PAPUA NEW GUINEA

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Papua New Guinea Rural Household Survey (2023): Synopsis of Selected Results

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Overview

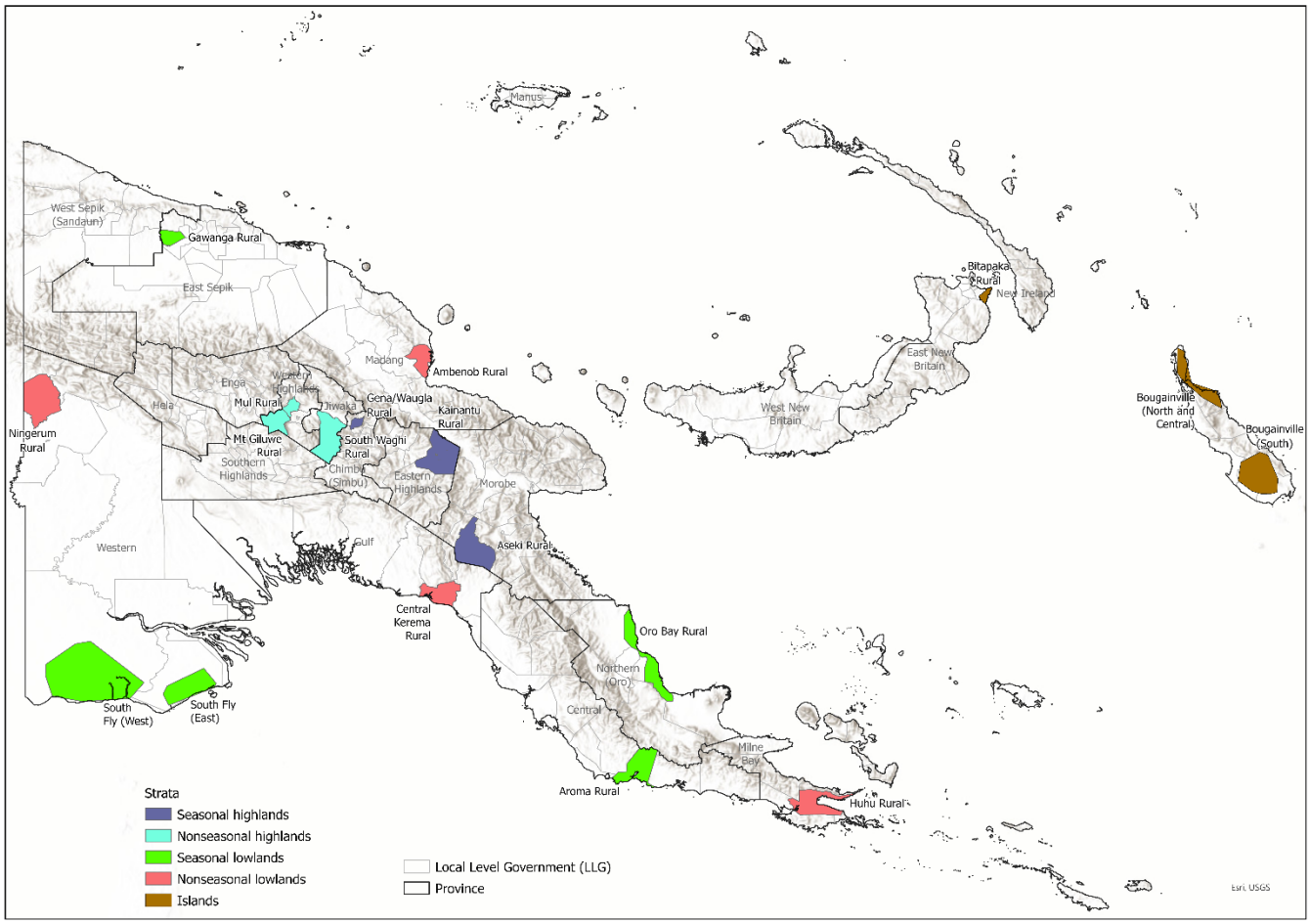
From May to December 2023, IFPRI implemented the 2023 PNG Rural Household Survey which was designed to understand rural livelihoods and welfare across different areas of PNG (Schmidt et al., 2024). Given the rural nature of the survey sample, almost all surveyed households depend on their own-farm production (predominantly starchy roots and tubers) to meet daily caloric needs. On average, households reported utilizing about 1.6 hectares of land for agriculture cultivation at the time of the survey. The survey collected a detailed account of the quantity of food types consumed by the household in order to estimate the average caloric intake per adult equivalent. Comparing the estimated caloric intake reported by surveyed households, with a recommended calorie intake suggests that only 45 percent of individuals in surveyed households meet the recommended daily caloric intake for a lightly active individual. The survey also collected anthropometry data for children under five years of age and found that 36 percent of surveyed children were stunted in their growth. The 2023 Rural Household Survey represents an important effort in collecting a wide breadth of information about rural livelihoods. However, greater investments of in-depth data collection and analysis should be undertaken to examine specific components of PNG household livelihood strategies.

