CUP LUMP PRODUCTION OF RUBBER IN PNG: AN IMPROVED SYSTEM FOR SMALLHOLDERS

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INTRODUCTION

In the early 1960's, the government of Papua New Guinea began a programme to encourage rubber production by smallholders. Since then, almost 6000 ha of rubber has been planted. However, only about 2000 ha has ever been tapped. Smallholder production has remained very low.

The purposes of this article are:

1. To explain some of the problems which have faced smallholder rubber development, and which have kept production low;

2. To describe a new method of production which has been introduced recently, and which is greatly increasing smallholder production.

SMALLHOLDER RUBBER PRODUCTION IN PAPUA NEW GUINEA

Smallholder rubber producers have, in the past, sold their rubber to D.P.I. as sheets of RSS (Ribbed Smoked Sheets). RSS was produced by the growers in village processing centres.

The process was as follows:

1. Latex (the juice that runs out of a rubber tree when you cut the bark, i.e. tap the tree) was collected from the rubber trees in the morning. The latex runs out more easily in the morning when it is cool.

2. It was strained and mixed with water.

3. The latex was coagulated (thickened) in special pans by adding acid.

4. The coagulated rubber was rolled out into sheets using a special machine.

5. The sheets were dried, then smoked for 3-5 days.

6. The sheets were inspected for dirt and other marks, which were clipped out of the sheets. This was called 'grading'.

7. $33\frac{1}{3}$ kg bales were packed, for marketing.

Tapping a rubber tree

Reasons for low RSS production

For smallholders, the main problem with RSS production was that the processing of the sheets took up too much time and labour. This discouraged smallholders from tapping their trees.

Other factors also discouraged tapping:

- The people were mostly self-sufficient and did not need much money. They did not need to produce regularly, especially as it involved so much work.

- Even if smallholders did produce RSS, they received only about 30% of the export price. Because rubber smallholdings are scattered over such a wide area, marketing costs were very high. Often only 1 or 2 sales were possible per year.

- Because of the above problems, the PNG Agriculture Bank was sometimes unwilling to lend money to set up village processing centres.

AN ALTERNATIVE PRODUCTION SYSTEM

Background

Until a few years ago, most smallholder rubber was marketed by D.P.I. in the form of RSS. However, recently there have been developments which have lead to a change in the system.

Most of Papua New Guinea's rubber is sold to Australia to be made into tyres. This market requires 'TSR10' and 'TSR20' grades of rubber. TSR stands for 'Technically Specified Rubber'. It is scientifically processed, graded and packed in a special factory. This is in contrast to RSS rubber, which is graded by eye.

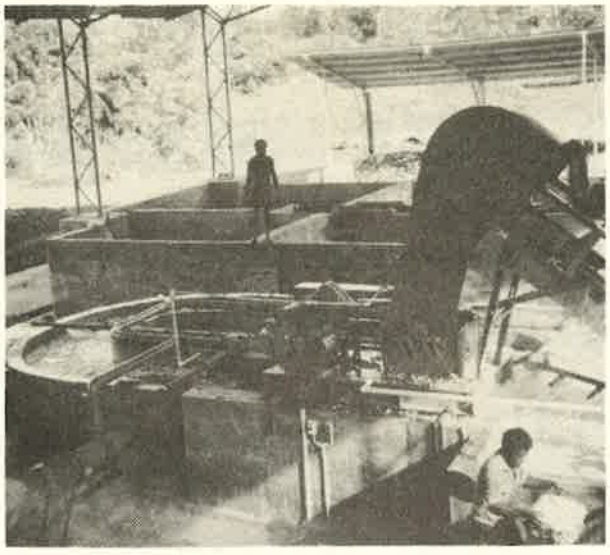
In order to suit the requirements of the market, the Government has ecouraged a number of major producers to establish TSR factories. These factories produce rubber known as PNGCR (PNG Classified Rubber) 20 grade. All TSR grades are traded as PNGCR within Papua New Guinea.

The TSR factories can handle various qualities of coagulum from the field. 'Coagulum' is latex which has thickened to a a rubbery solid. Instead of processing latex into RSS, the producer simply allows the latex to form into coagulum, and sells this to the factory. This coagulum is known as 'cup lump rubber'.

Collecting cup lumps

Cup lump rubber stored in the open air under a shelter

Bagging and weighing cup lumps ready to be trucked to the TSR factory for processing.



Part of a TSR factory

A bale of processed rubber graded as PNGCR 20

A one tonne crate of PNGCR 20 ready for shipment to Australia

Cup lump production

To produce cup lump rubber, the grower taps his rubber trees in the morning. The latex collects in the latex cups, and gradually coagulates (thickens to a solid) by itself. Coagulation can be speeded up by the following methods:

1. Add to the cup the thin layer of coagulated latex which formed over the previous tapping cut.

2. Leave in the cup a little of the serum (liquid) left after taking out the previous cup lump.

By early afternoon the latex should have coagulated. The cup lumps can be collected at any convenient time before the next tapping day. If rain falls before the cup lumps are solid, the latex must be collected as quickly as possible in a bucket or some other container. It can be left in a sheltered place to coagulate into a large lump.

