

**A STUDY OF DEVELOPMENT OF LEARNING SOURCE  
IN NATURAL AREA AND COMMUNITY: MULTIPLE CASE STUDY**



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**ABSTRACT**

The objective of this research was to study the components, development process, social and environmental contexts, and results of the development of learning sources and to synthesize the approaches used to develop learning sources in the natural and community from multiple case studies

The research was qualitative and quantitative using observation, interview, document study, and questionnaires for collecting data, 26 key informants were selected through purposive sampling, snowball sampling and multi-dimension sampling. 82 questionnaires were used by purposive sampling, and analyzed by inductive method and statistics techniques including percentage and mean. Research results were as the follows:

Key factors in learning source development are analysis of learning topic, administration and human resource preparation, and co-operation network between community and school or organization. The important processes in the learning source development are teacher, trainer and community leader development, curriculum design and development, management and administration system development, and linkage of Formal Education, Non-formal Education and Informal Education.

Research results suggest that teachers and school or organization administrators should enhance human resource development, create network with the community, analyze learning topics and develop curriculum with community leaders, improve the flexibility of management and administration system to support learning source development and linking

**KEY WORDS :    LEARNING SOURCE / LEARNING SOURCE  
   DEVELOPMENT / COMMUNITY**

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การศึกษาการพัฒนาแหล่งการเรียนรู้ในพื้นที่ธรรมชาติและชุมชน: พหุกรณีศึกษา (A STUDY OF DEVELOPMENT OF LEARNING SOURCE IN NATURAL AREA AND COMMUNITY: MULTIPLE CASE STUDY)

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### บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษาองค์ประกอบและการพัฒนาองค์ประกอบด้านต่างๆของแหล่งการเรียนรู้ ศึกษาบริบททางสังคมและสิ่งแวดล้อม และผลของการพัฒนาแหล่งการเรียนรู้ในพื้นที่ธรรมชาติและชุมชนที่มีต่อผู้เรียน และเพื่อสังเคราะห์แนวคิดในการพัฒนาแหล่งการเรียนรู้จากพหุกรณีศึกษา แหล่งการเรียนรู้ที่เลือกศึกษา ได้แก่ แหล่งการเรียนรู้จากพหุกรณีศึกษา

วิธีดำเนินการวิจัยเป็นการวิจัยเชิงคุณภาพร่วมกับการวิจัยเชิงปริมาณโดยใช้การสังเกต การสัมภาษณ์บุคคล การศึกษาเอกสาร และการใช้แบบสอบถามรวบรวมข้อมูล แหล่งการเรียนรู้ที่เลือกศึกษา ได้แก่ แหล่งเรียนรู้ของศูนย์กิจกรรมวิทยาศาสตร์ทางทะเลและการอนุรักษ์ โรงเรียนรักเจ้าพระยาภัตตาคารพิเศษ และโรงเรียนบ้านสันมะเค็ดสันจี้เหล็กหัวฝายพัฒนา คัดเลือกกลุ่มตัวอย่างในการสัมภาษณ์จำนวน 26คน โดยวิธีการสุ่มตัวอย่างแบบเจาะจง การสุ่มตัวอย่างแบบสโนว์บอลล์ และการสุ่มแบบหลายมิติ กลุ่มตัวอย่างในการตอบแบบสอบถาม จำนวน 82 คน คัดเลือกโดยการ การสุ่มแบบเจาะจง และนำมาวิเคราะห์โดยวิธีอุปนัย ร่วมกับการใช้สถิติร้อยละ และค่าเฉลี่ย ผลการวิจัยสรุปได้ดังนี้

ปัจจัยเงื่อนไขที่สำคัญในการพัฒนาแหล่งการเรียนรู้ ได้แก่ การวิเคราะห์หัวข้อการเรียนรู้ การบริหารและเตรียมความพร้อมด้านบุคลากร และเครือข่ายความร่วมมือระหว่างหน่วยงานและชุมชน กระบวนการสำคัญในการพัฒนาแหล่งการเรียนรู้ ได้แก่ การพัฒนาครู วิทยากร แกนนำชุมชน การสร้างเครือข่ายการทำงานระหว่างครูกับชุมชน การสร้างและพัฒนาหลักสูตร การพัฒนาระบบการบริหารที่เอื้อต่อการพัฒนาแหล่งการเรียนรู้ และการเชื่อมโยงการศึกษาในระบบโรงเรียน การศึกษานอกระบบโรงเรียน และการศึกษิตตามอัธยาศัย

ข้อเสนอแนะจากการวิจัย ครู และผู้บริหาร โรงเรียน และองค์กรที่เกี่ยวข้องกับการพัฒนาแหล่งการเรียนรู้ควรให้ความสำคัญกับการพัฒนาคน การสร้างเครือข่ายการทำงานร่วมกับแกนนำชุมชน การวิเคราะห์และสร้างหลักสูตรที่ตอบสนองความต้องการของชุมชน ตลอดจนพัฒนาระบบการบริหารจัดการที่ยืดหยุ่นเอื้อให้เกิดการเชื่อมโยงระหว่างการศึกษาในระบบโรงเรียน การศึกษานอกระบบโรงเรียน และการศึกษิตตามอัธยาศัย

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## CHAPTER 1

### INTRODUCTION

#### Significance of the problem

Learning is a very important activity in human lives. It is a continuous process that occurs anytime and in any place. It has an important role in developing human intellect for living together in their society and being harmonious with nature and the environment.

In the age of Thailand's educational reform which focuses on students' learning processes, educators have proposed various instructional approaches that aim to respond to the National Education Act of B.E. 2542 (1999), especially to Chapter 4, National Education Guidelines that has some important concepts as follows:

- Learners are the most important agents in the learning process (Section 22).
- In organizing the learning process, educational institutions and related agencies should organize the learning activities for learners to learn from direct experience and to drill in practical work for complete mastery. Also the activities should enhance learners' critical thinking, reading habit, and learning desire. In addition, the instructors should create "the ambience environment, instructional media, and facilities for learners to learn...In so doing, both learners and teachers may learn together from different types of teaching-learning media and other sources of knowledge" (Section 24).
- The government should support the establishment and management, in sufficient number and in an effective way, of all types of lifelong learning resources such as public libraries, museums, art galleries, zoos, parks, botanical gardens, science and technology parks, sports and recreation centers, data bases, and other learning sources (Section 25).

- Educational institutions should cooperatively work with families, communities, local organizations, local administration organizations, private agencies, private organizations, professional organizations, religion institutions, enterprises, and other social institutions to strengthen their communities by organizing learning activities within their own community (Section 29).

The learning activities, promoted in this Act, can be organized in any style—formal education, non-formal education, or informal education—that aims to encourage learners' simultaneous, lifelong learning.

According to the concepts from the National Education Act of B.E. 2542 presented above, all agents in the communities, with the coordination of the schools and communities, should play a role in organizing the learning process. R.J. Fisher (cited in Nittaya Kittiwetchakul, B.E.2542) stated the importance of local communities as learning bases that,

Learning will be efficient if the community is the learning base because children learn, not only from experts, but also from the members of their family and their local community. At the same time, the community members also can learn from children. This kind of learning can be a collaborative learning that; first, the community members engage in the activities themselves, and secondly, when the community members are challenged by children's questions, they have an opportunity to think more critically about what they are doing and why. Therefore, effective community-base learning creates greater educational benefits than classroom-base learning.

The learning processes that use the natural and social environment of the community as the learning source, through the processes of sensing, perceiving, acquiring, and learning, are important strategies that help learners make a connection between the knowledge they gained from the classroom and the application in the real world. Through these learning processes, the learners will learn to understand themselves and the context of the community they live in and become ready to be good members of the local community as well as of the world ecology.

From the review of previous studies on the learning process management, the researcher has found that the following is the characteristics of the learning activities

that were used in the learning process that uses the natural environment and community as learning sources.

1. Changing the learning atmosphere by taking the learners to see the real environment and community
2. Using the environment and community as a media or source of information for the learning activities
3. Conducting field studies to practice data collection skills, analysis skills, synthesis skills, and presentation skills.
4. Conducting studies in collaboration with the local community to solve problems and develop the community and the environment

In addition, the review of the literature also showed that, by using the natural environment and community as the learning sources and developed the learning sources continuously, some instructors and learning activity organizers expanded the potential of the learning sources to serve all levels of learners and from all types of education: formal, non-formal, and informal. To organize the learning activities, these instructors and learning activity organizers created an interdisciplinary program that integrated the contents and learning processes of various subjects together with the content of environmental education as the core of the curriculum and activities. This kind of educational management matches with the concepts of environmental education management has an emphasis on the integration of various disciplines through three learning dimensions of environmental education: learning “about” the environment, learning “in” the environment, and learning “for” the environment, and on the learning activities that enable the learners to learn from their direct experiences in the environment (John Fien, Debbie Heck, and Jo-Anne Ferreira, 1997).

Those characters differed from researches which researcher had primary studied in many aspects, such as most researches were using knowledge sources or community knowledge sources as a part of learning in normal classroom by separated to each subject such as an invitation of local instructor to career and technology classroom, using local legends in social studies classroom or in some case learners go to collect some information from community area. But never had seriously developed any natural area and community to be a learning source which learners can touch, take part in the problem, analyze, collect information for cooperation with community to

present correction of the community problems or have a learning activity which continuously both direct and indirect to the results.

In addition, most researches were quantitative researches which use survey research method which had given width views more than depth views. Some results of previous researches encouraged researchers to see the interesting problems in the next research. Especially in point of many component of learning sources in natural area and community where had different characters upon to the context of each area. Including development processes of many components of those learning sources thus these information characters were qualitative information which was suitable for in-depth research which used more qualitative research method. Furthermore researchers considered about limits in aspect of the difference learning sources development in each area. Selection only one case study might not get enough overview images and comparative acknowledgements. So, the researcher interested in the title of A Study of development of learning source in natural area and community: multiple case study.

### **Objectives of the Study**

1. To study the components, development processes, social and environment contexts, and effects of the development sources of learning sources in natural area and communities from case study and multiple case study.
2. To synthesize the approaches used to develop learning sources in natural area and communities from multiple case study.

### **Research Question**

1. What are the components of the developed learning sources?
2. What are the characteristics of the development processes of learning sources?

3. How do the various social and environmental contexts in each learning source affect the development processes of the learning source?

4. How does the development of the learning sources affect students, teachers, organization members, and communities?

5. What are the activities and the operations of the development processes of learning sources in different natural areas and communities?

### Research Scope

The study areas were the following three learning sources in natural area and communities that were obtained by using the specified sampling and were classified by the categories of natural ecosystem and community.

1. Coastal ecological area's learning source was the learning source of Marine Science Activities and Conservation Center: the MSAC Center, Samaesarn Sub-district, Sattaheeb District , Chonburi Province.
2. Fresh water resource ecological area's learning source was learning source of The Magic Eyes Chao Phraya Barge Program: The Barge
3. Forest ecological area learning source was Ban Sunmaked Sunkheelek Huafaipattana School: Ban Sunmaked School), Wiang papao District, Chiengrai Province.

### Definition of terms in research

**Learning source** means a natural area and community which were developed for many form of learning activity management.

**Learning source development** means a procedure in natural and community development for learning activity management.

**The components of the developed learning sources** means basic components included curriculum, learning program, learning activities, educational trail and

station, learning media, learning assessment, trainer and facilitator, and management and service.

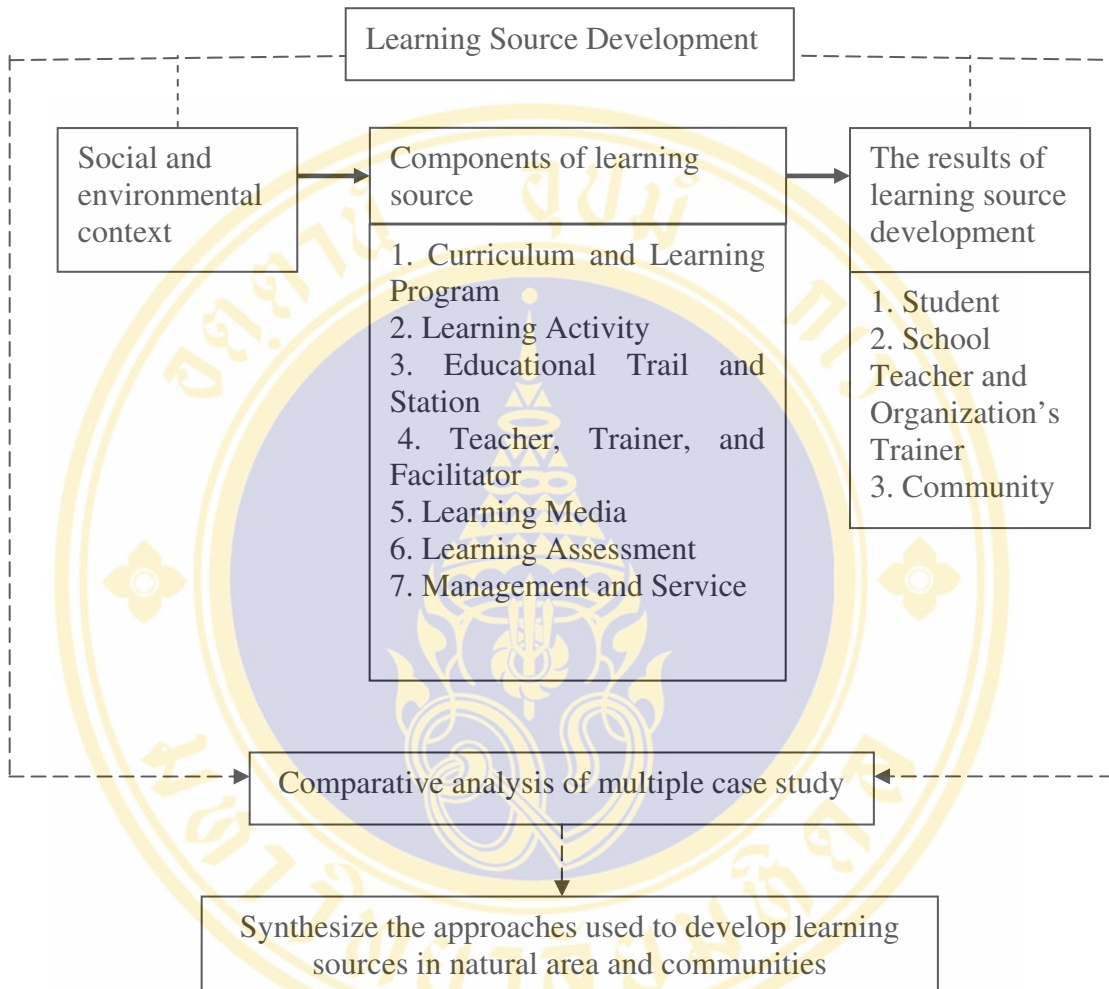
**Social and environmental context** means learning source's context included leadership and social structure, cultural characteristics, natural characteristics, local organization and related organization's administration, related policy and laws, relationship between learning sources and community.

**The results of learning source development** mean which effect to learners, personals and organizations and associate to community.

### **Primary Agreement of research**

Since this research was a narrative research which use qualitative research method regulations associated with historical research method which researcher had used as an important tool to collected information, analyzed and evaluated the reliability of information. And including definition and conclude research by inductive method which was a specific character of qualitative research method regulations which differ from quantitative method regulations.

## Conceptual Framework



## Limitations of research

Since this research was a multiple case study research, to get both overview images and comparative acknowledgements about natural area and community learning source development from many dimensions all of sea shore, forest and water resource ecological area. Each case study has the differences context of local area, time interval to collect informative field of each case study must flexibly and appropriable and simultaneously proceeded some case study because the researcher could not identify the distinct time of the study in each case. Furthermore researcher

had concentrated study on an importance of learning source development as emphasis. Studying of local area context where learning source locate might not enough intensity and could not cover which differ from the only one case study of ethnography research.

### **Expected Usefulness**

To gain overview and comparative acknowledgements about natural area and community learning source development which synthesize from many dimensions of study by multiple cases study method which can use as primary information to apply for the other areas later on.

## CHAPTER 2

### LITERATURE REVIEW

As documents and research report related to this research, the researcher has studied from textbooks, documents, journals, research reports and related field of research for the research guide line. This report consists of the following:

1. Learning Source
  - 1.1 Definition and components of learning source
  - 1.2 Categories of learning source
  - 1.3 Approach of learning sources' management and presentation activities
2. Using nature and community as a learning source for environmental education
  - 2.1 Values and importance
  - 2.2 Learning management by using natural areas and communities as learning sources
  - 2.3 Preparation and arrangement
3. Cases of learning activities by using natural area and community as a learning source
  - 3.1 Local curriculum management to support the learning in nature area and community
  - 3.2 Educational trail and station development and planning for used as learning source.
  - 3.3 Community resource mapping
  - 3.4 Service Learning
4. Cases of development of learning source in natural area and community
5. The related research

## 1. Learning source

### 1.1 Definition and components of learning source

Learning source is a word that similar to Community Resource by emphasizing on Learning Resource in many forms such as learning media not only persons but also objects and places which are employed in useful learning Nancy Osborn (1994) said;

Community resources can be people who provide information for teachers or visit their classrooms. Community resources can be places to visit. And community resources can be things to borrow or even have donated for classroom use;

People: staff from resource agencies and non-profit organizations, city employees, business owners, scientist, activists and parents

Places: nature centers, public works facilities, businesses, resource agencies, factories, state and national parks and laboratories

Things: simulation games, posters and activities, scientific models, information videos, environmental monitoring instruments and used computer equipment

Besides being sources of information and activities, community resources can help teachers integrate EE into their curricula while strengthening school-community relationship. They can expand the teacher's knowledge. Most importantly, they can spark students' interest while helping them learn relevant skills and concepts.

Naowaratana Likitwatanaset (2544) stated about definition of learning source which can be concluded that learning sources are the land residential area, original places, estate and knowledge centers where can enter to discover knowledge, understanding and expertise. So, learning sources may be nature or man-made environment, person, living things and non-living things. Moreover learning sources may be in classroom, inside, or outside school.

Saisuree Chutikul (cited on สี่อพลั้ง, 2546) said learning sources are not limited. Department stores, sports centers, and markets can be good leaning sources because learning is not limited to reading only. Public places in communities can provide learning of social skills, which is as necessary to life as knowledge learned in educational institutions. In addition, there are other electronics media. Learning sources are not limited to places. They should include "persons".

Learning source also means the source of all of learning resources which appear in any area which can be natural areas or communities where people live in. By managing or developing in learning management. Learning sources focus on the location where learning resource are overviewed and consist of person, learning media including sets of activities or management program which express both natural and cultural meaning in each area.

In the aspect of the components of learning source, Tassanee Supamathee (2532) stated that learning resource was the important component of learning source which consists of these following resources;

1) Human resource; Each locality frequently consisted of people who have knowledge, potentials, special academic abilities such as career, religion, culture, governing, public health etc. which may classified to 2 categories as :

1.1) Local instructors are people who have location, house and work in which locality such as government officers, merchants, gardener, farmer, monks etc.

1.2) Visiting instructors are a person in the other locality who are invited or visit community. Teacher should consider to invite these persons to be an instructor who give the knowledge to learners such as educational supervisor, development officers, government administrative officers.

2) Natural resource, for example, natural thing which teachers can use in learning and teaching. To make learners have knowledge, understanding, right visions and appreciation in their value such as rivers, canals, bays, oceans, forests, mountains, soil, stones, ores, waterfalls, plants, animals in locality etc.

3) Social resources means any man-made environment with purposes objectives, such as for learning, for understanding, for happiness and for enjoyment. These constructions; for example, public libraries, local museums, temples, churches, mosques, clubs newspaper reading houses of the village and work places

Chaiyos Imsuwan (2544) stated about components of learning source that should be considered as following:

1) Learning source, itself which emphasize on places where are managed to be a learning source location

2) Activities that may produce learning which has interactive processes between;

- People and People
- People and Group
- People and Media
- Group and Group
- Group and Media
- People and Event
- Group and Event

These interactive processes may happen in individual, or in group without any relations. At the same time, there is a relation which is based on conversation for exchanging knowledge between each other which may be formal or informal, intended or unintended depending on the leading of situation.

3) Educationalists who administrate learning activities.

4) Learning source management which is able to build up the environmental atmosphere of learning.

Thus, the study of each learning source must totally be considered of the characteristic of location where learning source locates. Learning activities and learning resources which appear may emerge by nature, be instructed or developed by thing or persons that has responsibility in the management and policy concepts which related to learning source.

## 1.2 Categories of learning source

To classify categories of learning source, many educationists presented following concept.

Wichai Prasittiwudhiwech (2535) classified learning resource as a component of learning source into 4 categories as following

1) Learning resources inside school, it can be things, person or places which are in school. These are source which help learners to learn all of learning and teaching activities, and extracurricular activities. Instructor should qualitatively consider and assign to their learners. Example of learning resource:

1.1) Persons in-school such as, teachers, and school officers who have knowledge and competence.

1.2) Learning media which learners can learn by themselves, for example corner about experience management, occasional exhibition management, offering services in classroom or knowledge centers such as learning media center, instant lesson etc.

1.3) Places where are learning resource inside school such as laboratory, apprentice house, audio-visual room, green house, seedbed, co-operative shop, including classroom.

2) Learning resource in group of schools such as personal who have responsibility group's knowledge, library knowledge centers, learning media etc.

3) Learning resource in locality which can be things, persons or places depending on instructor. For example:

3.1) Material sources which are in locality such as soil, stones, ores, woods, plants etc. they can help learners be conducted to knowledge, understanding and have the right vision and appreciate of these source.

3.2) Persons in each locality who have knowledge and competence in specific skill .They could be invited to be an instructor who can give good experiences to learners such as:

3.2.1) Local instructor such as those who has home and work in locality such as officers, merchants, farmers, skilled craftsmen , villagers etc.

3.2.2) Guest speakers such as those who are persons in the other locality who are invited or visit community sometimes such as educational supervisor development official specialist in each branch etc.

3.3) Place which are built for education or recreation. They are useful for learning and teaching, and could be categorized into:

3.3.1) Public library, village's reading rooms where learners can seek knowledge by themselves.

3.3.2) Local museums where cultural art, valuable materials are collected.

3.3.3) Important places within community such as official places schools, colleges, clubs, interesting groups, career training centers etc.

4) Outer local learning resource

Sumon Amornwiwat (2544) classified categories of learning source in community and natural learning source as following;

1) Community's learning sources and natural learning sources either public set up or originate by nature.

2) Learning sources in community where stated and public set up such as learning parks in a temple and in a community, history parks, national marine parks, locally national mountain parks, cultural and traditional centers, juvenile centers, community handicraft centers, libraries, public libraries, museums, local museums, community museums, natural museums about plants, animals, soils, stones, ores etc. These learning sources are everywhere in a country with well management, pleasant atmosphere and the instructors who excellent in giving knowledge in each branch to learners.

Other categories of learning source in community are community's institutes where already exist in living way and earn a livelihood in community such as churches, abbey pavilions in temple where are places to make traditional merit, grocery shops and markets where are people's congregate source, threshing yard, small plants in villages/forests/creeks, marshes, canals, swamps where villagers go to find food, collect bamboo shoots, collect mushroom, fishing etc. Everywhere are natural class room where broaden open for create atmosphere and great imagination.

Chaiyos Imsuwan (2544) classified categories of learning source base on administrative establishing purpose into 2 categories are.

1) Learning source where were established for learning purpose such as public libraries, museums, botanical gardens, science and technology parks etc.

2) Learning source where establish for another purpose by have or no have objective for learning such as art halls, sport and recreation centers, zoos, public parks etc.

According to the presentation, it may be concluded that classification of learning sources has many methods depending on measures of classification such as scope of area where learning sources appear, organization or group of establisher and objective to establish these learning source.

### 1.3 Approach of learning sources' management and presentation activities

Activities management and presentation in each learning source where have specific characters both of natural and cultural characters which have the difference for each area. Chaiyos Imsuwan (2544) discussed about the interesting concepts of learning source and activities management in learning as following ;

In each learning source will have natural characteristic. Management is non-manage by maintain stated of learning source for learning purpose or for other main purposes, however, should let it be as natural of that source. Management for learning is only the addition without seclude from nature of that learning source and should be harmony with learning source as its activities.

Learning activities management is an incentive to learning more, exciting, worth, and be a matter which persons create their learning by themselves, may have educationist who encourage learning.

Learning activities management in learning source should be accompanied in which activities management by community to prevent separation of learning from real life of person, and deep into each person's intellect.

Learning activities management is not necessarily to have any special management. Even if it is only a place where people come to sit and chat which enough to be a learning source. Then it is developed to talk about main point in learning source and change to the informal learning exchange which make activities management in learning source to be alive.

According to previous concept of Chaiyos Imsuwan (2544) presented that focused on the most consistence of nature and culture which are appearing naturally. Learning activities are only some things which occurred on that area in a period of time. It should not have the different or change from the original characters. Furthermore other focused point was to link community to join in a learning activity management to make learning in accordance with real condition in daily life which has flexible, informal characters and link learning to normal living way.

Saisuree Chutikul (cited on สือพลัง, 2546) presented an idea about learning activities in learning sources should be creative and touchable, able to attract people to get the service and thorough information. Museums, for instance, in addition to the

content display, should have presenters to provide information, explain and answer well-rounded questions. Videos and appropriate technology can be used to make the presentation more interesting to stimulate the curiosity of the public. This is to encourage their continuous research. Target groups should also be taken into consideration. For example, there should be different approaches in presenting information to children and adults.

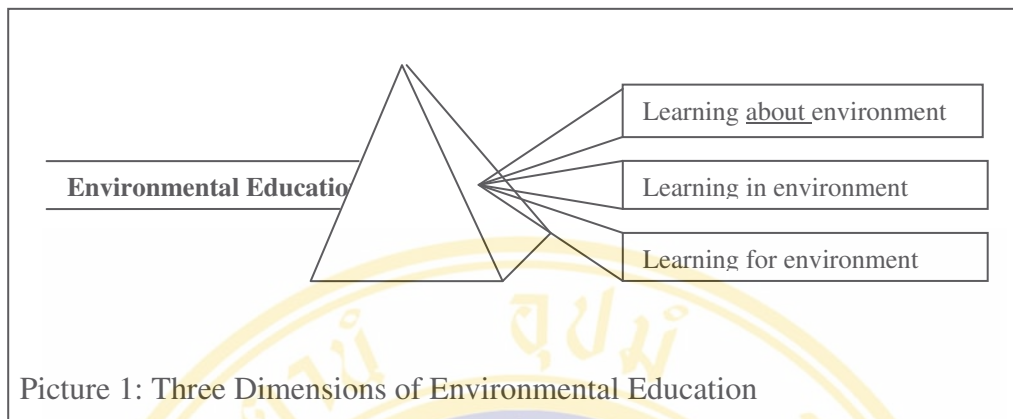
Presentation of any learning activities in learning source should have characters which focus on the learners to have a chance to do the real operation. Managing activities should be creative, encourage learners who are different. There are various of learning media and resource which use in learning source including should consider the perfection and accuracy of knowledge which are importance to manage for learners in order to encourage learners to be enthusiastic and interested and want to research more.

## **2. Using nature and community as a learning source for environmental education**

### **2.1 Values and importance**

Environmental education is educational management processes which focus learners on learning, development understanding about environment and relationship between human and environment, have desirable behavior purpose and aware of their role to stay with environment including participate to conserve and develop to create endurable environment.

Important focused points of environmental education activities management are modified thinking method and learners' temperaments and behaviors through 3 dimensions activities which covered all of environment learning (John Fien, Debbie Heck and Jo-Anne Ferreira, 1997) are learning about environment, learning in environment and learning for environment (see Picture 1).



An importantly prominent point of environmental education is learners can learn everywhere and every time both learning inner and outer school system and in way of living. Since knowledge components of environmental education are in everything around the learners included natural environment, and socio-cultural environment which were built by human. The environmental education management for learners is only clarify the communication of meaning which was concealed in natural and socio-cultural environment by integrate concepts from many disciplines altogether, for learners who can consider and learn environment as a holistic approach.

Nature and communities, the environment surround children, are the most important learning source where help learners to have chances to learn from real conditions, instructor or intellect of their community. Substances of learning are subjects and problems which really occurred in community. Sumon Amornwiwathana (2544) stated about the values of learning source in communities and nature as following.

Communities and nature are the great treasures where we can discover the never ending knowledge. We learned many subjects from communities such as relationship between groups in community, traditions, histories community's worships, religious learning sources, cultures, careers, earn a livelihood in community, phenomenon and situations etc. which occurred and effected to people's life in community.

Let learners have chances to go out off class rooms to touch natures, societies, and local intellect will help them to have direct experiences to living, to learn and discover contents of knowledge beyond textbooks. Teachers also have chances to

exchange learning with learners. These are actively brilliant learning atmosphere which lead them to activities, participating in thinking practice and various imagines.”

Learning processes, use environment and communities as a learning source, are the important strategies to help learners link knowledge, world of learning and world of truth altogether through absorption, recognize, learning and join in feeling accord with Sumon Amornwiwathana's concepts (2542) that were presented as absorptive learning processes management concepts which focused on the truth of life and environments. By focused on learners to touch and relate with natures to make learners love and protect environment.

Sumon Amornwiwathana (2544) presented basic concepts for educational management which were expanded to wide area to the communities and nature as following.

- 1) Learning could occur to everyone in everywhere at every time.
- 2) There are lots of communities' learning sources those are establishing organizations, communities' institutes, living ways, earn a livelihood, tradition, worships and natural environment.
- 3) Well learning arise from all parts which create networks of linking experiences, and form the learning societies and good ness societies.
4. Learning from learning sources in communities and nature are happiness process, create thought and valuable life experiences.

Furthermore, there are many educationists expressed their opinions about value and importance in learning processes management which use nature and communities as learning sources such as

Prawes Wasee (2543) stated about the importance of the expert in each branch who live in communities and support learning of learners, and expressed his perspective about the usefulness which will arise if these experts have a chance to join in learning management. He stated that “In communities have many more expert in each branch than teachers who only teach students to recite their books, these experts are agriculturists, mechanics, artist, religious experts, local doctors, small business owners, community's leader, folk philosophers, etc. The community's leaders who are thinkers, moralists have more intellect and goodness than the other people in high level. If schools open to their community in order to give a chance for teachers and

students learn from teachers in their community, they will have so many variety teachers who exactly understand to do. So they will make learning to link with the real practice, learning will be enjoyable. Importantly, this will be an adjustment of value system which our old education system taught to insult these valuable people. When these experts became teachers, level of value, prestige, and pride of community will be strongly raised up and weave their social relations.”

Pasinee Piampongsant (2536) stated about benefits of using communities as a learning source for learning and teaching that “Using communities as a learning laboratory, to practice intellect and social skills from babyhood, will make learners to learn more about their community such as understanding in community’s problem. Learners will be familiar with problems and develop the necessary skills to amend or at least try to amend. Further more importance, they will feel as a part of their community and more pride in their community”

Kleaw Nilsoom (Referred in Amornwitch Nakorntup, 2541), Vice Chairman of Watnongmoo school, Payuhakiri District, Nakhon Sawan Province presented idea that “I think ,if teachers only teach in front of a class room, explain on blackboard , certainly it can explain. But when their students go back to home, they will forget the knowledge which had stick on the blackboard. If learn by let learners go to rice fields, knowledge will stick in their eyes, their minds, and their hands, can do when go back. Children had never learned which how difficult to get rice if they learned only drawing the ear of rice but had never handle a beam of plough to know how tired, never know how to do transplant rice seeding, transplant paddy sprout in the field, harvest rice, is it as same as tired, isn’t it”

Amornwitch Nakorntup (2542) presented his perspective about learning which give occasions to learners to touch natural that “We can’t teach children to love nature by telling them to recite and to memorize or could not to force or squeeze love of nature out from them. Children will really love nature when they touch and be a part of the real nature. And then, love and cherish in nature will be sustain”

Joseph Cornell (2541) stated about worth of learning by touching nature that “I had never overlooked the worth of period of time when touched and went to the natural world. I had seen from my own experience and from the others that we can nourish our feeling and acknowledgement deeper than the past, maintain until they

became the real understanding and very importance which related to the external world.”

Soren Brieting (2546) concluded that students will receive benefits from touching with nature as following

Retrieving, surveying research and to have experiences in nature are the important motivation to students because;

1) Passing of the field experiences will give students occasions to admire works in the real world not only the assumed world in classroom.

2) Real doing in the field make students to practice according to the theories which learned from class room, and on another hand students can take experiences and information which received from the field to classroom for widely develop knowledge later on.

3) Outer class room experiences including unexpected experiences which will be the important base to stimulate students to learn and use in class room. Generally, experiences in nature are well experiences.

4) Field experiences will make students have continuous, tight and incredible knowledge which unforgettable.

