

SOCIO ECONOMIC ASPECTS OF GROUP PROCESSING OF SMALLHOLDER'S LATEX IN SRI LANKA

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INTRODUCTION

Group Processing of smallholder's latex in Sri Lanka dates back to 1946 when the Island's First Co-operative Processing Centre was brought into operation at Hataraliyadda in Kandy district. At that time the main objective of this method of manufacture was to collectivize sheet manufacture at the village level so that extension officers could supervise them as a group in order to improve the quality of Ribbed Smoked Sheet (RSS). Although the extension facilities were provided by the Rubber Research Institute of Sri Lanka (RRISL) no direct capital expenditure was incurred either by the RRISL or the government in the erection of buildings and the provision of equipment. The only kind of aid received by the Group Processing Centre (GPC) was a pair of rollers from the RRISL, on the basis of a long term credit facility. This had to be settled by collecting two cents per pound of RSS manufactured and no time limit was imposed. Thus the total cost of erection of buildings, purchasing of equipment and also the working capital were entirely met by the participants as a co-operative society.

This scheme did not expand appreciably, possibly due to two main reasons. One of them was the difficulty in organizing a co-operative society amongst villagers with diversified interests understanding and expectations. The other reason would have been that the rural folk are generally not risk takers, particularly in pooling their resources, such as capital and labour, and the subsequent re-allocation of those resources in running a co-operative enterprise. This would have been further affected due to the day to day fluctuations of rubber prices, associated with future price uncertainties. Thus until the end of 1970 or so not more than three such GPCC came into operation in the rubber growing districts of Sri Lanka.

However, in 1971 on the basis of the recommendations made by the RRISL the Government decided to review the scheme with more active participation. Thus the expansion programme of the scheme on a national basis was built into the Government five year development plan with adequate funds being allocated for speedy implementation of the new GPC scheme. Consequently the investments on village level GPC are directly undertaken by the state through the Advisory Services Department of the RRISL. As a result of this today, there are 84 such centres in operation while a further 24 are being constructed in almost all the rubber growing districts.

Present GPC Scheme

Objectives: The basic objective of the present GPC scheme remains the same and that is to improve the quality of sheet rubber manufactured by the smallholders (Table 1) at minimum cost. This is of national importance in two main

TABLE 1. GRADING OF RSS PRODUCED BY GPCC IN 1976*

GRADE	Percentage
RSS 1**	59.7
RSS 2	23.2
RSS 3	11.9
RSS 4 and 5	5.2
TOTAL —	100

Sample 41

* Up to end of June 1976.

** Seven GPC have reported over 80% of RSS 1.

Source: GPC Monthly Reports from RRISL for the year 1976 (January - June)

areas. One of them is to improve the socio-economic position of a large number of smallholders, of whom there are some 149,000 owning about one third of the rubber acreage in the island, with an average holding size of about 1.4 acres (Table 2).

TABLE 2. DISTRIBUTION OF HOLDINGS AND PLANTED ACREAGE BY SIZE OF HOLDINGS

Holding Size (ac.)	Registered Acreage (1000 ac.)	Number of Holdings	Average Extent per Holding in ac.	Planted Acreage in Tapping
Less than 10	208.1	149,002	1.4	171.8
10 - 99	154.3	6,061	26.5	132.4
100 - 499	147.0	655	221.6	265.3
500 and over	165.1	181	912.0	
All holdings	674.5	155,909	4.4	569.5

Source: Administrative Report of the Rubber Controller for 1970 Sri Lanka.

