

Seeds of Discontent: Oil Palm and Changing Production Strategies among Smallholders in Papua New Guinea

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INTRODUCTION

Boserup's intensification model of the late 1960s (Boserup 1965), on which much of the current debate on agronomic change still rests, postulated that rising population pressure over a fixed land area results in progressive agricultural intensification and the adoption of new technologies as people attempt to raise agricultural production. The model maps a unilinear sequence of agricultural change as people move from less to more intensive agricultural practices to achieve higher production. In this process, labour use increases and efficiency falls as labour is substituted for land.

Boserup's model provides a framework for understanding relationships between population density and the transformation of agricultural systems, and has stimulated much research and debate on agricultural intensification in developing countries (see Netting 1993; Turner *et al.* 1977; Turner *et al.* 1993; Tiffen *et al.* 1994). As a general theory of agricultural change, the model is useful for explaining the variability and changing characteristics of agricultural systems in several non-industrial agrarian societies, but it is less able to account for the diverse site-specific variables that influence processes of agricultural change. Hence the model's "value is not in being the final word but in being the first word; it is a model made to go beyond" (Stone 2001: 164). Indeed, there is now a large volume of 'beyond Boserup' literature that highlights the inability of the model to capture the complexity of processes of agricultural change. Other significant and often overlapping socio-economic, political, institutional and environmental variables also stimulate or facilitate agricultural change (Brookfield 1972; 1984; Netting *et al.* 1989; Tiffen *et al.* 1994; Morrison 1996; Guyer 1997; Stone 1998). The model has also been criticised for its emphasis on agricultural intensification as the only possible reaction to population pressure, so broadening the intensification debate by highlighting other responses, such as migration, changes in land tenure, agricultural and non-farm income diversification, environmental conservation and investment (Mortimore 1967; Bilborrow 1987; Adams and Mortimore 1997; Brookfield 2001a; 2001b).

Recently, Brookfield (2001a; 2001b) argued that a more comprehensive understanding of agricultural change requires acknowledging farmers' capital assets, management skills (in particular the organisation of land and labour), innovations, and their

adaptability and flexibility in responding to changing conditions through the diversification of production and livelihoods. This more holistic approach to agricultural change also acknowledges that for contemporary agricultural societies “the reality is one of constant adaptation to changing biophysical, social, demographic, economic and political conditions” (2001b: 182). Change is not merely in one direction and nor is it unidimensional. Rather, the labour intensification of agricultural production systems is only one of several possibilities, and labour is but one dimension. Brookfield concluded by stressing that in constantly changing environments, the diversification of production and livelihoods and the ability to adopt better strategies of managing and exploiting different resources are the keys to survival and successful change (2001b: 189).

In the context of the more recent debate on agricultural intensification, this chapter explores how smallholders residing on the Hoskins and Bialla oil palm land settlement schemes in West New Britain, PNG (Figure 1) maintain agricultural production, economic security and social stability in the context of population growth, limited opportunity for land use change, fluctuating commodity prices and contemporary social change¹. The chapter has two main objectives. The first is to broaden the intensification debate by illustrating the complex role of socio-cultural factors in agrarian change. While recognising that population pressure is an important variable explaining change in oil palm production strategies and other livelihood pursuits, the specific forms of managing and organising labour and production can only be understood by examining processes operating within the household (i.e., household decision-making), and how these processes interact with the broader socio-cultural, economic and institutional environments in which they are embedded. Household leadership, social relations of production, income distribution, social and kinship relations and obligations, and rising material aspirations are all important here. At the same time, household decision-making and farming practices are contained within an externally imposed land settlement model and a relatively rigid commercial and institutional environment.

