Research article

The Analysis of Rattan Productions in Prek Thnot Community Protected Area, Kampot Province, Cambodia

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Abstract This study generally aims to illustrate, promote and increase the awareness of the dwellers in the study area regarding the beneficial aspects of rattan. Particularly, it aims to identify the ways that the committee can use to sustain their rattan production and to determine the advantages (or beneficial effects) of rattan production to committee members' livelihood. To achieve these objectives, stratified random sampling was performed. Out of 82 respondents, 65 were collectors 13 were processors and 2 were middlemen, all living in three villages namely, Prek Thnot, Prek Kreng, and Chang Huon and 2 retailer reside in Kampot city. The study illustrated that rattan committee sustain rattan resource in their community by providing harvesting guidelines and initiating additional jobs from the production chain managing the amount of rattan resource to be used annually and replanting them, and applying harvesting technique from WWF. Rattan production with its beneficial effects is extremely important for all households in the production chain. It is not only used for food or handicraft but also a source of income for all actors along the chain.

Keywords rattan, management, rattan benefit, Prek Thnot Community Protected Area

INTRODUCTION

Majority of Cambodian population are farmers living in rural areas and depend on agricultural activities (Ros et al., 2011). The level of productivity of agriculture in Cambodia is low in comparison with neighboring countries in Asia (FAO, 2013). Since the lead source of income of farmers is low, additional income from other agricultural activities is significant. Mountainous people harvest forest products such as bamboo, resin, honey, and rattan which we know as Non-Timer Forest Product (NTFPs) after farming activity. A working paper of CDRI published in 2006 shows that average income from NTFPs is 280 USD per year for poor people in Cambodia. Moreover, NTFPs is used as a source of food, medicine, construction materials, shelter, and income for rural poor throughout the world (Warner et al., 2007; Khou, 2010). They are scarce resource and important to people who rely on harvest with sustainability. The people living near forest must be allowed to benefit from NTFPs in line with the development and sustainable resource management, which will encourage them to protect the forest for future generations (Tuan, 2007). Meanwhile Prek Thnot Community Protected Area had founded a rattan committee in order to manage rattan resource for the benefit of the community members and to ensure the stability of its usage. On the other hand, the information regarding rattan harvest, rattan production chain, and income from rattan production were still limited. In order to overcome these limitations, information about harvest, production chain, and economic condition of rattan were acquired during the study. This paper will identify the ways that the community can use to sustain rattan

production which serve as an important resource for Cambodians for food, furniture's, shelter, and extra income besides being one of their agricultural activities over centuries (WWF, 2010). Also, it will determine the profitability of rattan production to the Prek Thnot Community Protect Area members who are living and using rattan resources in Bokor mountain forest wherein they will be also encouraged to protect the forest and forest products. The awareness of profitability of rattan production in the study area is really significant. It is useful not only for protecting rattan resources but also many other important forest products in the study area.

OBJECTIVE

The analysis of rattan production in Prek Thnot Community Protected Area aims to identify the ways that the committee can use to sustain their rattan production and to determine the profitability of rattan production.

METHODOLOGY

This research was conducted in Prek Thnot commune, Teuk Chhou district, Kampot province Cambodia. Stratified random sampling was used to determine the representative household out of 118 rattan committee members in the three villages. The samples were composed of collectors, processor and middleman in three villages: Prek Thnot, Prek Kreng and Chang Huon. The sample size was 82 households in which 65 households were collectors, 13 were processors 2 middlemen and 2 retailers from Kampot City. Two types of data were collected for analysis; primary data which was generated from Rural Rapid Appraisal, e.g. key information deep interview, group discussion, semi-structured interviews using questionnaires, while secondary data was taken from rattan project publications, community records, committee records, the books, reports, and journals. All the data were stored and analyzed using the program SPSS version 16 determining useful tools such as frequency mean, compare mean analysis. Cost and Benefit and Margin method was applied to generate cost and return to all actors along the production chain. The history of community, timeline activities, and management strategies were described.

