ป่าชุมชนในภาวะคุกคาม กรณีของ ป่าชุมชนดงเค็ง จังหวัดขอนแก่น

Community Forest Management in Threat, the Case from Dong Keng Community Forest, Khon Kaen Province, Thailand

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บทคัดย่อ

การศึกษาเชิงสำรวจครั้งนี้มีวัตถุประสงค์เพื่อประเมินมูลค่าต้นทุนและผลประโยชน์ของการจัดการป่าชุมชนตำบลดงเค็ง จังหวัดขอนแก่น เพื่อตอบคำถามว่าการจัดการป่าชุมชนแห่งนี้มีต้นทุนและผลประโยชน์สอดคล้องกันหรือไม่ การสำรวจพบว่าต้นทุนหลักของการจัดการมาจากกิจกรรมป้องกันรักษาป่าไม้ องค์การบริหารส่วนตำบลจัดสรรเงิน 60,000.00 บาท ของงบประมาณประจำปีเพื่อเป็นค่าตอบแทนเจ้าหน้าที่พิทักษ์ป่าที่ทำหน้าที่ลาดตระเวนป่าและถือปฏิบัติกฎ ระเบียบ และข้อบังคับของการเข้าใช้ป่าชุมชนซึ่งโดยทั่วไปมุ่งเน้นที่การควบคุมการใช้ไม้ สำหรับของป่ายังคงอนุญาตให้เข้าเก็บหาได้ การจัดการป่าชุมชนแห่งนี้มิได้นำมาซึ่งผลประโยชน์เป็นตัวเงินแต่อย่างใดแก่องค์กรท้องถิ่น มีเพียงผลประโยชน์จากการเก็บหาของป่าที่ชาวบ้านได้รับซึ่งประเมินเบื้องต้นในปี 2547 มีมูลค่าประมาณ 283,663.70 บาท ปัจจุบันแม้การใช้ประโยชน์จากป่าชุมชนจะยังคงทำได้โดยที่ชุมชนไม่ต้องปรับเปลี่ยนรูปแบบการเข้าใช้ประโยชน์ แต่ชาวบ้านระบุว่าการเก็บหาของป่าจากคนภายนอกเพิ่มขึ้นและปริมาณของป่าลดลง เป็นผลให้ชาวบ้านต้องใช้เวลาในการเก็บหาของป่านานขึ้น สิ่งนี้แสดงให้เห็นถึงต้นทุนการเสียโอกาส (opportunity cost) ที่เพิ่มขึ้น และถึงแม้ว่าปัจจุบันผลประโยชน์ที่ชาวบ้านได้รับจะมีมูลค่ามากกว่าต้นทุนที่ชุมชนต้องรับภาระ แต่ต้นทุนการเสียโอกาสที่เพิ่มขึ้นชี้ให้เห็นว่าป่าชุมชนตำบลดงเค็งกำลังอยู่ในภาวะถูกคุกคามของการใช้ประโยชน์ป่าไม้เกินขีดจำกัดและการแข่งขันกันในการใช้ประโยชน์ระหว่างชุมชน ซึ่งการบริหารจัดการที่เคร่งครัด เช่น การเก็บค่าเข้าเก็บหาของป่า การกำหนดโควตาการใช้ประโยชน์ หรือการกำหนดจุดซื้อขายของป่า เป็นแนวทางที่ควรจะนำมาปฏิบัติ ก่อนที่ต้นทุนการเสียโอกาสจะสูงมากขึ้นจนทำให้ชุมชนขาดแรงจูงใจในการที่จะดำเนินกิจกรรมป่าชุมชนต่อไป

Abstract

This survey-based study investigates monetary costs and benefits of Dong Keng's CFM, Dong Keng sub-district, Khon Kaen province to answer a question whether or not the program is cost-benefit congruent. Primary costs of the program involve forest protection activities. Local institution i.e. Tambol Administrative Organization allocates 60,000.00 baht (US$1,518.99) of its annual budget to pay wages to forest guards who are responsible for forest patrol and enforcement of rules and regulations, which basically apply to prevent timber harvesting, while non-timber forest products (NTFPs) remain open-access. Meanwhile, the management program does not generate monetary benefits (e.g., lease, concession, etc), other than approximately 283,663.70 baht (US$7,181.36) brought into Dong Keng's local economy in 2004 from selling NTFPs. While use of the forest continues without drastic changes to community's social practices, alarmingly villagers reported evidence of outside access and declining amounts of NTFPs, which increase opportunity costs to the locals in terms of greater time spent to collect forest products. Although current benefits outweigh costs, the increasing opportunity costs suggest that Dong Keng's

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CFM is in threat of overexploitation and social competition for the resources. Regulations such as entry fees, harvesting quotas and NTFP distribution depots are necessary before the opportunity costs rise too high and villagers have no incentives to carry on CFM's activities.