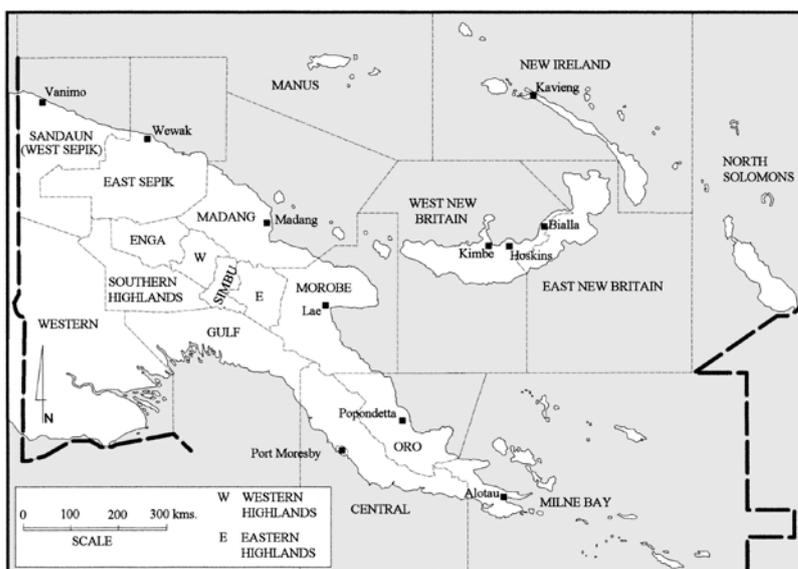


Figure 1 Papua New Guinea

The second objective is to explore further Brookfield's concept of risk in relation to agricultural innovation which he raised initially in his 1984 article "Intensification Revisited" and again more recently in his 2001 book *Exploring Agrodiversity*. While intensification, on the one hand, is about increasing inputs to raise productivity (e.g. labour or fertiliser), raising productivity innovation, on the other hand, involves new ways of combining the factors of production to "create qualitatively new elements in the farming system" (Brookfield 2001a: 181). This can entail new ways of organising land and labour or adopting new technologies in an attempt to create more viable agricultural production systems. The result is an increase in the productivity of labour inputs. Brookfield (2001a: 16) points out that the intensification of labour inputs may be a consequence of innovation, but it is a separate phenomenon to the productivity or qualitative changes in labour input under innovation.

According to Brookfield (1984: 38) the primary purpose of most innovations is to reduce elements of risk and uncertainty in agricultural systems (e.g. climatic and other natural hazards, environmental deterioration, etc.). Whilst there is some recognition of the social risk of innovation, the concept is not well developed. In this chapter the concept of agricultural risk is extended to social risk: the social disharmony and conflict that can occur within family and kin groups, particularly those under population stress, that may eventually result in the social fragmentation and dislocation of the productive group. To reduce these social risks, households and individuals embroiled in conflict will negotiate and develop innovative production strategies involving new combinations of land and labour. Innovative agricultural strategies may therefore not be concerned primarily with increasing production or labour productivity, but may actually be driven by efforts to ease social tensions and regain some measure of kin group cohesiveness in situations of social conflict. Indeed, measures taken by smallholders to resolve social conflict through agricultural innovation may, at times, take precedence over raising agricultural production and incomes (see the section *Social conflict*, below). This implies that smallholders evaluate innovations in labour strategies not solely in terms of production and income but also by other meaningful criteria, such as the status of social relationships within the group.

OIL PALM LAND SETTLEMENT SCHEMES IN PAPUA NEW GUINEA

Like many other countries in the 1950s and 1960s, PNG established land settlement schemes (LSSs) on alienated customary land as a means of promoting agricultural and economic development. The Australian colonial administration viewed these schemes as part of an overall strategy to develop a national agricultural export industry. The schemes were also viewed by the administration as a way to improve rural incomes, integrate Papua New Guineans into the cash economy, relieve population pressure in some rural areas, and bring into production "unused" or "under-exploited" land (Hulme 1984: 81).

PNG's first oil palm LSS was established in 1968 at Hoskins, on the north coast of West New Britain (Figure 1). The Australian Administration considered the coastal strip of northern New Britain ideal for timber extraction, agricultural production and LSSs because of its sparse population, suitable climate, fertile soils and extensive forest resources. The operation and structure of the scheme were based on the nucleus

estate model, with smallholder land settlement subdivisions surrounding privately owned estate plantations and a centrally located company mill. The estate company provided smallholders with access to planting material, extension services and fruit transport and processing (Hulme 1984). Following the perceived early success of the Hoskins LSS, the model was adopted for the nearby Bialla scheme which commenced operations in the mid 1970s. In both schemes, customary land was converted to state leasehold land, and individual lease holdings of approximately 6 to 6.5 hectares were allocated to smallholder families on 99-year leases. At the time, 6 hectares were deemed adequate for a family's needs, and smallholders were required to plant 4 hectares of oil palm with the remaining 2 hectares reserved for food gardens.

In recruiting smallholders for the LSSs, priority was given to applicants from land-short areas, such as parts of West Sepik and Morobe provinces, the Wabag and Maprik areas, and the Gazelle peninsula of East New Britain. Special government publicity committees were set up in some of these land-short areas to encourage people to resettle on the schemes. At Hoskins, the majority of settlers were recruited from East and West Sepik (42%), followed by Chimbu (22%), East New Britain (15%), Morobe (11%) and West New Britain (4%) (Hulme 1984: 242). Large numbers of people from these land-short areas have since settled in WNB, and leaseholders now provide a very important base for visitors from poor migrant source areas (Curry and Koczberski 1998; 1999).

Following the establishment of the LSSs at Hoskins and Bialla, local landowners were also encouraged to plant oil palm under the village oil palm scheme (VOP), and their participation in the industry has been increasing over the years. Most VOP blocks are 2 hectares in size, and the majority of VOP smallholders have holdings of other cash crops and remain engaged in subsistence production. In 2002, Hoskins and Bialla smallholders contributed 34% and 54% respectively to total company production.

