

The role of smallholder gardens in maintaining food security on the land settlement schemes

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This note is the second in a series addressing food security among oil palm smallholders. The first note (Technical Note 33) defined food security and its four key dimensions. This one focuses on some of the results of the food security assessment, among smallholders residing on the Land Settlement Schemes (LSS) at Hoskins and Biella.

BACKGROUND

Since the Land Settlement Schemes (LSS) at Hoskins and Biella were first established almost fifty years ago, access to gardening land has declined. When settlers moved on to the LSS, each family was allocated a state agricultural lease over 6 ha of land. At the time 4 ha were planted to oil palm and the remaining 2 ha were reserved for food gardening (Figure 1a). Until the early 1990s most smallholders' food gardens were located in the rear 2 hectares of the block.

Since the early 1990s block holders began planting oil palm in the 2 ha reserve area of land. Today, most smallholders have planted their whole block to oil palm (Figure 1b). The expansion of oil palm into the rear 2 ha of the block was due largely to population growth and the need to increase income to meet the cash demands of a larger resident population. There are now several households living on the blocks as the married sons (and some daughters) of the original settlers continue residing on the block and raise their own families. The average number of households per block is 3.7 at Biella and 3.8 at Hoskins with up to three generations now living on the one block.

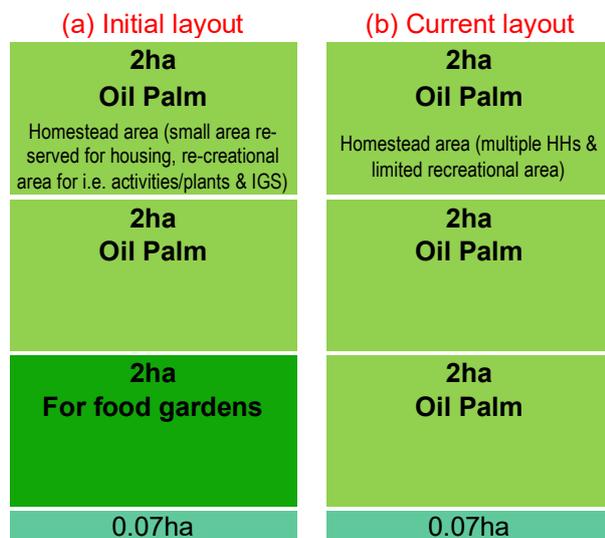


Figure 1. Typical layout of a 6 ha LSS block

THE IMPORTANCE OF FOOD GARDENS FOR HOUSEHOLD FOOD SECURITY

Despite there being less land available for food gardening the cultivation of food gardens remains a very important livelihood activity for smallholders and plays a major role in maintaining food security. For example of the 181 smallholder household surveyed at Hoskins and Biella, virtually all maintained food gardens, both for household consumption and cash income. It was also found that many smallholders spend considerably more time in food production than they do in oil palm-related work. For women, especially, gardening is a central part of their everyday lives. The findings for Hoskins and Biella are discussed below.

Garden cultivation

Ninety per cent of smallholder households cultivate food gardens. Of those who have food gardens 80% claim that their gardens meet their family needs. Households without gardens tend to be those where the household head is too old or suffering from a long-term illness or the household has insufficient land. These households rely on other family members to provide them with access to food.

For households maintaining gardens, data were collected on the farming systems and the main features of food gardens, including the main crops grown. Most gardens were dominated by mixed cropping systems with two or more sub-dominant staple crops and a variety of greens and vegetables (Figure 2). Less than 10% of gardens were mono-cropped.

Figure 2, shows the top four most widely grown staple crops in smallholder gardens. These are banana, Singapore taro, sweet potato and cassava. Less important crops included yam and

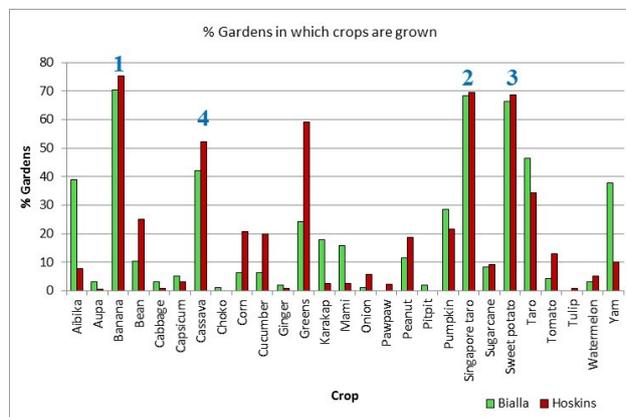


Figure 2: Percentages of gardens with different crop types.

