RUBBER BOARD BULLETIN - VOL 26 No. 4 1991

RUBBER CAN BE GAINFULLY CULTIVATED IN THE KONKAN

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During the last three decades, a lot has been talked, written and experimented on the development of Konkan. Various seminars and conferences have been conducted to formulate appropriate developmental activities for sustainable development. However, experience has shown that many developmental activities planned for the development of Konkan either have failed or have failed to produce expected results. In these days of high ecological consciousness, an alternate development strategy which will not scar nature so badly is always welcome.

It is, therefore, necessary to create awareness of rubber cultivation as one of the alternatives for the development of Konkan. With this background in view, an attempt has been made in this paper to explain the prospects of rubber cultivation and its direct and indirect benefits for the development of Konkan.

In India, the consumption of natural rubber has been increasing consistently during the last many years. The production in the year 1990-91 was 330,000 metric tonnes while the consumption was 365,000 metric tonnes, the shortage met by import. The demand for rubber in the country is increasing year after year thereby widening the existing gap between demand and supply.

It has been estimated that by 2000 A.D. the demand for natural rubber is expected to cross 650,000 tonnes.

The traditional rubber growing tract in India extends from Kanyakumari (8°N) to Mangalore (12°N). The total production from the region is not sufficient to meet the country's growing demand. Further expansion of area under rubber in the zone to increase the production is not feasible due to dearth of suitable land. Therefore, rubber cultivation was extended to other less congenial but potential areas. One such region where rubber is being tried is the Konkan region of Maharashtra State.

The Konkan region, stretching from North to South lies between 15° and 20° North latitude, comprising of a narrow strip of land on the Western ghats of Maharashtra. The area is distributed in four districts namely Sindhudurg, Rathnagiri, Raigad and Thane. Indiscriminate felling of the forest cover and shifting cultivation practiced by the local people has completely denuded vast tracts of land. The undulating topography, erratic rainfall associated with prolonged drought period have rendered the land unsuitable for cultivating annual agricultural crops, leaving vast area uncultivated.

To take up the work relating to development of rubber plantations in Konkan, the Rubber Board has initiated a Trial Rubber Plantation Project at Dapchari, with the help of the State Government of Maharashtra in the year 1981. The State Government has allotted an area of 50 ha. land to the Rubber Board under the Konkan Area Development Scheme. The Plantation is about 145 km away, towards north of Bombay on the Bombay Ahmadabad national highway. Encouraged by the initial growth response to rubber trees the Board has elevated the Trial Plantation to the status of Regional Research Station from 1986, to look into all aspects of rubber cultivation in the region. The station is slowly metamorphosing into a full fledged Regional Research Station.

Rubber has been grown in the region on small scale and on non-commercial bases as early as 60 years ago. Near Sawanthawadi one such planting was done by the late Shivaram Raje Bapusaheb Bhonsle, Maharaja of Sawanthawadi. The vegetative growth of the trees is comparable to the growth of trees in traditional area and is indicative of good potential. Unfortunately, the trees have not been subjected to any systematic tapping. But, about 20 years ago first commercial scale planting was

done by Mr. R.G. Ketkar at Parali, about 100 kms south west of Bombay near Khopoli. The vegetative growth of plants is good. The plantation is under regular tapping and according to Mr. Ketkar the plantation is yielding more than 1000 kg of rubber per hectare per year. In a private plantation near Goa, first year of tapping has yielded about 700 kg per hectare.

Observation from these pioneer plantations and the encouraging results obtained from the Board's own research plantations, it appears probable that by use of drought tolerant clones, combined with good crop husbandry, which involves timely establishment of polybagged plants, mulching and protection against wind and sunscorch could ensure the establishment of productive rubber plantations in the area. Once into maturity any significant area of rubber will exert a beneficial effect on local microclimate, the trees providing mutual protection against wind damage and sunscorch.

COST OF RUBBER CULTIVATION

The direct cost of land preparation and maintenance up to maturity of a hectare of rubber plantation is estimated at Rs. 35,000/-. The net return from a moderately yielding plantations would be from Rs. 10,000 to 15,000. Well maintained plantations would yield an average of 15,00 kg of dry rubber per hectare per year. Economically productive period is 25 years starting from the 8th year of planting. At the prevailing price of Rs. 20/- per kg., the gross income would be around Rs. 30,000/-. Cost of production of rubber could be relatively low in view of the good availability of land and infrastructural facilities, reasonable cost of labour etc. As Bombay is a major rubber consuming centre in the country, rubber produced in the Konkan can enjoy a better market than the traditional areas.

