
Eastern region	Nov 19, 1991	22,705,343.75	1,498,550.00	3,143.75
Western and central region and Pa-sak Watershed	Feb 21, 1995	57,212,325.00	11,797,181.25	742,621.00
Watershed area along Northern border and the others	Feb 21, 1995	23,122,243.75	11,604,225.00	537,114.00
Watershed area along Northeast border and the others	Feb 21, 1995	29,472,043.75	3,023,831.25	524,186.00
Total	6 cabinet agreement	320,696,887.50	58,181,475.00	4,564,889.75

Source: Adapted from Head water Conservation Division (1995)
          The disturbed area was interpreted from LANDSAT-5 satellite, 1993

The management practice in head water rehabilitation consists of officer education, people training, continuous support of local community opportunity building of local people participation, and integrated community development.

2. Present Watershed Management in Thailand

Presently, the established Ministry of Natural Resources and Environment (MoNRE) is a major agency for natural resource management. Watershed management becomes a highlight national agenda that need an immediate operation, with a participatory of several agencies, in particular, to build integrated management and planning. The related agencies are Department of National Park, Wildlife and Plants Conservation, Royal Forestry Department, Department of Mineral Resources, Office of Natural Resources and Environmental Policy and Planning (ONEP), and Pollution Control Department. The MoNRE's strategic policies on watershed management (Department of Environmental Quality Promotion, 2003) are

1) Reserve, protect, conserve, utilize and rehabilitate natural resources and biodiversity through people participation.

2) Conduct and supervise the environment to reduce pollution.

3) Promote a learning process and equitably access to public natural resources.

4) Construct a proactive integrated management and administration.

The operating under the MoNRE's strategies are taken seriously in surveying and determining a boundary of risky landslide covering areas in Phetchabon, Phare, Mae Hong Sorn and Chiang Mai Provinces. In addition, the strategies also include the acceleration for ecosystem rehabilitation, construction small scale check dam, preparation for the establishment of a new protected area, and promotion towards the local people to protect forest fire.

Aside from the plan of water resource management in Thailand, a conservation and restoration of river basin in Song-Kla lakes and upper Ping watershed also needs a participation approach.

Building for local people learning capacity in watershed resource management was operated by many campaigns including promoting community network by forming a local organization from at least 737 vicinity villages to conserve protected area, promoting permanent human settlement, training volunteers on forest conservation campaign. The most important campaign is established by 25 major watershed committees of the country. In addition, a network of sub-committee in provincial, district, sub-district and village levels are established.

However, community participation process has no exact procedure. Many agencies operate their own function and incorporate with others. This arose the conflict of resource utilization in many watershed areas. Consequently, a guideline to accomplish resolution process is needed. To develop the model of community participation, according to Area-Function-Participation (AFP), has brought a success for the watershed management.

3. Lessons Learned from the Watershed Development Project in Thailand

It has been more than 40 years since Thailand first began the watershed management and development. The water resources in the northern region has been improved through the forest growth in areas once used as farmland by various tribes. The management also has been expanded to other regions in the country. During this period, the government has used various strategies, both academic and managerial. These include centralizing the responsibility to one government authority; decentralizing the responsibility to the local people; and most recently, giving the community opportunities to participate in the local watershed resource management. The situation, however, does not impart enough confidence that watershed resources would exist in a sustainable way (Thangtham, 1997).

Lessons can be learned from the watershed development projects that have been successful and those that have failed. The Mae Sa Project, for example, which was supposed to have been an integrated development project was in actuality handled only by the Royal Forest Department. There was a severe lack of cooperation

among the relevant agencies because there was no coordination between the top-level and local-level managers. Hence, the Mae Sa Project did not achieve as much success as it should have.

The Mae Jam Project is another project that had similar objectives to the Mae Sa Project, but different strategies were utilized. The focus was placed on various relevant authorities at the Ministry and provincial levels, as well as local-level managers at the amphoe and tambol levels. This gave people more opportunities in the participation of planning and following up on the project, especially in the creation of an interface team that would be responsible for integrating the project's various activities with the people. This created a good level of cooperation for the project.

Most of the projects were initiated after the Mae Jam project. These included the Doi Sam Muen Project, Doi Paeper Project, Thai-German Project, Thai-Norway Project, and Doi Wiang Pah Project. The said projects utilized the strategy of having more community participation, focusing on motivation rather than management by regulations. It is believed that the development of individual project on the basic level and disseminating correct knowledge about high-altitude farming would give the local people an improved economic standing, as well as improve the environment of the local water resources. The strategy most often utilized in the later projects is to create a permanent settlement quickly and with the least number of villages, which would be done through the integration of villages together, the distribution of permanent farmland, and the promotion of planting freestanding crops in place of opium.