Traditionally a very large number of these people depended on the processing services offered by the well-to-do bigger smallholders who own such processing facilities in the villages. Although these facilities were available at a charge, the quality of the manufactured RSS was often found to be low (Table 3), because the processors are

TABLE 3. GRADING RSS PRODUCED BY HOLDINGS OF DIFFERENT SIZES

HOLDING SIZE	GRADES PERCENTAGE				
	RSS 1	RSS 2	RSS 3	RSS 4	RSS 5
Up to 1 ac.	—	4	88	7	1
1.01-2.00 ac.	—	8	86	6	—
Over 2.00 ac.	—	9	87	4	—

Sample Size - 296

Source: 1971 Smallholding Survey, RRISL

monopolists whose essential motive is profit making, so that little care was taken to maintain quality standards. In fact, irrespective of what quality rubber they manufactured, the manufacturing charge remained the same. Secondly, improvement in the quality of RSS means more foreign exchange for the country. This is well illustrated in (Tables 4 and 5) where the price differentials amongst different

TABLE 4. PRICE DIFFERENTIAL BETWEEN VARIOUS GRADES

GRADES	1972 (Cts)	1973 (Cts)	1974 (Cts)	1975 (Cts)	Average Differential (Cts)
RSS 1	6	9	17	5	9
RSS 2	3	2	7	9	5
RSS 3	6	5	11	25	11
RSS 4					

Source: Reports of Messrs Forbes & Walker Ltd., 1974-1975

TABLE 5. THE QUANTITY (LONG TONS) OF THE DIFFERENT GRADES OF RSS PRODUCED* 1970 - 1975

GRADES	Average	%
RSS 1	28114	27.2
RSS 2	21027	20.4
RSS 3	21564	20.8
Others 4 and 5	32515	31.6

* It is assumed that the quantity produced is graded at the point of export
Source: Rubber Control Department (Personal communication)

grades are shown. Thus, if the total quantity of rubber manufactured by the smallholders could be improved to grade 1 RSS, the additional foreign exchange earned would be substantial.

One other objective of this scheme is the creation of a certain amount of employment opportunities in the country-side. This however is debatable, because the new jobs may have been created at the expense of the old processors, who were also depending on the smallholders, at least to a certain degree for their living.

Finances and Implementation

In order to achieve the three broad objectives discussed above, a more positive and progressive policy was drawn up for implementation. A sum of Rs. 20,000/- was allocated per GPC by the Government in 1973. This sum of money included an outright grant of Rs. 8,000/- and a loan of Rs. 12,000/- which was to be recovered with interest over a long period of time at a rate of two cents per pound of RSS manufactured.

Location: Selection of suitable locations and sites is undertaken by the RRISL, as required, or when requests are made by groups of rubber smallholders. Suitable sites are selected on the basis of a field survey of smallholdings within a radius of about 1 to 1½ miles in order to assess the total crop potential of the area. If the potential is found to be around 800 - 900 pounds per day then a GPC is recommended for the village with the consent of the Member, National State Assembly of the area. Once the recommendation is made, a GPC society is formed amongst the participants. This society is directed by a committee consisting of a President, Secretary, Treasurer and working committee of 3 - 4 people. Usually the Rubber Instructor (RI) in the area is an ex-officio member of the committee and often acts as its Vice President. The selection of the actual site for the building is often the responsibility of the committee. Usually, sites are readily available, sometimes as gifts from wealthy persons in the village or on long term lease. However, before the construction of the buildings, the land is legally leased out by the Director, RRISL, in order to avoid disputes later.

Before money is given for the construction of the buildings the President, Secretary and the Treasurer of the society jointly sign a bond with the RRISL that the money allocated for the GPC will be properly utilized for the initial capital expenditure on buildings and equipment. A further clause is included to the effect that a sum of Rs. 12,000/- will be paid back to the Institute at a rate of two cts. per lb. of rubber manufactured. There is no time limit to the repayment of this loan. The detailed analysis of the expenditure involved in the construction of the GPC and the purchasing of a pair of rollers and other equipment is given in table 6.

