

FOOD SECURITY IN PAPUA NEW GUINEA

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Strengthening livelihoods for food security amongst cocoa and oil palm farming communities in Papua New Guinea. A project supported by the Australian Centre for International Agricultural Research.

This note is the first in a series examining food security among oil palm smallholders. OPRA in collaboration with Curtin University and PNG Unitech is examining the current status of food security of smallholder households by examining the socio-economic and cultural factors influencing their farming and livelihood systems and the capacity of households to adapt and respond to stressors in their farming system. The research findings will advance our knowledge on the sustainability of subsistence and commodity crop farming systems among oil palm farmers in West New Britain and Oro. This first note provides a background to food security in PNG and outlines how the status of food security among smallholders is being assessed. Later notes in this series will discuss the role of food gardens in maintaining food and income security among smallholders in West New Britain, and the livelihood strategies they pursue to maintain food security. The final note will outline food consumption patterns among smallholders.

WHAT IS FOOD SECURITY?

Food security can be assessed at various levels: at the individual, household, community, district or at a national level. Food security at the household level is our primary interest. This is because it is the household where most of the labour comes from for the production of food and oil palm. The Food and Agriculture Organisation's definition of food security states: "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO 2006).

THE STATUS OF FOOD SECURITY IN PNG

At the national level, the overall level of food security in PNG is good. There are several reasons for this. First, 85% of the population live in rural areas and most have enough customary land to meet their food production needs. Secure access to land is important for maintaining household food security.

Second, in most rural villages, subsistence agriculture is the primary economic and social activity of most residents. The bulk of daily food intake is produced from household gardens or is locally produced, and generally meets minimum calorie requirements (Bourke 2000). Despite food security being good overall, there is a high prevalence of underweight and stunted children in many rural districts of PNG (Mueller et al. 2001). This phenomenon is largely the result of insufficient access to high protein and energy-dense foods like meats, oils and fats. In some areas of PNG there are seasonal variations in food supply and/or short-term food shortages caused by frosts and droughts. In the 2015-16 drought there were severe cases of malnutrition

in parts of Western Province, some of the high altitude areas of the Highlands and the Kendep area of the Southern Highlands (Bourke 2016).

Third, Rural Papua New Guineans dependence on imported food for their daily intake is low compared with other Pacific Island Countries. In PNG, around 83% of food energy and 76% of protein consumed comes from local food sources, largely from household gardens. Most of the imported food in PNG is consumed by the growing urban population, with almost 50% of their diets made up of imported foods (Gibson 2000). By producing their own food, the majority of the rural population with access to garden land, are less affected by price rises of imported foods.

Fourth, rural people have adapted their agricultural systems to respond to relatively high population growth rates. Since the mid 1960s, PNG's annual population growth rate has been around 2.5% and local agricultural systems have, so far, managed to keep feeding the growing population. This is due to the adoption of more intensive land use practices by farmers, the most important of these being:

- The introduction of high yielding and rapidly maturing varieties of staple crop
- Extended cropping periods and
- Shorter fallows

Intensification has allowed a large increase in the productivity of food gardens. It is for this reason that the area devoted to subsistence cropping increased only marginally over the period 1975-1996, despite a high rate of population growth (Bourke 2000).

Finally, access to cash. Food and nutritional security in PNG has improved in many rural areas due to improved access to



cash to buy store foods or locally grown food crops when seasonal or other periodic food shortages occur. This is illustrated by the 1997 and 2015-16 droughts when many thousands of villagers experienced severe food shortages (Allen & Bourke 2000; Kanua et al. 2016). Villagers who had access to cash (like their own savings, cash crop income or access to cash from relatives working in town), were better able to cope with the droughts and frosts by purchasing store foods (mainly rice and flour).

Also, access to cash to purchase food is important in PNG to improve the nutritional quality of daily diets. Several nutritional studies have shown a strong positive correlation between child growth/nutrition and cash cropping (Mueller 2000). Whilst rural people are able to produce most of their own food, typical PNG rural diets have low protein and energy content due largely to the prevalence of bulky root crops in daily diets. The bulkiness of the root crops, of which up to 80% of the total dietary energy is derived, may make it difficult to consume sufficient volume to satisfy energy, protein or other nutrient requirements (Mueller 2000). Therefore, cash income to purchase store foods such as tinned fish/meat and fresh fish which are much higher in protein, zinc and energy than local staple foods, improves greatly the nutritional quality of diets. In PNG, diet and socio-economic status are the two most important single groups of variables in predicting patterns of child growth. Access to stable and steady incomes are very important for ensuring food and nutritional security. Nutritional security is therefore an important parameter of food security.

Despite the level of food security being generally good at the national level, there are expanding groups in the country who are vulnerable to food insecurity. These vulnerable groups are those that are:

1. Experiencing threats to or loss of their income sources. This may be because of a loss of markets due to deteriorating transport infrastructure, tribal warfare, falling prices, loss of buyers or environmental factors such as the spread of pests and diseases. These groups are vulnerable to food insecurity because their purchasing power to buy food has been undermined.
2. Migrants from poor rural areas moving to urban, peri-urban or non-village rural areas. These groups are growing rapidly in PNG and they have limited and/or insecure access to land and rely on their capacity to purchase food. Such groups may therefore struggle to maintain access to sufficient nutritious foods to meet their daily dietary needs, and are especially vulnerable to



Many families residing on an LSS block at Hoskins

price increases of imported foods.