คำสำคัญ: การจัดการป่าชุมชน จังหวัดขอนแก่น

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Introduction

Common-pool resources (CPRs) are characterized by the difficulty of excluding non-owners from the use. Since a given common area generates finite quantities of resource, one person's use subtracts from the quantity of the resources available to others (Ostrom et al., 1994). Many goods and services provided by forested ecosystems have the properties of CPRs. Without exclusive property rights, individuals who use and benefit from a forest may not contribute to its long term sustainability (Ostrom, 1999). As a result, destruction of forest resources usually occurs in open-access regimes where use rights are captured yet appropriators take no responsibility to their actions. An institutional system that sets out use quotas and zones, contribution of time, labor or money, and enforcement of rules and regulations is necessary for effective management of this type of resources. The institutional regime helps separate CPRs from open access and regulates socially unacceptable behaviors that often lead to resource deterioration.

Community forest management (CFM) constitutes a form of self-governance where users of the forest are involved in making and adapting rules for collective choices regarding inclusion or exclusion of participants, appropriation approach, responsibility of participants, monitoring and sanctioning, and conflict solution (Ostrom, 1999). Community forestry focuses on improving local livelihoods, while conserving forest ecosystems and treating community as a driving force of management decisions, which is a promising alternative to ensure forest sustainability. Since the early 1980s, this management practice has gained a lot of attention to policy makers and it is now being included in many nations' forest management plans. Despite all of the successful outcomes (e.g., Agrawal, 1998; Lise, 2000; Saigal, 2000; Larson, 2002), there are a number of problematic issues and conflicts that have emerged in the course of implementation. For example, distribution of benefits and costs has long been debated whether it is equitable among users, especially poor vs. rich. Spectral property rights regimes of the resources being managed also complicate the nature of management models necessary for forest sustainability. Hence, it is interesting to take a careful look at CFM's programs, especially in terms of costs and benefits generated from collective choices. Ostrom (1999) states that the distribution of benefits from appropriation rules should be roughly proportionate to the costs imposed by provision rules. When costs and benefits are incongruent, practitioners lose incentives to continue collective activities because they cannot ensure if their benefits will accrue, therefore CFM is likely to fail if such incongruence occurs.

CFM has been with Thailand's rural communities for a long period of time as a forest is considered a life-supporting system. However, it was officially recognized and introduced to the country's forestry policies approximately 30 years ago after conventional forestry practices failed to cope with deforestation problems, while local community in many parts of the country revealed effective protection and management of its forest. Dong Keng sub-district, Khon Kaen province is among thousands of Thai communities organizing a community forest. Villagers have access to forest resources for subsistence, develop community rules to regulate use, and form a group to patrol and protect the community forest. Although Dong Keng's community forest sounds ecologically and socioeconomically efficient as it was awarded "Tong Pitak Pa Peu Raksa Cheewit" —Safe Forest to Safe Life Flag from Her Majesty Queen Sirikit, little information regarding forest utilization and management, project's administration, and distribution of benefits and costs is known.

This survey-based study is conducted to answer a question whether or not Dong Keng community forest is cost-benefit congruent. The study documents use of Dong Keng community forest, identifies impacts of CFM's activities possibly occurring to local livelihoods, and examines tangible costs and benefits derived from this CFM program. When costs of investment and institutional change are higher than benefit returns, community members will lose incentives to continue their collective activities. Furthermore, if action to discriminate outsiders cannot be imposed, creating situations that contributing members are reaped out, there is no justification of why collectivity is necessary. These issues need to be addressed properly for effective implementation of CFM, especially when it is to be institutionalized at the national scale.

