

Status of Socio-Economic-Institutional Research and Identification of Needed Researches for Watershed Management in Thailand

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ABSTRACT

Literature concerning socio-economic and institution related to watershed management published by both university personnels, government agencies and foreign institutes were reviewed in order to fill the gap of watershed management research as mentioned by the Asian-US Watershed Project Director. Socio-economic-institution research in Thailand that could be employed as the basis of responsive and effective watershed management policies and strategies are substantially limited. They are mostly accomplished by graduate students in socio-economic under supervised by university professor. Most of the researches are directed toward the basic information in socio-economic aspect rather than approached for watershed management purpose. Various aspects of socio-economic and institution research are certainly needed in the next decades. The social forestry students are believed to be the persons who will efficiently tackle this kind of research in the future.

INTRODUCTION

Among factor affecting the dynamic behavior of watershed ecosystem, the social components which can generate economic and institutional systems are the most essential factor that manipulate and drive the watershed hydrological processes. Watershed scientists, however, pay less attention to this kind of research. So far, most of the watershed researches in Thailand devoted for the meteo-hydro-ecological processes and soil and water conservation techniques rather than socio-economic and institutional aspects. In most of all forestry activities involving forest harvesting, reforestation, watershed rehabilitation and even the national park management, the managers pay much more attention on technical matters rather than socio-economic-institutional problems.

The classic example of the above mentioned case in Thailand is the application of selection cutting system in the major kinds of forest type. This timber harvesting technique has been employed for almost a hundred years ago. The philosophy behind is that it would cause litter damage to ecological and environmental condition of the forests and watershed ecosystem. Meanwhile forest itself could naturally regenerate in nearly to original condition, i.e., return to their own ecosystematic behavior. The consequence was not as that the foresters expected. The results stem from ignoring the landless

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people and what the farmers nearby the forest needed was the disastrous deforestation. The existing forest area at present (29% of the country area) and the history if forest destructive rate and the events of continuing invasion of local people after timber harvesting are the evidences indicating the failure of the management technique in all aspects. Thailand lost not only the direct benefit from forest but also indirect profit in term of forest influences. Besides the commercial species and the whole forest ecosystem have been lost before the next management plan be developed and implemented. More importantly and less popularly known, the environmental transformations in tropical region have rarely successful for people's quality of life. Nevertheless, transformation typically from abundant virgin forest composition to agricultural crops using slash and burn techniques and turn back to unproductive secondary forest is truely serious problem. So far, there have been several cases that interaction among socio-cultural system, economic system and watershed ecosystem have usually been mutually destructive.

The above mentioned example reflected the consequence of ignoring the socio-economic problem of people in rural area. It is therefore the author's intention to wake up all foresters and watershed scientists in ASIAN countries to realize the importance of socio-economic research in watershed management. It is about time that we should quit talking to the trees and impressing "water yields" for a while but start talking to the people so that they can help us reaching the ultimate goal of watershed management in the next decades.

This paper was designed to report the background information on socio-economic and institutional problems related to natural resource conservation and watershed management in Thailand in general. The status of research dealing with the mentioned situation and problems was also discussed to find out the constraints of research opportunity and solution for activating and accelerating research activity in socio-economic and institutions dealing watershed management. Finally, research needs in this aspects for Thailand was proposed to meet the management goal in the future.

Background Information on Socio-Economic and Institution Problems Related to Watershed Management in Thailand

Socio-Economic Problems in Lowland and Upland Watersheds

Agricultural production in Thailand has not only increased absolutely during the last two decades, but it has also relatively, i.e., per capita of the population, even grown slightly, in spite of an enormous population increase. Unlike in many other South-East Asian countries, this production increase was reached less by means of intensification in existing farming areas than by means of clearing new areas for farming on previously untouched land (Fuhs, 1979). The increase in production thus had to be bought with the destruction of a large acre of forest reserves. Parallel to the drastic reduction of forest areas during the last two decades, areas used for agriculture has more than double in size and mainly replaced by various upland crops such as maize, cassava, or sugarcane. Meanwhile the forest areas on the highland of the north have been occupied by various hilltribes who practice agriculture by shifting cultivation system.

