

# Oil Palm in Indonesian Socio-Economic Improvement - A Review of Options

Zahari Zen\* ; Colin  
Barlow\*\* and Ria  
Gondowarsito\*

## ABSTRACT

*The Indonesian Government has used oil palm as a tool of rural socio-economic improvement, doing this through nucleus estates operated by estate companies and through assisting individual smallholdings. Over 900 000 ha of high yielding oil palm have been established in 2-3 ha settler blocks in nucleus estate plasma, and 250 000 ha have been planted on individual smallholdings. The initiatives have together raised the incomes of over 500 000 farmers, and may be judged successful market interventions which are far superior to laissez faire.*

*Although the average economic and social performances of both initiatives have been reasonable, their outcomes have been variable. The nucleus estates have sometimes suffered from faulty management, bad community rapport and difficult land conversions, and from the mistakes of government agencies and settler cooperatives. They were discontinued in 2001, due to scarce finance. The assistance to individual smallholdings has always had short funding, limiting its scope. Both initiatives were commenced under the New Order, and face fresh challenges in the present era of democracy and otonomi daerah.*

*The analysis of this paper nonetheless shows that these Indonesian interventions should be continued, albeit more capital being provided and their deficiencies being remedied. It denotes that the interventions compare well with official efforts in other countries, strengthening the general case for public action to assist poor rural dwellers.*

\* University of North Sumatra, Indonesia.

\*\* Department of Political and Social Change,  
Research School of Pacific and Asian  
Studies,  
ACT 0200 Canberra, Australia.

## INTRODUCTION

The Indonesian state has for three decades used oil palm as a major vehicle of rural socio-economic improvement, notably by promoting smallholding oil palm through nucleus estates and by assisting individual farmers. It has followed a model of market intervention, which, in the 1970s and 1980s especially, was heavily criticized as an approach to assisting small cultivators. This was particularly in light of what was seen as a dismal record in Africa, where subsidies, taxation, regulatory controls and direct public participation in the production and handling of agricultural commodities including oil palm were widely employed in the post-colonial era (Bauer, 1976; Hyden, 1980; Bates, 1981). Such interventions were assessed as costly and largely failing to meet their social and political objectives. They were also regarded as undermining the market efficiency, monopolizing scarce technical skills and other resources, bolstering and protecting powerful classes, and producing serious long-run distortions which often led to economic disruption. The critics of intervention argued that a government which governs best is that which interferes least, and that a *laissez faire* approach is far more effective. These criticisms were accepted by many practitioners of rural development, especially the multilateral development banks (World Bank, 1981). Hence, previous interventions in African states were largely dismantled in the 1980s (World Bank, 1999).

But in rural Asia, market intervention for social purposes was maintained, and indeed augmented, by governments more independent of the international practitioners. Thus, Fletcher (1991) showed how with oil palm

from the 1960s, the Malaysian state, through the Federal Land Development Authority, successfully promoted the interests of its poorer citizens, while at the same time securing the growth and international competitiveness of the sector. The role of the authority, a parastatal agency run by specially appointed staff, was mainly in organizing, on the basis of smallholdings, the production, processing, downstream manufacture and international marketing of what, by the 2000s had become one-fifth of Malaysia's total palm oil crop. In doing this, big increases in incomes were provided to over 300 000 families and one and a half million people. Manifestly, there were difficulties, particularly in later years when the smallholder areas under the authority had to be converted to an essentially estate basis following the ageing of the original settlers and migration of most of its young people to the urban areas. Yet, this did not negate what had been a major achievement, and adjusted the gigantic enterprise towards better sustainability.

Barlow (1997; 2001) also reviewed government interventions in plantation development in the global context. He concluded that micro-interventions, comprising both provision of infrastructure and services, and targeted programmes, including credit, extension and research, were often profitable and usefully overcame incomplete markets for credit and information. On the other hand, macro-interventions, comprising the exchange rate, trade and price administration measures, were almost exclusively damaging and ineffective. Respecting the latter, the far more open Malaysian and Thai regimes stood out as assisting development more adequately than what were, up to the mid 1990s, the inward-looking macro policies of India and, to some extent, China.

This paper focuses on the Indonesian socio-economic improvement through oil palm, scrutinizing targeted micro-interventions entailing the promotion of smallholdings through nucleus estates and the betterment of individual farms. The circumstances of Indonesian oil palm were recently analysed by Barlow *et al.* (2005), basing their work on a recent field study of production and processing. These authors scrutinized the estates, smallholdings and associated institutions in this large industry now covering over 4.9 million hectares of oil palm (Table 1). Further background information is given by PT Capricorn Indonesia Consult, Inc. (2004). The industry has expanded in area by 12% per year over the last decade, and engages the efforts of 1.7 million labourers and small farmers.