Establishment of Dong Keng's Community Forest

The Dong Keng community forest is located in Dong Keng sub-district, Nong Song Hong district, Khon Kaen province, Thailand. Dong Keng sub-district consists of 13 villages, encompassing 1,472 households. Tambol Administrative Organization (TAO) is currently organizing collective activities to protect and manage surrounding forests. The community forest covers an area of approximately 287 ha, dominated by Dry Dipterocarp Forest and to a certain extent mixed deciduous and bamboo riverine forests. Historically, the forest was occupied and used for agricultural purposes for generations. In particular, several areas of Dry Dipterocarp Forest were cleared for kenaf (*Hisbiscus cannabinus* Linn) and cassava (*Manihot esculenta* Crantz) cultivation. In 1985, the regional prices of kenaf and cassava dramatically declined. Villagers made the decision to stop their cash crop cultivation. Due to relatively low human pressure on the resources in the area, remaining stumps of trees were given time to regenerate and begin producing healthy shoots.

In 1990, Mr. Wichai Chareon, the leader of Hoa La Lueng village—one of the 13 villages of Dong Keng sub-district, initiated a grassroots group working on village forest conservation and protection. In 1994 when he was elected a sub-district leader, community rules and regulations being implemented at Hoa La Lueng village were introduced to other 12 village leaders and finally applied throughout the Dong Keng community. With collective activities regularly organized in attempts to improve forest conditions and the community living standard, Dong

Keng community forest, encompassing three contiguous forest patches: Non Chad, Hoa La Lueng, and Nong Doo community forests was awarded the "Tong Pitak Pa Peu Raksa Cheewit" from Her Majesty Queen Sirikit, which is one of the most prestigious recognition by the central government, in 1996 and 1997.

Since the program has been established, villagers put bob-wires in several areas to demarcate forest zones and post signs to inform users of rules and regulations regarding use of the community forest, including timber product, NTFP and fuelwood collection, hunting, sanctions, and fines. In addition, although the Thai government has not been able to find the political space to adopt any form of official recognition of CFM, the Royal Forest Department (RFD) has worked outside of the law for community forest. The RFD with assistance from university scholars offer a training course in forest management, including fire protection and control, silvicultural practices, and rural development activities to Dong Keng's village leaders. Afterward, those village leaders communicated their new skills and knowledge to community members. This development created greater understanding of forest management and willingness on the part of villagers to participate in the forest protection program. Moreover, one representative from each village was selected to form a Forest Protector Group (FPG) or "Poopitukpaa" in a Thai language, to patrol the forest utilization and fire occurrence, especially in dry season. Although the granted right given to the FPG is not legally defined, it instilled greater confidence and gave legitimacy to the community to manage and use its surrounding.

Timber harvest, especially for commercial purposes is prohibited according to Thailand's logging ban in 1989. Harvesting of some trees by villagers is possibly allowed for domestic use. A permit for desirable trees must be approved by the TAO or community leaders. The TAO and FPG enforce rules and penalties for villagers who do not follow the rules. For villagers their first violation results in a verbal warning. For a second violation, a fine of 500.00baht (US$12.66 or about 2.5 percent of mean annual family income) per tree is imposed. Finally, a repeated offender is turned over to the police department. For fuelwood only dead trees and/or dry branches can be collected. Hunting is prohibited. Violators will have to pay fine of 500.00baht for each bullet used to hunt. Finally, other NTFPs such as mushrooms, wild vegetables, bamboo shoots, medicinal plants and insects, can be gathered without any regulations. Nonetheless, villagers are asked to harvest only necessary parts of NTFPs, not to take the whole stumps, especially medicinal plants as an attempt to prevent overexploitation. Thus, the land began to regenerate rapidly under protection, providing substantial goods such as constructing materials, food, fuelwood, and medicinal plants for villagers.

Methods

A preliminary visit to TAO and community leaders was done to inform them of the project objectives. The research team gathered socioeconomic and ecological information as well as backgrounds of the community forest program through a small focus group. Collective activities that could possibly generate tangible costs and benefits to the community were identified. Afterward, the research team

