The OPRAtive Word

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Smallholder food consumption and food security

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This fourth note (Technical Note 35) in the series on food security among smallholders examines household food consumption patterns. The assessment of the status of food security gathered data on household food consumption and food acquisition. Information was gained on meal frequency, meal ingredients and food procurement. These data enabled an assessment to be made of household access to food and diet quality.

FOOD CONSUMPTION SURVEYS

Food consumption patterns were surveyed using two methods. The first method was a one-off 24 hour food intake recall surveys among 375 oil palm households. Household heads were asked to recall what each household member had consumed in the previous evening's meal. They were also asked to specify the source of each meal ingredient. The source of meal ingredients is important as an indicator of reliance on food gardens and the financial capacity of households to purchase food.

The second method used to assess food consumption patterns was a 24-hour dietary recall survey conducted over seven consecutive days. A subgroup of 42 households were visited each day over a seven-day period. Each member of the family listed the food they had eaten in the past 24 hours and from where it was sourced. This second method of assessment provides a better assessment of diet quality.

Both methods provide a 'snapshot' of the types and diversity of foods eaten, and from where the food is sourced. Whilst the combination of both a one-day and seven-day assessment of food consumption does not provide an indication of seasonal differences in diets or an individual's habitual diet, it does provide a good assessment of the range of different food groups consumed at particular points in time. This information can also be used to monitor changes in diets over time.

Studies have shown that nutritious diets are diverse. A diverse diet is one that includes foods from a wide range of food groups (e.g. vegetables, fruit, meat, dairy products, etc.). Conversely, a diet consisting of food from only one or two food groups, such as root crops and sago is less nutritious, especially when the high protein food groups like meat or chicken are absent. An assessment of dietary diversity, therefore, is not only an indicator of the variety of foods a household has access to, but it is also a proxy for the nutrient adequacy or quality of diets.

Past nutritional studies in PNG have shown that it is the quality of the diet rather than the quantity of food consumed that is the major factor contributing to poor nutrition and poor child growth in the country (e.g. Harvey & Heywood 1983; Gibson et al.1991; Mueller et al. 2001). The majority of the population generally have good access to food, but diet quality, especially protein levels, is inadequate in many rural areas. Rural diets are predominantly based on tubers such as sweet potato, yams and taro, and these low protein diets are associated with undernutrition in PNG.

DIETARY PATTERNS

The following discussion draws on the findings of the one-off 24 hour dietary recall survey of 375 households. Food consumption for three groups of smallholders are reported: smallholders residing on the LSS at Oro, smallholders in WNB living on the LSS schemes at Bialla and Hoskins and on CRP blocks, and Village Oil Palm (VOP) growers in WNB (Hoskins).

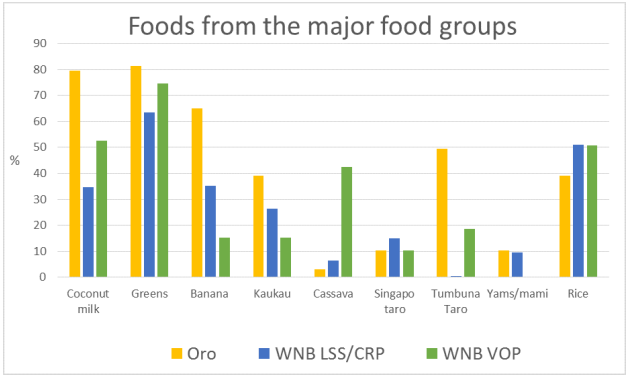

Figure 1. The percentage of households consuming foods from the major food groups applicable to PNG diets.

The proportions of households consuming foods from some of the major food groups are shown in Figure 1. The most common ingredients or foods consumed in the previous evening's meal were:

- Coconut milk
- Green vegetables (e.g. aibika, aupa, ferns and pumpkin tips)
- Traditional staples.

Bananas and tubers, such as Singapore taro, 'taro tru', and sweet potato remain important, and it is common for at least one or two staples to be part of a meal. 'Taro tru', once a significant crop in the gardening systems in WNB, is declining and people are planting more banana, sweet potato and cassava.