mami (*Dioscorea esculenta*), taro (*Colocasia esculenta*) and an assortment of other vegetables including corn (*Zea mays*), beans (*Phaseolus vulgaris* and *Vigna unguiculata*), choko (*Sechium edule*), capsicum (*Capsicum annuum*), cucumber (*Cucumis sativus*), pitpit (*Saccharum edule*), tomato (*Lycopersicon esculentum*) and green-leaf vegetables (e.g. aibika (*Abelmoschus manihot*) aupa (*Amaranthus tricolor*) pumpkin tips (*Curcubita moschate*), Chinese cabbage (*Brassica rapa cv.*) and pak choi (*Brassica rapa cv.*). Peanuts (*Arachis hypogaea*) and pineapples (*Ananas comosus*), were also popular cash crops.

Households at Bialla looked after more gardens (2 or 3) than those on the Hoskins scheme (1 or 2). The food garden surveys revealed that Bialla households had almost twice as much land available for food gardening as Hoskins households. A possible reason for this difference may be due to fewer Hoskins households replanting their old oil palm.

Smallholder households are now heavily reliant on replant areas for food gardening, either on their own or someone else's LSS block. Around 45% and 55% of food gardens at Hoskins and Bialla respectively were cultivated in replant areas on the LSS blocks. Almost a quarter of these households had their gardens in the replant area of another block. A high percentage of households don't have any gardens on their own land. The implications of the trend to relying on replant areas for gardening land is examined in the next Technical Note (Technical Note 35).

Garden labour input

Household survey and interview data indicate that gardening remains a significant daily activity, particularly for women. Women claimed they allocate more labour to food gardening than to oil palm production. When the husband and wife were asked to rank in importance the daily livelihood activities where they spent most of their time and labour, 60% of women ranked gardening as their primary activity. Men also commit time to food gardening but ranked gardening as secondary to oil palm. Males take responsibility for most of the harvesting of oil palm, a very labour intensive task. The availability of women's labour, therefore, to grow food for their families is very important in maintaining household food security.

The amount of time men and women spend in food gardening varies, and depends on the price of oil palm. When oil palm prices fall and people have less income, they tend to rely more on their food gardens for their daily meals. When prices are high growers take advantage of the increased income from oil palm to purchase more store foods (such as tinned fish and rice) (Koczberski et al 2012). Previously when smallholders were being paid monthly by the milling company and when oil palm prices were low, their consumption of store foods (especially protein) was concentrated in the first few days of receiving the monthly oil palm payment. After this period most food consumed came from their own food gardens. Thus, food gardens are very important in helping to reduce smallholders' vulnerability to fluctuating oil palm prices.

Gardens as a source of income

Food gardens play an important role in household income security. When smallholders were asked about their gardens, the majority said they were cultivated for the mixed purpose of firstly

providing food for family consumption and secondly for providing income from the sale of surplus food production at local markets (Figure 3). Only around 15% of households at Hoskins and Bialla cultivated gardens solely for home consumption (Figure 3). At Bialla and Hoskins, around 80% of gardens were for both family consumption and marketing.

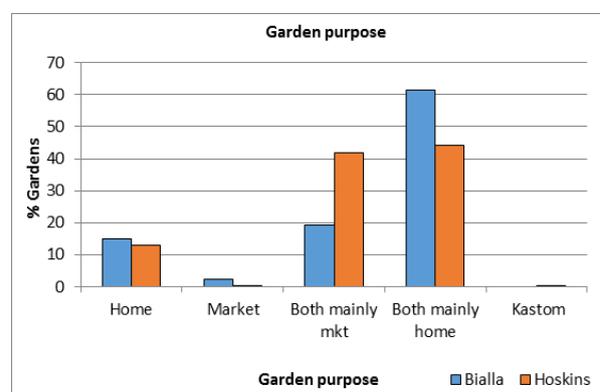


Figure 3. The primary purposes of food gardens.

The proportion of gardens primarily for marketing at Hoskins was more than twice that at Bialla. More families at Hoskins were planting food crops for commercial sale than at Bialla. The reasons for this may be because at Hoskins population pressure is greater and opportunities for marketing food crops is better than at Bialla.

The four most commonly sold food crops are listed in Table 1. They include most of the traditional staples consumed in PNG, such as banana, sweet potato, Singapore taro and greens. Banana is a high priority crop on the LSSs at both Bialla and Hoskins. The crops sold by LSS and Customary Rights Purchase (CRP) smallholders at Hoskins differ from those sold by smallholder women in the surrounding villages where cassava is the most commonly sold crop.