RESULTS AND DISCUSSION

History of rattan committee: There are three different divisions namely rattan group, medicine group and ecotourism group in the Prek Thnot Community Protected Areas. In 2007, Prek Thnot Community Protected Area founded rattan committee under support from rattan project of WWF-Cambodia, Forestry Administration and the Ministry of Environment which aims to manage rattan resource with sustainable manner and to provide job opportunity to community members throughout rattan collecting and rattan processing. Moreover, rattan project initiated a training course on how to produce several kinds of rattan furniture such as chair, bookshelf, and table as well as providing support material for furniture production to those interested. In 2012, there are 1,841 people who benefited indirectly from Prek Thnot Community Protected Area. Therefore, there are 118 people who got the profit from the rattan committee and they are potential in using the rattan resource for commercial purpose. Nevertheless, they are actively involved in rattan committee for setting up and practicing the regulation.

Rattan resource management: The structure of the committee is divided into three division namely marketing, financial management and natural resource management divisions. The division of marketing was created to enable market information for processors and collectors. Division of natural resource management is very important to manage resources in the forest when destroyed by fire or deforestation as well as planning rattan resource for annually usage and managing rattan nursery for replanting or sell out for cash income. Division of financial management is responsible for managing money usage. The income comes from selling rattan cane, contribution free of 1,000 R from members per harvesting, and per selling rattan furniture, and funding from other sources such as WWF and MAFF, FA. The main harvesting zone of rattan committee is around 78.30

hectares located in three villages namely Chang Huon (11.37 hectares), Prek Thnot (40.56 hectares) and Prek Kreng (26.39 hectares) village. Harvesting is being done by cycle in each zone depending on the time, number, and amount of actual plan of rattan committee. Moreover, around 30,000 rattan plants, from the nursery station of the community, were planted in the Prek Thnot Community Protected Area zone every year. However, the average rattan harvest of the community is around 27,000 canes (5 m per cane) per year or more which depending on the ability of committee members (collectors) and market force. The rattan committee helps on management of rattan resource and also contributes in sharing the profits and solving some problems of the collectors. Furthermore, the profit will be shared to committee members in case of cash need, hiring someone to manage the nursery, training, replanting, and helping the members in emergency cases like accidents in harvesting rattan.

Rattan collection technique of committee members: There are 21 species of rattan in Cambodia. Their harvest season varies according to species of each rattan. There are only five commercial species namely *Calamus rudentom, C. viminalis, C. palustrist, Korthalsia,* and *Som.* Collectors harvest rattan fallow the traditional and specified committee technique. Traditional technique used by the dwellers long time ago is unsustainable though because they harvest the rattan by digging its roots, destroying the young rattan. The committee technique, on the other hand, was taught and supported by WWF. These included three main activities. First, collectors identify the age and length of rattan. Second, only 60% of the rattan in clumps is being harvested while the 40% is left to support and provide nutrition to young rattan. Last, rattan cane should be cut 20-70 cm above the roots because the rattan trunks provide nutrition for young rattan. Only around 80% of the respondents are following the rule of committee harvesting. This technique for harvesting is very significant but it still needs to be improved and should be taught to all committee members. This harvest technique helps to enhance the sustainable resources in the protected area. According to the WWF (2011), the sustainable harvesting of rattan must consider the rattan age, seasonal harvesting, materials consumption and harvesting technique. The rattan recognized to be suitable for harvesting must have the fallowing characteristics; (a) mature in age; (b) height is over five meters; (c) rattan cane is dark green with black thorn; (d) leaves are dried and falling out; and (c) bearing flower and fruit. The best season for harvesting is during the dry season wherein the tree is protected from moles and insects infestation that could affect rattan growth. In addition, the proper harvesting tools should be utilized such as bush-whacker, special scissors, crampon and jungle-knife. These tools are very important. Crampon is being used for isolating cane from other trees growing with rattan. Bush-whacker is being used to cut and clean leaves from rattan cane which is easier than knife. Special scissors cuts rattan twigs looped to other tree. These tools avoid destruction of other plants significant for a sustainable rattan resource. The recommended four main steps for harvesting rattan are (a) collectors identify the right species; (b) cutting, rattan ten centimetres above the root; (c) removal of branches or twig meshed with other cane or tree before pulling: (d) pilling up of waste to the bush for fertilizer and to avoid fire. These steps are important harvesting technique for sustainable rattan production.

Importance of Rattan Production

Cost and return of collectors: Rattan is a potential resource for collectors because they do not invest capital but they can get profits from it. Time of collection of rattan depends on market demand and households' consumption. The collectors harvest the rattan around 22 days per person person. For every harvesting time, men can collect around 47 canes while women can carry 35 canes from the forest. The average capital cost is 61,600 R per household such as jungle-knife, thick clothes, gloves and so on. Average annual income of collectors is around 474,000 R per household.