It is noteworthy that Indonesia's efforts to use plantations in socio-economic improvement were preceded in the late 1960s and 1970s by vast government programmes of assisting small farm rice and *palawidja* cultivation, especially in Java. It was only from the late 1970s that sustained efforts began to be made with tree crops, partly as a means of developing previously neglected regions of the outer islands, and partly as a way of rescuing the by then huge transmigration settlements which had often failed due to their reliance on rice and subsistence crops.

It is important to remember in examining Indonesian policies, and especially in making international comparisons, that the reigning political paradigms and regional geographies significantly affect the outcomes. Thus, a system working well under the Malaysian conditions of a centralized and powerful government, and relatively uniform geography, may be less suitable in Indonesia. There

any system must cope with decentralized political control, a broadly more democratic situation, and enormous sprawling and climatically divergent locations in Sumatra, Kalimantan and other islands.

The paper now examines both the nucleus estates and the efforts to better individual farms. The institutional arrangements are checked, and economic and social outcomes examined. Conclusions are finally presented, and the global significance of the Indonesian experience is reviewed.

### GOVERNMENT AND OTHER MEASURES OF IMPROVEMENT

The Indonesian initiatives based on oil palm and other tree crops have been adopted against a background of widespread poverty in the outer islands, where a large, very poor and technically uninformed rural population lives side by side with a prosperous commercial estate plantation sector. While many small farmers in these regions are cultivating trees including oil palm as a spread effect from estates, their stands are usually low-yielding and land-extensive providing low returns, and this, taken with shifting cultivation of food crops, puts great pressure on forest resources in an environment already diminished through timber extraction (Potter and Lee, 1998). Although a few farmers have made autonomous transitions to high yielding varieties and secured major income increases, these have been mainly staff and workers from estates along with some well-endowed local businesspersons. Relatively few ordinary farmers have taken such action and it may thus be seen as necessary for government or a civil society organization to intervene to secure such change. The government has been the main entity concerned with small-holding plantation

crops in Indonesia, and this paper concentrates on it.

Some regions of the outer islands suffer especially severe poverty and environmental problems, needing enhanced attention to secure more appropriately balanced regional development. These regions include southern Sumatra, and eastern, western and central Kalimantan. The Kalimantan locations, in particular, have frequently been covered by large areas of the creeping and economically useless grass, *alang2* or *Imperata cylindrica*, which is the legacy of deforestation by timber companies and illegal loggers, or of clearing for food crop cultivation in transmigration schemes. The frequent burning during the dry season of both *alang2* and unutilizable timber has posed additional environmental hazards through smoke and haze, and these have damaged health in places concerned. The government under these circumstances has been keen to issue titles or *hak guna usaha* without substantial payment by developers, so as to secure the better option of oil palm cultivation.

The need under these circumstances is to introduce socio-economic improvements which match local resources and climatic endowments, and which can be adopted sustainably and profitably by local farmers and transmigrants. The yield-increasing nature of the improvements then enables the goal of reducing pressure on the limited land to be realized. It is vital too from a national viewpoint, and a critical additional justification, that the improvements generate a higher national income and foreign exchange. The main focus in the early years of smallholder plantation improvement was on rubber, which was already well-known to local people, cultivated

in low yielding mode over vast areas, and marketed through a competitive chain of traders. The improvements of those years could be built on an existing base which was somewhat easier than starting with a fresh crop. But from the mid 1980s, the revenue earning superiority of oil palm over rubber became clear, and the chief thrust of new initiatives has since focused on the former.

The principal constraints on improvement have always included the scarcity of development capital, although this was not acute until the 1997 financial crisis. More immediate significance has been the shortage of skilled personnel to implement the changes thought appropriate where the tree crop extension services or *dinas perkebunan* have lacked adequate staff and been perennially underfunded. The staffing difficulty was, nevertheless, overcome with the rubber improvement schemes of the 1970s and early 1980s, which were largely implemented by the Smallholders' Rubber Development Programme funded in part by the World Bank and progressively built into a most effective operation (Zen, 1997). This was a separate venture alongside the traditional tree crop extension, and engineered the bulk of new initiatives over those years.

But when interest grew in oil palm, the vast size of envisaged improvements, taken with the need to have large palm oil mills for the necessary economies of scale, meant that attention turned to seeking help from the government and private estates. These entities had high managerial and technical skills, huge palm oil mills, and ready access to capital. The nucleus estate model, which was pioneered in Africa in the 1950s by the Commonwealth Development Corporation and had come to be widely employed on that continent

(Graham and Floering, 1984), was adopted by the Indonesian authorities, and from the late 1970s to 2000 came to involve large areas of oil palm.

When the nucleus estate programme commenced, Indonesia was still in the highly centralized and authoritative mode of the New Order government. But, since 1999, this has been superseded, first by the newly important influence of local legislatures and then after 2001 by the decentralization arrangements of *otonomi daerah*. The increase in influence of local politicians and the placing of most of the administrative and financial power in the hands of *kabupaten* have importantly influenced socio-economic initiatives, not only through the nucleus estates but also through the extension by the *Dinas Perkebunan*. These changes have certainly had benefits, but also posed new constraints. The financial problems from 1997 additionally occasioned a slowing of the nucleus estates, and, in fact, there has been no further government-sponsored extension of these units since 2001. But several private estate companies have continued to establish such estates with their own resources, partly as a means of getting hold of more land for their commercial operations.