Survey sample and methodology

The survey collected information from 2,699 households across 270 communities and 14 provinces (Figure 1). The survey was designed to collect data from different agroecological zones throughout the country, defined by elevation and rainfall patterns. In doing so, the country was divided into highland (more than 1,000 meters above sea level) and lowland areas, as well as seasonal (low to high rainfall throughout the year) and nonseasonal (moderate to high rainfall year-round) areas, and islands. In total, five agroecological areas were defined as a first-level stratification for survey site selection:

1. Seasonal highlands
2. Nonseasonal highlands
3. Seasonal lowlands
4. Nonseasonal lowlands
5. Islands

Figure 1: 2023 PNG Rural Household Survey sample selection



Source: Authors' compilation.

Within defined agroecological zones, we randomly selected three to four local-level governance units (LLGs) to include in the survey. From each of these LLGs, we randomly selected 15 communities from a list that the PNG National Statistical Office provided for the survey selection exercise. Upon arrival in the selected community, enumerator teams updated the community roster to create a complete list of households residing in the community. From that list, 10 households were randomly selected to participate in the household survey.

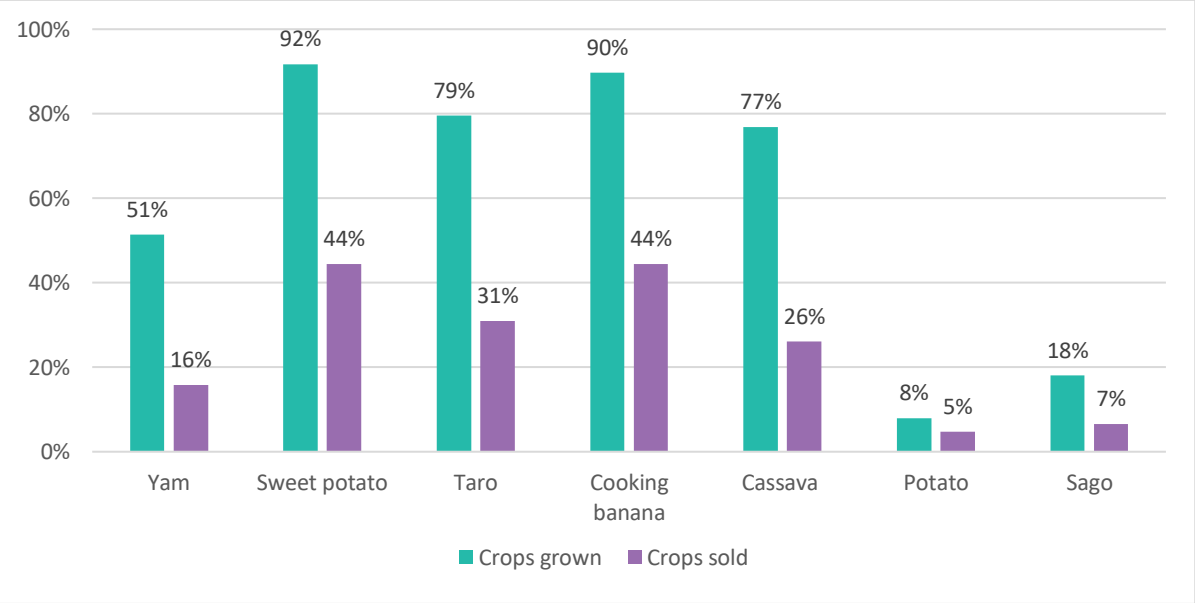
The design of the household survey questionnaire aimed to provide better understanding of rural livelihoods and welfare in PNG from an agrifood system perspective. The questionnaire consisted of a series of questions about the farm and nonfarm rural economy, including about food production, linkages to local markets, opportunities for nonfarm business development, and challenges and opportunities to increase economic vibrancy in rural PNG. In addition, the survey questionnaire included detailed consumption and expenditure modules to assess household income. Finally, enumerator teams measured the height and weight of children under five years of age and their respective biological mothers to evaluate indicators of child growth and nutrition environments. A detailed report of survey findings provides in-depth analysis of various findings, in addition to what is presented in this synopsis (Schmidt et al., 2024).