TABLE 6. FINANCIAL COSTS PER GPC WITH THE CAPACITY OF 700 LB/DAY

Capital Expenditure		Recurrent Expenditure	
Item	Rs.	Item	Rs.
Smoke House	7000.00	Manager	1200.00
Curing Shed	7000.00	Paid Assistants	900.00
Two sets of Rollers	3200.00	Labour	2400.00
Strainers (2)	100.00	Acid	434.00
Metrolac	250.00	Firewood	3000.00
Other Utensils	450.00	Miscellaneous	420.00
Miscellaneous	200.00	Transport	600.00
Working Capital	1800.00		
TOTAL	20000.00	TOTAL	8954.00

This money is generally channeled to the GPC through the Divisional Advisory Officer (D.A.O.) of the Advisory Services Dept in instalments on the progress of construction work.

Management: The responsibility of running the GPC falls on to the committee but the RI of the area is closely associated with the management. A suitable person is recruited as the Manager/Rubber Maker of the GPC to carry out the day to day functions; depending on the daily collection, extra labour is recruited from among smallholders or outsiders to assist the manager. The wage rate of the GPC work force, including the Manager will generally depend on the amount of rubber processed, as the cost of production COP is inversely related to the average turn over per day (table 7).

TABLE 7. RELATIONSHIP BETWEEN COST OF MANUFACTURE AND AVERAGE THROUGHOUT PER DAY FOR GPCC

Throughout per Day (lb)	No. of GPCC Reported	Grade 1 RSS (lb.)	Grade 2 RSS (lb.)	Grade 3 RSS (lb.)	Total Production (lb.)	Cost of Manufacture per (lb.)
Over 350	.. 4	132,610	26,756	5,020	168,859	17
300 — 350	.. 1	13,809	7,943	14,205	40,705	19
250 — 300	.. 5	122,710	36,496	15,757	178,160	17
200 — 250	.. 2	39,836	9,033	3,199	54,669	20
150 — 200	.. 11	162,059	60,927	15,692	243,744	20
100 — 150	.. 7	40,955	28,213	17,340	92,761	21
50 — 100	.. 11	38,794	44,944	39,358	143,424	22
TOTAL	.. 41	550,773	214,312	110,571	922,322	
Average	—	—	—	22,496	18

Source: RRISL - Economic Research Unit, Data Bank

The weight of dry rubber content (drc) in latex brought to the centre is measured by means of a metrolac and noted against the participant's names in a book maintained at the centre. Similar entries are made in the hand books usually carried by the participants or receipts are issued indicating the total (drc) of latex. This system is adopted in almost all the GPCC.

Once the field latex is handed over to the GPC the owners are free to leave, the rest of the operations being handled by the management. Weekly advances are generally paid to members on the basis of the total rubber* supplied by each

* The approximate total rubber content is measured by the use of a metrolac.

member per week and on the average selling price for that week. Sales are arranged once a month or at fortnightly intervals, depending on the volume of production, price trend, transport charges and the wishes of the committee. The RI who is an ex-officio member of the committee, often helps in solving technical problems, confronting the society. He also looks into the accounts and records so that any inaccuracies in accounting are reduced. He also helps the committee in contacting the buyers and in working out the accounts. From the sales revenue an amount of 20 cts per lb is deducted. (18 cts COP and 2 cts for loan repayment). The rest is divided according to the amount of latex brought in, and, any excess poundage, due to possible errors in the metrolac reading, is divided amongst the membership, in proportion to the share of total dry rubber supplied by them.

METHODOLOGY

An economic evaluation of any agricultural project such as the GPC programme is essential before resources are committed for expansion. This becomes even more important in a developing country like Sri Lanka where, not only are such resources limited but alternative investment opportunities are numerous. Further, this is important for politicians, administrators and planners for the development of national policy.

Analytical Model: Methodology for this analysis is based on the concept of time value of money often mathematically expressed by the equation.

$$V_0 = \sum_{n=1}^n \frac{B_n - C_n}{(1 + r)^n}$$

where V_0	=	is the present value
B_n	=	benefit in each year
n	=	number of years
r	=	interest rate also called the discount rate
C_n	=	cost in each year

According to this concept of the time value of money, productive investments could be undertaken as long as a positive net present value (NPV) is obtained at an interest rate which would be attractive to the investors.

