PAPUA NEW GUINEA PROJECT NOTE 09 AUGUST 2022

Synopsis: Rural household welfare in Papua New Guinea

Food security and nutrition challenges

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Key Policy Messages

- Ensuring a healthy diet in Papua New Guinea (PNG) is relatively expensive. We estimate that the cost of the healthy-diet food basket, which aims to fulfil specified nutrition targets, costs approximately 40 percent more than the energy-based food basket, which aims to fulfil a calorie adequate diet of foods typically consumed by poor households.
- Our results suggest that the majority (nearly 4/5) of households in the rural survey sample are unable to attain the healthy-diet food basket and meet basic needs based on current levels of household consumption and expenditure.
- PNG will continue to face disruptive climate events that quickly increase agricultural vulnerability and food insecurity in rural areas. The government of PNG in collaboration with development partners should consider piloting a social safety net program that can reduce food and nutrition insecurity risk for vulnerable households.
- A concerted effort is needed to better promote the importance of improved nutrition for greater economic growth and human development targets at all levels of government.
- Government officials, nutritionists and development professionals should identify a set of nutrition targets, with estimates of the associated household costs for achieving these targets to better inform development planning.
- PNG should invest in more-timely data collection of key welfare indicators to inform nutrition targets and development outcomes of key government and development assistance programs.

Overview

While a lot of development planning and policy attention has been dedicated to achieving dietary energy (i.e., calorie) adequacy to ensure food security and support greater household wellbeing, nutrition adequacy is also necessary to achieve improved human development indicators (e.g., improved educational attainment, decreased disease prevalence, and decreased child stunting prevalence). This study (explained in detail in the comprehensive working paper) calculates two poverty lines based on the costs that an individual faces in PNG to secure a diet consisting of foods typically consumed by poor households adjusted to align with a calorie threshold and healthy diet thresholds, respectively, together with modest non-food expenditures. Results suggest that over half of the sample households are unable to meet the necessary costs of ensuring an calorie adequate modest food basket along with some basic non-food needs (Schmidt et al., 2022). Comparing the healthy diet poverty line to average household income suggests that attaining a nutritious, balanced diet while meeting other basic needs remains out of reach for nearly 4/5 of the rural sample households.

Based on the study results, we identify 3 key interventions to improve food and nutrition security in vulnerable areas. First, PNG will continue to face disruptive climate events that quickly increase agricultural vulnerability and food insecurity in remote areas with limited market access and underdeveloped support services. The government of PNG in collaboration with development partners should pilot a series of social safety net programs that can assist vulnerable populations. These programs can be designed to build resiliency during non-shock seasons or years, such as improving livestock holdings, diversifying crop mix, investing in sustainable land management, and building agricultural production and other rural infrastructure for improved marketing and access to agricultural inputs. Second, a concerted effort is needed to promote the importance of nutrition at all levels of society. At the household level, training should aim to instill (for both men and women) the value of a costlier, but more nutritious diet. District and regional government officials, healthcare workers and other key stakeholders should be trained on methodologies to integrate nutrition programming into other development activities. High-level government dialogue and learning should aim to encourage greater coordination between local and federal government officials and across government departments to ensure improved nutrition outcomes for greater agricultural productivity and economic growth. Finally, PNG (both government and development partners) must invest in more timely data collection of key welfare indicators to inform nutrition targets and assistance programming.

