



Rubber Farmers' Perception of Rubber Technologies in Dambae and Peam Cheang, Kampong Cham

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Abstract The main objectives of the study were to 1) determine the level of the farmers' awareness of recommended technologies related to rubber tapping and 2) identify the farmers' perceptions of rubber technologies. A multistage random sampling technique was used to select the sample of 92 rubber smallholders from Dambae, a non traditional rubber region, and Peam Cheang, a traditional rubber region. Data were collected through pocket voting and preference ranking which are the tools of participatory methodology. Friedman's test and multiple comparisons were used to analyze the data. The study showed that rubber farmers were not well aware of recommended technologies related to rubber tapping, for instance required girth (23%), height of measurement (34%), cup hanging (46%), thickness of tapping (21%) and tapping angle (21%). However, the awareness of tapping panel marking was high (97%). It was discovered that there were significant differences in the participants' rank ordered preferences for techniques, during immature and mature stages, related to rubber collection works and dissemination media ($p < 0.001$). Establishment of cover crop, land preparation, correct tapping method and latex preservation methods were considered by the rubber smallholders as the most important techniques ($p < 0.05$) that they need the extension officers to address in designing extension activity programs for these regions. Workshop was the most preferred area ($p < 0.05$) of dissemination media through which the rubber farmers need the researchers and extension officers to transfer information and knowledge.

Keywords pocket voting, preference ranking, participatory method, Friedman's test

INTRODUCTION

Participatory Rural Appraisal (PRA) is a family of approaches and methods to enable local people to present, share and analyze their knowledge of life and conditions in order to plan, to act, to monitor and evaluate the situations. There has been increasing interest in PRA as it has been successful on many occasions in planning and decision support since its development in the late 1980s. An extensive review on the evolution, methods and practices of PRA can be found in Chambers (1994). Unfortunately, PRA has not been used for research on rubber smallholding in Cambodia. It has been found that the Cambodian smallholder rubber yield is very low (845 kg/ha/year) compared with the average smallholder rubber yield of other countries (Sovann, 2009). Malaysian smallholder rubber yield is 1047 kg/ha/year and for Thailand, 1530 kg/ha/year

(Pondikou, 2005). The low rubber yield is attributed to poor plantation management, use of conventional clones, low fertility of soil, use of old tapping systems, poor skill of the tappers and poor knowledge of rubber smallholders on rubber management techniques. To improve the knowledge of rubber smallholders' on rubber management techniques is an important factor in increasing the rubber yield. A better result can be achieved by collaboration with the farmers and by means of understanding their needs. Therefore, the topic "Rubber farmers' perception of rubber technologies in Dambae and Peam Cheang, Kampong Cham" is an important study.

The specific objectives of the study were 1) to determine the level of farmers' awareness of recommended technologies related to rubber tapping and 2) to identify farmers' perceptions of rubber technologies.

METHODOLOGY

This study was conducted in Peam Cheang and Dambae regions. Peam Cheang is located on the southern side of Kampong Cham and Dambae is on the Northern side of this province. A total of 92 rubber smallholders were selected. A multi-stage random sampling technique was used for sample selection from the two regions. Actual data collection used a variety of participatory methods such as, pocket voting and preference ranking. The study was conducted from September 16 to November 25, 2008.

Pocket voting was used to find the level of the smallholders' awareness of recommended technologies related to rubber tapping. Awareness on correct tapping practices among the smallholders was assessed using 12 questions with multiple choice answers. When all had voted, the slips were taken out from each pocket and the votes were registered (Wasana et al., 2006). Preference ranking was used to identify the farmers' perception of areas for which the techniques were needed and preferred dissemination media. Preference ranking was done by individual farmers, where a set of options was ranked according to their perception.

All data gathered from the pocket voting were analyzed using frequency and percentage statistics. Number of votes for the correct answer was awareness on correct tapping practices. Friedman's test (Fr.) was used for the analysis of preference ranking. When the number of rows and/or columns is large, it can be shown that the statistic Fr. is distributed approximately as chi-square (χ^2) with d.f. = k-1 (Abeyasekera, 2001). SPSS version 12 was employed in this analysis. For the options above the null and alternative hypotheses are given below:

H0 = There is no difference in the participants' rank ordered preferences for techniques during each stage of rubber and dissemination media.

H1 = There is a difference in the participants' rank ordered preferences for techniques during each stage of rubber and dissemination media.

Afterwards, multiple comparisons were made using the following inequality (Siegel and Castellan, 1988).

