

Is Betel Leaf Cultivation Widening Income Disparity in Teknaf?

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Abstract

Serious deforestation has been reported in the Teknaf peninsula of Bangladesh, and betel leaf cultivation is considered to be one of the responsible factors. This paper aims to reveal the differences in households engaging in this practice by examining when villagers first started cultivation. In particular, the hypothesis which was put forth in past research will be examined using the same questionnaire data regarding the consciousness and individual attributes of locals. The hypotheses are: betel leaf cultivation does not contribute to income generation for those who started cultivation within the last 10 years; forest degradation became remarkable 10 to 15 years ago; and because of this, households have been obliged to obtain wood from the market and are not able to increase their incomes.

INTRODUCTION

Serious deforestation has been observed in the Teknaf peninsula of Bangladesh. Several factors responsible for deforestation have been identified, including firewood collection by locals, migration into forest areas, and betel leaf cultivation. Betel leaf is a cash crop, making it widely cultivated in the Teknaf peninsula. Cultivation requires the use of *pan boroz*, a facility that offers shade and protection against sunshine for the leaves. Tani, Zulfikar, and Asahiro [1] revealed that the consumption of forest resources in *pan boroz* construction contributes to deforestation. Sakamoto, Tani, and Moriyama [2] conducted a case study of the MB village in Teknaf (Fig. 1), and found major differences between households that started betel leaf cultivation prior to 1995 and those that started within the last ten years. Sakamoto et al. [2] also found that betel leaf cultivation was not necessarily related to increases in income for households that began cultivation in the last ten years, and that the time period of 1995-2000 indicates the turning period of forest resources. Furthermore, remote sensing image analysis corroborated [2] these findings.

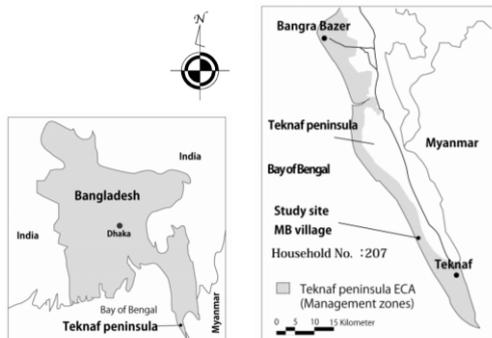


Fig. 1. Study site location [3]

In this study, the same village in the Teknaf peninsula previously studied by Sakamoto, Tani, and Moriyama [2] was selected as the case study site. By using questionnaire data surveying the consciousness and individual attributes of locals, the differences in household characteristics will be elaborately analysed with group classifications according to when villagers started cultivation.

MATERIALS AND METHODS

The survey was conducted in September 2010 for all 207 households of the case study village. Data was collected using prepared questions in face-to-face meetings with residents. The questions required 'yes' or 'no' answers as well as concrete digits and names.

Fig. 2. shows the occupation of household residents, Fig. 3. shows the annual income of households, and Fig. 4. shows the year when each household started betel leaf cultivation. Fig. 2. shows that 45% of households are farmers. Fig. 3. shows that the annual income in this region is severely low; by comparison, the average income of non-manufacturing workers in urban

areas is 20,000 taka/month, and hence, 240,000 taka/year [4]. In Fig.4, all of the households in the village are plotted according to the number of years they have been cultivating betel leaves. If a household does not cultivate betel leaves, then it is plotted as zero on the y-axis. At the time of the survey in 2010, 104 households were engaged in betel leaf cultivation, whereas 103 were not. Fig. 4. shows that the betel leaf cultivation has rapidly expanded in the last 30 years.

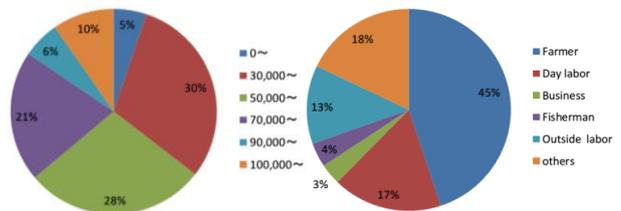


Fig. 2 Occupation

Fig. 3. Annual income

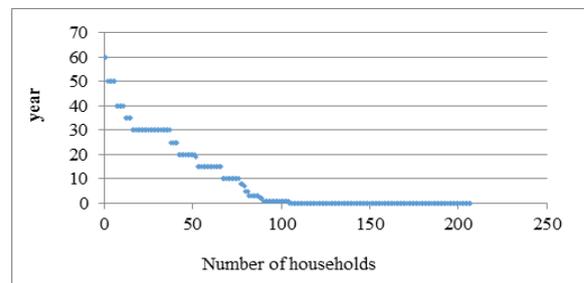


Fig. 4. Involvement period with betel leaf cultivation

Sakamoto et al. [2] classified the households into four groups depending on time periods when they began betel leaf cultivation. The four periods are: before 1975 (more than 35 years ago); from 1980 to 1985 (around 25 to 30 years ago); from 1990 to 1995 (around 15 to 20 years ago); and from 2000 to 2010 (around ten years ago). Because the villagers responded to the questionnaire in five-year intervals, we have adopted these classification periods by clustering their answers. This does not mean that there is a missing period in the analysis. The classifications are summarised in Table 1.