DEMOGRAPHIC CONTEXT

The demographic characteristics of the Hoskins and Bialla schemes have changed greatly since their establishment. The single nuclear family that typically first settled the blocks has gradually been replaced with multiple family units co-residing on blocks, as second generation settlers marry and continue living with their parents. Population density per block has risen markedly since the early 1970s (Table 1). At the more recent Bialla scheme, the mean number of persons per LSS block was 11.1 in 2002.

Table 1. Mean numbers of persons per LSS block, Hoskins, 1972-2000*

YEAR	1972	1975	1990	2000
Mean numbers of persons per block	5.9	7.2	8.6	13.3

* No long-term population data are available for the Bialla LSS.

The rapid rate of population growth at Hoskins LSS between 1990 and 2000 is partly attributable to the difficulties settlers now experience when attempting to resettle in their 'home' villages and the contraction of off-block residence options. Opportunities

for re-establishing themselves at 'home' are becoming remote because of their long absences, together with the fact that many of their children were raised in WNB and spoke Melanesian Pidgin rather than their indigenous languages (see Curry and Koczberski 1999; and Koczberski *et al.* 2001b). Their home areas are also likely to be experiencing population pressure, given that settlers were initially recruited from land-short areas, in some of which rising population pressure is leading to a tightening of the rules governing resource access (e.g. Carrier and Carrier 1989; Curry 1997; Neumann 1997; Zimmer-Tamakoshi 1997). This makes it much more difficult for long-term absentees to re-establish themselves in their home villages. Moreover, the opposition to informal urban settlements by provincial governments (Koczberski *et al.* 2001b) and the high rate of unemployment in PNG mean that settlers' off-block residence options are now much more constrained than in earlier decades.

It is not uncommon for three generations and several household units to be sharing the resources of one, 6-hectare block. On these multiple household blocks, the original settler house of milled timber typically sits among a cluster of several other houses, usually constructed of bush materials, and the 2-hectare reserve of food gardening land is shared among co-resident households. The monthly oil palm income the leaseholder receives from the milling company for oil palm fruit must also be spread across several households of varying age, status and household needs. For example, Beno and Lina, elderly Sepik leaseholders, still reside in their original house, but their house is now surrounded by five 'bush' houses. Together, the six houses accommodate 26 family members, and the monthly oil palm income is distributed among seven households.

Blocks with multiple, co-resident households are complex economic and social units. Because each co-resident household must meet costs for healthcare, schooling, food and other basic necessities, these blocks often experience economic and social pressures that can lead to tensions and conflicts between residents. Disputes and violence often occur around payday, triggered by the distribution of oil palm income. Although grievances are frequently resolved amicably, occasional violence does erupt, especially between fathers and sons and between brothers. In some cases, violent disputes can lead to the eviction of a block resident and their family, or to a household being placed under intense pressure to leave the block.

In response to this new socio-demographic environment, and to secure their livelihoods, smallholder households are adopting new oil palm management and harvesting strategies, and are pursuing a range of alternative livelihood strategies involving both agricultural and non-agricultural activities (Koczberski and Curry 2003). The LSSs provide a useful case study of socio-agronomic change because the area of land per block is fixed (6-6.5 hectares), the terms of the lease agreement preclude removal or intercropping of oil palm, and the 2 hectares of reserve garden land is the only land over which smallholders have some discretionary use. These changes in oil palm production can now be examined in the context of a new socio-demographic environment and a rigid institutional framework.

SMALLHOLDER OIL PALM PRODUCTION AND INNOVATION

The Hoskins and Bialla oil palm schemes follow a fortnightly harvesting schedule, in which the fruit is harvested by smallholders and then stacked in nets on the edge of their blocks for collection by company or contractor trucks (Figure 2). The nets of fruit are weighed at the roadside collection point and the weight recorded on a docket (Figure 2). Smallholders receive a monthly payment for their oil palm fruit.



Figure 2 Company oil palm harvest pickup, West New Britain

Harvesting is physically demanding work and requires the use of a chisel when the palms are young (palms bear at 18 months), switching to scythes mounted on harvesting poles when fruit bunches are above head height. Harvesting takes between two and three days each fortnight, depending on the age of the palms, area planted to oil palm and available labour. Both the fruit bunches (fresh fruit bunches) and fruitlets (loose fruit dislodged from the main bunch during harvesting) are collected. There is generally a clear division of labour by gender and age. Typically, loose fruit is collected by females of all ages, using wheelbarrows or large 10 kg plastic rice bags to cart the fruit to the roadside collection point (Figure 3). Fruit bunches are harvested by males, with elderly men relying on their younger sons or other male kin to harvest very tall palms (Figure 4). Males cart the fruit bunches to the roadside in wheelbarrows, though women occasionally undertake this task. Women sometimes harvest small bunches from young palms, and weigh these with their loose fruit. The companies pay women separately for loose fruit.



