HARDSHIP
IN VANUATU

2019–2020 NSDP Baseline Survey

VNSO
VANUATU NATIONAL STATISTICS OFFICE
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FOREWORD

Vanuatu implemented its fourth collection of household income and expenditure information as the core component of the National Sustainable Development Plan (NSDP) Baseline Survey during the 12-month period from February 2019 to February 2020. The survey intended to provide baseline statistics for the Vanuatu NSDP, including key information on consumption—a major component of hardship analysis. Vanuatu is among the first Pacific Island countries to adopt a higher calorie threshold per adult equivalent that better reflects the food needs of the population. The hardship estimates presented in this report are in line with the latest international standards used by The World Bank.

"Poverty" is not something most people in Vanuatu recognize in their communities. This is largely because the understanding of poverty as a state of being "poor" is packed with negative connotation—how can a man, woman or child be considered poor if they have free access to natural resources, have the traditional knowledge and skills to be productive with their resources, and are a part of a supportive family and community? The people of Vanuatu do not reflect an image of poverty. For this reason, it is important to consider poverty as "hardship" and understand it as a condition of inequality.

The data collected from the NSDP Baseline Survey yielded good quality data that is useful for informing hardship in Vanuatu. The hardship assessment report presents the analysis relevant to the key Sustainable Development Goal (SDG) indicators 1.2—proportion of the population living below the international poverty line—and indicator 1.2.1—proportion of the population living below the national poverty line. These indicators help track national progress at ending hardship in all forms, as defined by the United Nations and global partners.

This report shines a light on those in our society that are experiencing hardship. Our culture promotes equality through social incentives but development trends and the cash economy do not benefit individuals equally. We must first recognize where we are failing to share the benefits of development in our country if we are to ensure that all communities and all people get their share.

The Government of Vanuatu and the Ministry of Finance and Economic Management are proud to publish this hardship Assessment Report and remain committed to producing quality hardship statistics available for all users. It is with great pride we release these findings after several years of preparation, fieldwork, and analysis. Enjoy.

Hon. Johnny Koanapo RASOU
Minister of Finance and Economic Management
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EXECUTIVE SUMMARY

The rate of hardship for Vanuatu, defined as those individuals living below the "National Poverty Line" (NPL), is estimated to be 15.9 percent with 96.7 percent of people in hardship located in rural areas. The rate of hardship is based on a national "cost of basic needs poverty line" constructed using the 2019-20 NSDP baseline data (see Box 1). This translates to approximately 47,000 individuals living in hardship nationwide. This measure is based on an annual per adult equivalent[1] (AE) NPL of VT 147,944, or approximately VT 405 per AE per week. The rate of hardship in urban areas is 2.0 percent, compared to 20.8 percent in rural areas (Figure 1). There are also substantial geographic differences, with the highest rates of hardship in the rural provinces of Tafea and Torba (35.3 percent and 31.0 percent, respectively). Compared to other East Asia & Pacific countries, inequality in Vanuatu is relatively low with the Gini index estimated at 32.3 in 2019-20 based on per capita consumption.

Hardship is associated with lower levels of educational achievement and enrollment. A large drop off in enrollment rates for children aged 14-18 suggests that the majority of children in Vanuatu will never finish secondary school, with the lowest enrollment in this age group (15.4 percent) from the bottom decile. Almost half of households where the highest level of education of any adult is 0-2 years of schooling are in hardship. Rates of hardship decline steadily with higher levels of education completion, especially in rural areas. Econometric analysis suggests that education is positively associated with household consumption and negatively correlated with hardship, after controlling for other household characteristics.

Hardship is also related to differences in labor market characteristics of the household and income sources. Less than half of working age adults in Vanuatu are actively working, with 51 percent of men and 34 percent of women working. Most adults aged 15-64 who are working are employees (60 percent), followed by work in their own business (32 percent). Wage work is much more prevalent in urban areas, while close to half of the rural working population are self-employed (this includes subsistence agriculture). Over four-fifths (83 percent) of people working in hardship are working in agriculture. Similarly, income from employment comprises a much higher share of income in urban areas, while rural areas have much higher income from home production. The rural-urban differences in income and employment correspond to rural-urban differences in hardship. Econometric analysis suggests that external employment is positively associated with household consumption and negatively correlated with hardship, after controlling for other household characteristics.

A distinct characterization of people in hardship in rural areas emerges across Vanuatu, albeit with varying degrees of provincial concentration. In absolute terms, people in hardship number the greatest in Tafea (14,066), Malampa (9,069), rural Sanma (8,706) and Penama (5,204). Together, these four rural areas account for 78.4 percent of all the people in hardship in Vanuatu. Households in hardship in these areas have less educated adults and derive less income from employment. People in hardship, and more generally all rural households, are less connected to some services such as public water connection and electricity grid connection.

INTRODUCTION

The NSDP Baseline Survey and report structure

This publication reports on the results of the Vanuatu National Sustainable Development Plan (NSDP) Baseline Survey for 2019-20 on key dimensions of hardship and household welfare. The survey is an expanded Household Income and Expenditure Survey (HIES), designed to track progress toward the NSDP, based on the NSDP Monitoring and Evaluation (M&E) Framework launched in July 2017 as well as progress toward the United Nations Sustainable Development Goals (SDGs). The NSDP Baseline Survey was conducted between February 2019 and March 2020, which was before the onset of COVID-19 and its economic impact. The survey was conducted using computer-assisted personal interviewing (CAPI) technology. The sample size was 4,549 households nationally[2], or just under 10% of total households, spread across two urban strata—Port Vila and Luganville—and six rural strata—Torba, Sanma, Penama, Malampa, Shefa, and Tafea Provinces.

Prior to the NSDP Baseline Survey, the most recent published data available for hardship measurement was from the 2010 HIES. Using this data, 12.7 percent of the population were estimated to live below the national basic needs poverty line in 2010. While hardship in 2010 was similar to hardship measured in 2006 (the last HIES before 2010), comparability between the two periods was limited[3]. Methodological changes, in both the HIES survey and the subsequent hardship analysis, prevent the direct comparison of trends over time between the 2019-20 rounds and the data from 2006 and 2010. These changes are explained further in Annex 1. As such, analysis in this chapter will not include hardship trends over time but will rather focus on a snapshot of hardship in Vanuatu during the 2019-20 period. This is the first HIES analysis to use a national poverty line rather than sub-national poverty lines and sets a new baseline for future hardship analyses, based on recent standards of hardship measurement set by the Pacific Statistics Methods Board.

This publication is structured as follows: Section 1 provides selected contextual background on Vanuatu. Section 2 presents the headline numbers on monetary hardship and inequality, as well as non-monetary dimensions of hardship. Section 3 is a "profile of people in hardship", which compares hardship rates across several socio-demographic groups and compares the performance of households in and out of hardship across key non-monetary outcomes. Section 4 examines the income decompositions of households to investigate the sources of household welfare and possible causes of different hardship rates by group. Section 5 concludes the analysis by synthesizing the findings of previous sections to construct typologies of people in hardship, in order to better inform stakeholders of the key decisions that would most affect hardship and inequality in Vanuatu.

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1   Adult equivalency measures are used to reflect the differing consumption needs for members of the household, depending on their age. The Pacific Island Countries use a simple adult equivalency scale, where children aged 0-14 are considered as half an adult.

2   Detailed consumption data is a critical ingredient to hardship analysis. Due to issues with the quality of consumption data for some households in Torba and Tafea provinces, the sample used in the hardship analysis consists of 4,121 households (see Annex 1 for further information). This means that the statistics in this report (for example, estimated national population of Vanuatu) will not be the same as equivalent statistics published in other analyses.

3   The 2010 poverty line was recalculated using new baskets of goods from the 2010 HIES. Separate food poverty lines were estimated for each of three sub-regions: Port Vila, Luganville, and Rural. As the standard of living captured by the three baskets was likely different (potentially a higher standard for the two urban areas than for rural areas), urban-rural differences are likely to be misleading and are not comparable to statistics presented in this chapter.

Country context

The Republic of Vanuatu is an archipelago of 83 volcanic islands (72 of them inhabited) with approximately 12,200 square kilometers of land area, dispersed over an exclusive economic zone of about 827,000 square kilometers. Of Vanuatu's population, 37 percent live in Shefa Province where the main urban center of Port Vila is located. The rest are almost evenly distributed among the other five provinces: Malampa, Penama, Torba, Tafea and Sanma, where the country's second largest urban area, Luganville, is located. The economy is characterized by a formal sector driven by tourism and agriculture, and widespread informal subsistence activity outside the main urban centers of Port Vila and Luganville. Economic remoteness and internal dispersion result in high costs of basic infrastructure services. GDP growth over the past decade has been among the highest in the region, driven primarily by tourism. The 2019 per capita Gross Domestic Product (GDP) was estimated[4] at US$3,274 (PPP adjusted), meaning that Vanuatu is a lower middle income country. Very high population growth (due to high fertility rates and limited migration opportunities) means that per capita growth has been more modest at around 1.3 percent per annum. Unfortunately, as there has been no recent data measuring hardship, it is not possible to say whether economic growth has been associated with any hardship reduction.

Vanuatu has seen improvements in human development over the past two decades. According to the Human Development Index (HDI) published by the United Nations Development Program (UNDP), Vanuatu is in the medium development category, ranked 140 out of 189 countries, with a HDI value of 0.609 in 2019. Between 2005 and 2019, Vanuatu's HDI value increased by 6.1 percent from a value of 0.574 to 0.609. Between 1990 and 2000, Vanuatu's life expectancy at birth increased from 64.7 to 67.4 years and then increased to 70.5 years in 2019. There has also been an increase in expected years of schooling from 10.1 in 2000 to 11.7 in 2019. Vanuatu's GNI per capita increased by about 8.8 percent between 1990 and 2019 (UNDP, 2020).

The year 2020 will be remembered in Vanuatu for the devastation caused by Tropical Cyclone Harold in April, along with the economic impacts of the COVID-19 global pandemic. GDP was forecast to fall in 2020 by approximately 10 percent as a result of these twin shocks. TC Harold caused significant damages to homes, schools, medical facilities, and other key infrastructure, particularly in Sanma, Penama, and Malampa Provinces. Crops and livestock were destroyed, putting livelihoods and food security at risk across parts of the northern islands. Over 18,000 people were displaced and roughly 130,000 people were negatively impacted[5]. While there have been very few confirmed cases of COVID-19 in Vanuatu, the global pandemic has had a substantial negative effect on industry and tourism-related sectors. Overall, the events of 2020 have likely led to an increase in hardship since the NSDP Baseline Survey completed fieldwork.