Social Cost Benefit Analysis: This simple model is used to evaluate the economic benefits occurring to the society (Economy) due to a single GPC. In doing so the input costs and the output are subjected to shadow pricing to arrive at realistic social costs and benefits. This is illustrated in (table 8) where some of the capital inputs such as the rollers and other equipment are shadow priced 65% more than the actual market price because the raw materials needed for these are imported at FEECS*, rates from abroad. Labour costs in the construction of buildings have

*FEECS - Most of the imports are subjected to this adjustment by the Government under the Foreign Exchange Entitlement Certificate Scheme introduced in 1969.

TABLE 8. SOCIAL COSTS PER GPC WITH THE CAPACITY OF 700 LB/DAY

CAPITAL COST			RECURRENT COST		
Item		Rs.	Item		Rs.
Smoke House*	..	4200.00	Manager	..	1200.00
Curing Shed*	..	4200.00	Paid Assistant	..	900.00
Two sets of Rollers**	..	4522.25	Labour - Unskilled	..	—
Strainers (2)	..	60.00	Acid**	..	716.00
Metrolac**	..	412.50	Firewood	..	1800.00
Utensils	..	150.00	Maintenance	..	600.00
Miscellaneous Costs	..	200.00	Miscellaneous	..	420.00
Working Capital	..	1800.00	Transport Costs	..	891.00
TOTAL	..	15544.75	TOTAL	..	6527.00

* Unskilled labour inputs for the construction of smoke house and curing shed have been zero priced.

** Shadow priced at 65% more for the imported materials.

been computed at zero cost because of the fact that a large proportion of the labour used in these construction sites is unskilled. Their opportunity cost may be assumed to be more or less zero because of the large amount of unemployed labour existing in the countryside. As a consequence of this, the social cost of construction of the smoke house and the curing shed has been reduced to 40 per cent of the market cost.

Direct economic benefits are occurring to the economy mainly due to the increased flow of foreign exchange as a result of improved quality of RSS exported. In computation of these, two important parameters were taken into consideration. They are the average price differentials between the different grades of RSS exported (Table 4) and the average composition of the different grades of RSS exported over the last five years (Table 5). These two parameters were then used to measure the added value of sheet rubber produced at a GPC consisting about 85 percent of grade 1 RSS compared to about 27–28% for the whole country (Table 5). Thus it is observed that the added value obtained by the improved quality from grade 3 to grade 1 alone could be as much as 10–12 cts per lb (Table 4). Together with FEECS it works out to 16.5 cts per lb which is a substantial gain for the economy. This value is used to work out the cash flow in (Table 9). The NPV of the computed cash flow at an interest rate of 25% for a period of 20 years, *i.e.* assuming that the maximum life span of a GPC is limited to that period, is also given in Table (9).

Financial Analysis: It is also possible to work out a financial analysis of an average GPC using the same analytical model, on the assumption that the group as a whole is undertaking an investment of Rs. 12,000/- *i.e.* the amount which has to be repaid, out of the total grant of Rs. 20,000/-. This is expected to be paid back over an unlimited time period at the rate of two cts. lb. with an interest of nine percent.

In this analysis costs and benefits are valued at market prices of the inputs such as unskilled labour, rollers, equipment and the output, sheet rubber as set out in Tables (6 and 10). However, it should be noted that the net benefit is only the improvement in quality of sheet rubber from grade 3 and below to grade 1 RSS. Thus it is assumed that such an improvement would have given them an additional 18 cts of lb/RSS which would not have been possible without the GPC scheme (table 1).

