6. Smallholder rubber development policy in the future

Indonesia is poised to take the lead in natural rubber production. Rising wages already have reduced the competitiveness of producers in Malaysia and Thailand Malaysia's production levelled off as a consequence; even Thailand's output seems about to reach its peak. But production costs on Indonesian estates are almost as high as Malaysia's estates and Thailand's smallholders, while production costs for Indonesian smallholders are much lower than all of these (Barlow, Jayasuriya, and Tan, 1994). So, in the future, Indonesia's competitive advantage in natural rubber production will derive mainly from its smallholders.

Increasing exports. Raising smallholder productivity is Indonesia's best hope for expanding natural rubber exports for two reasons. First, as noted above, smallholders produce almost 3/4 of Indonesia's natural rubber. Second, and more importantly, Indonesian smallholders are not only the lowest-cost producers of natural rubber in Southeast Asia--they probably are the lowest-cost producers in the world

Economic development. Besides being the key to Indonesia's future competitive advantage in natural rubber, a workable strategy to raise productivity of rubber smallholders also would serve the three pillars of economic development in Indonesia: growth, equity, and stability. Despite development in other sectors, increases in smallholder rubber productivity still can be an important engine of economic growth and poverty alleviation

in regions of Sumatra and Kalimantan. The supply of workers continues to grow in these rubber-producing regions, while new land is getting scarce. Under these conditions, farmers will be eager to raise productivity if they have profitable options. If such intensification is achieved, the resulting expansion of income and employment would, among other benefits, help inhibit migration to Java

Environmental conservation. The environmental benefits of complex agroforests discussed above in section 3 give rubber agroforestry systems (RAS) a special place among smallholder rubber development options. Rubber agroforests provide a means of rehabilitating degraded forest land and, thereby, conserving Indonesia's soil and water resources. Moreover, planting trees may help alleviate global climate change stemming from "the greenhouse effect." Similar benefits from trees can be achieved through development of large-scale plantations of forest species or oil palms as well as smallholder rubber. But among tree-planting options, only complex agroforests (including rubber agroforests) compare to natural forests regarding conservation of biodiversity.

Thus, rubber agroforestry systems are unique among rubber development options because they offer opportunities to provide a wide range of benefits to smallholders, processors, the nation, and the world. This package includes greater income and employment for smallholders, expanded business opportunities for processors, a focal point for regional development, larger non-oil exports and environmental benefits, including conservation

of biodiversity for Indonesia and the world

But these important opportunities are being missed Although smallholders are planting a lot of rubber on their own most lack adequate access to higher yielding planting material suited to their conditions. In the places where such planting material is available, farmers need more practical information on to use it best

Over time, these missed opportunities will threaten Indonesia's competitive advantage in natural rubber. Just as in Malaysia and Thailand, higher wages will come with Indonesia's successful economic development. If there is no increase in smallholder productivity to offset rising labor costs, the low-cost advantage of Indonesia's smallholders will evaporate and so its natural rubber industry.

What can be done to support rubber agroforestry development?

Sustained success with agricultural exports requires a long-term commitment to invest in research and development in order to increase yields and reduce production costs.[1] For example when its share of the rubber market was threatened by synthetics in the 1950s, Malaysia acted to retain its competitive position At that time, almost half the area of its estates and 2/3 of its smallholdings were planted with trees over 30 years old. An ambitious programme of research, replanting, and rural

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[1]. Successful agricultural exporting countries also invest heavily in infrastructure, which reduces marketing costs, and maintain foreign exchange rates that provide sufficient incentives to exporters.

development transformed the situation (Barlow 1978) Malaysian natural rubber output grew more than 150% from 1955 to 1988 despite competition from synthetics abroad and rising wages at home. Thailand employed a very different rubber development strategy, suited to its smallholder sector and institutional capabilities, to overtake Malaysia. Now rubber agroforestry presents an opportunity--and challenge--for Indonesia to develop its own strategy suited to its unique conditions.