More generally, Vanuatu is exposed to a variety of natural shocks, particularly hydrometeorological and geophysical disasters due to its location in the South Pacific tropical cyclone basin and the Pacific Ring of Fire. These shocks include cyclones, floods, droughts, volcanoes, and landslides. During the period 1980 to 2012, Vanuatu experienced approximately 53 disaster events, affecting approximately 300,000 people during the period examined[6]. On a long-term annual average, the country faces VT 5.2 billion (US$48 million) per year in losses due to earthquakes and tropical cyclones, excluding losses from other disasters such as volcanic eruptions, droughts, and flooding. The impact of these disasters on people in hardship and the vulnerable over the past decade has been difficult to gauge without contemporaneous data. The 2019-20 NSDP Baseline Survey presents a unique opportunity to consider both hardship and resilience in Vanuatu.

HARDSHIP AND INEQUALITY SNAPSHOT

Monetary hardship – "cost of basic needs" method

The hardship rate for Vanuatu is estimated to be 15.9 percent[7] (Figure 1). This translates to approximately 47,000 individuals living in hardship nationwide. This rate is based on a national "cost of basic needs" poverty line constructed using the 2019-20 NSDP baseline data (see Box 1) and uses an annual per adult equivalent (AE)[8] poverty line of VT 147,944, or approximately VT 405 per AE per week. The hardship gap measure, which captures the depth of hardship in addition to the incidence of hardship, was relatively low nationally, at 0.04.

Figure 1   **Basic needs hardship rate**
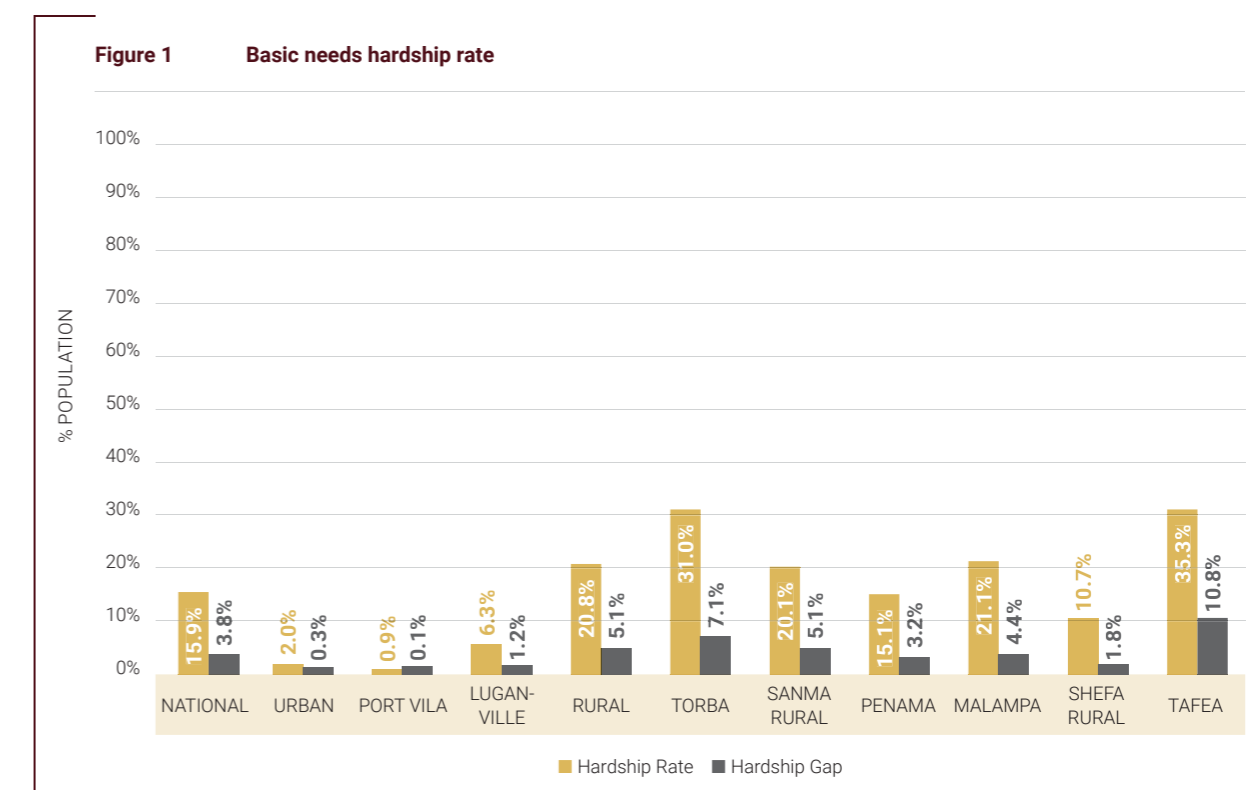
There are major geographic differences in the hardship rate (Figure 1). Hardship was considerably higher in rural areas than in urban areas, with an 18.8 percentage point difference between rural and urban hardship and a relatively low urban hardship rate of only 2 percent. There are also substantial differences by strata, with the rural provinces of Tafea and Torba having the highest hardship rates (35.3 percent and 31.0 percent, respectively). The measure of the hardship gap follows a similar pattern across strata, being highest in Tafea and Torba.

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4   *Pacific Islands - Regional partnership framework: FY17-FY21*. Washington, D.C.: World Bank Group. 2017.
5   World Bank Open Data
6   *Pacific Disaster Net. 2013. www.pacficdisaster.net.*

7   The 95 percent confidence interval is 14.0 percent to 17.8 percent
8   Adult equivalency measures are used to reflect the differing consumption needs for members of the household, depending on their age. The Pacific Island Countries use a simple adult equivalency scale, where children aged 0-14 are considered as half an adult.

Food hardship in Vanuatu is low at the national level but is prevalent in Tafea, Torba, and rural Sanma. The food hardship rate, which is estimated with the food poverty line of VT 107,815 per AE per year (VT 295 per AE per day) was 5.7 percent for 2019-2020. This measure was based on a calorie threshold of 2,560 calories per adult equivalent, which is approximately equivalent to 2,100 calories per capita. If the food poverty line was based on a lower calorie threshold (for example, 2,100 calories per AE), food hardship would be lower. Food hardship was generally a rural phenomenon (7.6 percent), with rates close to 0 percent in urban areas (Figure 2). Food hardship corresponds to marked differences in per adult equivalent calorie consumption and per capita food consumption (Figure 3). Both Torba and Tafea have average per adult equivalent calorie consumption of 3200 or less calories per day, while in Port Vila, Luganville, and Penama, average per adult equivalent calorie consumption is over 3,600.

Figure 2 **Food hardship rate**

The hardship rate is sensitive to the choice of calorie threshold. If a threshold of 2100 calories per adult equivalent were used instead of 2100 calories per capita (as was the case in the hardship analysis based on 2010 HIES data), the national hardship rate would be 8.6 percent (Figure 4). These hardship rates are presented as an example of the sensitivity of hardship measurement to an assumption that is not directly determined by the data but, rather, is informed by regional conventions. The hardship rates in Figure 4 are not used in the remainder of this report and are not to be considered the official hardship rate. Furthermore, methodological differences between the 2010 HIES based hardship assessment and this chapter mean that no conclusions can be drawn about the change in the hardship rate from 2010 to 2019. Both nationally and at the provincial level, hardship may have increased or decreased. What is clear from comparing Figures 1 and 4 is that hardship rates are sensitive to changes in methodological assumptions (of which there are many across hardship analyses over time for Vanuatu).

Figure 3 **Daily calorie consumption per adult equivalent**

Figure 4 **Hardship rate for basic needs poverty line based on alternative calorie threshold**
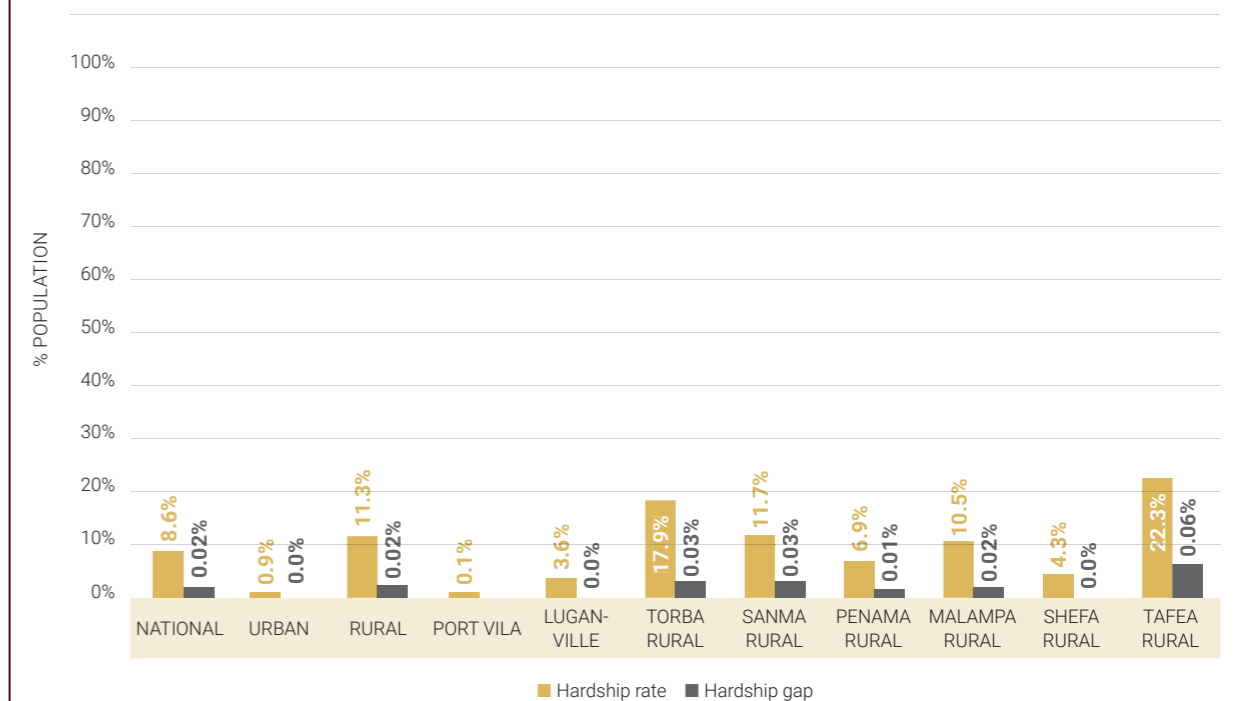
There is a clear pattern of food vs. non-food consumption across the welfare distribution. Based on Engel's Law, it is expected that people will spend an increasing share of consumption on non-food items. The share of food consumption for the bottom quintile is relatively high at 64 percent. For each quintile above the first, the share of food consumption drops with the highest quintile's food share at 44 percent (Table 1). While the food *share* drops, the total food consumption per adult equivalent increases by quintile. The top quintile consumes over 3 times the value of the first quintile. The higher value of food consumption is associated with higher calories consumed per adult equivalent. For non-food consumption, the difference between quintiles is ever greater, with the top quintile consuming over seven times the value of non-food consumption of the bottom quintile.