As regards organization, Riethmuler *et al.* (1984) observed that the clearing of agriculturally used areas is carried out nowaday in Thailand in two ways, i.e., (1) in the form of resettlement schemes, planned and set up by the government and partly financed with foreign aid, (2) in the form of spontaneous land clearing. Consider from the area point of view, spontaneous land clearing considerably exceeds government-directed settlement project. Only 0.5 million hectares of land were cleared for planned settlement project during 1945 to 1975 (Klempin and Sandler, 1975). Whilst between 1956 and 1975 alone, agricultural area had increased by 9.1 million hectares, i.e., from 7.8 to 16.9 million hectares. These figures indicate how important spontaneous land clearance is for Thailand's regional development.

It was expressed by Riethmuller *et al* (1984) that even the mentioned situation seems to be very serious problem in socio-economic development for Thailand, no empirical finding from investigations into those question have so far been made available. The following information which mainly drawn from various references are probably the reasons why the above mentioned situation have been prevailed for the past decades and perhaps in the future.

1) Land reserves were still abundant until recently. Population density of Thailand was about 44 inhabitants/sq.km in 1955 and about 91 inhabitants/sq.km in 1980. According to Asian standards, it is not over-populated.

2) A part of those deforested areas in relatively stem from the well developed system of infrastructure and in particular a road network which has been greatly improved during the last two decades and has opened up even thinly populated regions.

3) For more than 80 years of government policy, about 30 laws related to forest protection have been passed. However the government could never put them to use effectively for many reasons and indeed, occasionally they has no wish to do so (Khambanonda, 1972).

4) The price of rice was kept low for the producers by the rice premium (export tax), whilst at the same time there was a very favorable price development for corn, cassava, sugarcane and other upland crops on the world market. This constellation, along with diversification of agricultural products, expressly aimed at by the government, induced many Thai farmers, who until then had produced almost exclusive lowland rice, to extend their activities to the upland.

5) Another factor causing spontaneous land clearing is the Thai farmer's characteristics themselves, for example their weak ties with the soil, the little regarded duties outside the nucleus family, as well as their high mobility and readiness to accept innovation.

Socio-Economic Problems in Lowland and Upland Watersheds

For the highland area where the predominant agricultural activity is shifting cultivation, forest which cover rugged mountains are mostly cleared, burned and cropped. These swidden are abandoned as soil fertility declines or weed invasion increases markedly. These shifting areas do not revert to the original climax vegetation which was a closed hill-evergreen forest on most soils above 1,000 meters.

The inhabitants of the highlands have traditionally been called "hilltribes" a term which includes the ethnic groups, Karen, Meo, Lahu, Yao, Lisu and Akha. Keen (1972) has noted that the

highlands are also becoming more densely populated by "Khon Muang" - the lowland local people who are forced out of the lowland regions by overcrowding and associated factors. The population of the highlands is constantly being further increased by immigration of the various ethnic minorities from bordering countries.

The whole area of the highlands of northern Thailand, which play most essential role as head-water-resource for the north and central plains, is classified as forest reserve which theoretically outlaws tree felling, burning and cultivation. Residents of the highland employ their own systems of tenure, which although not recognized by the law are strictly adhere to within the community. One dominant feature of land holding despite variations in customs between and within tribes is the right of any one family to cultivate all the unoccupied land that they are capable of using for as long a period as they so desire. Sometimes the abandoned swiddens are used only by people from the same village or the same ethnic group but in other instances the swiddens of different ethnic groups merge in the same general area (Keen, 1972).

Villages move frequently as the soil become exhausted in one vicinity, but nowadays, the vacant unused tracts of land that once were easily found no longer exist except for areas with poor soils. The problem of land shortage is beginning to be recognized by the highlanders but there is at present little overall evidence of changes in agricultural systems or in attitudes toward land. Karen people, who usually settle in the lower altitudes of the highlands have evolved a rotational system that permits them to stay in the one area and are therefore an exception (Falvey, 1977).