5) Social relations among students during in the field often see that behaviors which present relation between each other of students differ from in a classroom. Changing of behavior of students will well effect to their social aspect which it is an importance for learning in classroom later on and including make better relation between teachers and students too.

The conclusion is everyone state that working in a nature and using nature as the same as classroom will always be valuable.

From the previous concepts, they may be conclude that value and importance of learning management use natural area and community as learning sources. For example, having loved, attached and being a part of the nature and the community by learners will be able to analyze and to understand the social and environmental context, self-knowing, ready to be a good member of the rural community and a good member of the world ecological system. Furthermore, the community as a learning source should join with a learning management to stimulate member of community to

learn and to aware the individual role in self-participation of being apart in learning management for the member of the community.

## **2.2 Learning management by use natural areas and communities as learning sources concepts**

In aspect of learning management by use natural areas and communities as learning sources, there are many educationists who had presented their concepts as following

Nitchaporn Suksawatamnuay (2541) had analyzed learning resources which used in community to compound studying and teaching concepts as follows:

1) Take learning resources in community to learners is taking learning resource in community that may be personnel or instructors, materials, equipments or living things which may be plants, animals to compound studying and teaching in schools or class rooms such as invitation the experts or instructors to lecture their concepts or demonstrate to learners to listen radio or watching television program etc.

2) Take learners to learning resources in community is taking students to study from learning resources in community which schools were located. In case which can not take learning resources to use in class room because of learning resource is a place or can not move or other reasons which learners necessarily go to those learning resources which may use traveling such as taking learners to see the landscape in community to compound lesson, taking learners to see a bureaucratic office near their school, see a museum, an archaeological find, zoos, rivers, canals or teachers can advise learners to research from outside libraries or interview people who has skills in community or join the activities of community etc.

Amornwitch Nakorntup (2541, 2542) synthesized concepts about learning processes through environment and communities from many cases of example such as; Curriculum of Ecosystem in the Rice-field of Watnongmoo School, Non-toxic Vegetables Cultivation Project of Banwangsawaddee School, Bansunmaket Community Forest School, Submarine Classroom Project of Plutalaungwiththaya School etc. had finalized the conclusion as “Environmental Learning Strategy” which has 4 strategies as following:

Strategies	Example of activities
Doing-Thinking-Learning by themselves	<ul style="list-style-type: none"> <li>- going to the forest, river, rice-field, collecting garbage touching injuries which nature were injured by human to feel these afflictions by themselves.</li> <li>- cultivate forest, coral, non-toxic vegetable, make natural fertilizer, separate garbage, make goods from waste to sell</li> </ul>
Community is a partner of learning	<ul style="list-style-type: none"> <li>- join to teach children, take tour the forests, gardens, invite children to see “reach community”, join to analyze and solve problem together</li> <li>- support resource and learning media, tell teachers that community is always beside teachers.</li> </ul>
Use group process show their power	<ul style="list-style-type: none"> <li>- arranging environmental camp activity, establish brotherhood and bucking to solve problems altogether.</li> <li>- brainstorming activities to make children’s potential and goodness, create good things by freedom from teachers.</li> </ul>
Conclude as a systematic knowledge	<ul style="list-style-type: none"> <li>- setting simple exhibition by using low cost things but expensive in concepts which present.</li> <li>- let children compose their story to make their imagination.</li> <li>- telling story and presenting in front of the class room to make self-confident.</li> </ul>

Carol Landis (cited in Thanatip Chuttapoot, 2545) had noticed about learning out of schools in the natural area as follows;

Using benefits from places which will go to, usually in the narrow point of view of any place make too much lost of occasion from learning. For example, learning in the natural sources, most people focus aspect to learning in natural subject only instead of there are so many aspects such as

Socio-economic aspect; people in those natural sources can use any benefits from their natural environment or what are things in those natural areas which can be the income sources for people.

Cultural aspect; Are those natural sources as a habitat of any communities?, What are their chronicles?, and How are relations with that area ,more or less ?

Conflicting aspect; What are the conflictions between people and natural environment in those areas?

If the teacher have a good planning, it will make more purpose for the learners from outside learning.

Soren Brieting (2546) observed about teaching which emphasis on natural learning sources. Thereby analysis about a different emphasis point in natural education to inculcate natural conservation with environmental education which develop and focus on participation of learners in considering conflicts and issue about environment in community as follows;

“Something we have got from experiences will be depended on pre-field preparation method, field meaning media and pre-field data developing. But if we have an over emphasis learning from the nature, it is possible to be regardless some relate condition in investigation for nature phenomena meaning presented. This may be lead to mistaken. There are noted for teaching method which started in the nature, if the natural education have a goal to prevent the environment crisis in the future. But this noted not related with a value of pure science from natural experience teaching. An important result from natural experience is a good feeling to meet nature and life. Accordingly, this method may be state as highly motivation or inspiration to natural conservation. But the weak point of this method is knowledge development about environmental issues. These issues are complicate contradicts in the community and finding these solutions.

In part of leaning activity plans which base on environment and community sources, Joshep Cornel (Suriya Jarayaphunta, 2541) an important American natural educationist proposed the concepts of environmental learning activity plans which called “Continuous learning”. It based on basic principles such as start at learners’ interesting then stimulate them to prompt and to participate in activities and take them to more delicate activities. The continuous learning have 4 steps, which are;

1<sup>st</sup> step: Making prompt by use activities such as games, to prepare learners before next activity.

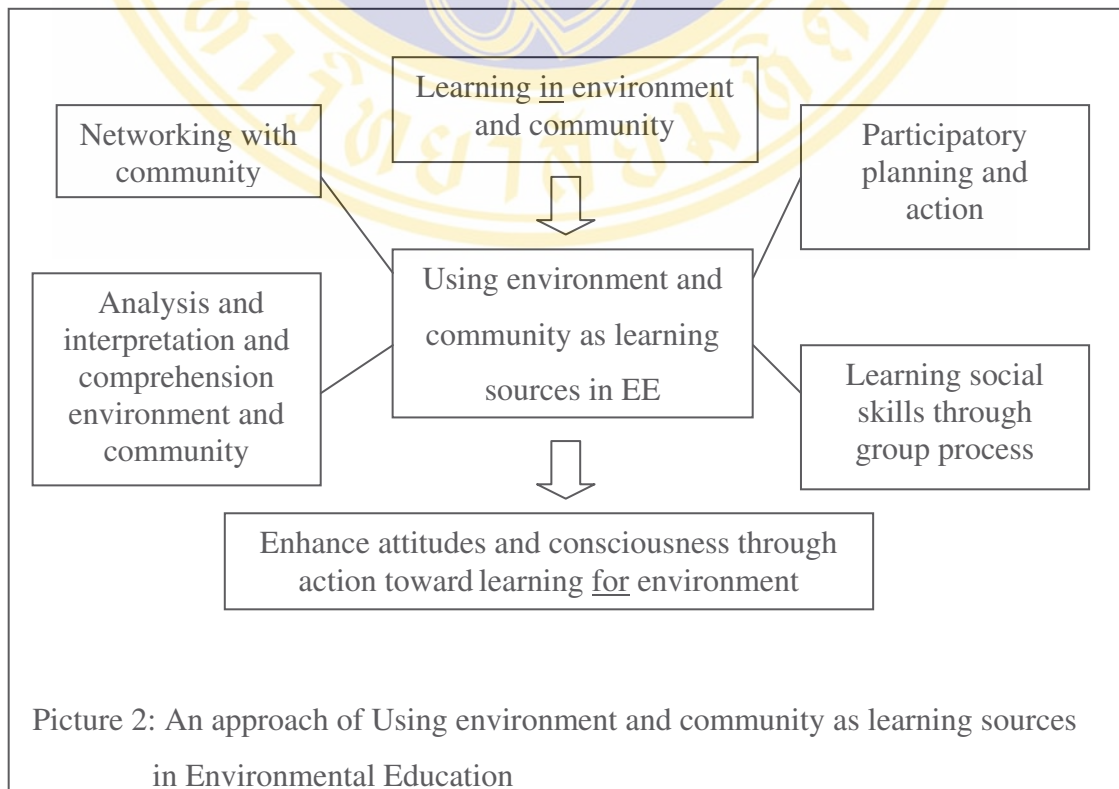
2<sup>nd</sup> step: Summary the interesting things using supporting activity for issues/problems clarification, which lead to self-practice in 3<sup>rd</sup> step.

3<sup>rd</sup> step: Directly experiences for every learners in the prepared environment and community.

4<sup>th</sup> step: Inspiration sharing, open experiences changing stage, impression and concepts from activities.

This emphasis point is to connect every activities in all steps continuous, harmonious, and naturally.

From the approach in using environment and community as learning sources of environmental education, there are specific points on opening opportunity for learners to participate and learn from the real conditions, also, from the nature and the community. Using learning activities which provide from co-operation between schools and community will stimulate learners to learn by themselves and exchanging their own experiences of via group working until able to link every kind of knowledge to understand the environment and the community as well as having an opportunity to plan a real operations, to participate in problems solving or environmental development by themselves. (see Picture 2)



### 2.3 Preparation and arrangement

Currently, although learning activities focus on using environment and community as the learning sources are widely respected. But in the real practice still confront with many problems and obstacles.

Sumon Armornwiwat (2544) analysis an obstacle reasons for outdoor classroom learning which it is very interesting.

1) Concept which still believe that a real study is only in class room. Regulatory classroom is a peace and quiet along class room-hour. A talkative learners or not stay at their chair are not regulated, teachers who lead the learners to go around or go to community mean try to go travel, and it is not a study. Furthermore, traveling consume budget, although learners enjoy, happy, and receive impressed experiences but in the final examination is not assessing those experiences.

2) A disadvantage from school management, the schools have a certain study table. There are many teachers such as classroom teachers, subject teachers, special teachers, which some teachers want to lead own learners to survey, observe, and study in the community which must spend many hours. It will cover another subject hour, and this must request for executive permission to journey, organize system, sometime it is not facilitate. When the management system is not fit, to “keep” the learners within the classroom is the last answer of learning processes.

3) The teachers who intend to lead the learners to study in the community must do well-preparation. In part of co-operation, activity planning, admit permission and trip control. Teachers have more loads and feel high risky, although can see much more benefit but not sure what will interrupt. Further, if teachers had ever studied about rule of Ministry of Education in case of outdoor classroom study trips, There are a highly risk to break the rule and these must paid many compensation. To ensure these will not occur, which “no manage”, “no risk” is to be more comfort.

4) One reason which makes the teachers’ unconfident to lead the learners to a trip is lack ness of economic and efficient insurance system. School administrators attempt to establish the funds for school insurance. This ensured schools when it faced an accident in trip or activity, but its high cost for parents and school. Sometime the insurance company has technique to avoid payment for accident compensate. To solve

these problems, every part should co-operate to find safety concepts and the efficient insurance.

5) To go out of the school whatever to study or activities participating in the community, it has too much anxiety for every parents. From pre-primary to pre-university there are surrounding with fear, also it may occur in town, rural, forest, river, bandit, wild animals, accident in journey etc. Most of parents always think about nature and community learning as a “trip” more than a study. Further, it unnecessary spends more expense, too. So, school must make an understanding, good project plan, and circumspect. For parent’s trusted, should let them participate, it will make them more ensured.

From the above analysis in learning by using the community and nature area as the resources, it should have preparation and pre-operation in many issues. Athapol Anunthavorasakul (2546) proposed the guide line to run an operation as following ;

1) To specify the learning source area for learning and analysis on environment and community, select the interesting topics for activities design. Specific area should have many suitable aspects such as a harmony between content of that environment/ community and curriculum targets, possibility of co-operation with community in the specified area.

2) Risk Analysis and management should be considered in 3 risky factors, people, equipments, and environment/community. This should specify the risk management by practical plan both in general and emergency situation.

3) Curriculum design should be considered with an analysis for its harmonies with that area. In case of the community representatives able to be participate in activities such as local wisdom person. Planning curriculum management should open for these persons to join. An aspect which should not ignore is knowledge integration from many subject to use for “comprehension” of their environment and community.

4) Management planning and details of cooperation such as accommodations, vehicles, supporting budget, local specialist, pre-connecting organizations, parents’ permission request, and project allowance request.

5) Learners and Staff readiness’ preparation for an participating activities such as giving primary information about accommodation and community, data collecting

guideline, using interviewing question, using question for education, emergency case operation.

### **3. Cases of learning activities by using natural area and community as learning source**

Learning activities by using natural area and community as learning source can organize in many various forms. From the primary study may present an example as follow;

#### **3.1 Local curriculum management to support the learning in nature area and community**

Sumlee Thongthew (referred in สารานุกรม ปีที่ 4, ฉบับที่ 44, พฤศจิกายน 2544) concluded confines and classified the local curriculum as follows:

The local curriculum mean all experience mass which every teachers and personnel in school and people in community which co-operation to management. Thereby, integration living way, Learning processes and unique culture of the local with subject context which maybe selected from core curriculum or all new planed. These are targeted on learners' connecting ability of knowledge and experience from the school as dynamical with the community stability and concerning it participation role in durational development.

Due to the above concepts, planning a local curriculum can be categorized in 4 kinds.

1) *Highly Technical Assistant/Technical-Version Local Curriculum* For this kind, the central specialists respond to determine the content, aim, and local curriculum constructing from. It is originated by national curriculum and related to local knowledge.

2) *School-based Local Curriculum* is the local curriculum which co-building from the teacher and learners. It emphasis on living applied. The teacher must be make

course syllabus, teaching outline, lesson plans by using curriculum document, there for supplied to learners' need.

3) *Community-based School Curriculum* is a co-operation of community's person with external specialist to plan a curriculum which harmonizes to their way of life, responds to local need, and support a sustainable development in community. Curriculum content will be selected some from national curriculum and another additive to be integration with local context. All of these must be allowed from local before it use.

4) *Self-Help Local Curriculum* is appearing in many local unit such as government, private, and business group. They give them hand to build it by emphasis in community strength encouraging or problem solving. Content of the curriculum is directly relate with local intellect and everyone want to learn it to be self-developing. The intellect pass on is the local's response.

From the concept of planning and developing the local curriculum, Lumnao (alias, 2003) proposed an example of local curriculum developing for used learning source in nature area and community. From an example case of Ban Hat Yai School Amphoe Phrompiram Pitsanulok which developed the local curriculum "Thai way in rice papilla" for grade 5-6 primary education. It gives an opportunity to local wisdom person and community's people to develop the curriculum which serve local's need harmoniously, in addition to be a specialist who pass on the knowledge and experience from rice field, to give an understood about rice planting which the main occupation in local. Thai farmer living sense whatever tradition and present to learn local intellect, culture, tradition though the relationship between an ancestor and rice. Then link it to the present social and concerning to value and forefather proud though rice planting.

For the learning processes formation used of natural learn by integration with the context groups to child developed, time usage for 1 education term.

### **3.2 Educational trail and station development and planning for used as learning source**

Soren Brieting (2003) explained the meaning of educational station, analysis a different between educational station for nature study and environment education.

Then he proposed the guideline to use the educational station for environment learning study, that;

“Educational station is in/outdoor place which suit for stimulating learners to be interest and reflex the context opinion. Its purpose is able to use to stimulate learning both in short period and long time activity...

After we select an area to be the educational station for encouraging an environment education study, there are concerned suggestions which how this place help the learners to have an important image related with environmental problem in the community?, what was happen in the past? This mean the educational station was planed for only nature study, not totally clear studied in environmental education. If its role as this comment, it needs to used as some part of more widely activities by joint it with other which able to highlight the environment problem issues.

In other word, the nature study’s educational station will have extremely suit for only science teaching. The good educational station for environmental education must be an opportunity to investigate, observe, and present an idea. The perfect educational station for environmental education in a new concept must more help the learners to reflex a crisis condition, including to comparison present for interesting and opinion between long/short period benefit”.

From the above concept of the educational trail and station development and planning as learning sources, Kritsasa Duangprame (1999) proposed the example case of educational station and learning environment at Wat Banbangkrai-nok (Yam-prompt-aupphatham) under the National Primary Education Board Office, it sited at Tambol Bangkhungong, Amphoe Bang-Gruay, Nontaburi Province. The interesting issue in a study planning of this school is the usage of specified educational stations by applying in the school area, surrounding community, temple, or nearby environment to be the study consequent. The example educational stations are Banana Clump, Garden, Grocery, Aquarium, River side, Playground, and Temple. Each station are emphasis on the integration.

Except to used these educational stations for instructions, the school use them in project learning by basis on an around environment as media and learning source such as the project about plastic mat graphic design. This mathematic project came from collected statistic in the community, observing a knowledge and synthesis their

own knowledge. This project was won the first prize (primary) from the Mathematic Project Contest of Thailand Mathematic Association ,1999.

In the example case of the education trail planning, Somchai Ditthasorn (1998) proposed information about nature study walking bridge at Kung Kraben bay development study center. Here is a Nature Trail from His Majesty the King's idea, sited at Amphoe Thamai, Chanthaburi Province with 850 m. trail. It planed for Mangrove study trail, along the bridge have the educational stations as 8 pavilions with date presented tag composed with Bay forming, Frontal Mangrove, Acidulous Forest, Planted Forest, Grand Copse Wood, Mangrove, Fishery, and Eco-tone.

To learn in this bridge, the center assigns study guide along the trail and prepare the trail guide book to explain more information which presented content covering the introduction of mangrove ecosystem, keystone species and human activities which effect on the mangrove ecosystem.

### **3.3 Community resource mapping**

Concept of community resource mapping has a highlight at leading learners to learn by community exploration, thereby, aimed at many resources in community and nearby place. Here, propose an example case which a similar type of Sompong Duansa-wai (referred in สารานุกรมฉบับที่ 5, ฉบับที่ 51, 2545 (A.D.)). It sets up an outdoor learning activity as the cultural conservation and tourism club, Wat Sungwetch School. Club's activity emphasis on cultural tourism aims the learners to learn about art and culture, way of living, history, including the important place around the school. Places in Rattanosintra isle as the classrooms in the real historic place. Before to real place study, it must be ensured to know what places to study, also ancient remain, antique, palace, temple, house, and Banglampoo's important places. Then interview community people who can tell a story of Banglampoo, including requests for knowledge from local wisdom person. This trip can done as walking tour which start in the school to visit the last lampoo, Santichaiprakarn garden, Prasumeru fortress, Chaopraya house, Pra-artit house, Chanasangkram temple, National Museum, and National Art Museum. While in a trip the teacher will play role as a guide who passes on history and knowledge about art in many places, learners should note, take a photo,

and summarize a data to be an article for the school's magazine called Lampoo journal. Except historic places, they plan to study the National artists who stay in Banglampoo bound such as Oob Chaivasu (Humerist, alias) Chaleoy Sukktawanich (dramatics best), Sujitt Durinapranith (Banglampoo golden vocal), and Pradit Yawapugga (National artist/architecture), including post after of Banglampoo such Tor Thanvarachorm of Tor Ngengchuan gramophone record company.

### 3.4 Service Learning

Service Learning is the concept to use the community as a learning source, Chanpen Chuepanich (2003) concluded the concept about it as:

“Service Learning is teaching method which assigns learners to learn through service community requirements with school and local co-ordination. This activity must be integrated in the curriculum with specific but flexible time. Its activity aims to extent skill and knowledge, helping learners to concern to service and help other.

In the curriculum meaning, service learning is not a study subject, but it is integrated learning through whole curriculum.

Duckenfield and Swanson (1992, refered in Chanpen Chuepanich, 2003) categorize service learning which integrated into the school's curriculum, may be 4 levels;

1) Extra curricular: service learning as voluntary activities. Learners do not register and it has no study credit.

2) Curricular Unit: service learning as learning unit in some subject or as extra-course with study credit.

3) Elective Course: service learning as elective courses which link learning experience in classroom with learning service experience. In this level it only some learners who select.

4) School-wide Integration: service learning as integrated unit in each subject. It is an importance requirement in school curriculum, school may initiate some project and learners can participate in the project through each subject learning.

Schine (referred in Chanpen Chuepanich, 2003) parted the learning activity by social service for 2 kinds. These are School-based Activity and Community-based Activity, which stated to;

School-based activity started project by school, assigned a budget, and planning activity/policy to integrate service learning into the curriculum or subject or activity. School-based are most run in school to avoid conflicts between community and teachers. Example activities are student club activities such as peer-tutor and short course training and workshop for community.

Community-based activity may start from the community and school is involved as associated organization or initiate by school and then community get involve as helpers. Service learning can appear in many places in community such as nursery, library, and hospital. Learners have good chances to learn more than only learning in-school. Moreover, community-based activities can help learners to have experiences in problem solving.

Suphatcharee Chantana (2002) proposed the example case of service learning in “Co-operative learning, Strengthening community” Project. This project arrange by University affair, Ministry of Education. 6080 university and college students were recruited and sent to stay 1 month in 152 communities nationwide. They chose 1 from 8 activities depend on their individual interesting and competency.

- 1) Developing or design package for local product in OTOP activity.
- 2) Collecting and storage important information of community and updating or presenting in community’s website.
- 3) Landscape planning by survey and propose some suggestions for physical adjustment and community mapping.
- 4) Collecting community’s natural resource and environment information.
- 5) Survey community member’s health and public health
- 6) Survey herbs in the community and “30 Bath for All” project.
- 7) Collecting art, culture, and local wisdom as basis in future survey.
- 8) Tourism, exploring an interested place of several local to be in tourism list of community.

Accordingly, Student project’s result must be sent to government and community for 10 papers for the efficient improvement coordinate. Moreover, they

have to present their project summary to community, local government unit, and provincial meeting. Then they shared their experience with student network. In 2004, the project targeted to have 9,120 learners and choose the community to by study area, also extent and new area for 228 communities and add more working time (see more information at <http://www.mua.go.th/Learning/learn.htm>).

From many cases of learning activities by using the environment and the community as the learning sources, the characteristics of learning activities can be described by level as

- 1) Changing the learning atmosphere, taking learners outdoor to see environment and community, let them have direct experiences. The learning focuses on conversation, lecturing, reading or studying from bulletin board but does not focus on systematic searching and planning. Learning activity is divided to the formal and informal, for example, the activity of cultural conservation and tourism club of Wat Sangvej School. This club supports the cultural tourism and some characters are agreed with the community resource mapping.

- 2) Using the environment and community as media or resource of activities, the activities are focused on various acknowledgements. The learners are able to participate in planning process and program/learning activities are formal prepared. For example, Wat Bang Krai Nok (yam prompt ubpatum) is a learning management through educational station such as using the bridge at Kung Kra Ben bay as a learning source to study the nature at Kung Kra Ben bay.

- 3) Field study research, collecting skill, analysis, synthesis and data presentation are designed to be more systematic in both curriculum and learning activities using research in a part of learning. Learners will get practice searching for information, step by step such as; developing in thinking skill and analyzing skill, and lead to the synthesis of conclusion. Then, it can be presented to the community or involved people as a case of learning activity management in local curriculum, “Thai style in rice” of Ban Had Yai School. Learners will collect their own information and learn about natural and local custom which learners are one part of curriculum and instructional design by teacher.

4) Participatory Action Research (PAR) with community for solving environment and community problems, is the activity which covers the outdoor activity but it is different in the way of how to solve the problem objectively. It is a learning that the learners will be seriously in a part of solving problem procedure or developing the environment and community such concepts on learning by community service and mark it as a goal for study, explore and cooperate in solving urgent problem which intensity levels of the problem are still different.

#### **4. Cases of development of learning source in natural area and community**

Development of learning source in natural area and community has many categories of learning and development. From is case study will present the sample of activity as

##### **Case 1: School and community for local wisdom conservation**

Lamnao (alias,2546) present the case study of learning management by using community as a data base to continue the local wisdom. Ban Noonsoongli school Payakapisai district, Mahasarakam province, teachers and committee programmed managing for learners from K-6 separate to 12 wisdom disciplines which integrate with the learning experience groups as follow;

Local Wisdom	Learning Activities
Wicker work from bamboo	Finding and choosing bamboo, cutting bamboo, pounding down, plaiting designs, how to plait vessels and utensils in the houses
Weaving silk fabric/ Mudmee/ Weaving carpet	To get the silk thread, how to produce the silk thread, Weaving the silk fabric
Herbs	Growing, using to cure simple illness, and transforming herbs

Local Wisdom	Learning Activities
Local Mathematics	Learning the basic mathematics about living in the community by; to calculate the area of the field roughly and use the result to compare with the real measuring
Phya/Soraphanya /Mo-Lam	Learning Phya, singing Soraphanya about Don-Lee village, local wisdom of Don-Lee village, Soraphanya about E-Sarnism, and rhythmic dancing including dancing, and singing Mo-Lum
Mo-Soo-Kwan	Preparing accessories for Bysri-Soo-kwan ceremony, chanting correctly, and rhythmic reciting Bysri-Soo-kwan prayers
Plaiting the net	How to make the accessories and the procedures to produce the net
Visual art	Local ceremony painting, Heet 12 Kong 14 and moulding Thai design
Mahoree	Learning to play easy songs in the Mahoree and to perform in some occasion, making some simple music instruments

Local integrated learning in each subjects open the chance for students to study learning unit which they interest 1 unit per academic year. Each subject teacher and local wisdom persons will co-create the programmed, planning, documentary and any learning media to support and suitable for learners.

The integrated learning will spend every Thursday afternoon which each teacher will teach in different ways. Mostly, they use the community's fable in introduction step to show that link to their daily life and then demonstrate to them.

### **Case 2: Activity Center of Environment and Conservation**

Center of mangrove ecosystem study and conservation, Bang Taboon Wittaya school, Banlaem district, Petchburi province manages the service for camping and activity in science and environment in term of Science and environmental camp

During the activity, the center create the lesson of science and environment lesson in "mine forest" by edited from secondary school operating lesson of

environmental education of Bang Taboon Wittaya school by project of school development for biology and environment Rajabhat Pranakorn Institute 2528. The structure is divided to many stations depended on the mangrove such as sea station, Samae station, Khongkang station, Chakram station etc. each activity in operation have 5 main activities as :

- Activity 1      Physical environment of mangrove
- Activity 2      Lives in mangrove
- Activity 3      Adaptation of plant and animal in mangrove forest
- Activity 4      Relation between lives
- Activity 5      Importance of mangrove forest

To join the activities, school must pay all the expenses as camping, water, electricity, equipment, food, book, expert, certificate and fee for boat sightseeing.

### **Case 3: Network and Community College**

Supacharee Jantana (2545) present the case of southern community university create from 7 center network for cooperate between study center of local area distribute to many area and there is no cooperation. Southern local community institute is established for the center of knowledge and co-operate with other segment, to support the knowledge stronger and develop the intellect. Now there are 7 centers, each has structure, people, location and equipment for transfer knowledge to interested men:

1) Institute of Klong pea, Jana district, Songkla province is the center of saving procedure and community welfare.

2) Orphan children community institute, Muang district, Pattani province is the center of orphan knowledge, finding fund and depending on own self by using religion for integration.

3) Center of fabric Na mern sri, Na yang district, Trang province is the center of fabric culture and spreading knowledge and intellect to new generation.

4) Chooporn village bank network, Muang district, Chooporn province is the center of community business. The interesting programmed are building business community, account and setting local community bank by themselves.

5) Community University (Wat Payang), Muang district, Nakornsrihamarat province is the center of alternative agriculture. It has biological fertilizer project.

6) Community college for development, Lanskar district, Nakornsrihamarat province is the center of self-efficiency business community as kanomjeen factory, dried palm, community welfare, water factory and Eco-tourism.

7) Ban Srivichai artist institute Huasai district, Nakornsrihamarat province is the center of local native culture. This part aims to conserve the culture for all nations.

Southern community institute use the area in Srivichai artist institute which is ready for the center. In each month, there are many wisdom persons from other centers come and exchange the problem and experience to tell and teach to another. Each center has different procedure but has same goal, let people know for their lives. Knowing culture will make community stronger. Structure and knowledge can create on potential and prompt time. The programmed will focus on who they are, status, adaptation for life. Even social has high competition, life goes on happily. People dare to build institute because they want their children can earn their lives with themselves.

#### **Case 4: Local wisdom school**

Thanathip Chatputi (2545) present the case of learning source for continue local wisdom. Lanna local wisdom school is the place setting between private enterprise, local community, government, private business and Northern institute. It began in 2540 (A.D.) to let parents and teacher bring knowledge of lanna people spread out. In 2543, the Lanna school is settle down and it is the center of all knowledge, meeting place for new generation. The subject in this school are, Lanna language, music, flag, food, fabric, handicraft, music instrument, sculpture, painting, performance, dancing, self defense, toy, agriculture, forest conservation. All committee mostly work for community development for many years. Relationship between them and parents are the way to find out the professional in each skill. Now, more than 50 professional comes and teach 3-4 hours per day in weekend, if the end of ordinary semester will teach on weekday too.

Even use “school” as a name of project, but the procedure is look like “club”. People who have free time can come and join the activities. This school is not depend

on any department, no test, no exactly programmed, everything can adapt for appropriate. Mostly the study will limit in 30-40 hours. After finish the course, it has certificate to guarantee the knowledge of Lanna. Learners have to pay 500 baht for “Wai Kru” per subject to help the professional (mostly old) for transport expense. There are more than 200 people in every age and gender study and find more knowledge. Moreover, many teachers come and study for adapting their teaching in their class room.

Moreover taking course, the school creates other activities for 5 objectives as:

- 1) Finding Lanna professional
- 2) Making book on local intellect base
- 3) Creating short course for learners
- 4) Spread out to public
- 5) Co-operation with government and private business for procedure

#### **Case 5: Learning Group for Local Wisdom Conservation**

Supatchree Jantana (2545) present the case study of Ban Padad which perform the group of older people for building local toy more than 40 categories and can earn money 500-2000 per month. The advantage is old people meet more friend and be center of community. Many teachers of ban pa dad school bring the knowledge of building by integrate lesson by making “Room of Toy” and learners come and play local toy in free time. Example “Bai Pat” only toy which an bring to adapt to every lesson, Thai lesson, mathematics, social science and old people (professional) come and help them too.

Moreover, the older professional started many project to support their role in communities. Many children setting “bicycle club” to ride and visit the older on weekend to fill up warm of older.

### **Case 6: The Project of Developing Environmental Education in School and Networking**

The River and Stream Investigation Project for Youth : RSPY, Green World Foundation (1999-2002) (sorananat Karnjanavanich and Nalumal Moonjinda, 2545) is supported with funding provided by the Danish Cooperation for Environment and Development (DANCED) Denmark, this project aims to enhance environmental education among participating teachers and students with special focus on monitoring the quality of stream water, while coordinating activities with local communities and raising their responsible attitude towards their communities. In collaboration with 51 schools in the Ping River catchment area in Chiang Mai and Lumphun provinces, the main outputs of the project are (1) Co-ordination of a teacher and student network in the River Ping catchment area; (2) Production of the stream investigation package; (3) Investigation of issues related to local stream health by secondary school teachers and students; (4) Sharing information among local communities; and (5) Dissemination of information to the public and interested parties.

The project develops the RSPY manual to investigate, and evaluate water quality by using biological indicators. The RSPY manual is composed of 5 books such as; RSPY book, RSPY leader book, Finding fish's name book, etc. The main activities in each book are;

- 1) Stream exploration;
  - 1.1 ) Lives in stream exploration such as; animal beside water, fish and small animal in water
  - 1.2 ) House of water lives exploration such as; watershed physical environment, water quality and quantity etc.
  - 1.3 ) Exploration effect from human being to the river such as; garbage and danger etc.
- 2) Communities exploration;
  - 2.1 ) Communities exploration planning
  - 2.2 ) Determination ways to explore
  - 2.3 ) Discussion and conclusion
  - 2.4 ) Presentation the result to public

### 3) Stream conservation;

#### 3.1 ) Situation analysis

#### 3.2 ) Review about water use in community

#### 3.3 ) Planning for conservation

#### 3.4 ) Evaluation plan of conservation

Even though the project is finished, the teachers and learners who used to participate in this project are still working on this network. In addition, there are some school environmental education project use the RSPY's activities as a base of applying such as; Tree SPY activity (orawan Srisawas,2547), Lake SPY activity (Somserm Choorak, 2546) and Coastal SPY activity etc.

From 6 cases which develop learning resources in different ways by different area, researcher can conclude notice about management and development of learning resource in natural area and community as follow;

1) The components of the developed learning sources means basic components included curriculum, learning program, learning activities, educational trail and station, learning media, learning assessment, trainer and facilitator, and management and service.

2) Development of learning source related to learning topic, especially local wisdom such as local toy and natural area such as watershed, mangrove ecosystem in addition, local identity such as Lanna culture, Thaksin culture. The identification will make clarity and specify the exact way to develop learning.

3) Learning area in nature and community has related and developed. It reflect to the linkage of society and environment in environmental education. Development of learning source can not be divided into one dimension.