Engaging in the development of watersheds with community participation is a strategy which believed to create a fair distribution of resources. The community would also be participating in the care and management of its local water resources. Chinsukjaiprasert (1997) stated that the process of managing the resource of watersheds included the following: (1) creating an acceptance from various authorities, especially of human honor, indigenous knowledge of the local community, and local customs and traditions; (2) exchanging information to create mutual understanding would help people adjust different work cultures; (3) creating a plan together to solve any existing problems; (4) working together to implement the established plan, both in community management and the management of watershed resources; and (5) developing better work practices.

Frameworks Regarding the Participation Process and the Lessening of Conflicts

1. Participation Frameworks

"Participation" has been defined in many ways, with most being relatively similar to each other. The definitions may be summarized as follows:

Jongwuttwej (1984) defined participation as the mental and emotional involvement of a person in a group situation, where participation in said situation

becomes the motivating force behind reaching the objectives of the group and thus becomes more than just being a part of the community. Wuthimatee (1983) stated that public participation gave the people opportunities to initiate, consider, decide, handle, and be responsible for various issues that have impact on them.

Daoweerakul (1996) stated that participation was a process where the people voluntarily participate in the planned changes, with the people to be able to participate in making decisions and proceeding with the plans, in order to meet objectives. This is similar to Preeyakorn (1992), who placed emphasis on the individual, group or organization that volunteered to participate in the decision-making process, the implementation, and the obtainment of the resulting benefits from the development project.

Sathiwittiyanan (1989) proposed three ideas concerning public or community participation:

1) the interest and concern from each individual turns into community concern;

2) the dissatisfaction felt toward the situation becomes a motivator for participation in the situation; and

3) the decision to cooperate as a group means working together at a certain activity.

The frameworks mentioned tend to focus on a certain situation becoming the motivating factor to start the participation process. This framework may be different from that of Techarint (1984), who declared that participation meant encouraging, leading, supporting, and giving opportunities for people to participate in the implementation of a certain project to meet objectives. At the very least, participation should have the following features:

1) Participation in studying problems, the source of problems, and community needs;

2) Participation in thinking and creating models to solve problems to respond to community needs;

3) Participation in creating policies, plans, projects, or activities for community development;

4) Participation in making decisions about how to utilize the community's resources for the greatest benefit;

5) Participation in improving the effectiveness of managing community development;

6) Participation in investing community activities according to organizational or individual ability to do so;

7) Participation in executing plans, projects, or activities to meet established objectives; and

8) Participation in evaluating the results of the plan/project so that it would proceed effectively.

Community participation in the process of forest conservation may have different roles, depending on the readiness of the individuals and the community. Wechakij (1992) stated that participation in forest conservation took on 3 forms as follows:

1) Direct participation—meaning the participation in activities that are related to the conservation of forests and wild animals. This can be done by planting trees, not hunting animals or collecting forest items in conservation territories;

2) Participation through groups—meaning the selection of a representative to head the local organization to execute any plans related to conservation of forests and wild animals; and

3) Participation through proxy—meaning letting a representative of the family—who could be the head of the household or another individual—to participate in the conservation of forests and wild animals.

In summary, participation is a process that needs to take place step-by-step. Government authorities should not come in to control the participation process directly, but instead take on a role that supports continuous participation. This is to let communities learn by themselves without governmental force. According to the evaluation of frameworks of the participation, people need to proceed the four steps in the following:

1) Planning—people must participate in analyzing problems, ranking their importance, establishing objectives, planning ways to utilize resources, planning ways to monitor and evaluate the results, and making decisions.

2) Implementation—people must participate in implementing the plan or project in the targeted location.

3) Obtaining benefits—people must directly receive benefits from the activities fairly and equally.

4) Monitoring and evaluation—people must participate in directing, following up, and evaluating the results of the project continuously in order to review and revise the implementation so that it may better integrate with the community's needs.

Participation may be considered an important tool in the watershed management, as it helps lessen the burden of the government in solving problems that occur. It also helps increase the value of decision-making and create building of consensus on various issues that would be further implemented. Most importantly, participation becomes a way to avoid confrontations in situations of community conflict. It is a stage that lets all involved parties come together to find a solution, which is a part of the foundation for true democracy.

2. Frameworks to Lessen Conflicts

Filly (1975) and Kae and Megginson (1981) stated that conflicts are a social phenomenon. Conflicts occur when involved parties have objectives that cannot be integrated or different values. These are usually perceived differences instead of genuinely real ones. Conflicts are struggles to get what a party wants. In addition, conflicts result in confrontations where one party wants the other to either lose or lessen the importance of the other party's issues to win.