Production

Given the rural nature of the survey sample, almost all surveyed households engaged in agriculture for their own household food consumption. On average, households reported utilizing about 1.6 hectares of land for cultivation at the time of the survey. To understand the differing production patterns across agroecological zones, respondents were asked about the crops they cultivate and sell at the market.

Rural households in PNG depend on subsistence agriculture to meet daily caloric needs. Thus, staple crops (such as sweet potato, cooking banana, taro, etc.) are the most common crops cultivated among sample households (Figure 2). Among the households that cultivate staple crops, 62 percent sell a portion of their production.

Figure 2: Share of households growing and selling staple crops



Source: Authors' calculations.

Approximately 93 percent of surveyed households grow vegetables, but there is limited diversity of vegetable production. Leafy greens, fresh beans, and squash are the most commonly produced vegetables, with 89 percent, 64 percent, and 51 percent of households cultivating these crops, respectively. Tomato and onion were the next commonly grown vegetable crops, with less than 20 percent of surveyed households cultivating these crops. A substantially smaller share of households that produce vegetables sell them at the market. As with vegetables, fruits were less commonly produced, with an even lower share of households cultivating and selling their fruit.

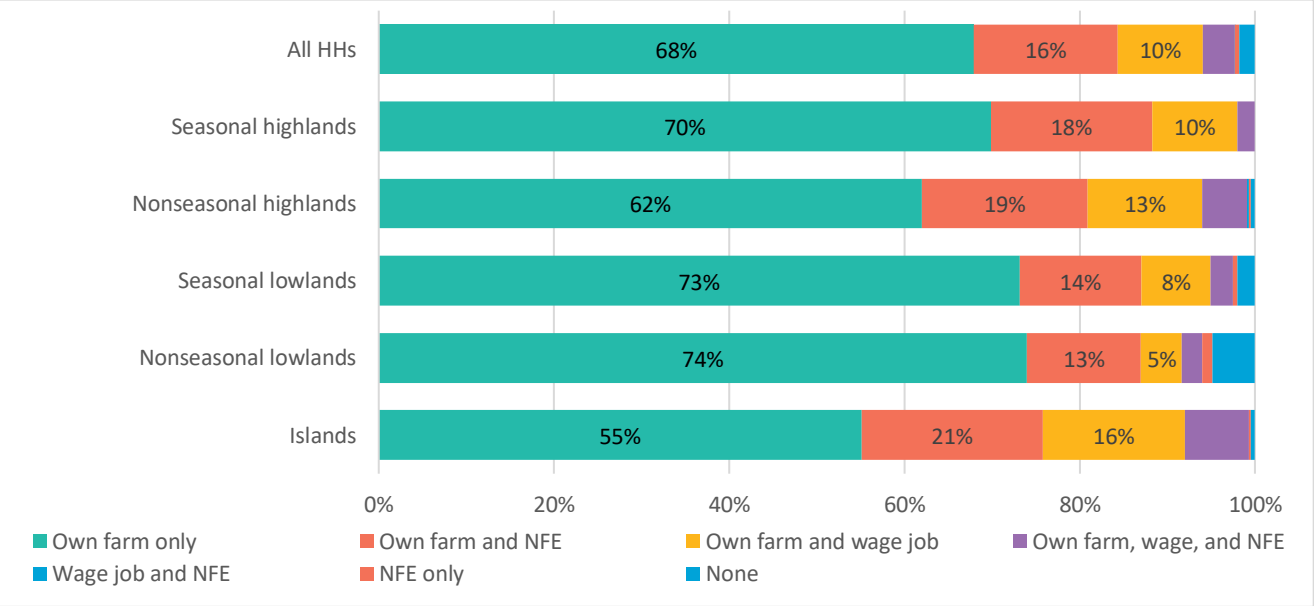
Cash crop cultivation is another important source of income for many rural households. Approximately 62 percent of the surveyed households engage in some form of cash cropping. Notable cash crops include coffee, cocoa, and betelnut (for domestic consumption), though production and sales vary by crop type and agroecological zone.