Table 1. Cultivation period wise group classifications

Group	Starting Period	Samples
0	Did not practice at the time of survey	103
1	Within the last 10 years	38
2	15 to 20 years ago	25
3	25 to 30 years ago	26
4	35 years ago	15

The survey data was analysed to determine whether economic and social variables can account for the observed differences in years spent cultivating betel leaves among these groups.

RESULTS

A. The difference in incomes

Sakamoto et al. [2] revealed that the mean annual income and annual income/number of family members of group 1 (started betel leaf cultivation within the last ten years) was significantly lower than the aggregate population of the other groups. Figs. 5 and 6 show the mean annual income and annual income/number of family members of each group.

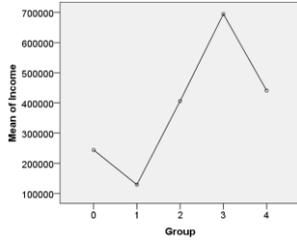


Fig. 5. Income

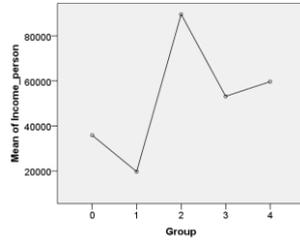


Fig. 6. Income per person

B. The difference in resources

Figs. 7-10 show the differences in mean land areas and land use, measured in acres. Figs. 11 and 12 show the differences in the average number of households that possess wells.

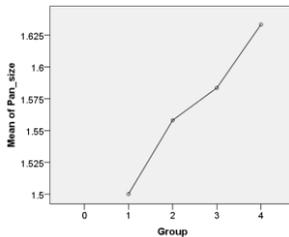


Fig. 7. Pan boroz size

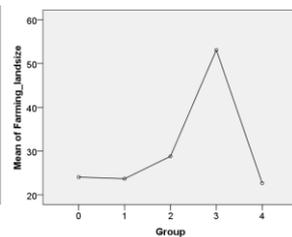


Fig. 8. Farmland area

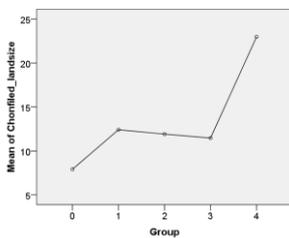


Fig. 9. Chon field area

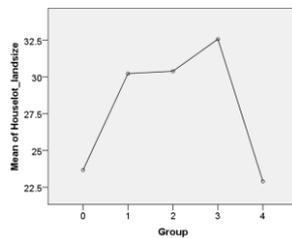


Fig. 10. Household area

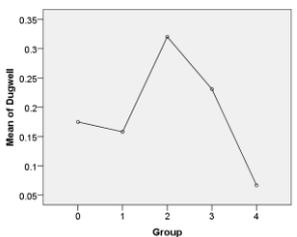


Fig. 11. Dug well

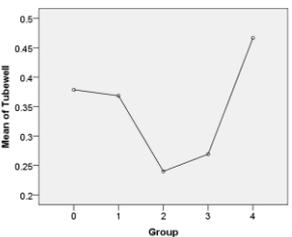


Fig. 12. Tube well

C. The differences in fuelwood acquisition

Figs. 13-15 show the ways in which households obtain fuelwood. Fig. 13 shows the average number of households that purchase it at bazaars, while Fig. 14 shows the average number that collect it themselves from the forest. Fig. 15 shows the households that get fuelwood through other means, for example, in exchange for labour.

per person. Fig.15. shows that group 3 may use different methods to get their fuelwood, which makes sense if we consider that it is the richest group in the village.

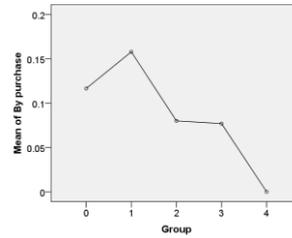


Fig. 13. By purchase

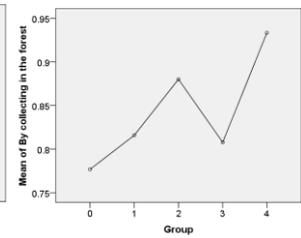


Fig. 14. From forest

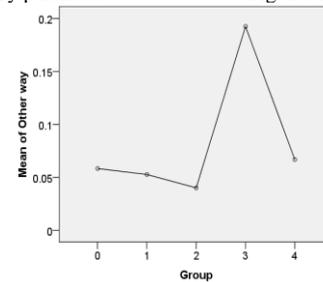


Fig. 15. Fuel wood obtained by other methods

Fig. 16 and Fig. 17 show the average number of households that collect fuel wood ‘for domestic purposes’ and ‘to sell’, respectively, if it is collected by themselves.