Figure 3 Woman's oil palm *lus frut* harvest, West New Britain



Figure 4 Fresh oil palm fruit bunch harvest, West New Britain

Changing Organisation and Remuneration of Labour

Oil palm production requires skills in organising and managing household labour because harvesting is labour intensive and must be completed within three days of a scheduled fruit pickup by the mill truck. If fruit is not processed within three days, oil quality is lower (a problem for the milling company) and bunch weight declines (less income for growers). To maintain yields, smallholder households must work outside the harvesting period, applying fertiliser, pruning and stacking oil palm fronds in windrows, weeding or spraying herbicide, and mending harvesting tools and wheelbarrows.

Until the mid 1980s, block maintenance and harvesting were undertaken by a communal work group involving all or most adult family members from co-resident households. Smallholders call this harvesting strategy "*wok bung*" (working together). The male head of the block, typically the father and original leaseholder, mobilised labour and allocated specific harvesting tasks. Providing there was sufficient labour on the block, the high level of inter-household cooperation during harvesting under this *wok bung* strategy resulted in an adequate labour supply for complete and regular harvesting. The income generated from harvesting was distributed amongst block residents by the head of the block. The main feature of the *wok bung* strategy was its

highly centralised control of production, with the head of the block responsible for organising labour and distributing income. However, as the number of co-resident households has increased, many multiple household blocks have recently adopted new oil palm production practices that involve different ways of organising and remunerating labour.

A new harvesting strategy that has emerged and which is becoming more widespread involves a move away from communal, *wok bung* production involving all adults from co-resident households to a strategy where harvesting work and the corresponding income generated are rotated on a monthly schedule among individual co-resident households. This new production strategy is known locally as *markim mun* (literally ‘marking the month’), and coincides with the milling company’s monthly payments to smallholders. At Hoskins, where it emerged initially, 50% of LSS blocks identified *markim mun* as their main production strategy in 2002. Following its initial appearance at Hoskins, the *markim mun* strategy has since spread to the nearby Bialla scheme (Table 2).

Table 2. Percentages of LSS blocks employing different harvesting strategies at Hoskins, Bialla and Popondetta.

LSS	WOK BUNG (%)	MARKIM MUN (%)	‘OTHER’ MIXED/HIRED LABOUR (%)
HOSKINS	48	50	2
BIALLA	67	32	1
POPONDETTA	93	0	7

Two fundamental differences between the old *wok bung* and new *markim mun* harvesting strategies concern the organisation and remuneration of labour. Under *markim mun* a different household each month harvests the oil palm and retains the corresponding income. Labour is drawn predominantly from the household whose month it is to harvest, with occasional recruitment of additional labour from co-resident or off-block households. By contrast, under *wok bung* labour is drawn from all co-resident households, with labour organisation and the distribution of oil palm income centrally controlled by the head of the block. Hence, under *markim mun*, there is less interhousehold cooperation in harvesting, and the size of the work group is typically smaller than that of the co-operative *wok bung* strategy. While the head of the block (usually the father) may still ensure that harvest months are rotated fairly amongst co-resident households, his control over the organisation, management and remuneration of labour is diminished as such decisions become the responsibility of the head of the household allocated that month’s production (usually a married son).

The two harvesting strategies are not rigid and some blocks switch between them, depending on their socio-economic circumstances at particular times. Some multiple household blocks have adopted a ‘mixed’ strategy, where the adult members of every household harvest together (*wok bung*) but rotate the oil palm income each month amongst co-resident households. This is similar to the “Sande” (Sunday) system that has long operated amongst plantation workers. Every payday the wages of voluntary group members are allocated to one member of the group. Each member of the group receives a large sum of money when it is his turn to receive the wages of other group

members. This system enables workers to make large purchases, such as to travel home, and to make major contributions to indigenous exchange, such as brideprices. In the case of LSS blocks, the leaseholder may be relinquishing some but not all of his authority in managing the block. This may be a partial response to the presence of conflict on the block, or, in some instances, it may represent a transitional stage as a block experiments with different labour strategies to lessen conflict.

Levels and types of labour remuneration differ in important respects between the two production strategies. Under a communal *wok bung* strategy, decisions relating to labour remuneration rest largely with the head of the block with payment levels governed by consideration of age, gender and kinship status. The social and kinship status of some members of the work group means that their remuneration level is often less than the market value of their labour contribution and often well below that of work group members of higher status. Women and younger sons normally have a lesser claim on the income than men and older sons, and as a consequence labour remuneration can vary greatly within and between households on *wok bung* blocks.