There are six major sources of conflicts in the Thai society that lead to confrontations by individual groups. They are:

1) Lack of society justice, especially with an unfair distribution of benefits;

2) Cultures and authority structures that emphasize the use of violence in managing all kinds of conflict;

3) Laws and regulations where the government attempts to use its power to manage the various problems;

4) Fast economic development that has resulted in brazen uses of resources and conflicts regarding those resources;

5) Lack of knowledge and skills in solving problems with peaceful means (Strategic Institute, 2001).

Methods to improve the community's ability to deal with the disputes include an Appropriate Dispute Resolution Process (ADRP). The ADRP is the most appropriate way of dealing with disputes through negotiation and searching for a mutual solution, utilizing a mediator to help support the negotiation process in order to result in agreement from all parties.

The role of stakeholders can be considered extremely important in finding solutions to disputes, especially as people or communities need to participate in finding solutions to problems where they show a clear stand. The government uses its legal authority to solve these problems and thus necessitates to have a high level of sincerity in wanting to solve those problems. The mediator may have to become the facilitator in order to facilitate meetings or gatherings for solving the problems. The facilitator must have skill in leading the process to the negotiation stage as well as

understand the local problems extremely well, have high trustworthiness, and have every party's respect.

3. Community Empowerment

Community participation in watershed management projects is the responsibility of many parties. The community usually experiences a lack of readiness in working together with the government, due to the fact that low quality of life, economy, and social standings necessitate the people giving more importance to earning a living than working together with the government. Empowering the community appropriately is something that the facilitators of the watershed management projects must consider depending on the situation in each area.

Empowering communities starts with a survey of the community to evaluate the present situation and problems within. Then, an analysis of the problem sources, from community behavior to history, should be done to analyze which behaviors should be changed. From there, decisions are made about what projects to introduce to the community in order to create community empowerment so that the community could solve problems together with the government.

Organizing projects to introduce are useful in motivating the community to solve problems, as well as being empowering. In the introduction of projects, the following factors should be considered (Payomyam, 1997):

1) The introduction project must have a clear goal and objectives, with an established time frame in the implementation of the project. The features of an introduction project could be any of the following 3 cases:

(1) A new program;

(2) A change in policy; and

(3) An adjustment in a practice program.

2) The time frame for the introduction program must be dependent on the situation or problem. This can be considered from the following:

(1) When the community sees that various needs have not been met the satisfaction;

(2) When the community authority has an ability to participate and respond to the community needs;

(3) When the facilitator of the project has evaluated the overall picture and decides that his authority is suitable for the work at hand.

3) The process in organizing the introduction project has the following actions:

(1) Establish the goal, especially in watershed development works where it is necessary for the community to conserve its resources correctly and act in ways that do not impact the environment;

(2) Evaluate the problem systematically, which may be done through observing the problem, doing surveys, interviewing the sample group, or using information from various sources to evaluate the problem;

(3) Establish the target group for the project, especially those who are involved in the problem that occurred;

(4) Establish whoever receives the resulting benefits from the project;

(5) Consult with the participants to find appropriate ways to deal with the problem;

(6) Identify the problems;

(7) Establish goals and objectives—this shows the overall picture of what is the intended results;

(8) Study previous projects or efforts in order to improve the effectiveness of new projects;

(9) Perform brainstorming among the participants;

(10) Decide a target project, where the project must be considered suitably from various sides in terms of time, location, resources, people, and situations;

(11) Study or forecast obstacles that may arise in the project;

(12) Establish various parts of the project process;

(13) Create an implementation plan;

(14) Conduct the pilot testing before actual implementation;

(15) Implement the project in its full capacity;

(16) Follow up and evaluate the results of the implementation.

4) The implementation of an introduction project consists of deciding on one of four levels of introduction:

(1) Interpersonal level

(2) Group and organization level

(3) Community level

(4) Society level

The media or tools such as pilot testing, learning through games or using geographic information system (GIS) technology should be used for appropriate introduction as well. In addition, a cooperative authority needs to give support to the community project; through the creation of cooperative networks with other government authorities, private organizations, and local organizations.

Besides the organization of an introduction project to the community, another implementation feature such as individual empowerment should be done to develop the expertise and potentiality of individuals in the community. The framework includes:

(1) Increasing the cognitive aspects of individuals in order for them to be capable to identify and solve problems;

(2) Increasing the affective aspect so that they may appropriately change their attitudes and uphold values that are beneficial to the community;

(3) Increasing the behavioral skill aspect to make their ability to learn new things and behave appropriately in society according to the situation.