Table 1   **Annual food vs. nonfood consumption by quintile**

QUINTILE	PER AE CALORIES PER DAY	PER AE FOOD CONSUMPTION	PER AE NONFOOD CONSUMPTION	CONSUMPTION FOOD SHARE
1	2,093	79,572	44,074	64.4%
2	2,880	120,464	74,952	61.6%
3	3,447	154,860	110,830	58.3%
4	3,801	184,781	166,774	52.6%
5	4,748	272,128	346,560	44.0%

Consumption inequality

Inequality in Vanuatu is relatively low compared to other East Asia & Pacific countries. The Gini index, a measure of inequality that scales from 0 (perfectly equal distribution of welfare across the population) to 100 (one person in the population holds all the welfare), was estimated at 32.3 for Vanuatu in 2019-20 based on per capita consumption. This level of inequality compares favorably to other Pacific Island Countries (PICs) as well as other Lower Middle Income Countries (LMICs) in the East Asia & Pacific (EAP) region[9]. (Figure 5).

Figure 5   **Gini index (consumption)**
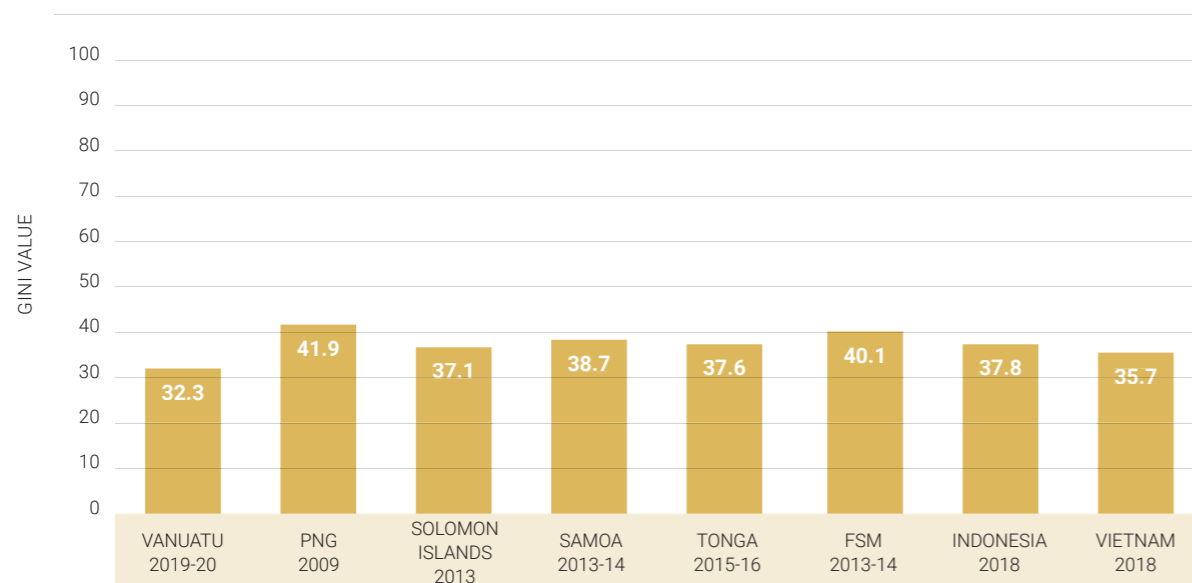
Other measures further demonstrate a relatively low level of inequality nationally, but with some variation across provinces. When examining the shares of consumption held by different parts of the distribution, the most well off 10 percent of individuals hold 7.4 times the consumption that the least well off 10 percent does, and their share of aggregate consumption is slightly higher than the bottom 40 percent (Table 2). Across all measures of inequality there are differences across strata, with Torba and Tafea having the highest Gini coefficients (the provinces which also have the highest hardship rates). Tafea also has the highest ratio of top decile consumption to bottom decile consumption at 8.9, while this ratio is lowest in Port Vila at 4.8. Inequality is also lowest in Port Vila, and consistently lower in urban areas than rural areas.

Table 2   **National and sub-national measures of inequality**

	GINI	TOP 10% OF CONSUMPTION DISTRIBUTION	BOTTOM 10% OF CONSUMPTION DISTRIBUTION	EXP. DECILE 10 TO EXP. DECILE 1 RATIO	BOTTOM 40% SHARE OF CONSUMPTION	PALMA INDEX (EXP. DECILE 10 (TOP 10%) / BOTTOM 40%)
National	32.3	23.78%	3.23%	7.35	20.77%	1.14
Urban	26.9	22.44%	4.32%	5.19	24.42%	0.92
Rural	31.9	23.57%	3.37%	6.99	21.12%	1.12
Port Vila	25.8	22.18%	4.63%	4.79	25.12%	0.88
Luganville	30.2	23.70%	3.69%	6.41	22.00%	1.08
Torba - rural	32.5	24.37%	3.73%	6.54	20.55%	1.19
Sanma - rural	30.6	22.39%	3.25%	6.89	21.05%	1.06
Penama - rural	31.2	24.11%	3.62%	6.66	22.13%	1.09
Malampa - rural	27.0	21.70%	4.08%	5.31	23.68%	0.92
Shefa - rural	29.9	22.29%	3.83%	5.83	22.40%	0.99
Tafea - rural	35.4	26.53%	2.97%	8.94	19.51%	1.36

Non-monetary dimensions of deprivation

Analysis on non-monetary deprivations is important to complement the monetary dimensions of hardship and present the full breadth of challenges faced by households. Though household consumption is an important welfare metric, it does not provide a complete picture of household well-being. There are several ways to present non-monetary deprivations, and several dimensions to choose from. This section presents a range of indicators related to access to utilities and education, some of which are included in the World Bank's Multidimensional hardship Measure[10].

Access to metered water connection is far from universal, with substantial differences between provinces and across the income distribution. Nationally, only 39 percent of people live in households that have a metered water connection (Figure 6). Metered water connections are over 90 percent in urban areas but only 20 percent in rural areas. In some rural areas (Penama and rural Sanma), water connection prevalence is under 10 percent while it is around 30 percent in Tafea and Malampa. Access to metered water also increases as people move up the consumption distribution. 20 percent of households in hardship have a water connection, compared to 43 percent of other households.

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9   World Bank Open Data

10   Comprises the monitoring of deprivations in infrastructure (consisting of drinking water, sanitation, and electricity) and education (consisting of educational enrollment and educational attainment).

Figure 6   **Access to metered water connections**

% OF ACCESS TO WATER CONNECTIONS
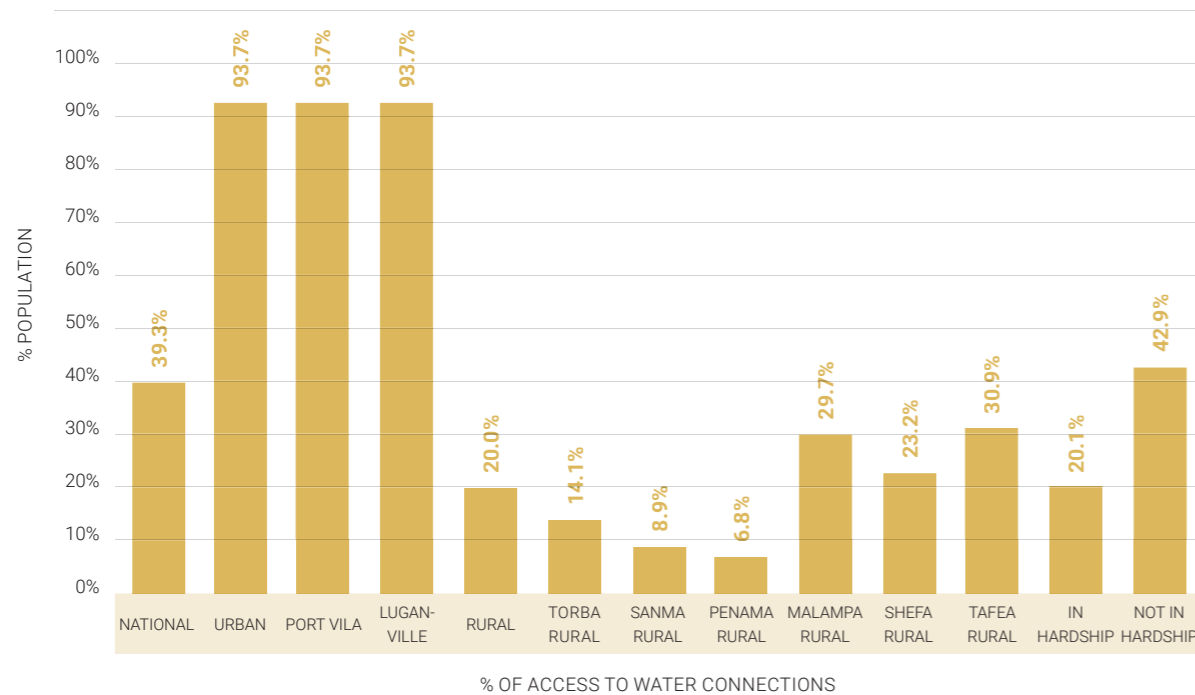
Household sources of drinking water are correlated with hardship. Figure 7 reports that households whose source of drinking water is surface water have a hardship rate of 23 percent. In contrast, for households that have piped water into their premises, the hardship rate is 6.8 percent.

