

Participatory Program on Aquatic Environmental Education for School, Local and Tribal Communities in Some River Watersheds of Chiang Rai and Mae Hong Son Provinces, Northern Thailand

Chitchol PHALARAKSH

Assistant Professor, Department of Biology, Faculty of Science, Chiang Mai University,
Chiang Mai, Thailand
E-mail: chitchol@chiangmai.ac.th

Tatporn KUNPRADID

Lecturer, Department of Biology, Faculty of Science and Technology, Chiang Mai Rajabhat
University, Chiang Mai, Thailand
E-mail: tatporn_kun@cmru.ac.th

Munetsugu KAWASHIMA

Professor, Faculty of Education, Shiga University, Shiga Prefecture, Japan
E-mail: kawa@edu.shiga-u.ac.jp

Keywords: Aquatic Environment, Tribal Community, Environmental Education

1. Introduction

The project will provide the co-operation (field study) and collaboration (Knowledge management) between university staffs and local community members. The data collecting in field and discussion along corporate members will make an exchange between both sides, such as students, community members and hill tribe communities may reveal the environmental protection by their community spirits or the living behaviour. On the other hands, the university staffs will inform the method of environment protection to members of the other side. Finally, the knowledge will issue by combination between researcher (university staffs) and communities. The students and local community members will know about the serious factors which effect on their environments, especially the water for household consumption and agricultural activities. They will learn about protection of stream, the important of water for daily life used. However, the emotions or behaviours may not be improved clearly in the short duration. But they will be better in the future. They will be assigned to protect and monitor water quality. One of the key-point results will be shown that the decreasing of patient or illness in the operation area. The water quality monitoring activities will be continued for water quality investigation and protection. Furthermore, the participants who concern the knowledge can provide or show these activities to the other groups. The long-term and sustainable activities are the final aim of this project. However, the other indirect succeed is the emotion and inspiration to protect the environment in the participants, especially the students who will be grown up and will be importance part of their communities in the future. According to the purposes mentioned above, we started to study about the participatory program on aquatic environmental education for school, local and tribal communities in some river watersheds of Chiang Rai and Mae Hong Son Provinces, Northern Thailand.

2. Location survey

The area surveying was done following the map of Mae Lao and Mae Kham watersheds which located in Chiang Rai Province and Mae Yuam watersheds in Mae Hong Son Province, Northern Thailand. These areas are occupied by 4-5 different hill tribes living with local communities. Two main conditions as location and potentiality of each schools/ community are considered. The schools/communities should be located close to the streams and distributed around tributaries or areas of Mae Lao, Mae Kham and Mae Yuam Watersheds.

The several schools and communities of main streams/rivers are selected in Mae Lao watershed, in Mae Kham watershed and in Mae Yuam watershed.

3. Training

The participants selected from schools and local communities participate to the training course. In the year 2008, three workshops, several meetings and visiting were organized for the schools/communities in Mae Lao, Mae Kham and Mae Yuam Watershed. The two-days workshop were arranged July 2008 at Wiang Pha Withayakom School, November 2008 at Wiang Pa Pao Withayakom School, December 2008 at Sansuk Village. The workshops, visiting and meetings were as follows;

Workshop on 11-12 July 2008, at Viang Pha Vithayakom School (Mae Lao Watershed)

The participants were: 1) Wiang Pha Withayakom School (Mae Yang Mint stream), 2) Phaya Kong Dee Administrative Organizations (Mae Yang Mint stream), 3) Ban Hang Tam School (Mae Lao River), 4) Pong Neua Administrative Organizations (Mae Lao River)

Workshop on 26-27 November 2008, at Wiang Pa Pao Withayakom School (Mae Lao Watershed)

The participants were: 1) Viang Pa Pao Vithayakom School (Mae Lao River), 2) Thung Ha Withayakom School (Mae Lao River), 3) Mae Poon Noi School (Mae Poon Noi stream), 4) Mae Poon Lunag School (Mae Poon Luang stream), 5) Pong Ta Vee Mae School (Mae Lao River), 6) Pang Makad School (Mae Chang Kao River), 7) Tung Yao School (Mae Chang Kao River and Mae Lao River), 8) Viang Ka Long Administrative Organizations (Mae Lao River)

Workshop on 21-22 December 2008, at Sansuk Village (Mae Khum Watershed)

The participants were: 1) Sansuk Village (Mae Salong River), 2) Sanjai Village (Mae khum River), 3) Mae Sa Lab Village (Mae Sa Lab River), 4) Sansuk Moo 4 Village (Mae khum River), 5) Sansuk Moo 5 Village (Mae khum River)

