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Custom and Capital: A Financial Appraisal of Alternative Arrangements for Large-Scale Oil Palm Development on Customary Land in Sarawak, Malaysia*

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***Abstract*:** The oil palm boom in Southeast Asia has increased demand for institutional arrangements facilitating large-scale plantation development on customary lands. A financial model of an oil palm plantation in Sarawak, Malaysia, is used to explore six project types, including managed smallholders, three different joint-venture arrangements, renting, and (for comparison) a private plantation on state land. Benefit-cost analysis is used as the basis for project, private (shareholder), and stakeholder analyses. There is a trade-off between the efficiency and equity outcomes of the alternative arrangements as modelled. While joint venture projects provide higher aggregate net benefits, managed smallholder projects provide more benefits to landholders. When the actual performance of the alternative schemes is taken into account, the managed smallholder approach is superior on both efficiency and equity grounds. The joint venture approach could be improved by paying advance dividends or combining a fixed rent with a share of dividends to reduce the income risk faced by landholders. In all cases, improved management is needed for the schemes to achieve their developmental potential.

Keywords: Benefit-cost analysis, joint ventures, Malaysia, managed smallholders, Southeast Asia.
JEL classification: O13, O22, Q14, Q15, Q18

1. Introduction

Rapid economic growth in East and South Asia is fuelling demand for Southeast Asian agricultural commodities, notably rubber and palm oil. The renewed profitability of these crops has in turn generated demand from local and foreign investors for access to land for large-scale plantation development. State actors at national and sub-national levels have been eager to satisfy this demand in order to capture a share of the rents generated by the boom in tree crops, whether in state-managed economies such as Laos and Vietnam or

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market-based economies such as Malaysia and Indonesia (Shi 2008; Manivong and Cramb 2008; McCarthy 2007; McCarthy and Cramb 2009). However, much of the remaining suitable land in Southeast Asia is already held by village-based smallholders practising semi-subsistence, long-fallow farming under customary tenure systems, rendering large-scale land development a complex social, political, and legal undertaking (Deininger 2003; Cramb *et al.* 2009). This has induced governments to develop a variety of institutional arrangements to combine the land, labour, capital, and management required for profitable tree-crop development (Barlow 1986; Casson 2000; Zen *et al.* 2005; Wright 2009; Zola 2009; SPF 2008; Baird, 2009). Some of these measures clearly amount to enclosure, expropriation, and ejection of farming populations, generating justifiable 'agrarian angst' on the part of affected landholders (Colchester *et al.* 2006, 2007; Then 2008; Turner and Caouette 2009). In many cases, however, domestic political and legal realities, pressure from international donors, and collaborative initiatives such as the Roundtable on Sustainable Palm Oil (RSPO) have constrained governments and investors to seek institutional arrangements that are perceived to be 'developmental', providing opportunities for customary landholders to participate equitably in land development projects.

The Malaysian state of Sarawak on the north-west coast of Borneo provides an excellent case study of institutional innovation in the large-scale development of customary land (Leigh 2001). Around 20-25 per cent of the total land area and 60-70 per cent of agricultural land (including forest-fallow) is claimed as Native Customary Land (though recent amendments to the 1958 Land Code have made it increasingly difficult to uphold those claims, hence the Sarawak Government asserts, on the basis of unpublished maps, that only 13 per cent of land is Native Customary Land) (Cramb and Dixon 1988; Cramb 2007). Such land is not surveyed or titled but is subject to various combinations of private and common property rights within an overarching framework of community governance. Hence it is more accurately characterised as 'community-based tenure' than 'communal tenure', given that most of the land is held by individual households (Cramb and Wills 1990; Deininger 2003). The Land Code makes it illegal for 'non-Natives' (primarily Malaysians of Chinese descent) to deal in Native Customary Land (Porter 1967). As much of the capital for oil palm development is in Malaysian Chinese hands, this creates a dilemma for a government intent on transforming the rural landscape via private-sector plantation development (Cramb 2011).

Sarawak is regarded as the last frontier for oil palm expansion in Malaysia, following the effective closure of the frontier in Peninsular Malaysia and Sabah (Fold 2000; Sutton 2001; McCarthy and Cramb 2009). From 23,000 ha in 1980, the area planted with oil palm had increased thirtyfold to 840,000 ha by 2009 (DA 2011). Oil palm now accounts for about 7 per cent of the total land area and 67 per cent of the area under agricultural crops in Sarawak. The official target was to plant one million hectares by 2010, including 400,000 ha of Native Customary Land. While these targets have had to be revised and extended (in particular, the Ministry of Land Development now aims for 380,000 ha of Native Customary Land to be planted by 2020), well over a million hectares have already been allocated to 'land banks' for oil palm development and the rate of expansion continues to be around 10 per cent per annum. Most oil palm plantations (80%) have been established by private companies (or privatised government agencies) holding leases over State Land (though claims to customary ownership are being pursued in perhaps a quarter of these (Cramb 2011)). As the profitable opportunities for developing State Land have been taken up over the past 20-30 years,

attention has increasingly turned to the development of areas officially recognised as Native Customary Land (Cramb 2011).

Two broad approaches have been adopted to facilitate large-scale oil palm development on Native Customary Land: (1) the 'managed smallholders' approach and (2) the 'joint venture' approach. There has also been considerable growth in both independent and state-assisted smallholder oil palm on customary land, though the area is only one-sixth of that under the large-scale schemes (Cramb 2011). Research to compare plantation and smallholder approaches is being conducted but is beyond the scope of this paper (Cramb and Sujang 2011).

The main agency responsible for implementing the managed smallholder approach is the Sarawak Land Consolidation and Rehabilitation Authority (SALCRA). This agency was established in 1976 to develop Native Customary Land 'for the benefit of the owners'. SALCRA is 'deemed to be a Native' under the Land Code and so can deal in native customary land. After taking adequate steps to 'ascertain the wishes of the owners', SALCRA can declare a tract of land (typically up to 5,000 ha) to be a 'development area', thereby giving it powers to develop the land. The SALCRA Ordinance requires it to survey the land and, on completion of the development, the right-holders are issued with full titles. SALCRA's mode of operation is to borrow public and donor funds for the capital costs of development. The costs are charged to the participants, who progressively pay back the debt as their palms are harvested, leaving them with the net proceeds from the sale of their fruit. While initially the plantation labour was entirely provided by the landholders, who were employed on a daily wage but worked on their own lots, in most cases Indonesian contract workers are now employed, especially for harvesting, as landholders pursue other farm and non-farm activities.