Cost and return of processors: According to the study, 70% of processors produce rattan furniture only after farming or fishing and 30% of processors produce rattan furniture around 7 months and a half in average per year. There are three main types of rattan furniture that processors produce such as bookshelves (3 shelves with width=0.4 m and height=1.5 m), chairs (width=0.4 m, Height=1 m), and table set (4 chairs and a table with height=0.4 m and width=0.5 m). In average

processors can earn around 3,872,200 R per year and spend around 466,400 R in average for capital or expenses. Processors use 100% of family labour.

Detail Cost of Producing Certain Furniture

There are two options for calculating the total cost of processing rattan. First option is that the total cost includes the cost of hiring labour and cost of buying raw rattan while second option is the use of 100% of family labour of the processors in processing and harvesting rattan from the forest.

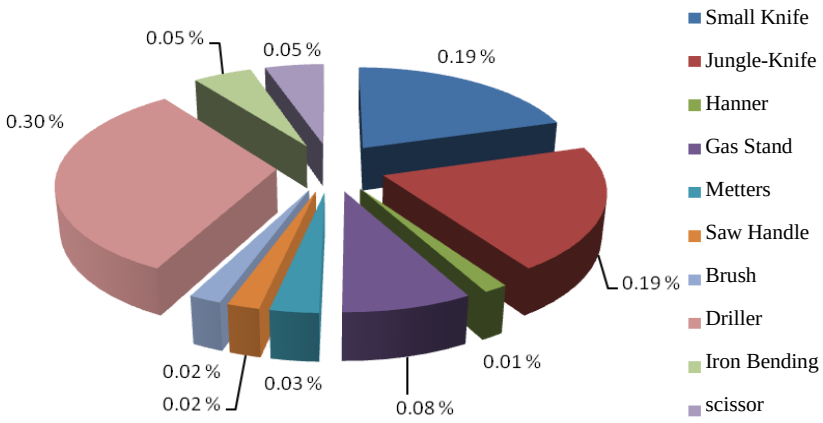


Fig. 1 Fixed cost of rattan processing

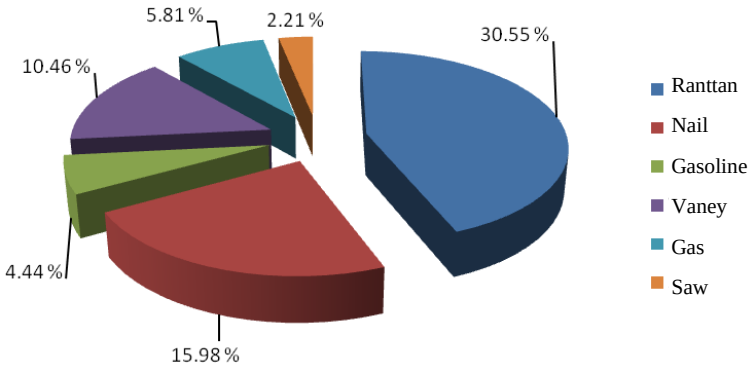


Fig. 2 Percentage of variable cost

Table 1 Processor's margin

Main Type of Furniture	Total Cost		FG Price	Margin	
	Option1	Option 2		Option 1	Option 2
Chair	19,700 R	4,900 R	20,000 R	300	15,100
Table Set	139,900 R	23,300 R	150,000 R	10,100	126,700
Bookshelf	26,800 R	4200 R	20,000 R	-6,800	15,800

Note: FG: farm gate

Profit of middleman and retailer: Middlemen are also community members who act as agents to collect rattan for traders in Phnom Penh City. In average, they earn 200 R commission per cane of rattan and around 426,600 R per season. Retailers are residents of Kampot market in the Kampot city; they can earn around 20,000 R profit from selling rattan furniture per month.

Timeline activities of rattan production: Timeline of activities contributed for evaluating and assessing the time spent by the actors in rattan production versus the benefits that they get. Table 2 show that after their main activities or in between of their activities farming or fishing activities,

rattan committee members can have more additional income from rattan production aside from farming and fishing. Based on the table, committee members don't harvest rattan the whole year but only during dry season and a little during rainy season.