A major disincentive for spread of rubber is its 7 to 8 years of gestation period and relatively high capital expenditure for maintaining a plantation till it starts generating income. Keeping in view the above facts, the Rubber Board has formulated an unique attractive financial assistance scheme for helping potential cultivators. Under the scheme, the cultivator is eligible for various cash subsidies and bank loans. Non-returnable financial assistance include cash subsidies Rs. 5000/- per hectare for plantation raising, latex processing, plant protection equipments, Rs. 1000-4000 per ha for boundary protection, Rs. 2500/- per ha limited to 50,000/- for irrigation, and Rs. 875 to 1225/- for bee-keeping. Growers belonging to SC/ST categories are eligible for enhaced rates of subsidies compared to general category growers. Apart from these, the Board has made arrangement with M/s National Insurance Co., Ltd., to provide comprehensive insurance cover for rubber plantations.

ADVISORY, EXTENSION AND TRAINING

The Board offers free advisory and extension services at all stages of planting, maintenance and production. Various training activities are also undertaken for enterpreuners and workers. The fields of training cover management of estates, small holder cultivation and production, budgrafting and nursery techniques, tapping and allied activities, crop processing, grading and packing of raw rubber and rubber goods manufacturing technology. Most of the training is given on levy of moderate fees. However, training for workers in budgrafting and tapping are not only free but supported by suitable stipends and free unfurnished accomodation.

ECONOMIC AND SOCIAL BENEFITS

Rubber planting is one of the highly labour intensive agricultural vocations. A hectare of plantation will provide regular daily on-farm employment to 0.7 man power. In the initial years of planting there are several operations such as clearing of land, lining, pitting, raising of cover crops, fertilising, plant protection, etc., which absorb labour at an average of 0.5 mandays per ha per day. Out of the Rs. 35,000/- to be spent for planting and maintaining a hectare of plantation to the bearing stage, Rs. 21,000/- is the cost of labour ie., 60% in terms of man power it is around 800 mandays. In the case of mature plantations also, around 60% of the recurring expenses incurred for upkeep, tapping and processing is for labour. These are only for direct agricultural operations.

Rubber plantations also provide timber, oil, oil cake and honey. The average timber yield from one hectare of rubber plantation at the close of the 33 years of economic life is 200 cubic metres. Rubber trunk wood is gaining widespread global acceptance for furniture, packing cases, plywood

and construction needs. Rubber can meet some portion of the total timber requirements, and therefore, to that extent it can help to conserve our precious forest resources.

These are some of the activities that could generate additional employment and income in rural areas, if rubber cultivation is adapted on a large scale. Once the rubber planting assumes large proportions, a lot of ancilliary activities can also emerge.

ECOLOGICAL BENEFITS

Rubber is a natural forest tree, which besides providing an excellent and thick cover to the land, serves other objectives as well. Thus it can help in bringing back the already upset ecological equilibrium. The rubber tree is a major source of fuel wood in South India, and most of the rubber growing countries. The timber, after borax treatment and seasoning, can be used for furniture making and construction purposes.

Studies conducted on biomass production by rubber plantations revealed that *Hevea brasiliensis* is comparable to any fast growing tropical forest tree species in regard to biomass production. An annual biomass production of 35 tonnes has been reported from rubber plantations. Being a deciduous tree, the tree adds to the soil leaf litter, estimated to the tune of 4 to 7 tonnes. Under domestication, this tree is cultivated on properly built contour terraces and is grown usually with a leguminous cover crop which adds another four tonnes of dry matter per hectare.

It has been reported that soil moisture conservation and water use efficiency of rubber is of a higher order when compared to most of the other forest trees. The amount of radiant energy reaching the soil surface is low which results in lower soil temperature of the order of 8°C compared to open area. This helps in reducing oxidation of organic matter. The build up in organic matter improves the soil texture, reduces the evapotranspiration losses and volatalisation of nitrogen. The well developed surface root system of *Hevea* gives good soil binding and minimises soil erosion. the rainfall interception is comparable to teak and is around 50% more than that of *Eucalyptus*.