RESULTS AND DISCUSSION

Farmers' awareness of recommended technologies related to rubber tapping

According to the results given in Fig. 1, the farmers' overall awareness of recommended technologies related to rubber tapping was moderate (54 %). The overall awareness of Sri Lankan rubber farmers of recommended rubber technologies of 55% to 58% was similar (Wasana et al., 2006). The plausible reasons for this moderate awareness could be traced to: a) the very low intensity of extension services provided by relevant research and development bodies. 83% of the rubber farmers responded that researchers and extension workers had never visited their regions (Sovann, 2009); b) Lack of funds to support the institutions related to the rubber smallholder development. The rubber farmers lacked the necessary knowledge of tapping techniques especially bark thickness of tapping and tapping angle (21%). When bark consumption has been excessive, capital value is lost through reduced economic life span of trees.

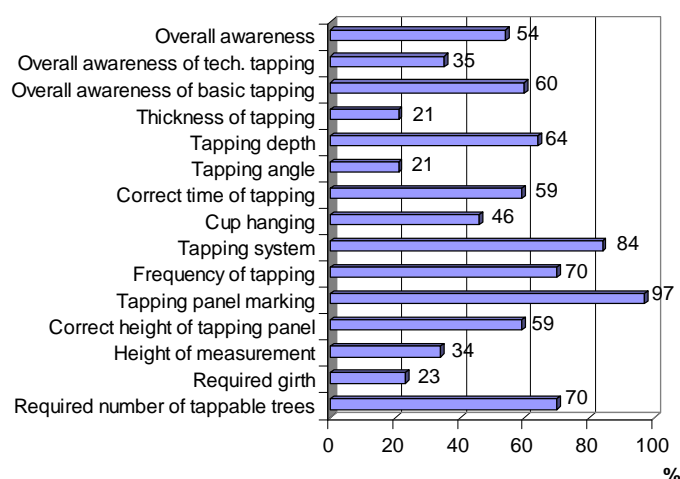


Fig. 1 Farmers' awareness of aspects of tapping technologies

Farmers' perceptions of rubber technologies during the immature stage of rubber trees

The rubber techniques used during the immature stage of trees that the smallholders selected for extension activity were land preparation, establishment of cover crops, fertilizer application, weeding and disease control. It was found that at least one treatment comparison was significantly different ($\chi^2 = 73.63$, d.f=4, $p < 0.001$, Table 1). The rubber farmers considered that land preparation and the establishment of cover crops were the most important techniques (lowest rank sum) and weeding was the least important (highest rank sum) during the immature stage that they needed to know ($p < 0.05$, Table 2).

Table 1 Friedman's Test of smallholders' rank of techniques in different stages and dissemination media

Parameter	Immature stage	Mature stage	Collection works	Dissemination media
N	92	92	92	92
Chi-Square	73.630	101.496	31.370	122.922
d.f	4	4	2	4
Asymp. Sig	0.000	0.000	0.000	0.000

Table 2 Rank sums of smallholders' perception of different techniques during the immature stage of rubber

Technique	Mean rank	Sum of ranks*	
1 Land preparation	2.20	202	a
2 Cover crop	2.68	247	ab
3 Fertilizer application	2.83	260	ab
5 Disease control	3.21	295	b
4 Weeding	4.09	376	c

*Sums of ranks with different letters are significantly different ($p < 0.05$)
Highest priority for the lowest rank sum

This was consistent with Wasana et al. (2006) who reported that land preparation was also considered as important by the rubber smallholders in the Badalkumbura area of Sri Lanka. In 2005, the International Rubber Research and Development Board recommended zero burning concepts for rubber plantation establishment (Abdul, 2005). Burning the field causes the microbial populations to die and loss of organic matter in the vegetation. Farmers therefore wanted to know more about the zero burning method for establishing the rubber plantation. At the immature period, the rubber trees are not yet tapped and the rubber farmers do not have income, so it is only the

cover crops planted between the rows of rubber trees that the rubber farmers can earn money from. In addition, farmers want to know which cover crops give the biggest profit and the impact of the cover crops has on the rubber growth. Accordingly, land preparation and establishing of cover crop were priority techniques.

Farmers' perceptions of rubber technologies during mature stage of rubber

The management techniques during the mature stage of rubber that the smallholders selected for extension activity programs included marking panel, correct tapping method, fertilizer application, weeding and disease control. It was found that at least one treatment comparison was significantly different ($\chi^2 = 101.496$, d.f = 4, $p < 0.001$, Table 3). According to multiple comparisons, the rubber techniques used during the mature period can be categorized into 3 groups as proposed in Table 3 ($p < 0.05$). The rubber smallholders have considered correct tapping method to be the most important technique (lowest rank sum) and fertilizer application to be the least important (highest rank sum). The main reasons for choosing correct tapping method were sustainable production, good health of rubber trees, reasonable consumption of bark and high quality of rubber. Alcala et al. (2005) concluded that a poor tapping system was also the most important factor to make rubber tree yield very low in the Philippines.

