SPICES:

The Problem of Premature Harvesting

S.M.M.Zuhari

Agricultural Economist, Department of Agriculture, University of Peradeniya

The minor export crop sector of Sri Lanka has been one of its neglected sectors for a long time and still is. Part of the reason for this is this sector's relatively low contribution to the country's foreign exchange earnings compared to the major crops such as tea, rubber, and coconut. This neglect is prominent in the government's attention on these crops as well as the research done on these crops. The few studies done on these crops have indicated the potentials of this sector in terms of foreign exchange earnings and as alternative crops on marginal tea lands. Even the establishment of a foetal research station for these crops came about only as late as 1969; this station is not fully equipped by any standard. The spices in the minor export crop sector produce a set of raw materials which turn out expensive products in the phamaceutical and the cosmetic industry. Yet, Sri Lanka has not developed the processing sector of the industry, which has immense potential as an income generator. Even a detailed set of information on the structure of the sector is not available. This includes basic information such as the number of holdings, average size of a holding, age of crop bearing trees, and the average yield of the crops. The problems mentioned above have at least been identified and have been subject to preliminary discussions. Some of these have been discussed elsewhere in this Special Issue.

Apart from these problems, one which escapes most eyes is the problem of premature harvesting. The objective of this paper is to present some findings of a research done to determine the reasons for this behaviour and to identify factors which can be used to predict this behaviour. This study was done during the 1985/86 growing season in the Matale and Kandy districts among a random sample of 240 MEC growers.The crops included in the study were: cocoa, pepper, nutmeg, cardomom, and pepper. This paper first presents the reasons given by the growers for premature harvesting. Second, it presents the results of a logit probability model estimated to explain this behaviour with socioeconomic characteristics of the farm family. The third section discusses some of the assistance required by the farmers, as stated by them, to rectify the problem of premature harvesting. The last section discusses some policy implications of the study findings.

The basis for the study is that growers could lose income by harvesting their crop at a premature stage of growth due to two reasons. One is the loss in the quantity of harvest and the other is the loss in the quality of harvest. This study did not estimate the income effect of quality loss for two reasons. One is that the loss of income due to loss of quality involves detailed analysis of the consequential effects in the pharmaceutical, the cosmetic, and the confectionery industries. The other is that the quality of the product depends to some extent on the method of processing, especially for crops like cocoa, coffee, and cardomoms.

An original objective of this study was to estimate the cash income loss due to premature harvesting both at the farm level as well as at the national level. The income loss to the country could not be estimated because of the lack of appropriate information on the exported quantities of the various grades of the study crops. The study showed that the loss of income at the farm level due to premature harvesting can be as much as Rs.3000.00 per year, which is about 25% of the total potential earnings. This is an average figure and can vary with the number of trees, the nature of the crop-mix, and the proportion of income from the MEC's of the total farm income.

Reasons for premature harvesting

The farmers in the sample were requested to rank some hypothesised reasons for the behaviour of premature harvesting. The main reasons included were fear of losing the crop due to thievery, harvesting the crop due to immediate money needs of the family, and harvesting the crop early to prevent pest and disease attacks. Table 1 summarizes the results.

The numbers shown in the table are the percentage of the farmers in the sample who reported the corresponding reason as the first, second, or hird important reason for harvesting he crop at a premature stage. It is clearly seen that a social factor plays a very important role in the behaviour. Premature harvesting due to thievery has two effects. One is the selling of the stolen produce and the other is owners harvesting the product before the thieves could get their hands on the crop. The second most important factor governing this behaviour is the farm family's need for money to meet day to day expenses, where the crop is harvested whenever the farm family needs money. The third factor is a preventive measure against the attack of pests and diseases. A small number of farmers reported other reasons such as insignificant difference in the prices of the various grades (5%), and demand for the crop irrespective of the difference in the stage of maturity (5%). Yet a smaller number of farmers (2%) reported that they harvest the crop at a premature stage only when the price paid for the crop is so high that they do not feel the difference in the income due to premature harvesting.