Research on rubber agroforestry systems. An unfortunate feature of the block planting strategy that Indonesia pursued in the 1970s and 1980s was that almost all of the limited supply of higher yielding planting material available for smallholders was restricted to project participants. Moreover, since much of the funding for rubber research has come from plantations, important scientific questions regarding application of higher yielding technology in smallholder settings have not received adequate attention (Tomich 1991). Indeed, there is little scientific evidence on performance of higher yielding rubber planting material under the conditions faced by Type III and Type IV farmers, accounting for roughly 75% of rubber smallholders in Indonesia

Filling these research gaps is of crucial practical importance since productivity growth in rubber agroforests depends on adaptation of higher-yielding planting material to these complex agroforestry systems. The trials discussed above in section 5 cover several questions that deserve priority Answers to these basic agronomic questions can provide the

technical foundation for new smallholder development programmes aimed, for the first time, at rubber agroforestry systems The methods to design and conduct these trials are well-understood; main barriers to rubber agroforestry research are institutional. In particular, how will it be funded?

New smallholder development programmes. To date, Indonesia's smallholder rubber development efforts have met with little success. Block-planting projects of the 1970s and 1980s including project management units (PMUs) like SRDP and PRPTE as as nucleus estate schemes (NES/PIR), were intended to produce large increases in yields. Achievement of the high yields necessary to justify the costs of block planting depended on application of purchased inputs at levels better-suited to large estates than to smallholders.

By the mid-1980s, it already was apparent that high-cost block-planting projects had proved difficult to implement in Indonesia and had benefited only a small fraction of rubber smallholders. Moreover, Indonesia's economic situation had changed because of declining oil prices, which forced cuts in the development budget About the same time, agricultural development projects began to fall from favor as international donors shifted their attention to environmental concerns As a result rubber development programmes withered

Indonesia's tight government budget constraints make it more important than ever to develop a feasible alternative to the costly block-planting strategy. Programmes aimed at gradual productivity growth in rubber agroforestry systems seem to hold

potential for productivity gains at a small fraction of the cost of block planting. Furthermore, the environmental benefits of rubber agroforests make projects aimed at development of these systems attractive to international donors. In short, compared to block-planting, rubber agroforestry programmes should put less demand on the government budget while being more likely to attract substantial funding from international donors.

Higher yielding planting materials is a key element. Improving the supply of higher-yielding planting material and providing farmers with practical information about its use should have key roles in any smallholder rubber development programme including one aimed at rubber agroforests. Various approaches already have attempted to improve planting material supplies for smallholders on a pilot scale. For example, Dinas Perkebunan offices have established nurseries of two hectares or so in many parts of the major rubber growing areas and in recent year also established village nurseries in South Sumatra and Jambi using APBD budget (provincial budget). Over the last three years, GAPKINDO has involved in increasing supply of higher yielding planting materials. GAPKINDO in collaboration with Disbun has sponsored to distribute of higher yielding planting materials to 2200 farmers in West Kalimantan. In addition, small nurseries established in North Sumatra and Jambi in collaboration with the Center for Policy and Implementation Studies contributed to an increase of the supply of higher yielding planting material in those provinces Finally, rubber research institutes have been involved in supplying planting material to smallholders

One of the main lessons from these pilot projects is that planting material programmes need to pay attention to demand as well as supply (Barlow, Quizon, and Suyanto, 1993). Since such a large proportion of smallholder rubber area (perhaps 75%) is still under trees grown from unhigher yielding seedlings projects have taken for granted that there is a big potential demand for higher-yielding planting material. Indeed, some unassisted farmers have started replanting with higher yielding materials. For instance, in parts of South Sumatra and North Sumatra it is common for farmers to buy higher yielding rubber planting material, usually in small quantities obtained from small private nurseries. Elsewhere, however, smallholders' lack of awareness or lack of information on how to achieve benefits of planting higher-yielding rubber may mean actual demand falls far short of apparent potential. Social marketing techniques may be a cost-effective means to address lack of awareness of higher yielding material and lack of information on its use (K. Fox, 1990). Social marketing would use mass media and other marketing channels to provide farmers with technical information they need to choose material that is appropriate to their economic circumstances and to help them to put it to its best use

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CONCLUSION

As concerned toward environment has been globally developed since Rio de Janeiro Summit in 1992, it is hoped that new waves on natural rubber development will also occur, especially on the development of smallholder rubber which are pillar of the rubber industry of the country.