There have as well since 1998 been widespread disputes over ownership of land, including areas

already provided to settler-smallholders within nucleus estate schemes. While the forced alienation of land for nucleus and commercial estate purposes was largely unopposed during the New Order, original landowners operating in a more democratic paradigm have seen the original virtual seizure of their lands as an act to be vigorously contested. These conflicts are also exacerbated by a growing land scarcity, where the traditional shifting cultivation of largely subsistence crops is becoming increasingly difficult to maintain and inevitably generates tensions.

### Routes to Improvement

There is, in the mid 2000s, a big Indonesian debate over the direction for socio-economic improvement through oil palm and other plantations. While earlier initiatives certainly had positive impacts, rural poverty is still widespread, and growing more oil palm in targeted schemes can overcome it further. The two chief routes for the future are still through more development of nucleus estates, and through more of the longer-standing approach of improving traditional individual smallholdings. These routes and their past performances are now examined in more detail, prior to considering how they might be developed in future.

**Nucleus estates.** The basic thrust of nucleus estates is to provide, for the purpose of smallholder development, a package comprising management, technology, including high-yielding trees, and services entailing the opening and planting of land, the supply of inputs and processing. This package is made available from a commercial nucleus or *inti* to a surrounding *plasma* of smallholdings in 2-3 ha units. The government from the late 1970s puts pressure on estates to undertake such *plasma* development, in return giving them access to land for *inti* and providing subsidized capital for *inti* and *plasma* development.

A total of almost 900 000 ha of smallholder *plasma* were established on nucleus estates up to 2003 (Table 1), involving 400 000 settlers and almost 2 million people in the families concerned. The proportion of *inti* in the total nucleus estate area was 20% for many years, but rose after 1998 to 40%, reducing the estate risk and enhancing the economies of scale. The usual arrangement was for estates to clear the *plasma* land, plant the tree crop, and administer the development for four years, during which time some employment was offered to the settler-smallholders. Then, administration was transferred to an elected settler cooperative,

TABLE 1. AREAS ('000 ha), ANNUAL AREA GROWTH RATES (%) AND PRODUCTION ('000 t) OF OIL PALM, 1980-2003

Year	Govt. estates	Private estates	Smallholdings	Total
1980	200 (499) <sup>a</sup>	89 (222)	6 (1)	295 (721)
1990	372 [6.4] <sup>b</sup> (1 247)	463 [18.0] (789)	291 [28.1] (377)	1.127 [14.5] (2 413)
2003	561 [3.2] (1 716)	2 555 [14.0] (4 778)	1 811 <sup>c</sup> [15.1] (3 257)	4 926 [12.0] (9 750)

Notes: <sup>a</sup> Figures in parentheses are '000 t of production.

<sup>b</sup> Figures in brackets are annual compound area growth rates, %, 1980-1990 and 1990-2003.

<sup>c</sup> Including 897 457 ha in nucleus estate *plasma*, and a balance of over 900 000 ha of individual holdings.

Source: Direktorat Jenderal Bina Produksi Perkebunan (2004).

which normally contracted the estate to continue the functions of management, extension and provision of services. The co-operative handled the repayment of *plasma* development loans, with 30% of the net crop proceeds being deducted to cover the subsidized interest of 12% and charges for inputs and services. The estates benefited through their fees for services, and through their returns from milling smallholder fruits into crude palm oil.

Five types of nucleus estate were established from the beginning in 1978, as described in Table 2. While the first PIR *lokal* only provided for surrounding farmers, subsequent types catered for both transmigrants and locals, with the former who often came from failed local cash crop schemes normally given priority. One problem persisting from the start, and never properly rectified, was that of producing enough subsistence over the first four years

until the oil palm started producing. Although the settlers were sometimes employed by the estates, notably in opening and planting the *plasma* land, this did not generally provide sufficient income. Settlers were also not permitted to inter-crop their young oil palm stands, where this could have substantially supplemented their returns. The prices paid for their crops of fresh fruit bunches (FFB) were further not high enough over the first two decades,