designed questionnaire instruments, which cover the following issues: importance and use of CFM, NTFP collection, impact of CFM to villagers, current CFM's practices, and demographic information. According to the declaration of Thailand's logging ban in 1989, timber use is limited; while NTFP collection continues and becomes a major use of the community forest. Although household logging is possible on a case by case basis, it is incomparable to the use of NTFPs. Therefore, tangible benefits were estimated from NTFPs derived in which the community depends on. A random sample of 200 households (Loomis and Walsh, 1997) were selected from a total number of 1,472 households in 13 villages of Dong Keng sub-district. Sufficient funds were available to allow for us to use personal interviews. From June to July 2004, the research team took about two months to finish the field investigation. A convenient meeting method was used to identify households for sampling, meaning that interviewers would walk through the villages and select any household members he/she met for the interviews. In addition to the personal interviews, a field forest survey was conducted to observe the community forest such as forest structure, species diversity, NTFPs harvested during the study season, and management activities implemented. A couple of villagers guided us to the forest and demonstrated how NTFPs were harvested. This gave us the idea of how much time villagers took to harvest forest products and why the forest remained productive when it was constantly used. A collecting calendar of NTFPs was created. It illustrates clearly that the forest provides villagers with consumptive goods all year round.

The data analysis is descriptive-based. Frequencies and percentages of all responses provided us an overview picture of how important the forest is to villagers and how much it is being used. Respondent perception to current management practices, especially in terms of impacts of CFM and program effectiveness, and possible future activities were also analyzed to determine problems and obstacles that could possibly increase the costs of Dong Keng's CFM program. Average amounts of NTFPs gathered and sold, family income generated from NTFPs, and numbers of trips to the forest annually that villagers take were identified. Finally, the data from personal interviews and ones obtained from the field forest survey were incorporated to examine costs and benefits of CFM that the community is enduring.

Results

Demographic Information

Approximately 33.7 percent of the respondents are male and 66.3 percent are female. The level of education shows a profile of 76.5 percent of the interviewees reported that they obtained a primary school diploma, 9.5 percent earned a junior-high school diploma, and 8.0 percent obtained a high-school diploma. Only 2.0 percent have acquired a 2-year college certificate and 1.5 percent has received a bachelor's degree, while about 2.5 percent have not been educated. The average number of family members is 4.51; and the average age is 47.45 years old. The average annual family income is 20,000.00baht or about US$506.39. About 29.5 percent of the respondents reported that they never participated in collective activities such as community meetings, fire prevention, and community development, 42.0 percent irregularly participated, and about 28.5 percent regularly involved in community activities.

Current Management of Dong Keng Community Forest

Although Thailand has not been able to find the political space to adopt any form of official recognition of community management of state-claimed forest lands, the RFD has worked with local institutions for community forest governance. At Dong Keng a group of villagers led by the Tambol's leader is working under the TAO to define local usufruct rights and develop common practices, including rules and regulations and collective activities in order to protect and conserve its local forest. Dong Keng's community forest institutional board consists of one Tambol leader, 13 village leaders, 26 deputy village leaders, and 13 TAO representatives. These people are working for the TAO and organizing community forestry is part of their job. The institutional board is responsible for developing and monitoring rules and regulations, cooperation between outside agencies and local communities, and implementation of collective activities. TAO allocates 60,000.00 baht (US$1,518.99) of its annual budget to pay wages to 10 forest guards who are responsible for forest patrol and enforcement of rules and regulations. One representative is chosen from each of the villages to work as a forest guard. Currently three villages decide not to nominate any representatives because of their limited access to the community forest. All of these institutional personals communicate with villagers on a regular basis through community meetings regarding rules and regulations, community contributions, development activities, and other relating issues such as evidence of rule infraction, forest fires, and outside access. This allows the institutional board to receive feedbacks necessary to keep the program going, while villagers are able to participate in decision making and community activities.

Since the program was established in 1994, none of the serious rule violations have been reported. Villagers obey rules and regulations as a result of educational programs that emphasize importance of the forest and impact of deforestation held by local and outside agencies. Furthermore, the award by Her Majesty the Queen heightened villagers' perception of the forest as the Queen's forest; therefore it is their honor to help conserve and protect the community forest. Fire prevention, forest demarcation, and eucalyptus plantation are the three major active projects done in attempts to improve forest conditions. Eucalyptus trees were planted on abandoned forest lands to increase green areas and to generate additional income to local institution. Yet, none of the eucalyptus trees has been cut and sold. Other than these three projects, no specific collective programs are currently in place. The community forest is basically set alone with limited access to timbers, while NTFPs remain open to all users.

Importance and Use of the Community Forest

Dong Keng villagers have used the forest for subsistence and household income, notably during the rainy season when forest productivity is high. Since the community forest was established in 1994, villagers have gained awareness of forest conservation and management. Community leaders and members with technical assistance and advice from outside agencies developed rules and regulations to assure that benefits derived from the forest and costs of organizing CFM can fairly be distributed in the community.