4) Management and development of learning source can happen in many ways such as

4.1) Learning source which occur in school and then spread to community such as Center of mangrove ecosystem study and conservation, Bang Taboon Wittaya school

4.2) Learning source which occur in community or learning network of community and then link to school such as old people group invent local toy of Ban Padad community

4.3) Learning source which occur by activity of group, organization or cooperation project from outside community and then create a co-operate between school and community such as RSPY project

5) Learning source in each area serve the formal education, non-formal education and informal education. The knowledge activity can be flexible and adapted to the appropriate system.

6) The linkage of learning source and learning activity in school is necessary to integrate through local curriculum. There are the usage of various learning resources not only person, place, and equipment but also activity which can be based on co-working with the community.

7) Development of learning source is not effect only the learners to learn about their community, but also people in community are activated to learn with their children and to be proud of their community. It can realize about the role and importance of community in cooperative educational management.

Besides, the development of learning source is an alternative to manage education which focuses on co-working between school and community. From the research work on “Alternative Education Research Project: Database and Analysis” (cited on สือพลัง, 2546) supported by Thailand Research Fund (TRF), alternative education in Thailand is divided into 7 groups as follows:

1) Alternative education arranged by families or Home School, covering single, group and networked families

2) Alternative education based on school system e.g. schools that arrange curriculum or learning processes different from general schools, focusing on learning innovation, experiment or experience e.g. Roong Aroon School, Children Village School.

3) Alternative education of wisdom teacher e.g. teachers, local sages who belong to groups or networks, and transfer knowledge to later generations with or without expenses. Knowledge transferred includes art, craft, folk medicine and herbs, ancient alphabet reading and writing, folk performance.

4) Alternative education based on religion and dharma practice: organizing learning for members on sufficiency economy, anti-consumerism, meditations according to beliefs, creating learning for participants.

5) Alternative education of extra-system institutions e.g. educational activities aiming to organize knowledge for their target groups both free of charge and with expense e.g. learning institute of non-governmental organizations, centers, clubs e.g. Midnight University, Community Potential Development Institute.

6) Alternative education of learning groups through activities is the most extensive and diverse learning sector. It can strengthen communities e.g. learning through activities, wisdom continuation, art and culture rehabilitation, resource preservation, local medicine, public health, community management, children, women.

7) Alternative education through learning media and source through mass media such as print, radio, TV and modern media e.g. web site, including library, museum, tourism, or public learning sources with continuation that can create learning.

So, development of learning source is an opportunity to turn back school to community. Moreover, other parts such as government and private business can be involved in this process to promote Thai educational development.

## 5. The related research

Deborah Simmons studied Using Natural Settings for Environmental Education: Perceived Benefits and Barriers. The research found that what motivates teachers to use various nature settings for environmental education (EE) is complex; in this study these motivations were described. Teachers (N=59) were shown photographs of four types of outdoor setting (rivers, ponds, and marshes; deep woods; county park; and urban nature) and asked to judge each setting using questionnaire items that described potential benefits and barriers to taking students to the setting for EE. Factors analysis of responses showed six benefits and barrier factors: Appropriateness of Teaching Setting, Teacher Confidence, Worries, Needs for

Training, Hazards, and Difficulty of Teaching EE. Deep woods and rivers, ponds, and marshes settings were seen significantly more appropriate for teaching EE than urban nature was, but they were also seen as presenting significantly more hazards than county park and urban nature settings.

Franz X. Bogner studied *The Influence of Short-Term outdoor Ecology Education on Long-Term Variables of Environmental Perspective*. The objective of this study was to evaluate empirically the ultimate goals of environmental and ecological education: fostering responsible environmental behavior, effecting long-term changes of students' attitudes toward conservation and nature, and providing basic ecological knowledge. One-day and 5-day versions of a long-established outdoor ecology program in a national park were examined. The study was designed as a pre- and post treatment evaluation, and the posttest was delayed for 1 month after participants experienced the outdoor education program (posttest was delayed for 6 months with a sub-sample). Approximately 700 students were surveyed by means of multiple-choice knowledge statements; the survey showed that both programs fostered cognitive levels. Similarly, the scores within the subdivision Human-Altered Nature increased. Furthermore, the 5-day program explicitly provoked favorable shifts in individual behavior, both actual and intended, a parameter that is generally seen as a complex and long-term process. Comparison of the average pupil population with the population enrolled in the outdoor education programs surprisingly revealed a more pro-environmental orientation in students enrolled in the program before any education at the nature site took place. Possible reasons-pre-selection and/or presensitizing of students—are discussed.

Detra Dettmann-Easler and James L. Pease studied *Evaluating the Effectiveness of Residential Environmental Education Programs in Fostering Positive Attitudes Toward Wildlife*. In this research residential environmental education programs offer many benefits to students, including time to be “in” nature, additional time for programs (evening in addition to days), and flexibility in the types of programs offered. The authors examined 6 residential programs in the upper Midwest to evaluate their effectiveness in fostering positive attitudes toward wildlife. Results

indicated that students had significantly more positive attitudes toward wildlife after residential programs than they did after an in-class wildlife program, and that these changes were retained at least 3 months after the program. Recommendations for maximizing the effectiveness of residential programs are discussed.

Irmeli E. Palmberg and Jari Kuru studied *Outdoor Activities as a Basis for Environmental Responsibility*. The research aims to develop pupils' affective relationship to the natural environment, their environmental sensitivity, and outdoor behavior, as well as their social relationships, through personal experiences. This study discusses the results of experiences from outdoor activities involving 11- and 12-year-old pupils in Rovaniemi and Vaasa, Finland. The qualitative research methods comprised case studies involving questionnaires, individual interviews, drawings, photographs of landscapes, and participant observations during camps. Nature experiences developed the pupils' self-confidence and feelings of safety, in particular, which in turn increased their willingness to participate in future outdoor activities. In this way, nature began to have new meanings for them on a personal level. Comparing pupils who were experienced in outdoor activities with pupils who were not, it was found that the former seemed to have a strong and clearly definable empathic relationship to nature. They also exhibited better social behavior and higher moral judgments. The reasons for conflicts between environmental attitudes and action, still observable in some experienced boys of the Vaasa group, are discussed in terms of conscious vs. unconscious action and applied knowledge. The role and possibilities of outdoor education in environmental education and natural studies are emphasized for schools as well as for teacher education.

Trudi L. Volk and Marie J. Cheak studied *The Effects of an Environmental Education Program on Students, Parents, and Community*. This study evaluated the impact of an environmental education program on students, parents and the community. The program, in place for 5 years in 5<sup>th</sup> and 6<sup>th</sup> grade classes, was designed to help learner take an in-depth look at environmental issues in their community, make data-based decisions about those issues, and participate in resolving those issues. Qualitative and quantitative methodologies were employed (including

student, parent, school personnel, and community member interviews). The authors discuss program connections to students' critical thinking, environmental literacy, and participation in the community; reading, writing, and speaking skills; student and teacher characteristics; and parent and community viewpoints.

According to related research, most of the research uses both qualitative and quantitative research methods. The research topics emphasize the effect of environmental education program to students, parents, and communities. The result of the research is that the environmental education program influences both primary and secondary students' characteristic development in the aspect of environmental knowledge, attitude and responsible behavior. Moreover, they have development in critical thinking skills, social skills and learning readiness. Besides, in terms of the effect on the parents and stimulates them to participate more in the students learning activity and aware of community's environmental problems.

## CHAPTER 3

### RESEARCH METHODOLOGY

In the research “A study of Development of Learning Source in Natural Area and Community: Multiple Case Study”, it has the research methodology as followed:

#### **1. Identification of Area, Population and Sample**

The identification of purposive sampling according to criteria which the researcher has set up is:

- 1) Developed learning source for learning activity presented of each kind of ecosystem such as coastal ecosystem, fresh water ecosystem and forest ecosystem.
- 2) Developed and used learning source in environment education learning activity continuously.
- 3) Accepted in academic field learning source in environmental education which is the model of study and further apply in learning management and learning source development in Environmental Education.

The study areas were the following three learning sources in natural area and communities that were obtained by using the specified sampling and were classified by the categories of natural ecosystem and community.

1) Coastal ecological area’s learning source was the learning source of Marine Science Activities and Conservation Center: MSAC Center, Samaesarn Sub-district, Sattaheeb District, Chonburi Province.

2) Fresh water resource ecological area’s learning source was learning source of The Magic Eyes Chao Phraya Barge Program: The Barge

3) Forest ecological area learning source was Ban Sunmaked Sunkheelek Huafaipattana School: Bansunmaked School), Wiang Papao District, Chiengrai Province.

Population in the study is people in the learning source area and in involved activity or learning development process:

1) Key informants such as teacher, trainer and facilitator in the organization which responsible in learning management, people in the learning source area and representatives from related organization.

2) Students participated in learning activities.

For key informants, the study uses the purposive sampling and the snowball sampling. For participated learners, the study uses the accidental sampling, purposive sampling, and multi-dimensional sampling in the field. Number of interviewee in each case presented as table 1.

**Table 1: Number of interviewee in each case**

Learning Source	Numbers of interviewee
The MSAC Center	6
The Barge	7
Ban Sunmaked School	13

## 2. Research Procedure

Research procedure is divided into 3 steps:

### 2.1 Pre-fieldwork Preparation:

2.1.1 Study related document, literature and information about study area.

2.1.2 Distribute research tools such as key question for interviewing, observation form, and activity evaluation form for teachers and students. Then, hand in the research tools to advisers and co-advisers to check for content validity.

## 2.2 Fieldwork

2.2.1 Introduction fieldwork phase 1 during May to August 2001 (4 months). Introducing the researcher and people in research area, gathering documents to improve key questions by using Non-participant Observation and Informal Interview.

2.2.2 Fieldwork phase 2 during June 2001 to January 2002 (8 months). Gathering information by Non-participant Observation, Participant Observation, Formal Interview, Informal Interview, Key-Informant interview, Field Note, Observation Note and Tape and Video recording.

## 2.3 Analysis and Synthesis

2.3.1 Validity and Reliability check information of document files are from internal and external critics. Information from interview and observation is verified by Methodological Triangulation.

2.3.2 Analyze and translate information of fieldwork

2.3.3 Synthesize concepts and rearrange information for research paper.

Besides, the information in the part of evaluation and efficiency evaluation of learning source of the MSAC center and the Barge Program. Due to the timing in each participation is limited, so, the researcher collects more information from evaluating activity of teachers, students, and people who participate in the activity. In addition, the researcher is supported by the teachers and the students of Saint Joseph Rayong School during 27-29 July 2001 and also the students of Rajabhat Rampaipunnee Institute who help set up the activities in “Love Sea, Love Local” camp during 31 August to 2 September 2001. In the Barge program, the teachers and the students of Wattana Wittayalai school have cooperated. The researcher has received the questionnaire sent by mail as follow:

**Table 2: Number of Questionnaire**

Participants	Number of Questionnaire
The teachers of Saint Joseph Rayong School	4
The students of Saint Joseph Rayong School	54
The students of Rajabhat Rumpaipanee	14
The teachers of Wattana Wittayalai School	2
The students of Wattana Wittayalai School	8

### 3. Research Tools Development

Consist of:

3.1 Open-ended key question used in the interview is divided into 3 parts with 40 questions as follow:

Part 1	Learning Source Development	25 questions
Part 2	Social and Environmental Context	7 questions
Part 3	Learning Source Product	8 questions

3.2 Observation Note is observational framework of Loflund (Cited in Uthai Dulyakasem) consisted of Setting, Acts, Activities, Relationship, Participation and Meaning

Observation Note is divided into 2 sets:

Set 1	Physical Learning Source Observation Note
Set 2	Activity of Learning Source Observation Note

3.3 Questionnaire about activity of Learning source management is the tool that researcher has added for Learning source of MSAC center and the Barge program study. Because both of them are the learning source which set as non-formal activity and have no formal evaluation. Moreover, Baan Sunmaked School has no any specific activity evaluation because it is long-term activity arrangement for a whole semester.

The researcher has studied about activity of learning source management; the researcher used the information of the fieldwork phase 1 and set up teachers and

facilitators to verify the questionnaire. The activity evaluation form can be classified into:

- 1) Questionnaire about learner activity for student
  - Set 1 Questionnaire about activity arrangement of MSAC center
  - Set 2 Questionnaire about activity arrangement of the Barge Program
- 2) Questionnaire about activity for teacher
  - Set 1 Questionnaire about activity arrangement of MSAC center
  - Set 2 Questionnaire about activity arrangement of the Barge Program

The questionnaire is divided into 4 parts

- Part 1 General Information, word filling and open-ended question. (9 questions)
- Part 2 Usefulness and appropriation level evaluation, according to Likert's scale. (17 questions and 3 open-ended question)
- Part 3 Satisfaction evaluations in management and service, according to Likert's scale. (10 questions and 1 open-ended question)
- Part 4 Learner characteristic evaluation developed from activity participation as checklist (3 questions)

The tool quality analysis done by

- 4.1 Key question and observation note analyzed content validity by advisors.
- 4.2 Questionnaire about learning source activity management analyzed content validity by teachers and facilitators in that learning source.

#### **4. Data Analysis**

4.1 Qualitative data; observation and interview is managed during the fieldwork and after that by indexing and Typology categorized into 3 aspects. They are learning source component, social and environmental context and learning source development product, then, the process of Taxonomy and analyzing information by induction which leads to the conclusion.

4.2 Quantitative data; an opinion about usefulness, appropriation and satisfaction is analyzed by statistics, frequency, percentage and means for the research paper.

The scoring method according to Likert's scale is:

4.51-5.00	means Very Useful, Strongly Appropriated and Strongly Satisfied
3.51-4.50	means Useful, Appropriated and Satisfied
2.51-3.50	means Some what
1.51-2.50	means Little Useful, Appropriated and Satisfied
0.01-1.50	means Useless, In-appropriated and Unsatisfied

## CHAPTER 4

### RESULT

This research has study about development of learning source in natural area and community: multiple case study. The researcher chose 3 cases to study the components, development processes, social and environment contexts, and effects of the development sources of learning sources in natural area and communities. The research consequence was presented by description followed:

1. Coastal Ecosystem Learning Source: Learning Source of Marine Science Activity and Conservation (MSAC) Center: the MSAC Center
2. Water Ecological Learning Source: Learning Source of Magic Eyes Chao Phraya Barge Program: the Barge
3. Forest Ecological Area Learning Source: Learning Source of Ban Sunmaked Sunkeelek Hua-fai-pattana School: Ban Sunmaked School
4. A Comparison for Synthesis the Concept of the Learning Source Development in Nature and Community Area

#### **1. Coastal Ecosystem Learning Source: Learning Source of Marine Science Activity and Conservation (MSAC) Center: the MSAC Center**

##### **1.1 General information**

The MSAC center is an educational organization on environmental education, which established in 1992, from cooperation from teachers and students of Ploo-Ta-hluangwittaya, Sattaheeb district, Chonburi province. In the past, it only run an activity in the club level as a marine science club; then, it extended the serving

coverage to students, college, youth, and interesting person group, and it separated to be liberal organization. They play a role on the environmental education in Samaesarn sub-district, Sattaheeb district. This area set up and developed to be the learning source in the present was separated in two parts: the camp sited at beside beach road and diving area at the beach in front of Wiharn Luang Por Dum, Samaesarn sub-district. There are three key persons and more than a hundred men acted as trainers and trainer assistants. All of them were the school's alumni, students, or ones who have ever trained form the center, and they trained to be efficiently practicable.

### **1.2 Social and environmental context**

The two leaning sources of the MASC center located in the traditional community, Samaesarn, which occurred in the Prajeenburi precinct map made in 1917 by Ordnance Survey Department. Now, Samaesarn is the one of five Sub-district of District Sattaheeb, its composed with 4 villages and 5,392 populations in 20,213 rai area but their held by the privates around 2,000 rai. These causes from most area are in the royal inventory, which hold by government from 1986. The area's observing organization is Royal Thai Navy, now there is conflict on the land right ownership between local with the government organization.

All land area in Samaesarn can not released the right bill because it conflict to the legal, caused to the people unable to managing on the local infra structure and environment in the local such There are no waste area. Because the post waste hole was banned by Royal Thai Navy, people can not request durable electricity which they must install the temporary run by Sattaheeb well fair electricity enterprise and must paid its more expensively cost.

This social contradict make Samaesarn coastal area which suitable for fishery and travel development should not be as possible. In the present day, most of people here have been in fishery, commercial, agricultural, and employee occupation. Most of income came from fishery, dry sea food making, and manioc plantation, local grouping in only 2 jobs (Samaesarn development plan, 2002-2006).

*“Regret to the community occasion, Samaesarn has a development efficiency to be fishery and travel community, but now it trapped in the land ownership right. People must buy water from serving car for 250 / 1 once, paid 4-5 baht / unit. Our community was living individually from another people, now we begin to unite because of this contradiction.*

Pramote Thowsakool, 17 Nov. 2001

Sanaeha Pitakkorn, ex-kamnan of Samaesarn concluded to the changed which occur with environment and community of Samaesarn. He stated *“Samaesarn were the fisherman’ s local from the past, we ever have perfectly beach forest, clean water, too much fish. There were around 100 households, then we received more evacuators, now here around 1,400 families including to ten thousands labors and aliens. More civilized and more environment changed, more people and more waste, ever clean water now smell because people more making dry Katak fish. Around ten thousands using drag purse net to fish kept, they never think our fish will be distinct, Samaesarn have much changed in this age.”*

Sanaeha Pitakkorn, 31 August 2001

*“Samaesarn shore have more than 52 kinds of coral, more than 150 plants found here. The center attempt to survey and collect an information to be distributed to the children who ever been here to knew a natural many. Local people do their fisheries which directly depended on nature, past we can stay with our natural, but now because of avaricious to taken a pushing purse net to be used. More and more then we lost, it is similarly of the several seas even though some countries, if it damaged will impact to another, it the sea of global man kind.”*

Damronk Suphasit, 1 September 2001



Picture 3: Samaesarn Sub-district: Fisherman Village

### 1.3 Components of the learning source

The natural environment changed and social contradict which presented in the part of social context and environment, these have a directly relationship with the learning source of the marine science and conservation center. Because the center is located on a rental land, which uncertain rental fee, thereby the admission fee to the camp is 15 baht/person/once time. Caused of this reason the camp is unable to fully develop. Now, even though its adjusted on the landscape for the tent established, but it faced many problems such the camp is nearby to a fish exposed ground and very smell, camp is on the hill and long distance to go down to toilet and bathroom which inconvenience in the dark. Further more, the center must spent an expensively water and electricity cost, this caused to high cost for the activity run.

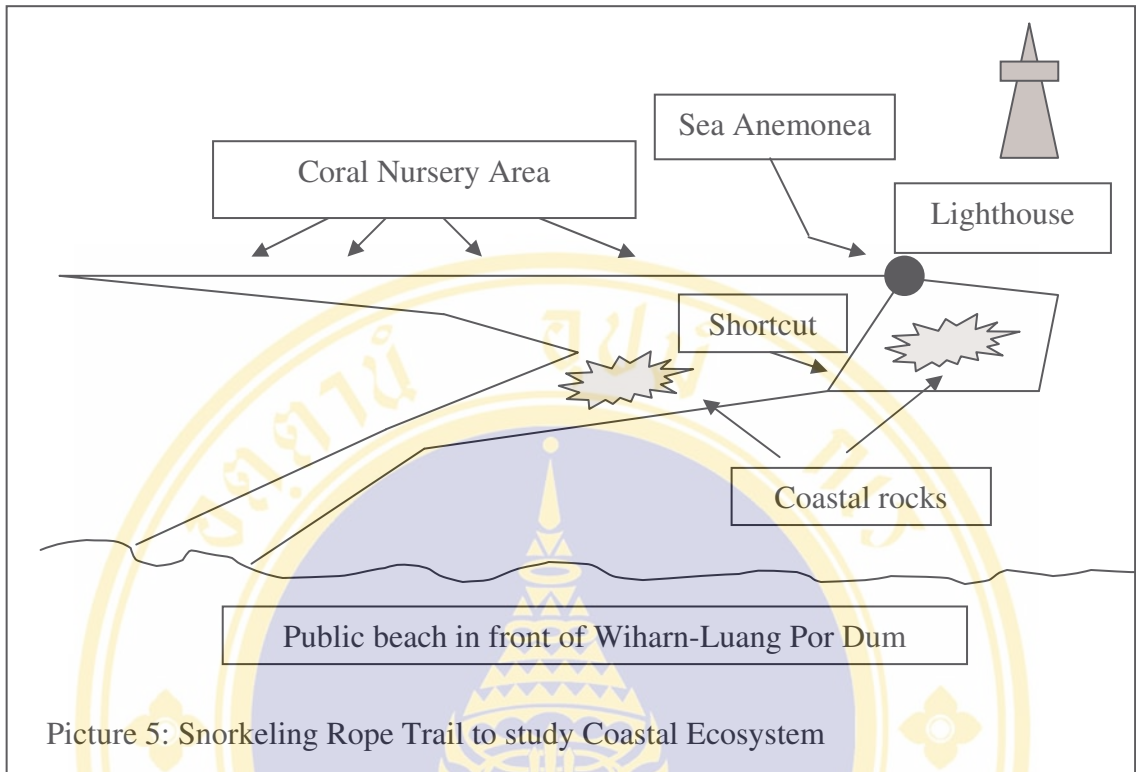
The camp sited closed to the beach overture road, in front beach is the stone beach which unsuitable to play in it. The accessories set in the camp are compose with 28 big size tents for 8-10 person/one, 11 bathroom and toilet, receiving room for 80-150 guests/once time if case of 1 day activity its maximum received for 240 person. The land owner builds 3 shelters for the tourist and teacher whose lead their students to the camp. The center serve a meal by 30 baht/person/once time, rest fee for 50

baht/person/1 night, and 75 baht/person/2 night and the center supported fee for 150 baht/person (Prasarn Sangpibool, 31 August 2001). Media and equipment served are diving mask and snorkel and float suit around 140 sets, life study experimental tool, slide multi vision with explained and additive knowledge book.



Picture 4: Camp Site and Tents

The diving area which sited at beach in front of Wiharn-Luang-Por-Dum public beach little far from the camp, the center have a car service to go to that, from Wiharn-Luang-Por-Dum area to down stairs to beach is around 3-5 minutes. In the past, this area was degenerated until the center developed it to be a learning source by set up the nature study trail in the sea. It made from manila rope with 1 inch diameter, pass the developed point for the shore coral ecological study. The important point are natural coral row, sea flower sight seeing, coral looked after area for half, one, one and a half, and 2 years old which add planted by the center. This is a one-way trip and adjustable for an activity participation head numbers, including to daily natural changing such as weather, water level, water flow. Its summary distance is around 800-1200 meters.



*“The first consideration in diving way set up is safety, the content to be minority. This way character especially the coral row is very difficult to fix because living organs have several time motion except a coral and sea flower which sited. The main rope has a reasonable purpose, many living organs appearing to watch. This way should be tested by the trainer assistant who exploring any problem or not, swift flow water, wind direction. All of assistant must use the frog paws to emphasis on suddenly help.”*

Prasarn Sangpibool, 28 July 2001



Picture 6: Snorkeling Activity to study Coastal Ecosystem

The main activity which now running;

1) *Marine science camp activity* is served for teacher and students from several schools including to external interested person. Target group are post primary level education, secondary level, university level students, teacher and interested person. The camp's curriculum will set by age and post-knowledge of participated person, the main activity emphasis on real experience in the under sea classroom. Students will be trained to basic skin diving by snorkel and real practice in Samaesarn beach. In diving will have a closely take care by trainer and assistant for more suggestion and explain. Moreover, camp will serve another additive activity such as slide multi-vision, marine science experimental, fisherman's community learning et all. There are depending on a time period and school' demand and the studied group. An activity time is able to set up a flexible curriculum from half day to 4 days and 3 nights.



Picture 7: Marine Camp

2) *Coastal recovering activity* is composed of many sub-project as Green beach and beautiful sea project (shore tree planting to preserve the beach condition from erosion damage), Sea shore coral degeneration project (additive coral planting by making the planted area), and Beach waste kept project (keep the beach waste and diving to keep).



Picture 8: Coral Planting

3) *Natural museum activity* is the cooperation with Ploo-Ta-Luang Wittaya School by present the exhibition for knowledge given, including to present the identified sea life. The future aim will be cover the content about local fisherman living way and local intellect.

4) *Marine science club activity and sea guide club* are the cooperation with Ploo-Ta-Luang Wittaya school for knowledge given and learning experience trained in the under sea classroom. Clubs member will be trained on basic diving and sea guide by the diving specialist from Royal Thai navy.

*“The club member must start at grade 1 secondary level, swim and dive trained until able to dive with other. There are 3-6 years trained, from 30 members in started may be 3 who have which level ability remained. The continuous activity as sea guide is come from after they have knowledge about Marine Science, we will looked how they can pass it on others. Many tourists want to enjoy to the sea beautiful, but we can not found someone who know and able to lead they to see it. If we not prepared them, it used to take place at Koa Laan and many tourism places in Thailand. When the tourism business is coming, you can count down for ending nature, finally it must be move to other places. Someone who want to appreciate a beauty of nature, if he come and seen nothing, he won't to come back again. But if we trained they to be the sea guide, only shell skeleton they can told you many story, we need this guide character. The relationship between guide and tourist is very*

*important, when the tourist want to take a coral back, then they stated “released it please”, when they want to keep a shell, they stated “it not moved to some where, I will take care on it”, which we teach them. If we have this guide, the nature can still. We attempt to let the children who pass the Marine science club to sense the real experience to self developed to be a good sea guide.”*

Dumronk Suphasit, 28 July 2001

Knowledge distribution to community activity is the motional exhibition activity in the community and external boundary. It emphasis on marine ecological knowledge given and conservation mind built.

5) *Field study center* is the project which cooperation between the center and Rajabhat Pamphaipunnee Institute, established for the practical training center to the institute’s science students.

6) *Youth Volunteer camp for environmental prevention and Local sea conservation kids’ camp projects* are cooperation between the center and Rajabhat Pamphaipunnee Institute,

Students and youth in Samaesarn, Payoon, and Pala sub-district. Set up to study on community’s environment situation and joint in the community’s environment situation activity. Fund received from Department of Environmental Quality Encouragement, Ministry of Science Technology and Environment since 1999.

Many activities are important to the learning source development which widely knew. Continuously marine science activity which served to students and youths until sometime camps is overlay which separated staffs in two groups and alternating on activity regarding. Example is the first group diving in the morning the do an experiment in the afternoon, the second group do these oppose, therefore buffering to all of participated.

The staff now the center have 3 dominantly persons in a job.

1) Mr.Prasarn Sangpaibool, ex-science subject teacher of Ploo-Ta-Luang Wittaya school, now teach in the Department of Biology, Faculty of Science, Rajabhat Ramphaipunnee Institute Chantaburi Province.

- 2) Mr.Dumronk Suphasit, biology teacher of Science section of Ploo-Ta-Luang Wittaya school.
- 3) Ms.Sunanta Bhudhapoom, chemical teacher of Science section of Ploo-Ta-Luang Wittaya school.

Mr.Prasarn and Mr.Dumronk are the main trainers and Ms.Sunanta works on camp's well fair.

Furthermore, the center have around 100 volunteers cooperated, they composed with Ploo-Ta-Hluang wittaya school's students and alumni including to external bound students whose ever pass the marine science club and the center's activity. These volunteers will rotated to participate as trainer assistants in the camp, including to in other such as the activity in Coastal resuscitated project.

They have ever been an intensively trained, Dumronk Suphasit stated to the training's step and processes to be the trainer and volunteer;

*"All science club members are strongly, they was ran in 5 km. distance and who can finished we will accept to be our club. They must trained to be restrained, to dive for coral helped they must be strong and able to help own self before. They feel which must be done to be diving, this course called F-A Set....Starting with swimming training course which we spend the pool rental fees, bought them swim pant because they don't have enough money. Then shift to E step, must trained to use a diving mask, frog paws and 5 feet diving, 10 meters moving, and half-hour floated. If they can done, we will lead to island pass swimming which called willpower test to 2 and a half hours swimming. This step passed (called D step) then go to C step, to a real diving to full the bottle with sand, bending a porcupine hair, or rope cut or bind, train they to hold them breath, we hope they will be camp regarded. After C step passed, we accept them to be the trainer assistant with 80 baht/day hire, they must started at cooking with Ms.Sunanta, someone who passed will have a good respond, someone can not stayed will not been here. Then who passed will promoted to be the trainer with 150 baht/day hire, to wearing the trainer shirt is their proud. They able to teach diving to several friends for experience kept, 1 year later B and A steps started to training. The center must spent 4,000-5,000 baht/person to rent training equipments or pool rental fees, it*

*depended on the center's capital, mostly they must wait for their turn. Nothing easily to get, but it be proud to get, they are in the brotherhood relationship."*

Dumronk Suphasit, 1 September 2001

In the assessment form, caused of a short period activity in the camp, the center assessment should emphasis on a sense or opinion reflected by camp's member though group processes and presented in a night activity. Except this, the center using a pre/post study test for a school who requesting. The test categories is 60 items of multiple choices which content covered about sea ecological system, basic knowledge in skin diving, and natural resource conservation way.

*Example of student's presentation*

"Something we lost and something we need to be come back"

We feel which why our mankind are selfish, think only self benefit without natural concern, how have it been? Will we lose an ecological system or not?

We need back a clean water, beautiful beach, and it been fishes resident place.

We feel which everyone wants to turn a natural resource back to be in passed.

*Students group, Wat Pla School, The third Local sea conservation youth camp, 31 August – 2 September.*

An important problem and advantage of learning source and running activity development is the area limited also camp and diving beach, the community have less participated with the center. Except to some community specialist such Mr.Saneha Pitakkorn the Province Council Member who invited, most of local' s member are less in activity participation as possible.

*"Community has extremely contradicted in several power, pull, and benefit. Community's nature have no relationship, more external person entranced and more badly. In our resident have ever been in trouble, someone dose not understand to us which our job is conflicting to them."*

Prasarn Sangpaibool, 31 August 2001

While the center's strongly point are the accurate activity, flexible curriculum, and strongly teamwork. A relationship as teacher-students and seniority help personal management system as specialist-trainer-assistant and mentor to be strong and preparing the new generation staff though 2 clubs of Ploo-ta-hluang wittaya school, while the seniors are still rotated to join in the center activity. In the other word this system is a limit too, because in the main specialist role who responding in the knowledge content are only Mr.Prasarn and Mr.Dumronk, and never preparing the new generation to be learn or respond to this activity.

In the learning source set up efficient part, the center has not to self assessment. The researcher requested from the center administrator to collecting more information from teacher and students who in activity participation. There by making the activity result assessing form to keep this data to be composed to the research presentation. In part of learning source activity and learning source set up assessment and learning source management, presented as table with description by using means, shown in these 3-6 table;

**Table 3: An opinion of teachers about usefulness and appropriation of activities conducted by the MSAC Center**

Activities	Usefulness (Means)	Meaning	Appropriation (Means)	Meaning
1. Overall activities	4.75	Very useful	4.25	Appropriated
2. Lecture with slide presentation 1 “Life and Environment” by Mr. Damronk Suphasit	4.75	Very useful	4.50	Appropriated
3. Lecture with slide presentation 2 “MASC Center’s activities” by Mr. Damronk Suphasit	4.75	Very useful	4.75	Strongly appropriated
4. Lecture with slide presentation 3 “Fundamental knowledge about Sea life” by Mr.Prasarn Sangpaibool	4.75	Very useful	4.50	Appropriated
5. Snorkeling	4.75	Very useful	4.50	Appropriated
6. Life Experiment	4.75	Very useful	4.25	Appropriated
7. Conclusion, discussion and Q&A Activities	4.50	Useful	4.25	Appropriated
8. Evaluation (Pre-test and Post-test)	5.00	Very useful	5.00	Strongly appropriated
9. Using audio-visual and learning media	4.75	Very useful	4.25	Appropriated

Table 3: Teachers think that in the aspect of usefulness most of the activities are in the “very useful” level. In the aspect of appropriation, most of the activities are in the “appropriated” level.