TABLE 2. TYPES OF NUCLEUS ESTATE

Type	Main features	Performances
A). PIR <i>lokal</i> , from 1987	On government estates only. Solely for local farmers surrounding estates. Each settler allocated 2 ha of oil palm, with all settler land in both PIR <i>lokal</i> and in (B) through (E) being given by the local farmers in return for their inclusion.	Not good. Major problems with failed subsistence food crops and consequent lack of food during 4-year immaturity, with lack of other incomes in the remote areas involved 2 ha of oil palm also gave insufficient income, especially as government set too low a price for FFB and stipulated a 30% deduction from this. Many settlers abandoned their lands, selling them to rich traders, <i>etc.</i>
B). Assisted PIR, from 1984	On government and private estates, partly funded by WB and ADB. Priority (1) for locals and (2) for transmigrants, some of whom were from failed schemes whose land now became available. Each settler with 2 ha oil palm and 1 ha food crops, incl. house area. Schools, health centres, markets, roads, <i>etc.</i> also provided.	Reasonable. Problems again with failed food crops and lack of other incomes. But fewer settlers left the <i>plasma</i> , and the situation once trees began to produce incomes was better for participants, especially following government's upward revision of the price from 1987. But there were still difficulties owing to the 30% deductions up to the time of loan repayments. From 1997 following rules relaxation settlers also planted 1 ha food crop areas with oil palm, and this together with higher yields after trees were 9-10 years old and other outside activities were started much improved their incomes and enabled loans to be finally repaid.
C). Special PIR, from 1984	On government and private estates, funded by Indonesian Government. Priority (1) for transmigrants and (2) for locals. Areas and other facilities as under (B), but 35 m <sup>2</sup> added for housing.	Reasonable. But transmigrants especially had problems with failed food crops, since land was not suitable for these. Other conditions, and improvements post-1997, were similar to those of (B).
D). Accelerated PIR, from 1984	On government and private estates, funded by Indonesian Government. For transmigrants only. Areas and other facilities as under (B) and (C).	Reasonable. Still severe problems with food crops. Other conditions and improvements post-1997, were similar to those of (B) and (C).
E). PIR <i>trans</i> & KKPA, from 1986, replacing (B), (C) & (D)	On government and private estates, funded by Indonesian Government, but with interest on KKPA loans later raised to 16% without further subsidy. For both transmigrants and locals, land from the latter being included in the scheme.	Reasonable, similar to (B), (C) and (D).

and this was only improved from 1997 when the official *formula* for this purpose was altered. Again, the 2 ha of oil palm per settler were really not sufficient to generate a reasonable income, especially in the early lower yielding years. But, after 1997 participants were allowed to plant oil palm on their additional cash crop area of 1 ha, and they universally took advantage of this.

The settlers' situations usually improved greatly when their palms came into full production after 9-10 years, which was also a stage when they were normally able to complete both their principal and interest repayments. Although there were exceptions, most of the farmers in *plasma* areas established up to the mid 1990s were doing well by the mid 2000s, although there was the usual variable performances characteristic of small farm agriculture. There were also big differences between separate nucleus estate schemes.

Thus, relating to estate differences, the competence of management of sponsoring estates was a key influence on performance, affecting the original conversions of land, the quality of palms and cultivation, the standard of product, the handling of settlers, and relations with cooperatives and other parties including local governments and transmigration officials. For estate managements previously geared to profitably running commercial units, it was a new ball game to enter the realm of socio-economic improvement, with a continuing temptation and tendency to emphasize the core *inti* which was after all the profit core of their operation. The situation was further complicated from the late 1990s by the major political changes, which impinged on the relations of estates with the local communities. The frequently domineering attitudes of managements made it hard for

them to solve the serious land problems that arose with the original owners, especially when transfers had not been properly documented during the New Order (Soeleiman, 2000).

Hence, estates had frequently not properly checked the ownership of each of the many hundreds of individual parcels comprising a proposed *plasma* area of several thousand hectares, although to avoid claims under the changed political conditions it was necessary to do so and secure the individual agreements to transfers. This omission released the potential for prolonged disputes. A related dilemma was the contention of local settlers that they were entitled to more land than the norm, because they had contributed big areas to the schemes. Indeed, certain locals contributed their land to the nucleus estates, but were not later included in the *plasma*. It was observed in the study that these difficulties often led to the freezing of large blocks, including those in existing *plasma*, disrupting operations for long and sometimes indefinite periods.

There were also common misunderstandings between estate managements and local governments, which became more serious as power was devolved from the centre to the *kabupaten*. A generation of managements used to ignoring local officials took time to realize they now needed good rapport with these people who could otherwise make it very difficult for them. In one recent case in the study, the *bupati* blockaded for several months the main access road into a big nucleus estate, making it difficult to export its produce until the estate agreed to defer on a particular issue.

Some managements were incompetent even at running normal commercial operations, and this carried over into the

*plasma* where such aspects as wage payments to workers were delayed and lower than agreed. In a further study case of complete ineptitude, furious settlers took over the estate offices and ran the operation themselves. In another case, only 200 ha of a 500 ha *plasma* had been poorly developed even after several years, since the technically competent estate management was unable to establish workable relations with the local settler groups.