Generally, forest resources, particularly NTFPs, are important as a subsistence and economic buffer in hard times. Now the community forest is perceived very important, because it made Dong Keng sub-district widely recognized by outsiders, especially when it was awarded by Her Majesty the Queen. As is shown in Table 1, the importance of community forest stated by the villagers concentrates on benefits to ecological sustainability such as improving community landscape, increasing numbers of wildlife and stabilizing hydrological cycle. The role of the community forest as the resource providing household income and timbers is perceived only slightly important. Data gathered reveal that Dong Keng community forest is generally less used for livestock grazing, fuelwood collection, tourism, education, performing community ceremonies, and growing vegetables and cash crops. Meanwhile, villagers regularly gather NTFPs, while logging was not reported.

These results perhaps relate to villager's appropriation and perception toward the forest as well as CFM's rules and regulations. Since 1989, all timbers on both public and private lands are treated as state property. Logging is not allowed without permission. This changed villager's perception regarding forest importance and logging activities decreased drastically. Most NTFPs, on the other hand, are unprotected by law, but productivity remains constant as a result of the logging ban. It is observed that use of some NTFPs such as wild vegetables, fuelwood, insects, and resin is declining. This is possibly because villagers gain more access to market goods; improved supplies of food crops have diminished the need to depend on forest foods; or the opportunity cost of gathering NTFPs becomes higher.

Use of Non Timber Forest Products

Surveyed data indicate that subsistence use of NTFPs generally remains large and important. Approximately 82.5 percent of the respondents reported that they harvested NTFPs in the community forest. A group of respondents who did not gather NTFPs identified several reasons for their action. Basically, it is not convenient for that person to travel (31.5 percent of the non gatherers) and his/her house is too far from the community forest (20.0 percent). NTFPs sold at local markets (14.3 percent) and substituted food crops (11.4 percent) also encouraged non gatherers to quit harvesting. Approximately 11.4 percent of the participants explained that they did not know how to collect NTFPs, while some said that all NTFPs were available on his/her rice fields and orchards (2.9 percent) and that they did not want to disturb the forest (2.9 percent).

The majority of respondents harvested NTFPs with an average of 53.58 trips per year. They described that forest products were available all year round but the highest productivity was in the rainy season (Table 2). Approximately nine types of NTFPs with more than 27 species of mushrooms, 16 wild vegetables and 15 wild fruits are reported of being harvested from Dong Keng community forest. In sum, Dong Keng's villagers harvested approximately 1,277,964.85 kg of NTFPs from the community forest in 2004. About 81.7 percent of the respondents indicated that these NTFPs were primarily used for household consumption as food, fuel and medicinal plants. Only a minor portion of the respondents (18.3 percent) reported selling NTFPs. Usually, harvested products are first used in a household. Only excessive products are sold in local markets. Sometimes, traders come to a village

and ask villagers at home if they have NTFPs, particularly mushrooms to sell. A very small proportion of villagers intentionally harvest NTFPs for a market sale purpose. Among NTFPs harvested, mushrooms are the major products gathered and highly demanded (Table 2). Sometimes, mushroom prices increase highly to 200.00 baht per kilogram, especially during the early harvesting season. Generally, prices stay around 100.00–150.00 baht per kilogram. Mushrooms are considered delicacy and important supplement diets to local people, especially for certain species such as *Termitomyces* spp. and *Amanita* spp. Although there have been several experiments attempting to cultivate wild mushrooms, none generated successful outcomes. As a result, a great amount of mushrooms is harvested from the community forest each year. This helps stimulate local economy and generate additional household income to some villagers.