The Participatory Action Research (PAR)

1. Definitions

Participatory Action Research (PAR) has been defined relatively similarly by many experts, all of whom have stated that it is a process where a certain number of people in an organization or community participate in the study of a certain problem through participating in activities with the researcher from the start of the research until it ends. The research is problem-oriented, starting from the problems in the community. This kind of research would be flexible, the research plans re-adjusting constantly to what is happening within each phase (Whyte, 1991; Praputnitisarn, 2003; Dulyakasem, 1993; Teewakul, 2000).

In addition, Walaisathien (2000) emphasized that PAR placed people in the status of community members, with important aspects being the handling of community problems and the participation of the community. The people in the

community must participate closely in the research with the researcher. In any case, participatory action research differs from scientific research because it places emphasis on the acceptance or consensus of people in the community. Therefore, in this type of research, the researcher must constantly evaluate the people in the community (Jantwanij, 2002).

2. Framework

The framework in researches using the PAR technique focuses on giving the community and stakeholders in the community the opportunity to participate in the study of the community, problem analysis, and solution identification to those problems. This type of research must result in solutions, and the community must see its own importance in the process of solving the problems (Table 2).

Table 2 Framework for PAR

Principles	Methodology and Strategies
1. A method that helps solve community problems 2. A method that empowers communities to handle their own problems 3. Focuses on action-based research 4. Focuses on studying myriad sources of information	1. Create a systematic means of working between the researcher and the community 2. Create cooperative networks 3. Let the community participate in the analysis, implementation, monitoring, and evaluation of results

3. Steps

The implementation process of PAR integrates the community management frameworks regarding community learning and problem solving together. The steps are as follows (Table 3):

Table 3 PAR process

Phases	Research Steps and Processes
1. Preliminary Research (pre-research)	1.1 Select a community and visit the community 1.2 Create rapport between the researcher and the community 1.3 Investigate preliminary information from the community
2. Research	2.1 Study and analyze problems together with the community 2.2 Train a local research team 2.3 Design research tools for the information collection 2.4 Collect data in the field 2.5 Analyze the data

Table 3 (Cont'd)

Phases	Research Steps and Processes
3. Planning	3.1 Train the main planning committee 3.2 Review community problems 3.3 Establish the vision, goals, objectives, and management framework 3.4 Establish a plan, project, or activity 3.5 Find appropriate budget and supporting authority 3.6 Create a plan for monitoring and evaluating the results
4. Implementation	4.1 Prepare the readiness of the people 4.2 Train the implementation team and preparing the area
5. Monitoring and Evaluation	5.1 Establish a monitoring and evaluation team 5.2 Monitor and evaluate the results and constantly review the plan and project

Source: Adapted and improved from Niyom and Rattana (2004)

4. Measurement of Accuracy

Mills (2000) placed importance on establishing criteria to evaluate the quality of PAR-type researches. Because of the unique features of PAR, the set of criteria established must be different from other kinds of research, which can be categorized into five areas:

1) Accuracy in democracy, which involves the participation of the target group of people in the research—both the research process and the research results must reflect the thoughts and feelings of every participant

2) Accuracy in results, where the resulting solutions must be ones that can be implemented on the foundation of knowledge gained through the research in order to solve problems

3) Accuracy in process, which dependent on the integrity of the methods that have been used to collect the information used in answering the research problems

4) Accuracy in stimulating the conscience, awareness, and participation of the community in solving the problems

5) Accuracy in criticism in regards to the quality of the research project, through criticisms from people involved in the aforementioned project

Literature Review and Relevant Research

From a review of the related literature concerning community participation in watershed management, it was found that there were few researches that were available. This is because most of the research of watersheds is taken on the scientific side. More or less, there are also some social research studies about watersheds, but most research studies are quantitative rather than qualitative.

Action research has begun to achieve more interest, especially the Participatory Action Research (PAR) studies. Nonetheless, the application of PAR seems limited in the time intensive for execution due to the necessity of getting community participation, as well as the effort needed to empower the community to manage its own watersheds. This has created a limited pool of this type of research.

Panuves (2002) studied about "Determining Administrative Model of Watershed Resources Management Compatible for Thailand" and found that problems and obstacles in the management of natural resources and the environment in watershed areas included: problems in centralizing management authority to the central government; lack of decentralization of authority; lack of a specific organization that would help coordinate work among the various government authorities in order to manage the projects well and to decrease complexities; and the lack of community participation in management.

From creating artificial models, it can be stated that the form of a managing organization should be separated into three levels:

1) The central government authority must establish a department of natural resources and environment as well as a managing committee to help manage the natural resources and environment in the local watershed areas;

2) The regional government authority should adjust the roles of the province governors so that they have the highest authority in the province, in accordance to the province management system set up for the ultimate development of the province; and

3) The local government authority should distribute authority to the Tambol Administrative Organizations (TAO) and the people so that they may participate more in the resource management through the establishment of a managing committee for local watersheds, and a watershed network committee.