The transfer to settlers of the requisite skills also proved difficult, especially with people having non-agricultural backgrounds. Often, it took many years for such settlers to competently handle their areas, especially with harvesting and other operations that required much expertise. When the managements used to dealing with hired workers ignored this training problem, the results were inevitably poor, but where proper and sympathetic extension was instituted the results were often very good, increasing net returns for all concerned. Indeed, many estate companies adjusted well following earlier setbacks, managing to achieve excellent results.

Hence, in a further instance in the study, a big company engaging in numerous nucleus estates set up a special section to deal with settler extension and community relations, and concentrating on the 20%-30% of participants with particular difficulties. This company, whose commercial results were already excellent, secured much better than average settler performances and cordial relations, raising both its and the settlers' earnings. This was still within the framework of general discipline and toughness necessary in such big operations. Indeed, it is noticeable that commercial companies have generally performed better than government

estates in the nucleus estates programmes. They are more imaginative and flexible in management, and their observance of the *bottom line* has served to promote more effective settler management.

The estates were not the only parties affecting the outcomes, however, and troubles also arose from unsuitable settlers selected by the Department of Transmigration and Manpower. Such settlers often failed completely, and eventually dropped out of the schemes. Again, Bank Indonesia was frequently slow in its disbursements to commercial banks offering the loans, while the latter banks co-ordinated poorly with both, the Department and estate companies. This led to delays of months or even years in land clearing and planting, incurring higher expenditures in the interim to

support *plasma* farmers. Co-operatives on occasion functioned poorly, especially in earlier years, when those responsible had to engage in a massive learning process, and corruption amongst the elected officials led to losses of settlers' money. But these complications were often surmounted, especially under pressure from an increasingly knowledgeable and vociferous membership, and as the co-operatives adjusted towards better administration.

Despite these problems of nucleus estates, estimates based on the study and using currently forecast prices indicate a moderate average net return (Tables 3 and 4). The estimated mean internal rate of return (IRR) of *plasma* over the 28 years involved is 15%, after deduction of land charges which in

practice do not always apply. This compares with an estimate of 18% after land charges for purely commercial estates. A good part of the substantial net return per kg of the *plasma* (Table 3) flows back to the settlers, adding to the wage of Rp 21.000 per day paid for harvesting and other manual inputs.

Yet these results subsume the considerable differences between individual settlers, with a check in the study of individual farmer's record books showing a variation of at least 50% around the mean *plasma* yield. Again, some nucleus estate *plasma* as a whole, and notably those making the positive adjustments just discussed, did much better than average. But even the worst performing entities have survived, although the return per settler is much lower.

TABLE 3. EXPECTED PRICES, YIELDS AND COSTS

	Estates	<i>Plasma</i> s/holding	High-yielding s/holding	Low-yielding s/holding
Factory-gate price (Rp/kg FFB)	600	573	495	441
Yield of FFB (t/ha)	21.3	19.0	17.0	10.0
Interest rate (%)	12	12	12	12
Wage (Rp/day)	21.000	21.000	18.900	18.900
Harvesting cost (Rp/kg FFB) <sup>a</sup>	60	60	54	54
Overheads (Rp/kg FFB) <sup>b</sup>	19.8	18.9	5.4 <sup>c</sup>	2.7 <sup>c</sup>
Capital (Rp/kg FFB) <sup>c</sup>	9.0	10.1	8.8	1.7
Land (Rp/kg FFB) <sup>d</sup>	28.2	31.6	35.3	50.0
Total cost (Rp/kg FFB) <sup>e</sup>	289.4	299.8	265.3	290.6
Net return (Rp/kg FFB) <sup>f</sup>	310.6	273.2	229.7	150.4
Official investment cost ('0000 Rp/ha) <sup>g</sup>	-	19.019	1.300	-

Notes:

<sup>a</sup> All-in, including value of housing and all perquisites provided to workers.

<sup>b</sup> Assuming that the overheads of high- and low-yielding smallholdings are 30% and 50% respectively of those on estates and *plasma* holdings.

<sup>c</sup> Charge for interest on working capital in the enterprise.

<sup>d</sup> Charge for interest on the value of land.

<sup>e</sup> Including upkeep, fertilizer, harvesting, overheads, capital and land (but not expenditures on any services provided by government departments including the *Dinas Perkebunan* and *Biro Transmigrasi*).

<sup>f</sup> Factory-gate price *less* total cost as defined in *f*.

<sup>g</sup> In the case of the *plasma* smallholding, this is the total cost including overheads of getting the stand up to year 4 when it commences production. Most of this cost is repaid at interest by the smallholders concerned, but that could take six to eight further years. In the case of the high-yielding smallholding, this is the cost of providing the subsidized seedlings and the accompanying extension by the *Dinas Perkebunan*.

Source: Data secured in the Group's Indonesian oil palm study, 2002-2005.

In overall assessment, the nucleus estates may be judged a reasonable success, despite the problems demanding solutions if the route is to be further developed. Desirable adjustments are explored in the conclusions of the paper.