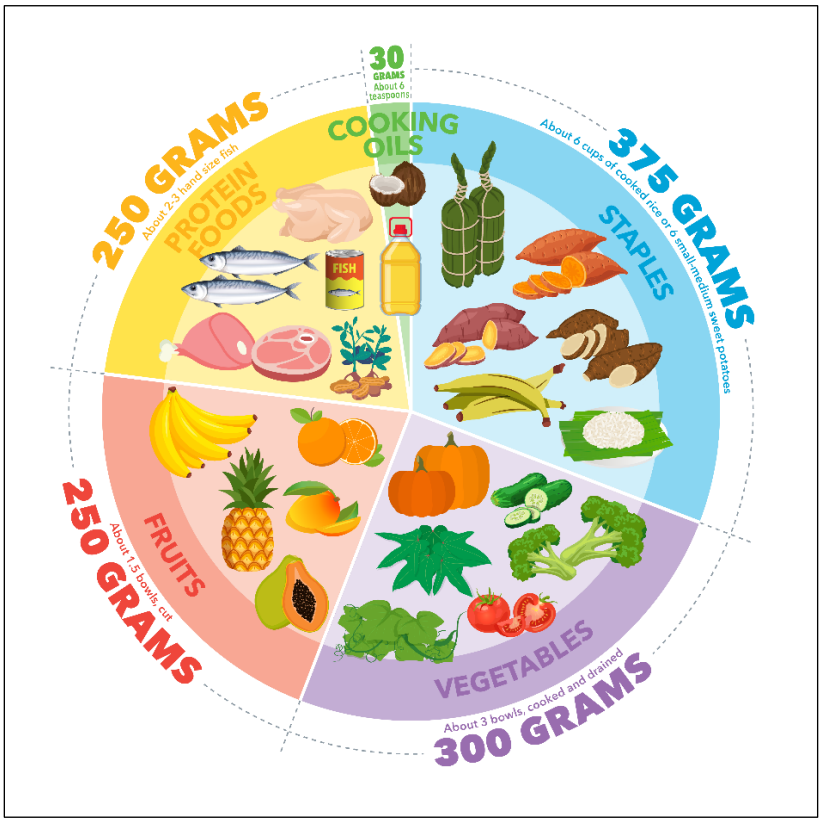
Data and methodology

We calculate a total household consumption-expenditure value using the reported household food consumption and non-food expenditure data from the 2018 PNG Rural Survey on Food Systems (RSFS). Given that the majority of households included in the survey sample are subsistence farming households, total income is estimated using reported consumption-expenditure estimates. This is because it is difficult for subsistence households to estimate a monthly wage or annual income value from their subsistence farming work. Thus, we estimate the income derived from subsistence farming by summing the total value of reported consumption (by food item quantity at market prices) and total value of weekly, monthly and annual non-food expenditures reported by the household.

We also use the household consumption and expenditure data to estimate two food poverty lines which represent the cost of basic needs of a household. Previous work has analyzed poverty prevalence using the conventional cost of basic needs poverty line which is the cost of a modest basket of foods consumed by poor households adjusted to meet a threshold for adequate calorie consumption (approximately 2,250 calories/person/day) plus the cost of basic non-food needs (Schmidt et al., 2020; Gibson, 2012). However, because poor households likely consume diets heavy in starchy staples and lacking in other nutritious food groups, the traditional cost of basic need poverty line likely falls short in meeting important health and nutrient standards. Given the intransigent child stunting rates that remain across the country, further work is needed to evaluate the cost of a modest basket of foods consumed by poor households that ensures a nutritionally balanced diet that supports healthy growth and wellbeing. The analysis presented here compares both: 1) the energy-based food poverty line (which only targets a calorie threshold) and 2) the healthy diet food poverty line (which targets a calorie threshold *and* a more comprehensive healthy diet standard) demonstrated by Mahrt et al. (2022) and Herforth et al. (2020).

The healthy diet food poverty line is based on healthy diet recommendations outlined in food based dietary guidelines (FBDG). We develop a recommended diet for PNG by evaluating commonly consumed food items within the PNG survey areas and adapting the Indonesia FBDG (which provides food item quantity recommendations for daily consumption to meet nutritional targets for specific age groups) to reflect PNG consumption trends. The PNG recommended healthy diet is visualized in **Figure 1**.

Figure 1: PNG healthy diet plate based on adapted food based dietary guidelines



Note: Grams are specified in terms of raw edible portions for fruits, vegetables, and protein foods and in terms of dry rice for staples.

Source: Indonesia food-based dietary guidelines, and authors' calculations.