Labour Practices and Indigenous Exchange

In-kind payment of labour (usually food) is more commonly associated with *wok bung* harvesting than with *markim mun* harvesting. Because remuneration under a *wok bung* strategy is mediated by indigenous cultural norms and values, the head of the block is able to draw on 'unpaid' or 'under-paid' household or kinship labour using the rhetoric of obligations to the collective group. This moral economy of labour means that such labour contributions lie outside the market and are cast as indigenous exchange not requiring market rates of remuneration. However, other exchange obligations are created by such gift transactions: the son giving labour will expect his father to be the main financier of his brideprice; the son-in-law or nephew may anticipate that his family will be given rights to live on the block and be granted some land for gardening.

Indigenous or gift exchange in PNG is central to maintaining and building social relationships and defining group boundaries. Without exchange the identity and unity of the kinship group is undermined, and opportunities for resolving conflict decline. Participation in the cash economy through wage labour, small business, or cash crop production is often motivated by a desire to earn cash to invest in indigenous exchange (Curry 1999). Similarly, gifts of labour, whether in subsistence production, house building or the production of cash crops like oil palm, have meaning beyond the market value of work done (Curry 2003). The *wok bung* co-operative labour strategy is most closely aligned with this indigenous exchange economy.

However, with the shift to the *markim mun* strategy, labour remuneration is governed less by cultural norms associated with the indigenous exchange economy and more by market values, so that remuneration of labour is more likely to reflect market rates of pay. There is also limited in-kind payment for labour, and if food is cooked for the work group it is usually in addition to, not in lieu of, cash payments for labour. Thus, under *markim mun* market relations are privileged over indigenous economic and social relations of production and exchange.

Overall, the shift from *wok bung* to *markim mun* is more than a simple reorganisation of labour in oil palm production. It also signals a significant socio-political

reorganisation of power and economic relations on a block. The shift from the highly centralised organisation of production under *wok bung* means that leaseholders – the older men – no longer have absolute control over labour and income flows, indicating their diminished role in oil palm production. Furthermore, the adoption of the *markim mun* strategy entails an erosion of indigenous economic and social relations in oil palm production with a consequent strengthening of market-based economic relations. Whether or not this represents a permanent shift towards market-based labour relations is a difficult question to answer, given that throughout PNG indigenous economic forms and cultural values have shown resilience and an ability to renew and refashion themselves by exploiting new opportunities in altered political and economic contexts (e.g. Boyd 1985; Maclean 1989; Nihill 1989; Goddard 1995; Imbun 2000; Curry 2003). However, the shift to more market-based economic relations associated with the *markim mun* strategy remains incomplete and ambiguous because elements of the two economic frameworks are present in both strategies. The change is more one of degree rather than a real transformation of economic and social relationships.

Population Pressure

This section argues that innovations in labour organisation and remuneration arose endogenously in response to several inter-related factors, including population growth, changing generational values and aspirations, and social conflict. While the switch from *wok bung* to *markim mun* is associated with population density, it is driven largely by a younger generation of men holding different values and aspirations to their fathers. For this younger generation of men, social conflict is an instrument for change, the effectiveness of which increases with population density. Two kinds of evidence suggest that population density is associated with the shift from the *wok bung* to *markim mun*, though the link appears to be indirect. First, anecdotal evidence from extension officers and smallholders indicates that *markim mun* is a recent innovation that emerged at Hoskins within the past 10 to 15 years, coinciding with the period (since 1990) of most rapid population growth since the scheme’s inception (Table 1). A major study of smallholder production in the Hoskins and Bialla schemes in 1991 made no reference to the *markim mun* strategy, and the project’s agro-sociologist did not recall *markim mun* being a significant feature of harvesting practices during her surveys (C. Benjamin 2002 pers. comm.; Landell Mills 1991).

Second, blocks that have switched to *markim mun* tend to have a larger resident population and a greater number of co-resident households than blocks practising *wok bung* strategies (Tables 3 and 4). Moreover, at Popondetta in 2001, where mean population per LSS block at 8.3 is much lower than at Bialla or Hoskins, *markim mun* was not recorded in our surveys (Table 2), though agricultural extension officers stated that a few blocks had adopted this strategy.

Table 3. Mean population per LSS block by harvesting strategy at Bialla and Hoskins.

LSS	Wok Bung	Markim Mun
Bialla	9.2	14.3
Hoskins	12.2	14.7

Table 4. Mean numbers of households per LSS block by harvesting strategy at Bialla and Hoskins.

LSS	Wok Bung	Mixed Strategy	Markim Mun
Bialla	1.6	2	3
Hoskins	2.5	1	3.2

The evidence suggests that the conventional *wok bung* harvesting strategy that dominated smallholder production until recently is becoming less viable in the context of population growth and rising economic pressure on multiple household blocks. *Wok bung* appears more suitable for smaller, disciplined work groups, but becomes more difficult to sustain as block population increases and co-resident households start behaving more like autonomous economic and social units. However, as we argue below, the suggestion that population pressure causes social conflict directly, and thus leads to agricultural innovation, is inadequate for explaining agricultural change in the smallholder sector.