Visiting the schools and Meeting with Teachers and/or Students

- Visiting and meeting on 7 May with a Akha Community leader at Sansuk Village (Mae Khum Watershed)
- Visiting on July Mae Sariang Boriphath School, Mae Hong Son Province
- Meeting with teachers and students of Wiang Pha Withayakom School, Wiang Pa Pao Withayakom School and Communities on 23-24 July 2008
- Meeting on 22 December with teachers and students of Mae Sariang Boriphath School (Mae Yuam Watershed)
- Meeting on 21 February, 2009 with teachers and students at Wiang Pa Pao Withayakom School

The training course in the workshop aims to give the idea and to make understanding about aquatic environment, the importance of water quality, the relationship between physical, chemical and biological components in streams/rivers and certainly, to create awareness of keeping water clean. The training course was divided into 2 parts as lecture and practical work. Lecture topics are simply defined as 1) general ecology and aquatic environment, 2) physical properties of aquatic ecosystem, 3) chemical properties of aquatic ecosystem, 4) biological composition of aquatic ecosystem, 5) human impacts, 6) calculation of ASPT, and the practical works are headed to 1) sampling techniques, 2) physicochemical parameter measurement: water temperature, color, odor, width, depth, water velocity, pH, DO etc. 3) macro-algae sampling technique, 4) aquatic macro-invertebrate sampling technique, 5) identification techniques. The equipments for measurement and collecting were distributed to each schools/ communities .

4. School Student Practical works

After the training course, trained participants would start their own projects. The target groups would be effective members of communities and final year of primary school students and second and third year junior high school students. The trained participants would be expected to transfer the knowledge and techniques to the target groups. Along this process, staff team visited the school as often as possible. Target students were set for group working in each area or village. Each group was assigned to do the practical works. These practical works were divided into 2 parts as basic physical-chemical team and biological team. Each group was assigned to collect the field data at least once a month, 12 months in total. The data including physical-chemical and biological data is collected from the stream and/or river close to their areas. The physical-chemical data are water colour, water odour, stream width, depth, water velocity, water temperature and pH of water. The data are recorded in provided data sheet by students. For biological data, the aquatic macro-invertebrates including aquatic insects, bivalve mollusk, gastropod (snail) and oligochaete worms and macro-algae are simply collected from different micro-habitat of stream/river. Then, the organisms are identified in field by using provided illustrated key books.

Both of the groups collect and measure the samples together. The responsibility of work is switched between each group within their area. When practical work is done in each collecting times, they make a briefly discussion. The data are prepared as a spreadsheet and send to the university staff directly via the local coordinators.

The meeting along staff team and participants were held at the selected villages several times after field study started. The meeting aim to discuss the problems and the progress of each school. Participants gave presentations of the progress and result of the project.

5. Data analysis

We used the evaluation method of water quality using aquatic macro-invertebrates (aquatic insects) and macro-algae. ASPT (Average score per taxon) is calculated from the scores of aquatic insects which are living in the target field, and ASTP is used as evaluation of the water quality. Identification of aquatic insects is not so difficult for students, and has a merit that chemical reagent or special equipment is not necessary.

We are planning to prepare Hill Tribe Participatory Evaluation Index. Hill Tribe Participatory Evaluation Index is an index that combines the factors related to the water quality and quantity, riparian activities and the feeling to the water. Aims of the determination of the index are to establish the utilization of running water for combination of water used and to express different graduates. The Hill Tribe Participatory Evaluation Index is one of many indices used as a tool to classify and reveal the situation of water quality. To calculate Hill Tribe Participatory Evaluation Index, measurements of some physical and chemical properties and riparian condition are needed. Those physical and chemical properties are water temperature, pH, DO, water velocity and some nutrition. The riparian condition are also including in the Index. The riparian activities are the riparian plants, the feeling of people that related to the water. The data from each factor will be process by 5 axial gradients. Each gradient will combine together for compare the situation of each sector and category. The Hill Tribe Participatory Evaluation Index of the investigation activities in each time can keep as the previous data base for net investigation. The changing of the sector and category in each investigation time can reveal the better of worse water quality in the stream.

6. Future Plan

We just started this project in 2008. We continue to study for at lease three years about the participatory program on aquatic environmental education for school, local and tribal communities, and we want to confirm that this program is effective on the management of the river and its watershed by March 2011.