Factors to explain the behaviour

This section briefly discusses the results of a prediction model estimated to explain the behaviour of premature harvesting with certain socioeconomic characteristics of the farm family. The variables included were: family size, age of the farmer, farming experience of the chief of household, number of

TABLE 1 REASONS FOR PREMATURE HARVESTING

Reason	Rank 1	2	3	Number of responses as a percentage of total sample
Fear of theft	50	30	20	88
Immediate money needs	48	35	17	82
Pest and Disease problems	20	34	46	52

minor export crops grown by the farmer, total family income, level of education of the farmer, and the proportion of total land under rice to the total land cultivated by the farmer. This article will not justify the selection of these variables to explain the behaviour. Interested readers are referred to the author. The signs of the estimates of the logit model can be interpreted as the direction in which the probability of premature harvesting can be influenced by manipulating the explanatory variable. Of the variables included to explain the behaviour, the income variable, the land ratio variable, and the education variable had a significant influence on the behaviour. Of these the income variable and the education variable had a negative relationship with the probability of premature harvesting. This implies that an increase in the income or an increase in the level of education of a farmer would decrease the probability of that farmer harvesting his crops at a premature stage of growth. The land variable had a positive effect implying that any increase in the land holding ratio will increase the probability of premature harvesting. Increase in the land ratio variable implies that the proportion of land under paddy has increased.

Assistance Requested by the Growers

When the farmers were asked what kind of assistance they would require to rectify the problem, the answers they gave were consistent with the reasons for premature harvesting and the results of the logit model. The major responses are given in table 2. Ninety-eight percent of the sample requested protection from theft of which 49% ranked it as the most needed assistance. An almost equal amount requested consumption credit to provide an income means to carry them through the growing season. Nearly a fourth of the sample requested the market for these crops to be institutionalized, in a fashion similar to the market for the subsidiary food crops. About 20% of the farmers requested extension information on the prices and other cultural practices for the crops.

TABLE 2 ASSISTANCE REQUESTED BY THE GROWERS

Assistance	1	2	3	4	5	6	7	Total
Protection from theft	49	7	7	5	27	3	0	98
Consumption credit	29	9	1	0	11	3	0	95
Institutionalized markets	3	25	6	8	2	1	0	80
Extension information	2	22	17	45	7	2	2	71
Stricter regulation on grading	2	8	61	23	5	0	0	43

Policy Implications

The objective of this section is to highlight some policy measures which appear promising to solve the problem of premature harvesting. Implementing these suggestions would require careful detailed feasibility and benefit-cost analysis.

Of the variables included to explain the behaviour of the farmers, the education varaible lends itself to convenient manipulation with simple policy measures. As suggested by the sign on these variables, improving the level of education of the farmers would decrease the incidence of premature harvesting. The mean age of the sample, 52.5 years, indicate that an average MEC grower has long passed the age of formal schooling and education. Hence, any attempt to increase the level of education of these farmers has to be done through the extension service. Extension policies need to be directed at teaching the farmers the implications of premature harvesting and the measures that can be adopted to minimize the risk of letting the crop mature on the tree, such as proper pest control measures. Besides these measures, the extension service can disseminate information on the market price of these crops. A recent study has shown the marketing margin for these crops to be between 25 and 40%, which is fairly high. With more farmers having access to TV's and radios, steps could be taken to announce the auction prices over the mass media.

The implications of the estimate on the income variable are however, broader than those of education variable. Policy measures to increse the level of income of the household can be achieved in at least two ways. One way is to increase the household income by increasing the employment opportunities. This alternative is part of the national employment policies and, thus, is beyond the scope of this article. A second approach is to increase income from other agricultural producers in the regions. This can be achieved by improving the benefit-cost relationships for these crops by providing input subsidies and price supports for the output.

This article addressed the problem of premature harvesting of minor export crops in Sri Lanka. The main reasons given by farmers for premature harvesting were fear of theft, immediate money needs, and as a preventive measure against pest and disaese attacks. The growers' income, education, and the porportion of paddy land were related to this behaviour. Even though some of the assistance requested by the growers were not practical, one form of the assistance requested by them, consumption credit, is worth considering. As policy measures, increasing the level of education, improving the extension information given to the farmers, and improving the general level of income of growers are worth detailed analysis as alternative measures. Besides these, the sector needs detailed record keeping on the export of these crops.