

# **A REVIEW OF STUDIES ON RUBBER SMALL HOLDER SECTOR IN SRI LANKA WITH SPECIAL REFERENCE TO COST OF PRODUCTION (COP).**

*By*

**W. N. WICKREMASINGHE,\* S. De SILVA\*\* and L. T. PEIRIS\*\*\***

## **Abstract**

In Sri Lanka about 72% of the area under rubber consists of small holdings of 20 hectares or less in extent. Therefore small holder sector is responsible for a major share in Sri Lanka's contribution to world natural rubber output.

Most of the research done on natural rubber in Sri Lanka, has been geared to the interest of the estate sector. The work done on smallholder sector has been proportionately less.

The purpose of this paper is to review the countably few studies done for the small holder sector with special reference to cost of production (COP) aspect. These studies are classified according to objectives, scope of the study and the priority given to COP aspect. The studies which considered COP aspect are further discussed and emphasis is given to significant cost items. Recent practices of COP estimation are also mentioned. Constraints and suggestions for improvement are also discussed.

## **Introduction**

In Sri Lanka about 72% of the total area under rubber consists of small holdings of size 20ha and less. Therefore, smallholder sector is responsible for a major share of Sri Lanka's contribution to world's natural rubber output. The estate sector, which accounts for the balance 28% of the area under rubber, consists

---

\* Dept. of Statistical & Computer Science, University of Colombo, Colombo 3, Sri Lanka.

\*\* Central Bank, Colombo 1, Sri Lanka.

\*\*\*

of large estates. Majority of these estates are managed by the government while some are still owned by the private sector.

Most of the research done so far on natural rubber in Sri Lanka, has been (geared towards) the interests of the estates sector. The work done on the smallholder sector was proportionately less.

The purpose of this paper is to review the countably few studies done so far on the smallholder sector with special reference to cost of production (COP) estimates. An attempt will be made to classify these studies according to their objectives and degree of priority given to estimate COP in them. Sampling methodologies and the populations represented by the samples in these studies will also be taken into consideration in the classification. The recent work with specific objectives related to COP estimation will be discussed in brief.

### Studies done so far

Several studies on smallholder sector, with various objectives, have been done in the past. These mainly used sample surveys. Some of the early work was due to Dissanayake (1963, 1968 and 1978). They provided preliminary information on specific aspects such as, economic life span of rubber trees and trends in extension methods. Jayasuriya and Carrad (1977) provide a thorough economic analysis on the aspect of replanting based on a survey of 165 smallholders from Colombo, Kalutara and Ratnapura Districts. Because of the inadequacy of the sample size relative to the population of interest it is doubtful if the results could be generalized. Another comprehensive economic study on smallholder rubber in a selected region using a sample of 289 small holdings, is reported by Barlow *et. al.* (1975). Though the size of the sample seems to be relatively adequate the study seems to be biased, for it talks only about the 'good' holdings purposely selected and does not represent the average rubber smallholding in that region. Chandrasiri *et. al.* (1977) also used survey data of Barlow *et. al.* (1975) to estimate a production function for smallholder rubber. Chandrasiri *et. al.* (1978) have studied socio economic aspects of group processing of smallholders' latex. Waidyanatha *et. al.* (1980), and Widanapathirana (1980 and 1982) also provide detailed aspects of smallholder rubber. The smallholder survey done as part of the rubber Master Plan Study (C.D.C. 1979) is one of the best available which gives preliminary information on all aspects of smallholder rubber in the country. Another striking feature of this study (C.D.C. 1979) is the sampling methodology used which deviated from the conventional method of selecting from a frame, but gives a more representative picture of the entire smallholder sector. Smallholder Rubber Rehabilitation Project I (SRRP 1) of Sri Lanka which commenced in 1981 (Jayasena and Herath 1984) is a result of the recommendations given by the Master Plan Study (C.D.C. 1979). A base line survey to analyse the pre-project situation with emphasis on socio economic conditions was done in 1981 (Jayasena and Herath 1984). This was followed by two in-depth surveys as an evaluation of the on

going project, also by the same authors (1986a, 1986b). These surveys have been well planned and adequately designed and provided representative information. SRRP II which is the second phase of the Smallholder Rubber Rehabilitation Project with aim of improving the quantity and quality of smallholder rubber in Sri Lanka, was a follow up to the on going Smallholder Rubber Rehabilitation Project I. Under this project a program of adaptive research to cater to the needs of SH's was started in 1989. Recent study by Liyanage and Moogahawatto (1989) has looked into all aspects of rubber production but has emphasized none on the cultural aspects since it was done mainly to identify areas in which adaptive research programme could be implemented in the SH sector. The study carried out by Wickramasinghe *et. al.* (1986) mainly concentrated on socio economic aspects and smallholder practices in the three main rubber growing areas in Sri Lanka, namely, Kalutara, Ratnapura and Kogalle. The survey was well designed and could be thought to provide representative information as in the case of Jayasena and Herath (1984). However, the sample size was smaller than that of Jayasena and Herath (1984). A complete census of the entire rubber land followed by a sample survey to obtain specific information on smallholders, was carried out by the Rubber Control Department complete census of the entire rubber land followed by a sample survey to obtain mont (RCD) in 1984.