After a slow start in the 1970s and 1980s due to lack of resources and experienced manpower, by 2006 SALCRA had established 19 schemes with over 45,000 ha of oil palm (about 7% of the total oil palm area) involving over 12,500 participants, an average of around 4 ha per participant. Though the agency has been criticised for being caught up in patronage politics (King 1986; Thien 2005), high palm oil prices, the payment of proceeds, and the issuing of titles have eased many of the participants' concerns and there is unmet demand in many inland regions for SALCRA oil palm schemes. Nevertheless, historical problems of remote and fragmented plantation areas, often with poor soils, combined with inadequate management at the estate level, have restricted the performance of some schemes (Cramb 1992). In large part, this is due to SALCRA's original aim of providing development opportunities to poor rural communities rather than maximising profits.

In conjunction with the Minstry of Land Development, the agency responsible for the joint venture approach is the Land Custody and Development Authority (LCDA), established in 1982. LCDA is not primarily a land development agency in the same sense as SALCRA but an intermediary between landholders and private plantation companies. As with SALCRA, LCDA is deemed to be a 'Native', giving it power to deal in customary land. LCDA too proceeds by declaring land to be a development area, though the only condition is that 'it appears to the Minister that it would be in the interest of the inhabitants of any area that such area should be developed.' The joint venture approach made little headway until the launch of the New Concept (*Konsep Baru*) policy in 1994 (Uning n.d.; MLD 1997). Under this policy the customary landholders agree to assign their land rights to LCDA (by

signing a trust deed), which forms a joint venture company (JVC) with a private-sector partner (Bulan 2006). The JVC then applies to be 'deemed to be a Native' under the Land Code. A consolidated lease covering 5,000 ha or more is issued to the JVC for a 60-year period. Following a picket survey of individual holdings within the lease area, the JVC pays the value of the land to the owners, which until 2009 was pegged at MYR 1,200 per ha (which is below the market value of favourably situated land). Of this, 10 per cent is paid up-front in cash, 30 per cent is invested in a government unit trust scheme, and 60 per cent is invested as the landowners' equity in the company. The private-sector partner holds 60 per cent equity, the landholders 30 per cent, and LCDA 10 per cent. Landholders receive no title to their land but can expect to receive dividends according to the area of land contributed. They can obtain employment on the estate but are not involved in any management decisions or financing arrangements. The primary intention behind the joint venture approach has been to draw on private capital and management to open up customary land for development at a commercial standard (Uning n.d.; MLD 1997; Cramb 2011).

By 2008 there were 33 joint-venture projects on customary land, involving 11,850 participants, and 45,000 ha under oil palm, an average of 4 ha per participant (very similar, in fact, to SALCRA). However, even more so than with SALCRA schemes, the joint venture projects have come in for heavy criticism (Ngidang 1999; 2000; 2002; Songan and Sindang 2000; IDEAL 2001; Matsubura 2003; Majid-Cooke 2002; 2006). These concerns seem well justified in that, by 2009, only one of the JVCs (with a planted area of 1,800 ha) had issued actual dividends. An investigation by an experienced plantation manager commissioned by LCDA found that one of the key problems was inexperienced and ineffective management at the plantation level (as indeed with SALCRA). The earliest and largest project (the Kanowit Oil Palm Project), established in 1995 and accounting for over a quarter of the current area in joint venture projects, had been unable to declare dividends by 2009 due to low yields and heavy borrowings at high interest rates. In 2008, this led to protests and blockades and in 2009 some of the participants initated legal proceedings against LCDA (Thien 2008). In response to landholder concerns, LCDA has proposed modifications to the New Concept policy, including the payment of advance dividends to landholders from the first year. Other options under consideration include the incorporation of a fixed rent component, with or without a share of dividends, and increasing the notional land value used to calculate the investor's capital injection, in order to reduce the required borrowings of the JVC.

The aim of the research reported in this paper is to compare the current and proposed arrangements for large-scale oil palm development on customary land in Sarawak in terms of both efficiency (maximising net present value) and equity (the distribution of benefits among stakeholders). The question of whether private sector involvement can also accelerate progress in developing Native Customary Land is not directly considered but is noted briefly in the Discussion. The focus of the research is on financial benefits and costs, for the time being leaving aside questions about the on-site and off-site environmental costs associated with the broad-scale conversion of mainly forested land (primary and secondary) to an oil palm monoculture (Lian and Wilcove 2008; Tanaka *et al.* 2009; Tisdell and Nantha 2009; Venter *et al.* 2009). Given the highly variable performance of both managed smallholder and joint-venture projects, it is difficult to make meaningful comparisons based on observed data alone, and impossible in the case of proposed modifications to existing arrangements

which are yet to take effect. Hence the approach is to develop a realistic model of a large-scale oil palm plantation in Sarawak conditions and to vary the key parameters in line with the alternative institutional arrangements discussed. The outcomes for each alternative could then be meaningfully compared with each other, as well as with the observed outcomes of actual projects. This kind of analysis is greatly needed to inform the policy debate in Sarawak and elsewhere about the choice of institutional arrangements for this kind of land development.

2. Methods

2.1 Overview

A spreadsheet model was developed for a 15,000 ha oil palm plantation in a typical upland area of Sarawak with mineral soils, undulating terrain, and young secondary forest cover. The data for the model were obtained from several sources, including survey data and detailed feasibility studies prepared by local agricultural consultants, SALCRA, and subsidiaries of the State Farmers' Organisation, as well as interviews with and recorded data provided by key informants in public and private organisations involved in oil palm development. These data were cross-checked with detailed survey data collected by the Malaysian Palm Oil Board (MPOB 2006). The model assumed a 25-year planning horizon (Year 0 to 25) to encompass the economic life of the plantation. Prices and costs were expressed in 2007 Malaysian ringgit (MYR); the average exchange rate in 2007 was USD 1.0 to MYR 3.5. The nominal cost of capital in 2007 was around 8 per cent and the inflation rate around 2 per cent, hence a real discount rate of 6 per cent was adopted.