TABLE 9. SOCIAL COST BENEFIT ANALYSIS FOR A GFC OF CAPACITY 700 LB PER DAY
TOTAL ANNUAL CAPACITY — 140,000 LB (200 WORKING DAYS/YEAR)

YEAR*	CAPITAL COST Rs.	REPLACEMENT & REPAIR COST Rs.	OPERATIONAL & MANAGEMENT COST** Rs.	TOTAL COST Rs.	TOTAL REVENUE*** Rs.	CASH FLOW	DISCOUNTED CASH FLOW AT 25 PERCENT
1	15544.75	—	6527.00	15544.75	9240.00	-15544.75	-12953.44
2	7180.00	7180.00	9240.00 (a)	2713.00	1883.91
3	7897.00	7897.00	13860.00 (b)	2060.00	1192.12
4	..	400.00	8687.00	9087.00	13860.00 (b)	5963.00	2875.36
5	9556.00	9556.00	17325.00 (c)	4773.00	1918.27
6	10512.00	10512.00	17325.00 (c)	7769.00	2601.84
7	11563.00	11563.00	18480.00	6810.00	1900.67
8	11563.00	11563.00	18480.00	6917.00	1608.20
9	..	600.00	11563.00	12163.00	17880.00	6317.00	1340.51
10	11563.00	11563.00	18480.00	6917.00	1020.19
11	11563.00	11563.00	18480.00	6917.00	931.03
12	11563.00	11563.00	18480.00	6917.00	775.39
13	11563.00	11563.00	18480.00	6917.00	646.05
14	11563.00	11563.00	18480.00 (d)	6917.00	538.83
15	..	600.00	11563.00	12163.00	17880.00	6317.00	448.19
16	11563.00	11563.00	18480.00	6917.00	374.21
17	11563.00	11563.00	18480.00	6917.00	311.95
18	11563.00	11563.00	18480.00	6917.00	259.38
19	11563.00	11563.00	18480.00	6917.00	216.50
20	11563.00	11563.00	18480.00	6917.00	180.53

NPV = 7970.65

- * Year of construction of buildings and installation of equipment.
- ** Operational and Management Costs are assumed to increase by 10% per annum up to the 8th year.
- *** Total Revenue is calculated at the rate of 16.5 cents/lb of rubber exported (FEECS at 65% has been included).
- (a) 40% Capacity — 1st two years of operation.
- (b) 60% Capacity — 3rd & 4th years of operation.
- (c) 75% Capacity — 5th & 6th years of operation.
- (d) 80% Capacity — 7th year onwards of operation.

TABLE 10. FINANCIAL COST BENEFIT ANALYSIS FOR A GPC OF CAPACITY 700 LB/DAY
TOTAL ANNUAL CAPACITY — 140,000 LB/YEAR (200 WORKING DAYS/YEAR)

Year	Capital Cost Rs.	Repair & Replacement Cost. Rs.	Operational & Management* Cost Rs.	Total Cost Rs.	Total Revenue** Rs.	Cash Flow	Discounted Cash Flow @25 Percent
1	12,000.00		—	12,000.00	—	-12,000.00	-9,755.00
2			8,954.00	8,954.00	10,080.00	1,126.00	744.17
3			9,849.40	9,849.40	10,080.00	230.60	1,123.92
4			10,834.34	10,834.34	15,120.00	4,285.66	1,871.98
5		400.00	12,317.77	12,717.77	15,120.00	2,402.23	853.27
6			13,109.55	13,109.55	18,900.00	5,790.45	1,671.70
7			14,420.51	14,420.51	18,900.00	4,479.49	1,051.77
8			15,862.56	15,862.56	20,160.00	4,297.44	820.38
9			15,862.56	15,862.56	20,160.00	4,297.44	666.96
10		600.00	15,862.56	16,462.56	20,160.00	3,697.44	466.25
11			15,862.56	15,862.56	20,160.00	4,297.44	483.89
12			15,862.56	15,862.56	20,160.00	4,297.44	358.41
13			15,862.56	15,862.56	20,160.00	4,297.44	291.37
14			15,862.56	15,862.56	20,160.00	4,297.44	236.79
15		600.00	15,862.56	16,462.56	20,160.00	3,697.44	165.65
16			15,862.56	15,862.56	20,160.00	4,297.44	156.43
17			15,862.56	15,862.56	20,160.00	4,297.44	127.20
18			15,862.56	15,862.56	20,160.00	4,297.44	103.57
19			15,862.56	15,862.56	20,160.00	4,297.44	84.23
20			15,862.56	15,862.56	20,160.00	4,297.44	68.33