Once coagulated the cup lumps are allowed to dry on top of a raised wooden stand, sheltered from the sun and the rain until sold to D.P.I. or private buyers.

The TSR factories

So far, 5 factories are in operation. Three of these are run by private companies. These are:

- Dalum TSR Factory, New Ireland Province - set up in 1973, and began PNGCR production in 1983.

- Doa PNGCR Factory, Galley Reach, Central Province - set up in 1979.

- Mamba Development TSR Factory, Kokoda, Northern Province - set up in 1982.

These 3 factories are centred on nucleus estates which supply coagulum for processing. Smallholders in the area were encouraged to change over from RSS to cup lump production to supply the factories.

The other 2 factories are operated by D.P.I. at present. These are:

- Cape Rodney TSR Factory, Central Province - set up in 1982

- Gavien TSR Factory, East Sepik Province - set up in 1985

Advantages of cup lump production

For the smallholder, producing cup lump rubber instead of RSS rubber has several advantages. These include:

1. Collecting cup lump rubber is more flexible than collecting latex. Provided it does not rain, the smallholder does not need to collect on the same day as tapping.

2. Time and labour is saved because the smallholder does not have to process cup lump rubber. So the system suits the traditional lifestyle of the smallholder very well. More time can be spent on other activities such as gardening and hunting.

3. Cup lump rubber production fits in well with use of 'stimulants'. Stimulants cause the latex to flow for longer. For RSS production, the latex is collected 3-4 hours after tapping. Any latex flow after this (called 'late drip') is wasted. With cup lump production, the late drip is not wasted. The use of stimulants will therefore make it possible to tap less often, but still maintain the same production.

4. The number of trees tapped can be increased because more time is available.

5. Cup lump rubber is easier to transport than latex. Thus trees can be tapped over a larger area for processing in a central factory.

6. The equipment needed to produce cup lump rubber is much cheaper than that needed for RSS processing.

7. Since processing equipment is not used, the problems of maintaining the equipment in village processing centres (e.g. difficulty of getting spare parts) do not apply.

8. Late afternoon or evening tapping of trees is possible.

9. Cup lump rubber can be stored for up to 6 months if it is kept clean, dry and in a shaded place.

Disadvantages of cup lump production

The cup lump system does have the following possible problems in Papua New Guinea:

1. Because more trees can be tapped, the extra work involved may lead to poorer tapping standards.

2. Cup lump rubber is easy to steal.

3. In some areas, heavy rainfall before the latex has time to coagulate may wash the latex away, unless a coagulant is used. A 'coagulant' is a special substance which makes the latex thicken very quickly (e.g. a formic acid solution).

4. Using a coagulant could slow down the rate of tapping.

5. Transport costs will increase, as cup lump rubber contains more water than RSS.

The use of stimulants

A stimulant is a special chemical which causes latex to flow from the rubber tree for longer. This chemical is sold as ETHREL. Smallholders can buy it as a $2\frac{1}{2}$ % solution.

If stimulation is introduced, it could increase production in those areas where smallholders tap their trees only twice or even once a week on average.

Initially, D.P.I. will introduce the practice to selected farmers on the land settlement schemes. The best settlers will act as pioneers. Gradually it will be introduced to other settlers who follow D.P.I. recommendations. The Government will control stocks of Ethrel, and will carry out applications to rubber trees at first.

After a few years, D.P.I. will review the

progress of the scheme, and will consider introducing stimulation at a village level.

PROGRESS IN THE RUBBER INDUSTRY

The growers in Manus Provinces and New Ireland Province were the first to convert from RSS to coagulum (cup lump) production. In Manus Province, in the first year of coagulum production, total production increased by 100%.

Since 1982 the majority of smallholders in all the rubber growing provinces have accepted the system.

Marketing of rubber is gradually being taken over by private enterprise. This should result in a more efficient marketing service which could also help to increase smallholder production.

CONCLUSION

Production of cup lump rubber by smallholders, instead of RSS has the following benefits:

- it is more suited to the life-style of Papua New Guinea farmers.
- it is allowing areas of untapped mature trees to be opened up.
- central processing in factories has greatly improved the quality of Papua New Guinea's rubber.
- it allows techniques such as stimulation and therefore less frequent tapping to be used.

As a result of introducing the cup lump system, smallholder rubber production in 1984 has increased by more than 100% from less than 300 kg per ha per annum to an average of 650 kg per ha per annum.