Figure 7   **Drinking water source and hardship rate**
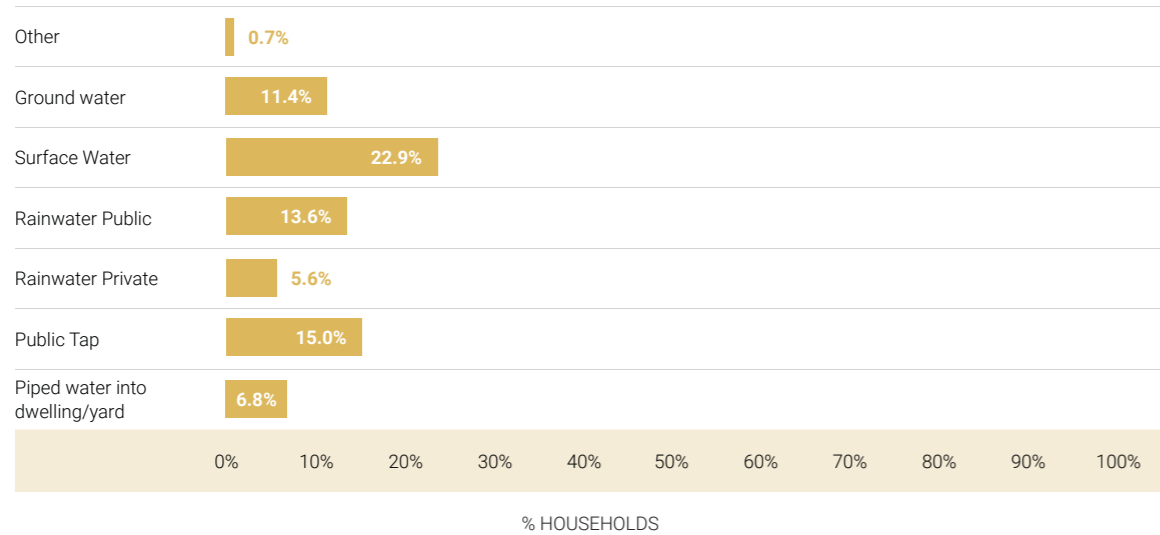
% HOUSEHOLDS

The prevalence of flush toilets is only high in urban areas (87 percent), while only 13.5 percent of households in rural areas have access to flush toilets (Figure 8). Nationally, 32.6 percent of Ni-Vanuatu have access to a flush toilet. The other noteworthy difference is between people in and out of hardship, with only 4.6 percent of households in hardship having access to flush toilets, compared to 37.9 percent among other households. While this difference is not as significant as the rural-urban divide, within both rural and urban areas, people in hardship are still less likely to have flush toilets.

Figure 8   **Access to flush toilets**
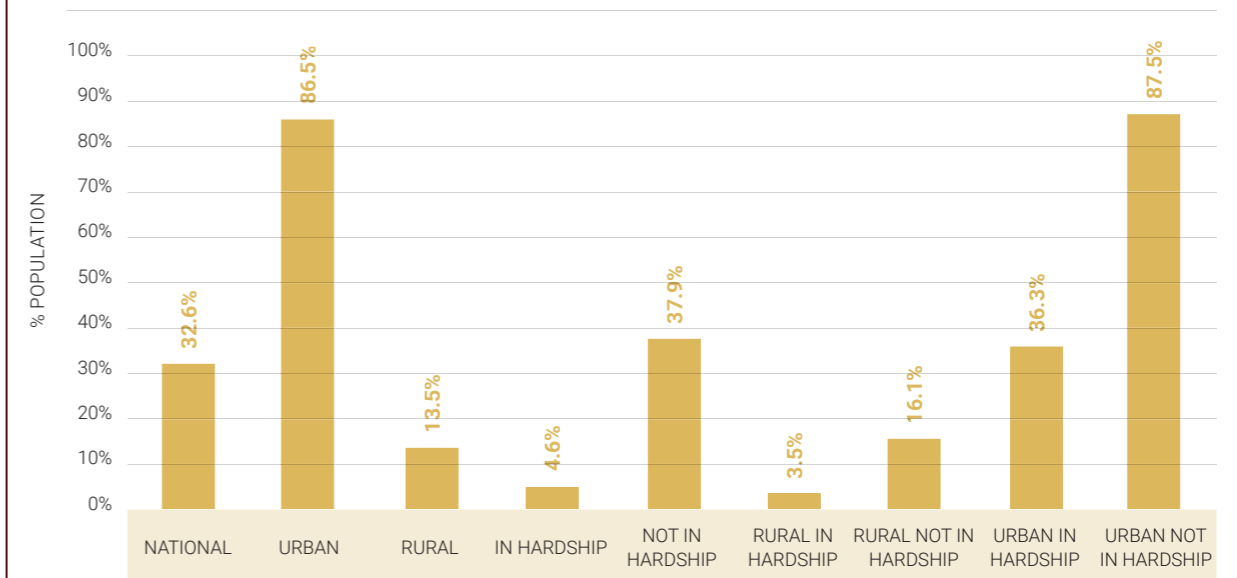
While over 80 percent of Ni-Vanuatu households in Port Vila and Luganville get their electricity from an electricity grid, this is much less in Provinces with the greatest rate of hardship, at 0.3 percent in Torba to 11.5 percent in Tafea (Figure 9). The household prevalence of the main source of energy for lighting is reported in Figure 10 alongside the hardship rate for households using that source. Solar panels are the most common used source nationally, while roughly one-third of households use electricity for lighting. The hardship rate for households using electricity for lighting is only 2.6 percent. In contrast, for households using solar lamps (not solar panels), the hardship rate is 33.8 percent. This implies that a lack of electricity access (exclusive of renewable solar home systems) and hardship are linked.

Figure 9   **Prevalence of electricity connection, by strata**
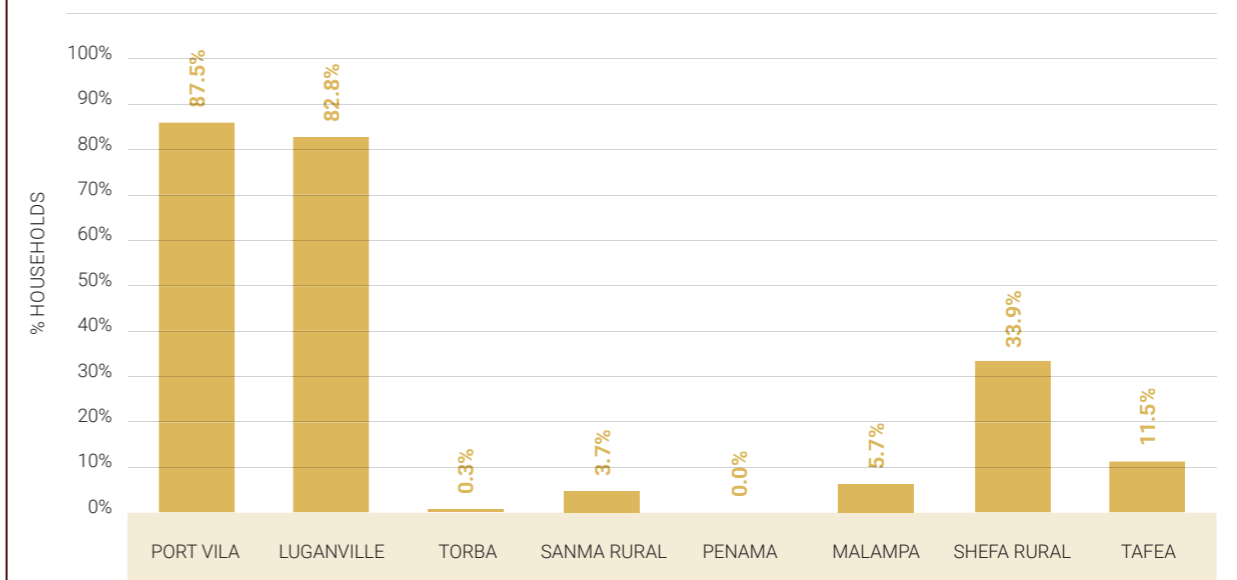
Figure 10   **Main source of energy for lighting and hardship rates**

Legend: ■ Prevalence of connection ■ Hardship rate
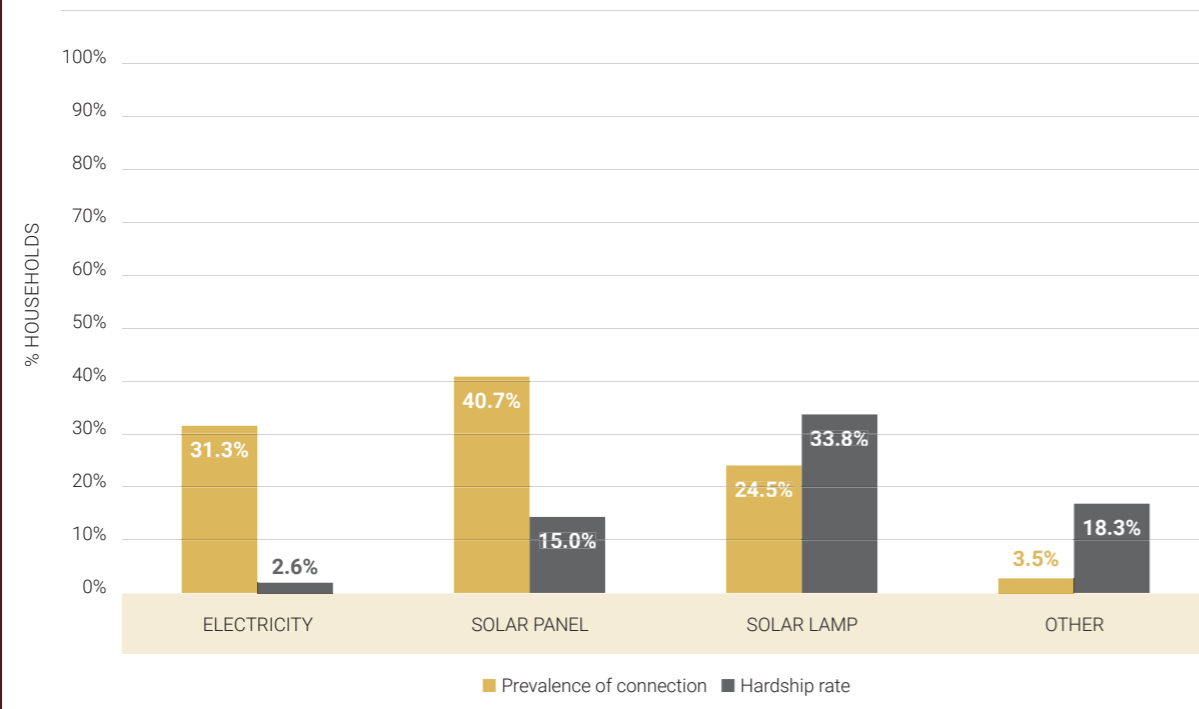
Though people in hardship tend to be the most deprived of access to services, many households that are not in monetary hardship still face non-monetary deprivations. Households and individuals in the greatest hardship also tend to be the most likely to be deprived of access to water, sanitation and electricity. It is important to note that many households not in hardship still lack access to one or more of these non-monetary dimensions.

HARDSHIP PROFILE

Geographic distribution

Vanuatu is a largely rural country with a population quite evenly spread across the provinces (Table 3). The major exception to this is the province of Shefa, in which over a third of the population of Vanuatu lives. Shefa has the main urban center of Vanuatu, which holds 21 percent of the population. Of the estimated population of 297,000[11] in 2019-20, 26 percent lived in urban areas. Aside from Shefa, only Sanma has an urban population, with 27 percent of its population urban dwellers. The rural provinces of Torba, Tafea, Penama and Malampa comprise 43 percent of the population.