This model was used to explore six project types (Table 1): (1) a government-managed plantation following the SALCRA approach, with land retained by the landholders and 100 per cent of the net proceeds paid to them (Managed Smallholders); (2) a joint venture plantation following the current New Concept approach managed by LCDA (Joint Venture I), with land contributed to the joint-venture company in return for an up-front advance or incentive payment of MYR 480/ha and a 30 per cent share in the equity and dividends; (3) a modified joint-venture scheme (Joint Venture II) in which advance dividends were paid at MYR 150/ha/y for six years, after which actual dividends are projected to exceed this amount; (4) a joint-venture scheme involving a mixture of renting and dividends (Joint Venture III) in

Table 1. Equity, rental and advances in six project types

Project type	Equity (%)	Rental (MYR/ha)		Advance (MYR/ha)	
	Land-owner	Investor	Agency		
1. Managed Smallholders	100	0	0	0	0
2. Joint Venture I	30	60	10	0	480
3. Joint Venture II	30	60	10	0	480+150 p.a.
4. Joint Venture III	15	75	10	500 p.a.	0
5. Fixed Rent	0	90	10	1,000 p.a.	0
6. State-Land Lease	0	100	0	741	0

which landholders receive a fixed rent of MYR 500/ha/y for the life of the project, and a 15 per cent share in the equity and dividends; (5) a scheme in which the landholders rent their land for MYR 1,000/ha/y but have no equity in the project (Fixed Rent); (6) for comparison, a private estate on State Land, paying the standard one-off premium to the government of MYR 741/ha (State-Land Lease).

Following Campbell and Brown (2003), for each of the project types, a project analysis was undertaken to evaluate the benefits and costs at market prices, regardless of their incidence. A private analysis was also undertaken so that the benefits and costs to the equity holders could be calculated taking into account company tax and financing arrangements. Finally, a stakeholder analysis was conducted, drawing on the previous two analyses to calculate the aggregate net benefits from each stakeholder's perspective – local landholders, local workers, estate management (salaried workers), foreign workers, private investors, and the government.

2.2 Development Costs

The costs associated with communicating and negotiating with landholders prior to the commencement of the project were not included. These are borne by the various government agencies involved as agency overheads and have not, in the past, been charged to a specific project. The cost of surveying land for titling purposes, as required in a SALCRA project, was also not included as this cost is covered by a grant from the Sarawak Government. However, the costs of conducting the picket survey to determine landholders' shares in joint-venture projects are charged to the JVC. Likewise, the cost of any feeder road to the project villages was not included as this too is part of government expenditure on rural infrastructure, with benefits well beyond the plantation. It was assumed that an appropriately sized palm oil mill was located within 20-30 km of the plantation, hence the costs of constructing and operating a mill were not included.

A plantation area of 15,000 ha was assumed, compact but not necessarily contiguous, developed in three phases, each of 5,000 ha, from Year 0 to Year 2. This is at the larger end of the distribution of plantation size in Sarawak, but there would have been little change to the comparative results if a smaller area had been assumed. The plantable area accounted for 90 per cent of the gross area, with the remaining 1,500 ha being utilised for the nursery site, drains, roads, buildings, and reserve. The assumed management structure followed industry practice, with an overall plantation manager and three estate managers, one for each phase. Government salary scales were applied to the Managed Smallholder project and (higher) private-sector salaries were used for the other five project types.

Plantation establishment included marking perimeter boundaries and surveying the area; land clearing (under-brushing, felling, lining, pruning, and inter-row stacking); nursery establishment; constructing field drains and bridges; constructing field roads and clearing internal paths for harvesting; terracing; mechanical holing; and planting. The planting material was assumed to be the Tenera hybrid (Dura by Pisifera cross). The nursery culling rate was 20 per cent. About 3.4 million seedlings were required.

Establishment costs were staggered from Years 0 to 2 according to the three development phases. Other capital expenditure included buildings and quarters, plant and machinery, and furniture, fittings, and office equipment. These were also staggered over the first three

years to reflect commercial practice. Maintenance of the planted-out palms was assumed to begin in Year 1 and included fertilising, weeding, and pest and disease control up to maturity.

Table 2 shows the breakdown of costs to maturity (Years 0 to 2 for a given phase) expressed on a per-hectare basis. The total development cost was around MYR 12,000-13,000/ha, which accords reasonably well with estimates from documentary sources and key informants. If anything, the development cost was at the upper end of the observed range. The importance of establishment costs, incurred in Year 0, can be clearly seen, accounting for 63 per cent of the total, with road construction alone accounting for 27 per cent.

2.3 Operating Costs

Estate operating costs begin once the palms in each phase reach maturity and start bearing fruit. Scout harvesting for the initial small yields normally begins 24-30 months after planting. The harvesting interval is 10-15 days, i.e., 2-3 rounds per month. Fresh fruit bunches (ffb)

Table 2. Breakdown of development costs (Years 0-2)

Cost item	MYR per ha	Percentage
Establishment Costs		
Land preparation	1,422	11.1
Drains	972	7.6
Roads[a]	3,449	26.9
Nursery	662	5.2
Seedlings	290	2.3
Terracing	880	6.9
Planting	357	2.8
Sub-total	8,032	62.7
Other Capital Costs		
Buildings, office equipment	120	0.9
Quarters	441	3.4
Plant and machinery	385	3.0
Other	128	1.0
Sub-total	1,074	8.4
Maintenance Costs		
Fertilising	2,042	15.9
Weeding	1,055	8.2
Pest/disease control	193	1.5
Tools	46	0.4
Infrastructure	65	0.5
Other	153	1.2
Sub-total	3,554	27.7
Estate General Expenses	153	1.2
Total	12,813	100.0

[a] Excluding gravelling, which is deferred until Years 3-5

must be delivered to the mill within 24 hours, involving labour and transport costs. Field workers also undertake weeding, fertilising, pest and disease control, pruning, and maintenance of infrastructure.

In Sarawak, about 90 per cent of harvesting and collecting work is undertaken by foreign (mostly Indonesian) labour (MPOB 2006). Hence the cost of harvesting was based on a piece rate of MYR 21/ton, the conventional rate used for foreign labour, combined with the yield for a given year. A figure of 2.0 t ffb harvested per man-day was used, reflecting the higher productivity of foreign labour (compared with 1.5 t/day for local labour). Transportation to the mill was assumed to be done by contractors on a piece rate. About 60 per cent of field workers and other general workers on Sarawak oil palm plantations are foreign (MPOB 2006). However, local labour is given priority in schemes on Native Customary Land, hence it was assumed that only local labour was employed for maintenance work, at local wage rates.

Road gravelling costs were delayed until the operating stage began and were spread over Years 3 to 5. This reflects the general practice in both government and private agencies of delaying this large item of expenditure as long as possible. Remaining road infrastructure maintenance costs were incurred from Year 6 over the project life, reflecting annual upgrades.