Approximately 526.52 baht (US$13.33) is earned per month per household for those reported of NTFP sale. In other words, one household generates about 1,053.04 baht (US$26.66) per year from selling forest products (the average number of harvesting trips is approximately two months per year). This number is accounted for 5.26 percent of an average annual household income (20,000.00 baht or US$506.39). Overall, approximately 283,663.70 baht (US$7,181.36) brought into Dong Keng's local economy in 2004 from exporting NTFPs (the calculation is based on percent of households reported selling NTFPs, the total number of Dong Keng's households, and the average income generated by NTFP sales per year per household). This estimation reveals the amount earned by Dong Keng's villagers alone, which is likely to be smaller than the actual amount the community forest provided if all harvestings are included. In fact, a large number of outsiders gathering forest products have been reported by villagers. Outsiders usually come as a group on a pick-up truck or motorcycles. Outsiders tend to travel long-distance and they are gathering NTFPs to sell rather than household use. For these reasons, they often collect as many NTFPs as possible. Some villagers reported that the whole medicinal plants, not certain parts like usually harvested by the locals, were taken by outsiders. They were worried if such external access remained the community forest would no longer be able to maintain its productivity. It was also reported that NTFPs would be more available if outside use were controlled. Unfortunately, no legal or social protection is applied to NTFPs, therefore outside access is almost impossible to restrain. Forest guards can only ask outsiders to follow rules and regulations and gather NTFPs with care.

Costs and Benefits of Dong Keng Community Forest

The analysis focuses on tangible costs and benefits generated from Dong Keng community forest. The costs of organizing the program include capital construction costs, administrative overhead, office supplies, infrastructure and facilities, and wages. Costs of the first four categories are covered by governmental budgets as they are part of government's local administration. The only actual costs of organizing CFM applied to TAO are forest guard's wages, the total amount of US$1,518.99 per year. Other activities such as forest fire prevention, forest demarcation, landscape improvement, eucalyptus plantation, and community meetings

introduce only small monetary costs to TAO because of villager's labor and time contributions. However, these activities account for opportunity costs but have not been taken into considerations in CFM processes. Presently, TAO is not organizing any activities (e.g., forest lease, NTFP concession, etc) or even with its current collective activities that may enable to produce monetary returns to the organization.

Meanwhile, approximately 1,277,964.85 kg of NTFPs are gathered for supplement diets and these may help to reduce economic burdens for food, fuel, and medicines during hard times. In addition, a great amount of monetary benefits is generated from NTFP sales (283,663.70baht or US$7,181.36 generated in 2004.) This seems that although TAO does not receive monetary benefits it still gains indirect profits as local economy grows. It is possibly true but such indirect profits would be very small since direct taxes are not applied to Thailand's local administration. At present, TAO does not realize these cost-benefit throughputs as a problem because it still receives administrative budgets from the government. Moreover, forest productivity remains sufficient for villagers to continue NTFP collection, keeping competition among the locals for forest products low. However, since the forest supply of naturally occurring products is inelastic, villagers could increase their harvesting of NTPFs in response to higher product prices regardless of rules and regulations imposed. Fortunately, Dong Keng's villagers did not react to product price elasticity in such the way because their primary reason for collecting NTFPs is for household use. Villagers reported that they reduced household consumption to supply the market demand when the price rises.

NTFPs remain open-access and enforcement of CFM's rules and regulations is not legally effective, which encourage outside users to behave otherwise. Dong Keng's villagers expressed that if outside access were not controlled there would be little forest products left for them to use. Villagers will be forced to spend longer time searching for desire forest products. If the harvesting time costs too much, villagers will quit their current practices and find other alternatives that enable them with better-off returns. In other words, opportunity costs imposed to collectivity are likely to increase when forest dependency is decreasing, because villagers do not expect any benefits gained from participating in community activities. It is perceived better off to exploit the resource now rather than protecting it for future use because other people will take advantages from the resource anyway. The majority of respondents expressed that they would be willing to pay entry fees or to harvest forest products in designated zones if these could help to suppress outside access.

Impacts of Community Forestry to Local Livelihoods

It is understandable that since the Dong Keng's community forestry program was established in 1994 with rules and regulations to be enforced, local livelihoods to a certain extent should have changed, especially for those whose lives depend on forest products. Surprisingly, Dong Keng's villagers revealed that their forest-based lifestyles, including NTFP collection and income generation did not drastically alter. First, villagers' usufruct rights to the community forest remain. Secondly, substitutes of some forest products from their rice fields, orchards and homestead gardens also reduce pressure on the villager needs to actually grow NTFPs

on the community forest area. Moreover, the majority of villagers tend to favor market foods and fuelwoods, which are convenient to get from local markets and usually less expensive than NTFPs sold in marketplaces. Finally, timber use is already prohibited as a result of the national logging ban.