Social Conflict

While smallholders did not deny that population pressure was a contributing factor in their decision to switch to a rotational, *markim mun* harvesting strategy, almost all interviewees stressed the shift was triggered by social conflict (often between fathers and sons and between brothers) rather than by population pressure itself. Conflicts often arise on multiple household blocks and usually involve household heads (sons) contesting labour allocations and the distribution of oil palm income by the leaseholder (father or elder brother). Conflict may take several forms including withdrawal of oil palm labour, ‘stealing’ the monthly oil palm cheque, verbal disagreements, physical violence, and occasional evictions of block residents. If conflict persists and begins to undermine social relationships amongst co-residents, new ways of organising and remunerating labour may be canvassed.

While labour and remuneration disputes do occur on *wok bung* blocks, they are contained by the leaseholder. Multiple household blocks that continue to work together successfully in a *wok bung* or ‘mixed’ strategy can generally be described as cohesive family units, where inter-household cooperation and sharing remain important. On such blocks, cooperative labour strategies also extend to other areas of life. For example, these families commonly employ communal labour strategies in food production and cooperate to establish and manage small businesses by pooling labour and capital. Disputes over labour and income rarely disrupt oil palm production or other economic activities. Such high levels of cooperation often depend on the skilful management and organisation of labour by the head of the block, and his leadership and authority rarely being challenged. Indeed, when power relationships are destabilised, for example by the death of a leaseholder, it is not uncommon for social relations to begin to unravel, with a consequent rise in social conflict. Destabilisation may trigger multiple household blocks to shift to the *markim mun* strategy. Thus, the decision as to whether or not to switch harvesting strategies depends to a considerable extent on household social dynamics, particularly issues of leadership, power and authority.

Smallholders are not necessarily driven to adopt *markim mun* by a desire to raise production. More often the switch in production strategies is an outcome of their

immediate efforts to reduce conflict among family and kin, and this can lead to lower production. For example, if *markim mun* emerged in response to prolonged and destabilising conflict between co-resident households, often the family whose month it is to harvest cannot call on other co-resident households for labour with the result that they are unable to complete a full harvest. The total income and production for the block is therefore less than it would be under a communal, *wok bung* or ‘mixed’ strategy. Yet, for most block residents, particularly women, a shift to *markim mun* represents a successful innovation if it leads to a reduction in the level of social conflict amongst co-residents of a block.

That smallholders sometimes sacrifice production for desired social outcomes is understandable given the cultural beliefs concerning the role of social relationships in the welfare of individuals and groups. In many Papua New Guinean societies, social conflict within the group is often perceived to be a cause of illness and poor health, particularly amongst children (Hamnett and Connell 1981; Connell 1997; Koczberski and Curry 1999). It is also believed to result in poor subsistence production (food crops and animal husbandry), and in the modern context reduced yields of cash crops such as oil palm and the failure of chicken projects, tradestores and other businesses (Curry 2003). Thus, family conflict has serious repercussions, with considerable ramifications for the welfare of the group. In a village setting, when conflict occurs between brothers, lineages or subclans, the extended family will exert pressure on the antagonists to reconcile their differences through exchanges of food and wealth items. Such exchanges often ripple out through wider networks of exchange as more distant kin are drawn in to support the exchange and process of reconciliation. On the LSSs, where social and kinship networks tend to be truncated, social conflicts can persist for prolonged periods. This often causes considerable distress to family members, especially women, whose responsibility for children and food production makes family social particularly distressing. The pressure to adopt the release valve of the *markim mun* strategy can therefore become irresistible.

Rising Aspirations and Ambitions

As we have argued, the shift to a *markim mun* strategy represents a move to more market-oriented and individualistic production, with a corresponding decline in the importance of indigenous economic and social relationships characterised by reciprocal and in-kind labour. This change is being driven primarily by a younger generation of men no longer content with the ‘old ways’. Better educated than their fathers’ generation and living in an increasingly commodified economy, second generation settlers now expect and demand to be paid market rates for their labour.

A conjunction of social changes, especially rising material aspirations and revised notions of kinship, are leading younger men to challenge the authority of their fathers and to question ‘traditional’ cultural norms and values that mediate labour organisation and remuneration. In particular, young married men desire financial autonomy and greater control over oil palm income to meet their household needs, and to create what Li (1999: 33) terms their “imagined futures”. Their imagined futures often include leasing their own blocks, living in permanent houses, education for their children, visiting distant relatives and founding successful businesses. While such desires for reform of economic relations are latent among many young men on *wok bung* blocks, these desires cannot often be realised because the head of the block (their fathers) still exercises considerable authority and power. While part of his authority is

morally sanctioned by indigenous socio-economic values, such as those associated with gift exchange, the ultimate source of this power resides in his legal title to the block and the authority this confers on him as leaseholder. In extreme situations of conflict, some leaseholders have exercised this ultimate authority by evicting a persistently 'troublesome' son or by selling their leases and returning 'home' to live out their retirements, leaving their sons without land or incomes.