The organization of the Nam Chuen Natural Resources and Environmental Management Framework for Sustainable Development: MFSD, a project from the Royal Thai Government (RTG), was supported by the Canadian International Development Authority (CIDA). This project enabled the relevant central, regional, and local authorities to organize a plan for the integrated management of natural resources, through emphasis on participation from the community and local organizations based on managing the watershed ecosystem.

On November 16th, 1993, this project was focused on the Chuen watershed, one of the watersheds featured in the cabinet agreement entitled "The Implementation Plan for the Management of Featured Watersheds (Mae Taeng Watershed, Chuen, and Klong Yan)". On May 21st, 1996 another cabinet agreement on "The Implementation Plan for the Management of People Living in Forest Conservation Areas (Mae Taeng Watershed, Chuen, and Klong Yan)" was promised. The cabinet bestowed the Office of Environmental Policy and Planning (OEPP) with the responsibility of coordinating with other relevant authorities. After only a short period of time, however, the project experienced problems with management integrity and unity, with conflicts occurring between the policies of the government and the local people.

The management of the project had three major means (Office of Environmental Policy and Planning and the Natural Resources and Environmental Management Project, 2000):

1) Establishment of the Core Planning Team (CPT), consisting of representatives from various relevant government authorities to prepare the planning framework for Chuen watershed development.

2) Development of community participation in preparation of the planning framework for Chuen watershed development, through establishing meetings where the opinions of the people could be heard. Representatives of the community were able to listen, express their opinions, analyze problems and opportunities, establish the vision, goals and objectives, set management zones, and establish a plan of implementation, as well as decide on plans for monitoring and evaluation. In addition to that, the people also received training in order to participate in solving problems and conflicts with the CPT as well.

3) Adaptation and training of Geographic Information System (GIS) to province-level and central-level officers, as well as installing a GIS and database systems at the province's central hall and at other involved government authorities. All of which were done to support the planning and decision-making processes of the CPT

The project resulted in relatively high levels of success, as it continuously developed the participation process and gave stakeholders in the local area around Chuen watershed the opportunity to help analyze and create implementation plans for the sustainable development of the watershed. The processes utilized in this project were even adapted for watershed projects in many other locations. A major problem that occurred, however, was the discontinuity of support by the various government authorities at both the central and regional levels for the CPT.

The Office of Environmental Policy and Planning (2002) proceeded with organizing "A Framework for the Sustainable Management and Development of Natural Resources and Environment around the Yoi Huay Mae Tia Watershed Area in Amphoe Jom Thong, Chiang Mai Province." was hoped to lessen the conflicts that occurred in the watershed area through utilizing community participation. A core

planning team of 20 people was founded in order to establish the framework. There were 7 team meetings in total, with another 3 meetings set up to listen to the opinions and ideas of the people.

The project resulted in the establishment of four zones for the management of natural resources in the watershed areas. This includes

1) Forest conservation areas

2) Usable forest areas

3) Forest restoration areas

4) Usable land areas

In each area, appropriate regulations such as soil erosion prevention, crop growing in high altitude areas, and local indigenous knowledge survey applied by communities utilizing natural resources would be set. It was apparent that this project could lessen conflicts in the watershed area, with sincere efforts in the plan implementation, .

"The Project for the Empowerment of Local Administrative Organizations for Province-Level Environmental Management of Nakorn Ratchasima Province" was another project initiated by the Office of Environmental Policy and Planning. The goal was to empower local administrative organizations to have the skills to manage local natural resources and environment. The Lamchiang Krai watershed area was selected for this project (Office of Environmental Policy and Planning, 2000).

The Lamchiang Krai watershed area is about 3,235 km^2, covering the areas of 7 amphoes: Amphoe Dahn Khun Thot, Amphoe Nohn Thai, Amphoe Nohn Soong, Amphoe Tepharak, Amphoe Pra Thong Kam, and some parts of Amphoe Sri Kew and Amphoe Muang. The major problem was the deterioration of forest and water, droughts, high levels of soil erosion, and high levels of saline soil.

The steps of implementation consisted of establishing a core planning team of 48 people made up from authorities of all levels in the area. Together, the team identified and analyzed the area's problems and established methods of solving the problems through participatory actions, which included surveys in the field. The procedures resulted in a plan for the Restoration Project for the Watershed Area. The plan was then presented to the province and all relevant authorities for further process.

Another research project was the Watershed Management by Communities, done by Wiset and Boonserm (2003). This participatory action research was done in the Ing watershed area, with the research placing emphasis on the empowerment of the community in participatory watershed management. The beliefs, traditions, culture, and local indigenous knowledge of the community became the tools with which the community began managing the watershed area. Techniques used in the

research included such things as sharing the community history, hiking, creating a model of the watershed, participating in the map creation, creating printed material, organizing festivals, organizing incidences regarding timeframe, and creating a local curriculum. These techniques were integrated in the study of the community for effective and appropriate management of the water basin area.