**Table 4: An opinion of Rajabhat Rumpaipanee students about usefulness and appropriation of activities conducted by the MSAC Center**

Activities	Usefulness (Means)	Meaning	Appropriation (Means)	Meaning
1. Overall activities	4.50	Useful	3.93	Appropriated
2. Special Lecture by Mr.Sanaeha Pitakkorn	4.29	Useful	3.64	Appropriated
3. Lecture with slide presentation 1 “Life and Environment” by Mr. Damronk Suphasit	4.64	Very useful	4.50	Appropriated
4. Lecture with slide presentation 2 “MASC Center’s activities” by Mr. Damronk Suphasit	4.64	Very useful	4.50	Appropriated
5. Lecture with slide presentation 3 “Fundamental knowledge about Sea life” by Mr.Prasarn Sangpaibool	4.64	Very useful	4.50	Appropriated
6. Snorkeling	4.79	Very useful	4.64	Strongly appropriated
7. Community Survey Activities	4.07	Useful	4.00	Appropriated
8. Conclusion, discussion and Q&A Activities	4.21	Useful	4.00	Appropriated
9. Coral planting	4.93	Very useful	4.93	Strongly appropriated
10. Evaluation (Pre-test and Post-test)	4.36	Useful	4.29	Appropriated
11. Using audio-visual and learning media	4.29	Useful	4.36	Appropriated

Table 4: Students think that in the aspect of usefulness most of the activities are in the “useful” level. In the aspect of appropriation, most of the activities are in the “appropriated” level.

**Table 5: An opinion of students about satisfaction of activities conducted by the MSAC Center**

Items	Satisfaction (Means)	Meaning
1. Overall activities	4.13	Satisfied
2. Lecture with slide presentation 1 “Life and Environment” by Mr. Damronk Suphasit	4.57	Strongly Satisfied
3. Lecture with slide presentation 2 “MASC Center’s activities” by Mr. Damronk Suphasit	4.59	Strongly Satisfied
4. Lecture with slide presentation 3 “Fundamental knowledge about Sea life” by Mr.Prasarn Sangpaibool	4.37	Satisfied
5. Snorkeling	4.78	Strongly Satisfied
6. Life Experiment	4.09	Satisfied
7. Conclusion, discussion and Q&A Activities	3.96	Satisfied
8. Evaluation (Pre-test and Post-test)	3.89	Satisfied
9. Using audio-visual and learning media	4.26	Satisfied

Table 5: Students think that in the aspect of satisfaction most of the activities are in the “satisfied” level.

**Table 6: An opinion of teachers about satisfaction of service and management of the MSAC Center**

Items	Satisfaction (Means)	Meaning
1. Setting camp location	3.00	Some what
2. Resident and Tents	3.50	Some what
3. Setting Garbage Bin	4.00	Satisfied
4. Food and drink	3.25	Some what
5. Toilet and Bathroom	2.50	Little Satisfied
6. Vehicle and transportation in each activities	3.25	Some what
7. Snorkeling equipment	4.00	Satisfied
8. Facilitating by trainer and assistant trainer	4.50	Satisfied
9. Safety in the camp and during activities participation	4.75	Strongly Satisfied

Table 6: Teachers think that in the aspect of satisfaction most of the services are in the “somewhat” level, excepted Safety in the camp and during activities participation is in the “strongly satisfied” level.

**Table 7: An opinion of Rajabhat Rumpaipanee students about satisfaction of service and management of the MSAC Center**

Items	Satisfaction(Means)	Meaning
1. Setting camp location	4.14	Satisfied
2. Resident and Tents	4.43	Satisfied
3. Setting Garbage Bin	4.21	Satisfied
4. Food and drink	3.64	Satisfied
5. Toilet and Bathroom	3.57	Satisfied
6. Vehicle and transportation in each activities	3.57	Satisfied
7. Snorkeling equipment	4.14	Satisfied
8. Facilitating by trainer and assistant trainer	4.36	Satisfied
9. Safety in the camp and during activities participation	4.36	Satisfied

Table 7: Students think that in the aspect of satisfaction all of the services are in the “satisfied” level.

**Table 8: An opinion of students about satisfaction of service and management of the MSAC Center**

Items	Satisfaction(Means)	Meaning
1. Setting camp location	4.04	Satisfied
2. Resident and Tents	4.26	Satisfied
3. Setting Garbage Bin	3.96	Satisfied
4. Food and drink	4.17	Satisfied
5. Toilet and Bathroom	3.28	Some what
6. Vehicle and transportation in each activities	2.75	Some what
7. Snorkeling equipment	4.05	Satisfied
8. Facilitating by trainer and assistant trainer	4.48	Satisfied
9. Safety in the camp and during activities participation	4.50	Satisfied

Table 8: Students think that in the aspect of satisfaction all of the services are in the “satisfied” level.

#### 1.4 Results of leaning source development

The MSAC center was over 10 years run, now there are over 60,000 person who ever been here (Dumronk Suphasit, 28 July 2001). In the flow of education reform, more teachers want to lead them students to join to the center's activity.

An importance effect which taken place to Samaesarn community may be presented as concrete, even though they are more perceptive to the center activity but still less participation. There are a limited relationship between the center with community and local organism. While the center's job and staff receiving congratulation from educationist and distributed via the media to public perception. For example; Learner's newspaper, Reality of The Country book volume 2 (Prasarn Sangpaibool, 27 July 2001). Benefit from the center development is going out from Samaesarn, here little form water or dessert selling to the children, but it not everlasting. While the community still faced to contradict and needed to protect them benefit as first issue, the work net participation will never taken place.

*“Community begun to know about our job and we received some coordination such the beach in front of Wiharn Luang-por-dum which used as waste dropped area, but when they see our learner's entry, they step back. Local' people are knowed but they not much changed, because many thing are them living way such as dry fish smell which they not sense it as a problem.”*

Dumronk Suphasit, 27 July 2001

The students's characteristics which ever developed from the center, the researcher using the activity result assessing form to the students of St.Joseph Rayong and Rajabhat Pamphaipunnee Institute assessing them characteristic after developed. The teacher assessing to students which they developed from the center's activity joined. The summary presented in table with description form by using percentage statistic value, shown as table 9-11.

**Table 9: An opinion of teachers about student’s characteristics which developed through participation in the MSAC Center’s activities**

Characteristics	Percentage
1. Knowledge	
- Fundamental knowledge about coastal ecosystem .....	75
- Fundamental knowledge about sea-lives .....	100
- Relationship between lives .....	50
- Life adaptation .....	50
- Situation of community’s environmental problem .....	100
- Effects of human activities to environmental quality .....	100
2. Attitudes and values	
- Love and care about lives and natural environment .....	100
- Awareness of community’s environmental problem situation .....	75
- Awareness of own roles to participate in conservation, prevention and solving environmental problems .....	75
- Environmental values	50
3. Skills	
- Observation skill .....	100
- Questioning skill .....	25
- Snorkeling skill .....	100
- Social skill .....	100

Table 9: Teachers think that students were developed in each characteristic except questioning skills that 25% of teachers think students were developed.

**Table 10: An opinion of Rajabhat Rumpaipannee students about their characteristics which developed through participation in the MSAC Center's activities**

Characteristics	Percentage
1. Knowledges	
- Fundamental knowledge about coastal ecosystem .....	92.86
- Fundamental knowledge about sea-lives .....	85.71
- Relationship between lives .....	85.71
- Life adaptation .....	85.71
- Situation of community's environmental problem .....	100.00
- Changes of fisherman community's way of life style .....	57.14
- Knowledge about environmental and conservation .....	85.71
- Knowledge about environmental education activity arrangement for youth .....	78.57
2. Attitudes and values	
- Love and care about lives and natural environment .....	92.86
- Awareness of community's environmental problem situation .....	85.71
- Awareness of natural resource values	100.00
- Awareness of own roles to participate in conservation, prevention and solving environmental problems .....	85.71
- Environmental values .....	64.29
3. Skills	
- Observation skill .....	85.71
- Questioning skill .....	42.86
- Snorkeling skill .....	92.86
- Social skill .....	85.71

Table 10: Students think they were developed in each characteristic except questioning skills that 42.86% of students think they were developed.

**Table 11: An opinion of students about their characteristics which developed through participation in the MSAC Center’s activities**

Characteristics	Percentage
1. Knowledges	
- Fundamental knowledge about coastal ecosystem .....	79.63
- Fundamental knowledge about sea-lives .....	96.30
- Relationship between lives .....	79.63
- Life adaptation .....	61.11
- Situation of community’s environmental problem .....	81.48
- Effects of human activities to environmental quality .....	79.63
2. Attitudes and values	
- Love and care about lives and natural environment .....	83.33
- Awareness of community’s environmental problem situation .....	55.56
- Awareness of own roles to participate in conservation, prevention and solving environmental problems .....	90.74
- Environmental values .....	90.74
3. Skills	
- Observation skill .....	77.78
- Questioning skill .....	38.89
- Snorkeling skill .....	92.59
- Social skill .....	85.19

Table 11: Most of students think they were developed in each characteristic except questioning skills that 38.89% of students think they were developed.

## **1.5 The learning source development**

The learning source development and setup have as interesting character as it started from the system education school and then developed until to be external school system. Its niche point is the interested learning activity, students sensed a real experience in the under sea classroom. There are efficiency using of natural environment to be learning source, even though sited in the space, capital and communities' contradict limited. The center has also efficiency human resource and interested activity in these limited and cooperation advantage with local. In the present day, the center building the network composed with education unit and education specialist. This makes the center to have an opportunity to the future development.

## **2. Water Ecological Learning Source: Learning Source of Magic Eyes Chao Phraya Barge Program: the Barge**

### **2.1 General information**

The Barge is the project which started since 1994 called "Chao Phraya Barge Program" by Mom Hluang Thee-tos Dhaewakool who established Three-tos International School in Chiang Mai. An importance objective is to present the new way to education to Thai youth, international youth, and interesting person. It is emphasis on a real experience learning processes with high efficiency and created. Then in 1997, Thai creation association was entire to run this project and renamed to be Magic Eyes Chao Phraya Barge Program. It was extending the target group and more chance opened for government and private school. The project's emphasis point is to presenting several knowledge as environment, history, Thai culture, and relationship between Thai and water, there by linked into Chao Phraya River as the natural classroom.

The importance learning source of The Barge is separated in 2 parts which the Barge classroom as the floating classroom and study points on 2 sides of the river. The research summary will present by emphasis on floating classroom and only one study

point chosen at Ko Kret, because The Barge was continuous using here to setup activity. There are main activity points which every group have ever been sense and learn.

## 1.2 Social and environmental context

The Barge using the riversides of lower Chao Phraya to be the learning station and study trail, there for activity setup will sited in Phranakornsri-Ayutthaya, Pathum-Thanee, Nonthaburee, and Bangkok. There have a composite social character between agriculture, industry, and civil community. The importance places also in history, natural, and cultural, this present will be emphasis on Ko Kret area which the site of traditional community beside the river.

Ko Kret is the island sited in the middle of Chao Phraya River, in the past it was a land overlaid follow the river curve, called Ban Hlam. In 1822, the age of King Taay-Sra of Ayutthaya Empire, he ordered to dig a short-canal called “Lud Kred Noi” canal (Sub-district administrative organization of Ko Kret). The water flow in this canal is very swift to directly flow make its more wildly until the island appeared, this first called “Ko Salakool “came from the temple name. When District Pak Kred was established, the island shifted to be Ko Kret sub-district (Ed Phirom,1999 ).From the old sited at cape tip have a historic community, There are importance as the commercial hub and the ship check point sited, here the art and culture still remained; the beautiful architecture of the post-Ayutthaya including to the many folk way also Thai, Thai-Morn, and Thai-Muslim.

In the present, Ko Kret’s status is sub-district, 4.12 sq.km. or 2,578 rai, it compose with 7 villages/ 1,240 households. The population separated by national, Moo 1,6, and 7 are Thai-Morn national which 43 per cent, Moo 2,3,4, and 5 are Thai and Thai-Chinese which 42 percent, and Thai-Muslim are spread beside the river in Moo 2 and 3 boundary which 15 percent. The 85 percent of all population are buddhist and here 6 historic temples.

Most of people are in an agriculture part as gardener, planted area is around 1,420 rai and a traditional burned soil molding as minority. In the past they ever made also used tool such as jar, bowl, small pot et al, and art accessory in a jug shape which

emphasis on its shape and stripe carving. But after the tourism activity have more roles in the island, this molding craft should emphasis on a small souvenir including to decreased using of soil molded accessory, which a little made remained. Art stripe mold craft made in the present day are not emphasis on Morn art stripe caving, but turned to a simple Thai stripe which its customer demand harmoniously. Now they import a soil from Samkok district because decreasing of “Middle island soil” and faced a landslide.

There are limited of public infrastructure caused island condition, only one around the island road and small short- way for walking or bicycle. Moreover, the cultural tourism rush is effect to many tourists flowing here and spent their money. Waste problem rapidly increased, now island people have the waste keeping day which responded by sub-district administrative organization to hire the responding private to picked cross the river to Pak-Kret.



Picture 9: Ko Kret, Community which is very famous about soil molding

Community in the island has a perception about the Barge’s activity from it lead also Thai and international students to studied environment, way of living, and culture of community. Even though The Barge using the island as a learning source but it never make a strong co-operation to developing to be the environment education learning source. Consequently, now the island is been the favorite touring site, in weekend, it has many tourists then most people have their job as merchant. In weekdays they will go out for work, if they not been a gardener, this making a co-activity to difficult. A continuous activity which the Barge try to do every time is “Clean up the world” in September to keep a waste on Ko Kret. Moreover, in the

human source, the Barge have a good supported form local craftsmen and many stove owners to explaining, demonstrating, and teaching in soil burned molding to the students, including to give an information and answer to the prepared question.

*“Early, we ever tried to join with Wat-Paramai-Yigawas School which invites many craftsmen to teach them students. We lead our students to join, but the school system is not supported to our job. Sometime it is not associated between schedules because the school teaches by it which hard to flexible, while our activity which in a period some time more Ko Kret trip frequently. We turn to request for one by one craftsman such aunt Sri with whom many time teach at her house, when we want to go to which we make an appointment with her, if inconvenience then we contact to other.”*

ChomPoonoot Thanabadee, 29 October 2001

### **1.3 Component of learning source**

The 2 learning source of The Barge;

1. On boat classroom, the boat of Magic Eyes Chao Phraya Barge Program is the teak wood boat modified to be the floating classroom. It can receive 22 persons in night trip or 25-30 persons for a one day trip. There are 2 floors, top floor for do an activity with the emergency equipment for 30-40 person, book corner, and accessories for an activity. The down floor is the bedroom and adjustable to be an activity place when faced rainy and its not suitable for activity done. The boat tail is a kitchen, bathroom and toilet also 2 rooms. Except these, the boat have a waste therapy tank to keep a used water to dropped at the office building, for it passed the therapy before drop into the river. The toilet wash water is hand pumped from the river, for bathing and other used the water form Tree-tos building which filled in the boat tonnage. In the long trip there are a water severing point at Wat-Singha peer, Bangbal district and Piyawan Resort peer, Bang-sai district, they supporting cheap water. The safety part, the Barge has 40-50 floating suits and safety advice activity must do before the boat activity started.



Picture 10: The Barge, floating classroom



Picture 11-12: Learning activities on the Barge

For the activity's media and tool, prepared and able to used suddenly such as binocular, small fresh water watching manual, magnifying glass, simple water quality test, color, pencil et al. Moreover, in every trip The Barge will preparing the Learning Journal for everyone, it composed with work sheets for several activities and additive note.

In the boat trip will load and release the students at River Rhine Condo pier which nearby to Nontaburi pier, there by supporting in every trip of The Barge.

2. Natural and cultural classroom: The Barge decides program, trail and station by the trip, considerate on trip day and target group demand. Generally, the trail is Bangkok-Pathumthanee for one day, Bangkok-Ayutthaya for 2-5 days trip. Importance stations are Ko Kret, Wat Pai-lorm animal preserved area, Bangsai Art

center, community beside Noi river, Manoerah canal, Ayutthaya, and Bangpa-in palace.

Ko Kret as the main learning source of The Barge have 2 important study trail (see picture 10).

1. The first trail around a big circle from Wat KlangKred peer go west and turn to east pas Moo 2,3,4,5,6, and 7 to finish at Wat Paramai-yigawas. This trail is suitable for adult or youth, emphasis on the real natural experience sensing and studying to living way and agriculture on Ko Kret

2. The second trail, one or two-way form Wat Chimplee to Wat Saotongthong, this trail will pass Moo 1, 6, and 7 which a commercial zone of souvenir. There are the mold craft factory and important historic places such Wat Paramai-yigawas the historic Morn temple, more than 200 years. In this temple have the museum collected the art antiques. Wat Pailorm or Pia-To, the post age of Ayutthaya empire temple with the beautiful temple and twelve angles basis pagoda. Ban Kwan-Ar-Marn, the local museum which collected the rarely Morn stripe mold craft. This trail is able to flexing the study time and selected the suitable station for the learner group and activity time. This trail is emphasis on folkway of Thai-Morn cultural and an effect form tourism activity.

The activity on these 2 trails will use the main activity which its similar structure is to survey Ko Kret by PPP technique (Pieces, Patterns, and Processes). There by separating the persons in 3 main groups for 3 parts question in environment, economy, and social culture. Then assigning them to study to community, emphasis on observe, interview, and real data collected. When the activity finished it will discuss on several groups summary for a widely image.



Picture 13-16: Learning Activities on Ko Kret Island

The Barge activity have a main concept at to learning in the natural classroom, to sense, absorb, and find an answer by them self. There are also emphases on group for social skill and individual activity for private interest, all activities was designed for one trip, activity program composed of;

- 1) Environment study activity such as Water quality testing, Secret of water hyacinth, Bird watching, Tons of trash, Watershed model, Creating a watershed, River observation, Sound map making, Stepping stone, Paper making, Shopper's choice, common dilemma etc.
- 2) Social skill training activity, group relation and games such as Name game, Square jigsaw, Captain's coming, Human knot, Sherman tank, and Barge crew which 4 groups separation for responding to boat cleaning, cooking, trip journey noting and pre-meal activity leading.

The designed activity has a similar teaching structure, accurate steps also Pow, Bridge, Body, and Debrief. All activities which setup in the program is covering to Exploration, Investigation, Solution, and Action ( environmental studying activity

manual for Chao Phraya basin conservation, 2003). Except these, a further activity set for specific trip such as train to molding a burned soil craft with the local craftsmen and joining to trash kept with the students at Ko Kret.

A learned in several programs of The Barge, except to do activities the participated person must learn “living for environment” too. Example to separating dropped trash in fixed bins, have a meal in the rule to less a trash food, they must clean their own cocotte. They can reuse a water simply by used the first washed water to mixing to washer in the next meal. A bathing time is only 3 minutes fixed for a night trip, refusing a polystyrene container and plastic bag. (look to the Wattana Wittayalai School trip program)

**Example of 2 days trip program for Wattana Wittayalai school**

18 August 2001

<b>Time</b>	<b>Places</b>	<b>Activities</b>
08.30	River Rhine Condo's pier	Welcome to the barge
08.40	On the barge	Safety introduction/Staff and crew Introduction/Barge community Introduction/Name game
09.30	On the barge	Snack and drink
09.45	On the barge	Tons of Trash
10.45	Pathumthaneer market	Shopper's choice
12.00	On the barge	Lunch
13.00	On the barge	Paper making
14.00	On the barge	River observation
14.45	Bangsai bay	Canoeing and swimming
15.00	Bangsai bay	Cleaning/Snack
16.00	On the barge	Sherman Tank
16.30	Ban Bangsai	Barge crews
17.15	On the barge	Dinner
18.00	On the barge	Stepping Stones
19.00	On the barge	Shower/Free time
20.00	On the barge	Bed time

**Example of 2 days trip program for Wattana Wittayalai school (continued)**

19 August 2001

Time	Places	Activities
06.00	On the barge	Wake up
06.30	On the barge	Barge crews
07.00	On the barge	Breakfast
08.00	On the barge	Bird beaks game
08.45	On the barge	Introduction to Silapasheep Bang Sai center
09.00	Silapasheep Bang Sai center	Chao Phraya bird and fish watching
10.15	On the barge	Snack
10.30	On the barge	Secret of water hyacinth
11.45	On the barge	Barge Crews
12.15	On the barge	Lunch
13.30	On the barge	Human Knot
14.00	On the barge	Introduction to Ko Kret and Mon's culture
14.30	Wat SoaTongthong's Pier Ko Kret	Ko Kret exploration
15.30	On the barge	Back to the barge/Snack/Conclusion
16.00	On the barge	Closing
16.30	River Rhine Condo's pier	Farewell to the barge

There are also Thai students and International students whose the activity target group, activity designed and programming have a difference. There by Thai students is emphasis on environment study or natural activity, while International to study on Thai living with water. There are depending on the teachers' advice.

*“Working with Thai and International teacher is certainly difference, Thai teacher are not familiar to this activity, they lost the way to setup an environmental study, where and how they should emphasis. When we contacting to International teacher, they specifying what they wan to emphasis. Some teacher whom work in a long time can chose what activity needed.”*

Chompoonoot Thanabadee, 28 June 2001

For the summary assessing form, because The Barge's activities emphasis on directly practice, this make an assessment to do on a real condition. When the activity

day, 3 staffs will go to meeting for worked conclusion and daily journal noted. Moreover, when the trip finished they will do an assessment activity by students, also oral assessing on learned from activity, impressed noting, or impressed activity scoring, including sending the assessing question form to the teacher or group leader.

Because of The Barge have not making the document assessing form for every trips. The researcher was making the assessment question form by students and teacher for the Wattana Wittayalai School's trip in 18-19 August 2001. They composed with 2 teachers and 24 students, 18 questionnaire form were turned back, the activity assessment summary and program running by The Barge;

**Table 12: An opinion of Wattana Wittayalai school's students about satisfaction of activities conducted by the Barge**

Items	Satisfaction (Means)	Meaning
1. Overall activity	4.78	Strongly Satisfied
2. Safety introduction	4.78	Strongly Satisfied
3. Barge community introduction	4.44	Satisfied
4. Name game	4.22	Satisfied
5. Tons of Trash	4.56	Strongly Satisfied
6. Shopper's choice	4.89	Strongly Satisfied
7. Paper making	4.33	Satisfied
8. Broken square	4.44	Satisfied
9. Human Knot	4.00	Satisfied
10. Sherman Tank	4.78	Strongly Satisfied
11. Stepping Stone	4.67	Strongly Satisfied
12. Canoeing and swimming	5.00	Strongly Satisfied
13. Chao Phraya bird and fish watching	4.44	Satisfied
14. Secret of water hyacinth	4.67	Strongly Satisfied
15. Ko Kret's exploration	4.56	Strongly Satisfied
16. Barge crews	4.67	Strongly Satisfied
17. Conclusion and last evaluation	4.67	Strongly Satisfied

Table 12: Students think that in the aspect of satisfaction all of the activities are in the "Strongly Satisfied" level.

**Table 13: An opinion of Wattana Wittayalai school's students about satisfaction of service and management of the Barge**

Items	Satisfaction (Means)	Meaning
1. Barge environmental management	4.78	Strongly Satisfied
2. Bedroom	4.89	Strongly Satisfied
3. Toilet and bathroom	3.89	Satisfied
4. Food/Snack/Drink	5.00	Strongly Satisfied
5. Vessel	4.78	Strongly Satisfied
6. Waste management	4.89	Strongly Satisfied
7. Book corner	3.67	Satisfied
8. Learning media in each activity	4.67	Strongly Satisfied
9. Barge safety	4.89	Strongly Satisfied
10. Facilitating by staff	4.78	Strongly Satisfied

Table 13: Students think that in the aspect of satisfaction all of the services are in the "Strongly Satisfied" level.

The assessment by 2 teachers able to conclusion as this composition;

The first teacher is the chief of students activity of Wattana Wittayalai School, have an experience in an environmental study activity trained and ever been join The Barge's program for 7 times. The teacher told which too much satisfied in this time joined is the group process which to separating respond, work switched, and good activities integration. The activity have an interesting and harmonious with the new learning. The learning activity assessment, the teacher stated which all activities are in the purpose level and high level suitable. Noted on trash separating, friendly buying, Ko Kret surveying, and Barge crew are in the maximum suitable level. The teacher give an additive suggestion which its too expensive for Thai students, concerned it not to distributed as possible. In the learning source setup assessment, service, and learning source management, the teacher give a much level satisfied scored. Noted on trash management and convenience conducting by The Barge's staffs are in a maximum level, immediately level for book corner.

The second teacher is teach in the secondary education of Wattana Wittayalai School who never been in The Barge's activity. The teacher told which a maximum

satisfied in this trip is a real practical activity. In the learning activity assessment, the teacher think which all activities have a maximum purpose and suitable. Noted which every activities have maximum purpose and suitable. In the learning source setup assessment, service, and learning source management, the teacher give a maximum satisfied level scored, noted on room and book corner in a much satisfied level.

The organization management, now The Barge is in the Thai Creation Association Project, but it most independence administrative directly to the association minister (Khun Ying ChodChoi Sophonpanitch), this make it smooth managed.

There are 12 presently staffs, composed with;

1. Project Director; Chompoonoot Thanabadee.
2. Teacher; 3 Thai teacher and coordinator, 3 foreigner teachers.
3. Office manager 1 person.
4. Office worker 1 person.
5. Boat captain and 2 crews.

Moreover, the teaching staffs have the foreigner volunteer from PISCOL and VSO to join. They are most important to helping on concept development and used of an innovation to developing The Barge's activity running more efficient. All Thai staff are good in English command which have an efficiency to the International students group. For one trip, the team work composed with 3 teaching staffs, if in the International trip will have 1 Thai and 2 foreign staffs.

Training and human preparing to teaching practice, caused form some staff of The Barge were not educated in education science, but they have a specific skill, such as Environment science, history, art. The Barge holding which as the needed activity, even though there are not certain scheduled to be training day. The Barge has a work shop meeting for revise and prepare to teaching at lease 1-2 times / year.

In the budget management, The Barge done by fees from activities in several project, the running capital is too expensive especially in the boat tripping and maintaining including to staff salary.

The Barge must be self managing for these which make a one trip cost is around 30000 baht / day. From this cause, an activity fee which the joint school must

paid too expensive for Thai school. The Barge understanding to this limited, now There are 3 rates of service fee.

From the budget limited, most of activity joint schools are the International school's students because they can responding to the service fee. Including to their have a facile classroom management which their classroom is around 20-25 students, this numbers is suitable for The Barge buffered in once trip. For Thai school, The Barge attempt to find for the supported fund from external organization to the project encouraged for special group children such as less opportunity children or the students whose study in the school sited on the river side but lack of chance to learning with The Barge. There by setup the special project to finding the donation such "Art for The River" project which hand given form many artist such as Master Prahyatt Pongdum, Prof. Assistant Prateep Sawangsook, Master Wichok Mookda-manee et.,all. They were gone with The Barge with other artists Master Sri-wan Janehuttha-karnkit, Master Sawatt Tuntisook to do there arts creation for the exhibition and sell. Total income used for "Artists Love Chao Phraya Fund" established for The Barge pay for free activity serving for Thai children groups.

#### **2.4 Results of the learning source development**

From the started run by Thai Creation Association called Magic Eyes Chao Phraya Barge Program since 1997, now persons who ever been joined to The Barge for 10732 persons. (See table 12 and 13) There are covering to several target groups such child, youth, and adult also Thai and foreigner. The activities setup in the boat classroom as a learning source, natural classroom in Chao Phraya basin, and another sources such as Koa Yai national Park, learning sources in Chiang Mai, Kra Bi, Kanchanaburee, and Udonthane.

**Table 14: Number of trips and participants who participate in Barge trip of the Barge during 1997-2002**

Year	Thai Students		International School (in Thai) Students		Adult		International Schools and Organizations	
	Number of trips	Number of Partici- pants	Number of trips	Number of Partici- pants	Number of trips	Number of Partici- pants	Number of trips	Number of Partici- pants
1997	4	76	4	82	2	44	-	-
1998	6	129	31	726	31	581	2	31
1999	28	691	47	1,127	22	358	10	220
2000	10	246	43	1,001	15	251	11	216
2001	23	506	36	720	11	177	12	240
2002	26	563	51	1,122	9	188	10	220

**Table 15: Number of trips and participants who participate in land-based trip of the Barge during 1997-2002**

Year	Number of trips	Number of Participants
1997	-	-
1998	1	52
1999	5	138
2000	10	354
2001	9	223
2002	15	450

In the characteristic assessment, because of The Barge never made this assessing tool, the researcher should make the self-assessment form for the students and done by the teacher who lead the students to join the activity, the characteristic developed from The Barge's activity joined. Information was given from teachers and students from Wattana Wittayalai School, analysis the result by percentage vale, the result presented here (see table 16).

**Table 16: An opinion of Wattana Wittayalai school's students about their characteristics which developed through participation in the Barge's activities**

Characteristics	Percentage
<b>1. Knowledge</b>	
- Fundamental knowledge about waste management .....	88.89
- Impacts of human activities on environment .....	88.89
- Environmental behavior .....	
- Fundamental knowledge about natural resource .....	100.00
- Fundamental knowledge about living things .....	88.89
- Adaptation of natural lives .....	77.78
- Using zoo-plankton as an indicator to evaluate water quality .....	77.78
- Fundamental Knowledge about background, society, culture, and economic of Ko Kret community .....	88.89
- Changing of the river side communities and environmental conservation .....	100.00 77.78
<b>2. Attitudes and Values</b>	
- Commitment and care about life and natural environment .....	100.00
- Awareness of environmental problem situation .....	88.89
- Awareness of local culture as cultural heritages .....	100.00
- Awareness of human roles in conservation, prevention and solving the natural and man-made environmental problems .....	100.00
- Expected Value about environment such as reducing of consumption which makes unnecessary waste .....	100.00
<b>3. Skills</b>	
- Observation Skill .....	100.00
- Questioning Skill.....	66.67
- Data Collecting Skill .....	66.67
- Social Skill .....	100.00

Table 16: Most of students think they were developed in each characteristic.

Information analyzed result stated above is harmonious with information from 2 teachers led them students to joined the activity. They stated which the students developed to their characteristic from activities joined, covering to knowledge and understanding, objective, favorable, and skill.

For the effected result from the learning resource developing to be the environment study place of The Barge to the community which this research aim to Ko Kret. The researcher found which the developed source are not to developing the new source in Ko Kret, but to programming the activity for learning source used. This is the learning resource which also in natural environment and Social-Cultural environment value. The effected result may not taken place as concrete in the community changed, but the people perceiving to The Barge's entry. Especially, the specialist group such as the community's local wisdom belongs to the familiar merchants. They suddenly know to polyester container and plastic bag avoiding when the students buy them goods, they will use the banana leave vessel.

*“People know which if we lead the children to buy snack, they will containing it by banana leave vessel. While the children were prepared to ban a fome box and reducing the plastic bag”*

Au-sa BoonKosol, 16 September 2001

The similar view was occurred at Pha-toomthane market which the study and market point of The Barge. This activity could be done in the night trip as the consequent of “Friendly buying with the environment” activity. The children will learn to refuse the fome box and plastic bag reducing by preparing of fabric bag and plastic box for go to market. When they holding these and walk into the market, several shop owners know which they come with The Barge.

In the education and environment study, Thai teacher with whom the researcher interviewed while in field data collecting belong to study from document. There were stated to the staff efficiency and interested of the activity which done by using the learning source to managing the environment study of The Barge, similar to;

*“They are the representative teacher who able to teach the children to think, practice, and learn by themselves”*

Kanchana Sangplung, 19 August 2001

*“Activity is the clear example of integration, able to insert the good idea by the children enjoying to learn”*

Thassanee Jintananonta, 16 September 2001

*“In the last 2-3 years, we were widely talked to the child center learning, but never seen it until gone with The Barge. This make we understood what the child center are.”*

Thongdee Yam-srual, 1999

The learning source of The Barge are not only for the children, youth, and interesting person, but There are a role in the learning source of new study management by used the environment study processes as the importance emphasis point. The project acceptant can look from the United Nation Environmental Project (UNEP) selecting The Barge to be 1 of 6 organizations in Asia-Pacific which have the excellent practical in the environment study. Except this, the human resource for learning or personal learning source of The Barge who have respected in the environment study working. Chompoonoot Thanabadee the ex-director with whom write the book “ Green Bridge “environment managing manual supported by The Department of Environment studying quality encourage”. In 2001, Mr. Robert Steele, Chompoonoot Thanabadee, and Poowadol Namdokmai the staffs from The Barge were qualified to present the environment studying activity in the work shop meeting “Community-based Environmental Education in Asia-Pacific” during 20-24 May 2002. The Barge have capital supported from The British Embassy for run the environmental education project for Chao Phraya basin conservation, there for distributing the learning technique and processes to 30 schools in Autthaya, Phathomthane, nontaburee, and Bangkok.

## 2.5 The learning source development

In the weak point/strong point and vision specified and the important development strategy of The Barge, Chompoonoot Thanabadee ex-director, Daranee Weanuchantra director, and Robert Steele project coordinator reflex an interested opinion;

*“We have unique character of activity, even though we adjusted it from western idea, but we trying and learning with the children. Today we can say which we confident in our activity, even though staffs changed, who walked in / out. If we have still done the technique and processes which we are, The Barge can still, too.*

*We have a quality staffs, able to work mainly, they have own skill and specialist but their team working to be strongly, including to western working culture and facile management. Who have any problem, then we will talk to clearing it, everyone responding to own job.*

*One thing may not be a strong point but it is uniquely appeal which is boat. It is only one in this mission”*

Chompoonoot Thanabadee, 29 October 2001

*The small group activity is our strong point, this make the children fully learn and change. While it is the weak point because an expensive head-cost which to be limited, our social see which “value” less important than “price”*

Daranee Weanuchantra, 15 March 2002.