Household income and labor portfolio

The survey included questions on the use of fertilizer, pesticide, and improved seeds. Only 15 percent of the surveyed households reported using chemical inputs, while 19 percent reported using improved seeds. Many households have adopted sustainable land management practices such as constructing water drainage. However, only half of surveyed households that reported experiencing erosion have implemented some type of erosion control. Overall, households reported that agricultural extension is uncommon or does not exist in their community. The most common agricultural extension that households received was information regarding new crops, followed by facilitated access to improved seeds.

Approximately 68 percent of surveyed households reported that their only form of employment was own-farm cultivation. The remaining 32 percent of surveyed households engage in a combination of own-farm cultivation, nonfarm enterprise (small business) ownership, and wage labor. A greater share of surveyed households in the islands and nonseasonal highlands rely on diversified household employment portfolios to meet household needs, potentially reducing income risk via differing labor engagements (Figure 3). Most of the wage work that households engage in is agricultural work on other farms or unskilled nonfarm labor. Nonagricultural trade is the most common type of nonfarm enterprise.

Figure 3: Income sources, by study area



Source: Authors' calculations.
Note: HH = household; NFE = nonfarm enterprise.

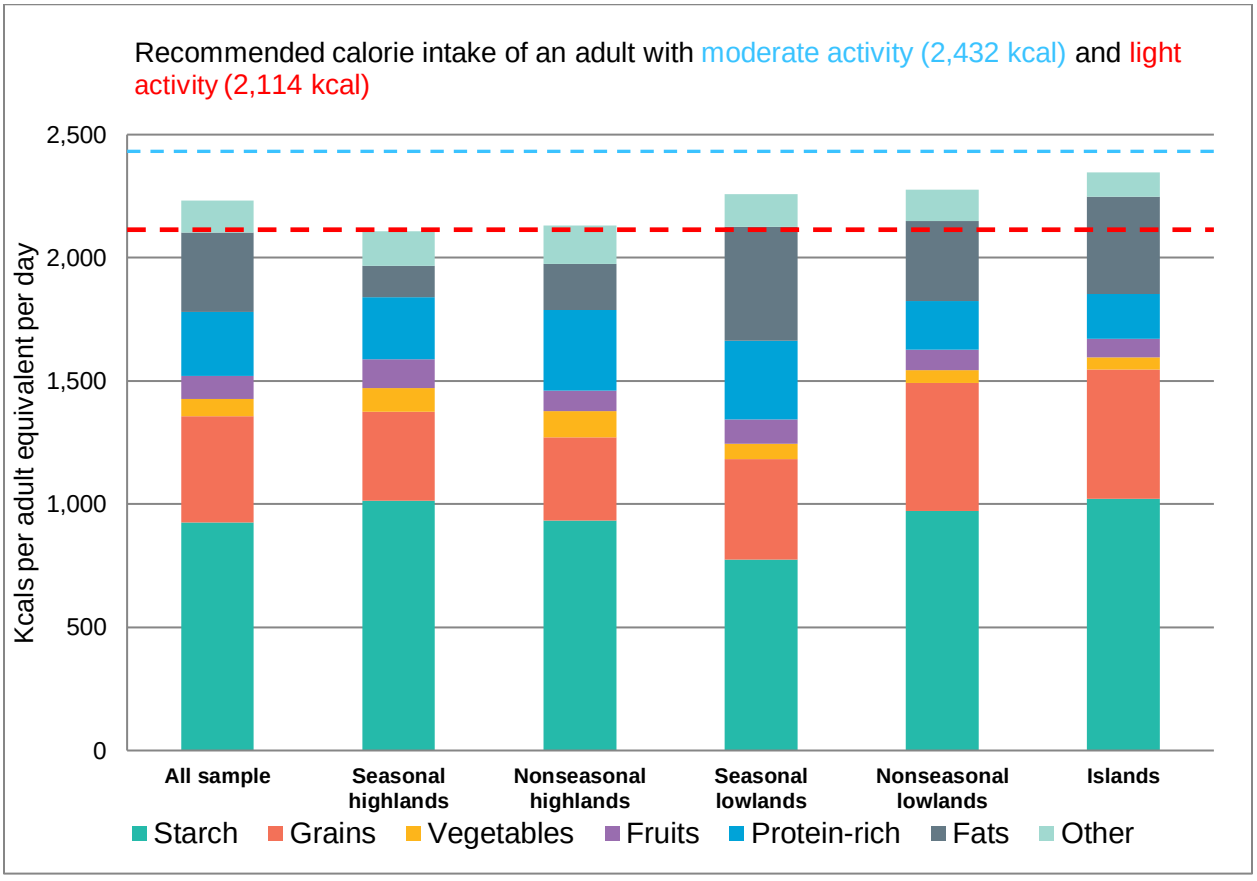
Household consumption and expenditure

The household survey questionnaire included a set of detailed consumption and expenditure modules to assess household welfare. Survey respondents were asked whether they consumed 75 different food items common to PNG. If they responded "yes" to consuming a particular food item, respondents were asked to estimate how much of the item their household consumed during the seven days prior to the survey and from which source (own production, purchased, or gifted). For purchased items, respondents were asked to report the price of the food item at the market. The reported local market price was then used to impute the value of food consumed across self-produced, purchased, and gifted foods.