While the demands of a younger generation for reform of economic relations in oil palm production partly relate to changing material aspirations associated with modernity and the market, there remains an element of 'bigmanship' in their demands, a 'bigman' system being one where leadership is said to be achieved rather than ascribed, in contrast to Polynesian chiefly societies of inherited rank (for further discussion see Sahlins 1963; Feil 1987; Lederman 1990; Lepowsky 1990). Previously, strategies for achieving and retaining bigman status were located in the indigenous realms of warfare, gardening, indigenous exchange, and organising and staging large ritual events. Today the arena of competition has broadened to accommodate new introductions in the political and economic realms, such as education, wealth accumulation, business ventures, politics, positions in community, church or oil palm organisations, and managing and controlling oil palm production (see Connell 1997: 246-251). For example, the position of leaseholder not only allows an individual to control the flow of oil palm labour and income, but it also carries with it social capital that adds to their status in the settlement community and their own ethnic group. Therefore, leaseholders are reluctant to divest power and decision-making to their sons, and many strongly assert that it is their right as leaseholder to hold authority over the allocation of work tasks and oil palm income. Frequently, they articulate this view by referring to their individual achievement of acquiring the leasehold block. Their feelings are summed up in the comments of one elderly leaseholder, Raphael: "This block belongs to me alone. I obtained and planted the block. Moreover, the work on the block was done only because I organised it." Thus demands for more control over oil palm production made by an aspiring generation of young men, ambitious to make their mark in the broader community, are sometimes fiercely resisted by leaseholders, in much the same way that 'traditional' bigmen tried to maintain their status in the face of competition from younger men.

If a leaseholder resists innovation, the block can enter prolonged periods of social conflict and instability when a resident (usually a son) persists in destabilising and undermining the economic power and dominant position of the leaseholder (his father). In such situations, the *wok bung* strategy can persist and full harvesting may still be attainable, provided that enough residents continue to recognise the authority of the leaseholder and remain committed to *wok bung*. The shift from *wok bung* to *markim mun* is not contingent on the collapse of the former production strategy; rather, it occurs when social conflict reaches intolerable levels for most residents that the impetus for change gains momentum and is more likely to succeed. The power struggles between fathers and sons and between brothers for status and authority pose risks for block residents because of the potential for disintegration of social relationships. Therefore, the effectiveness of social conflict for inducing change in the direction of more individualistic and market-oriented production depends to a considerable extent on the leadership qualities of the leaseholder and his ability to exercise authority, manage conflict effectively, and to skilfully evaluate the risks for the broader group of not innovating. Although the leaseholder himself stands to lose

status and economic power by innovating, and oil palm production may fall, the social risks of not innovating may ultimately become too great to ignore.

DISCUSSION AND CONCLUSION

In response to Brookfield's (2001a and 2001b) call to broaden the intensification debate, this chapter has examined some of the complex processes facilitating agricultural change amongst oil palm smallholders in PNG. Change is the outcome of interplay of population growth and changing socio-cultural factors, set within a fairly rigid institutional and commercial framework. The LSSs were established on the basis of individual lease holdings over fixed areas of land and a set of land tenure regulations that specified not only the cash crop to be cultivated but also the area of land reserved for food production. Under such rigid constraints on production there is no scope for crop substitution and little opportunity for supplementary cash cropping in the land area reserved for food gardens. Thus, when population and economic pressures emerged over time, the range of agricultural responses open to smallholders was limited. Intensification of labour and other inputs like fertiliser are options, but have only been pursued by smallholders to a very limited extent.

Within this rigid institutional framework, the conventional communal *wok bung* production strategy, which dominated smallholder production until recently, came under pressure on several fronts, not least by the demands and aspirations of a generation of younger men who began challenging the foundations upon which *wok bung* relied: centralised control over labour and income and the indigenous norms and obligations associated with labour and exchange. Consequently, a younger generation of men have sought to innovate oil palm production through reorganising labour arrangements and payments. The *markim mun* strategy, with its rotation of harvesting and remuneration among co-resident households, is spreading steadily in the densely populated Hoskins and Bialla oil palm LSSs. It appeals to younger married men who have established their own households on their parents' block because it is closer to meeting their needs and aspirations, and it enables individual co-resident households to control and organise their own production.