Table 2 Timeline activities of committee members

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rattan Harvest												
Processing												
Collecting												
Selling Furniture												
Farming Activities												
Fishing Activities												
Hiring labour												

Furthermore, there are some rattan collectors that go to the forest during rainy season. From October until mid-May, collectors can harvest rattan because they are free from their farming or fishing activities. They can also harvest during mid-May until the end of September but they harvest during the day when they finished from their farming or fishing activities. With regards to the collectors, they mostly process furniture almost every day except from mid-May until mid-July because during that time they are busy with their farming activities. Retailers sell out their product every day because their main job is to sell rattan furniture and other furniture in Kampot Province.

Rattan Production Chain

The production flow shows how rattan resource is used in the community. According to the study, rattan production is mainly being sold out fresh, about 69% of all rattan from the forest, while only 30% is being processed as furniture and 1% is used as houses building materials

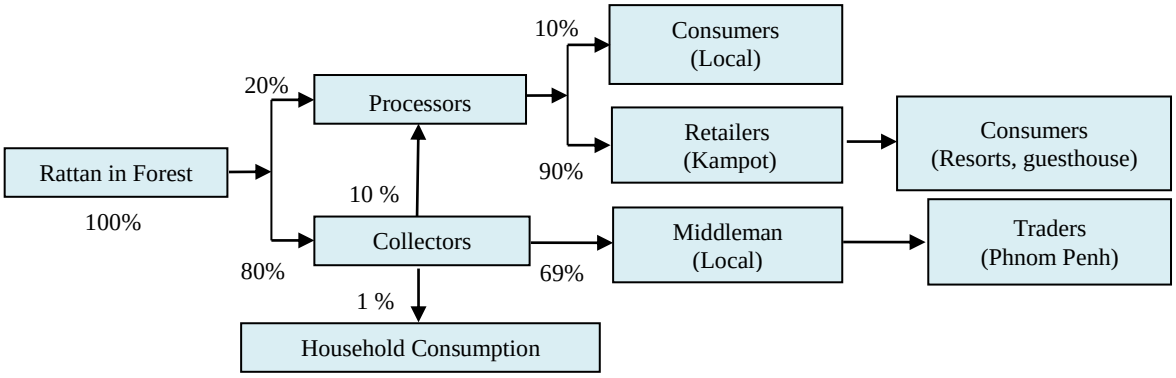
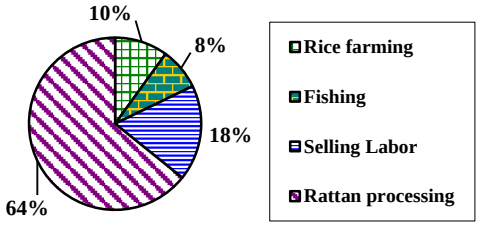


Fig. 3 Rattan production flow

Contribution Income to Committee Members

Rattan is very important for people along the production chain. People use rattan for food, and not only to make handicraft for household usage but also contributes to household gross income. The benefits of rattan production are extremely important for all households in the study area. They use the income to support child education, household repairs, food, and other expenditures for daily living. Furthermore, rattan production offers employment to all members of the family. It reduces migrant labor and members of household can earn more profit from collecting rattan and selling furniture's. According to Fig. 4 and Fig. 5, rattan processing had shared about 65% to processors annual income while collection had shared about 9% of collectors' annual income.



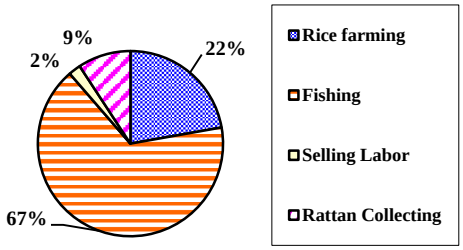


Fig. 4 Income source of rattan processors **Fig. 5 Income source of rattan collectors**

CONCLUSION

The rattan committee sustain rattan resource in their community by providing harvesting guidelines and initiating additional jobs from the production chain managing, the amount of rattan resource to be used annually and replanting them, and applying harvesting technique from WWF. Rattan resource in the study area share benefits to all actors along the production chain and it plays an important role in the income source of committee members after agricultural activities and fishing. Annually, collectors can earn 474,000 R which shared 9% of annual income and processor can earn 3,872,200 R which shared 64% of annual income. Middlemen earn 200 R commission per selling of cane of rattan, while retailers earn 20,000 R per month on selling rattan furniture. Nevertheless, the rattan resource is limited and need long time to grow for harvesting again plus it requires management.

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