Shifting cultivation are practiced under three different system. (1) An opium based forest fallow in which virgin or mature secondary forest is felled early in the year and the plot double-cropped to maize and opium for as many years as possible. (2) A subsistence based bush fallow, employs a one year cultivation and ten or less years regrowth rotation. (3) An opportunistic supplementary shifting cultivation, which is practiced by lowland people forced to clear swiddens in the highland and does not involve planned rotational fallowing or control of fires. Another word, spontaneous land clearing is also practiced on highland by both the hill-tribes and lowland peoples.

The short fallow periods, or more particular successive years of cropping, which are common to all shifting cultivation systems except that of the Karen, do not allow the reestablishment of the original forest cover before the land is cropping again, and savannah grasses tend to dominate. This invasion is encouraged by the wild fires escaping from the preparation of new swiddens. The dominant grass species under this system is **Imperata cylindrica**, which is the main native pasture species supporting the existing ruminant industries in the highland.

Institutional Problems

The following will be the brief discussion on institutional problems related to both the lowland-upland and highland watershed. The objective of this section is to connect the socio-economic situation mentioned above to the institutional problem in general, so that the status and needed researches on socio-economic and institution related to watershed management for Thailand can be formulated.

There are more than a dozen of institutions undertake watershed management work. The main job, however, belongs to the Watershed Management Division of the Royal Forestry Department, RFD. This institute deals mainly with the hilltribes and highlands in watershed protection, reforestation, agricultural land use and settlement. It was established quite recently in 1975.

The Soil and Water Conservation and Management Division of Department of Land Development, DLD, has set up many Land Development Centers in all regions especially in the north and northeast. Their works in general includes mobile unit for soil and water conservation constructions, soil improvement, green manure experiment, soil erosion and sediment monitoring for small agricultural watersheds, soil and water conservation demonstration and extension. Their work, however, are mostly concentrated on lowland and gentle slope upland watersheds.

Many other institutions and multi-lateral and bi-lateral projects such as the Royal Irrigation Department, Department of Public Welfare, Department of Agricultural Extension, Office of National Environmental Board; ONEB, Electric Generating Authority of Thailand; EGAT, National Energy Authority; NEA, Department of Meteorology, The King's Project, Kasetsart University, Chiang-Mai University and even The 3rd. Army have partially play role in watershed management in Thailand. The international agencies such as FAO, UNDAC, USDA and USAID also share their responsibilities on watershed activities in different aspects. However, the responsibility for watershed development and conservation farming rests mainly on RFD and partly on DLD.

It was mentioned by FAO Specialist, Sheng (1980) that co-ordination among those institutions so far are less even among Divisions of the same Department. Every institute considers its own work as more important than that of others. Institutions or organization with different levels of efficiency cannot co-ordinate effectively. These are perhaps the symbol of developing countries where qualified staff is scarce, government employees underpaid and working morale is not high. The co-ordination among organizations is an extremely difficult task. The above mentioned situation together-with out-of-system administration and the unforceable forest laws cause inefficiency of watershed management in Thailand.

Status of Socio-Economic and Institutional Research

It was stated by Saplaco (1985), the Project Director of the ASIAN-US watershed project that socio-economic and institutional research dealing on watersheds as well as that hydro-meteorology studies are substantially limited. This is no exception for Thailand. There are relatively few publication concerning socio-economic and institution of watershed management. This situation also mentioned by Riethmuller *et al* (1984) that even socio-economic problems of the rural people in Thailand are very serious but no empirical finding from investigation have been made available.

Research involving socio-economic and institution of watershed management in Thailand which has been done can be classified into three main categories, i.e., (1) social attitudes toward conservation of natural and watershed resources, (2) socio-cultural and economic impact on watershed management, and (3) institutional problems. They are mostly accomplished by graduate students under

supervised by university professors. There are some that carried out by research institutes outside the country and international agencies. Some have been investigated and published by governmental agencies who undertake the watershed management project such as Mae-Sa Integrated Watershed and Forest Landuse Project, Agricultural Land Reform Office and Tribal Research Center, Department of Public Welfare, etc.