An element of continuity is embedded within these new aspirations of younger men. Many are striving for a form of bigman leadership status but are blocked by the position and authority of their fathers in oil palm production. Traditional labour practices like *wok bung*, where control of labour is centralised and labour value is mediated by indigenous cultural norms and values rather than market values, serve to reinforce the central position and authority of their fathers in oil palm production. By demanding market rates of return for their labour, and by other more direct challenges to their fathers' authority, young men are contesting the indigenous labour practices and values that constrain realisation of their ambitions. The switch to *markim mun* weakens the authority of their fathers by removing them from the centre of labour organisation and remuneration. This opens up spaces for sons to pursue their own socio-political and economic ambitions.

Not all multiple household blocks have adopted the *markim mun* production strategy, which raises the question of under what circumstances do blocks shift from *wok bung* to *markim mun*? The answer hinges on the household dynamics affecting everyday

decision-making and social relationships. Innovations in oil palm production illustrate the importance of micro-social processes operating within households and how they interact with the broader social context of change to influence the direction and nature of agricultural change. In the 30 years since the establishment of the LSSs, PNG has undergone significant social change that has precipitated the transformation of social and cultural institutions and altered the attitudes, values and desires of a new generation of smallholders. Yet within this changing social context, the older men (the leaseholders and fathers) are resistant to these broader influences and want to retain their 'traditional' leadership and authority over their sons and their economic power and dominant position in oil palm production. Thus, oil palm production has become a site of conflict, negotiation and power struggles between a younger generation attempting to erode the centralised power and authority and their fathers who stand to lose from agricultural innovation. In short, a shift in production strategies says as much about inter-generational power relations and household socio-political processes as it does about agricultural change and population pressure.

For leaseholders, a shift to *markim mun* means a diminution of their authority in oil palm production and an erosion of their socio-political role in daily decision-making, particularly their position at the centre of exchange relationships on their blocks. For many leaseholders, therefore, there is a disincentive to innovate. However, in their final analysis, and albeit reluctantly, many older leaseholders are prepared to innovate to lessen social conflict on the block and thus avoid the social consequences that may arise from not innovating. Their decision to innovate may be swayed by family members not involved directly in the conflict. Smallholders are acutely aware that the maintenance of social relationships is especially important now that off-block residence and employment opportunities are limited. For most smallholders, the 6-hectare block represents their only security in the increasingly uncertain national economy. Former LSS residents living in precarious situations such as on a friend's block, in 'squatter' settlements or on insecure 'purchased' customary land, after voluntarily or involuntarily leaving the family block because of ongoing conflict, are a constant reminder to settlers of the damaging material effects of prolonged social conflict.

While it could be argued that the innovations in production arising from the presence of social conflict are an outcome of population pressure (a Boserupian interpretation), this is too simple. Broader factors are at play at the community and household levels, and the presence of a larger block population creates an environment in which these other factors are more likely to result in change. Placing the household at the centre of the analysis casts light on these issues. However, the adoption of a *markim mun* strategy does not sit comfortably with Brookfield's notion of innovation leading to higher production and incomes. The switch from *wok bung* to *markim mun* can lead to lower labour productivity and production than if all residents cooperated in oil palm production by pooling their labour. The 'mixed' strategy, involving the deployment of communal inter-household labour for harvesting and rotating the monthly payments amongst households, is probably the most efficient in terms of labour productivity and leads to the highest production and income for the block. But it has been adopted by only a small minority of blocks. While Brookfield acknowledges that not all innovation is successful and the effect of failure may be a reduction in the productivity of labour, for many smallholders the sacrifice in production and incomes associated with the shift to *markim mun* is worthwhile. It is successful as a strategy

for reducing conflict and thus lowering the social risks of disintegration of the kinship group.

In this way, innovation is about reducing social risks on conflicted blocks. While we agree with Brookfield that the main purpose of innovation is to reduce agricultural risk, his concept of risk could be usefully extended to include social risk to help explain processes of agricultural change amongst oil palm smallholders. Social risk in smallholder oil palm production arises from a conjunction of factors involving a younger generation's material aspirations that are more closely aligned with market values, mixed with an ambition and desire to achieve the status and renown associated with managing oil palm production. Social risk heightens as these desires are resisted by an older generation of leaseholders, whose source of authority, power and status is dependent on keeping oil palm production within the indigenous realm of labour and kinship obligations with themselves at the centre. In this contest between generations, between leaseholder and ordinary block resident, between the individual and the group, between modernity and tradition and between market and indigenous economic relations, social risks are heightened and the efficacy of social conflict for influencing the nature and direction of agrarian change increases.

Note

1. Data are drawn from 2001-2002 fieldwork conducted as part of a smallholder socio-economic study among oil palm leaseholders in West New Britain. The research was a collaborative project between the Department of Human Geography, Australian National University, Papua New Guinea Oil Palm Research Association (OPRA) and Curtin University of Technology. The study was funded by the Australian Centre for International Agricultural Research.

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