Similarly, surveyed households were asked about a series of nonfood items that they purchased in the last week, month, and year. Using food and nonfood consumption expenditure data, we estimated an average daily consumption expenditure value per adult equivalent, which is often used as a proxy for income measurements in low- and lower-middle-income countries. The average daily consumption expenditure value of the sample households is 9.94 PNG Kina (PGK) per adult equivalent. Almost three-quarters of household consumption expenditure is dedicated to food. This is common among subsistence farming communities whose primary occupation is farming for their own consumption.

Given that the survey collected data on the quantity of food types consumed by the household, we can estimate the average caloric intake per adult equivalent by using food composition tables that assign caloric levels per kilogram of each food type. Comparing the estimated caloric intake reported by surveyed households, with a recommended intake of 2,432 kcals per person for moderately active and 2,114 kcals per person for lightly active individuals (based on PNG physical stature reported in Benjamin 2007), only 35 and 45 percent of individuals in surveyed households meet the recommended daily caloric intake, respectively (Figure 4).

Figure 4: Reported daily caloric intake per adult equivalent, by study area



Source: Authors' calculations
Note: Protein rich foods include animal source foods and plant source foods high in protein. Starch denotes starchy staples which predominantly comprise roots and tubers in PNG.

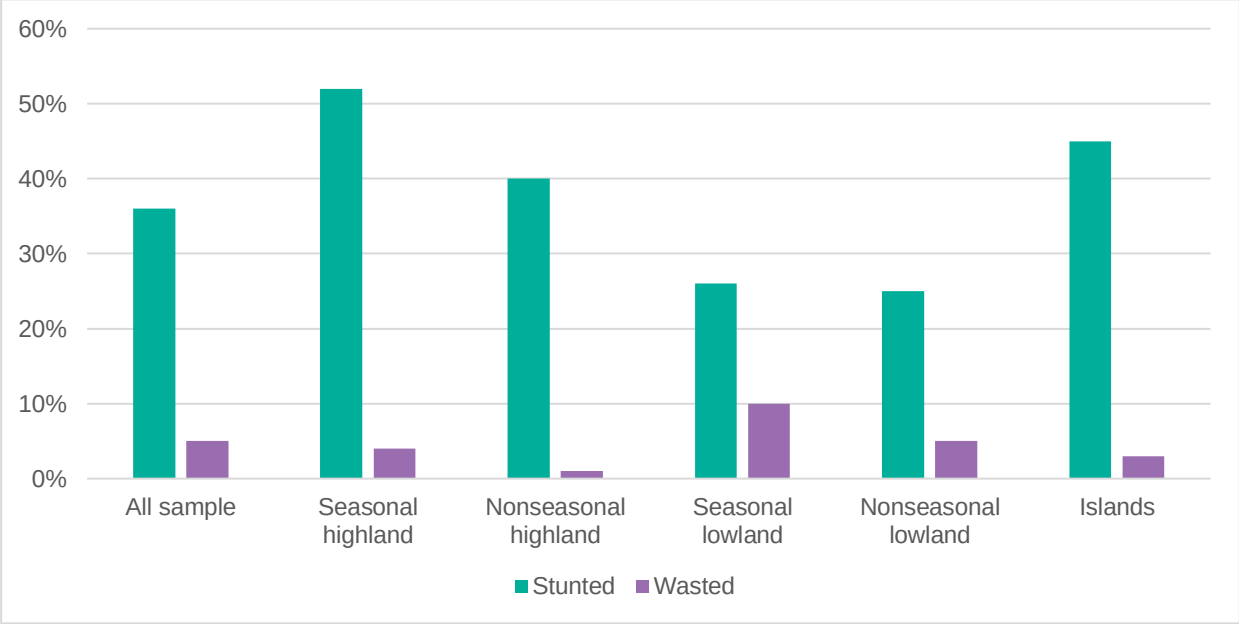
Child growth and dietary diversity

The survey collected height and weight data from all children under five years of age within the surveyed households, as well as the height and weight of each child's mother. Using these data, we focus on two indicators of child growth: stunting and wasting.