On the people's attitudes toward resource conservation, the people in general has less consideration on the necessity in conserving of natural resources since they have experienced that utilization of natural resources in Thailand brought the benefit to the smaller rich and powerful people and contribute less development program to the society. Most of the students and teachers have positive attitudes toward the forest resource conservation (Dejma, 1981; Paointr, 1982 and Niumsuwan, 1984). Most of students in the north agreed to have natural resources be conserved and felt that the youth in rural area has more enthusiasm to participate in conservation program than those in urban area (Paointr, 1982). Research dealing directly with the people' attitudes toward watershed management concept seems to be unavailable recently.

Study on the socio-cultural and economic impacts on forest resource and watershed management indicated that population growth was the most important factor causing land use change for all provinces of northern Thailand. Among infrastructure development variables, government budget allocated to each province was the most significant factor, the least were irrigation project and transportation (Krisanaseranee, 1982). Low income farmers who seek for more through off-farm employment activities such as timber cutting and forest product collecting and the social value that one can be wealthy by being a landlord are also very essential factors affecting on more rapidly deterioration rate of the National Forests (Tangikitjavisuth, 1979).

Comparative study on soil and water conservation practices of the northern Thais and Karen (Yospun, 1982) and environmental effects of shifting cultivation practiced by opium and non-opium growers (Surarerks, 1979) have been carried out. This kind of study, however, seems to be very limited. Inputs and outputs by private farmers on terraced and unterraced land (Kang, 1981) and an adoption of conservation farming by farmer in the Mae-Sa Integrated Watershed and Forest Land-use Project (Kongyarith, 1984) were also investigated for further recommendation and management strategies. There are some other studies related to socio-economic aspects of lowland and highland inhabitants but they are directed toward the basic information such as age-sex composition, working and non-working population, level of education, type of principal occupation, farmland ownership, land holding, etc., rather than approached for watershed management purpose.

For institutional research, even though its importance was emphasized by several investigators, there are very few publication. Most of them are however written in form of observation rather than in scientific reports. The concluding remarks on this aspects especially on the co-ordination among institutes has been made by Sheng (1980) which is included in background information section.

Constraints of Socio-Economic and Institutional Research in Watershed Management and Their Solutions

The past and present status of socio-economic and institutional researches dealing with watershed management in Thailand has been largely ascribed to three major constraints as same as that stated by Saplaco (1985) for the status of watershed management researches in the ASIAN region. The mentioned constraints in sequential priority for Thailand are: (1) lack of highly purposive centralized and institutionalized agency to plan, support and undertake comprehensive study on the socio-economic and institutions of integrated watershed management, (2) relative scarcity of highly trained research manpower in social-forestry, and (3) the limited financial support.

Solving the problem caused by the first constraint is very difficult task. The main reason is that there are several government institutes and agencies involve in watershed management arena, but no agency likes to confront or plays around with people and institutional problems. The administrators, even they know how important the socio-economic and institutional problems is, always ignore to deal with or try to avoid to study because of the difficulty in undertaking this kind of research. Since most of the watershed management activity are under the RFD responsibility, it might be possible if the socio-economic and institutional research be handled by RFD in-cooperative with any socio-economic research institute.

For the second constraints-the scarcity of highly trained research manpowers can be perhaps partially solved by social forestry program which has been developing by the Faculty of Forestry, Kasetsart University. It is unfortunate that in the past, professional foresters had been trained in traditional aspect of forestry. Even now, forestry training is mainly in the field of forest production, protection, conservation and utilization of forest products. The forestry curriculum tended to isolate the foresters from the people instead of training them to deal with rural institutions that need the forest resources to develop their communities (Ruangpanit, 1985).