Table 3 shows the breakdown of operating costs, defined as costs incurred from Years 3 to 25 for a given phase. Fertilising accounted for around half the total expenses during the productive life of the plantation, followed by harvesting (21%). Fertiliser prices have doubled between 2007 and 2009, adding 50 per cent to operating costs. Many plantation managers cut back on fertiliser applications during this period, with impacts on yield. The 2007 rates and costs were assumed in the model. Overall, labour costs accounted for only 23 per cent of total costs, largely because of the importance of fertiliser inputs. Of the labour component, harvesting and transportation of the fresh fruit bunches accounted for around 58 per cent. Upward pressure on wage rates for foreign labour is beginning to impact on operating costs, but 2007 rates were retained in the analysis.

Table 3. Breakdown of operating costs (Years 3-25)

Cost item	Total		Labour component		Annual average
	MYR/ha	%	MYR/ha	%	(MYR/ha)
Fertilising	35,605	49.7	370	2.2	1,548
Weeding	9,676	13.5	3,920	23.8	421
Pest/disease control	3,870	5.4	231	1.4	168
Pruning	277	0.4	157	1.0	12
Harvesting/collection	14,989	20.9	9,503	57.6	652
Tools	505	0.7	0	0.0	22
Infrastructure [a]	1,513	2.1	286	1.7	66
General expenses	2,150	3.0	1,500	9.1	93
Other	3,098	4.3	520	3.2	135
Total	71,682	100.0	16,487	100.0	3,117

[a] Including road gravelling.

2.4 Yield and Revenue

Oil palms begin to yield in the third year after planting. The yield profile then increases sharply, reaching a plateau from about the eighth to sixteenth years before slowly declining (Corley and Tinker 2003). Yields of 20-25 t/ha ffb are readily achieved in well-run private estates on mineral soils in Sarawak. Such yields are also generally assumed in project proposals for joint venture schemes (though, in practice, they have generally failed to attain them). SALCRA schemes, however, average 15t/ha in estates that have reached the yield plateau, for reasons indicated in the Introduction.

Figure 1 shows the high and low yield profiles used in the analysis. The former averages 21 t/ha and attains a maximum of 25 t/ha while the latter is assumed to achieve only 60 per cent of this figure, averaging 12 t/ha and attaining a maximum of 15t/ha. The high-yield profile was used for all the project types involving the commercial sector (Joint Venture I, II, and III, Fixed Rent, and State-Land Lease) and the low-yield profile was used for the Managed Smallholder project type. The implications of not actually attaining commercial yields in the joint venture projects are discussed later in the paper.

For the project analysis, the net cash flow in each year was calculated by deducting all of the capital and recurrent costs incurred in that year from the revenue obtained. Revenues were calculated based on the price and yield for each year. The price in Year 3 was MYR 580/t ffb. Due to improvements in bunch quality in the first few years of production, the price increased to MYR 600/t by Year 7 and remained constant thereafter. These prices reflect average prices in 2007 for Grade B bunches, which were probably at the upper end of the price cycle. A lower Year 7 price of MYR 400/t was also used to reflect the degree of fluctuation in this key variable.

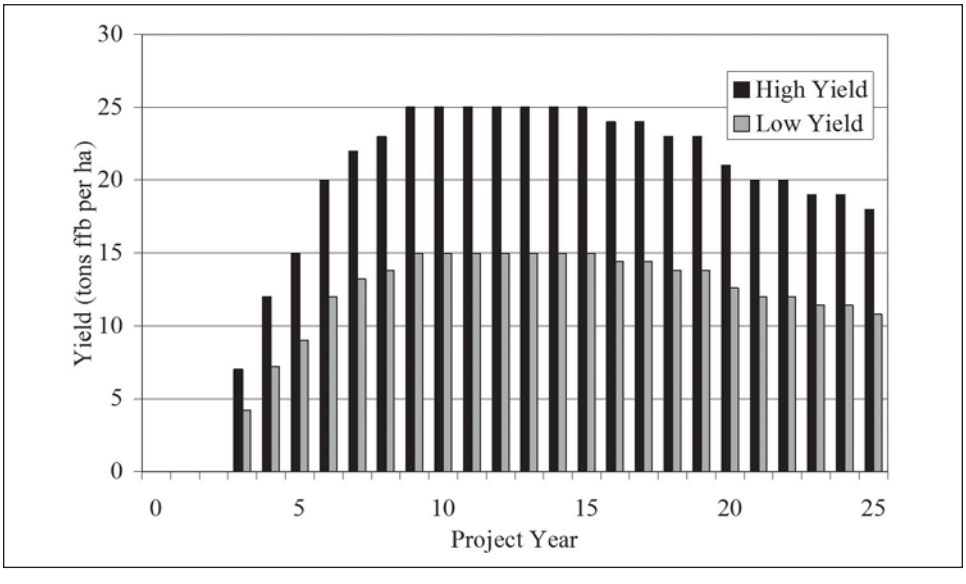

Figure 1: *Estimated yield profiles (tons/ha ffb)*

2.5 Land Costs

The private plantations on State Land were assumed to make a one-off payment to the state of MYR 741/ha – the premium for a provisional lease. This was staggered from Year 0 to Year 2 according to the 5,000-ha development phases of the project. There is anecdotal evidence that some private lessees, having set up a paper company for the purpose of acquiring a lease, effectively 'on-sell' the lease (by selling their shares in the company to a genuine investor) at a market rate five to ten times the original premium, but this situation was not explored here. In any case, from an economic point of view, this merely involves an advance of profits from the genuine investor to the pseudo-investor.

This land cost does not apply to SALCRA or LCDA projects as both of these utilise Native Customary Land. No land rent is paid to the participants of a SALCRA estate as there is no private investor involved and the local landholders receive 100 per cent of the net proceeds; this was the assumption in the Managed Smallholders project type (Table 1). In Joint Venture I, the investor was assumed to pay for the landholders' equity in the joint-venture company (JVC) based on the notional land value of MYR 1,200/ha. Sixty per cent of this value (i.e., MYR 720/ha) constitutes the landholders' 30 per cent equity in the joint venture; hence the investor's total capital injection amounted to MYR 2,160 per ha. The remaining 40 per cent (MYR 480 per ha) was paid to the landholder as an advance from the JVC.

Two hypothetical project types were developed in which the landholders leased their land to the private investor (Table 1). In the first case (Joint Venture III), the landholders were assumed to receive a fixed annual rent of MYR 500/ha from Year 0, plus a 15 per cent share of the dividends, while the investor's equity was increased to 75 per cent. In the second case (Fixed Rent), the landholders were assumed to receive a fixed annual rent of MYR 1,000/ha and no dividends, while the investor's equity was 90 per cent. The lease value of MYR 1,000/ha/y is well above the premium for a provisional lease of State Land (it is equivalent to an up-front payment of MYR 13,000/ha) and better reflects the market value of undeveloped but accessible land suitable for oil palm.