Next we will attempt to classify the above mentioned studies by various workers, on the directions given in Table 1.

### A Two Way Classification of Work Done so far

With the aim of identifying studies done so far that give representative information on COP aspects, they have been classified according to objectives, methodology and degree of priority given to COP estimation. (Table 1)

**Table 1 A TWO WAY CLASSIFICATION OF STUDIES DONE ON SMALLHOLDER RUBBER SECTOR IN SRI LANKA**

<i>Sampling design and scope of the study</i>			
Objectives of Study	Adequately designed Represent entire smallholder sector	Adequately designed but limited scope	Sample may not be adequate for the objectives or details of design not given
Main objective is COP estimation	—	—	—
COP estimation is one of the objectives	8	1	—
Though not an objective some information on COP aspect can be obtained	2	—	—
Does not address COP aspect	5, 6, 7, 9, 10, 12, 13	3, 14	4, 11

In addition to the studies listed in table 1 there are a few more which will not be discussed as the COP aspect has not been of priority in them.

Our attention will only be focussed to items 1 and 8 of Table 1. in this paper.

### Cost of Production

The items 1 and 8 of the literature reviewed, have included COP estimates as one of the objectives. The two studies which deal considerably with COP are by Barlow *et. al.* (1975) and Jayasena and Horath (1984). Their studies are comprehensive and give a break down of the cost items which is given in Table 2 as a percentage of the total COP/kg.

**Table 2** COP/kg OF THE DIFFERENT COST ITEMS AS A PERCENTAGE OF TOTAL COP/kg.

<i>Cost item</i>	<i>Barlow et. al.</i> <i>(1975)</i>	<i>Jayasena and</i> <i>Herath (1984)</i>
(i) Weeding .....	5.5	6.0
(ii) Soil conservation .....	—	1.6
(iii) Fertilizer .....	1.7	1.5
(iv) Pest and disease control .....	11.7	3.0
(v) Tapping .....	61.0	72.0
(vi) Processing .....	20.0	16.0

### Significant cost items

It is observed that the main cost item is tapping and this together with processing account for more than 80% of the total cost. The low proportion of the fertilizer cost in the total COP is due to the small number of smallholders actually using fertilizer and because the figures given are averaged over the entire sample irrespective of fertilizer use. But when only the effective sample size relevant to fertilizer use is considered, fertilizer cost accounts for about 12% of the total COP.

These studies indicate that the cost structure has not changed very much over time and we can expect it to be the same at present, too. Most of these operations are labour intensive and studies have shown that over 80% of the total COP is spent on labour. Hence in estimating COP of the smallholder it is important to have a method by which the labour use is accurately estimated.

## **Present practice in estimating COP**

The Rubber Control Department (RCD) carries out mail surveys annually, with the help of the Department of Census and Statistics to estimate the COP in the estate sector. A survey in the smallholder sector in this respect was initiated but has been curtailed due to the disturbances experienced in the country. Generally the COP for smallholders are estimated using the estate sector surveys and eliminating cost items which are not relevant to the smallholder. Although this would give a fairly accurate picture of the total COP the approach adopted is an indirect one. A direct estimation of smallholder COP could be anticipated once the survey planned by the RCD for the smallholder sector comes into effect.

## **Labour use & constraints**

As mentioned earlier, since labour is the main component of most cost items, it would be appropriate to look into the labour use further in trying to estimate COP.

The smaller holdings mainly rely on family labour for their operations where as the larger holdings use hired labour. Cost of hired labour can be estimated with considerable accuracy since wage rates could be known but the estimation of family labour may cause difficulty because most of the family members are involved in working in the holding and they may not be comparable with each other. For eg., work done by women and children, are not comparable with the type of tasks performed by men.

Complications are also present in the wages paid to tappers. Different criteria such as wage per day, wage per intake and share of intake are observed. In sharing output, some tappers get all the scrap for them while others get only part of it with either half or one third of the latex intake.