Table 3   **Population spread of Vanuatu**

REGION	TOTAL POPULATION	SHARE OF TOTAL POPULATION
National	297,321	100.0%
Port Vila	61,385	20.6%
Luganville	16,359	5.5%
Torba - rural	11,372	3.8%
Sanma - rural	43,217	14.5%
Penama - rural	34,557	11.6%
Malampa - rural	42,884	14.4%
Shefa - rural	47,754	16.1%
Tafea - rural	39,792	13.4%

Most of Vanuatu's people in hardship are concentrated in Tafea (30 percent), Sanma (21 percent), and Malampa (19 percent) (Table 4). These three provinces account for 70 percent of the total population in hardship. As Tafea also has the highest rate of hardship, at 35.3 percent, it is the center of hardship in Vanuatu. In contrast, while Torba also has a high rate of hardship (31 percent), it makes up less than 10 percent of the total population in hardship. Penama and Shefa have the lowest hardship rates and the second and third lowest numbers of people in hardship, behind Torba. In addition to the clear correlation of hardship to provincial location, hardship is also mostly a rural phenomenon in Vanuatu. People in hardship in urban centers number less than 2,000, while about 46,000 of those in rural areas are in hardship who account for 97 percent of people in hardship nationally (Table 5).

11   This estimate of population (based on the sample of 4,121 households used for the poverty analysis) is higher than the estimated population based on the full sample, which is 295,495. All population estimates are based on the sample used for hardship analysis, for consistency with other statistics presented in the hardship analysis.

Table 4 Hardship rates by province and distribution of people in hardship

PROVINCE	HARDSHIP RATE	TOTAL # OF PEOPLE IN HARDSHIP	DISTRIBUTION OF PEOPLE IN HARDSHIP
Sanma	16.4%	9,741	20.6%
Shefa	5.2%	5,668	12.0%
Torba	31.0%	3,522	7.5%
Penama	15.1%	5,204	11.0%
Malampa	21.1%	9,069	19.2%
Tafea	35.3%	14,066	29.8%

Table 5 Distribution of people in hardship across urban and rural areas

GROUP	TOTAL	SHARE OF TOTAL	SHARE OF HARDSHIP
Urban out of hardship	76,166	25.6%	
Urban in hardship	1,579	0.5%	3.3%
Rural out of hardship	173,885	58.5%	
Rural in hardship	45,691	15.4%	96.7%
Total population	297,321	100.0%	

Another useful way to assess hardship geographically is to consider the following three geographic groupings: Urban centers, the rural areas of the provinces where the urban centers are located, and all other rural arease. This disaggregation shows that people living in the rural areas of the largest provinces (Shefa and Sanma) have a much higher rate of hardship than those in urban centers of Shefa and Sanma, but not as high a hardship rate for rural areas outside of the main provinces (Table 6).

Table 6 Distribution of people in hardship by geographical disaggregation

AREA	HARDSHIP RATE	TOTAL # OF PEOPLE IN HARDSHIP	DISTRIBUTION OF PEOPLE IN HARDSHIP
Rural Provinces(Torba,Penama,Malampa,Tafea)	24.8%	31,861	67.4%
Rural Sanma and Rural Shefa	15.2%	13,830	29.3%
Port Vila and Luganville	2.0%	1,579	3.3%

Age

The population of Vanuatu is very young, with one-third of the population under 15 years of age (Table 7). Vanuatu's population distribution is pyramid-shaped, with each older age group being a smaller cohort than every age group that is younger (Figure 11). Those over 60 years of age comprise less than 6 percent of the population. This population distribution is reflected in a high child dependency ratio of 0.66 but a much lower elderly dependency ratio of 0.07.

Figure 11 Vanuatu population distribution, 2019-20

Table 7 Dependency ratios

Number of children 0-14	113,015
Number of adults 15-64	172,328
Number of elderly 65+	11,977
Child dependency ratio	0.66
Elderly dependency ratio	0.07
Total dependency ratio	0.73
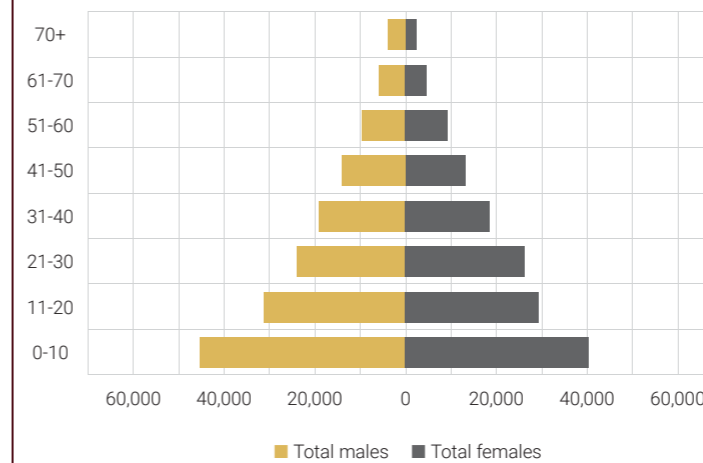
Most of Vanuatu's people in hardship are children and young people. This is primarily because children and youth make up a larger share of the population, rather than there being higher rates of hardship for these groups (Figure 12). Hardship rates are slightly higher for the half of the population that is aged 0-20, than for those aged 21-40. However, the highest rate of hardship is for the elderly aged 70 plus, at 21.8 percent. Overall, hardship seems to be spread across the population proportionally to the age distribution. This is a striking contrast to the spread of hardship over geography, which is much more concentrated.

Figure 12 Hardship rates and distribution of people in hardship, by age group
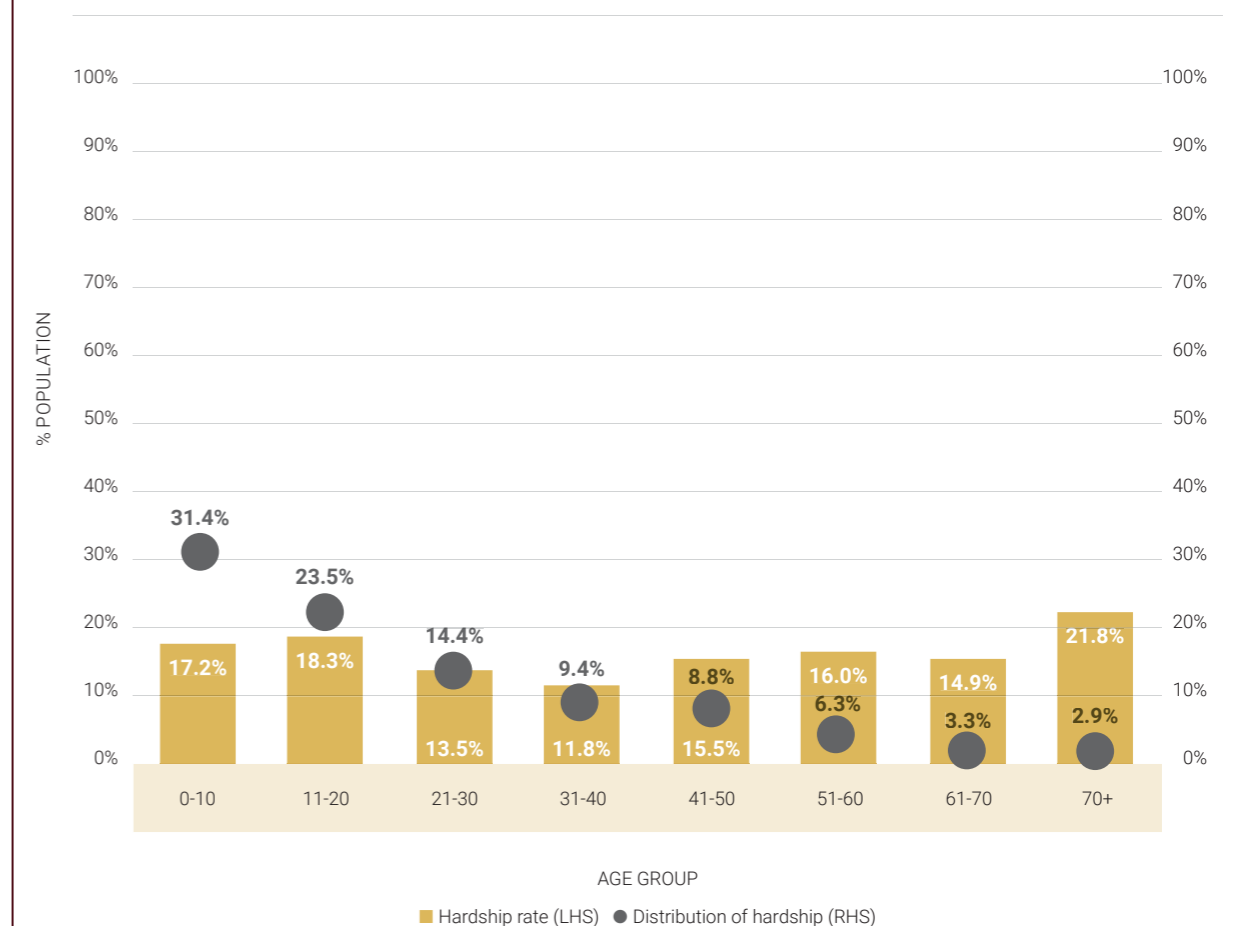
Gender

While there is no evidence of a difference in hardship rates between men and women, this is based on the strong assumption of an equal distribution of resources within households. At the individual level, women and girls seem no more likely to be in hardship. However, this conclusion assumes that household welfare is shared equally between all household members, because the welfare data is only available at the household level. International evidence would suggest that there can be differences in consumption within households based on gender, though this is an under-researched area for the PICs. Unfortunately, HIES data do not allow for analysis into the intra-household distribution of resources so no definitive conclusions can be made about gender and hardship. At the individual level, there is no significant difference in the percentages of males and females living in households in hardship (15.6 percent compared to 16.2 percent, respectively).

Female-headed households are more common in urban areas and are therefore less likely to be in hardship (Figure 13). The majority of households (63.2 percent) in Vanuatu are headed by men but this is due to the prominence of male-headed households in rural areas. In urban areas, 57.3 percent of households are headed by women. The hardship rate for people living in male-headed households is 18 percent compared to 12 percent for people living in female-headed households[12]. However, this is again driven by the higher rate of male-headed households in rural areas. The hardship rate for male-headed households in rural areas is 21.7 percent compared to 18.8 percent for female headed households, a difference that is not statistically significant.