**Improvement of individual smallholdings.** A majority of the current area of Indonesian individual oil palm smallholdings is planted with low-yielding palms, whose estimated average annual yield of FFB is only 10 t/ha compared to the 21.3 t on estates (Table 3). The smallholding palms are generally purchased from little private nurseries or travelling traders, whose low prices of Rp 4.000 each appear to the farmers short on cash and needing to establish around 120 palms/ha. The farmers' lack of technical knowledge also makes it hard for them to distinguish between such poor materials and more than twice as expensive high-yielding trees sold by a few big nurseries which are also hard to access and hence imposing additional transaction costs. These inferior palms are also often planted haphazardly without terracing, and fertilizer applications are low. But the fact that those involved are usually local people means they can access land without the substantial charges often applied to estates and other outsiders. They accordingly secure an estimated IRR (without land costs) of 19% (Table 4), but their lesser outputs mean they obtain only half the

estimated net present value of the *plasma* holdings. The economic attraction of such smallholder oil palm is nonetheless attested to by its rapid expansion of 15% per year over the last 13 years (Table 1).

While most such traditional smallholders have had no contact with plantation extension officers, the limited operations of the *Dinas Perkebunan* with individual smallholdings since the 1960s have actually had quite positive impacts, notably through the distribution of high-yielding materials by reputable nurseries. This was illustrated for rubber by Barlow and Muharminto (1982) and Zen (1997), who observed how a small proportion of smallholders had been thereby enabled to plant better trees, and how this and improved husbandry led to doubled yields over the 20-year life of the stands. Similar efforts have continued more recently with oil palm, with an especially promising joint initiative in several locations in the 2000s between the Indonesian Oil Palm Research Institute (IOPRI), the local *Dinas Perkebunan* and local estate companies. The companies have set up large nurseries selling improved seedlings at subsidized prices, in an extension programme implemented by the *Dinas* and seeing widespread tree adoption in each case.

But these, like other initiatives, have again been affected by the recent political changes, notably by decentralization by which the local *Dinas* are now almost exclusively

under the control and financial jurisdiction of *kabupaten* showing varying degrees of interest in rural improvement. Sometimes, especially in the richer provinces including Riau and East Kalimantan, the programmes of the *Dinas* have been strongly bolstered, and supplemented by special subsidized loans assisting the developments further. In other instances, however, the *Dinas* are even more constrained than they were under the New Order, where they were at least assured of a minimal level of finance.

There has, nonetheless, been a considerable advance of smallholder high-yielding oil palm, although part of this is due to the autonomous actions already discussed. Often the areas of these autonomous actors were quite large by smallholding standards, approaching 10-20 ha. But there are also more traditional smallholders, frequently *pendatang* from other parts of Indonesia, planting such better materials on their 2-3 ha, where they were impelled to do this by both the *Dinas* and their bigger and more knowledgeable smallholder neighbours. Their estimated average yields were reasonable at 17.0 t/ha (Table 3), and with labour and other costs being lower than those of estates, they managed a mean IRR of 18% after land charges, with a quite substantial net present value (Table 4).

Those who have established high-yielding independent smallholdings can accordingly be judged

TABLE 4. EXPECTED INTERNAL RATES OF RETURN (IRRs) AND NET PRESENT VALUES (NPVs)

	Estates	<i>Plasma</i> s/holdings	High-yielding s/holdings	Low-yielding s/holdings
IRR (%)				
With land cost	18	15	18	12
Without land	20	16	21	19
NPV (Rp'000)				
With land cost	11.852	6.066	6.975	Negative
Without land	15.477	9.720	10.832	4.485

as having secured useful increases in income, and if this approach can be extended to more traditional smallholders it will mark a significant advance. It is hard to estimate the extent of such improved holdings, but it is thought unlikely to exceed 250 000 ha in the total of over 900 000 hectares of individual oil palm holdings (Table 1). In many ways improvement through small independent smallholdings is more flexible than those through the comprehensive package and careful control entailed with nucleus estates, and it certainly involves a lower official investment which is advantageous with the scarce development capital (Table 3). It is also more appropriate to the new Indonesian era of devolution and greater personal independence. Suggestions as to how a more effective policy of this kind might be achieved are included in the conclusions.

One aspect not yet mentioned is the very substantial spread effects which can be anticipated as a result of improvement operations like those just described. These effects basically stem from training of the persons involved, where one observation of the study was that numerous settlers in the *plasma* had applied their knowledge through planting high-yielding trees on other land outside the schemes. A further and more minor effect spring from demonstration, where progressive surrounding farmers observe the improvements made by their colleagues, consult them, and themselves plant high yielding stands. There are always considerable lags in such dissemination of innovations, however, first in the learning process, and then in the time needed to amass sufficient capital to take action. But these spread effects should certainly be taken into account in assessing the final results of socio-economic

improvements like those described.

**Other initiatives.** Other players, beside government have attempted the socio-economic improvement of rural populations, and three initiatives implemented by big commercial companies are now explored, but there are of course other schemes, launched not only by business but also by non-government and other civil society organizations.