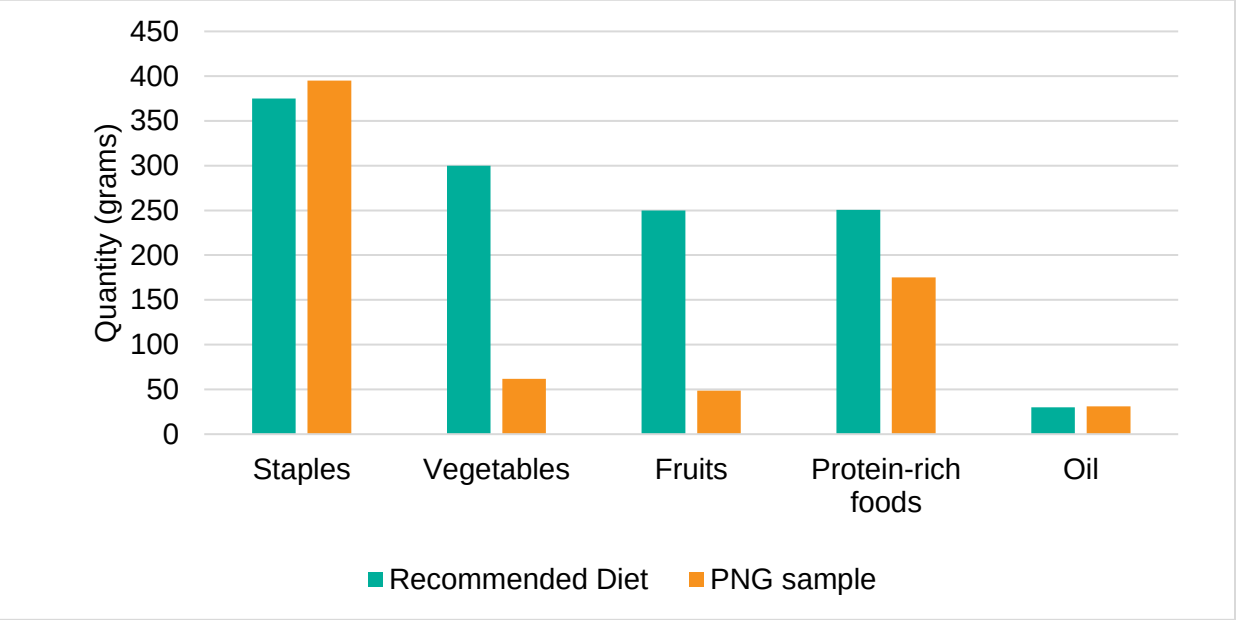
Next, we calculate a non-food allowance that incorporates typical expenditures on non-food items (e.g., soap, fuel, farming tools etc.) by relatively poor households, which is added to each food poverty line to form a total poverty line. Total estimated household income (value of total reported household consumption-expenditure) is measured against the total poverty line value to assess whether households are able to meet the cost of living defined by each poverty line, respectively.

Observed household consumption patterns

On average, individuals within the survey sample consume the recommended daily amount of staple and oil foods, however daily consumption of vegetables, fruits, and protein-rich foods fall significantly short of recommended healthy diet targets. **Figure 2** shows average daily (per adult equivalent) food consumption quantities of each food group based on the RSFS survey and compares these quantities with the constructed PNG healthy diet targets represented in Figure 1. Under-consumption of vegetables and fruits may be associated with: limited market access to a wider array of consumable produce (either for sales or purchase); lack of access (financial or physical) to production inputs and agricultural technology (land, seed, fertilizer, agricultural extension etc.) to promote a diversified crop production system; and / or increased (perceived or realized) risk of foregoing staple crop production for greater vegetable and fruit production systems in rural areas of PNG.

Our results additionally suggest that higher-income households in the survey sample also substantially under-consume vegetables and fruits, which may be linked to a lack of knowledge of the health and development benefits of eating a diversified, nutritious diet. Regardless of fresh fruit and vegetable cost, limited access to markets that regularly sell diverse food items may also be limiting diversified diets,.