*“We try to give a chance to the staff to create own project, who want to propose a new project which we please. We believe which everyone have an efficient, rapid learning, many never study in education, someone educated in history and someone in science, but they prompt to learn. We must give them time and external learning chance, train them to finding an issue and have own view, able them to present an opinion, and activating them to do the organization agent role.”*

Chompoonoot Thanabadee, 29 October 2001

*“Look forward, we look to The Barge will have own Land-based Site for extend an opportunity to Thai students and teacher to learn more. We want to extend to training job and more land-based activity setup, several at Kra-bi, Koa Yai, Chiang Mai or somewhere we able to entry and use as the environmental education working. We try to connecting to the environmental education network in Asia-Pacific federal and we want to shift The Barge to be the one “learning source”for Thai education.*

*One work we want to do is extending to work with the community. We usually use Ko Kret as the classroom; it should have some project to work with this community. “*

Daranee Weanuchantra and Robert Steele, 15 March 2002

The Barge developed to be the learning source until it strong and endure. There are many interesting issues;

1) The activity developing in a concrete integration is able to use the learning source in efficiency activity done. Even though the classroom changes from the boat to the land-based sites, the developed activity is able to adjust to associate with the new content and vision in the new context.

2) The many activities lead to be a highly flexible curriculum to adjusting for several target groups.

3) The staff preparing make a continuous learning including to used of the study and learn innovations such as activity, learning media et, all. These make the media, activity, and personal in the learning source have modernized, able to activate an interesting from the children, youth, and adult group.

4) The Barge looks on it self as the organization of learning which developing to be “learning source” also domestic and federal level. There are a privatized management with high facile, able to earning while doing an education activity. There by There are clear main target group in The Barge supported. This is important to enable The Barge to opening on the education stage or environmental education working also domestic and federal.

### **3. Forest Ecological Area Learning Source: Learning Source of Ban Sunmaked Sunkeelek Hua-fai-pattana School: Ban Sunmaked School**

#### **3.1 General information**

Ban Sunmaked Sunkeelek Hua-fai-pattana School is sited at Moo 1 Sub-district Wiang-ga—hlong, District Wiang-pa-pao, Chiang Rai, which an intermediate primary school in The Office of National Primary Education Board regulation. The school has 12 rai 3 ngarn 93 tarangwa, composed with 2 study buildings, and 1 workshop. There are 8 classrooms and 1 language lab (20 seats), science and computer lab. It receive grade 1-6 primary education classroom which 1 room/ 1 grade, and pre-primary level 1 and 2 for 2 classroom totally. There are 9 teachers and 1 administrator, in 2001 There are 237 students whose came from Moo 1: Ban Sunmaked, Moo 2: Ban Sunkeelek, and Moo 12: Ban Hua-fai-pattana separated from Moo 1 (Operational plan, 2001 education year).

The school was started to the forest ecological area learning source development in 1996 by joined to The Developing Environmental Education activities with community forestry participatory case study project. This project is cooperation of The Curriculum developing center, Educational Technique Department with The Office of National Primary Education Board, Elementary Education Department and Michigan Stated University. They plan this project for developing the education process which emphasis on the community problem analysis and exploring to the practical solution. There by let the students to participate in the living decision and the real problem in own community. This joint have an importance effect on activating to co-learning between the school and community by using the community forest as the learning source.

Even though The project was finished its running period, but the forestry ecological area learning source which The school use Moo 1 and 12 , 4 kilometers far with around 1000 rai (Mr. Choo-chart Chai-sri, 5 August 2001) as the learning source is still regarded and used as learning source continuously. Except this, the community still has participated to developing it by the community's organization called "forest

prevention volunteer and environmental conservation youth” which co-regarding to the community forest with the school.

## 1.2 Social context and environment

Ban Sunmaked is the tradition community which more than 100 years sited in a plain and hill side plain of Wiang Pa-pao basin with Lao river passed though. Most of people are buddhist and do a rice field, luffa planting, and industrial factory employee. They life are still depend on the forest by gathering for the forestry products such as firewood, mushroom, bamboo shoot et., al. In Moo 1 have 275 households, 40 percent of them are still relied on forestry product as bamboo shoot and mushroom, red ant egg, chewing insect, thick banana leave, usage wood and firewood (Somsak Sukawong, 2002).



Picture 17-18: Ban Sunmaked Village



Picture 19-20: Community Forest

Forest found here is five-kind forest which bamboo dominantly in many kinds. Earlier, here have a perfect forest area but in 1982-1985 the government was entry to done the land reformation effect on the forest pioneered to be usage area. The people have more usage land but they still have no more out put, then began to sold their land to external capitalist. The capitalist who forestry concession given began hire them to cut the tree, this make more forest trespassed and effect to the community's forest.

*“Early, in the village bound ever have the perfect forest, but when it more trespassed from the concession, our road almost to less our cars which many wood drag truck. Our people were stilled do a floating field, the forest area began back warding and reduced of wildlife. At the village's graveyard ever have hiding barking deer, a tiger have ever resident in Sunmaked temple's church. The forestry official have ever warned the people to preserving it but no one belief, each one do forestry until dried of canal”*

Singha-kum Kid-arn, 7 August 2001

*“In the passed here very perfect forest, it began to changed when the land reforming by government.*

*We ever have too much forest area and many big trees, but the government was entry more over land by bulldozer car to landscape adjusted. They told us which our benefit, but only one year it fully of grass until we can't plant anything, then it sold to capitalist. There were totally around 600 rai which ever been the forest, people have a good living earlier but when the government entire here we go badly.”*

Ta Ma-wai, 12 December 2001

*“The good changed of the forest was started after Ban Sunmaked School established their teaching way followed the environmental education learning process development project, primary education level and secondary education. There by study to the community forest as emphasis on participation that let the students to study a real problem condition in the community. In this learning process the students have field study from community surveyed belong to problem analysis and learning*

*summary presented to the community. This impacting to the community turned to give an importance to participate in the forest conservation.*

*“The children asked that ‘If we still been this time, how have been next?’ our child will not seen forest, when we lost it. This makes the people to think and activated.”*

Ta Ma-wai, 12 December 2001

*“The day that our children presented their result, each question they asked we can not answer. We were still living with the forest, when they asked us then we concerning that here we born, growth, and die. However we must live here with the forest.”*

Aonkeaw Tidchai, 9 August 2001

*“The student comes to interviewed for the passed condition of community and forest information, after that they presented to the community perspective. Also in pictures, drama, and story told reflecting to see our changed in community and forest. One question they shocked us that “Why we not to concerning to the forest today?” This is the strike hit, someone who can realize and going to cry.”*

Singha-kum Kid-arn, 7 August 2001

*“After the students finished in community data collecting, they presented it to the people that they told the community history, stated to changing of resource, and living way. Early we ever love other, now we are separated and tradition changed, resource changed that some elder crying.”*

Sawwanee Chai-mongkol, 6 August 2001

*From the role as only information giver, the people began they participate as the community expert. They rotate to respond their guide role to lead in the local forest tour. Then they group to establishing the forest prevention volunteer and environmental conservation youth by Por Luang Singha-kum Kid-arn who is the headman of Moo 1 as the important axial.*

*“I am the first hand up and told that to be preserving it, a little hand followed tome. The community head group began to help the school by leading the students to forest walk. The students asked then we answered, from a small group that extending to hundreds members. When we lead them in the forest, more explained that more we concerning all value of trees. Then we were in the volunteer group meeting, we stated that “not to cut the big tree”. The teacher let students to learning with us to pass on the knowledge.”*

Singha-kum Kid-arn, 7 August 2001

*“Started members from Por Luang Singha-kum and around 20 people, we met first hard time because many people not accepted. They ever get benefit and we try to influencing by the children as the understood media. Now each 3 villages are giving a good hand, people got the purpose from the forest to gathering its products such as soil-mushroom, red mushroom, and chicken-mushroom.”*

Mr. Aonkeaw Tidchai, 9 August 2001

*“First not many volunteers that Por Luang Singha-kum was the axial, I handing to be boarder (that time, Por Luang Thongkum is the headman deputy-researcher). First generation was around 10 persons but we attempt to make an understood with each people groups. They asked us that ‘what we did for?’ then we answered them that we not only did for the children but we did for our community, children can use it as the learning source. It started to small grouping until 1995 we joint all village, first time have someone countered but we tried to talk in the local meeting sometime they stay in group that we talk with.”*

Ta Mawai, 12 December 2001

In the present, the forest prevention volunteer and environmental conservation youth is the private group, but they have the organization management by president election and continuous activity. Example such to do the forest fire protection row, sending an agent to be the expert for the forest tour leader. Now they are more concerning about an importance of community forest and more participated in the learning setup for the students.

*“People joint to be the learning expert, teacher explains to each groups of village to know. Push them to co-regarding to the forest, make a fire protection row, plant it, and help in improvement because its village’s benefit. The school want the students to learn about forest, present condition have a problem caused from it reduced. The people participation makes the forest turned to be perfect.”*

Ta Mawai, 12 December 2001

*“When lead the children to walk, they will ask about plant then adult giving an information. When we will lead them, we make an appointment with the village’s agents, separate in 3 groups with 3 adults*

Aonkeaw Tidchai, 9 August 2001

In the social and culture characteristic, Ban Sunmaked community is the plain group in the Lanna cultural boundary. People still use local language to communicate; most living way is the agricultural social depended on community forest as a main food resource. This tradition community make they have the folk relationship system that changed since a capitalist entry. Labor hired to wood cut and related to benefit, it effect to the village’s unity. The school and community turned to have cooperation to developing the learning source in the community forest have impacted them to be united. Establishment of community’s organization for the forest regarding make it turned to be more replete and be the main food source. The community forest is not only finish its role as the school’s learning source, but it link the school with community, help people to be united and add a good living to people.

*“Earliest, we were united but in the forestry period that began to separated because a benefit. After that we turning to reunite to preserve our forest, now people have a good life, planting, do a garden, or plant the rice field, and some gathering the forest products.”*

Singha-kum Kid-arn, 7 August 2001

*“Early we have individually living, sent a child to the teacher respond and they come back in noon. Something they studied, parents never know but when they go to*

*learning in community that make we more closed. The school's activity is similar to be community's activity, too such as planting in the school then we give them our heart. Community have more unity, now I hope that if I have a power, I will do this for every school in Thailand as the network for forest regenerated"*

Aonkeaw Tidchai, 9 August 2001

Moreover developing the learning source in community forest area, now people groups are attempting to develop the cultural learning source. There by Mr. Suwat Dararatt, the important local intellect who has ever been in the monk hood as the abbot of some temple in Chiang Mai. He retired and settle his life in Ban Sunmaked community and he is the axial in The Local Intellect and Lanna Living Way Continuous Center established in 2000. This center is work with the school and community to collecting the Lanna living way knowledge and local intellect to pass on to the new generation also in/external.

*"Now we trying to collect the local knowledge from elder age, invite the grand master for his hand. The center tries to collecting the traditional house of northern and modeled it for next generation. This knowledge used very long time to kept, every elder people have some knowledge but these are value. When we collect them as the value intellect, they will proud to themselves.*

*"We ever passed these intellects to die with elders, really they never appearing in the social. Thailand must accept our local intellect because it is value heritage we could exploring and continue. Our work is similar to a candle light in the dark, who can do something must be done, but we hold on the correctly technique. Culture is relied on living way, if we need to regenerating it, we must done it survive in our simple life."*

Suwat Dararatt, 8 August 2001

### **3.3 Component of the learning source**

Ban Sunmaked School is integration the environmental education into the curriculum and teaching. There by use the teaching formation by community forest

case study to link knowledge also in natural environment and community. The importance learning source is village's community forest integrated to be consequence of the curriculum as dual-technology. Environmental education integration unit about community forest is the axial in the experience subject, primary education grade 1-6. It is the continuous unit for 2 education term, first semester it emphasizes on the general data collecting from document and local expert's interview. The second semester, it emphasizes on experience-based observation and survey in community forest. In grade 5 will emphasis on studying a general condition to know the forest components and it's dominant, not to study about problem issue. In grade 6 curriculum, it emphasizes on environment problem in the community forest. For grade 1-4 have the forest integration that harmonious with grade 5-6 study issue but not emphasis on real walking in forest, only data collecting from the expert, parent interviewing, and walk outside the forest. The issue specified to study in each year will be different depending on the consideration and advice given from community leader.

*“Generally, grade 5 will collect a general data, grade 6 is revising on the passed content that how it perfectly. A studied problem is coverage of not, what problem is solved, what is remaining. These are stormed to considering and let they select what interested.*

*This year we have 7 main problems from first debated and considering that what we want to study. May be we revising from senior's issues or newly problem that never studied, what problem we easy to collecting data. This year we conclude at the rare natural food, after that we will debate what we study, making the map and explore to its description. Begin to brain storming and conclusion debate, some group got a plant problem, other got animal problem. Then surveying to know what more / less and rarely such a mushroom still growth but begin to reduced and more expensive. After that, we will grouping them to study by their interest and project making. When their present in the classroom, we will concluded into one issue and making the classroom project.*

*This rare natural food issue that presented and selected only bamboo shoot because it impact to most community's people and easy to collecting the data.”*

Sawwanee Chaimongkol, 13 December 2001

When the study issue specified, teachers will analyzing to the curriculum for developing to be integration teaching plan in the learning group. There by teach as integration dual-technology, as example;

The Flexible curriculum is make the local's knowledge linked, and learning source benefit will have various roles in each year including to the expert group who joint as rotation by an issue skill. The study way and point specified have a differential depended on each objective to walk, teacher and community expert will join to fixed it. Now community forest have around walk way as the main course and sub-study way fixed in several year.

*“The study way is changing depend on the study issue and then fixing points, sometime looking to planted tree, sometime pointed to look for what plant found in plain, moisture with gravel how it different. Walking point specified, students will fixing it and teacher will advice them to the expert that help to programming. Tell them what they learn and get, children will ask from community of tour leader. Education term finished, this will be concluded, we lead them 2 times / year with grade 1-6 walked for real learning. Grade 1-2 will walked near their home and more deeply in grade 3-4, all grade studied because a continue and link for basic knowledge. When I present this issue, I try to tell that forest learning must be continuous.”*

Aonkeaw Tidchai, 9 August 2001

Learning activity will run following to the guide line from the education processing development project by the step of the activity as a long period learning activity program; (Pensri Juntraduang and associate, 1997)

1) Study and examine the base information of community for exploring to the study issue.

- 1.1 ) Meeting to explain an objective and teaching guide line
- 1.2 ) Training for data collecting skill.
- 1.3 ) Planning to collecting in community.
- 1.4 ) Field operation.
- 1.5 ) Data analysis.

- 1.6 ) Setup the community data center of the school.
- 2) Select a problem issue for study and deeply information studying to come across the related details.
  - 2.1) Considering for cause and sorting the problem issues in community.
  - 2.2) Presenting issues to community for co-decision.
  - 2.3) Collecting deeply information for problem analysis.
- 3) Reporting an explored to community
  - 3.1) Making the activity in community for reporting to the problem analysis.
- 4) Join with community to study alternate solution and chose a possible alternate.
  - 4.1) Study a solution to problem solving with community.
  - 4.2) Problem solution chosen.
  - 4.3) Practical planning by alternated.
  - 4.4) Co-planning to operation.
- 5) Practice by alternated.
  - 5.1) The school and community practice to plan project step by step.
  - 5.2) Note the operation result, problem, advantage for plan and running process adjusted.
- 6) Operation assessing and improving
  - 6.1) Concluding the co-operation with community.
  - 6.2) Operating information, concluding the data to adjust and improvement.

From the guideline of the education processing development project, Sawwanee Chaimongkol (2002 ) the project responded adjusting it and concluding to be the teaching guide from experience of Ban Sunmaked School;

The learning activity in each step have a flexible and various, teacher will give a chance to students to ask the question and specifying the way to investigating for the answer from community forest case study. The example questions from the students are;

***Questioning Skills Work***

***Foods from forest: Lacks of Bamboo Shoots***

*Environment*

1. How many kinds of bamboos are there? What are they? and How are each?
2. How is the area of where bamboos can grow well?
3. In what month or season are there many bamboo shoots? Why?
4. What do bamboos use to breed? and How?
5. How can we use bamboo shoots and bamboos?
6. How is the difference between the numbers of bamboos in the past and in the present? Why?
7. What are the related factors with the growth of bamboos? How should each be?
8. How is the impact of people getting many bamboo shoots to eat without considering the result?
9. What should we do, if we want to have bamboos to use forever?

*Society and Culture*

1. In what month, do people most get bamboo shoots?
2. How many of bamboo shoots are there in each getting?
3. What are the vehicle and the instrument in getting bamboo shoots?
4. Why do people like to eat bamboo shoots? How is the usefulness of them?
5. Is the problem of people's living caused lack of bamboo shoots? If so what is the cause of it?
6. How does getting bamboos and bamboo shoots effect to the community?

*Economics*

1. What is the impact on the community, if there were not bamboo shoots? In the past, what was the solution?
2. What is the suitable solution to have bamboo shoots forever?
3. How do people use bamboos?
4. What would the impact on people and environment be, if there were no bamboos and bamboo shoots?
5. In the past, how do people get bamboo shoots?

*Policy and Law*

1. Are there any laws about getting bamboo shoots, nowadays? If so, how is it and who created it?
2. How do people think about this law?
3. Are there any actions against the law? If so, what do they do?
4. What will the other village people do, if they want to come to get the bamboo shoots?

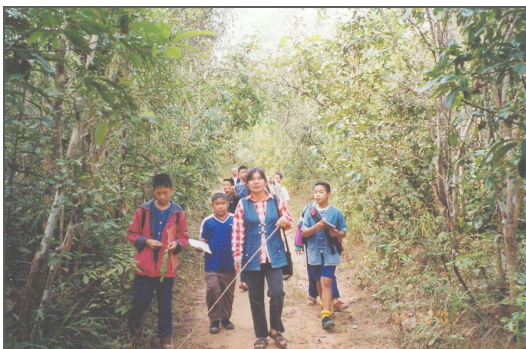
From the question for study guideline specified, the students must investigate the document, interview the expert and local intellect belong to community forest survey. Therefore, collecting the information to analyzing and propose to people as the group result here presented.

The learning activity of the school is using the learning source benefit also in nature area and community. This help to be linked between natural ecology of community forest with social ecology system. The students have a chance to learning about local story from local people by issue from community's learning source such community forest. In the learning process is emphasis on real condition sense, connecting the school with community.

*“Now studying the community history, teacher Sawwanee let each groups make the question separated in economy, social, environment, and political policy. She make an appointment with local elders and let each groups to interview that we very fun. We know our community history, name biography, if not so far we will go by bicycle, if to go long distance the teacher will pick us there.”*

Warodom Chaimool and Witchuda Thisorn,  
Grade 6 , 7 August 2003

The activities are setting to be flexible and various favour to integration, make the media and several tools have a flexible property too. Most learning media are real deal and found in the natural area and community, especially real media sighted in several trail. These are stimulating the students to be activated and fun.

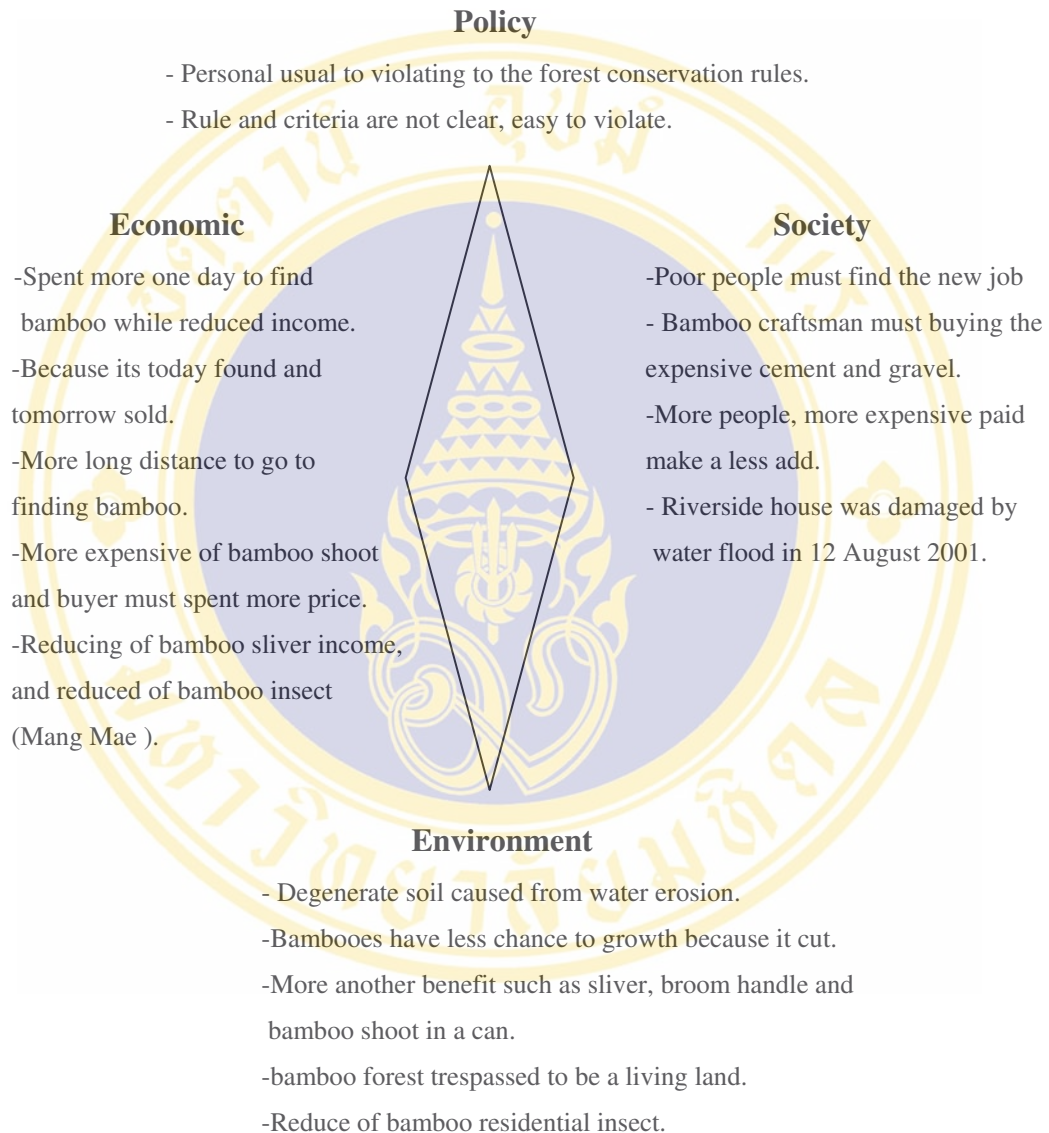


Picture 21-22: Learning Activities in Community Forest

***Example work of grade 6 student in the integration unit learning***

***'Food from the forest'***

*Analysis chart about an effect from less remained of bamboo shoot problem.*



*Done by Sunisa Sornjai, Aorrapan Kunnachuntra, and Thanaipon Pasa*

*Grade 6 students*

*“When we going to the forest with teachers and adults such Grand father Sanaeha and Sook (Moo 1). Teacher let us make the walk journey, tree founded such as Ton Tung, Ngae, Shorea, Carotropis, Teak, animals such bird, chicken, wild hog,*

*hornet , and Hwae. We spent a day for walk around 3 kilometers on made way. Last year we added to make a fire prevention row, clean up, and make description label. Teacher let us gone every year and 3-4 times per year”.*

Warodome Chaimool and Witchuda Thisorn ,  
Grade 6 students, 7 August 2003.

For the specialist and activity staffs, teacher in each levels should be main staff by meeting to co-planning in the integration teaching, then meeting with the participated people agent. The agents are most come from the forest prevention volunteer and environmental conservation youth group will propose the guide to field activity, trail specified, and study points specified. Therefore objective and content harmonic, the responding local wisdom person has a rotation by own skill, selecting from the specialist volunteer.

For the assessment form, caused from this study based on school system which have the coverage assessment also real condition with the summary assessment. In the integration unit, teacher has a working assessment also in group and personal by the fixed criteria. The measurement and assessment tool are observation form, project summary assessment form, multiple choices test form, and writing test. Moreover, when the educational year finished the teachers will present the project exhibition to the community and perceive their opinion, additive information, and joint to success assessing to the students learned.

### **3.4 Results of the learning source development**

The learning source of Bansunmaked School was developed to be the teaching consequence for the students since 1993 until present day. There are continuous activity participation and some alumni come back to be the forest prevention volunteer and environmental conservation youth group member.

In the early of learning activity process by case study method which emphasis on integration learning though activity in the learning source. The student have a good knowledge characteristic and objective to environment belong to learning skill, group

working, management, data investigation and present, but their success in learning for some subject in an intermediate level and tend to reduce. Such as math skill, and Thai language skill that teachers and school administrator attempt to solve that trouble by separate the curriculum in 2 parts. These are study math Thai and English in the morning and integration learning to experience and behavior in the afternoon. Now the school is celebrated from parent and community that able to teach efficiently. The finished students are able to compete with the civil students and they have a charisma, dare to think and performance, and able to learn by self while they relate and love own local and continuous participate in the local activity.

*“When the integration learning newly started, teachers have no skillful that aim to do it until reduced of subject skill success. It effect on the secondary entrance examining of the students, then we teach this 2 subject for learning skillful.”*

Choo-chart Chaisri, 5 August 2001

Ms.Sawwanee Chaimongkol who responding to this project was promoted to be the science “Outstanding teacher (National teacher)” award in 1998 and accepted from teachers in the school groups that able to teach efficiently.

Cause of cooperation of teachers in the teaching activity process by community forest case study method which used the community forest as the learning source is they have a good planning to the integration teaching until the school selected to be the school in the student’s quality development school project of The Office of National Education board.

*“Our school has Ms.Sawwanee as the “Outstanding teacher” and from many development projects make the school interested and accepted in education wide. Recently, we applying to be the school in the student’s quality development school project of The Office of National Education board which only 253 schools received, only 5 selected in Chiang Rai.”*

Choo-chart Chaisri, 5 August 2001

In the community, now “Ban Sunmaked have the community forest committee which developed from student’s suggestion. Especially, they study on the forest problem that impact on social, life, environment, and local economic. This committee was established in 1995 responding to cover and regard to forest, they released the community forest rule, forest survey, make a fire prevention row, plant add forest, and link the study to the conservation (Somsak Sookawong, 2002). Community groped to regarding the environment while they have more learning setup participation. Many axial respond to be the school board and help to do activity in the learning source also to be the forest walk leader, activity planning in the forest area, trail and study point specifying. The community forest is help to link the school with community; this relationship is the important factor make the development to endure.

*“Information makes adults waking up, many village headman and axial standing up to be the forest prevention group. Main function is regarding for sneak wood cut, people able to gather but cannot cut, covering by their. The finished student turning back to be the environment conservation youth group and work with community, this is successfully project. Community give more forest regarded because its concrete result, our forest closed to District Wang Nua in Lampang that it be plain in a little year but our side have more and more replete. The dominant of this project is cooperation between the school and community by the student who collecting data as a link, now it still run also in the school and community. Community have own committee, someone do wrong to forest such wood cut, burning that unaccepted from 300-400 households, they select a dead tree to be firewood.”*

Choo-chart Chaisri, 5 August 2001

### **3.5 The learning source development**

Community forest area learning source of Ban Sunmaked School was established and developed in 1993 from joint in the environmental learning process development in primary and secondary education by

Community forest case study method as emphasis on participation project that the cooperation of The Curriculum developing center, Educational Technique

Department with The Office of National Primary Education Board, Elementary Education Department and Michigan Stated University. There are the learning steps as;

In the learning source development also in school learning resource and community forest area have a continuously activity such curriculum teaching, co-activity between school and community and external organization. The strategic to developing the learning source of the school is applying the whole school approach for environment that get from the Rung-Aroon Project participated. The school has 29 projects running with simple teaching dually, while limited of human resource 9 person, but with the flexible administration concept and several projects linked adding to good running. The main project is the learning process development by community forest case study method.

The running in learning source development has a good supported from community, teachers and parents, government organization and external private organization. Budget received from many sources, the efficient factor which make it to be endured is a good relationship between the school, community, and several organizations. It sighted as the teachers success to “Give the school back to community “ that make the participle in every activities belong to the community’s learning resource stormed to use to be learning setup also human, object, place, and activity.

Moreover, all teachers were assigned here more than 15 years, 3 teachers sited in community and other 4 stay in the school’s houses. There are well know, acceptant, and have a good communicate with people here. In the other hand, the school is in the government system that make they lack of management efficiency especially in budget, all activities run by additive fund from the project or external unit. Including to the school as intermediate size always the administrator disputed, may be this make the vision, policy, and long period plan to lack of continuous. It needs to relay on cooperation and participation from community to developing the learning source to be endurance.

#### 4. A Comparison for Synthesis the Concept of the Learning Source Development in Nature and Community Area

From studied on the learning source development in nature and community area, can compare analysis this from multiple case study as;

**Table 17: Comparison of each case study in the component of learning source**

Component of the learning source	the MSAC center	The Barge	Ban Sunmaked School
Curriculum and learning program	Learning program composed with sub activities developed for learning about coastal ecosystem and setting to be suitable for learner groups	Learning program composed with sub activities developed for learning about beside river living and setting to be suitable for learner groups	Integrated curriculum linked the learning topic “community forest” with learning subjects and to be education curriculum as integration unit and integrated into each study subject.
Learning activity	Each activities use a short time with specific learning topic, emphasis on real practice, co-working ,and external learning such diving to study to nature	Each activities use a short time with specific learning topic, emphasis on real practice, co-working ,and external learning such Ko Kret surveying	Do activity also internal and external classroom, activity following to the curriculum emphasis on learning from community and nature in community, activity continuous education term.
Educational trail and station	Developing own trail and study station as the rope way in diving, each point have unique content, flexible purposed by activity program and time.	Trail fixing by activity program, each station is post available source, trail designed for each group will supplying to teacher and student’s require.	Different trail and station in each education year, depend on sub learning topic in that year, it specified by teacher and community head.

**Table 17: Comparison of each case study in the component of learning source (continued)**

Component of the learning source	the MSAC center	The Barge	Ban Sunmaked School
Teacher, trainer, and facilitator	2 main teacher and around 100 trainer/ facilitator in rotation to do activity	Also Thai and foreign staffs to running activity boat trip use 3 staffs and 3 crews	7 teachers responding grade 1-6 and local expert who leading in forest trail
Learning media	Use the real media that own developing and additive such diving tool, stuff animal, science experiment tool, book, slide multi-vision.	Use the real media that own developing and additive such trip journey, small water animal watching manual, water quality test manual, floating suit, canoe boat.	Use both real media found in community forest and classroom media
Learning Assessment	Assessment from real practice and pre-post assessment activity participation	Assessment from work piece and result, use circle debating to guest program, self-assessment, teaching team meeting after day for working assessment	Assessment from work piece and result with an examination in the end of education semester.
Management and service	Camp area is rental from the owner, diving tool and tent can buffering 200 students, staff responding to convenience director in staying and activity.	Staying place and main activity area are on the boat which able to receive 22-25 students, the staff rotating to teach and training students to stay with other, cooking, and boat cleaning in the staff regarding.	Have volunteer group responding to regard the community forest area and switching to be expert for student.

**Table 18: Comparison of each case study in the social and environmental context**

	the MSAC center	The Barge	Ban Sunmaked School
Social and environment context	The shore fishery tradition community, condition mostly to degeneration, local fishery changed to be intermediate and big size make more external labors hired, earlier community relationship is privatized and now they united because the contradict with Royal Thai Navy about land ownership right and in a court fight, very rare relationship with learning source, community only know that children diving in public beach but never entry to developing participation.	It is the original communities beside Chao Praya River. Most of the population are “morn”. Main career is pottery. Thai and thai-muslim will do the agricultural. Now “Ko Kret” is the famous sightseeing for culture. It is very famous and the business on Ko Kret is very interesting. Many people decide to be a merchant. Local organization becomes more important, sub-district organization, but not yet involved and due to “Barge school” for education development. They hope to develop Ko Kret to be a source of acknowledgement.	It is an agricultural community. Lanna culture is the symbol here. In the past, there is a forest invading from people but when the activities of preserve comes in communities, people and school are cooperate and decide to preserve the communities forest. Now, they have a strong leader and many volunteer to protect and preserve the relationship between school and communities.