Figure 2 shows the percentage of households consuming vegetables, fresh fish/seafood, fresh meat/bush meat, tinned fish and tinned meat as part of their previous evening's meal. The category 'vegetables' includes a range of foods such as capsicums, eggplants, onion, etc. These were consumed by less than 30% of households at all study sites. As expected, consumption of fresh fish was higher for the coastal VOP households than among households residing on the LSSs and CRPs, where over

30% of the meals consumed the previous evening contained tinned fish. Meat consumption was often associated with customary events .

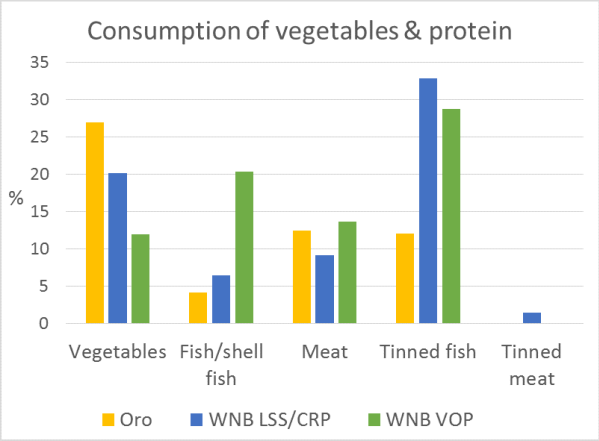

Figure 2. The percentage of households consuming vegetables, fish and meats in the previous evening's meal.

Fish and meat are very important nutritionally in PNG because, as outlined above, the traditional diet of bulky root crops has a low density of protein and energy. Studies in the 1980s and 1990s demonstrated that in rural areas of PNG where cash crops such as coffee, copra and cocoa were introduced, there was a consequent improvement in the nutritional status of the population, especially among children. For example, research undertaken by the International Monetary Fund (IMF) showed that the consumption of rice, tinned fish/meat, fresh fish and legumes, which are much higher in protein, zinc and energy than local staple foods was significantly positively correlated with improved child growth (in length and/or weight) (Mueller et al., 2001). Thus, access to income to purchase high density nutrient foods to supplement traditional diets has a beneficial effect on diets and nutrition. It also explains why in many parts of rural PNG where access to markets and income is low, poor nutritional status among children remains a significant problem.

Changing diets

The dietary patterns shown in Figure 1 reflect the results of the garden surveys and interviews with smallholders conducted as part of the study. The most striking shift in diets and farming systems is among VOP farmers in WNB where cassava is rapidly replacing traditional taro as the dominant garden food crop. Evidence of this shift can be seen in Figure 1 where cassava was eaten as part of the previous evening's meal by 42% of VOP households. Smallholders have indicated that this shift from a taro culture to cassava has occurred rapidly, in less than two decades. The cause of the shift is primarily due to population increases and land pressures. The high labour demands of taro cultivation relative to cassava is also likely to be driving this change. This decline of traditional taro in diets is also occurring on the LSS (Figure 1). Thus the 'glory days of taro' (Bourke 2012) in WNB are coming to an end, as elsewhere in PNG.

The other important finding from the dietary intake surveys is the high rate of rice consumption**.** At all sites, rice was consumed by 40-50% of households in the previous evening's meal. These rates of rice consumption are much higher than in rural areas but lower than for urban populations (Saweri 2001). Rice consumption is presumably matched by a reduction in the consumption of traditional staples. The data suggest that rice is steadily becoming a primary staple on the LSSs and VOPs in WNB and a secondary staple in Oro. Rice is no longer a luxury food as is still the case in many rural areas of PNG. It has become a standard part of the diet, and people, especially young people, expect to consume rice regularly.