Figure 2. Quantity (grams) consumed of each food group, per adult equivalent/day



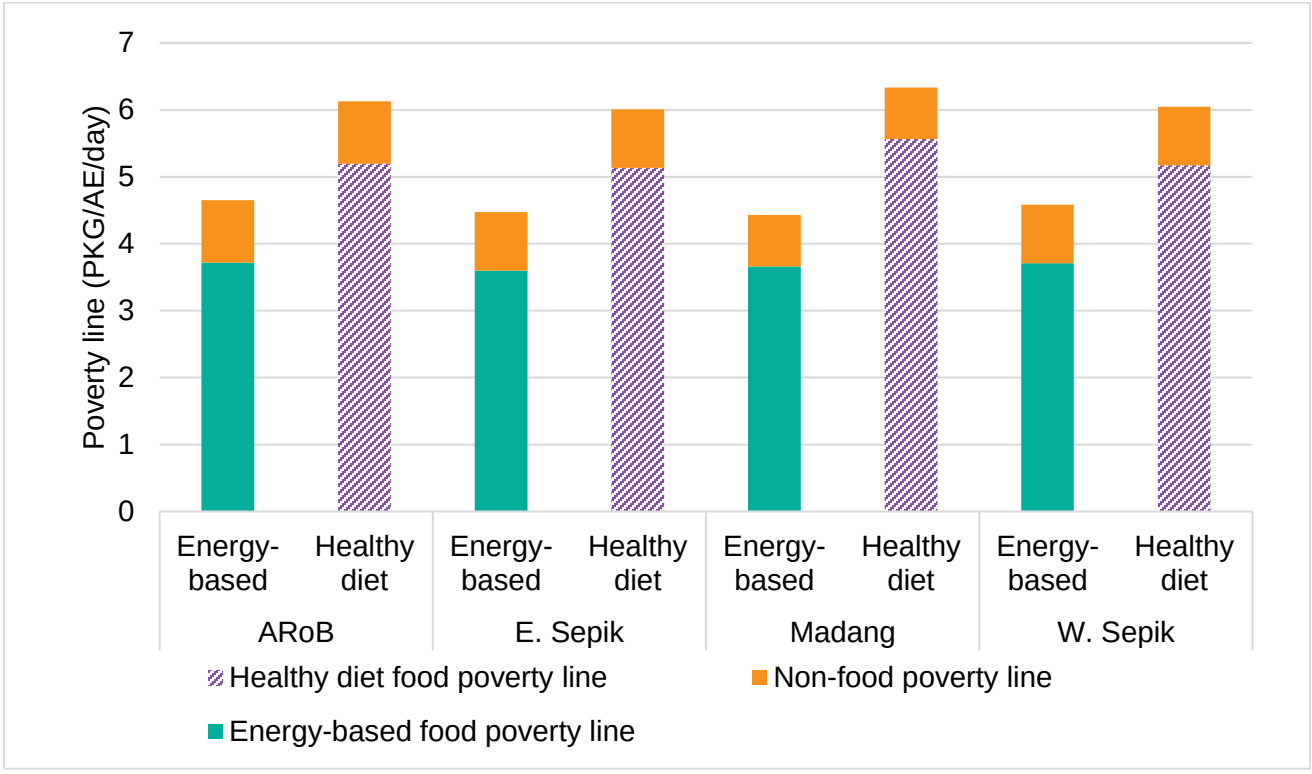
Note: Quantities in food group equivalent grams.

Source: RSFS (2018)

FOOD BASKET COSTS

Comparing the cost of the energy-based food basket with the healthy diet food basket demonstrates the increased cost of achieving important nutrition targets. On average, the cost of the healthy-diet food basket costs approximately 40 percent more than the energy-based food basket. **Figure 3** compares the cost of the energy-based food basket (which ensures adequate calorie intake) with the cost of the healthy diet food basket (which ensures adequate calorie intake and recommended food group quantity intake to achieve nutrition targets) by sample area. Given that different sample areas eat different foods and face differing costs, we ensure the food baskets that are incorporated in the poverty line assessment represent consistent welfare levels across sample areas which allows for comparison of poverty prevalence across locations. While sample households in Madang face the least expensive energy-based poverty line of the survey areas, they face the most expensive healthy diet poverty line (6.33 PGK/AE/day). The Madang survey sample is predominantly located in Middle Ramu district (approximately 8 hours outboard motorboat from a city center). The significant remoteness and limited market access of the Middle Ramu households create significant challenges to achieving diversified diets required to meet nutrition targets.

Figure 3: Utility-consistent absolute poverty lines by province (kina/adult-equivalent/day)



Source: RSFS (2018)

Poverty estimation

We compare the value of total household consumption-expenditure per adult equivalent per day with the cost of the energy-based poverty line and the healthy diet poverty line, respectively. Individuals in households that have a total consumption-expenditure value greater than the poverty line are considered non-poor. Approximately 58 and 76 percent of the sample does not have the required consumption-expenditure to meet the energy-based and healthy diet poverty lines, respectively (**Table 1**).

We split the sample by income (i.e., total consumption-expenditure) quintiles where the households in the lowest 20 percent of the income distribution are represented by quintile 1 and the households with the highest level of income (top 20 percent of the income distribution) are in quintile 5. While the top two quintiles have sufficient consumption-expenditure levels to secure a modest calorie adequate diet, only households in quintile 5 (and 20 percent of the second quintile) have the means to secure a healthy diet while meeting other basic needs.