**Table 19: Comparison of each case study in the result of the learning source development**

Result of learning source development	the MSAC center	The Barge	Bansunmaked School
Result to characteristics of the learner	Target group covering from primary to university student, most learner assessing them self that developed knowledge, skill, and good objective to environment from activity participated.	Target group covering from primary to university student and adult also Thai and foreigner most learner assessing them self that developed knowledge, skill, and good objective to environment from activity participated.	Main target group joint in activity is grade 3-6 primary student, they have charisma, dare to performance, good working with other, management skillful, and activate to be participle in community's environment conservation.
Result to School Teacher and Organization's Trainer	Two main teachers were accepted from the teacher organization as national teacher and one of them move to teach in university. Their role in network working with Rajaphat Rumpaipunnee, volunteer is training and developing to be a guide and take care the next generation.	School representative is accepted in activities programming and has many important in environment job. In school now, there is the management or educational system and smooth , besides Thai and foreign teamwork learn more about innovation and create the new activities of preserve	Teachers who join with the development acknowledgement from the technical team and accepted from them is chosen to be a national teacher. Many teachers in school can bring the experiences from work as an example of integrating teaching activities. In time of new programmed, school is the first one to use and distort the knowledge for teaching and to develop the integrating teaching programmed until it is accepted from the head of communities who come and learn about the activities and be sure to

**Table 19 : Comparison of each case study in the result of the learning source development. (continued)**

Result of learning source development	the MSAC center	The Barge	Ban Sunmaked School
Result to School Teacher and Organization's Trainer			explain to the next generation student Interesting to working with the school
Result to community	The leaning source development have no effect directly to community	The development is not affect directly to the community because it is the area of tourism, There are more income. The symbol of culture is the motivating point of business more than the knowledge that communities give to other people.	The learning source's development make people in community turn to preserve the environment and manage all sources in local and arouse people to realize their role in educational system for their children in communities stronger and be the important network in learning source.

From the study of the learning source development in natural area and community, including both each case and multiple case study, the researcher can synthesize concepts of learning source development in the natural area and community as follows:

1) The difference between the curriculum and the activity program for the Formal Education and the Non-formal Education.

From the study, it was found that the curriculum and the activity program for Formal Education, such as in case of Bansunmaked School, will have the perpetual curriculum and activity program that the period longs as a semester or a school year. The activity and the curriculum content will have integrated between the learning from

the core curriculum and the local knowledge. Otherwise, it gives a chance for the community to be a part to develop the curriculum and to support the interaction and coordination between the school and the community.

The curriculum arrangement and the activity program for Non-formal school, such as the Barge program and the MSAC center, will have the short period curriculum that is not perpetual. It consists of the short activities combining to a set. Each activity will have the learning point that not connected in integration. It will effect the connection or pulling the community to be a part in developing the curriculum and the activity program are limited. The community can do only prepare the area for the activity but doesn't work together in the formal way. However, the curriculum and activity program for the Non-formal education has the variety and interesting to stimulate the learner to learn. It might be because of the variety of students in each group and the learning atmosphere. The students will have the experience in the different areas other than the ordinary classroom.

Otherwise, the successful arrangement and development of the curriculum and the activity program for the Non-formal Education always have the organization, money source, and the network from the inside and outside of the community to support, such as the foreigner volunteer that comes to teach at the Barge. This volunteer group brings the experience and the new knowledge of the activity arrangement to develop the curriculum and the activity program creatively.

2) From the local's context to learning topic, the learning source development have related with natural context and community. In this context, it is important to specify "Learning Topics" in that learning source area, such as the learning topic about "Riverside life" of the Barge, "Coastal ecosystem" of the MSAC center, and "Community forest" of Ban Sunmaked School. These stated topics have the wide and covering to subtopics that able to extent to be various activities and more chance to using that learning sources, such as the learning activity about water, basin, living in water, the way of living, and culture of riverside people of the Barge, and learning activities about the basic knowledge of sea life, coastal ecosystem, effect from human activity to coastal ecosystem, conservation way and regeneration of the MSAC center.

Study and analysis of the context of the area have an important to the curriculum, learning activity, and study station design, including planning the learning source development to be part of the next learning arrangement. From multiple case study, the learning topic is the main topic with the specific and harmonic with the context of the area, this makes the learning source development more clearly than activity topics, such as forest plant and energy conservation that a sub topic separated from main topic.

3) Links between natural learning sources and cultural learning sources. The learning source development in natural area and community has a relationship between the natural environment and cultural environment. If the developing process give more importance to one or can not balance between two parts, the activity will tend to be “nature study” or “environmental study” and “cultural study”. These are differences from environmental education that emphasis on integration and linking the environment dimension with social, such as in the case of the MSAC center, which located in the contradict community. The learning activities focus on the marine ecosystem and less from community linkage, which is different from Ban Sunmaked School that connects between the way of living and community forest.

4) Internal, External person with sustainable impact, the development as “entry to study” by external community person, such as in the case of the Barge and the MSAC center, effecting the sustainable impact less than the “cooperation between school and community” by internal person. The corporations form need time and must have a continuous cooperative leaning activities, including to be supported by external organizations. While “entry to study” form have an advantage of high flexibility and ability to adjust for other area context. Curriculum and activity of the Barge and the MSAC center can be easily applied, such as adjusting from diving activity to study coastal ecosystem to diving in San Sab canal, applying the PPP technique of Ko Kret survey to other areas.

5) Human resource development is the center of the learning source development. An important strategy synthesized from this study is that for some learning sources have sustainable development, it needs person, place, curriculum, and activity developing. From three case studies, it was found that although there are different natural areas and community’s context, somewhere more related to urban

environment (such as Ko Kret), affected from tourism and somewhere having high contradiction, unable to linking to the community (such as in the case of Samaesarn), the development able to run by developed human resource (such as teacher, trainer, facilitator) in activity arrangement. In the part of curriculum and activity, development may be started at taking the concept in the external researchers, such as in the case of the Barge or the MSAC center. Curriculum and activity setup of three cases have slowly adjusted to local's context, learner's requirement, including cooperation among teachers, students, and community. Curriculum and activity appeared in three learning sources have high flexibility and ability to use with student, youth, and adult groups.

6) From the learning source of learner to the learning culture of everyone, the development not only has an effect on the learner group, but it also has an effect on personal, organization, and community. For example, in the case of the Barge, staffs who participated in activity arrangement, when they pass this step to be learning resource or personal learning resource with a role in environmental education. Someone who had been in the Barge team and now working in other projects, such as Rung Aroon Project phase 2, the local science project, including teachers from Ban Sunmaked School who were selected as "Outstanding teacher" in environmental education and similar to the staff of the MSAC center who selected to be Outstanding teacher in science teaching. Human resource is a value learning source from several sources. They are important in environmental education development as the specialists who create environmental education network with several organizations efficiently.

In the part of result to community, there are different in each learning source area. An important finding from this research is that cooperation process in learning source development is very important. In addition to making a sustainable development, it stimulates community to promptly participate in learning activities for children and youth in community, including making them feel proud as the community member. For example, in the case of Ban Sunmaked School, which worked closely with the community, now the group of people has an active role and responds to develop their learning source as the Forest-Prevention Volunteer and Environmental Conservation Youth group. Furthermore, another source has developed, such as The Local Wisdom and Lanna Cultural Center in Ban Sunmaked area.

The development of learning source in natural area and community for using as a part in learning arrangement is the process related to person, organization, and many groups in community. It is the process to open the opportunity to co-learning and to create the cooperation network. The development form has variety and difference in several contexts. Finally, if the process in learning source development operates efficiently, it will have an impact on many target groups and strengthen the environmental education in local, country, and regional levels.



## CHAPTER 5

### DISCUSSION

Research titled studying of learning source development in natural area and community multiple case study have the objectives to study the components, development processes, social and environment contexts, and effects of the development sources of learning sources in natural area and communities from case study and to synthesize the approaches used to develop learning sources in natural area and communities from multiple case study. Discussion on the results of this research was present in 4 parts as follows;

1. Learning source: Where? How to use?
2. Learning source: Hitch factor in development
3. Learning source: How to arrange, How to develop?
4. Learning source: Chance and alternative

#### **1. Learning source: Where? How to Use?**

From studying concerned literature review found that learning source have meant definition more than only place or area in community but meant are include source of any learning resource that appearing each area, maybe natural area or community. Having management or developing to use in learning activities. Learning source focuses on places where combine learning resource consist of person, any learning media, including set of activities or learning activities program that present meaning of that area both of natural and cultural. Thus, learning source is anything that can appear in everywhere such as temple, ancient building, natural area in local include and place that have activities of community etc. Developing of these learning resources to be learning sources, it's necessary to take management and development

of that learning source to be a part of learning activity. From literature review and case studies may conclude to be characteristic of learning activities administration that use natural area and community to be learning source are;

1. Changing learning atmosphere; Taking learner out to touch environment and community.
2. Using environment and community to be medical information source for doing activities.
3. Field research and developing students' skill of collecting, analysis, synthesis and presentation of information.
4. Participatory action research with community to solve problem/develop community and environment.

When take result of studying these paper to use to consider result of research from multiple case study found that learning source development in 3 case study character of activities develop from start point in character of taking learner out to touch environment and community as in case of marine science and conservation activities center that start from activities of marine science group in Ploo-ta-luang Withthaya School and develop to “Using environment and community to be media or information source in doing activities” In case of Ban Sunmaket could develop learning activities to level of “Field research” by student and having more potential enough to develop to level of “Participatory action research with community” Learning source development were born together with using learning source in activities administration.

From difference type of learning activities found from literature review reflected that in current there are many schools and educational organizations interesting in learning activities development by use learning source both of developed learning source and developing learning source. Thus, considerable issues are not only “What kinds of learning source that we should construct?” but also “In different contexts of learning source area, how can we efficiency choose, use and develop all learning resource to be parts of learning source?” and “Is it really necessary to construct a new learning source for learning?”

From the case study found that all 3 cases focus on “use” and “develop” to the learning resource or learning source which presented available. Thereby, attempt to develop the activities for that source full purposed given, while trying to improve its condition and more efficient to buffering for target groups which entry to used as “widely and touchable class room” to be maximize endure. For example, development of the diving area of the ocean science activity and conservation center started at a degenerate condition of beach ecology and full of waste until to be the learning source with natural study trail as “under sea classroom”. There are trainer, assistant, and trained mentor whose systemize developed or in the rental land base with limited space, the center tries to work under these limit until now its condition able to receive more than 1,000 person.

In case of The Barge, even though There are more chance to developing “Floating Class room” to be own learning source, but while There are the limit as too expensive trip cost and limited of person on the boat. The barge attempts to solve this problem by adjusting to land-based activities for extending service covering to Thai student. Including to using the purpose form the learning resource or available source such as Bang Sai Art and occupation center, Bird watching point at Pai-Lorm temple, Historic study center and Ayutthaya History Park, temple, historic place and Kwan Ar Marn local museum on Ko Kret island. The activity staff on the boat not responding to directly teach, but their role is “designer” of learning program with replete to the learning source used including to be “interpreter” for the meaning of appeared environment and culture.

## **2. The Learning Source: Hitch Factor in Development.**

The learning source development from document study and various case study, the researcher analysis about the hitch factor that importance to the learning source developing in natural area and community, able to discuss as;

## 2.1 Analysis of learning topic to the curriculum and activity

From studied about document studied and various case study found that the first hitch factor which supporting to the strength in the learning source development process from 3 cases study is the clearance “ learning topic “ as the main item replete to sub-topic analyzed which lead to curriculum and activity designed. The topic specified have related and connected to a different context of each local. To study and analysis the context of the area have an important to the curriculum activity and trail designing clearance including to direction in the learning source developed to be consequent of in the learning management. Such the main topic fixed about community forest as an axial of learning source development replete the teacher to designing curriculum and learning activity integration through each learning subject. The learning as dual technology in the experience unit, the students of Ban Sunmaked have “Community forest” as the learning heart from grade 1 The learning have a deeply and more coverage in higher level by the content to be sub-topic changed in several education year. This sub topic of that year learning will be lead to activity, trail, and station, community expert have the learning participation, interview question, document media and other information. While the collected knowledge of several years is the “Discovery knowledge of community” that a chance to changing their knowledge, experience, and wisdom for the solution.

Moreover, determination of learning topic which suitable to integration is the connected of social and cultural dimensions with natural environment in the environment education such “Thai life with river” of the barge”. It is benefit replete and developing the learning source also in natural space and community. This is harmonic with the principle in environmental education’s learning activity which emphasis on integration and covering to the natural and social environment.

In part of the school system education such case of Ban Sunmaked School, the linkage of learning source and school system learning activity need to integration as local curriculum. The various learning sources used several person, place, media tool, and activity to be the basic for cooperation. The curriculum of the school made have an associate with the community based school curriculum. It is the community members making for community demand and help to be everlasting development of

community. The content of curriculum will be selected from some axial curriculum and add another contents to integration with the local's content. All of these must be accepted from the members before it is set up to be taught (Sumlee Thongthaw, referred in สานปฏิรูป ปีที่ 4 ฉบับที่ 44 พฤศจิกายน 2544). Lead the learning topic from the source to integration with school based of Ban Sunmaked school is the important factor to use and develop the learning source continuously and let it developed everlasting.

## **2.2 Administration and personal preparation**

The second important factor is preparation of administration system and teachers or trainers who play their roles in use and develop the learning source to be fully efficient. From the case study found the formative in administration and preparing that different in each organization such case of Ban Sunmaked School intermediate school with 10 teachers is the small team for running on learning source. Everyone has participated by the main staff is the deputy principle expertise as the leader in curriculum analysis, design activity, and make cooperation with people. The teamwork preparing will use internal communication process which is fully supported by administrator and connected to external unit for the staff training or go out to be expert trainer to the network school. Now the network of the schools which teach by this method, emphasis on community forest used as learning source.

In case of The Barge and The MSAC and conservation center have a similarity as their private organization, but differ as The Barge has permanent staffs to coordinating with the target group and external unit while The Ocean has only 3 main staffs further in the rotation system. Now The MSAC has the management system as teacher(specialist)-trainer-assistant-facilitator and preparing the new generation through the marine science and sea guide clubs of Plo-ua-luang Wittaya School. The relationship as teacher-student and seniority make it strength while limited because the main staff who responding to learning content are only 2 persons and never prepared new generation. The Barge has clearance human resource management, several responsibility separated and internal training for experience changing and new generation prepared. Including to various educational background and different skill, the Barge has highly internal learning and a chance to examining the new activity

concept. These make their staffs have more chance to be developed until accepted in environmental working, which the important factor of the Barge success and domestic and federal acceptant.

### **2.3 Cooperation network between the unit and community in the learning source development**

From literature review, the researcher can synthesize to be the concept about the setup and develop of the learning source which many approaches (see more in page 33-39) ;

1. The learning source took place in the school and expanding to community such the conservation and study of shore jungle ecology system center, Bangtaboon Wittaya School.
2. The learning source took place form the people group to community learning network and then expanding to the school and education system such the elders group for local toy making at Ban Padad community.
3. The learning source took place from activity of group, organization, or external community cooperation project and boosted to be the school and community cooperation such the water inspector project.

From the above approaches will see the role and importance of cooperation network built in learning source development. Successfully in development from various case studies have a different in each such case of the ocean science activity and conservation center have developing from internal school activity before expanding to community. Similar to the conservation and study of shore jungle ecology system center, Bangtaboon Wittaya School but now the ocean science activity and conservation center separated to be independence organization while it resident in the community so far from school making its network limited.

In case of the Barge in form of external unit entry to work, but too many learning space make its network unclear. In Ko Kret study point here the barge work with local specialist as local wisdom, cause from the first civil social and it external organization make a limit in cooperation. The Barge however concerning to this problem, it started the environmental education project for Chao Phraya watershed

conservation. There by teachers, students and school agent from 30 schools in 4 Provinces boundary such Ayutthaya, Phatoomthanee, Nonthaburee, and Bangkok sited beside the river, one is Wat Paramaiyikawas School from Ko Kret. Except this, the Barge's administrator presents the vision in this issue that they hope to developing the environment project with Ko Kret community. That is the network building for more strengthening work.

In the cooperation network, in case of Ban Sunmaked School have more accuracy than above 2 projects that they joint since the project started and still in cooperation. This success reflecting to see that the community 's learning source not only effect on learner, but it activating to the community to be in the learning process belong to local proud and concerning to a role and community importance to education participated.

### **3. Learning Source: How to Arrange and Develop**

From multiple case study, the results of the procedure in the arrangement and developing the learning source in the nature and community area are

#### **3.1 Building up the human, building up the network: Building up the human first and the human will build up the learning source**

It is the very important procedure. From the Ban Sunmaked School case study, the understanding making with the school teachers will help to understand each other in working and with the community connection, the working will go to the same direction. The important success of the Ban Sunmaked School learning source development is changing the teacher's attitude to see community as the companion to develop the work together, to look at the local knowledge value and to create the inspiration to work with the community. For the Non-formal school such as the Barge program and the MSAC Center, the interesting point is the human resource who works there are the volunteer. They have the preparation more than the teachers in the school system to work with the community. The next important point is how to prepare these

human resources or develop any capability to work with the community more efficiently.

The leader group of the community is very important. From the study, the learning source that connects the working between the teachers or the human resource in the organization and the leader group of the community, will stay long and do the activities perpetually. The leader of the community will be the important drive to arrange and develop the learning source. It's necessary to find out who is the leader among the people in the community and connect the leader to the learning system by creating the roles of working together such as the problem analysis and the community needs, the topic of the learning, the curriculum design, the activity program and the area to do the activities together, and the roles in supporting the work of the school teacher staff or the human resource in the organization who has the core role in the learning source development, etc.

The connection between two-group development, the teachers and the leader group of the community, is very important because of the roles and the acts to be respected and trusted. No matter the school teachers will be "inside the community" or the human resource from the organization will be "outside the community". If the network and the procedure in the learning exchange can be done to develop between these two groups together, the teachers and people in the community will be the important drive in developing learning source continuously.

### **3.2 Creating the curriculum: The local curriculum by local for local**

For the presentation about the learning source: The hitch factors in the arrangement and development, the researcher presents the point about the learning topic analysis that it's an important factor for the learning source development. For the learning topic of the learning source, it's necessary to "see the whole local and find out the outstanding point of the community". The learning topic can't be created by the school teacher or the human resource of the organization analysis only. It's necessary to bring out the leader of the community to join "the seeing together" so that the curriculum will be created from what the community needs. The school knowledge and the outside organization will be only "the device" for searching the

“real” knowledge that hide in the community or the device to lift up the community knowledge level to have value and meaning.

In this case of Ban Sunmaked school is the good example to talk about this point. The Ban Sunmaked School joins the activity of the Environmental educational managerial procedure development project. This project is the coordination of the Thai official staff from the Department of Education and the foreigner official staff in learning procedure arrangement of the project to focus on the local problem analysis and find out the solution by action. It focuses on the learner to be a part of decision making about the real problem that happens in their own community. The created curriculum will be “the opening stage” for the students to be the one who analyze the problem, find the cause and offer the resolution that can be done by using the learning procedure prepared by teachers, but “Discovery the real knowledge from the community”.

When the procedure has been done continuously, what happen is the kids’ knowledge found from the education will turn to be the mirror that show out the existing knowledge in the community, how much the resource in the community and how the community problem effects the people. However, the students’ discovery will alert the community to stand up and ask the curious questions, find the coordination, work together and solve the problems by themselves. For the teachers’ part, when the procedure has been used continuously, it will bring in the leader of the community to be a part of analyzing the learning topic, designing the curriculum, doing the activity program, locating the area for the educational area and road together. The curriculum will be “the community curriculum making by the community and giving the benefits to the community” for real.

For the Barge program and the MSAC Center, there are the curriculum and program in the short period. The limitation is the time for learning in the learning source is limited. The teachers and the activity hosts must help the learners to understand “the Nature of the Area” the most because it is concrete and tangible. It’s the new experience for the learners’ interest. It may reduce the importance of the activity to be learned and understood “the Society and Culture” that is the abstract and hard to understand in the limited time. It takes enough time to analyze, connect and

understand how the cultural social environment connects or stands on the resource base that is the local natural environment.

The Formal education should also concern this point. Even though the activity arrangement in school system can continue and have the longer period, there is a chance that the curriculum gives the importance to understand “the natural environment of the community” and neglects that “in the natural environment of the community, there is people”. The teachers, the human resource and the involved people with the curriculum development procedure of the learning source should concern that “not let the children see only the natural environment but people in the environment”. It will be nothing if the children see only the beauty and value of the nature but never see that in the beauty of the nature how people live and how they harm it. Is there any way to turn those people to be the nature protector and live in the nature peacefully?

### **3.3 Creating the opportunity: Developing the system in the management to benefit the learning source development**

From the creating people and network to creating curriculum that I already presented, reflects the importance of “Space and Time” to benefit the teachers and human resource to work with the leader of the community. The management of the learning source is important as “the device to support” the activities, between two groups which are the teachers or the human resource in the organization that provide the learning and the leader of the community who represent the people in the community, to work together. The activities may be the existing activities in the community for the special occasions or special activities such as the case of the Ban Sunmaked school. The school gets a chance to be in the research project. It’s like “Opening the school fence” for the teachers and students to learn and work with the local people. In the same time, it’s “an invitation” for community to be a part of the educational management for their offspring. With this point, the Non-formal education organization has a lot of limitations such as in case of the Barge program that tries to connect with the local wisdom teacher group by inviting those PEOPLE to be host in the activity. But it lacks of “the continuous opportunity” for the local

wisdom teachers to be a part of the developing procedure of the learning source. The arrangement and the development of the learning source is the same as the case of the MSAC Center that has not organized to benefit “building up the relationship with the community” in concrete.

A remarkable point is the success in working with the community such as in case of the Ban Sunmaked School. It will be clear to let the community have “roles in the curriculum and learning activity” and join the role of local wise, designing the curriculum, preparing the trail, leading the trail for the students or listening to and giving out their opinion and appreciating the result of their offspring in the presentation day. The school is just the opening stage for the people in the community, children in the community and the teachers to meet more often by scheduling the activities in both curriculum and school timetable that benefit to the community such as in the rainy season, the students can't trek in the forest. The curriculum will focus on the general analysis to let the students going out and interviewing the elders “at home”. After the rainy season passes, those elders will lead the trekking leader. The curriculum will focus on the real exploration and problem solving in the jungle “the timetable to use the natural classroom” of Ban Sunmaked school students will be rhythmical with “the timetable of the community resource usage”.

### **3.4 Creating the connection: Making everywhere to be the learning source**

The arrangement and development of the learning source are different between the Formal Education and Non- formal Education. There are some advantages and limitations differently which is

The development of learning source by school may have the advantage in the curriculum design that can connect to the National Education Curriculum and the local knowledge and make a school curriculum. The integration between each learning group and learning topic analysis can be done clearly. The activity arrangement and program schedule can be done continuously and have enough time period. Otherwise most school has the character as “Inside-community organization”. The working connection with the community has “a chance and possibility” higher than the

arrangement by “the organization from outside” to give the education. In the same time, the limitation of school in the learning source development is up to the teachers who have a lot of burden and get familiar with working inside the school more than working with the community. The curriculum arrangement gives the importance to the development in the knowledge outside community more than the connection between the local knowledge and the international knowledge. The activity arrangement that continues in the long time may be good but some activities lack of interesting and exciting for the young learners. The management counts on the government system lacks of its independence.

Meanwhile, the arrangement and development of the learning source by the organization that educates in the Non-formal education has the advantages in the short curriculum and program that fit learners’ interest. Most activities focus on the real workshop and experience opening the new world of knowledge and challenging them to learn such as the diving activity to learn the nature by the MSAC Center, the learning on the boat floating in the middle of the Chao Praya river by the Barge program. The human resource, both temporary and permanent, who have the variety of the learning basis and experiences (such as the Barge program), turn to work in the learning source. The preparation of the volunteer is continuously and systematically (such as the MASC Center) shows the independency in the organizational management. In the opposite, there are some limitations such as the curriculum and the program for the short activity that the time is limited. Each activity has its own topic. They need the sequence to be continuous and connected. Otherwise the curriculum is designed to benefit “by the outsider and for the outsider” more than respond the community’s needs directly. The community doesn’t see the benefit to coordinate. And working with the community in the short period and the turnover of the staff and volunteers makes the connection with the community weak.

The advantages and limits of the arrangement and development of the learning source by Formal Education organization and Non-formal Education organization can be concluded and presented as follows;

**Table 20: Comparison the advantage and limits of the learning source by Formal Education organization and Non-formal Education organization**

The arrangement and development of the learning source	Advantage	Limit
By School (Formal Education)	<ol style="list-style-type: none"> <li>1.The curriculum design can connect between the National Education Curriculum and the local knowledge and make a school curriculum</li> <li>2.The integration between each learning group and learning topic analysis can be done clearly.</li> <li>3.The activity arrangement and program schedule can be done continuously and have enough time.</li> <li>4.School has the character as “Inside-community organization” The working connection with the community has “a chance and possibility” higher than the arrangement by “the organization from outside” to give the education.</li> </ol>	<ol style="list-style-type: none"> <li>1.the teachers who have a lot of burden and get familiar with working inside the school more than working with the community.</li> <li>2 The curriculum arrangement gives the importance to the development in the knowledge outside community more than the connection between the local knowledge and the international knowledge.</li> <li>3. The activity arrangement that continues in the long time, may be good but some activities lack of interesting and exciting for the young learners.</li> <li>4. The management counts on the government system lacks of its independence.</li> </ol>
By Other Organizations (Non-formal Education)	<ol style="list-style-type: none"> <li>1. The short time curriculum and program that fit learners’ interest.</li> <li>2. Most activities focus on the real workshop and experience opening the new world of knowledge and challenging them to learn</li> <li>3. The human resource, both temporary and permanent who have the variety of the learning basis and experiences turn to work.</li> <li>4. The preparation of the volunteer is continuously and systematically shows the independency in the organizational management.</li> </ol>	<ol style="list-style-type: none"> <li>1. Curriculum and the program for the short activity that the time is limited.</li> <li>2. Each activity has its own topic. They need the sequence to be continuous and connected.</li> <li>3. The curriculum is designed to benefit “by the outsider and for the outsider” more than respond the community’s needs directly.</li> <li>4. The community doesn’t see the benefit to coordinate. And working with the community in the short period and the turnover of the staff and volunteers makes the connection with the community weak.</li> </ol>

The development of the learning source from both the school to the community and the organization outside to community and school has the advantages and limitations in their own ways. In the same time they both can “fill in” each other which the procedure needs to connect the educational management in the Formal Education, Non-formal education and Informal Education together with the managerial system especially “Scientific managerial system” that has the crucial role for the learners’ development.

The following point will be an example. Consideration the concept that the Scientific managerial system, both the education that perform by the school and other organization that not in the school system will get along with the learning procedure from the Formal education, Non-formal education and Informal education.

- How to let the knowledge and the experience that the students get from joining the environmental education activity performed by the Non-formal education organization, be the part of the learning evaluation by the standard involved with the environment in some groups such as Science and Social education.
- How to let the teachers in the school will design the curriculum that has “the studying class” for the host from the Non-formal education organization. Let “those brothers” to be the exciting part with the joyful activity, not only the normal activity plan that be scheduled by the teachers.
- How to connect the knowledge about the environment that the students learn everyday in their lives with the knowledge from the classroom or the education from any divisions.
- How to use “the learning resource” and “the learning source” that is in the community and the natural area of the community to give the highest benefit to our students.
- How to change the people’s thought in the community that the knowledge doesn’t stay only in the school but everywhere is the learning source for the community that they live in.

Etc.

#### 4. The Learning Source: Chances and Alternative

From the studied to the learning source in natural and community space development, from 3 various case study including to related literary revised let us see the image of learning source development. In the status of chance and alternative tin setup and develop, especially in the environmental education work. The learning source development for environmental education learn help to be connect it to the education also in the school system and external school system and independence education. Moreover, It's the chance that community and organization which interesting to the learning and environmental education for child, youth, and learner group to be participated in education development. Including be an alternative of school or education unit which turning to done as alternative education that very various. Also in school basic education, alternative education in wisdom teacher line, alternative education as external government system, alternative education of learning group though activity and alternative education though study media and learning source. (สื่อพลัง, 2546)

The development of learning source is the community chance and alternative of the school in education development for child, youth, and community and leading to participation in strengthening of education management in the learning reformation flow in the present day.

## **CHAPTER 6**

### **CONCLUSION AND RECOMMENDATIONS**

This research has study about development of learning source in natural area and community: multiple case study. The researcher chose 3 cases to study the components, development processes, social and environment contexts, and effects of the development sources of learning sources in natural area and communities. The areas of study which is chosen as 3 cases study which is recruited by purposive sampling; the learning source of the MASC center, the learning of the Barge program, and the learning source of Ban Sunmaked Sunkheelek Huafaipattana school. The samples in the study are 26 key Informants and students participated in the activity were selected by Snowball Sampling with purposive sampling, accidental sampling, and multi-dimensional sampling. Moreover, Colleting information is gathered by document study, field study, formal and informal interviews, participant and non-participant observation, validity and reliability analysis of the information, using internal and external critical analysis in the document study, and methodological triangulation by using different information collecting in the information examination from interview and observation for collecting field work information of the MSAC center and the Barge program. Due to learning activities of the 2 organizations have short-term curriculum and limited time, thus, the researcher has distributed questionnaire about learning source activity management and there are 3 institutes associating with as the participants which can be classified into 2 groups; 18 questionnaires from teachers and Rajabhat Rumpaipannee students who lead learners to participate in the MSAC center's activity and the Barge and 56 questionnaires from the learners participating in the activity. In addition the information from the qualitative research has inductive analysis while the information from the quantitative research use the analysis of statistics which (percentage and means). From the research operation, it can lead to the result and the suggestion of the research as follow:

## 1. Conclusion

### 1.1 Development of learning source's components

Due to the study, the researcher can conclude the hitch factor that importance to the learning source developing in natural area and community presented as follow;

#### 1) Analysis of learning topic to the curriculum and activity

From the study found that determination of the specific and clearance learning topic which can reflect area identity both natural and cultural characteristic and that topic replete to sub-topic analyzed which lead to curriculum and activity designed is an strongly important to the designing of curriculum, activity trail and station including to direction in the developing of learning source and the learning source management.

#### 2) Administration and personal preparation

From the case study found the form in administration and preparing that different in organization characteristic. For the formal education, supporting by administrator and connected to external unit for the staff training or go out to be expert trainer to the network school is significant to help teacher able to work with the community in learning source developing. For the non-formal education, clearance human resource management, several responsibility separated and internal training for experience changing and new generation prepared. Including chances to try out an innovation and to appropriately adapt to working in learning source are meaning to staff preparation in organization.

#### 3) Cooperation network between the unit and community in the learning source development

Cooperation network built in internal organization such school and community group and have a chance to continuously work together has more opportunity to develop and to sustain their learning source. Whereas, Cooperation network built from

external organization such NGOs or cooperative project have to prepare continuum activities which link community and their learning source. This linkage can efficiently support development of learning source.

### **1.2) Using the environment and the community as the learning sources**

The characteristics of learning activities by using the environment and the community as the learning sources can be described as

1) Changing the learning atmosphere, taking learners outdoor to see environment and community, let them have direct experiences. The learning focuses on conversation, lecturing, reading or studying from bulletin board but does not focus on systematic searching and planning. Learning activity is divided to the formal and informal.

2) Using the environment and community as media or resource of activities, the activities are focused on various acknowledgements. The learners are able to participate in planning process and program/learning activities are formal prepared.

3) Field study research, collecting skill, analysis, synthesis and data presentation are designed to be more systematic in both curriculum and learning activities using research in a part of learning. Learners will get practice searching for information, step by step such as; developing in thinking skill and analyzing skill, and lead to the synthesis of conclusion. Then, it can be presented to the community or involved people.

4) Participatory Action Research (PAR) with community for solving environment and community problems, is the activity which covers the outdoor activity but it is different in the way of how to solve the problem objectively. It is a learning that the learners will be seriously in a part of solving problem procedure or developing the environment and community.

### **1.3) An approach used to develop the learning source**

From multiple cases study and literature review, can synthesize to be the approach used to develop the learning source presented as;

1) The learning source took place in the school and expanding to community such the MSAC center, Ban Sunmaked school and the conservation and study of mangrove ecosystem center, Bangtaboon Wittaya School.

2) The learning source took place from the people group to community or learning network and then expanding to the school and education system such the elders group for local toy making at Ban Padad community and Southern community university.

3) The learning source took place from activity of group, organization, or external community or cooperation project and boosted to be the school and community cooperation such the RSPY project.