Different methods are used in processing as well. Almost all the smallholders do the coagulation of latex on their own. Most of the small farmers mill their sheets else where, mainly at a mill owned by a larger farmer, while the latter does his milling on his own. Most smallholders do their own smoking but not necessarily in a smoke house. The very small holders smoke their sheets in their kitchens.

Further the priority given by the smallholder to rubber is also important since most small holders have sources of income other than rubber. This has to be taken into consideration when opportunity costs for family labour has to be calculated.

## Suggestions

In estimating COP for smallholders in a broader sense it would be appropriate to have estimates with reference to the different categories of smallholders such as priority given to rubber, land size, type of labour used, other sources of income etc. This would give a variation of the COP among smallholders and the reasons for them could be isolated.

## Acknowledgements

The authors wish to thank the Rubber Research Institute of Sri Lanka, for the encouragement and permission to present this. Thanks are also due to the Rubber Controller and his staff, for the co-operation extended.

## Literature reviewed

1. BARLOW, C., PERIES, O. S., DISSANAYAKA, A. B., AND CHANDRASIRI, G.R. (1975) Some Aspects of Economics of Smallholdings Rubber in Sri Lanka. *Proceedings of the International Rubber Conference*, October 20 — 25, Kuala Lumpur, Malaysia.
2. COMMONWEALTH DEVELOPMENT CORPORATION (1979). Report on the Rubber Industry Master Plan, Vol IV, London.
3. CHANDRASIRI, G.R., CARRAD, B., TEO, C.K., AND WEERASINGHE, S. (1977). The Specification and Estimation of a Production Function for Smallholding Rubber in Sri Lanka, *Jl. Rubb. Res. Inst. Sri Lanka*, 54, part 1, No. 2, pp 398 — 416.
4. CHANDRASIRI, G.R., GUNASEKERA, H.D.B.H., AND WEERASINGHE S.L. (1978) Socio Economics Aspects of Group Processing of Smallholder Latex in Sri Lanka. *Jl. Rubb. Res. Inst. Sri Lanka*, 55, pp 13—22.
5. DISSANAYAKE, A.B. (1963) A Survey of Tapping in Smallholdings Planted Under The Rubber Replanting Subsidy Scheme. *Quarterly Jl. Rubb. Res. Inst. Sri Lanka*, 39, pp 38—49.
6. DISSANAYAKE, A.B. (1968) The Economic Life span of the Rubber Tree in Smallholdings. *Quarterly Jl. Rubb. Res. Inst. Sri Lanka*, 44, pp 49—53.
7. DISSANAYAKE, A.B. (1978) Trends in Extension Methods in Smallholdings *Jl. Rubb. Res. Inst. Sri Lanka*, 55, pp 1—4.
8. JAYASENA, W.G., AND HERATH, H.M.G. ————— Economic Conditions of Rubber Smallholdings of Sri Lanka, A Pre-project study of Ratnapura, Kalutara, and Kegalle districts, *ARTI, Research Study* No. 61.

9. JAYASENA, W.G., AND HERATH, H.M.G. (1986<sup>a</sup>) Innovation, Receptivity and Adoption in Rubber Smallholdings of Sri Lanka, *ARTI, Research Study* No. 71.
10. JAYASENA, W.G., AND HERATH, H.M.G. (1986<sup>b</sup>) Smallholder Rubber Replanting in Sri Lanka; Trends, Problems, and Factors Influencing Their Decisions, *ARTI, Research study* No. 72.
11. JAYASURIYA, S.K.W., AND CARRAD, B. (1977). Decision Making in Smallholding Rubber; Attitudes to Replanting in Sri Lanka, *Jl. Rubb. Res. Inst. Sri Lanka*, 54, part 1, No. 2, pp 381—397.
12. WAIDYANATHA, U.P. de S., WIDANAPATHIRANA, A.S., AND DE ZOYSA, R.P.M. (1980) Some Observations on Sri Lankan Rubber Smallholder Practices with Special Reference to Tapping. *Paper presented at the 4th seminar and workshop on progress and development of Rubber Smallholders*, Colombo, Sri Lanka.
13. WICKREMASINGHE, W.N., De. SILVA, S., AND TALGASWATTA, H. (1986) Preliminary Report of the Survey on Socio Economic Aspects and Practices in the Rubber Smallholder Sector in Sri Lanka, (Unpublished).
14. WIDANAPATHIRANA, A. S. (1982), Knowledge and Attitudes of Small Rubber Growers towards Intercropping. *Paper presented at the 38th session of the Sri Lanka Association for the Advancement of Science*, Colombo.