Stunting represents an extreme deviation from the expected height for a child's age. In technical terms, a child is considered stunted if the measured height is two standard deviations below the World Health Organization's (WHO) growth standard for the child's specific age (measured using a height-for-age z-score [HAZ]). Stunting can indicate a poor nutritional environment, including repeated infection (resulting from inadequate water, sanitation, and hygiene [WASH] practices, for example) whereby children are unable to absorb nutrients from the food that they eat. While stunting is an indicator of long-term chronic malnutrition, wasting (or a low weight for height) is an indicator of acute undernutrition. Wasting is often due to extreme, relatively short-term insufficient food intake or a high incidence of infectious disease that may include symptoms such as diarrhea or poor nutritional uptake.

According to survey measurements, approximately 36 percent of children under five years of age in the surveyed households are considered stunted (Figure 5). Stunting incidence is higher in the seasonal highlands, whereas the lowland survey areas have less stunting among children under five. Evaluating the predicted HAZ scores by month for the sampled children shows that the HAZ score starts to deviate below the WHO growth standard as the child reaches seven months of age. This suggests that other environmental factors (e.g., water, sanitation and hygiene), and food and liquid preparation for infants (as they wean from exclusive breastfeeding) and young children may be inadequate. The predicted HAZ score among sampled children continues to fall until the age of two years.

Figure 5: Growth outcomes for children under five years of age, by study area



Source: Authors' calculations.

A substantially lower share of surveyed children demonstrate severe deviations in weight-for-height z-scores (wasting). This is to be expected given that wasting is an indicator of acute malnutrition, which is usually relatively short term. Approximately 5 percent of surveyed children under five are wasted.

To further investigate nutrition acquisition in rural PNG, the survey included a dietary diversity questionnaire developed by the Global Diet Quality Project (2024a, 2024b) for mothers and young children (ages two to five years), as well as infants (age six months to two years), based on a 24-hour recall period. Each respondent is asked a series of yes/no questions about food groups that they may have consumed during the last 24 hours. Using this information, we constructed a composite indicator to evaluate minimum dietary diversity (MDD). An individual meets the MDD indicator if he/she consumes food and/or beverages from at least five out of eight defined food groups during the previous day. Approximately 26 percent of children ages six months to two years in the survey sample consumed a satisfactorily diverse diet, as measured by MDD. The proportion of young children ages two to five years and mothers satisfying MDD was 33 percent and 34 percent, respectively (Table 1).

Table 1: Dietary diversity of mothers and children (2–5 years old), by study area

	Mothers		Children ages 2–5 years		HHs with children ages 24 – 59 months (*N*)
Study area	**MDD**	**Mothers (*N*)**	**MDD**	**Children (*N*)**	
All households	34%	787	33%	690	770
Seasonal highlands	56%	113	54%	110	142
Nonseasonal highlands	56%	90	52%	93	108
Seasonal lowlands	19%	255	17%	247	259
Nonseasonal lowlands	28%	182	23%	132	145
Islands	37%	147	45%	108	116

Source: Authors' calculations.
Note: HH = households; MDD = minimum dietary diversity.

Conclusion

The 2023 PNG Rural Household Survey collected a breadth of information on rural livelihoods and food systems to inform policy and investment that aims to promote agricultural transformation within the country. Survey findings demonstrate that most rural households in PNG depend on self-produced food for an important share of their diet. According to reported household food consumption, more than half of households do not meet recommended caloric intakes for a lightly active or moderately active individual. Carbohydrate-rich staple foods (e.g., roots and tubers) make up the largest share of the diet, suggesting a need for improved production and market access to nutrient-rich foods such as diverse vegetables and fruits.

Lack of sufficient quantity and quality of food, as well as inadequate WASH practices, may be affecting child nutrition and growth outcomes. The survey collected anthropometry data for children under five years of age and found that 36 percent of surveyed children were stunted, with an average HAZ of more than two standard deviations below international child growth standards.

Given the goal of informing overall livelihood strategies and increasing the understanding of the nutritional status of rural households in PNG, the survey represents an important effort in collecting a wide breadth of information. However, more in-depth data collection and analysis should be undertaken to examine specific components of agricultural and rural livelihood strategies and how they are linked to overall nutrition, food security, and welfare outcomes.

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