One venture scrutinized in the study was by a medium-sized estate company in Sumatra, which, with advice from IOPRI and the livestock extension service, launched in 1996 a scheme for distributing cattle to its 500 employees. The company negotiated and then administered a seven-year loan with Bank Rakyat Indonesia, which enabled the distribution of three animals to each employee family. The beasts were grazed under the oil palm, with supplementary feeding on oil palm waste and kernel cake. These animals were used for breeding and fattening and as well as for transporting harvested FFB. By 2003, the number of cattle in the scheme had doubled, while the area harvested per worker had risen from 10 to 15 ha and the incomes of those concerned had been commensurately increased. The scheme was well managed by the estate staff, which also sought outside professional advice on health and feeding regimes. It was featured too by excellent continuing relations with the communities involved, and may up to now be judged an outstanding success.

Another recent venture undertaken by a large commercial estate company, under pressure from the local community and government and following both the failure of a *plasma* enterprise and

retaliatory destruction of estate facilities by dissatisfied local residents, was the establishment of 20 ha community oil palm areas, one beside each of 26 villages. The basic problem in this case, was that while the company established and subsequently managed the areas at a high technical level, it barely liased with the local communities, so that the latter was hardly involved. They thus learnt little which was ironical as the areas would eventually be handed to them to manage. This venture was later scrutinized by Zen *et al.* (2005), who explored the underlying issues and suggested ways in which the approach could be amended. The latter notably involved a higher extension effort, far more local participation, and the promotion of better relations with villagers concerned.

The third initiative was the modification by a very large company with several nucleus estates of the established mode of operation. In this *pola patungal* approach, the settlers did not receive their own 2 ha blocks when the oil palm matured after four years, but were instead given share certificates for 2 ha. They then had the choice of working in the *plasma* area under the cooperative, which had been carefully trained by the company in management and administration, or of becoming regular employees in the estate *inti* workforce. Although this change, which was financed by the company, was chiefly made to avoid settler-company and settler-settler conflicts over the inevitably variable quality of individual blocks, it also enabled a higher operating efficiency to be secured. It was noticed in this study that the yields were high, and that most of the settlers not only improved their original houses but also had satellite dishes and motorcycles. An interesting comparison may be made here with the FELDA scheme

in Malaysia, where the share system was subsequently adopted both to handle the problem of ageing settlers and again obtain better efficiency. The difficulty with individual smallholder operation is always the variability in individual performance, and, with some notable exceptions, conversion to the more highly technical and rigorous general management is likely to improve performance.

These three examples all demonstrate the importance of intervenors designing initiatives which match the systems of workers and smallholders they are attempting to assist. It is notable too that the very success of the first and third initiatives, and the benefit conferred on the participants, also much enhanced the profitability of the companies and rendered the whole affair mutually beneficial. In contrast, the difficulties with the second initiative have since led to a further souring of relations, and the recent killing by the villagers of some staff from the commercial enterprise concerned.

## CONCLUSION

This review of oil palm as a vehicle of socio-economic improvement has indicated the moderate success of the Indonesian Government's nucleus estate programme, while also highlighting the difficulties in implementation. It has likewise denoted a reasonable outcome in establishing high-yielding individual oil palm smallholdings, although this effort was partly due to private agents who had benefited from experiences on nucleus estates. Both programmes secured major increases in living standards of the participants, along with considerable output rises and there were in addition considerable spread effects. The programmes may thus be seen as well justified in economic and social terms,

especially as commercial estates under the previous *laissez faire* had merely stimulated the planting by smallholders of low-yielding trees, with little movement to higher technical levels. These oil palm programs are amongst many official actions to assist rural improvement, using the outstanding economic performance of a particular crop as a means of extending prosperity.

The programmes discussed here are targeted micro-interventions, attempting to overcome incomplete markets for credit and information. The nucleus estates interestingly involved harnessing commercial expertise toward socio-economic goals, it being notable that private estates often managed more effectively than their public counterparts, adjusting to the new task and simultaneously increasing commercial returns. The assistance to individual smallholders worked well on its restricted scale, and dovetailed effectively with the efforts of progressive farmers. The scarce technical skills and other resources were committed to these two programmes, secured estimated average returns to investment little different from those on commercial estates, and occurred within an expanding and competitive industry, which consequently distributed its wealth to many more people. Indeed, recent Indonesian domestic pressures for greater equity, and the disastrous consequences for estates ignoring this, mean there is little alternative to organizing further such programmes. They contrast strikingly with the Indonesian official oil palm macro-interventions, notably with export taxes, which were broadly unsuccessful (Marks *et al.*, 1998).