Surveyed respondents reported that community forest did not introduce negative impacts to local community and generated some positive outcomes. For example, community landscape and environments look nicer. Regenerating trees increase green areas and attract some wildlife, especially birds to feed in the community forest. It is also recognized that community members are more aware of the importance of their forest and perceive a sense of responsibility to their community and natural resources. The majority of villagers usually participate in community activities, especially those request labors. However, involvement in decision making remains limited. Villagers generally get informed of rules and regulations and management activities already decided by institutional board. In deed, this is a very common practice of community forestry where a grassroots group acts on behalf of the entire community, especially in decision making procedures.

Villagers revealed satisfaction of current management activities because they help improve forest conditions and ensure their access to the forest resources. A few suggestions were provided, including forest guard responsibility and external access. Some villagers expressed that forest guard job description was too flexible. It is difficult to check if the forest guards perform their job regularly. Some villagers said that it was not worth paying wages to forest guards if they did not do their job. However, forest guards are the only system in place that can suppress outside access and protect local users and their benefits. If the forest guards do not perform their job, the concern on outside access and its impacts to the forest and local use can never be resolved. Villagers, therefore, would like to see more regular patrols of the forest and a system to effectively delineate or control outsiders.

Discussion and Conclusions

This study illustrates Dong Keng community forest, one example of community-based management in attempts to bridge gaps between forest conservation and rural development. Local community is working to conserve its surrounding forest, while improving the community living standard. TAO designates protected areas where timber products are saved from logging in order to improve forest conditions. Simultaneously, usufruct rights to the community forest are retained for users whose lives still rely on forest resources.

In order for the Dong Keng program to result in positive outcomes, the program needs to address several issues that are likely to post threats or obstacles to the program's development. Current management of the Dong Keng's program can be considered very *passive*, meaning that the forest is not actually managed, other than set alone and protected from fire disturbances. The claim that communities together with outside agencies organize forestry activities to improve forest conditions and biodiversity seems possibly exaggerated. None of the forest restoration activities such as forest enrichment, species inventory, forest regeneration and forest health studies is being implemented. However, this does not mean what the Dong Keng community is doing is useless. Rather, it is the

recognition of forest regenerative capability. If it is managed more effectively the forest will be able to produce greater amounts of products with the greater benefits to the community.

The Dong Keng program has resulted in *incongruent cost-benefit throughputs*. TAO invests certain money with management activities but does not receive any monetary returns from its investment. Unfortunately, financially driven programs such as forest leases and NTFP collection concession are not easy to carry on in such rural conditions where local economic status is unstable and forest products are considered free complements. Additionally, markets for NTFPs are flexible and do not guarantee consistent economic returns if any individuals want to invest in NTFP business. Therefore, the only kind of benefits from the Dong Keng's program is derived from the community forest and flowing directly to local people and it requires systematic regulations such as entry fees, harvesting zones and quotas, and NTFP distribution depots to deal with the issue of equitable benefit distribution among users.

Although the estimated benefits overwhelm costs of organizing community forest, opportunity costs may rise as a result of increasing numbers of users. At present, villagers may be able to bear such opportunity costs since the forest supply remains sufficient. However, due to the inelasticity of the forest supply, it is likely for users to change their behavior and compete for forest products in the future, especially if product prices rise or market goods become unaffordable. Competition for forest products can get more serious when outside and local users are not differentiated. Local users might remain their traditional harvesting practices as a result of social norms, coupled with rules and regulations, but outsiders are likely to act otherwise since no enforcement and punishment are imposed toward them. When such condition emerges, forest overexploitation is unavoidable. The lesson learned here is that the program that seems to gain benefits overall is possible to fail if costs and benefits do not correspond accordingly.

Dong Keng community forest illustrates a type of common-pool resource management that involves *multiple property rights regimes*. Basically, the forest itself and specifically timber products are treated national properties, owned by the state and protected by laws. NTFPs, on the other hands, are characterized open access but appearing in a community-based managed forest. Although access to the community forest is regulated by collective rules, use of NTFPs in general remains open to publics with loose regulations. In addition, since Thailand's community forestry has not yet been legitimated, exclusion of non-owners or -contributors is legally impossible and only socially discriminated. Thus, evidence of outside access and relating problems are actually expected. In a community that does not have strong social connection to recognize local appropriators and differentiate outsiders, together with restrictedly enforced rules and regulations, open access can post a serious threat of resource overexploitation and social conflicts to the management of common-pool resources. Rules and regulations enforced within a community forestry sphere focus on protection of timber products when they are already protected under the state property regime. Simultaneously, the same rules pay little attention to NTFPs which are in fact mostly used by local people and outsiders. Although NTFPs can be

protected under the umbrella of timber protection, the open access-liked nature of NTFPs will make themselves overexploited, especially when a system to discriminate external access is not yet in place.