NPV = 591.27

- * Operational & Management Cost is valued at cost prices, and they are assumed to increase at 10% per annum up to the end of 8th year.
- ** Total Revenue is calculated at a rate of 18 cents/lb of RSS manufactured.

- (a) 40% capacity — 1st two years of operation.
- (b) 60% capacity — 3rd and 4th years of operation.
- (c) 75% capacity — 5th and 6th years of operation.
- (d) 80% capacity — 7th year onwards of operation.

RESULTS AND DISCUSSION

The foregoing analysis revealed that a single GPC is yielding a return more than 25% on the capital investment. This can be considered as an attractive rate of return on the basis of at least two important factors. One of them is that the interest rate payable on long term credit to most of the lending institutions in Sri Lanka such as the Bank of Ceylon, People's Bank, Agricultural and Industrial Credit Corporation and the State Mortgage Bank is usually in the region of 12 to 15% per annum. The other is the fact that most of the state owned Industrial Corporations are not yet earning substantially more than 10 per cent on their capital investments.

However, it should be noted that this achievement is solely dependent on three important factors: the existing price differentials between the different grades of RSS; the extent to which the improvement in quality of rubber is possible at a GPC; and the quantity of RSS produced per GPC.

If all these factors are on the positive side then the project as a whole can be considered as a success. On the other hand this may be impaired, if any one of the above factors is not maintained at a satisfactory level. However, it must be emphasised that there is very little control over the first factor, because the price differentials are dependent on the world market conditions of supply, demand and the speculative motives of suppliers and buyers. On the contrary second and third factors could be controlled by the GPC Committee to a great extent by being efficient and enterprising. In this case the ability of the Manager-Rubber Maker plays a vital role and therefore due care should be taken by the committee in appointing this person.

Though it may be possible to manufacture high quality rubber and increase the turnover of a given GPC, it may not always yield the maximum economic benefits to the country if the rubber exported is of low quality, due to deterioration as a result of inefficient handling and storage; particularly when a large number of traders are involved in bringing the produce from villages to either Colombo or Galle for shipment.

Although the financial analysis shows a net benefit for the smallholders participating in the GPC scheme, this is again dependent on at least two important factors; the extent to which their rubber, hitherto processed into grade 3 or below, could be improved and the question of what quantity of rubber could be processed per day. The latter is inversely proportional to the cost of processing per pound of rubber and therefore, these two factors determine the efficiency at which the GPC is managed for maximum economic benefit. However, here again the smallholders in a GPC are likely to lose their potential benefits if the traders including the Commodity Purchase Department Stores, are not ensuring a fair deal by way of correct weighing and grading at the time of sales.

CONCLUSIONS

Assuming that there are no other major problems in the organization and administration of the GPC scheme, it may be concluded that;

- * the GPC scheme as a whole brings about socio-economic benefits to the country and participants.
- * the economic benefits are primarily dependent on the price differentials between various grades of RSS, the extent to which the improvement in quality is possible at the GPC and the quantity of rubber produced at each GPC.

- * the maximum benefits for the country can only be achieved if an efficient system of transport, storage and handling could be provided to minimize the deterioration in quality before shipment.
- * the rubber produced by the GPCs should be given a fair deal by way of correct weighing and grading at the times of sales to maximize the benefits to the smallholders.
- * emphasis by the extension worker should be directed towards improving the quality of rubber produced, and
- * even if the loan of Rs. 12,000/- is not paid back by the GPC yet it is a profitable project for the entire economy as illustrated in (table 9).

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