Faculty of Forestry of Kasetsart University-the only academic forestry school in Thailand has planned to offer the socio-forestry course and will undertake manpower training in community forestry for rural development. The program will look into new approach as the possible solution to forestry problems and certainly including the watershed management aspect. The social forestry curriculum includes the following courses required for the major :-

Introduction to Rural Sociology, Principle of Community Development, Introduction to Anthropology, Thai Society and Culture, General Psychology, Principle of Management, Introduction to Cooperation Science, Introduction to Soil Science, Photogrammetry and Photo-interpretation, General Forest Engineering, Introduction to Social Forestry, Principle of Agroforestry, Forestry Extension, Economic Analysis of Social Forestry Project, Small-scale Forest Product Industry, and Field Social Forestry.

The selective course for the social-forestry students include: Agricultural Components of Social Forestry, Applied Agroforestry, Introduction to Political Science, Introduction to Social Psy-

chology, Human Relations, Principles of Marketing, Propagation and Public Communication, Public Relations Techniques, Public Speaking, Principles of Animal Husbandry, General Aquaculture, Principles of Plant Product Preservation, Forest Law and Administration, Public Relations in Natural Resources Management, Introduction to Outdoor Recreation, Range Science, Forest Product Utilization, Minor Forest Products, and Energy Technology from Wood.

All forestry students in every major have to take courses in watershed science especially the Principles of Watershed Management. It is hoped that the program will contribute not only knowledge capability for foresters but also fill the gaps of knowledge between social and forestry fields so that research on socio-economic and institutions can be efficiently carried out and problems on watershed management can be possibly solved in the future.

Constraint on the limited financial support more or less have been facing to researchers in almost every developing countries. It was estimated that less than 0.01% of benefit gain from agricultural products is contributed for agricultural research by the government. This is perhaps the indicator that how much socio-economic and institutional researches could receive a share from this tiny amount of budget. Fortunately, there have been financial support from foreign agencies who realized the problems. This, however, will last not too long. It should be the government responsibility to allocate more budget for this field of research by adjusting its priority.

Needed Researches in Socio-Economic and Institutions for Watershed Management

Based on the background information, previous works and constraints of socio-economic and institutional research as mentioned previously, the meaningful and substantial research on the socio-economic and institutions for the effective management watershed in Thailand should include the following aspects:-

A. Socio-Economic Aspects :

- Attitudes of watershed occupants toward integrated watershed management concept.
- Socio-economic feedback affected by transferring technology of soil and water conservation.
- Evaluating social benefits of watershed management program.
- Economic evaluation of the integrated watershed management project.
- Socio-economic aspects of agro-forestry system for lowland and highland watershed management.
- Comparative study on socio-economic impacts of selection and clear cutting system in National Forest Reserves.

B. Watershed Management Extension:

- Factors influencing innovation success in watershed management program.
- Application of marketing process for watershed management extension program.
- Behavior of watershed occupants in relation to extension program.

- Comparative study in form of productivity assessment of technology transfer techniques in watershed management extension using Factor Analysis.

C. Institutional aspects:

- Institutional modeling for integrated watershed management including job analysis and effectiveness of the manager and staff.
- Evaluating managerial function of watershed management organization within agency and interagencies.
- Conflict analysis in forms of Institutional and/or Organization conflict inventories; Survey of managerial interests with respect to conflict; Conflict resolution and management.

CONCLUSION

One of the reasons of ineffective watershed management in Thailand is the oversight of socio-economic and institutional problems. This paper attempts to remind the concerned authorities and watershed managers that the correct understanding of watershed occupants and rural situation in every aspect is of utmost importance. Past experiences of the failure in forest management have been, however, in the memory of Thai foresters. It is about time that foresters and watershed scientists should play more roles on socio-economic and institutional researches. Since the several projects of integrated watershed management are going on but lacking of socio-economic information for effective watershed management, it is therefore a great opportunity of the foresters trained in social forestry to fully exercise their knowledge capacity in doing such kind of research. Meanwhile the institutional problem which is also the significant constraint in watershed management activity must be reconsidered by ways of systematic research and not conduct by single agency.

Special attention should also be directed to evaluate social and economic benefits of watershed management program and technology transfer techniques. The research results may lead more people participation and consequently more effective strategies in watershed management in the future.

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