#### **1.4) The concepts of learning source development in the natural area and community**

From the study of the learning source development in natural area and community, including both each case and multiple case study, can synthesize concepts of learning source development in the natural area and community as follows:

1) The curriculum and the activity program for Formal Education have the perpetual curriculum and activity program that the period longs as a semester or a school year. The activity and the curriculum content will have integrated between the learning from the core curriculum and the local knowledge. Otherwise, it gives a chance for the community to be a part to develop the curriculum and to support the interaction and coordination between the school and the community. For the Non-formal Education, the curriculum arrangement and the activity program have the short period curriculum that is not perpetual. It consists of the short activities combining to a set. Each activity will have the learning point that not connected in integration. It will effect the connection or pulling the community to be a part in developing the curriculum and the activity program are limited. The community can do only prepare the area for the activity but doesn't work together in the formal way

2) Development of learning source related to learning topic, especially local wisdom and natural area will make clearance and specify way to develop learning.

3) Learning area in nature and community has related and developed. It reflect to the linkage of society and environment in environmental education. Development of learning source can not be divided into one dimension.

4) The development as “entry to study” by external community person, effecting the sustainable impact less than the “cooperation between school and community” by internal person. The “entry to study by external community person form have an advantage of high flexibility and ability to adjust for other area context. While as, the “cooperation between school and community by internal person” form need time and must have a continuous cooperative leaning activities, including to be supported by external organizations.

5) The linkage of learning source and learning activity in school is necessary to integrate through local curriculum. There are the usage of various learning resources not only person, place, and equipment but also activity which can be based on co-working with the community.

6) Development of learning source is not effect only the learners to learn about their community, but also people in community are activated to learn with their children and to be proud of their community. It can realize about the role and importance of community in cooperative educational management.

### **1.5) The process of learning source development**

From the study can synthesize process of learning source development as follows:

1) Developing teachers, trainers and community's key man and link networking between teachers/trainers and community process such as developing school teachers and trainer in organization to work with community, searching and developing community's key man and networking with link this key man to learning process, identifying roles in participation, analyzing problem and needs of community, determination of area for learning activities including their roles to support teachers or trainer in developing of learning source.

2) Construction and developing the curriculum process. This process, teachers and representatives from community work together to construct and to develop the

curriculum. Firstly, we can start with analysis learning topic which appropriated to local context and then develop to curriculum construction which respond to students and community needs. In this process, teachers and community can be participated in learning topic analysis, curriculum design, planning the learning program, determination of area for trail and station etc. The curriculum will be “the community curriculum making by the community and giving the benefits to the community” for real.

3) Developing the system in the management to benefit the learning source development process. For example, developing the system in the management; academic administration, human resource administration and general administration which promote and support activities leading school teachers or trainers in organization and community’s key person to meet, work together and exchange their experience. The activities can be traditional activity in local or special activity. In this point, non-formal education organization may find the limits because of lack of “continuous chance” for community’s representative to participate in the process.

4) Liking Formal education, Non-formal education and Informal education altogether process. Such as, developing the system which link learning in school, learning source and community by flexible academic administration, giving a chance to school teachers and trainer in many organizations which respond to create or manage learning activities share their experiences. Including, developing local wise trainer to be able to present their local wisdom link to knowledge from school and external organization.

## **2. Recommendations**

### **2.1 Suggestion from the research**

The learning source development study in the natural area and the community: multi-case study. The result of the study can be concluded as a suggestion as follow:

1) Conditional factors which are very important in development learning source, for example, topic learning analysis, human resource administration and

preparation, and creating cooperating connection between the organization and the community. Therefore, teachers, human resource, schools, and organization that are interested in learning development should consider and focus on teacher preparation, searching the community leader who is interested in and willing to be a part of work including activity arrangement which provide an opportunity for the teachers and the community leader to exchange their experiences in order to reach learning source development.

2) Administrators and those who associate with curriculum development in learning source should focus on working together with the community in analyzing the real need of the community in the learning source and for the formal educational group. It may be included in the school curriculum which connects the subject groups with the local acknowledgement while, the non-formal educational group can develop the community trainer in the educational station by arranging the developing lecturers activity continuously and also provide opportunities for the lecturers to participate in the activity curriculum development and the activity program associated the human resource in the organization who is the outsider.

3) Learning topic analysis ought to emphasize the unique characters of the community in both aspects of natural and cultural environment to link to activity arrangement which cover the natural environment understanding and the connection to activity of human who live in that area, and according to this, curriculum management in the formal school can manage more continuously. On the other hand, the short-term curriculum designing of the non-formal education group need to focus on the balance of natural and community study including the importance of the activity which help the learners to link the relation between the nature and the nature.

4) Academic administration of the school and the non-formal organization should be flexible and be able to connect the formal, the non-formal and the informal education. For example, scheduling the integration activity which connect with learning source or learning units transformation arranged in the school curriculum to the non-formal organization in the learning of the community or activity designing as short-term activity which is clear in the aspect of learning but can arrange with other activities as the set of activity that can response the various need of non-formal learners.

5) Schools in which there is the natural and community area are able to be managed and developed as learning resource. They could begin with the first step activity, for instance, taking the learners outside to have authentic learning or they can use that learning source as a media to do the activity or as informational source like in the educational station or path. Moreover, if the schools have enough potential to do the field resource and the Participatory Action Research with the community, it will be very important to help the learning source development process effective and have opportunity to gain continuous and sustainable development.

6) Organizations who are interested in educational activity management by using learning source as approaches for the finding from the research in developing the activity or working network with the school and the community later. Besides, in the beginning of learning source development, it should focus on the potential of the area and the participating community including on the importance of the analysis of the learning resource in the community, the unique of natural and cultural area for designing the curriculum, learning activity, educational station, media, and educational information in the future.

7) Organizations whose duty is related with environmental education development should have the network of schools and organizations. They could arrange a discussion to exchange the experiences in learning source arrangement and development which are different in terms of the context of the community and the environment.

## **2.2 Recommendation for future research**

1) There should be an action research with the community for studying the development process of teachers and leaders of the community including creating working network and studying other conditional factors influenced to the effectiveness, the efficiency and the sustain of that learning source arrangement and development.

2) There should be the research about curriculum constructing model, academic administration, school and other organizations in learning source connected with the formal, non-formal and informal education.

3) There should be the research about synthesizing the experiences from the case studies in which there is learning source arrangement and development in the natural and community area in other models, for example, learning source arrangement and development by the villagers, the community or the working network in the



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### แนวคำถามหลักสำหรับการสัมภาษณ์

#### การพัฒนาแหล่งการเรียนรู้และองค์ประกอบของแหล่งการเรียนรู้

1. การพัฒนาแหล่งการเรียนรู้มีลำดับขั้นตอนของการพัฒนาอย่างไร และมีแผนการอย่างไรในการพัฒนาแหล่งการเรียนรู้
2. มีกิจกรรมใดบ้างที่จัดขึ้นเพื่อพัฒนาแหล่งการเรียนรู้
3. หลักสูตรที่จัด และพัฒนาขึ้นใช้ในการจัดกิจกรรมของแหล่งเรียนรู้มีโครงสร้างของหลักสูตรอย่างไร
4. การจัดทำกรอบเนื้อหาของหลักสูตรมีการบูรณาการองค์ความรู้ในพื้นที่ของแหล่งการเรียนรู้เข้ามาใช้หรือไม่ อย่างไร
5. เส้นทางการศึกษาของแหล่งเรียนรู้มีกี่เส้นทาง และมีลักษณะอย่างไร
6. ในเส้นทางการศึกษามีการกำหนดจุดศึกษาที่จุด แต่ละจุดมีเนื้อหาและกิจกรรมการเรียนรู้อย่างไร
7. การจัดและพัฒนาเส้นทางการศึกษา และจุดในการศึกษา มีเกณฑ์ และวิธีการอย่างไร
8. ในปัจจุบันมีกิจกรรมการเรียนรู้ใดบ้างที่จัดขึ้นในแหล่งการเรียนรู้
9. การจัดโปรแกรมกิจกรรม สำหรับกลุ่มเป้าหมายที่แตกต่างกันมีลักษณะอย่างไร
10. ในการจัดกิจกรรมการเรียนรู้ ผู้ดำเนินการจัดกิจกรรมได้ใช้สื่อ และอุปกรณ์ใดบ้าง
11. สื่อและอุปกรณ์ดังกล่าว ได้รับการอนุเคราะห์จากหน่วยงานใด หรือหากจัดทำ และพัฒนาขึ้นเอง มีวิธีการอย่างไร
12. การจัดกิจกรรมการเรียนรู้แต่ละกิจกรรมใช้วิทยากรและผู้ดำเนินการจัดกิจกรรมประมาณกี่คน วิทยากรและผู้ดำเนินการจัดกิจกรรมดังกล่าวมีบทบาทอย่างไรในแต่ละกิจกรรม
13. ในปัจจุบันแหล่งเรียนรู้มีวิทยากรและผู้ดำเนินการจัดกิจกรรมจำนวนกี่คน และมีการบริหารจัดการบุคลากรอย่างไร
14. บุคลากรที่เข้าร่วมเป็นวิทยากร ผู้ดำเนินการจัดกิจกรรม รวมถึงบุคลากรอื่นๆ ของแหล่งการเรียนรู้ มีการคัดเลือกอย่างไร และได้มีการเตรียมความพร้อมหรือพัฒนาบุคลากรเหล่านั้นหรือไม่ อย่างไร
15. แบบแผนการประเมินผล และเครื่องมือที่ใช้ในการประเมินผล มีลักษณะอย่างไร และมีวิธีการสร้างและพัฒนาขึ้นอย่างไร
16. การบริหารจัดการด้านทรัพยากร สถานที่ และการบริการต่างๆ มีลักษณะอย่างไร

17. ในการจัดกิจกรรมต่างๆ ของแหล่งการเรียนรู้ ได้รับการสนับสนุนด้านงบประมาณจากแหล่งงบประมาณใดบ้าง
18. ค่าใช้จ่ายต่อคนสำหรับผู้เรียนที่เข้าร่วมกิจกรรมในแหล่งการเรียนรู้ มีการจัดเก็บในอัตราค่าบริการอย่างไร
19. เมื่อเปรียบเทียบต้นทุน และรายรับที่ได้จากการจัดบริการแหล่งการเรียนรู้ การจัดแหล่งการเรียนรู้มีความคุ้มค่าในการลงทุนมากน้อยอย่างไร
20. การจัดและพัฒนาแหล่งการเรียนรู้ในแต่ละองค์ประกอบมีปัญหาหรืออุปสรรคอย่างไร
21. ยุทธศาสตร์ที่กำหนดขึ้นเพื่อใช้ในการพัฒนาแหล่งการเรียนรู้มีอย่างไร
22. ปัจจัยใดบ้างที่มีส่วนส่งเสริมในการพัฒนาแหล่งการเรียนรู้
23. การดำเนินการจัดแหล่งการเรียนรู้ที่ผ่านมา ผู้ดำเนินการประเมินว่ามีประสิทธิภาพและประสิทธิผลมากน้อยเพียงใด
24. จุดอ่อน และจุดแข็งของแหล่งการเรียนรู้ที่จัดขึ้นคืออะไร
25. มีการกำหนดแผนระยะยาว และวิสัยทัศน์ในการพัฒนาแหล่งการเรียนรู้ในอนาคตอย่างไรบ้าง

#### บริบททางสังคมและสิ่งแวดล้อม

1. ลักษณะความสัมพันธ์ หรือโครงสร้างทางสังคม ของท้องถิ่นมีลักษณะอย่างไร
2. ผู้นำคนสำคัญในท้องถิ่นมีใครบ้าง และผู้นำคนดังกล่าวได้เข้ามามีส่วนร่วมในการพัฒนาแหล่งการเรียนรู้อย่างไร
3. องค์กรระดับท้องถิ่น และองค์กรอื่นๆ ที่เกี่ยวข้อง กับการจัดและพัฒนาแหล่งการเรียนรู้ มีการบริหารจัดการองค์กรอย่างไร
4. ในการจัดกิจกรรม และการพัฒนาแหล่งการเรียนรู้ได้รับความร่วมมือจากองค์กรระดับท้องถิ่น และชุมชนอย่างไรบ้าง
5. นโยบาย หรือกฎหมายใดบ้างที่มีความเกี่ยวข้องกับพื้นที่แหล่งการเรียนรู้ และการพัฒนาแหล่งการเรียนรู้
6. พื้นที่ที่เป็นที่ตั้งของแหล่งการเรียนรู้ มีลักษณะเด่นของสิ่งแวดล้อมและวัฒนธรรมอย่างไร
7. อาชีพที่สำคัญของประชาชนในท้องถิ่นคืออะไร และมีความเกี่ยวข้องสัมพันธ์กับพื้นที่ของแหล่งการเรียนรู้อย่างไร

ผลผลิตของแหล่งการเรียนรู้

1. ในช่วงเวลา 3 – 5 ปี ที่ผ่านมา มีการใช้บริการแหล่งการเรียนรู้จากผู้เรียนกลุ่มต่างๆ อย่างต่อเนื่อง มากน้อยเพียงใด
2. ผลสืบเนื่องจากการเข้าร่วมกิจกรรมในแหล่งการเรียนรู้ที่มีต่อผู้เรียนซึ่งผ่านการร่วมกิจกรรมในแหล่งการเรียนรู้ไปแล้วมีอย่างไรบ้าง
3. ผู้เรียนซึ่งผ่านการร่วมกิจกรรมในแหล่งการเรียนรู้ไปแล้วมีคุณลักษณะตามที่ พึ่งประสงค์หรือไม่ อย่างไร
4. การเข้าร่วมกิจกรรมในแหล่งเรียนรู้ของผู้เรียน มีส่วนในการเสริมสร้างความรู้หรือเปลี่ยนแปลงเจตคติของผู้เรียนต่อสิ่งแวดล้อม ในประเด็นใด มากน้อยเพียงใด
5. บุคลากร และองค์กรที่เข้ามามีส่วนร่วมในการจัดและพัฒนาแหล่งเรียนรู้ได้รับประโยชน์ หรือเกิดผลสืบเนื่องจากแหล่งเรียนรู้อย่างไรบ้าง
6. ชุมชนที่เป็นที่ตั้งของแหล่งเรียนรู้ และชุมชนในพื้นที่ใกล้เคียงได้รับประโยชน์หรือเกิดผลสืบเนื่องจากแหล่งเรียนรู้อย่างไรบ้าง
7. ประชาชนที่อาศัยอยู่ในชุมชนที่เป็นที่ตั้งของแหล่งเรียนรู้ และชุมชนในพื้นที่ใกล้เคียง มีความคิดเห็น และมีความรู้สึกรู้สึอย่างไรต่อการจัดและพัฒนาแหล่งเรียนรู้
8. การจัดและพัฒนาแหล่งเรียนรู้ ได้มีส่วนช่วยให้เกิดเครือข่ายของความสัมพันธ์ระหว่างแหล่งเรียนรู้ องค์กรระดับท้องถิ่น และชุมชน หรือไม่ อย่างไร







**แบบบันทึกการสังเกตลักษณะทางกายภาพของแหล่งการเรียนรู้**

แหล่งการเรียนรู้ที่สังเกต .....  
 สถานที่ .....  
 วัน - เวลา .....

ประเด็นที่สังเกต	รายละเอียด
๑. พื้นที่ ๑.๑ ขนาดของพื้นที่ ๑.๒ การจัดผัง ๑.๓ อาคาร และสิ่งก่อสร้าง ๑.๔ อื่นๆ	
๒. เส้นทางการศึกษา ๒.๑ ระยะทาง ๒.๒ ระยะเวลาที่ใช้ในการเดินทาง ๒.๓ สภาพแวดล้อมทางธรรมชาติ ๒.๔ สภาพแวดล้อมทางสังคมวัฒนธรรม ๒.๕ อื่นๆ	
๓. จุดศึกษา ๓.๑ จำนวนจุดศึกษา ๓.๒ สภาพของจุดศึกษา ๓.๓ ลักษณะเด่น และเนื้อหาของจุดศึกษา ๓.๔ อื่นๆ	
๔. สื่อ และอุปกรณ์ที่ใช้ในการจัดกิจกรรมในแหล่ง การเรียนรู้ ๔.๑ ประเภทของสื่อ ๔.๒ จำนวน ๔.๓ ที่มาของสื่อ ๔.๔ การผลิตสื่อ ๔.๕ ลักษณะ / สภาพของสื่อ	

ผู้สังเกต .....



### รายการกิจกรรมการลงภาคสนาม

#### 1. ศูนย์กิจกรรมวิทยาศาสตร์ทางทะเลและการอนุรักษ์ อ.สัตหีบ จ.ชลบุรี

ครั้งที่ 1 วันศุกร์ที่ 27 กรกฎาคม 2544 - วันอาทิตย์ที่ 29 กรกฎาคม 2544

- สังเกตพื้นที่ + บันทึกภาพ
- สังเกตอย่างไม่มีส่วนร่วมในกิจกรรมการบรรยาย (อ.ประสาน แสงไพฑูริย์ และ อ.ดำรง สุภามิต)
- สังเกตอย่างมีส่วนร่วมในกิจกรรม และดำเนินร่วมกับผู้เข้าร่วมกิจกรรม
- สัมภาษณ์อย่างไม่เป็นทางการ (เอก – อาสาสมัคร )
- สัมภาษณ์อย่างไม่เป็นทางการ (นักเรียนระดับชั้น ป.6 โรงเรียนเซนต์โยเซฟ ระยอง – ผู้เข้าร่วมกิจกรรม)
- สัมภาษณ์อย่างไม่เป็นทางการ (อ.ดำรง สุภามิต)

วันศุกร์ที่ 31 สิงหาคม 2544 – วันอาทิตย์ที่ 2 กันยายน 2544

- ร่วมสังเกตกิจกรรม ถ่ายภาพ และดำเนินร่วมกับนักเรียน โรงเรียนวัดปลา จ.ระยอง นักศึกษาจากคณะวิทยาศาสตร์ สถาบันราชภัฏรำไพพรรณี และ นักศึกษาจากสถาบันเทคโนโลยีราชมงคล วิทยาเขตพระนครศรีอยุธยาหันตรา

วันเสาร์ที่ 17 พฤศจิกายน 2544 เดินทางไปสัมภาษณ์ กำนันปราโมทย์ ที่เสมสาร

#### 2. โรงเรียนบ้านสันมะเค็ดฯ ต.เวียงกาหลง อ.เวียงป่าเป้า จ.เชียงราย

วันเสาร์ที่ 4 สิงหาคม 2544 เดินทางไปเชียงใหม่

วันอาทิตย์ที่ 5 สิงหาคม 2544 เดินทางจากเชียงใหม่ไปเชียงราย

วันอาทิตย์ที่ 5 – วันพฤหัสบดีที่ 9 สิงหาคม 2544 เก็บข้อมูลภาคสนาม สัมภาษณ์ และสังเกตการทำงาน โรงเรียนบ้านสันมะเค็ดฯ 1

อาทิตย์ที่ 5 ส.ค.

1. สัมภาษณ์อาจารย์ใหญ่ อ.ชูชาติ ชัยศรี เกี่ยวกับภาพรวมของการบริหารงานโรงเรียน แนวคิดเกี่ยวกับกิจกรรมการเรียนรู้ป่าชุมชน ตลอดจนกิจกรรมอื่นๆ ของโรงเรียน

2. กราบบนั้สการพระธาตุแม่เจดีย์ คุญุมิทัศน์ของอ.เวียงป่าเป้า จากคอบแม่เจดีย์  
จันทร์ที่ 6 ส.ค.

1. เดินตลาดเช้า คุสภาพทั่วไปของหมู่บ้าน
2. สังกคคอย่างไม่มีส่วนร่วมกิจกรรมตลอดทั้งวันของโรงเรียน
3. สนทนาทำความเข้าใจเกี่ยวกับจุดประสงค์ และแผนในการเก็บข้อมูลงานวิจัย กับ  
อาจารย์เสาวณีษ์ ไชยมงคล (ผช.ฝ่ายวิชาการ และผู้รับผิดชอบโครงการ)
4. ทำความรู้จักคุ้นเคยกับคณะครู
5. สัมภาษณ์อย่างไม่เป็นทางการ อ.เสาวณีษ์ + อ.สมบัติ

อังคารที่ 7 ส.ค.

1. สัมภาษณ์อย่างเป็นทางการกับพ่อหลวงสิงห์คำ อดีตผู้ใหญ่บ้าน ม.1 แกนนำ คน  
สำคัญของชาวบ้านในการเข้าร่วม โครงการ
2. จั้มอเตอร์ไซค์ คุพื้นที่ม.1 และม.12 (มีโรงงาน และโรงสีในหมู่บ้าน)
3. สังกคคอย่างมีส่วนร่วมในการประชุมอาจารย์ทั้งโรงเรียน
4. ทำบันทึกสนาม และบันทึกประจำวัน วิเคราะห์ข้อมูลเบื้องต้น

วันพุธที่ 8 ส.ค.

1. สัมภาษณ์อย่างเป็นทางการ นร. ป.6 2 คน
2. สังกคคอย่างมีส่วนร่วมในกิจกรรมการเรียนการสอน (สอนแทน) ระดับชั้น ป.2
3. สัมภาษณ์ คุณสุวัฒน์ คารรัตน์
4. ทำบันทึกสนาม และบันทึกประจำวัน วิเคราะห์ข้อมูลเบื้องต้น

วันพฤหัสบดีที่ 9 ส.ค.

1. สัมภาษณ์ คุณอ่อนแก้ว
2. ทำบันทึกสนาม และบันทึกประจำวัน วิเคราะห์ข้อมูลเบื้องต้น
3. ช่วยอาจารย์เตรียมสถานที่สำหรับกิจกรรมวันแม่ 10 ส.ค.

วันจันทร์ที่ 10 ธันวาคม 2544 เดินทางไปเชียงใหม่

วันอังคารที่ 11 ธันวาคม 2544 เดินทางจากเชียงใหม่ไปเชียงราย

วันอังคารที่ 11 – วันศุกร์ที่ 14 ธันวาคม 2544 เก็บข้อมูลภาคสนาม สัมภาษณ์ และ  
สังกคการทำงาน โรงเรียนบ้านสันมะเค็ดฯ 2

วันอังคารที่ 11 ธ.ค.

1. สัมภาษณ์อย่างไม่เป็นทางการ อ.วันชัย ปัญญาวิชา
2. สัมภาษณ์กิจกรรมของโรงเรียน
3. ร่วมสังเกตการสำรวจพื้นที่ป่าชุมชนสำหรับการตั้งค่าย
4. พบ อ.สุวัฒน์ คารารัตน์ (ศูนย์สืบสานฯ) พ่อหลวงจันทร์ จินะเทพ (ประธานกรรมการโรงเรียน) พ่อหลวงทอง สุธะทา (ผู้ใหญ่บ้าน หมู่ 12)

วันพุธที่ 12 ธ.ค.

1. สัมภาษณ์อย่างเป็นทางการ พ่อหลวงทองคำ มาไว ผู้ใหญ่บ้าน หมู่ 1
2. สัมภาษณ์อย่างเป็นทางการ คุณสมพล ยารังสี ศิลปินผู้ช่วยสอนศิลปะเด็ก
3. สัมภาษณ์อย่างเป็นทางการ พระครูสถิตตีสุนทร (เจ้าอาวาสวัดสันมะเค็ด)
4. ศึกษา และบันทึกผลงานของนักเรียนที่นำเสนอต่อที่ประชุมชาวบ้าน (นำเสนอเมื่อวันที่ 21 พ.ย.2544)

วันพฤหัสบดีที่ 13 ธ.ค.

1. สังเกตกิจกรรมการเรียนการสอนเชิงบูรณาการ ระดับชั้น ป.6
2. สังเกตอย่างไม่มีส่วนร่วม การประชุมครู เตรียมการต้อนรับคณะศึกษาดูงาน
3. สัมภาษณ์อย่างไม่เป็นทางการ อ.เสาวณีย์ ไชยมงคล

วันศุกร์ที่ 14 ธ.ค.

1. สังเกตอย่างมีส่วนร่วมในกิจกรรมเดินป่าชุมชนกับนักเรียนระดับชั้น ป.5 และ ป.6
2. สัมภาษณ์อย่างไม่เป็นทางการ อ.วันชัย ปัญญาวิชา
3. สัมภาษณ์อย่างไม่เป็นทางการ คุณพ่ายพ สิงห์แก้ว ประธานกลุ่มอาสาฯ

3. โรงเรียนรักเจ้าพระยากับตาวิเศษ สมาคมสร้างสรรค์ไทย

วันพุธที่ 23 พฤษภาคม 2544 ประชุมเตรียมความพร้อมสำหรับการออก Trip

วันจันทร์ที่ 28 พฤษภาคม 2544 เดินทางไปอยู่ชุกกับทีมงาน โรงเรียนเรือ

วันอังคารที่ 29 พฤษภาคม 2544 สังเกตอย่างมีส่วนร่วม และปฏิบัติหน้าที่อาสาสมัคร

ช่วยสอน นักเรียนโรงเรียนประชากรรังสฤษฎ์ กลุ่มที่ 1 (ป.5-ป.6)

วันพุธที่ 30 พฤษภาคม 2544 สังเกตอย่างมีส่วนร่วม และปฏิบัติหน้าที่อาสาสมัคร

ช่วยสอน นักเรียนโรงเรียนประชากรรังสฤษฎ์ กลุ่มที่ 2 (ป.3-ป.4)

วันพฤหัสบดีที่ 31 พฤษภาคม 2544 สังเกตอย่างมีส่วนร่วม และปฏิบัติหน้าที่

อาสาสมัครช่วยสอน โรงเรียนวัดสิงห์สุททาวาส

วันเสาร์ที่ 2 มิถุนายน 2544 สังกัดอย่างมีส่วนร่วม และปฏิบัติหน้าที่อาสาสมัคร  
ช่วยสอนเด็กๆ และพนักงานจากบริษัทไทยพลาสติกและเคมีภัณฑ์ กลุ่มที่ 1

วันจันทร์ที่ 4 มิถุนายน 2544 สังกัดอย่างมีส่วนร่วม กิจกรรมฝึกอบรมเจ้าหน้าที่  
โครงการ โรงเรียนเรือฯสถานที่ สำนักงานโรงเรียนเรือรักเจ้าพระยากับตาวิเศษ

วันอังคารที่ 19 – วันพฤหัสบดีที่ 21 มิถุนายน 2544 สังกัดอย่างมีส่วนร่วม  
กิจกรรมฝึกอบรม เจ้าหน้าที่สมาคมสร้างสรรค์ไทย และโรงเรียนเรือฯ  
สถานที่ ไทโร โยค ฮิลล์ แฟมิลี่ รีสอร์ท จ.กาญจนบุรี

วันอังคารที่ 26 มิถุนายน 2544 ประชุมเตรียมความพร้อมสำหรับการออก Trip

วันพฤหัสบดีที่ 28 มิถุนายน 2544 สัมภาษณ์อย่างเป็นทางการ คุณชมพูนุท ธนบดี  
อดีตผู้อำนวยการโครงการ โรงเรียนเรือฯ

วันเสาร์ที่ 30 มิถุนายน 2544 สังกัดอย่างมีส่วนร่วม และปฏิบัติหน้าที่อาสาสมัคร  
ช่วยสอนเด็กๆ และพนักงานจากบริษัทไทยพลาสติกและเคมีภัณฑ์ กลุ่มที่ 2

วันเสาร์ที่ 18 – วันอาทิตย์ที่ 19 สิงหาคม 2544 สังกัดอย่างมีส่วนร่วม และปฏิบัติ  
หน้าที่อาสาสมัครช่วยสอนนักเรียน จากโรงเรียนวัฒนาวิทยาลัย

วันเสาร์ที่ 15 – วันอาทิตย์ที่ 16 กันยายน 2544 สังกัดอย่างมีส่วนร่วม และปฏิบัติ  
หน้าที่อาสาสมัครช่วยสอนนักเรียน จากโรงเรียนวัดพลับพลาชัย

วันเสาร์ที่ 6 ตุลาคม 2544 สังกัดอย่างมีส่วนร่วม และปฏิบัติหน้าที่  
อาสาสมัครช่วยสอนนักเรียน จากครอบครัวพนักงานยูโนแคล

วันจันทร์ที่ 29 ตุลาคม 2544 สัมภาษณ์อย่างเป็นทางการ คุณชมพูนุท ธนบดี  
อดีตผู้อำนวยการโครงการ โรงเรียนเรือฯ

วันเสาร์ที่ 1 – 2 ธันวาคม 2544 สังกัดอย่างมีส่วนร่วม และปฏิบัติหน้าที่  
อาสาสมัครช่วยสอนนักเรียน จากโรงเรียนวัดพลับพลาชัย

วันศุกร์ที่ 15 มีนาคม 2545 สัมภาษณ์อย่างเป็นทางการเพิ่มเติม คุณดารณี เวณจันทร์  
และคุณโรเบิร์ต สตีล



### ตัวอย่างแบบบันทึกการสังเกตกิจกรรมของแหล่งการเรียนรู้

**แหล่งการเรียนรู้ที่สังเกต** แหล่งการเรียนรู้ของโรงเรียนเรื่อรักเจ้าพระยากับตาวิเศษ

**สถานที่** ห้องเรียนบนเรือ และเกาะเกร็ด

**วัน – เวลา** วันเสาร์ที่ 2 มิถุนายน 2544 / เวลา 13.00 – 15.30 น.

**บุคคล** ผู้ดำเนินกิจกรรมหลัก (คุณอุษา)

ทีมครูผู้สอนของโรงเรียนเรื่อ 4 คน (รวมผู้สังเกต)

ผู้เข้าร่วมกิจกรรม (เด็กๆ จากครอบครัวในโครงการของบริษัทไทย TPC

จำนวน 11 คน และเจ้าหน้าที่ของบริษัท จำนวน 4 คน)

**กิจกรรม** เรียนรู้เกาะเกร็ด

**รายละเอียดกิจกรรม**

#### ห้องเรียนบนเรือ

1. สนทนาแลกเปลี่ยนความรู้เกี่ยวกับเกาะเกร็ด ในประเด็นต่างๆ ดังนี้
  - การกำเนิดของเกาะ
  - ความเป็นมาของกลุ่มคนที่อาศัยบนเกาะ
  - เอกลักษณะ และวัฒนธรรมท้องถิ่นของผู้คนบนเกาะเกร็ด
 ( ใช้ภาพแผนที่ และเครื่องปั้นดินเผา – สื่อของจริง ประกอบการสนทนา )
2. เตรียมตัวลงจากเรือเพื่อเก็บข้อมูล และเรียนรู้วิถีชีวิตผู้คนบนเกาะเกร็ด

#### เกาะเกร็ด

1. แบ่งเป็น 3 กลุ่ม เพื่อศึกษาเกาะเกร็ด ใน 3 มิติ คือ
  - ด้านเศรษฐกิจ
  - ด้านสังคมวัฒนธรรม
  - ด้านสิ่งแวดล้อม
2. เด็กๆ แต่ละกลุ่มจะเตรียมตั้งคำถามเพื่อสัมภาษณ์ และกำหนดประเด็นที่น่าสนใจสำหรับการสังเกต โดยมีทีมครูผู้สอน และเจ้าหน้าที่ของบริษัทฯ ที่มาเป็นผู้เลี้ยงคอยดูแล
3. แบ่งกลุ่มออกศึกษา ใช้เส้นทางจากท่าหน้าสาธารณะวัดปรมัยยิกาวาส เดินลงทางใต้ เลียบแม่น้ำด้านคลองลัดเกร็ด จุดนัดพบสุดท้าย คือ ท่าหน้าหน้าสถานสงเคราะห์บ้านเกร็ดตะการ
4. จุดที่กำหนดให้ครูพาเด็กๆ แวะศึกษา ได้แก่

- พิพิธภัณฑ์ชาวบ้าน ศาลาสำหรับฝึกงานศิลปหัตถกรรมในโครงการ สืบสานอนุรักษ์ศิลปหัตถกรรมพื้นบ้าน และโบสถ์ของวัดปรมัยยิกาวาส (สังคมวัฒนธรรม)
  - ร้านค้าริมทางเดิน : ร้านน้ำ1 – ลานหน้าวัดปรมัยฯ (เศรษฐกิจ)
  - ร้านค้าริมทางเดิน : ร้านขนมหวานหันตรา (เศรษฐกิจ)
  - โรงปั่นเครื่องปั่นดินเผา (เศรษฐกิจ สังคมวัฒนธรรม และสิ่งแวดล้อม)
  - บ้านคุณลุงหงสา ช่างชาวบ้านสลักลวดลายบนเครื่องปั่นดินเผา (สังคมวัฒนธรรม)
  - วัดฉิมพลี (สังคมวัฒนธรรม)
  - วัดป่าเลไลยก์ (สังคมวัฒนธรรม)
  - บ้านหมู่ 3 ทำเครื่องจักสาน (สังคมวัฒนธรรม และเศรษฐกิจ)
- \*\*\* กลุ่มสิ่งแวดล้อม ใช้วิธีการสัมภาษณ์ชาวบ้าน และการสังเกตในประเด็นต่างๆ คือ
- ทรัพยากรบนเกาะเกร็ด (ดินและน้ำสำหรับอุปโภค-บริโภค)
  - การจัดการขยะ
  - ปัญหาสิ่งแวดล้อมบนเกาะในปัจจุบัน

5. แต่ละกลุ่มกลับมารวมกันอีกครั้งในห้องเรียนบนเรือ เวลา 15.00 น.