The researchers summarized that the research gave the following results: (1) knowledge about watershed management was gained, which included knowledge that focused on the government being the main managing force and knowledge focused on the community being the main authority in managing the watershed; (2) the management of watersheds should be in the form of co-management; (3) new knowledge about watershed management was discovered, such as the relationships among the watershed, the community, and the natural resources; and (4) a learning process for people in the watershed area was created, in order to create the skills and experience needed in correctly managing the watershed.

Based upon the literature review, it was found that economic and social factors were those that had the most impact on the participation in natural resource management. The solution would thus be the development of quality of life for the people, both economically and socially, in a simultaneous way with the development of a plan for conservation.

Eksiripong (2000) conducted a quantitative research on "Community Participation in Community Forest Management: The Case of Baan Lhung Community, Tambol Sra Jarake, Amphoe Dahn Khun Thot, Nakorn Ratchasima Province." He used questionnaires coupled with interviews as research tools. The target population totaled 144 samples. The study results showed that the majority of people in Baan Lhung community had attained a primary school level education and possessed land of their own, with most being farmers. Some areas had problems of saline soil and inefficient use, resulting in families earning low income. With a concern on the community forest management, it was found that local residents wanted the central authorities to give them more support in terms of budget, knowledge, and tools, in order to conserve the community forests for mutual benefits.

Based on a study of relationship between variables, it was found that age and social status had a statistically significant relationship with participation in the community forest management at the 0.05 level, whereas gender, education, number of people in the household, residency, income, land ownership, and occupation did not have any relationship with participation.

Meekhun (1994), who studied "Community Participation in Community Forest Management: The Case Study of Tambol Sri Lakor, Amphoe Jakraj, Nakron Ratchasima Province" had different results from Eksiripong (2000) in which the community had a low level of participation in the management of the community forest. Factors like education, land area, type of land ownership, forest utilization, and membership in different groups in the community had a statistically significant relationship with participation at the 0.05 level. This correlated with the research of

Puengsaengkaew (1994), who studied "Community Participation in Forest Conservation: The Case Study of Huay Kaew Community Forest, Amphoe San Kampaeng, Chiang Mai Province." It was found in the study that the community had a low level of participation in forest conservation; however, the community had a high level of participation in identifying problems, planning, investing, implementing, and monitoring and evaluating project results, all of which would be considered indirect participation through their utilization of the forest.

Chatdecha (1997) studied "Community Participation in Conserving Forests in Conservation Areas: The Case of the Mae Toh National Park, Amphoe Hod, Chiang Mai Province." The author found that the community had a mid-level participation in identifying problems, creating and implementing plans, investing, and following procedures. Monitoring and evaluating the results had a low level of participation from the community. These results correlated with those of Thongsamnuek (1999), who did research on "Community Participation in the Community Forest Management: The Case Study of Baan Sai Thong, Amphoe Muang, Lampoon Province." The author discovered that there was mid-level community participation in the management of the community forest. In addition, it was found that the reception of benefits from the forest and the reception of information with regards to the forest had a statistically significant relationship with participation at the 0.05 level.

Boonchai (1982) researched "Participation in Forest Conservation by the Tambol Assembly Members: The Case Study of the Central Northeastern Region" and found that groups with good economic standing would have the highest level of participation, through investment of income and time involved in the implementation of activities. In addition, social standing was also a factor in establishing the level of participation in forest conservation in a statistically significant way. It could be concluded that if the communities still had low economic standings and continued to live in poverty, it would be difficult to encourage and promote the participation of the communities in forest conservation. However, other environmental factors also influence participation.

The forest management of the local administrative organization and communities have been given the duty to participate in the management of natural resources such as the forest and wild animals through the decentralization of authority from the central government to the regional and local authorities. Sungkasitthi (2000) studied on "The Participation of Tambol Administrative Organization Members in Forest Management: The Case Study of Amphoe Dahn Chang, Suphanburi Province." Through a questionnaire coupled with 156 interviews with the sample group, it was discovered that the sample group had attained primary school level education, had a low average income, and worked mostly as farmers, with only 17.3% who utilized the benefits of the forest (for a purpose of gathering mushrooms and other plants, for instance).