Figure 13   **Gender of household head for urban and rural areas**
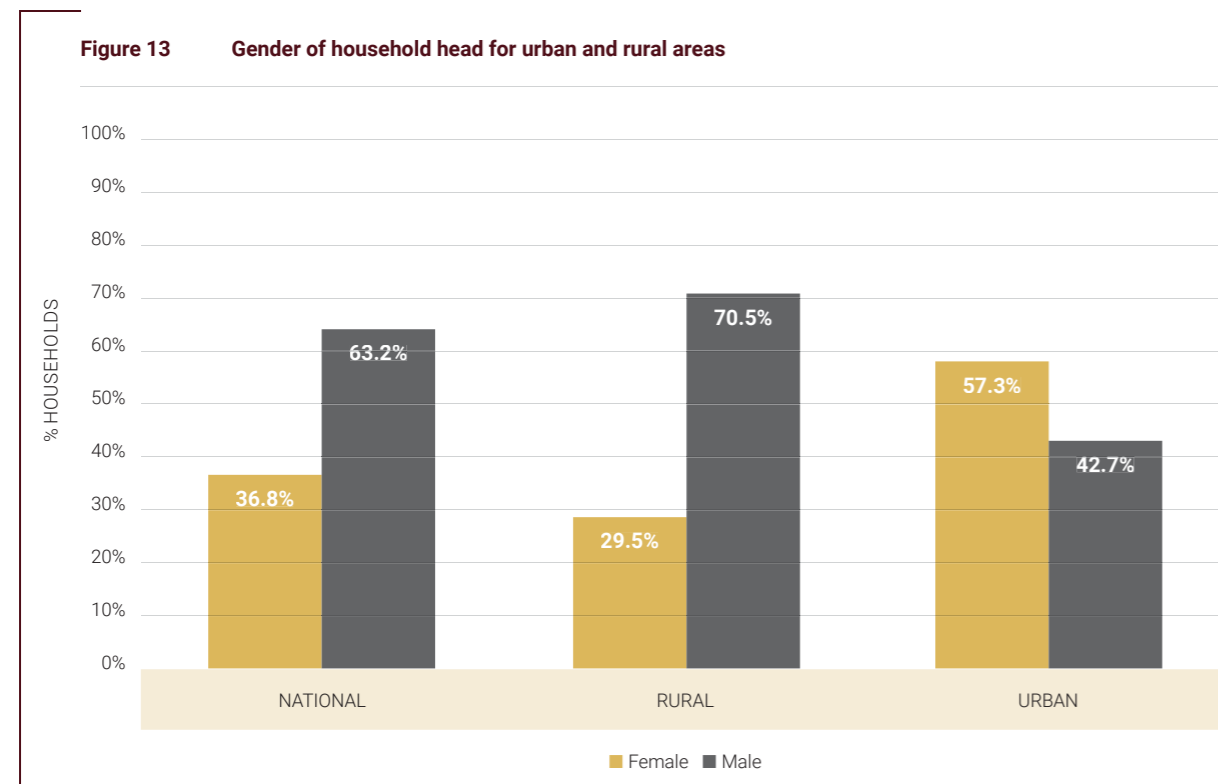
Education

Almost half of all households in Vanuatu are headed by people who never completed schooling beyond grade 6 (Figure 14). However, these households usually have other members with higher levels of education; only 17 percent of households do not have any members that completed schooling beyond grade 6. While many Ni-Vanuatu have completed some junior or senior secondary school, only 5 percent of households are headed by someone with a tertiary qualification (either a university degree or technical

12   hardship rates by gender of head of household are not reported in figure 13 as the differences are not meaningful unless considered in geographical context

or college certificate or diploma). Considering the highest level of education in households[13], only 12 percent have a household member with a tertiary qualification.

Of those households in which the highest level of education of any adult is 0-2 years of schooling, 51 percent are in hardship (Figure 15). More generally, hardship rates are strongly correlated with the highest education within the household, more so than with the education level of the head of household. Hardship rates decline significantly as the highest education level in the households increases. In households where the highest level of education is greater than 12 years of education, hardship rates are below 10 percent, with hardship less than one percent in households where someone has a university degree.

Figure 14   **Highest level of education in HH vs highest education of HH head**
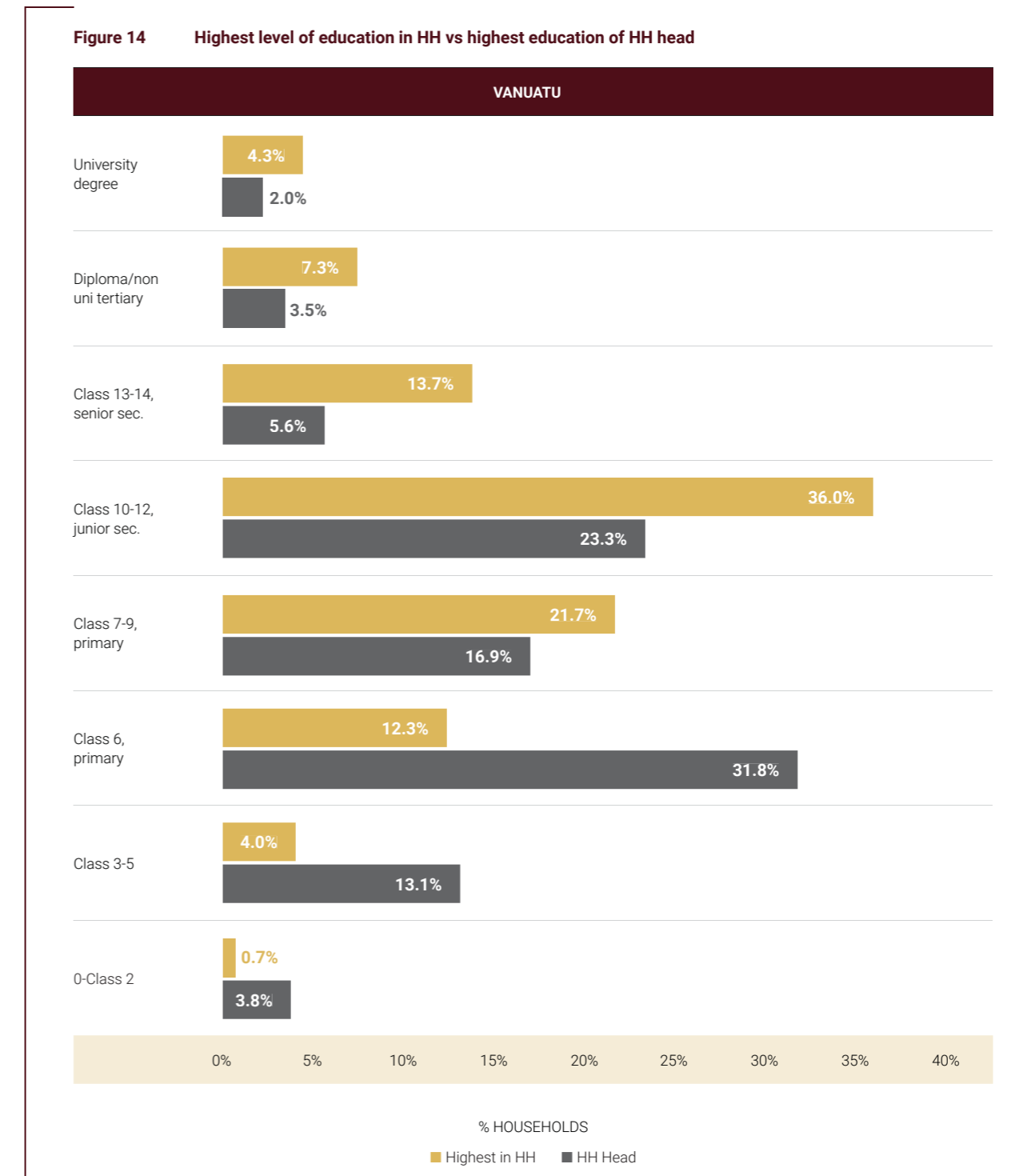
13   The education groupings are based on the design of the baseline questionnaire and the distribution of responses, rather than a reflection of the structure of the education system

Figure 15 — Hardship rates by education completion of HH head and of highest educated adult

Figure 15 Hardship rates by education completion of HH head and of highest educated adult

% HOUSEHOLDS

Category	HH head	Highest in HH
0- CLASS 2	24.5%	51.1%
CLASS 3-5	17.0%	40.2%
CLASS 6, PRIMARY	15.0%	21.5%
CLASS 7-9, PRIMARY	9.5%	25.3%
CLASS 10-12, JUNIOR SEC	4.4%	10.6%
CLASS 13-14, SENIOR SEC	2.2%	7.5%
DIPLOMA/NON UNI TERTIARY	3.1%	8.5%
UNIVERSITY DEGREE	0.0%	0.4%
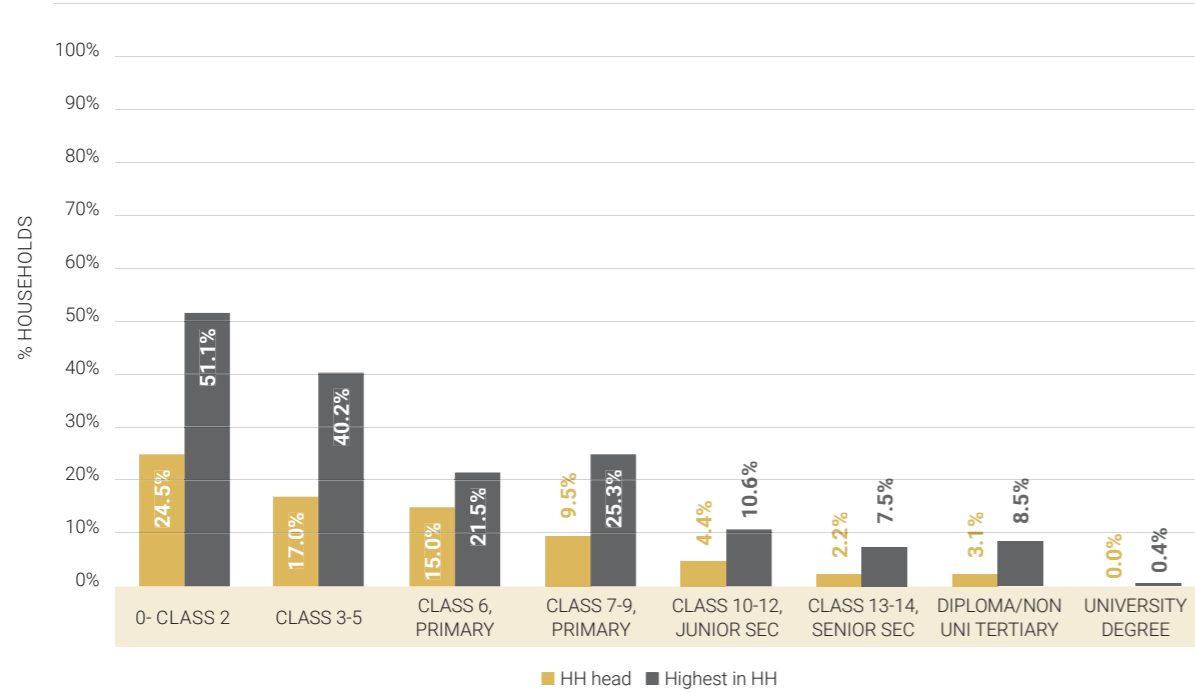
Hardship rates for adults decline steadily with higher levels of completed education, a trend more pronounced in rural areas. The hardship rate for individuals with less than class 3 completion is over 25 percent in rural areas but under 15 percent in urban areas (Figure 16). Hardship appears to be most prevalent for those with low education in rural areas. In all areas, hardship is close to zero for those with a university level education. Overall, these results suggest that there exist high returns to investing in education at all levels and that the scope for hardship reduction through education is likely to be greatest in rural areas.