In conclusion, Dong Keng's community forest represents the management program that seems efficient and results in positive outcomes to the community. Unfortunately, it is simultaneously facing threats of social conflicts and forest deterioration that emerge from the complicated nature of property rights regimes and incongruence of cost and benefit throughputs derived from the management. Hence, institutional regimes that clearly define users, rights, and responsibility for both timber and non-timber forest products, together with governmental intervention capable of regulating the use of resources more effectively and balancing costs and benefits of collective activities accordingly must be considered the priority.

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Table 1 Importance and use of the community forest classified by activities

Activity			
Importance of CFM	Rank (score out of 4.0)	Use of the forest for	Rank (score out of 4.0)
1) making community widely recognized	Very important (3.4)	1) NTFP collection	Regular use (2.7)
2) improving community landscape	Very important (3.3)	2) Fuelwood collection	Slight use (1.9)
3) increasing numbers of wildlife	Very important (3.2)	3) Logging	Don't use it at all (1.0)
4) stabilizing hydrological cycling	Important (3.0)	4) Performing community ceremonies	Slight use (1.4)
5) providing food and fuel for household use	Important (3.0)	5) Livestock grazing	Slight use (2.0)
6) reducing salt-affected soil problems	Important (2.5)	6) Planting vegetables and cash crops	Slight use (1.3)
7) maintaining traditional practices	Important (2.4)	7) Tourism	Slight use (1.9)
8) generating family income	Slightly important (2.0)	8) Education	Slight use (1.9)
9) providing timber products	Slightly important (1.9)		

Note: Importance of CFM: 0-1.0 = not important, 1.1-2.0 = slightly important, 2.1-3.0 = important, 3.1-4.0 = very important

Use of the forest: 0-1.0 = don't use it at all, 1.1-2.0 = slight use, 2.1-3.0 = regular use, 3.1-4.0 = heavy use

Table 2 NTFPs' Calendar, Dong Keng Sub-district Community Forest, Khon Kaen

NTFPs	Month												Amount harvested
	1	2	3	4	5	6	7	8	9	10	11	12	(Kg/year)
1) Mushrooms:~27spp.					←	—	—	—	—	—	—	→	125,805.84
2) Wild vegetables: ~16 species harvested.	←	—	—	—	—	—	—	—	—	—	—	→	37,480.14
3) Insects (e.g., ant eggs)				←	—	—	—	→					11,493.56
4) Medicinal plants	←	···	···	···	←	—	—	→	···	···	···	→	10,726.18
5) Wild fruits	←	···	···	···	···	···	···	···	···	···	···	→	52,968.44
Syzygium cumini Druce					←	—	→						
Ficus geniculata Kurz						←	—	→					
Diospyros rhodocalyx Kurz							←	→					
Phyllanthus emblica Linn	—	→										←	
Irvingia malayana Oliv. ex A. Benn.								←	→				
Xylia xylocarpa var. kerrii Nielsen	→											←	
Sindora siamensis Teijsm. ex Miq.								←	→				
Ziziphus oenoplia Mill.									←	→			
Polyalthia evecta Finet & Gagnep.	←	—	—	—	—	—	—	—	—	—	—	→	
P. debilis Finet & Gagnep.								←	→				
Olax psittacorum (Willd.) Vahl								←	→				
Salacia chinensis Linn.	←	—	—	→									
Flacourtia indica (Burm. F.) Merr.										←	—	→	
Carissa spinarum auct. mult. non L.		←	→										
Unknown		←	→										
6) Fuelwood	←	—	—	—	—	—	—	—	—	—	—	→	927,946.75
7) Bamboo shoot					←	—	—	—	—	—	—	→	29,362.94
8) Resin	—	—	—	→							←	—	10,410.59
9) Wildlife	←	—	—	—	—	—	—	—	—	—	—	→	71,770.41

Note: Dotted lines indicate that harvesting is reported all year round but at limited extent. Solid lines indicate as to when forest products are typically harvested.