2.6 Financing

SALCRA is able to obtain concessional loans from the Malaysian Government to finance its projects. The loan repayment schedule runs from Years 7 to 24 of the project; that is, there is a seven-year grace period between Years 0 and 6. Moreover, no interest accrues on the principal drawn down within the grace period. Equal instalments of the principal are paid off between Years 7 and 24, with interest charged at 4 per cent per annum on the outstanding balance within this period. These assumptions were used for the Managed Smallholders project.

Loans for the other five project types were assumed to be taken out annually from Years 0 to 4 and were linked to the capital requirement for each of these years, less the paid-up capital in Year 0. For consistency, in all these project types, the paid-up capital was based on a figure of MYR 2,400/ha, derived from the policy which prevailed up to 2009 of pegging the value of customary land at MYR 1,200/ha. As 60 per cent of MYR 1,200 (i.e., MYR 720) was deemed to be the landholders' 30 per cent equity, the full paid-up capital was MYR 720/0.3 = MYR 2,400. In Joint Venture I, 30 per cent of this was considered the

customary landholders' share in the company. The private investor contributed 60 per cent as its equity share, and also paid for the landholders' share as they had contributed their land instead. Therefore, the private investor contributed 90 per cent of the paid-up capital (MYR 2,160/ha) and the managing agent (LCDA) contributed the remaining 10 per cent (MYR 240/ha). This also applied to the Joint Venture II, Joint Venture III, and Fixed Rent projects. In the State-Land Lease project, the investor contributed all MYR 2,400/ha.

In Malaysia, many banks also provide a grace period of 3-7 years for private plantations. Interest is charged during the grace period but interest payments can be deferred until the grace period terminates for each loan. The assumption made in this analysis was that the financier allowed a 5-year grace period and that interest was charged at 7.5%. The repayment schedules for the loans were staggered in the same way as the loan drawdown, with full repayment due within 10 years. As the grace period was included in the 10-year total repayment deadline of each loan, principal repayments were made in equal annual instalments over the final 5 years of the repayment period. The interest calculated on the principal for the initial 5 years was then a constant annual amount spread evenly across the final 5 years of the repayment period. In addition, interest was also calculated annually on the reducing balance in the final 5 years and paid in this period. The total loan repayment schedule for the plantation was an aggregation of the individual repayments from each loan made in a given year.

The current corporate tax rate in Malaysia is 26 per cent. Corporate tax was deducted annually for each of the schemes at 26 per cent of net profit, except for the Managed Smallholder project. Though SALCRA pays tax on its overall operations, scheme participants are paid pre-tax 'net proceeds' rather than dividends, thus avoiding this imposition. However, before calculating net proceeds, SALCRA deducts around 20 per cent for a landholders' reserve fund, partly to cover years of poor returns and partly for replanting at the end of the project. For the Managed Smallholder project, these deductions were made in each year of positive returns and paid out as a lump sum in the final year.

3. Results

3.1 Project Analysis

In project analysis, the net present value (NPV) and internal rate of return (IRR) are computed for the project as a whole using market prices, regardless of how the net benefits are distributed. This is a measure of the overall efficiency of the project, ignoring financing arrangements and distributional considerations (i.e., who gets what). Table 4 summarises these results for the six project types for output prices of MYR 400 and 600/t ffb.

It is clear from Table 4 that, at an output price of MYR 600/t, all the project types were profitable in their own right. The Joint Venture I and II and State-Land Lease projects all generated NPVs of over a billion ringgit, or MYR 67,000/ha, and rates of return of around 26 per cent. The project types with a rental component (Joint Venture III and Fixed Rent) performed less well but were still highly profitable at 22-24 per cent. The Managed Smallholder project performed least well, given its lower yield profile, but still generated a return of 17 per cent. At the lower output price, the projects with private sector involvement were all still profitable at 16-18 per cent but the rate of return to the Managed Smallholder project was only marginally above the cost of capital.

Table 4. Project NPV and IRR by type of project and output price

Type of project	MYR 600/ton ffb		MYR 400/ton ffb	
	NPV at 6% (MYR million)	IRR (%)	NPV at 6% (MYR million)	IRR (%)
Managed S/H	396	17	63	8
Joint Venture I	1,019	26	465	18
Joint Venture II	1,010	26	456	17
Joint Venture III	935	24	381	16
Fixed Rent	845	22	381	16
State-Land Lease	1,016	26	462	18

3.2 Private Analysis

The private analysis examines the aggregate profitability of the projects from the point of view of all the equity holders, including private and public investors and participating landholders. This analysis builds on the project analysis but also allows for financial inflows and outflows in the form of borrowings, interest payments, principal repayments, allocations to the reserve fund, and company tax liabilities (where relevant), to give a figure for net proceeds or dividends. This figure reflects the combined financial returns to the project participants.

Table 5 shows that all project types generated substantial dividends, at both high and low price levels. The Managed Smallholder project, though generating the lowest net proceeds, performed relatively better in this analysis, largely because of the concessional financing and avoidance of corporate tax. The Joint Venture I project was comparable to the purely private sector project (State-Land Lease), but the payment of advance dividends (Joint Venture II) reduced the total value of dividends by around MYR 9 million relative to the current model, the combination of renting and advance dividends (Joint Venture III) reduced total dividends by around MYR 63 million, and straight renting (Fixed Rent) reduced

Table 5. Present value of total dividends/net proceeds at 6% by type of project and output price

Type of project	MYR 600/ton ffb		MYR 400/ton ffb	
	Total (MYR million)	Per ha (MYR)	Total (MYR million)	Per ha (MYR)
Managed S/H	419	27,959	121	8,042
Joint Venture I	773	51,555	363	24,175
Joint Venture II	766	51,093	356	23,708
Joint Venture III	710	47,356	298	19,884
Fixed Rent	646	43,073	230	15,327
State-Land Lease	771	51,374	360	23,994

dividends by around MYR 127 million. These represented reductions of 1 to 16 per cent relative to Joint Venture I.

Figure 2 shows the flow of undiscounted net proceeds or dividends over the life of the project. All project types began to yield returns from around Year 5 or 6. The Managed Smallholders project peaked in Years 10 to 16 at just under MYR 4,000/ha and averaged MYR 2,360/ha over the 25 years (not counting the notional payout of the reserve fund in Year 25). The other five project types peaked in Years 14 to 16 at around MYR 8,000-8,750/ ha. The early dip and later peak in total dividends for these five project types reflects their commercial financing, with heavy repayments kicking in between Years 7 and 10.