Figure 16 Hardship rates for adults (25+) by education completion

% POPULATION

	NATIONAL	RURAL	URBAN
0-Class 2	27.8%	29.9%	11.7%
Class 3-5	18.4%	20.4%	5.0%
Class 6, Primary	15.8%	19.0%	2.7%
Class 7-9, Primary	10.7%	14.7%	2.1%
Class 10-12, Junior Sec	4.7%	7.6%	1.1%
Class 13-14, Senior Sec	2.6%	5.5%	0.3%
Diploma/non uni. tertiary	4.9%	9.3%	1.4%
University degree	0.3%	0.0%	0.4%
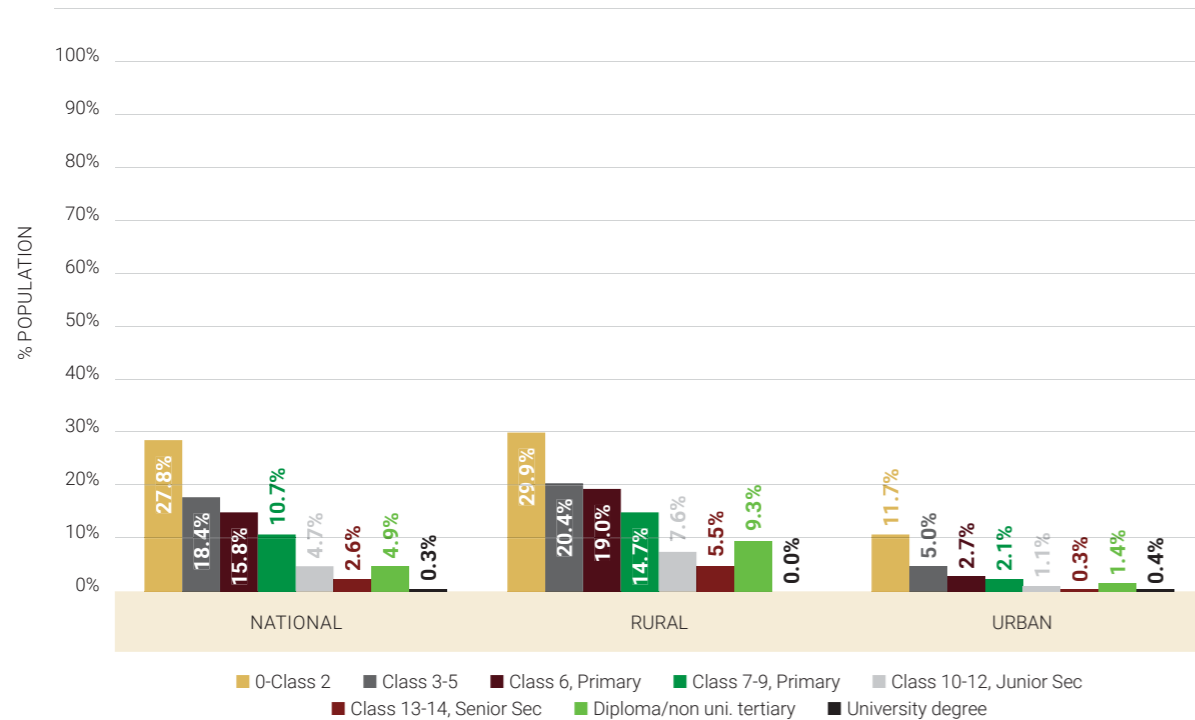
Over half of children aged 4-5 are enrolled in early childhood education (Figure 17). The rate of enrollment in early childhood education for children aged 4-5 is 59 percent nationally and is the same in both rural and urban areas. However, the enrollment rate is much lower for people in hardship (50 percent). By consumption decile (Figure 18), enrollments in early childhood education are highest for the 7th decile (75 percent) and the 10th decile (68 percent).

One-fifth of primary school-aged children are not enrolled in school. The rate of enrollment in school for children aged 6-13 sits at 82 percent nationally and is significantly lower for people in hardship at 74 percent (Figure 17). By decile, enrollment rates are lowest for the bottom decile, at 73 percent, while they are above 80 percent for each of the top seven deciles (Figure 18). The enrollment pyramid in Figure 19 shows that some children do not finish primary school until they are secondary school aged (ages 14-18). What is striking about the enrollment pyramid is that for both boys and girls, enrollments are largely at the primary school level, with enrollments dropping of significantly for secondary school and tertiary education. When combined with the higher rates of hardship among adults who do not complete primary school, it suggests the possibility of some form of "hardship trap", as children growing up in households in hardship are more likely to remain in hardship as adults because they do not stay in school. To draw more concrete conclusions about this would require an investigation of why children (especially from backgrounds of hardship), drop out of school.

Figure 17 Enrollment in school, by age group

% POPULATION

	National	Rural	Urban	Non poor	Poor
AGES 4-5	59.2%	59.1%	59.3%	61.0%	50.4%
AGES 6-13	82.3%	81.6%	85.1%	84.0%	74.4%
AGES 14-18	30.3%	25.5%	46.9%	33.8%	17.4%
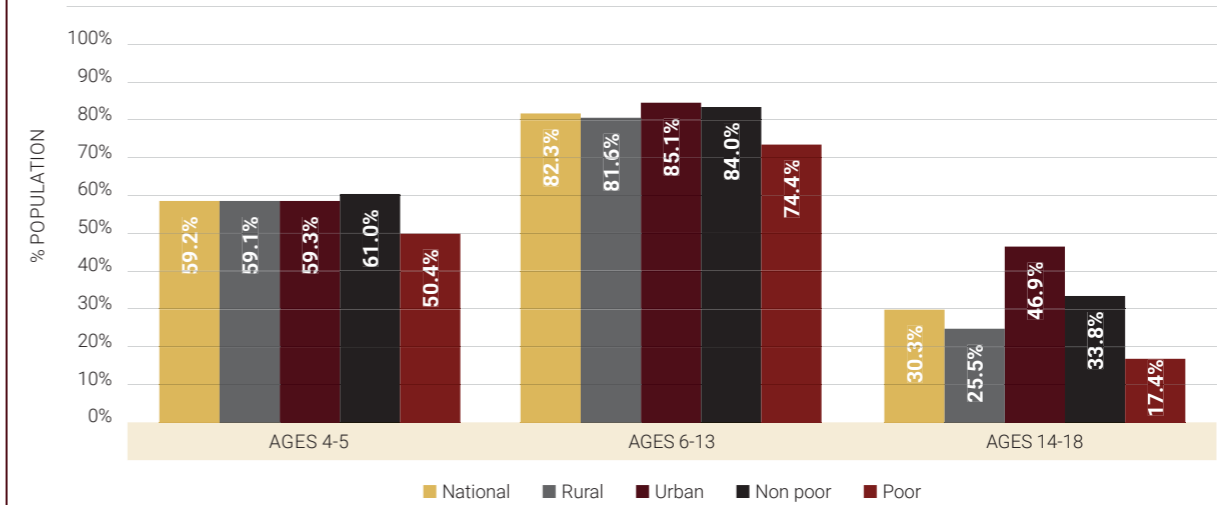
Figure 18 Enrollment in school, by age group and per-capita expenditure decile

% POPULATION

	0%-10%	10%-20%	20%-30%	30%-40%	40%-50%	50%-60%	60%-70%	70%-80%	80%-90%	90%-100%
AGES 4-5	46.9%	55.9%	49.4%	58.6%	66.6%	63.3%	74.2%	55.0%	54.6%	67.7%
AGES 6-13	72.9%	78.8%	82.6%	80.1%	85.0%	88.0%	85.5%	85.9%	83.8%	84.0%
AGES 14-18	15.4%	20.8%	22.5%	26.7%	27.1%	36.2%	24.1%	45.0%	45.7%	46.4%
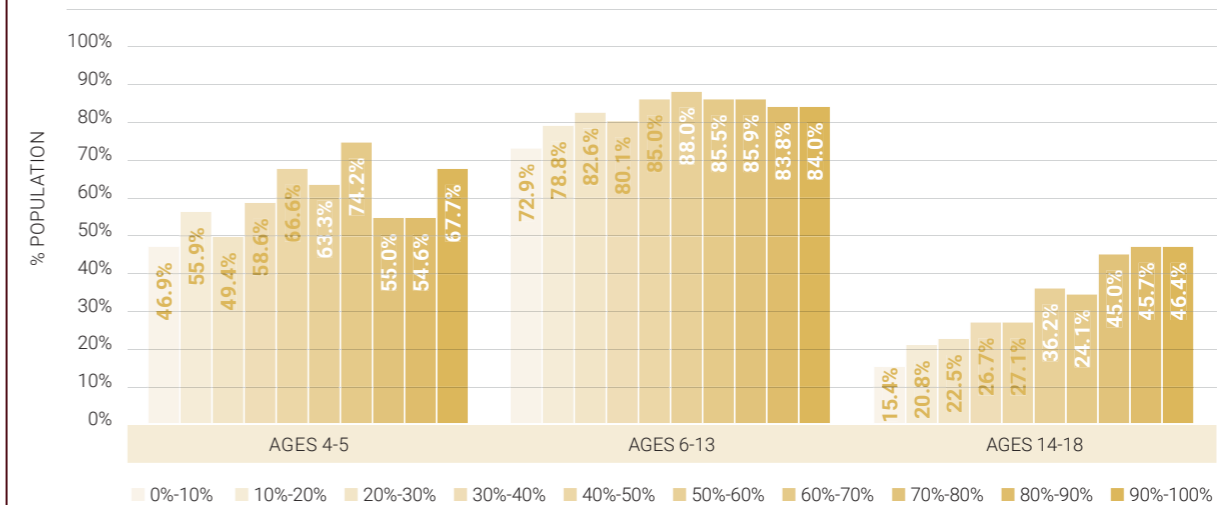
There is a large drop in enrollment rates for children aged 14-18, indicating that the majority of children in Vanuatu will never finish secondary school. The national rate of school enrollment for children aged 14-18 (30 percent) is much lower than primary enrollment. This increases with consumption and is much higher for the top decile (nearly 50 percent) than for the bottom decile (15 percent) (Figure 18). The urban-rural divide in enrollment rates is greatest for this age group, at 47 percent in urban areas but just 26 percent in rural areas. There is also a significant difference of 16 percentage points between secondary enrollment rates for people in hardship and those that are not, with people in hardship having an enrollment rate of only 17 percent.