3. Those living in areas where population density is high. Population pressures may limit access to land for cash-earning activities or for food gardens and/or may lead to land degradation, especially in places where the environment is poor such as small islands and areas with impoverished soils. Examples include some islands in Milne Bay Province and the Momase region provinces (Bourke 2000).

4. A final group are those living in very high altitude locations such as the Kandep District in Enga Province and highland fringe locations (e.g. those in very remote villages in parts of the Southern Highlands, Enga, the WNB/ENB provincial border area, Western Province and around the Kaintiba area of the Gulf Province). People living in these areas are vulnerable to food insecurity because they often live in difficult environments with steep slopes, high rainfall, frost risks, poor road access and little access to cash.

OIL PALM SMALLHOLDERS AND FOOD SECURITY

Where do oil palm growers fit into these food insecure groupings and what are the threats to their food security?

Population and land pressures are potential threats to food security on the Land Settlement Schemes (LSS), Customary Rights Purchase (CRP) blocks and in some of the Village Oil Palm (VOP) holdings around Hoskins. On the LSS blocks, falling per capita income and declining access to land for food gardening are occurring because of population growth. Over the past 40 years population densities on the Hoskins LSS have risen from 98 persons per km² to 222 persons per km², and on the Bialla LSS it is around 187 persons per km². Today, virtually all the leaseholders on the Hoskins LSS have planted their full 6 ha block to oil palm, extending oil palm into the rear 2 ha that were once reserved for food gardens. Gardens are being displaced off-block to land over which smallholders have insecure tenure and to environmentally sensitive land. Similar land pressures for food gardening are also arising on some of the CRP and VOP blocks in the Hoskins Oil Palm Scheme.

ASSESSING THE STATUS OF FOOD SECURITY AMONG SMALLHOLDERS

It is important to assess the status of food security among smallholders because food gardening is a central part of their livelihoods and is one of the many daily activities smallholders undertake in addition to oil palm production. Food gardening and oil palm production fit into a broader smallholder livelihood system that together provide food and income security. When considering the long-term sustainability or vulnerability of oil palm farming systems consideration must be given to the broader livelihood system in which it is a part. This is because if, for example, there are stressors or upheavals in food production and gardening then these are likely to have an impact on oil palm production and productivity and *vice versa*.

There are four key dimensions of food insecurity which typically form the basis of food security assessments. These four dimensions are:

1. Food availability (food supply): the food that is available locally. This is the food that is physically available because it is grown in household gardens or produced locally, or imported.

Food availability can be affected by seasonal or climatic factors (e.g. drought), pests and diseases, the supply of household labour to grow food, garden productivity (e.g. soil fertility maintenance practices) and infrastructure.

2. Access to food. How do people access the food available? Is it accessed from their own gardens, by borrowing, exchanging, purchasing, foraging, hunting or stealing? Access is determined by a household's resources – their access to land and labour to cultivate gardens, access to social and kinship networks, and access to money to purchase nutritious food. Also, food access is affected by the distribution of income within a family, one's social position in the family, the coping strategies of households to adjust to pressures, the price of store foods and access to markets and stores. Food access can be negatively influenced by conflicts over land, loss or drop in income and the collapse of, or restrictions on, social safety nets.

3. Utilisation. Utilisation is the way people use the food for a healthy life – the consumption of adequate nutritional food. It can depend on the quality of the food, how it is prepared (e.g. sanitation, cooking skills), how the food is stored, food taboos (e.g. during pregnancy), cultural preferences for particular crops, nutritional knowledge, as well as the health status of the individual consuming the food.

4. Stability. There must be a continuous supply of nutritious food at all times to ensure food security. Thus, the stability of the three key dimensions above – availability of food, access to food and stability of the intake of nutritional food are needed for a household to be food secure.

Using the above four dimensions of food security, an assessment of the current status of household food security and vulnerability on the LSS, CRP and VOP blocks was conducted using the following methods:

1. Household socio-economic questionnaire surveys of LSS growers in WNB (Hoskins and Bialla) and Popondetta, and VOP and CRP oil palm growers in the Hoskins area. These surveys focused on the main socio-economic characteristics that are linked to the availability and access to food at the household level: for example, income, number and sources of income, control of household income, educational levels, household size and number of dependants, access to garden land and land tenure, food production, asset/resource base, impacts of and responses to land pressures.

2. Household garden surveys. Households were selected from the main sample in WNB and their food gardens surveyed. The household food garden surveys recorded: the number, size and location of food gardens by garden type; fallow characteristics; range of staple food crops; planting sequence; intercropping of oil palm; garden management and cultivation practices employed to enhance or maintain garden productivity (e.g. cropping intensity, short-maturing food crops); soil fertility management; pest management; proportion of crops cultivated for sale, consumption and gifting; land tenure and ownership; and, strategies to access additional land for food gardens.

3. Household food consumption and income and expenditure surveys. The same households whose gardens were surveyed

were visited each day over a 7 day period to conduct a 24 hour dietary recall survey. Each member of the family listed the food they had eaten in the past 24 hours and from where it was sourced (their own garden, someone else's garden, the local market, a gift of cooked food, the store, the ocean/river/bush). This information was to assist in assessing how people met their food needs.

During visits to the household, information was also collected on income earned and expenditure by the household in the last week, especially expenditure on food. This was to help determine the capacity of households to purchase food and their reliance on store foods.

The results of the food security assessments will be the subject of forthcoming issues of *OPRative Word* (Technical Notes 33, 34 and 35).

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