The Figure 3 results are supported by data collected on the main income sources for families. Men and women were asked to rank their three most important food crop income sources. While most men and women at Hoskins and Bialla rated oil palm as their primary income source, many women ranked the sale of garden foods as their primary income source (25% and 18% of women at Hoskins and Bialla respectively). Women tend to have more control over the income they earn from marketing food crops than from oil palm.

Table 1. Most important food crops for income (% Households)

Priority	Bialla	Hoskins		
	LSS	LSS	VOP	CRP
Most common	Banana (70%)	Sweet potato (51%)	Cassava (59%)	Sweet potato (45%)
2nd most common	Sweet potato (58%)	Banana (49%)	Greens & Banana (47%)	Banana (37%)
3rd most common	Singapore Taro (38%)	Greens (48%)		Greens (34%)
4th most common	Greens (33%)	Singapore Taro (44%)	Singapore Taro (39%)	Peanut (18%)

The marketing of garden foods is both a primary income source for some women and an important secondary income after oil palm. This additional cash is critical to food security as it enables people to buy food (especially protein) when oil palm income is short and when prices fall.

There are three main reasons explaining why a large number of households, especially women at Hoskins, claimed market sales to be an important income source. These are:

1. Income pressures on the heavily populated blocks mean that some households such as secondary households and female headed households have less regular access to oil palm income. The involvement of these households in local food markets is more "business oriented" with food production mainly for sale at local markets. Other co-resident households (e.g. primary households controlling oil palm production) sell only surplus garden produce, and market income plays a less important role in household income security.
2. Some women claimed that market income was their primary income source. These women often did not have access to a *Mama card* and/or they did not work in oil palm because their husbands did not share fairly the oil palm income with them.
3. Good market access. When conducting the household surveys interviewees were asked if any household members had sold garden food in the previous 7 days. This is an indication of the regularity of market income. Figure 4 shows the proportions of households that sold food in the past week. On the LSS at Bialla over a quarter of households had sold garden foods whereas at Hoskins almost half of households (46%) had sold garden foods in the preceding 7 days. Even among Village Oil Palm (VOP) households and CRP blocks, many households had sold garden foods in the previous week.

The findings on the marketing of food crops support earlier research on local marketing among LSS women. Research findings from an earlier ACIAR project and a 2008 student research study at Hoskins found that women from the LSS comprised the major group selling produce at the main town market in Kimbe (Koczberski et al., 2001; Ryan 2009). Almost 80% of the root crops and vegetables on sale at Kimbe market in 2000 were from the LSS. In the follow up survey in 2008 the figure was 70%.

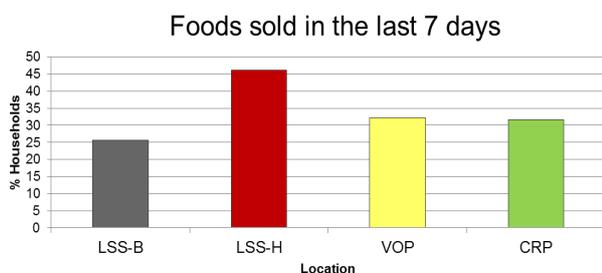


Figure 4. Households that had sold food in the last 7 days B=Bialla; H=Hoskins).

Gardens and dietary intake

The importance of gardens in maintaining household food security can also be judged by examining the reliance on garden foods for dietary intake. In a 24 hour dietary recall component of the household surveys, 80% of all the evening meals consumed by households contained some ingredients sourced from their own gardens. The most common foods consumed included: traditional staples such as bananas and tubers (sweet potato and Singapore taro), greens (mostly aibika, aupa, ferns and pumpkin tips), and coconut milk. Non-garden ingredients of meals consisted largely of store-purchased foods such as tinned fish, meat and rice. A more detailed discussion on smallholder food consumption patterns and household food security is provided in Technical Note 36.

CONCLUSION

The findings highlight that despite smallholders planting the full 6 ha of their leasehold block to oil palm, food gardening remains an important daily livelihood activity and source of household income. The additional source of income from food gardens takes some of the pressure off the oil palm income which is now shared among a growing number of households living on the LSS block. Thus food crops cultivated by women on the LSSs, particularly at Hoskins, play an important role in maintaining household income security. Furthermore, women from the LSS are contributing to food production and distribution in the local area. By marketing fresh produce to the fast growing urban population of Kimbe, many of whom do not have good access to land for gardening, LSS women are contributing to maintaining food security at the local level. Finally, food gardens make a very important contribution to daily dietary intake and they reduce smallholder households' vulnerability to food insecurity when oil palm prices fall.

The following Technical Note 35 considers how smallholders are changing their food gardening systems to respond to the growing population and land pressures on the LSSs.

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