## Recommendations for the Future

It is judged that both oil palm nucleus estates and the improvement of individual oil

palm holdings should be strongly continued, following appropriate adjustments. For nucleus estates, adequate capital should be provided, but with no subsidization of interest under the expectation of further rate declines. The inter-cropping of oil palm should be permitted during immaturity, with additional guidance to settlers in cash cropping and marketing, and with cattle and other high value items being included. These changes should raise participant incomes during the critical early years. Training courses should be given to help the nucleus estate staff better transfer their technologies, deal more effectively with land transfers and sustain good community relations. There should likewise be more guidance and monitoring in running cooperatives. Interest and loan repayments should be made more flexible, with lower deductions during the years of smaller yields.

The approach to individual smallholdings also requires adequate finance, which might be provided from the centre in a special fund, enabling less well-endowed provinces to parallel the efforts in Riau and north Sumatra. The emphasis of this less expensive programme should be on nurseries providing reputable high-yielding planting materials, whose price might be subsidized to stimulate adoption. This initiative should be backed by technical advice through local extension centres. It is tragic that over half the individual smallholder plantings in the 2000s are still with inferior low-yielding trees, and it is crucial to check the practice almost halving outputs for over 25 years.

The Indonesian socio-economic thrusts with oil palm stand out globally as major tree crop interventions. While they have been more constrained in capital and skills than the earlier efforts

of the Malaysian Federal Land Development Authority, the use of nucleus estates in conjunction with the commercial sector has helped overcome this. Although the extension of high-yielding varieties to individual smallholdings has also been less well-endowed than similar efforts in Malaysia,

Thailand or India, it has shown that reasonable results can be secured on a smaller budget. Certainly the situation in areas improved by official initiatives in all these countries is far better than under *laissez faire*, and the disastrous effects of withdrawing the admittedly badly flawed

previous initiatives in West Africa are shown by the current smallholder scene there. Government and other intervenors are undoubtedly crucial in socio-economic improvement through tree crops, and the challenge is to make these initiatives even more effective.

## REFERENCES

BARLOW, C and MUHARMINTO (1982). *Smallholder Rubber in South Sumatra. Towards Economic Improvement*. Balai Penelitian Perkebunan, Bogor.

BARLOW, C (1997). Growth, structural change and plantation tree crops: the case of rubber. *World Development Vol. 25 No. 10*: 1589-1607.

BARLOW, C (2001). The role of institutions in planting improved smallholder rubber. *The Future of Perennial Crops. Investment and Sustainability in the Humid Tropics* (Robert Yapo Assamoi; Kees Burger; Dominique Nicolas; Francois Ruf and Patrice de Vernou eds.). Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement and BNETD, Montpellier.

BARLOW, C; ZAHARI ZEN and RIA GONDOWARSITO (2005). *Estates and Smallholdings in Indonesian Palm Oil Production: Performance and Prospects*. International Oil Palm Study Group, Canberra.

BATES, R (1981). *Markets and States in Tropical Africa*. University of California Press, Los Angeles.

BAUER, P T (1976). *Dissent on Development*. Harvard University Press, Cambridge.

DIREKTORAT JENDERAL BINA PRODUKSI PERKEBUNAN (2004). *Statistik Perkebunan Indonesia, 2001-2003* (Statistics of Indonesia Tree Crop Farms, 2001-2003). Departemen Pertanian, Jakarta.

FLETCHER, F (1991). Regulation with growth: the political economy of palm oil in Malaysia. *World Development Vol. 19 No. 6*: 623-636.

GRAHAM, E and FLOERING, I (1984). *The Modern Plantation in the Third World*. Croom Helm, London and Sydney.

MARKS, S V; DONALD, F L and JACQUELINE POMEROY (1998). Economic effects of taxes on oil palm products. *Bulletin of Indonesian Economic Studies Vol. 34 No. 3*: 37-58.

PT CAPRICORN INDONESIA CONSULT, INC. (1997). *Study on Oil Palm Industry and Plantation in Indonesia*. Jakarta.

POTTER, L and JUSTIN LEE (1998). *Tree Planting in Indonesia: Trends, Impacts and Directions*. Centre for International Forestry Research, Bogor.

SOELEIMAN (2000). *Tanah Adat. Kenyataan Empiris Implementasi Hukum Tanah Nasional di Sumatera Selatan* (Traditional Land. Empirical Reality in Implementing the National Land Rights of South Sumatra). Palembang.

WORLD BANK (1981). *Accelerated Development in Sub-Saharan Africa*. Washington, DC.

WORLD BANK (1999). *Cote d'Ivoire. Revue de l'aide de la Banque Modiale au pays* (The Ivory Coast. Review of World Bank Country Aid). Washington, DC.

ZEN, Z (1997). *The Improvement of Smallholder Rubber*. Unpublished Ph.D thesis. University of Western Australia, Perth.

ZEN, Z; JOHN McCARTHY and COLIN BARLOW (2005). *Environmental Economics in an Age of Regional Autonomy: the Case of Pollution in the Plantation Sector of North Sumatra*. Universitas Sumatera Utara, Medan.