CHAPTER VI
DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

The study on "Technology and Community Innovation for Environmental Resources and Management: A Case Study of Water Resources at Ban Na Mai Community, Tambon Wang Pai, Amphoe Huaikrachao, Kanchanaburi" aims to investigate the situations and proposes to solutions for water management through community involvement. The whole research can be concluded as follows:

6.1 The community water situation

In 2010, Ban Na Mai Community had 586 people or 149 households living in 16,730 rai. Important water resources of the community are rainfall and five community's water reservoirs containing around 331,084 cubic meter/year. However, the demand for water in the community is 41,520,917.59 cubic meter/year. This clearly shows that the demand for water, by far, outnumbers the existing supply. In addition, the quality of water in the community is poor as the water contains floating sediments which is suitable for agricultural purposes.

The main source of water is clearly from rainfall and water distribution from local authority during drought. Water for daily consumption is from the water supply system which only covers 96 households and is set to release the water only twice a day in the morning and the evening. The public water resources available for consumption and use were artesian well and public pond with the size of five- rai of land. It was used to supply water in the community with the coverage of 96 households. There were also 4 public ponds with the water capacity of 82,230 cubic meter for husbandry purpose as well as for consumptions of those who lived in the closer areas. The public ponds were located on different areas based on lands donated by the local members. The villagers who did not have water supply system had built

their own water resources for household purpose. It was performed as the substitution for areas with no water supply system available as well as to lower the restrictions on artesian wells drilling that was costly. Furthermore, there were other relevant factors influential in developing water resources included:

1. Geographic conditions, hydrological conditions, and meteorology: The community was located in the rain shadow with the annual rainfall of approximately 970 millimeter. There was along drought period.
2. Production system: There were changes in water consumption in the community including agriculture and husbandry.
3. The conditions of water resources in the community: The conditions were shallow and lacked of maintenance.
4. Land ownership: Lands rented for agricultural purpose obstructed the construction of water resources in the areas.

When the current problems arise, it is necessary to develop water reservoirs in order to eliminate drought problems as well as annual water shortage. In addition, the community is able to plan on agricultural produce and perform more effective water activities such as the maintenance of soil moisture and fertility by paving water ways and constructing ponds, and the enhancement of residents' quality of life by setting social standards and solid water management system.

6.2 Proper water management through the community participation

Proper water management suitable for the local conditions comprised of the construction of ponds, water pathways, and check dams. The community members have worked together to develop the guidelines of the pond construction, water pathways, and water dams as well as to set up the community water organization in order to look after the water management. The agreements, rules, regulations, policy, and work allocations were made clear for equal and mutual benefit sharing. Furthermore, it would maintain the traditional way of living together in the community (Nethdao Paedkul and Montree Chandrawong, 2000).

For the guideline to solving water management problem, the community has used the community involvement including 5 processes (Jermsak Pinthong, 1983; Asin Rapeepat, 1988) as follows:

1. Analysis on water situation in the community which depends are:

- Information on water quantity in the area (who, what, and how….) including past and present, and concepts on technology suitable for community water management
- The analysis on community capability including strengths and weaknesses in order to eliminate the shortage problems in a sustainable way. The conclusions of water management are 4 patterns involving creating ponds, dredging waterways, constructing dams, and electronic water pumping stations

2. Plans that community shared the ideas and conducted: Everyone reaches the mutual understanding with the coordinators including those who are interested in supporting the ideas of working through involvement by setting up the volunteers working in one team.

3. Investment and resource allocation by community: Community role and leadership have been allocated. The waterway survey is conducted by Tambon Administration Organization and community. The pond size and water ways are designated. Budgeting, equipment arrangement, coordination, and collaboration with other relevant units are arranged.

4. Follow-up and evaluation on execution: The villages learned from each other to solve the obstacles and problems through discussion

5. Mutual benefits through involvement: Everyone realized the importance of the project and the aggregation to drive and move ahead with the community water management.

The community participation in proposing guidelines to appropriate community water management has come to the conclusion that there was no fixed pattern. It would take time and constant execution with sincerity. The execution of Ban Na Maicommunity had started from setting up the operating team and assigning roles for the local residents to take part in execution based on occasion and

opportunity. The operating team was set up to make the execution easy and convenient as well as to make the decision in each step. Nonetheless, the local residents were able to take part in each step of the execution in order to reach the goals.

6.3 Discussion

According to the information gathered from the community, it is found that the community has their own unique characteristics. Some factors causing development success in some areas might not be successful in some other areas. The development regulated by the outsiders might not be in accordance with the actual needs of the local community because the culture and social background.

Relating to the government policy and execution guideline, the government has assigned the leaders to be the policy acknowledger. However, the civilians did not have the opportunity to take part in consideration process. Therefore, the water management problems occurred in the community owing to the lack of the participation from the local members. It has been suggested that the leader elected by their own community is most appropriate. This has been a complex issue that has never been solved until these days to correspond with the needs of the residents. Therefore, in search of appropriate water management guidelines through the participation of government units, private sectors, civilians, and other relevant entities has become suitable for the water management in that community. Thus, the participation process of the local residents has caused the variety in thoughts. Besides the proper technology that meets the needs of local people, it has also helped the government to save budgets as well as manpower in maintenance (Chalong Dithsi, 1998).

At the problem solving for water management in Ban Na Mai community, the researcher believed that the villagers were able to solve their water problems. During the initiation of the process, it was found that the thinking process of the community members and the researcher were not matched. The community members were not able to change their thoughts simultaneously. They needed to take time to learn and understand about participation process. According to the public forum, the

ideas on water management were proposed as the villagers should divide their lands partly for agriculture and partly for building water storage for more productions. While members in the community stated that “the agriculture areas were rented, they were not able to build water storage”, the villagers, however, possessed the lands approximately 24 rai of land per person. If the lands were divided for the construction of water resources, the rice production would require the 35 tanks of rainfall quantity to produce per rai of land. Once water became available, the production would be up to 80-90 bushel per rai of land.

Although, the government has encouraged citizens in taking part more in solving water management problems, however the awareness in water use and the maintenance of water resources in the citizens were found to be less. The perception of villagers at the present moment showed that they still believed that there were sufficient amount of water and it was a free gift from a nature. Consequently, the support in participation and the development of the organization in problem solving are necessary to create the awareness in water use among the community.

6.4 Suggestions based on research conclusion

The awareness of Ban Na Mai community is likely to be in low level causing prior problems as tediously asking helps from the government so that raising environmental awareness among villages is needed for a better water and other natural resource allocation and management