3.3 Stakeholder Analysis

In this analysis the stakeholders included local landholders, local workers, foreign workers, salaried plantation staff, the private investor, and the government. The value of dividends, wages, rent, and tax all provided some form of benefit to stakeholders. The assumption made with respect to labour was that foreign workers carried out the rigorous work of harvesting the fresh fruit bunches and were paid a piece rate for this activity, while local workers engaged in the upkeep and maintenance of the plantation. Where local labourers had equity in the scheme, such as in the Managed Smallholder and Joint Venture projects, the benefits they derived from a particular arrangement equalled the sum of the dividends or net proceeds allocated to them and their wages from working on the plantation. NPVs were calculated for each benefit category and for each stakeholder group to compare the distribution of net benefits under the different project types (Table 6 and Figure 3).

The most striking outcome of this analysis is that local people fared much better under the Managed Smallholder project than any of the other arrangements, even with the lower

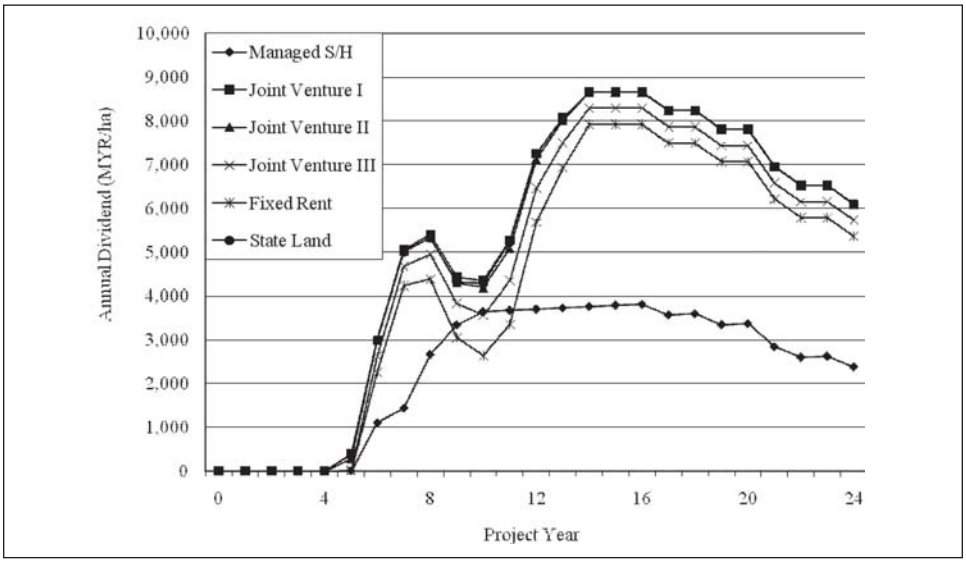

Figure 2: *Annual total dividend/net proceeds per hectare by type of project (at MYR 600/t ffb)*

Table 6. Distribution of stakeholder benefits by type of project (MYR million, discounted at 6%; output price = MYR 600/t)

Stakeholder group	Type of project					
	Managed Small -holders	Joint Venture I	Joint Venture II	Joint Venture III	Fixed Rent	State-Land Lease
Local people						
Dividends	419.4	238.2[a]	238.1[b]	106.6	0	0
Wages, contracts	34.5	34.5	34.5	34.5	34.5	34.5
Land rent	0	0	0	90.6	181.2	0
Total	453.9	272.7	272.6	231.6	215.7	34.5
Foreign labour	39.2	62.5	62.5	62.5	62.5	62.5
Estate mngmt.	11.4	22.1	22.1	22.1	22.1	22.1
Private investor	0	431.6	433.6	500.4	549.1	734.6
Government						
Net dividends	0	73.7	74.1	67.4	61.0	0
Land rent	0	0	0	0	0	9.9
Company tax	0	271.7	269.3	249.6	227.0	270.8
Total	0	345.4	343.4	317.0	288.0	280.7
Grand total	504.5	1,134.3	1,134.2	1,133.6	1,137.4	1,134.4

[a] Including MYR 6.4 million up-front payment.
[b] Including MYR 6.4 million up-front payment and MYR 9.0 million in advance dividends.

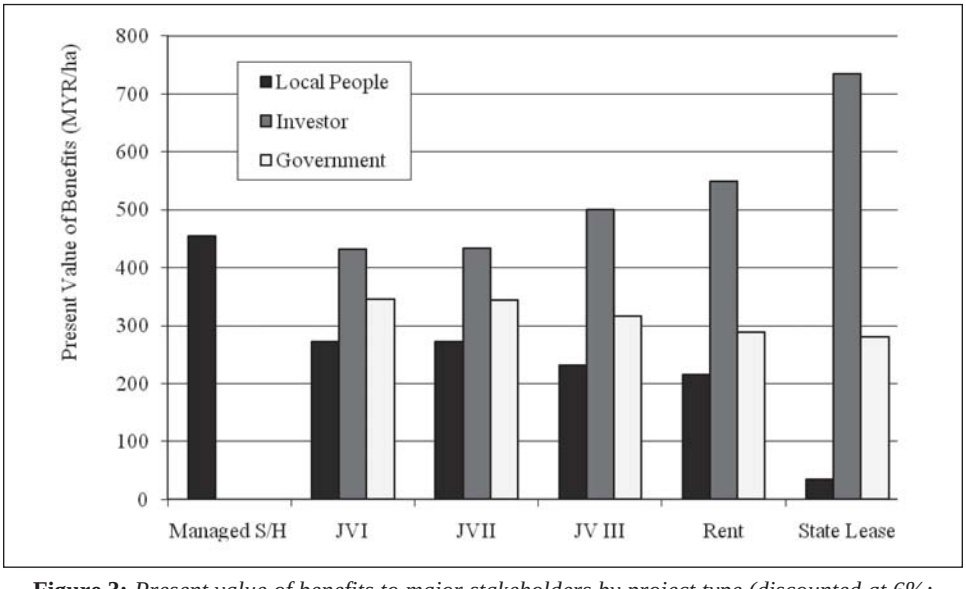

Figure 3: *Present value of benefits to major stakeholders by project type (discounted at 6%; output price = MYR 600/ton)*

yields. The lower total net proceeds for this project type seen in Table 5 and Figure 2 nevertheless all accrued to the landholders. They also received some wages but most of the benefits (92%) were in the form of net proceeds. Under the Joint Venture I and II projects, local benefits were about 60 per cent of those from the Managed Smallholder project. Interestingly, the payment of advance dividends (Joint Venture II) did not significantly reduce local benefits. However, including a rental component at MYR 500/ha (Joint Venture III) or MYR 1,000/ha (Fixed Rent) reduced local benefits by 15-20 per cent relative to the current model (Joint Venture I).