Natural rubber is elastomer that still is very important in the automotive tyro-making, especially the radial one. Due to its molecule characteristics, natural rubber has a low rolling resistance so that it reduce the use of fuel and subsequently pollutant tory, and thus it is good for environmental friendly-tire ("green tire) component. Aside of that, this elastomer results biologically as such energy-saving. To produce the same amount of synthetic-rubber it needs less than other materials since the energy of bio-synthesis natural rubber come from solar energy.

Smallholder rubber, in this case "jungle rubber", which has similar pattern to that of secondary forest posses very positive value from the ecological point of view. It has a good hydro-orology for reducing erosion and enriching bio-diversity.

Due to limited funds available, so far only 15 % of smallholder rubber area have been reached by Government development program. If such condition will continue, Indonesian rubber industry which actually has competitive advantage may miss the good opportunity of natural rubber development in the next future. GAPKINDO (the Indonesia Rubber Association) concern on the future prospect of rubber production, quantity and quality; and therefore willing to take a part to its development. Joint with ICRAF (International Centre for Research in Agroforestry), GAPKINDO will develop an agroforestry system based on the smallholder rubber to increase farmer income and simultaneously keep the ecology sustainable. Accordingly pilot projects of planting better clone of rubber in intensive manner in West Kalimantan (Sanggau and Sintang Districts) and Jambi (Muara Bungo district) provinces was planned. In this case, rubber will be planted intercropp with other perennial as such there will be a diversified income and biodiversity. Intercrop plants which are possible for interplanting (as have been tried in Thailand and Malaysia) area: rattan (Manau variety), durian, salak (Salaca edulis), cempedak (Artocarpus sp), coffee, lansicum, candle nut, etc.

It is planned that the project will be started in the beginnning of 1995. As stimulant it will be done in the small scale, and hopefully will be enlarged both by government and International agency who concerned about the environment sustainability. Agroforestry which involve perennial in its system is not new for most Indonesian farmers. It is a traditional agricultural system for most farmer in Kalimantan and Sumatera. As the system has been practiced for generations, and proved very effective in sustaining ecology; in the limited funds available agriculture and forestry sector should work hand in hand for developing the system.

ACRONYMS

AARD	Agency for Agricultural Research and Development
ANRPC	Association of Natural Rubber Producer Countries
BPS	Balai Penelitian Sembawa, Rubber Research Center of Sembawa
CS	Clonal seedlings planting material
CIRAD	Centre de Coopération Internationale en Recherche Agronomique pour le Développement
CIRAD-CP	CP = Cultures Pérennes = Tree Crop Department of CIRAD.
DISBUN	DINAS PERKEBUNAN
DGE	Directorate General of Estates
GAPKINDO	Union of indonesian rubber industry.
IPARD	Indonesian Planters Association for Research and Development
ICRAF	International Center for Research in Agroforestry
IRRDB	International Rubber Research and Development Board
HYPM	Higher Yielding Planting Material
IRRI	Rubber Research Institute of Indonesia, Sungei Putih
or CRIR	Central Research Institute of Rubber
PCS	Polyclonal seedlings planting material
PPK	Pusat Penelitian Karet = IRRI
PPSP	Pusat Penelitian Sungei Putih, Rubber Research Center, Sungei Putih
PRPTE	Project for Replanting, Rehabilitation and Extension of Export Crops
RMP	Rubber Monospecific Plot
RAS	Rubber Agroforestry System
SRDP	Smallholder Rubber Development Project
SNI	Indonesian National System for rubber specifications
SIR	Standard Indonesian Rubber
SFDP	Social Forestry Development project
TCSDP	Tree Crop Smallholder Development Project
TSR	Technically Specified Rubber