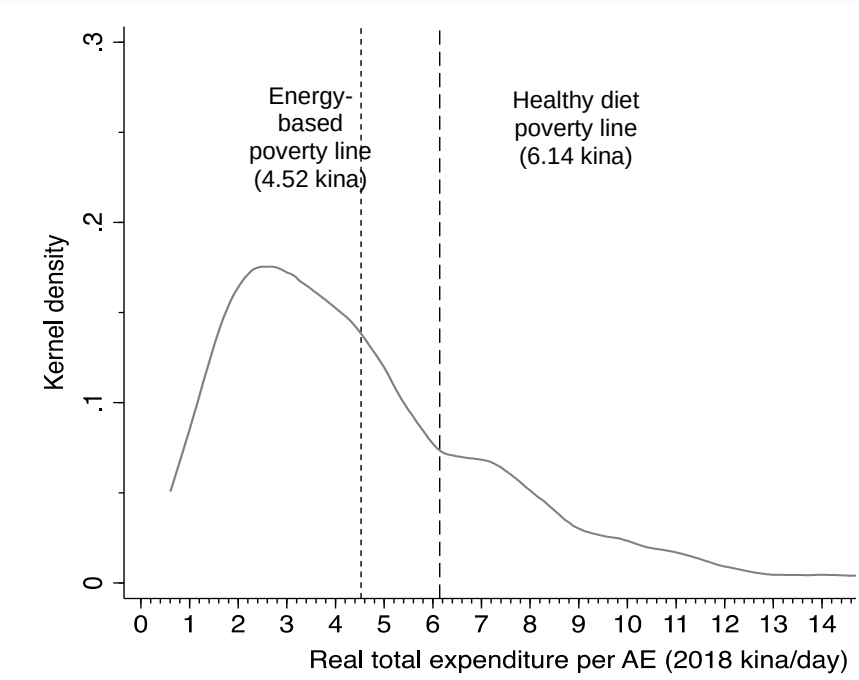
Table 1: Poverty rates, by province and expenditure quintile (kina/adult-equivalent/day)

	Poverty rate (% of population)	
	Energy-based poverty line	**Healthy diet poverty line**
All HH	58	76
Provinces		
ARoB	53	73
E. Sepik	58	73
Madang	58	78
W. Sepik	62	77
Expenditure quintiles		
Q1	100	100
Q2	100	100
Q3	93	100
Q4	0	80
Q5	0	0

Source: RSFS (2018)

Figure 4 illustrates the distribution of total daily consumption-expenditure per adult equivalent. The largest share of individuals within the sample has a daily consumption-expenditure between 2 and 3 PGK per day. Thus, the majority of the rural survey sample has consumption-expenditure levels that fall short of the energy-based or the healthy diet poverty lines. Thus, while policy should focus on reducing traditional energy-based cost of basic needs poverty, there is an opportunity to address both food insecurity, as well as nutrition insecurity when designing assistance programs.

Figure 4: Distributions of total consumption-expenditure and the energy-based and healthy diet poverty lines (spatially adjusted kina)



Conclusion

Ensuring a healthy diet in PNG is relatively expensive, and our results suggest that the majority (nearly 4/5) of households in the survey sample live below the healthy diet poverty line. More than ½ of the survey sample does not have the means to meet the less expensive energy-based poverty line (a modest basket of foods typically consumed by poor households that meets a calorie threshold) in addition to basic non-food needs. This suggests that policy and programming will need to develop initiatives that not only provide assistance for households to ensure they are able to consume modest calorie adequate diets, but also target important nutrition standards to promote wellbeing and healthy child growth and development objectives.

We highlight three interventions that should be prioritized based on the poverty line results presented in this analysis. First, pilot social safety net programs should be designed, tested and modified to build resilience during non-shock seasons or years. Activities could include improving livestock holdings, diversifying crop mix, investing in sustainable land management, and building agricultural production technology and other rural infrastructure for improved marketing and access to agricultural inputs. These programs can also quickly support vulnerable households when local populations are confronted with an unexpected shock (e.g., El Niño, Covid-19, crop and livestock pest epidemic). Second, a concerted effort is needed to better promote the importance of nutrition in food consumption choices across all households regardless of income levels, as well as within households and with both men and women household members. Finally, PNG must invest in more timely data collection of key welfare indicators to provide data and evidence to support and inform government programming and policies.

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ACKNOWLEDGMENTS

We benefitted immensely from discussions and technical input from Channing Arndt and Sherman Robinson. We also thank Dickson Benny, Paul Dorosh, Mark Ivekolia, Fiona Lynn, Raywin Ovah, and Jessica Raneri who provided feedback on study design and earlier versions of this manuscript.

Funding for this work was provided by the Australia Department of Foreign Affairs and Trade (DFAT) through the Australia High Commission (AHC) in Port Moresby and the Regional Strategic Analysis and Knowledge Support System for Asia (ReSAKSS-Asia) funded by United States Agency for International Development (USAID). This publication has been prepared as an output of the Papua New Guinea Food Policy Strengthening Project and has not been independently peer reviewed. Any opinions expressed here belong to the author(s) and are not necessarily representative of or endorsed by IFPRI.