The results of this research have also shown that most members of the Tambol Administrative Organization (TAO) had a role in promoting and introducing the community members to the concept of plantation and careful watchfulness of forest

destruction in the area that is under the TAO's jurisdiction. Problems experienced in forest conservation included the fact that most people in the community are poor, thereby resulting in very low income for the TAO from the levied taxes as well as no budget for the implementation of conservation activities. In a near future, if the responsibility of forest conservation is given to the TAO in addition to all its other responsibilities, the strain on the TAO's abilities may reach a breaking point.

The Study Area

1. Location and Physical Conditions of Kon Watershed

Kon Watershed, a sub watershed of Greater Nan Watershed, located on latitude 10° 051"-101° 06"N and longitude 19° 15"-19° 25"E, was selected as a model for community participation in this research. The study area, covering Thung Chang district Chiang Klang and Pua district, Nan Province, is about 223.66 km^2. The most part of the study area is on Doi Phu Ka National Park.

Kon Watershed generally is setting on high mountain over 100 to 1,920 m.MSL 27 km by length and width. The Kon River whose flow direction from East to West with high slope (over 35%) is a major river of the Kon Watershed. Some areas are used for agriculture (shifting cultivation) with 150 cm. soil depth with a good drainage. (Figure 1)
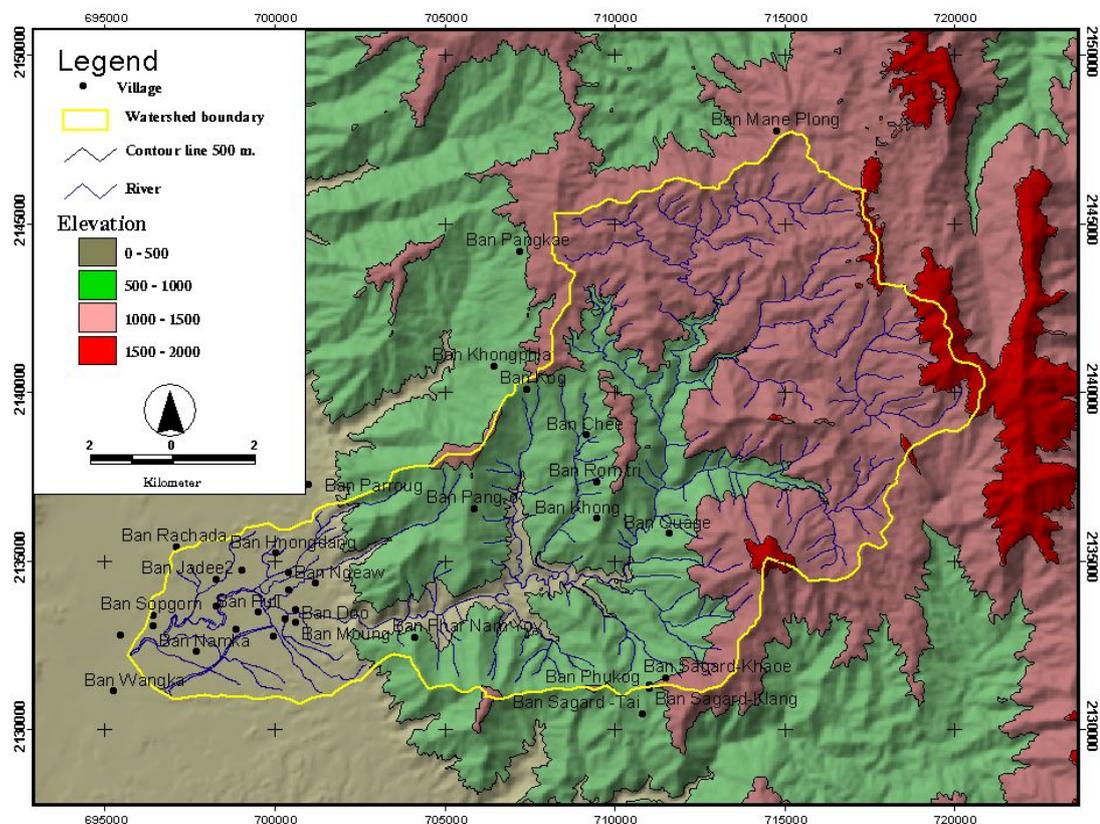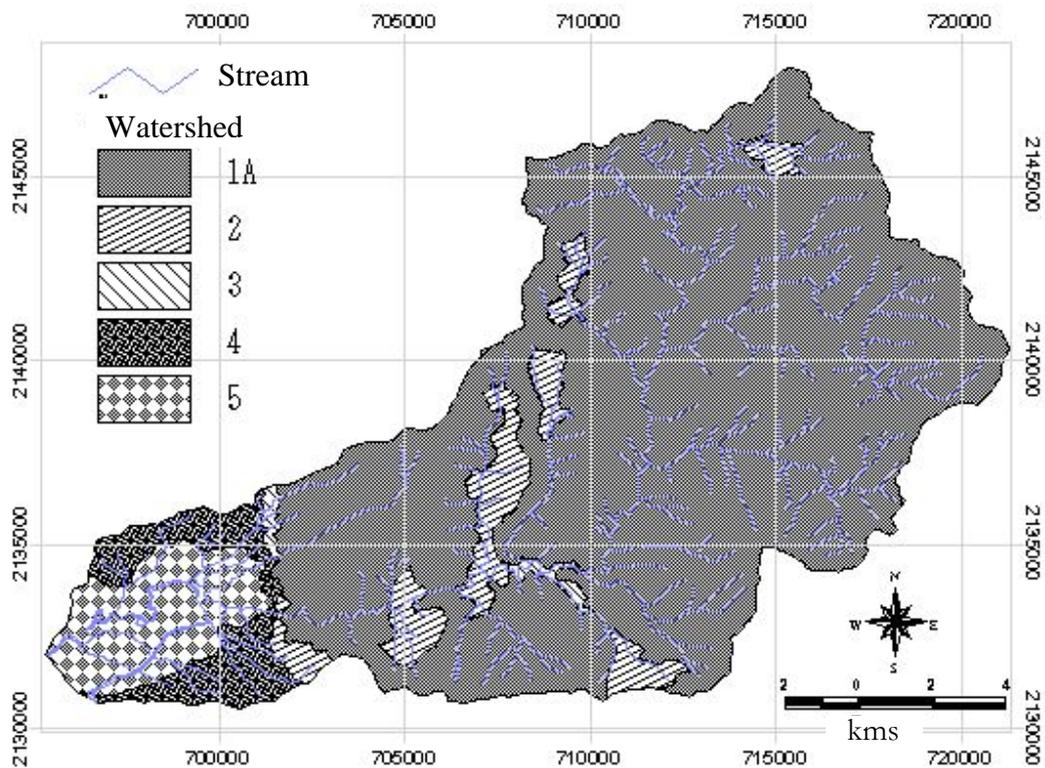

