
Promoting the conservation of watershed forestry among environmental education students at the faculty of environment and resource studies

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Abstract The comparative knowledge in the conservation of watershed forestry of students majoring in Environmental Education was evaluated and compared the attitudes of students towards the conservation of watershed forestry. The 30 senior students majoring in Environmental Education at the Faculty of Environment and Resource Studies, Mahasarakham University was sampling and they were volunteered to participate in the evaluation. The research instruments comprised a manual on the conservation of watershed forestry, a leaflet on the conservation of watershed forestry. The test on the conservation of watershed forestry was a multiple-choice test consisted of 20 items in each four choices and an attitude test towards the conservation of watershed forestry comprising 10 items each with a 3-point response scale. Result showed that prior to participate in the conservation of watershed forestry, the student knowledge was assessed as the moderate level (=13.57) and identified as the high level (=17.60). Knowledge scores before and after their involvement in the conservation were compared and found significantly difference from each other at the $P = 0.05$. Before they participated in the conservation of watershed forestry, the students' attitude were rated as the 'agreed' level (=2.63), and still remained at the same level after their participation ended (=2.91). However, when compared to each other, these two figures showed the difference in student attitudes before and after their involvement in the conservation.

Keywords: Promoting, Conservation of watershed forestry, Knowledge, Attitudes

Introduction

Forests are important to living things, whether it be humans or animals. Forests provide raw materials for the four basic needs of human beings: food, clothing, shelter, medicine. They also help maintain the balance of the nature. Forest degradation can have a negative impact on natural resources such as wildlife, soil, water, air, etc. Further effects of deforestation include degradation of soil and water quality. Burning or cutting trees down has removed most of the vegetation that holds the soil in place. As a result, erosion and decline in soil fertility can be easily triggered

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by rainfall. In addition, the loss of trees to absorb water could be blamed on devastating floods in the rainy season and also on the incapacity of soil to hold water in summer. Excessive deforestation, in watershed forests in particular, causes rivers to drop to dangerous levels. Some of the tremendous impacts of decreased river flow on the economic system and the society include insufficient water supply for irrigation, failure in rice production, and shortage of water for electricity generation (Department of Environmental Quality Promotion, 2001). The major cause of forest degradation is the conversion of forests into agricultural plantations. Due to a growing number of population in the country, forests have been destroyed for multiple reasons: a need of land for sheltering and making a living, illegal logging trade with industrial manufactures, and charcoal burning. Moreover, some large projects such as dam construction or road construction have been shown to be the major contributors to the loss of trees and the substantial decline in the fertility of the forests. Forests, as the origin of ground water that flows into streams, are generally featured with mountains or hills that are usually tall and steep. Tree density of the forests plays an incredible role in reducing the runoff of rainwater, preventing soil erosion, and retaining the fertility and moisture in the soil. Decayed leaves piling up on the land surface capture and absorb rainwater increasing a chance for water to move into the soil and then discharging the remaining part of it to flow into streams or rivers at a steady speed all the time. Forests are important as they are attributed to a constant supply of water flowing down rivers throughout the year (Suwannachatri, 2009). Realizing their many great benefits, the researcher has been interested in promoting the conservation of watershed forests particularly to environmental education students. This may due to they could play a role in imparting environmental knowledge to local communities in the future. Besides, their environmental attitudes would be enhanced and would be helped in conserving and bringing forests return to life by transforming them to a learning area where accurate conservation of forest resources. The objectives were to study and compare knowledge on watershed forest conservation of the environmental education students at the Faculty of Environment and Resource Studies, Mahasarakham University and to compare the attitudes before and after research intervention of the environmental education students at the Faculty of Environment and Resource Studies, Mahasarakham University towards watershed forest conservation.

Materials and methods

Study Site was the Loan Village, Nang Dad Sub-district, Nong Bua Daeng District, Chaiyaphum Province. Population and sample were the total of 67 third-year students taking a degree in environmental education during the academic year 2018 at the Faculty of Environment and Resource Studies, Mahasarakham University. The sample was a group of 30 third-year students doing a degree in environmental education at the Faculty of Environment and Resource Studies, Mahasarakham University as volunteer to participate in the study. Independent variable was Watershed Forest Conservation Program and dependent variables was set up as knowledge in watershed forest conservation and attitude towards watershed forest conservation.