A good number of flora and fauna are known to thrive in rubber plantations. More than 100 species are commonly seen. Such growths are not seen with other plantations. Many shade loving medicinal herbs also grow very well in the rubber plantations. A Comparison of soil characteristics,water uptake etc., in areas intensively planted with rubber with those of denuded forests of where a forestation has been made exotic species such as *Eucalyptus*, etc., have revealed thar *Hevea brasiliensis* is certainly a better option for effective afforestation.

Rubber cultivation is still awaiting exploitation by the people of Konkan. It is a crop which could be gainfully cultivated in areas with good soil depth and light irrigation potential. Any development activity has to satisfy three conditions. it should be economically feasible, socially beneficial, and ecologically acceptable. Rubber satisfies all the three. From the foregoing thesis it can be said that by use of suitable agrotechnology, which involve timely establishment of polybag plants, mulching, irrigation etc., productive plantations can be established in the area. ●

Rubber Honey

Rubber tree is a prolific producer of honey. In the rubber tree, honey is found at the extra-floral nectory glands at the end of the petiole where the leaflets join. It is estimated that honey from rubber plantations form around 40 per cent of the total Indian production of honey. Studies show that about 15 hives can be placed in a hectare of rubber plantation. In a normal year about 10 kg of honey can be obtained from one hive.

Honey is a saturated solution of sugars. Rubber honey contains three major sugars viz. fruit sugar, grape sugar and cane sugar. Cane sugar forms only a very small percentage and hence rubber honey is devoid of the harmful effects associated with cane sugar.

Rubber cultivation in Uganda, at 1200m above sea level

The following article has been provided by T R Chandrasekhar, Rubber Research Institute of India. During an assignment for the Commonwealth Secretariat in Uganda, the author collected much information about rubber cultivation in that country whose height above sea level is outside the normally accepted limits.

Introduction

Hevea brasiliensis, the only commercial source of natural rubber in the world, is mainly grown in the tropics and sub-tropics between 20° latitudes on either side of the equator. In the literature it has been stated that 600m is the altitude limit for growing *Hevea*[1,2] and there seem to be no references to growing *Hevea* above 600m. Can *Hevea* can be grown successfully above 600m? Can it be grown in areas with less than 1500mm rainfall per year?

Uganda

Uganda, described as the "Pearl of Africa", is a land-locked country located in the heart of the great African high plateau in the equatorial region: most of the country is about 1200m above sea level. It is an agricultural country blessed with plenty of rainfall in the mid-western, western and southern regions. The equator runs through southern Uganda and, because of high altitude, temperatures are mild. Much of the country enjoys a temperature regimen of 10-30°C with well distributed annual rainfall of 1250mm. According to the literature, it would seem *Hevea* cannot be grown in these conditions.

The reality

Although these conditions do not conform to those apparently necessary for rubber cultivation, in fact four blocks of 35-40 years old *Hevea* plantations already exist in the country. Near the country's capital Kampala, in Mukono district, there exists a plantation along with coffee and tea estates. The other three blocks are present in the district of Masindi, about 200km away towards the north-west of Kampala. The trees are well planted and the age of the older trees may be about 35-40 years. In many places, seeds produced from the old plants have grown to full size trees. Apart from these blocks, plants are also present in Kampala and Entebbe. All the plantations have been established from the unselected seed source.

Uganda plantations in the literature

As of now, there is no mention of the existence of rubber plantations in Uganda, although there are references to the existence of rubber in many sub-Saharan countries[3]. Based on the information collected by the author while in the country it appears that the crop might have been introduced into the country in the early 1940s. Though records are not available, enquiries indicated that a Mr C A Margach, might have been responsible.

The present and the future

At present, there is hardly any natural rubber production in the country. However, with the help of technical assistance provided by the Commonwealth Secretariat, rehabilitation of 50ha of plantation near Masindi has been completed and the production has exceeded five tonnes a month. A local footwear manufacturing company is purchasing all the output. If the remaining plantations were also to be rehabilitated, more than 200 tonnes/year of natural rubber could be produced. Thus, the indications are

IRRDB Information Quarterly
1995 Part 2

that viable and successful rubber plantations could be established in Uganda.

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