

ADAPTIVE RESEARCH FOR RUBBER SMALL HOLDERS

By

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Traditionally, plantation crops tea, rubber and coconut have occupied a predominant position in Sri Lanka's economy. Rubber accounts for about 10% of the total export earnings, 14% of the Government's budgetary revenue and 8% of the total agricultural employment. About 200,00 families are engaged directly or indirectly in cultivation, processing and marketing of rubber. However, despite its continuing importance, the performance of this sector has been poor, mainly due to years of neglect, lack of proper planning, failure to implement research findings and their poor adoption by small holders.

Sri Lanka's rubber production recorded, a progressive increase from the 1940's. The most significant growth was in the 1960's reflecting the initial success of the rubber replanting scheme. The total production exceeded the 150,000 tons mark at the turn of the 60's fluctuated around 140,000 to 150,000 tons in the 70's. A progress drop in production was observed in the 1980's except in the years 1983 and 1984 when the production had been 140,000 and 142,000 tons respectively.

Although accurate information is lacking, the total rubber area is estimated to be about 199,000 ha. Small holders who constitute the private sector own 142,000 ha which represent 72% of the total rubber area. In this sector 93% of the holdings, covering an extent of 50% of the registered lands area are less than 1.6 ha. The balance 50% of the registered land, making up only 7% of the holding is between 1.6 to 20 ha and is owned by small holders who are financially more stable. Extents less than 0.5 ha and below 1 ha occupy 50% and 80% of the holdings, respectively. This shows that the rubber sector is dominated by a large number of 'Mini' small holders whose yield and income levels are well below the national average. Furthermore, only few crops other than rubber could be grown in areas where rubber is already planted. It is therefore necessary to arrest the decline of income levels in this sector. One way of achieving this is by increasing the productivity of their rubber lands by adopting proper agronomic practices and improving the quality through upgrading the existing processing facilities.

Adaptive Research Technology has a very important role to play in improving the productivity of the farming units by fulfilling the following objectives : (a) Facilitating local adoption of research results that have been obtained at research stations and state sector estates and which cannot adequately represent the range of situations encountered under specific conditions in farmers fields and farmers resource situations. ;(b) Helping to evaluate and refine or modify if necessary the technologies developed at research stations and in State Sector Estates to fit better a particular resource and risk situation and to meet the needs of farmers, (c) Helping to obtain farmers reactions to the feasibility and profitability of the developed technologies, ;(d) Making it possible to narrow-down the range of expected economic returns from an innovation given the local resource conditions, (e) Expanding scientists and extension workers understanding of the local farming system practices and problems through field visits and interaction with farmers in real world situations, ;(f) Facilitating "bottom-up" planning of agriculture research in place of a "top-down" approach. The ultimate objective of this line of research would be to get a group of researchers, extension workers and small holders to work together withing a given farming models to identify appropriate technologies to suit their farming conditions. In this context, the farmer himself becomes an active participant in the technology generation based on adaptive research.

As it has been realised that most of the RRI recommendations could not be implemented by the small holders due to various socio-economic problems, adaptive research programmes are now being implemented in small holder fields especially to solve small holder problems on regional basis. Programme on nursery practices are being implemented to compare the three budding techniques *ciz* brown budding, green budding and young budding in poly bags to determine the budding and planting success growth and costs. Programme on soil and moisture conservation compares the conventional practice of growing creeping type of legumes with bush and three legumes which would improve soil fertility and also would provide material for mulching as a soil and moisture conservation practice. Many small holders still rely on bare root budded stumps for planting. Only a few use polybags. The casualty rate is high if wet weather does not coincide with planting. Although the advantages of using polybaged plants were known for many years, still farmers have not adopted it. With regard to planting material, in Sri Lanka the clone PB 86 accounts for over 75% of the total planted area and this figure approaches 90% in the small holder sector. The yield potential of this clone is low compared to the recommended RRIC 100 series clones. A very intensive clone testing programme is now in progress in smallholder fields using the recommended clones such as RRIC 100, 102, 110 and 121. Aspects that are considered, are immature vigour, yield, bark renewal, tolerance to diseases resistance to wind, response to small holder tapping practices etc. Small holders have a tendency to tap the rubber tree daily ($\frac{1}{2}$ -s, d/1) during the dry weather periods. However, they do not tap their trees during raining weather and during the time of sowing and harvesting of paddy fields. This means that the farmers tap continuously for a long period interspersed with extended dry periods. Therefore, tapping systems that covers these aspects are included in another programme along with the use of yield stimulants and rainguards.

Intercropping and multicropping programmes are also implemented with the objective of (a) Utilization of interrow space in rubber plantations to grow crops that would give an income during the unproductive period of rubber for 5 to 6 years and also during the productive period on wet days when harvesting of rubber is not possible; (b) To increase productivity of unit area of land. The decision to intercrop depends on factors such as soil conditions and terrain, marketing and labour availability. It is profitable to plant more than one intercrop during the entire immature period. Crops that are considered are pineapple, banana, passion fruit, vegetables etc.

Multicropping of Rubber with Tea is another subject that is gaining popularity both in the state and small holder sector estates. RRI commenced studies on this subject in 1985 in collaboration with the TRI, SLSPC and JEDB and were done on eight sites, viz Nuechatel State Plantation, Hill Stream State Plantation, Perth State Plantations Miriwatta State Plantation, Kiriporuwa Estate, Karandupcna Estate, Panawatta Estate and Sapumalkanda Estate. Based on these studies it has been possible to tentatively recommend multicropping rubber lands with tea using a spacing of 40 ft. by 8 ft. for planting rubber with 7 rows of tea in between 2 rows of rubber. This would provide approximately 70% of the recommended planting density of rubber and 57% of the recommended planting density of tea. More experiments are in progress to determine the most economical combination with regard to planting density for Rubber and Tea. In the meantime, a pilot study has also been planned to extend this programme to the small holder sector and to ensure the participation of a reasonably large number of rubber small holders in order to gather more information with regard to cost of planting, yield, cost of production, profits, interactions and management problems.

A wide range of factors inhibit the development of the Rubber small holder sector. Development priorities must be tailored towards overcoming the constraints within the resource limitations. A strong regional focus should prevail in all production projects so as to maximise the production effort, to efficiently utilize personnel and other resources and to improve the integration of rubber production with other crops.