This experimental research was focused to promote the students. The one group pre-and posttest design was evaluated before and research finding (Srisa-ad, 2000). The research was conducted by knowledge transfer tools as a manual, a leaflet and a field trip in the watershed forest. Assessment and evaluation tools were tested by a multiple-choice test covering 20 questions to each with 4 answers. An attitude towards watershed forest conservation comprised 10 questions on the three-point response.

Research Procedures and Data Collection

The research was carried out in 3 phases as follows: Phase 1: Survey and study of primary data was gathered from the chief of the Loan Village, Nang Dad Sub-district, Nong Bua Daeng District, Chaiyaphum Province to inform the upcoming research for arrangement workshop location and selection the invited speakers specialized in watershed forest of the Chi River. Phase 2: Designing knowledge transfer tools were the research tools regarding the conservation of watershed forests including a manual, a leaflet, a field trip, and a test. Phase 3: Knowledge transfer process was the activities to organize to the 3-day plans.

Data were analyzed using percentage, mean and standard deviation to determine the quality of the research tools and Index of Item Objective Congruence (IOC), correlation and alpha coefficient, item difficulty and paired t-test at $P = 0.05$.

Results

The research findings found that prior participation in the Watershed Forest Conservation Program, the students' knowledge was demonstrated at a moderate level. Upon the completion of the program, it was determined as a high level. A comparison between the two cases was made. The result showed that student knowledge after the completion of the program was higher than prior participation the program (Table 1). Result showed prior to participate in the Watershed Forest Conservation Program, the mean score of student attitudes was 2.36 which was equivalent to 'agreed' level. Upon the completion of the program, their attitudes remained at the same level with the increasing mean score of 2.91. Thus, the mean score after the completion of the program against the prior participation of the program which significantly increased at $P = 0.05$ level (Table 2).

Table 1. A comparison of knowledge on watershed forest conservation of the environmental

| Area | Knowledge (N=20) | | | After (n=30) | | | df | t-test | P |
|---------------------|---------------------|------|----------|-------------------|------|-------|----|------------|-------|
| | X | S.D | Level | X | S.D | Level | | | |
| Knowledge (N=20) | 13.57 (67.85%) | 3.58 | Moderate | 17.60 (88.00%) | 1.67 | High | 29 | - 6.746 | .000* |

* statistically significant at $P = 0.05$ level

Table 2. A comparison of attitudes towards watershed forests conservation of the environmental education students

| Area | Knowledge (N=20) | | | After (n=30) | | | df | t-test | P |
|--------------------|---------------------|------|----------|-------------------|------|-------|----|--------|-------|
| | X | S.D | Level | X | S.D | Level | | | |
| Attitude (N=20) | 13.57 (67.85%) | 3.58 | Moderate | 17.60 (88.00%) | 1.67 | High | 29 | -6.746 | .000* |

*statistically significant at $P = 0.05$ level

Discussion

The research finding results were found that students' knowledge average scores after the completion of the program surpassed the scores