Conversely, the private investor did significantly better under the rental projects (Joint Venture III and Fixed Rent) than under the current joint venture arrangement (with or without advance dividends to landholders). Across the six project types, investor dividends increased with increasing equity in the project. The Fixed Rent project (90% investor equity) yielded 27 per cent more dividends than Joint Venture I (60% investor equity). Unsurprisingly, the State-Land Lease project, with 100 per cent investor equity, yielded 70 per cent higher returns than Joint Venture I.

The government as a financial stakeholder benefited most from Joint Venture I and II, but received less from the rental projects (Joint Venture III and Fixed Rent), due to both smaller dividends and less company tax. It received less again from the State-Land Lease project due to the absence of dividends, and gained nothing financially from the Managed Smallholder project (though in practice SALCRA, as the government agency responsible, does make money through the associated mills, which pays for its head-office operations).

Figure 4 shows the distribution of local people's annual benefits (undiscounted) over the project period, expressed on a per-hectare basis. The Managed Smallholders project

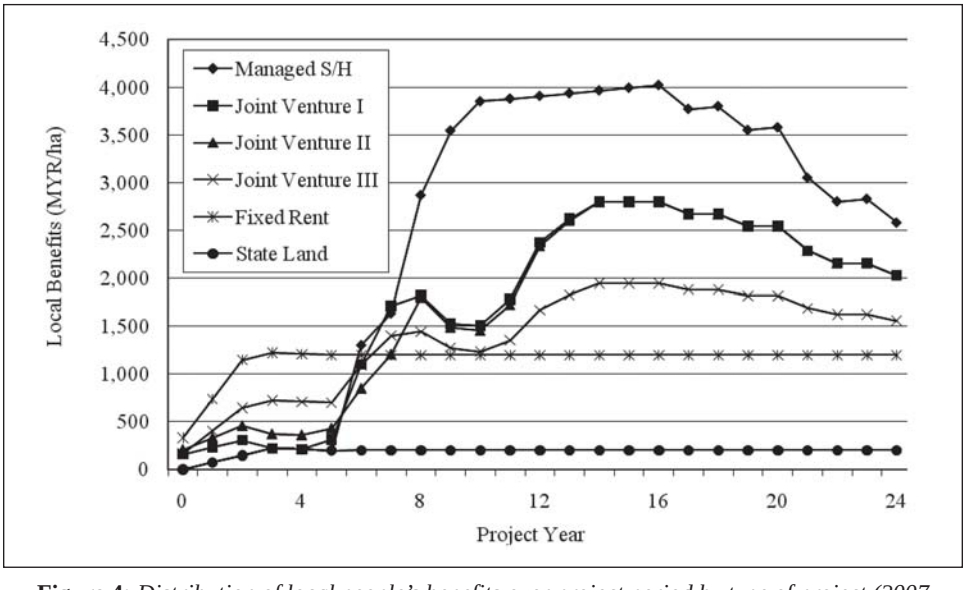

Figure 4: *Distribution of local people's benefits over project period by type of project (2007 values, output price = MYR 600/ton ffb)*

provided higher local benefits from about Year 6. It is clear that the two rental options (Joint Venture III and Fixed Rent) and the payment of advance dividends (Joint Venture II) evened out the flow of benefits, providing income to landholders in the first 5-7 years of the project when development was still underway and little or no net revenue was being generated. However, the higher the initial income, the lower the income in the middle and later phases of the project. Leaving aside the Managed Smallholder project, and given the parameters used in the analysis, it would seem that Joint Venture II (advance dividends), provided the best compromise between short-term income security and maximising income in the long term, as this option closely shadowed Joint Venture I from about Year 8 and provided only marginally less benefits in aggregate.

4. Discussion

The analysis highlights the trade-off between efficiency and equity in large-scale schemes to develop Native Customary Land in Sarawak. The Managed Smallholder approach is less efficient in terms of project net present value, aggregate net proceeds, aggregate stakeholder benefits, and revenue to government. However, this approach provides substantially more benefits to local landholders and is therefore to be preferred on equity grounds. The choice between approaches thus depends on the relative weights given to these two objectives. As both Managed Smallholder and Joint Venture approaches are advocated by the Sarawak Government as a means to make better use of Native Customary Land for the benefit of local people, it would seem that the equity objective is given considerable weight, hence the Managed Smallholder approach may be considered optimal. This conclusion is reinforced when the above results are compared with the actual yields and dividends observed in the various schemes to date.

The predicted net proceeds per ha for the Managed Smallholders approach can be readily compared with records of actual net proceeds paid by SALCRA in its various estates. An analysis was conducted based on only the most advanced phase of each estate, which is usually the phase with the highest yield and hence net proceeds; later phases may be still at the rising stage of the yield profile or not yet in production. Net proceeds averaged about MYR 1,500/ha in 2007, ranging from as low as MYR 200/ha to around MYR 2,500/ha. The average figure represents about 40 per cent of the maximum net proceeds per ha predicted by the model (MYR 3,820/ha), and the highest recorded figure for net proceeds was about two thirds of the predicted figure. That the model overestimates average net proceeds to this extent is not unexpected, given the degree to which historical and geographical conditions in some schemes have resulted in increased development costs and lower and more variable productivity than assumed in the model. For example, the Saribas scheme was established after a failed cocoa scheme on inherently poor soils, hence the recorded yields and net proceeds have never attained the level of better-sited schemes such as the Lemanak scheme, and hence drag down the average. Given these considerations, the results accord reasonably well with actual yields and net proceeds.

The dividends predicted for the Joint Venture approach cannot be so easily compared with actual dividends paid in LCDA's joint venture projects as these data are not readily available. However, there is considerable evidence that, while the joint venture plantations were expected to achieve the same yields and returns as the private sector, in practice they have performed no better than the SALCRA schemes, and in many cases considerably

worse. By the end of 2009, in all but one small scheme, no dividends had been declared, though the model predicts dividends from Year 6, which also accords with commercial expectations. A combination of low yields and heavy borrowing at high interest rates has saddled many of these schemes with an unprofitable financial structure. A 2005 assessment of the Kanowit Oil Palm Project, by far the largest joint-venture scheme, indicated yields of only 7 t/ha, an annual loss of over MYR 28 million, and accumulated losses of MYR 95 million in its ninth year of operation. Hence the company projected that shareholders would never see a return on investment, unless the government injected around MYR 120 million to reduce the debt.