Table 3 Rank sums of smallholders' perception of different techniques during the rubber mature stage

Technique	Sum of ranks*		Priority
2 Correct tapping method	157	a	High
1 Marking panel	275	b	Moderate
5 Disease control	275	b	Moderate
4 Weeding	306	b	Moderate
3 Fertilizer application	367	c	Low

*Sums of ranks with the different letters are significantly different ($p < 0.05$)
Highest priority for the lowest rank sum

Rubber collection works

The techniques related to rubber collection that the smallholders selected for extension activity programs included preservation method, coagulation method and stocking method. It was found that at least one treatment comparison was significantly different ($\chi^2 = 31.37$, d.f = 2, $p < 0.001$, Table 1). According to multiple comparisons, the management techniques related to the rubber collection can be categorized into 2 groups as proposed in Table 4 ($p < 0.05$). The rubber smallholders considered latex preservation method as the most important technique (lowest rank sum) that they need to know, and stocking and coagulation methods as the least important (highest rank sum). The main reasons for choosing the latex preservation method as most important were price of latex and the distance between their rubber plantations and the rubber processing factory.

Table 4 Rank sums of smallholders' perception of different techniques related to the rubber collection works

Technique	Sum of ranks*		Priority
1 Preservation method	143	a	High
3 Stocking method	191	b	Low
2 Coagulation method	218	b	Low

*Sums of ranks with the different letters are significantly different ($p < 0.05$)
Highest priority for the lowest rank sum

Farmers still think that the rubber coagulum they sold is not rated on the quality but its weight. It was the same in Indonesia (Akiefnawati and Joshi, 2006). It was for this reason, that smallholders in these study regions considered that the coagulation method and the stocking method were the least important techniques.

DISSEMINATION MEDIA

The media that the smallholders preferred for dissemination were lectures, workshops, video documentary, radio programs and newspaper supplements. It was found that at least one treatment comparison was significant difference ($\chi^2 = 122.922$, d.f = 4, $p < 0.001$, Table 1). According to multiple comparisons, the dissemination media can be categorized into 3 groups as proposed in Table 5 ($p < 0.05$). The rubber smallholders considered workshops as the most preferred type (lowest rank sum) of dissemination media and radio programs as the least important (highest rank sum). The rest of the dissemination media were considered as moderately important. It was the same in Sri Lanka (Wasana et al., 2006). The main reasons for not preferring mass media were due to absence of discussion, inappropriate time of broadcasting and lack of delivery means. The rubber smallholders preferred workshops because they thought that in workshops they could easily discuss their specific problems and share their knowledge and experience.

Table 5 Rank sum of smallholders' perception of different dissemination media

Dissemination media	Sum of ranks*		Priority
2 Workshops	150	a	High
5 Newspaper supplements	260	b	Moderate
3 Video documentary	276	b	Moderate
1 Lectures	317	bc	Moderate
4 Radio programs	377	c	low

*Sums of ranks with the different letters are significantly different ($p < 0.05$)
Highest priority for the lowest rank sum

CONCLUSION

The study showed that the rubber farmers' awareness of tapping techniques was poor. The awareness of tapping angle and bark thickness of tapping was only 21%. This poor awareness has made an impact on the economic life span of rubber trees, yield and income stability. This study has opened up the need for an awareness program on tapping rubber trees. Following analysis of results, it was concluded that there were differences in the participants' rank ordered preferences for techniques during each stage of rubber growth and for dissemination media ($p < 0.001$). At the immature period, the rubber farmers considered that land preparation and the establishment of cover crops were the most important techniques that the rubber smallholders need to know about. The smallholders gave least priority to weeding. According to the study on smallholders' perception of different techniques during rubber mature stage, the smallholders considered correct tapping method as the most important technique. Fertilizer application has been considered by the farmers as the least important. Among the techniques related to rubber collection methods, the smallholder considered the latex preservation method as the most important technique that required awareness raising. Rubber stocking and coagulation methods were considered by rubber smallholders as less important areas for awareness raising. Based on the results of the study, workshops were nominated by the rubber farmers as the most preferred area of dissemination and radio programs were considered as the least important. Establishment of cover crop, land preparation, correct tapping method and latex preservation method were the most important techniques which should be addressed in designing extension programs for the study areas. Workshops were the most preferred area of dissemination media through which researchers and extension officers can transfer the above techniques to farmers.

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