ห้องเรียนบนเรือ

5.1 แต่ละกลุ่มสรุปผลการศึกษาให้เพื่อนๆ ฟัง

5.2 ผู้ดำเนินกิจกรรมหลักนำการสนทนา และอภิปรายแลกเปลี่ยนความคิดเห็น โดยเปิดโอกาสให้เด็กๆ ครูผู้สอน และพี่เลี้ยง ทุกคน มีส่วนร่วมในการสนทนา ประเด็นหลักของการสนทนา ได้แก่

- ขีดจำกัดด้านทรัพยากรของเกาะเกร็ด
- เอกลักษณ์ และภูมิปัญญาที่น่าสนใจ
- วิถีชีวิตของผู้คนที่กำลังเปลี่ยนไป
- ปัญหาสิ่งแวดล้อมของเกาะ
- ผลกระทบจากการท่องเที่ยวที่มีต่อสภาพการเปลี่ยนแปลง
- ความยั่งยืนทางสิ่งแวดล้อม และสังคม ของเกาะเกร็ด

### บันทึกสำหรับผู้สังเกต

จุดเด่นที่เป็นเอกลักษณ์ในการสอนของครูทุกคนของโรงเรียนเรื่อๆ คือการตั้งคำถาม ในกิจกรรมนี้จะเห็นได้ชัดเจนว่าครูพยายามใช้คำถามกระตุ้นให้เด็กๆ คิด และพยายามเลี้ยงที่จะใช้วิธีการบอกโดยตรง นอกจากนี้ลักษณะของกิจกรรมเปิดโอกาสให้เด็กๆ ได้เรียนรู้จากสภาพจริง ด้วยการทำงานเป็นกลุ่มให้มากที่สุด

การกำหนดเส้นทางการศึกษามีความยืดหยุ่นสูง ระยะเวลาที่แวะศึกษาตามจุดศึกษาแต่ละจุด ยืดหยุ่นตามความเหมาะสม จุดเน้นในการศึกษาบนเกาะเกร็ดสามารถครอบคลุมทั้งด้านเศรษฐกิจ สังคมวัฒนธรรม และสิ่งแวดล้อม ตามที่กำหนดไว้ได้จริง

ความสัมพันธ์ระหว่างครูของโรงเรียนกับชาวบ้านที่อยู่ในแต่ละจุดศึกษา เป็นไปด้วยดี และมีนัยยะที่บอกได้ถึง impact บางอย่างที่มีต่อชาวบ้าน เช่น ร้านขนมหวานหันตราจะรู้ทันทีว่าเมื่อเป็นเด็กๆ ที่มาที่โรงเรียนเรื่อๆ จะต้องเปลี่ยนวัสดุในการบรรจุขนมจากโฟม และพลาสติก เป็นใบตอง เนื่องจากครูจะมีข้อตกลงกับผู้เรียนทุกคนให้พยายามเลี่ยงการนำโฟม และถุงพลาสติกขึ้นบนเรือให้น้อยที่สุดเท่าที่จะทำได้ หรือกรณีของโรงปั่นเครื่องปั่นดินเผา ช่างอาวูโส คนหนึ่งจะคอยอธิบาย สาธิต และเปิดโอกาสให้เด็กๆ ได้ลองปั่นเครื่องปั่นดินเผา โดยพูดว่า “เอาเลย ไหนๆ มาแล้ว ต้องลองทำดู” “เด็กโรงเรียนเรื่อมาบ่อย”

เด็กๆ ที่ค่อนข้างเจียมมาตลอดกับกิจกรรมในช่วงกลางวัน มีความกระตือรือร้นมากขึ้นในการเดินศึกษา ตลอดเส้นทางมีการตั้งข้อสังเกต ถามครู พี่เลี้ยง และชาวบ้าน ในประเด็นต่างๆ ส่วนใหญ่ครูจะพยายามไม่ตอบเองทั้งหมด แต่จะพยายามสนับสนุนให้เด็กๆ ถามจากชาวบ้าน

กิจกรรมการสรุปช่วงท้ายน่าสนใจ แต่ละกลุ่มจะเล่าประสบการณ์ และข้อมูลที่รวบรวมมาได้ ข้อมูลต่างๆ ในการสรุปจึงเหมือนภาพต่อ ที่ช่วยให้ภาพของเกาะเกร็ดมีความชัดเจนมากขึ้น



### ตัวอย่างบันทึกภาคสนามประจำวัน 5 ส.ค.44

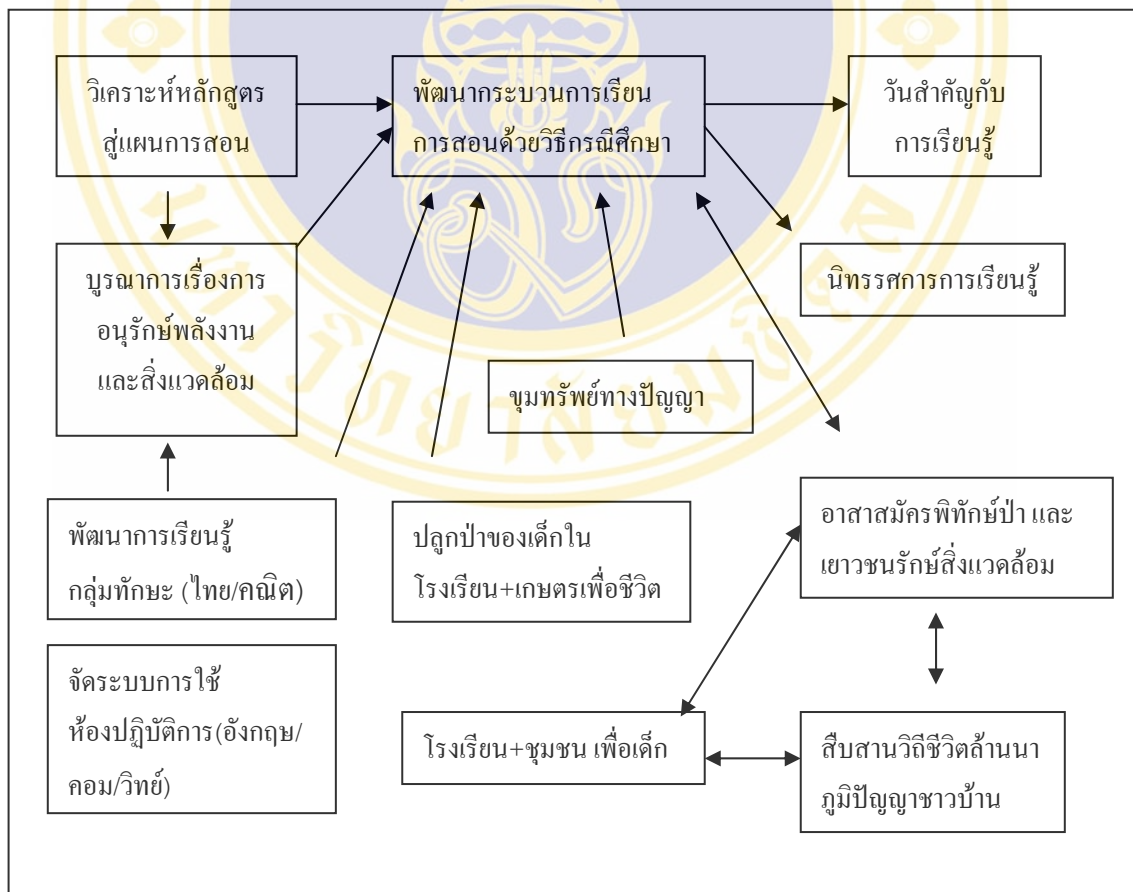
เดินทางมาถึงปากทางเข้าโรงเรียนบ้านสันมะเค็ด ประมาณ 15.30 น. โบกรถเข้าซอย ประมาณ 2 กม. ถึงโรงเรียน แนะนำตัวกับอาจารย์ชูชาติ (อาจารย์ใหญ่) อาจารย์ชวณนังคุษ และ บรรยายสรุปเกี่ยวกับงานที่ทำในโรงเรียน (รายละเอียดดูในบันทึกสัมภาษณ์ และเทป)

สิ่งที่อาจารย์เล่าให้ฟังน่าฟังมาก จุดที่น่าสนใจเป็นพิเศษคือ ความเข้มแข็งในการทำงาน ร่วมกันระหว่างโรงเรียนกับชุมชน โครงการดีๆ หลายโครงการเกิดขึ้น และดำเนินการไปด้วยดี เช่น โครงการกรณีศึกษาป่าชุมชน (โครงการที่เราจะมาศึกษา) ที่แม้จะเป็นโครงการที่มีแนวคิดเริ่มต้นจาก หน่วยงานภายนอก (สปช.+RECOFTC) แต่เมื่อนำมาปฏิบัติก็ป็นรูปเป็นร่างด้วยฝีมือครู แม้จะต้อง ลองผิดลองถูกกันหลายต่อหลายครั้ง อาจารย์ใหญ่บอกว่าแรกๆทำงานกันแบบสุดขั้ว พาออกนอก ห้องเรียนและบูรณาการไม่ถึงจุดที่ควรเป็น เมื่อมีเสียงสะท้อนจากนักเรียนและผู้ปกครอง เพราะนักเรียนจะขาดการพัฒนาไปในหลายๆ จุด เช่น ทักษะด้านภาษา ทักษะคณิตศาสตร์ ฯลฯ นักเรียนที่เรียนจบไปเรียนต่อที่อื่น จะมีปัญหาเกี่ยวกับทักษะเหล่านี้ แต่สิ่งที่ได้มาชดเชยกัน คือ เด็กๆ เหล่านี้จะมีความกระตือรือร้น กล้าคิด กล้าเป็น มีทักษะในการจัดการ การแสวงหาความรู้ และการนำเสนอ เพราะถูกฝึกให้สร้างองค์ความรู้ด้วยตนเองมาตลอด นอกจากนี้ในส่วนที่เป็นผล สืบเนื่องต่อชุมชนก็คือ ชุมชนหันมาตระหนักถึงความสำคัญของป่าไม้ ส่วนหนึ่งมาจากข้อมูลที่เด็กๆ สืบเสาะมานำเสนอ ทำให้ผู้ใหญ่ “อึ้ง” และหันมาจับมือ ร่วมกันคืนชีวิตให้ผืนป่า และเมื่อทำอย่างต่อเนื่อง (โครงการเริ่มประมาณ ปี 2535) ผลที่เกิดขึ้นก็เห็นเป็นรูปธรรม ของป่า + ผลผลิตจากป่า มากขึ้น (หน่อไม้ เห็ด ฯลฯ) ป่าที่แต่เดิมเคยเสื่อมโทรม ตอนนี้นักกลับเขียวทึบ อุดมสมบูรณ์ อาจารย์ ใหญ่เองเคยเป็นเด็กในพื้นที่ใกล้เคียง เคยเห็นพื้นที่ดังกล่าวมาตั้งแต่เด็ก ความเปลี่ยนแปลงที่เกิดขึ้น ชัดเจนที่สุดและเป็นคำตอบที่ดีที่สุดให้แก่ชาวบ้าน

จากจุดเริ่มต้นใน 1 โครงการ ชาวบ้านเริ่มเข้ามามีส่วนร่วมในการจัดกิจกรรมและการ จัดการเรียนการสอนของโรงเรียนมากขึ้น โครงการอาสาสมัครพิทักษ์ป่า และเยาวชนรักษ์ สิ่งแวดล้อม (วิชาการ) และโครงการสืบสานวิถีชีวิตล้านนาภูมิปัญญาชาวบ้าน (กิจการนักเรียน) เป็น ตัวอย่างที่ชัดเจน โครงการแรกเป็นความร่วมมือระหว่างโรงเรียน – ครู – ชุมชน – นักเรียนเก่า (กลุ่ม เยาวชน) – นักเรียนปัจจุบัน มีการจัดการองค์กรโดยผู้ใหญ่บ้าน 3 หมู่บ้าน เป็นแกนนำ ชาวบ้านจะ เลือกระชากรกลุ่มเอง โรงเรียนและครูเข้าร่วม ดึงเยาวชนในท้องถิ่นเข้าร่วม กลุ่มมีความเข้มแข็ง เป็น Forestry Watcher ที่ดูแลการเข้าไปใช้ประโยชน์พื้นที่ป่าของชาวบ้าน “เดี๋ยวนี้ใครเข้าไปทำ อะไรไม่ดีกับป่า ตัดไม้ หรือก่อไฟทิ้ง ชาวบ้าน 300-400 หลังคาเรือนไม่ยอม จะเอาไม้มาทำพื้นต้อง เอาเฉพาะที่ตายแล้ว”(อ.ชูชาติ) ส่วนโครงการสืบสานวิถีชีวิตล้านนาภูมิปัญญาชาวบ้านนั้น เริ่มจาก

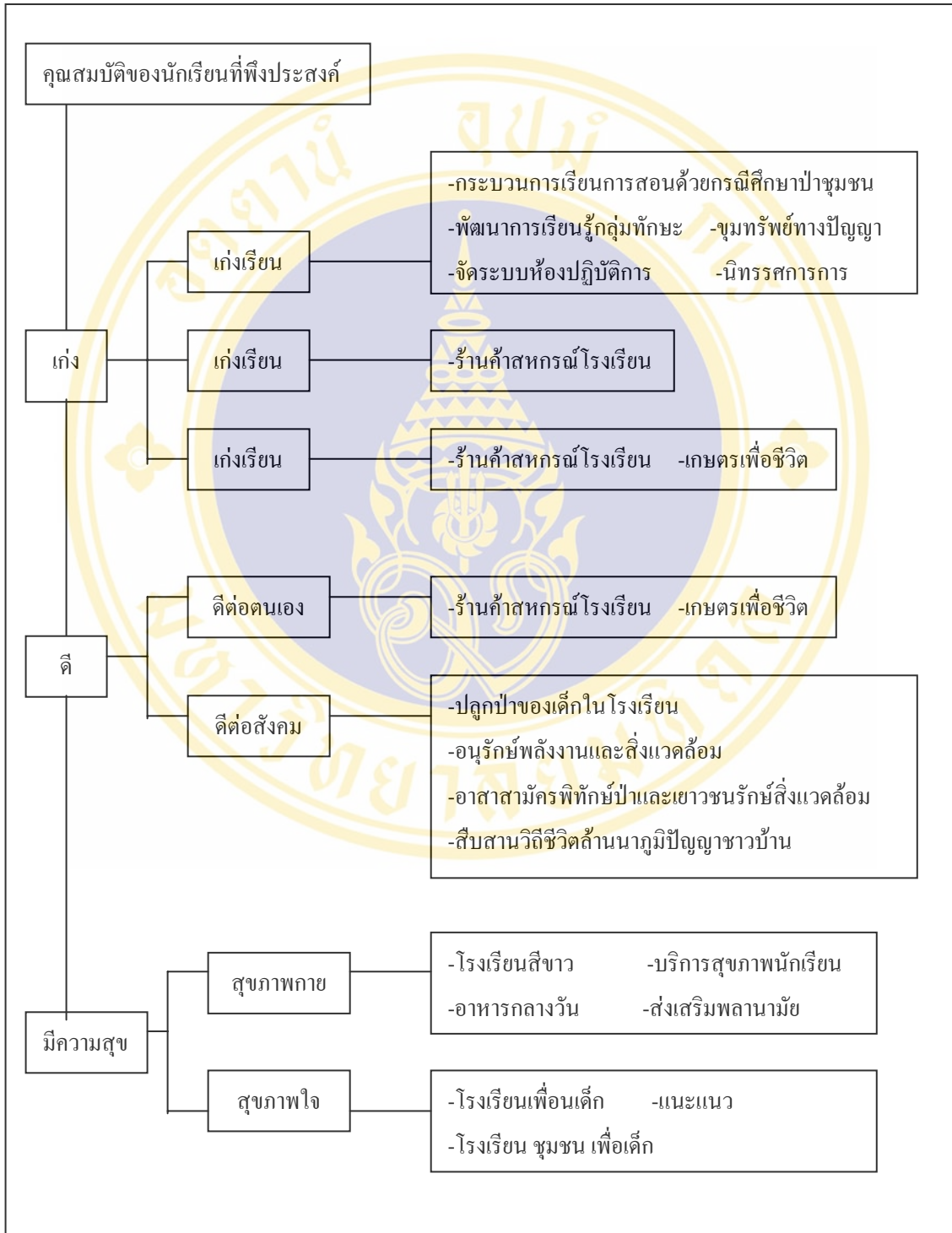
ชาวบ้าน ม.1 ม.2 และม.12 ร่วมกัน มีอาจารย์ใหญ่เข้าร่วม และนำเด็กๆ เข้าร่วมเรียนรู้และสืบสานในรูปแบบค่าย 4 วัน ช่วงปิดเทอมจะจัดบวชเณร และบวชชีพรามณ์ โครงการดังกล่าวมีศูนย์สืบสานฯ ตั้งอยู่ที่ไร่น้ำใสไม่งาม (ม.2) มีคุณสุวัฒน์ คารารัตน์ เป็นผู้อำนวยการศูนย์ ศูนย์มีความเข้มแข็งและให้การสนับสนุนงานของโรงเรียน (ระดมทุน จัดอบรม) ด้วยดี นอกจากนี้ศูนย์ยังได้รับความช่วยเหลือจากชุมชนผู้ดำเนินงาน มหาวิทยาลัยเชียงใหม่ ซึ่งช่วยจัดหาวิทยากรมาสนับสนุนอย่างต่อเนื่อง

อีกประเด็นหนึ่งซึ่งมีความสำคัญ และเป็นแนวคิดที่น่าสนใจในการบริหารจัดการ ก็คือ การประยุกต์ใช้แนวคิดการจัดการโรงเรียนทั้งระบบ (Whole School Approach) เพื่อสิ่งแวดล้อม (โรงเรียนได้รับแนวคิดมาจากการฝึกอบรมในโครงการรุ่งอรุณ) มาใช้ในการทำงาน โรงเรียนบ้านสันมะเค็ดฯ มีโครงการต่างๆ ที่ดำเนินงานควบคู่ไปกับการจัดการเรียนการสอนมากถึง 29 โครงการ ขณะที่บุคลากรจำกัดมากเพียง 9 คน แต่ด้วยแนวคิดในการบริหารที่ยืดหยุ่น และมีการเชื่อมโยงโครงการแต่ละโครงการให้เอื้อต่อกัน ช่วยให้การดำเนินโครงการต่างๆ เป็นไปด้วยดี วิเคราะห์ได้ดังแผนภูมิที่ 1



แผนภูมิที่ 1 วิเคราะห์กิจกรรมของโครงการต่างๆ ที่โรงเรียนได้ดำเนินการในลักษณะบูรณาการ โดยใช้แนวคิดการจัดการโรงเรียนทั้งระบบ (Whole School Approach)

นอกจากนี้กิจกรรมในโครงการต่างๆ ที่โรงเรียนได้ดำเนินการเพื่อมุ่งเน้นการพัฒนาผู้เรียนสามารถวิเคราะห์ตามกรอบแนวคิดคุณลักษณะของผู้เรียนที่พึงประสงค์ (เก่ง-ดี-มีความสุข)และนำเสนอได้ดังแผนภูมิที่ 2



แผนภูมิที่ 2 วิเคราะห์กิจกรรมในโครงการต่างๆ จำแนกตามคุณลักษณะของนักเรียนที่พึงประสงค์



**แบบประเมินผลการจัดกิจกรรมของโรงเรียนเรื่อรักเจ้าพระยากับตาวิเศษ  
(แบบประเมินสำหรับครู)**

**ตอนที่ 1 ข้อมูลทั่วไป**

1. ตำแหน่ง .....
2. สถาบัน .....จังหวัด .....
3. ประสบการณ์การทำงานด้านสิ่งแวดล้อมศึกษา และการอนุรักษ์  
.....  
.....  
.....
4. ท่านเคยนำนักเรียน/นักศึกษาในสถาบันของท่านเข้าร่วมกิจกรรมของ โรงเรียนเรื่อรักเจ้าพระยา  
กับตาวิเศษ มาก่อนหรือไม่  
 เคย ครั้งนี้เป็นครั้งที่ .....  ไม่เคย
5. ท่านรับรู้ข่าวสารเกี่ยวกับการจัดกิจกรรมของ โรงเรียนเรื่อรักเจ้าพระยากับตาวิเศษจากแหล่งใด  
.....  
.....
6. เพราะเหตุใดท่านจึงมีความสนใจที่จะนำนักเรียน/นักศึกษาในสถาบันของท่านเข้าร่วมกิจกรรม  
ของโรงเรียนเรื่อรักเจ้าพระยากับตาวิเศษ  
.....  
.....
7. สิ่งที่ท่านพึงพอใจมากที่สุดในการนำนักเรียน/นักศึกษาในสถาบันของท่านเข้าร่วมกิจกรรมของ  
โรงเรียนเรื่อรักเจ้าพระยากับตาวิเศษในครั้งนี้ ได้แก่  
.....  
.....
8. สิ่งที่ท่านมีความคิดเห็นว่าโรงเรียนเรื่อรักเจ้าพระยากับตาวิเศษควรปรับปรุงในการจัดกิจกรรม  
ครั้งต่อไป ได้แก่  
.....  
.....  
.....
9. ข้อเสนอแนะอื่นๆ (ถ้ามี)

.....  
 .....  
 .....

**ตอนที่ 2** แบบประเมินผลกิจกรรมการเรียนรู้

1. ประเมินผลภาพรวมและรายกิจกรรม (ทำเครื่องหมาย 3 ในช่องที่ตรงกับความคิดเห็นของท่าน)

มาก ←————→ น้อย    มาก ←————→ น้อย

รายการ	ระดับความเป็นประโยชน์					ระดับความเหมาะสม				
	5	4	3	2	1	5	4	3	2	1
1. ภาพรวมกิจกรรมทั้งหมด										
2. กิจกรรมแนะนำระบบความปลอดภัย										
3. กิจกรรมแนะนำความเป็นอยู่บนเรือ										
4. กิจกรรมแนะนำตัว										
5. กิจกรรมการแยกขยะ										
6. กิจกรรมจำลองสถานการณ์เป็นมิตรกับสิ่งแวดล้อม										
7. กิจกรรมทำกระดาษสา										
8. กิจกรรมต่อภาพสี่เหลี่ยม										
9. กิจกรรม ปมมนุษย์ (Human Knot)										
10. กิจกรรมยิงรถถัง (Sherman Tank)										
11. กิจกรรมข้ามแม่น้ำกรวด (Stepping Stone)										
12. กิจกรรมพายเรือแคนู / ว่ายน้ำ										
13. กิจกรรมผูก-รู้จักปลา ที่ศูนย์ศิลปาชีพบางไทร										
14. กิจกรรมค้นหาความลับของผักตบชวา										
15. กิจกรรมสำรวจเกาะเกร็ด										
16. กิจกรรมหน้าที่ลูกเรือ										
17. กิจกรรมสรุป และประเมินผลส่งท้าย										

2. กิจกรรมที่ท่านเห็นว่ามีความน่าสนใจมากที่สุด ได้แก่ (เลือกตอบเพียง 1 กิจกรรม)

.....

3. กิจกรรมที่ท่านเห็นว่ามีความเหมาะสมมากที่สุด ได้แก่ (เลือกตอบเพียง 1 กิจกรรม)

.....

4. กิจกรรมที่ท่านเห็นว่าควรปรับปรุงมากที่สุด (กรุณาให้ข้อเสนอแนะเพิ่มเติมด้วย) ได้แก่  
(เลือกตอบเพียง 1 กิจกรรม)

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**ตอนที่ 3** แบบประเมินผลการจัดแหล่งการเรียนรู้ การบริการ และการจัดการแหล่งการเรียนรู้

1. แบบประเมินผลการบริการ และการจัดการแหล่งการเรียนรู้ในแต่ละด้าน (ทำเครื่องหมาย / ในช่องที่ตรงกับความคิดเห็นของท่าน)

รายการ	ระดับความพึงพอใจ				
	5	4	3	2	1
1. การจัดพื้นที่ และสิ่งแวดลอมบนเรือ					
2. ห้องพัก					
3. ห้องน้ำ และห้องอาบน้ำ					
4. อาหาร อาหารว่าง และน้ำดื่ม					
5. ภาชนะในการรับประทานอาหาร					
6. การจัดการขยะมูลฝอยหนังสือ					
7. มุมอ่านหนังสือ					
8. สื่ออุปกรณ์ต่างๆ ในแต่ละกิจกรรม					
9. เสื่อชูชีพ และมาตรการด้านความปลอดภัยต่างๆ					
10. การอำนวยความสะดวกโดยทีมงานของโรงเรียนเรือฯ					

2. ความเหมาะสมของการกำหนดเส้นทางศึกษาสิ่งแวดลอม และชุมชน บนเกาะเกร็ด

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.....

.....

#### ตอนที่ 4 คุณลักษณะของผู้เรียนที่ได้รับการพัฒนาจากการเข้าร่วมกิจกรรม

จากการเข้าร่วมกิจกรรมของโรงเรียนเรื่อรักเจ้าพระยากับตาวิเศษ ท่านมีความคิดเห็นว่า  
นักเรียน / นักศึกษา ในสถาบันของท่านได้รับการพัฒนาคุณลักษณะในด้านต่างๆ อย่างไร

##### 1. ด้านความรู้

- ความรู้เบื้องต้นเกี่ยวกับการจัดการขยะ
- ผลกระทบจากกิจกรรมต่างๆ ของมนุษย์ ที่ส่งผลต่อสิ่งแวดล้อม
- แนวทางการปฏิบัติตนในด้านต่างๆ เพื่อเป็นมิตรต่อสิ่งแวดล้อม เช่น ลดการใช้โฟม พลาสติก และกระดาษ
- ความรู้เบื้องต้นเกี่ยวกับทรัพยากรธรรมชาติ
- ความรู้เบื้องต้นเกี่ยวกับสิ่งมีชีวิตชนิดต่างๆ เช่น นก และปลา
- การปรับตัวของสิ่งมีชีวิตในธรรมชาติ
- การวัดคุณภาพน้ำโดยใช้สิ่งมีชีวิตขนาดเล็กในแหล่งน้ำเป็นดัชนีชี้วัด
- ความรู้เบื้องต้นเกี่ยวกับความเป็นมา สภาพสังคม วัฒนธรรม และเศรษฐกิจของชุมชนบนเกาะเกร็ด
- การเปลี่ยนแปลงของวิถีชีวิตชุมชนริมน้ำ กับการอนุรักษ์สิ่งแวดล้อม
- อื่นๆ ได้แก่ .....

##### 2. ด้านเจตคติ และค่านิยม

- ความรู้สึกรัก ผูกพัน และห่วงใยสิ่งมีชีวิต และสิ่งแวดล้อมทางธรรมชาติ
- ความตระหนักในสถานการณ์ปัญหาสิ่งแวดล้อมในด้านต่างๆ
- ความตระหนักถึงคุณค่าของวิถีวัฒนธรรมท้องถิ่นที่ควรแก่การอนุรักษ์
- ความตระหนักเกี่ยวกับบทบาทของตนในการอนุรักษ์ ป้องกัน และแก้ไขปัญหาสีสิ่งแวดล้อมทั้งสิ่งแวดล้อมทางธรรมชาติ และสิ่งแวดล้อมทางสังคมวัฒนธรรม
- ค่านิยมที่พึงประสงค์ด้านสิ่งแวดล้อม เช่น ลดการบริโภคที่จะก่อให้เกิดขยะโดยไม่จำเป็น
- อื่นๆ ได้แก่ .....

##### 3. ด้านทักษะ

- ทักษะการสังเกต
- ทักษะการตั้งคำถาม
- ทักษะการเก็บรวบรวมข้อมูล
- ทักษะในการทำงานร่วมกับผู้อื่น
- อื่นๆ ได้แก่ .....





**ตอนที่ 2** ความพึงพอใจในกิจกรรมต่างๆ (ทำเครื่องหมาย ✓ ในช่องที่ตรงกับความคิดเห็นของท่าน)

มาก ← → น้อย

รายการ	ระดับความพึงพอใจ				
	5	4	3	2	1
1. ภาพรวมของกิจกรรมทั้งหมด					
2. การบรรยายประกอบสไลด์ 1 “ชีวิตกับสิ่งแวดล้อม” โดย อ.ดำรง สุภามิต					
3. การบรรยายประกอบสไลด์ 2 “กิจกรรมของศูนย์วิจัยฯ” โดย อ.ดำรง สุภามิต					
4. การบรรยายประกอบสไลด์ 3 “ความรู้เบื้องต้นเกี่ยวกับสิ่งมีชีวิตในทะเล” โดย อ.ประสาน แสงไพบูลย์					
5. กิจกรรมฝึกดำน้ำ และการดำน้ำศึกษาธรรมชาติ					
6. กิจกรรม Lab ศึกษาสิ่งมีชีวิตในทะเล					
7. กิจกรรมสรุป อภิปรายและตอบคำถาม					
8. กิจกรรมการประเมินผล โดยใช้แบบทดสอบก่อน – หลัง เรียน					
9. การใช้ไฮตัทศนูปกรณ์ และสื่อการเรียนรู้ต่างๆ					

**ตอนที่ 3** ความพึงพอใจในการบริการ และการจัดการแหล่งการเรียนรู้ (ทำเครื่องหมาย ✓ ในช่องที่ตรงกับความคิดเห็นของท่าน)

มาก ← → น้อย

รายการ	ระดับความพึงพอใจ				
	5	4	3	2	1
1. การจัดสถานที่ และสิ่งแวดล้อมภายในค่ายพัก					
2. การจัดที่พัก และเต็นท์					
3. การจัดพื้นที่รองรับขยะ					
4. อาหาร และน้ำดื่ม					
5. ห้องน้ำ และห้องอาบน้ำ					
6. ยานพาหนะ และการรับส่งนักเรียนในแต่ละกิจกรรม					
7. อุปกรณ์การดำน้ำ					
8. การอำนวยความสะดวกโดยครูฝึก และผู้ช่วยครูฝึก					
9. ความปลอดภัยในค่ายพัก และการเข้าร่วมกิจกรรม					

**ตอนที่ 4** คุณลักษณะของผู้เรียนที่ได้รับการพัฒนาจากการเข้าร่วมกิจกรรมจากการเข้าร่วมกิจกรรมของศูนย์วิทยาศาสตร์ทางทะเล และการอนุรักษ์

1. สิ่งที่ท่านได้เรียนรู้เพิ่มเติม ได้แก่

- ความรู้เบื้องต้นเกี่ยวกับระบบนิเวศชายฝั่ง
- ความรู้เกี่ยวกับสิ่งมีชีวิตในทะเลชนิดต่างๆ
- ความสัมพันธ์ระหว่างสิ่งมีชีวิต
- การปรับตัวของสิ่งมีชีวิต
- สถานการณ์ปัญหาสิ่งแวดล้อม
- ผลกระทบจากกิจกรรมต่างๆ ของมนุษย์ที่ส่งผลต่อคุณภาพของสิ่งแวดล้อม
- อื่นๆ ได้แก่ .....
- .....
- .....

2. จากสิ่งที่ได้เรียนรู้ ทำให้ท่านรู้สึกอย่างไร

- รู้สึกรัก ผูกพัน และห่วงใย สิ่งมีชีวิตและสิ่งแวดล้อมทางธรรมชาติ
- ปัญหาสิ่งแวดล้อมกำลังทวีความรุนแรงเพิ่มขึ้น
- เราทุกคนควรมีส่วนร่วมในการอนุรักษ์ ป้องกัน และแก้ไขปัญหาสิ่งแวดล้อม
- การปฏิบัติตนของเราสามารถมีส่วนช่วยอนุรักษ์ ป้องกัน และแก้ปัญหาได้ เช่น ไม่บริโภคอาหารจากสัตว์ป่า ไม่ใช่สินค้าที่ทำจากอวัยวะของสัตว์ และสิ่งมีชีวิตในธรรมชาติ ฯลฯ

3. ในการเข้าร่วมกิจกรรม ทำให้ท่านมีความสามารถในเรื่องใดต่อไปนี้เพิ่มมากขึ้น

- การสังเกต
- การตั้งคำถาม
- การดำเนินเบื้องต้น
- การทำงานร่วมกับผู้อื่น

## BIOGRAPHY

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