If the low-yield profile in Figure 1 is used for Joint Venture I, the project NPV falls to MYR 355 million and the IRR to 16 per cent at an output price of MYR 600/t, and to MYR 23 million and 7 per cent at an output price of MYR 400/t – somewhat lower than the returns to the Managed Smallholder project shown in Table 4. Thus the efficiency advantage of the Joint Venture approach disappears. The benefits to locals are even more sensitive to the lower yield, falling by more than half to MYR 125 million at an output price of MYR 600/t. At MYR 400/t, the Joint Venture project is not able to meet its interest and repayment schedule, resulting in an accumulated net loss of MYR 140 million by Year 13. This is not dissimilar to the actual performance of the Kanowit project. Even if, as proposed by LCDA, paid-up capital is doubled to MYR 4,800/ha to reduce the borrowing requirement, at low yields and prices the Joint Venture project still fails to generate dividends within a reasonable timeframe.

The efficiency-equity trade-off is also related to the sharing of risk between the partners. Turning to the variants on the Joint Venture approach considered above, the results indicated that, given a high yield profile, the renting options (Joint Venture III and Fixed Rent) were both less efficient than Joint Venture I and provided less local benefits. Even though the rental values used were reasonably high, they were more than offset by the consequent decline in dividends. The primary reason for evaluating these options was because landholders have been pressing for more security of income, especially in the early years of the development. It seems that the payment of advance dividends, as in Joint Venture II, while providing fewer benefits in the early years than the rental options, does reduce some of the risk currently borne by landholders without having a significant impact on long-term benefits. However, when both low yields and a low price are assumed, all these options become uneconomic and are unable to meet loan repayments.

Nevertheless, the mixture of dividends and rental in Joint Venture III has considerable appeal as it ensures upfront income to the landholder and shifts risk onto the investor, yet it does not increase the costs of the JVC unduly and provides landholders with an incentive to maximise the dividends of the operation after payment of rent. However, in the scenario modelled, the benefits to local people were reduced by 15 per cent relative to the current arrangement. What this suggests is that the landholder equity assumed (15%) was too low. Increasing the equity to 20 per cent at the expense of the investor, while keeping the rental constant at MYR 500/ha, would increase local benefits to MYR 267 million, not greatly different to that from Joint Venture I and II (Table 6). The investor's dividends, while lower at MYR 465 million, would still be higher than in Joint Venture I and II. Hence if an equity/rental model is to be implemented, consideration should be given to setting landholder equity at around 20 per cent and rental at MYR 500/ha/y.

As noted in the Introduction, one of the original arguments for the New Concept or joint venture approach, apart from considerations of efficiency and equity, was that harnessing private sector capital and management would vastly accelerate the development of Native Customary Land (Uning nd; MLD 2007). This argument has not been directly evaluated in the research reported here. However, it can be said that the argument has probably underestimated the transaction costs involved in setting up and managing such joint venture schemes and overestimated the capacity of both the private sector and the government agencies responsible for brokering the schemes. Hence after 15 years of the New Concept policy, the area developed under joint ventures was a relatively modest 51,000 ha, about 4,000 ha less than the area under managed smallholder schemes and well below the original target of over 300,000 ha. Meanwhile, the area of indpendent oil palm smallholdings has grown at 36% per year since 2000 (albeit from a low base), compared with 17% growth in joint venture schemes (Cramb and Sujang 2011). The absolute increment in area planted by independent smallholders since 2000 has been similar to that in joint venture schemes (3-4,000 ha per year), despite smallholders receiving little or no support and even active discouragement compared with the massive government-funded campaign surrounding the New Concept approach (Cramb and Sujang 2011). Future research could explore other institutional arrangements at various scales for harnessing private capital and expertise to support development of Native Customary Land.

5. Conclusion

The rapid, government-sponsored expansion of oil palm plantations in Sarawak in the past 25 years has often been depicted as a clash between custom and capital, with traditional landholders inevitably the losers. There is an important element of truth in that view, particularly in areas where customary land rights are disputed by the Sarawak Government. However, many customary landholders are keen to develop at least part of their land with this highly profitable crop, provided an acceptable contractual arrangement can be made. Much of the agitation from landholders has not been in opposition to oil palm development on their land but in pursuit of clearer and fairer agreements with public- and private-sector land development agents. The experience with alternative approaches in Sarawak provides valuable lessons for the design of improved institutional arrangements for the development of customary land, both in Sarawak and elsewhere in Southeast Asia.

The analysis reported in this paper suggests that the Managed Smallholders approach may be a better option developmentally than the Joint Venture approach. If the Joint Venture approach lives up to the expectation of achieving commercial yields and dividends, it is superior to the Managed Smallholder approach on efficiency grounds. However, the Managed Smallholder approach achieves reasonable yields and positive net benefits overall, while providing significantly more benefits to local people, not only in terms of income but also with regard to security of tenure and the degree of participation in scheme affairs. Hence this approach is to be preferred on equity grounds. When the actual yields and dividends achieved by the joint venture schemes are taken into account, the Managed Smallholders approach is superior on both efficiency and equity grounds.

Where the Joint Venture approach is implemented, the analysis shows that payment of a moderate level of advance dividends (MYR 150/ha/y) is a viable option, reducing income risk to landholders without having a significant effect on the efficiency of the project. The

renting options considered accentuate the trade-off between income security in the short term and higher dividends in the long term. A higher rental component comes back to bite the landholder with lower income than would otherwise be achieved once the plantation is in full production (in much the same way as paying higher wages to landholders employed on the scheme reduces their long-term returns). However, further consideration could be given to the combination of landholder dividends and rental. An arrangement with about 20 per cent landholder equity and rental of MYR 500/ha/y would generate local benefits comparable to those achieved under the current joint venture arrangement without impinging on the overall efficiency of the project, while providing increased dividends to the investor. It would provide reasonable income security to the landholder while retaining an incentive for the landholder to contribute to the project's success.

The key to the success of both the Managed Smallholder and Joint Venture approaches is obtaining a 'commercial yield'. As indicated, this is crucially dependent on the quality of management at the estate level, especially the management of landholders and labour. The essential feature of plantation development on Native Customary Land that distinguishes it from purely private-sector plantations is that the landholders have occupied and farmed the area independently for generations. Hence transforming them into an effective plantation labour force as well as partners in a large-scale commercial venture requires patient negotiation, effective two-way communication, and a genuinely consultative style of management. Unfortunately, the pressure to exploit the oil palm boom for private gain has often outstripped the capacity of both state agencies and plantation companies to provide this kind of management.

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