Figure 1 Kon watershed topography

2. Classification of Kon Watershed

Watershed classification in Kon Watershed is mostly 1A class (Table 4 and Figure 2)

Table 4 Kon Watershed class area

Watershed class	Area (km^2)	Percentages
1A	179.94	80.45
2	15.39	6.88
3	1.63	0.73
4	11.21	5.01
5	15.49	6.93
Total	223.66	100.00

Figure 2 Watershed classification of Kon watershed

3. Kon Watershed Community

The communities in Kon Watershed comprise of 25 villages (as known as Moo Baan) of 6 Tambol Administrative Organizations (TAO's) (Chiang Klang TAO, Phaya keaw TAO, Chiang Khan TAO, Sakad TAO Thung Chang TAO and Sobkon Mulnicipality) in 3 districts (as known as Amphoe) (Amphoe Chiang Klang, Amphoe Thung Chang and Amphoe Pua). At least 50 percent of the people is farmers. The

area has no infrastructure due to class 1A watershed but in fact people have been living here for ages. (Table 5)

Table 5 Community data (village, household and population) of Kon watershed

Location	Village	Household		Population	
Ching Klang TAO, Amphoe Chiang Klang	1. Ban Du	116		410	
	2. Ban Nong	119		450	
	3. Ban Chee	68	592	236	2,286
	4. Ban Kok	100		428	
	5. Ban Ngeaw	106		385	
	6. Ban Romsai	83		377	
Phaya keaw TAO, Amphoe Chiang Klang	7. Ban Phayakeaw	61		233	
	8. Ban Pha Nam Yoi	108	330	458	1,368
	9. Ban Kwad	117		485	
	10. Ban Muang	44		192	
Ching Khan TAO, Amphoe Chiang Klang	11. Ban Wang Ka	65	65	275	275
Sakad TAO, Amphoe Pua	12. Ban Sakad Nue	66		258	
	13. Ban Sakad Klang	176	529	742	2,202
	14. Ban Sakad Tai	163		686	
	15. Ban Phu Kok	124		516	
Thung chang TAO, Amphoe Thung chang	16. Ban Pang Kae	151	151	1,682	1,682
Sobkon Mulnicipality, Amphoe Chiang Klang	17. Ban Sri Udom	175		740	
	18. Ban Chiang Kom	147		561	
	19. Ban Jadee 1	172		671	
	20. Ban Jadee 2	180		532	
	21. Ban Sob Kon 1	569	2,053	2,018	6,855
	22. Ban Sob Kon 2	347		565	
	23. Ban Nam Ka	200		768	
	24. Ban Kan Na	174		647	
	25. Ban Phun	89		353	
Total		3,720		14,668	

Source: Department of Community Development (2003)