made prior to their participation in the program. This finding indicated that the students had acquired better knowledge as a result of the use of Knowledge Transfer Process regarding environmental education which is performed through a workshop training which involved quality tools, namely, manuals, leaflets and lectures all the way till the end. Students' knowledge was measured using the Watershed Forest Conservation Questionnaire. Their knowledge had been improved as a result of their first-hand experiences gained during the field trip to the Chi River upstream. This finding is consistent with the idea of Wongchantra (2012) where he pointed out that environmental knowledge transfer is the act of transferring environmental knowledge, regardless of whatever method is utilized, to the target group in a complete systematic manner so that they can think, act and tackle problems associated with environmental issues. There are a number of ways to imparting environmental knowledge to people. Examples are: (1) Telling or Orally Educating—a great way to communicate or convey meanings that are clear and comprehensible to listeners, (2) Lecturing Method—typically found in formal learning contexts where the teacher is trying to impart knowledge to the students mainly through the method of oral communication or instruction, and basically involving the 'transmitter' and the 'receiver' and (3) Demonstration Method—placing an emphasis on when the teacher is trying to impart the skills through demonstrations and then, under the care of the teacher, the students perform as exactly what the teacher has just done and it is this time the intended skills could be acquired. Wangpanich (1983) stated that once individuals have learned something new form, for example, learning, practice, reinforcement or through the five senses, they will be able to identify facts/details of which can eventually become part of their own experiences. Such facts/details will continue to be shared with another person and then restored in a person's life, and finally become his/her knowledge. A variety of transfer methods, together with fun interesting recreational activities, increases the chance of good comprehension. This idea is consistent with the findings by Nuntachan (2013) entitled "Promoting the Plantation of *Acacia mangium* in Support of the Conservation of Community Forest at Baan Khok Kong, Kuntharat Sub-district, Kantarawichai District, Mahasarakham Province". Besides, Seedachompoo (2014) carried out a study to promote the use of a manual on conservation and plantation of *Plumeria* as an ornamental plant which was designed especially for environmental education students. Wongphongsakorn (2014) conducted a study entitled "The Promotion of

Bioextract Making Form Leftover Household Fruits and Vegetables at Don Bhom Village, Waeng Nang Sub-district, Muang District, Mahasarakham Province”. Other related research studies include: a study on the plantation and conservation of Kaffir lime trees for household consumption conducted by Sa-yhong (2014); a study on promoting the use of earthworms in organic waste management by Sajjanun (2013); and a study on promoting the conservation of *Syzygium gratum* in Hua Khuaw Village, Thakhonyang Sub-district, Kantarawichai District, Mahasarakham Province by Rojanathiwat (2013). The results revealed that the average knowledge scores after the completion of the conservation program made by the participants of each study mentioned above were higher than those obtained before the commencement of the program. This could be concluded that such conservation processes through the use of manuals, leaflets and lectures, played an important role in enhancing the participants’ environmental knowledge and capability to apply it in their everyday lives.

As results, it revealed that upon the completion of the program the students had better attitudes towards watershed forest conservation than they did before taking part in the program. The program involved various conservation processes in which knowledge could be acquired through the availability of manuals, leaflets, questions/answers, giving opinions, and fun interesting recreational activities. Their attitudes were measured and assessed after the completion of the program using a questionnaire of which was designed to encourage a positive attitude towards watershed forest conservation. Wongchantra (2012) listed some key features of environmental education. He viewed environmental education as the kind of learning which is aimed at fostering environmental awareness, attitude and value. The public awareness of the environmental problem as well as positive attitudes toward the environmental value should be highly in order to secure ecological sustainability. Therefore, teaching-learning process and evaluation of teaching and learning had to put a heavy emphasis on raising awareness, building positive attitudes and increasing great values than just acquiring knowledge or memorization. According to Lasuwong (1983), the important features of attitude concerned the impact of learning or experiences. It was not innated, and was a behavioral index. A good attitude allowed a person for possibility to express a particular behavior. On the other hand, a negative attitude made a person to try to get rid of that behavior, and passed on from one person to another. For example, it was likely a child will not like the person whom his father/mother does not like,

and it can be changed. This is due to attitude from learning. A change in learning environment or experience could lead to change in a person's attitude. The change to positive attitudes of the participants were demonstrated in this study. This finding is consistent with Boonbumrung (2014) who stated that the use of a manual on conservation and plantation of ginger for household consumption, and on the promotion of fermented Sadao bioextract to eliminate insect pests by Nuntasook (2014). Some other related studies included a study on promoting the use of a manual on the conservation and plantation of Indian gooseberry trees as an herb in local communities by Nonyaso (2014), and promoted the plantation and conservation of Banana trees by Wannapaphoe (2014). The findings showed that the participants' average attitude scores after the completion of the conservation program was higher than prior to their participation in the program. This indicated that conservation processes, which emerged a variety of tools such as manuals, leaflets, lectures, questions/answers and sharing opinions, could lead to a positive attitude toward environmental conservation.

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