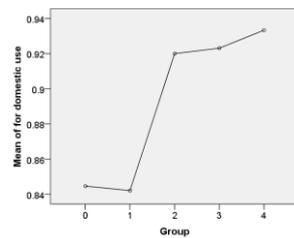


Fig. 16. For domestic use

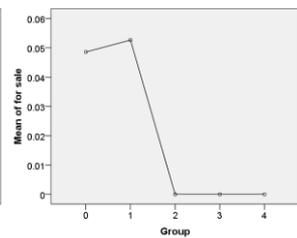


Fig. 17. For sell

Figs. 11 and 12 indicate that water availability may influence household decisions to begin cultivating betel leaves.

Sakamoto et al. [2] hypothesised by showing Fig. 17 that the time period of 10 to 15 years ago marked the beginning when households were obliged to purchase trees and thatch from the market, although betel leaf cultivation had not provided sufficient benefits to those who started cultivation in this same period.

1st period before 1975	2nd period 1980-1985	3rd period 1990-1995	Turning point of forest resources	4th period 2000-2010
Betel leaf cultivation was started experimentally.	Betel leaf cultivation was rapidly disseminated among the poor. It contributed to income increases.	Betel leaf cultivation was disseminated among the poor. It contributed to income increases.		Betel leaf cultivation was disseminated among the poor. It did not contribute to income.

Fig.17. Distribution process of betel leaf cultivation

Fig. 13 to Fig. 15. support this, as the main method for group 1 to get fuelwood is through purchase. Although this study only surveyed villagers on how they obtained wood for fuel, their responses can also be applied to wood acquisition for Pan boroz construction in betel leaf cultivation.

Figs. 16 and 17 indicate that group 1 needs more income, therefore the majority of group 1 answered that they would sell purchase fuelwood if they could get it by themselves.

Considering that the characteristics of group 0 (has not started betel leaf cultivation) are similar to that of group 1, there seems to be a number of households who are potential

DISCUSSION

Based on mean income (Fig. 5), farming land area (Fig. 8), and household lot size (Fig. 10), group 3 seems to be the wealthiest. Although Fig. 6 shows that income per person is not the highest in group 3, this may be because they are rich enough to support more children, thereby decreasing income

candidates to start betel leaf cultivation, although it would not generate much income for them. Therefore, some measures should be taken to prohibit villagers from cultivating betel leaves. However, for the purpose of forest preservation, Fig. 14 suggests that the bans should focus on group 4 first because they seem to be the biggest consumers of forest resources.

CONCLUSION

This study has focused on betel leaf cultivation as a factor of deforestation in the Teknaf peninsula of Bangladesh, and has examined the differences between the groups engaged in betel leaf cultivation, which were categorised according to when they began this practice.

The results supported what Sakamoto et al. hypothesised: that betel leaf cultivation did not contribute to income generation for group 1, who lastly started the practice; the turning point in forest resources occurred 10 to 15 years ago; households in group 1 were obliged to purchase wood from the market because of the turning point in forest resources; and this is perhaps the reason why betel leaf cultivation has not been able to increase the household incomes of group 1.

However, some questions still remain: 1. Why can group 4 get much fuel wood from the forest? 2. How does group 3 get fuel wood from? 3. Why is only group 1 obliged to purchase fuel wood? Does water availability influence the crops selected to be cultivated?

The data on land areas was based on the stated answers of households. Figs. 8, 9, and 10 are based on data obtained in the same questionnaire, but Fig. 7 is based on data obtained in an additional survey, which was conducted by visiting all of the *Pan boroz* and asking owners about their size. Fig. 18 shows *Pan boroz* size based on data obtained in the same questionnaire as Figs. 8, 9, and 10.

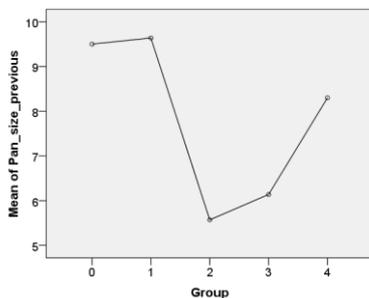


Fig.18. *Pan boroz* size in the previous survey

Fig. 18 shows a totally different tendency and scale from that of Fig. 7. Therefore, it is better to ask villagers about the area of their land while visually referencing it. In this sense, the data on farmland areas and *chonfield* areas should be recollected.

ACKNOWLEDGEMENT

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