It has been assumed that increased consumption of rice in PNG merely reflects a move to a modern western lifestyle and diet. Whilst this assumption may be accurate for the urban middle class in PNG, the consumption of rice in some of the study sites is more likely to be an indicator of broader issues relating to the interactions between land pressures, labour demands, returns to labour and regular access to income. Although no definitive evidence is yet available, it is likely that the purchase of rice is a strategy to alleviate some of the pressures on land in areas experiencing land shortages for gardening.

Regular consumption of rice may also reflect women's high workloads and labour demands. For women, purchasing rice means less time spent on a range of livelihood activities, including garden work, meal preparation and the collection of firewood. In interviews, smallholders on the LSS often raised the problem of firewood scarcity for cooking.

Presently, it cannot be concluded whether smallholder households are becoming more dependent on purchased foods, such as rice to maintain food security or if the shift in diet merely reflects changing taste preferences for store foods over traditional staples, and/or the benefits of a regular income to purchase store foods.

FOOD PROCUREMENT

The stability of the food supply is also an important indicator for food security. There must be a continuous supply of nutritious food at all times to maintain food security. The source of food can provide an indication of stability of the food supply.

Figure 3, shows the source of ingredients in the previous evening's meal . The main sources of food included:

- Household's own garden
- Someone else's garden
- Store
- Market
- Bush/sago grove
- River or ocean

- Food/meals given by a relative or friend
- Customary event

Overwhelmingly, people's own food gardens were the main source of food consumed the previous evening. These were supplemented by foods purchased at stores or, particularly for those on the LSS, the market. The results show that smallholder households continue to depend heavily on food gardens as a source of food for daily diets.

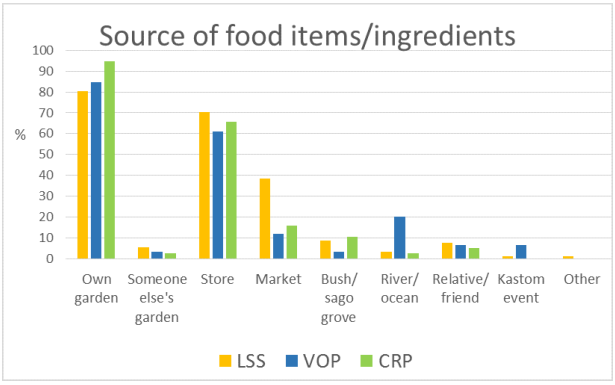

Figure 3. The source of ingredients in the previous evening's meal on the LSS, VOP and CRP at Hoskins, as a percentage of households.

CONCLUSION

The 24 hour dietary recall results suggest that food availability and access to food is generally good. A diversity of foods is consumed and diet quality appears to be adequate for most households. Smallholder diets contain more protein and energy rich foods (meat, fish, oils, etc.) than are typically consumed by rural households in PNG (Gibson & Rozelle 1998).

This is likely to be the result of several interacting factors, including:

- Smallholders who were part of the study all live within 20 km of a provincial town and transport infrastructure is relatively good. This enables them to have good access to town and opportunities to earn income from town markets and to purchase food at both town markets and stores.
- Most households have regular access to income — both men and women.
- The utilisation of social and kinship networks to access land for food gardening (see Technical Note 35).
- Access to fertile volcanic soils for food gardens in most locations.
- In coastal areas, good access to marine resources and bush resources to supplement garden foods.
- Internal capacity of households (and village social institutions) to adapt and intensify traditional agricultural systems and labour inputs in response to growing land and population pressures.
- The introduction of cash crops and the production of food crops for local markets.

However a challenge facing the LSSs over the next 10-15 years is whether existing farming systems will be able to meet the food and cash income requirements of the growing population in a sustainable manner. An integral component of the research is to assess household food security over the longer-term. Currently, the research team is considering the following questions:

- How will climate change impact on a household's ability to increase production from a given piece of land?
- Can we assume that all households will continue to have good access to income to purchase food?
- What options are there for introducing new high yielding cultivars of staple food crops?
- How will soil fertility be maintained under intensive methods of production?
- Will education levels increase to improve livelihoods?
- How can we best assist smallholders to strengthen food security over the long-term, given the rapid population growth rates on the LSS blocks?

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