The rate of enrollment in tertiary education is very low for both boys and girls. While boys and girls generally have similar enrollment rates for primary and secondary education, there are substantially more boys in secondary education aged 18 and over (Figure 19). This indicates that they are more likely to continue in secondary school until they finish even as they move beyond the typical age range for secondary school. Less than 2 percent of women aged 19 to 20 were enrolled in tertiary education and close to none aged 21-23 were enrolled. Less than 1 percent of boys aged 19 to 23 were enrolled in tertiary education.

Figure 19   **Enrollment pyramid, children aged 5-23, by sex**

PERCENTAGES (BOYS LHS, GIRLS RHS)

■ Pre-primary   ■ Primary   ■ Secondary   ■ Tertiary
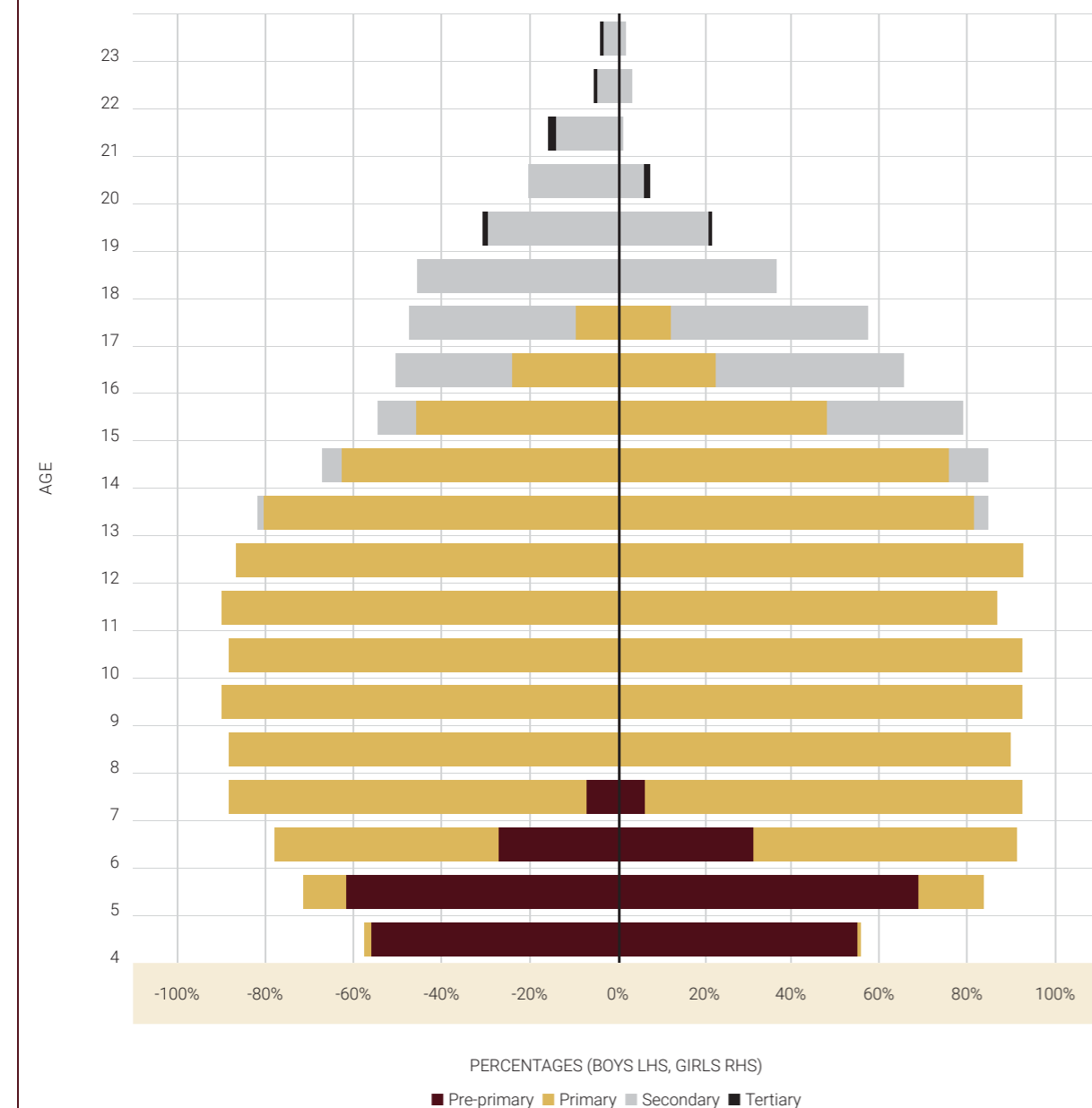
Employment

Half of the population of working age are in the labor force[14]. This labor force participation rate (LFPR) represents those working or looking for work divided by the population aged 15+. The LFPR is 54.2 percent for men which is also much higher than for women, at 46.3 percent (Table 7). Among active labor force participants, the rate of unemployment (people not working who are looking for jobs) is slightly lower for men than for women at 6.7 percent compared to 9.4 percent respectively. Overall, women are less likely to be employed in Vanuatu, but low levels of employment and considerable levels of unemployment are a problem for both men and women.

Table 7   **Labor force statistics (population aged 15+)**

STATISTIC	ALL	MEN	WOMEN
Labor force participation rate (employed + unemployed / total population aged 15+)	50.2%	54.2%	46.3%
Unemployment rate (unemployed / employed + unemployed)	7.9%	6.7%	9.4%
Employment rate (employed / total population aged 15+)	46.3%	50.5%	41.9%

Source: 2019-20 NSDP Baseline data and ILO Labour Market Monograph

Hardship is high for adults that are involved in domestic work (21 percent) and for those who are working in agriculture and subsistence (22 percent). Figure 20 presents the main activity of adults aged 15-64 and the hardship rates for each of these groups. The lowest rate of hardship (4 percent) is for those who are working in the private or public sectors but not in agriculture/fishing/handicrafts/subsistence. hardship is also above 10 percent for those in voluntary work, those who are looking for work, and those who are studying or training. Interestingly, those who are old or retired were less likely to be in hardship than most other groups.

Figure 20   **Hardship rate by main activity of adults aged 15-64**

■ Hardship rate   ■ % of adults
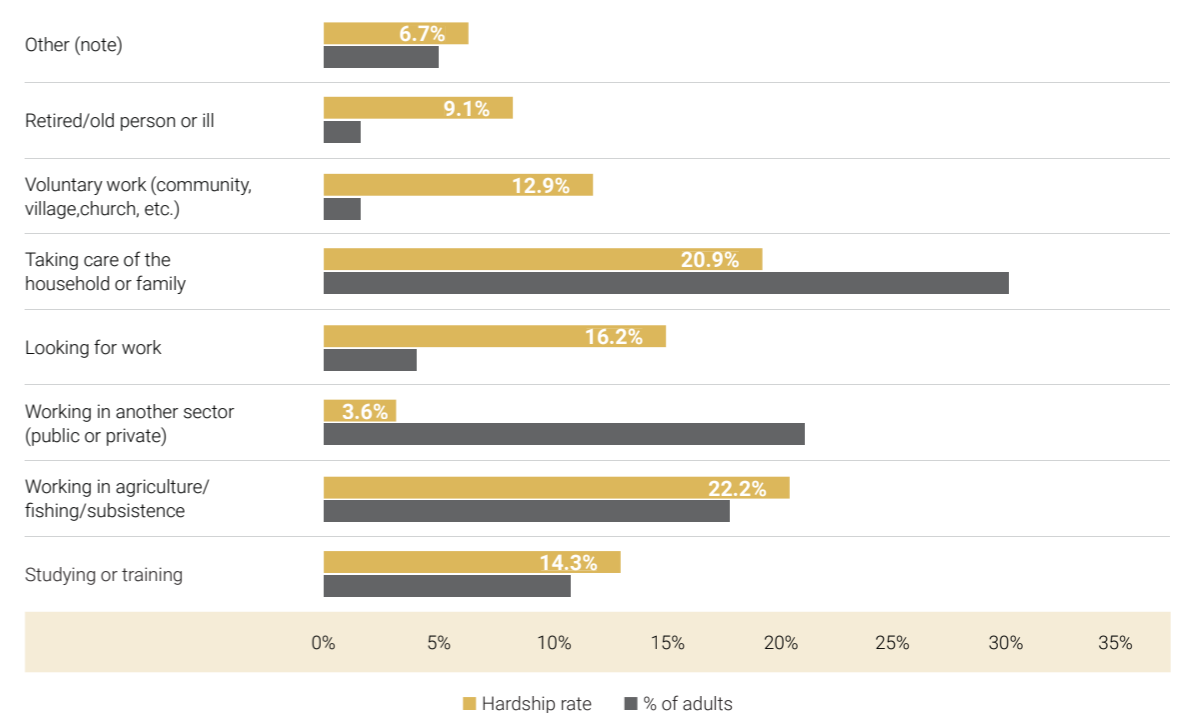
14   This is the ILO estimate of labour force participation. Table 7 reports statistics using the full sample for consistency with official ILO statistics, while the proceeding analysis comparing poverty with labour, uses the hardship analysis sample.

Most adults aged 15-64 who are working are employees (60 percent), followed by work in their own business (32 percent). Wage work is much more prevalent in urban areas, while rural dwellers are more likely to be working in their own business (self-employment). More than four out of five workers in urban areas are wage/salary earners, compared to only two out of five in rural areas. Close to half of the rural working population are self-employed (this includes subsistence agriculture) (Table 8). The distribution of employment status is similar for men and women.

Table 8   Status of employment, population aged 15-64, by urban-rural and gender

STATUS OF EMPLOYMENT	ALL	URBAN	RURAL	MEN	WOMEN
In his/her own business activity	31.8%	9.2%	47.8%	33.7%	28.8%
In a business operated by a household or family member	2.5%	2.4%	2.6%	2.2%	2.9%
As an employee	60.1%	87.8%	40.3%	58.0%	63.2%
As an apprentice	5.3%	0.4%	8.9%	5.7%	4.8%
Other	0.3%	0.3%	0.4%	0.4%	0.3%

There are substantial differences in hardship rates for adults by employment status. While the average hardship rate for adults who work as employees is 4 percent, it is 10 percent for those working in the own business or a family business. By gender, the patterns are similar except that there is no significant gap for women between the hardship rate for those who work in a family business (12 percent) versus those who work in their own business (13 percent).

Figure 21   Hardship rate by employment status and gender (population aged 15-64)

Legend:
- In his/her own business activity
- In a business operated by a household or family member
- As an employee
- As an apprentice
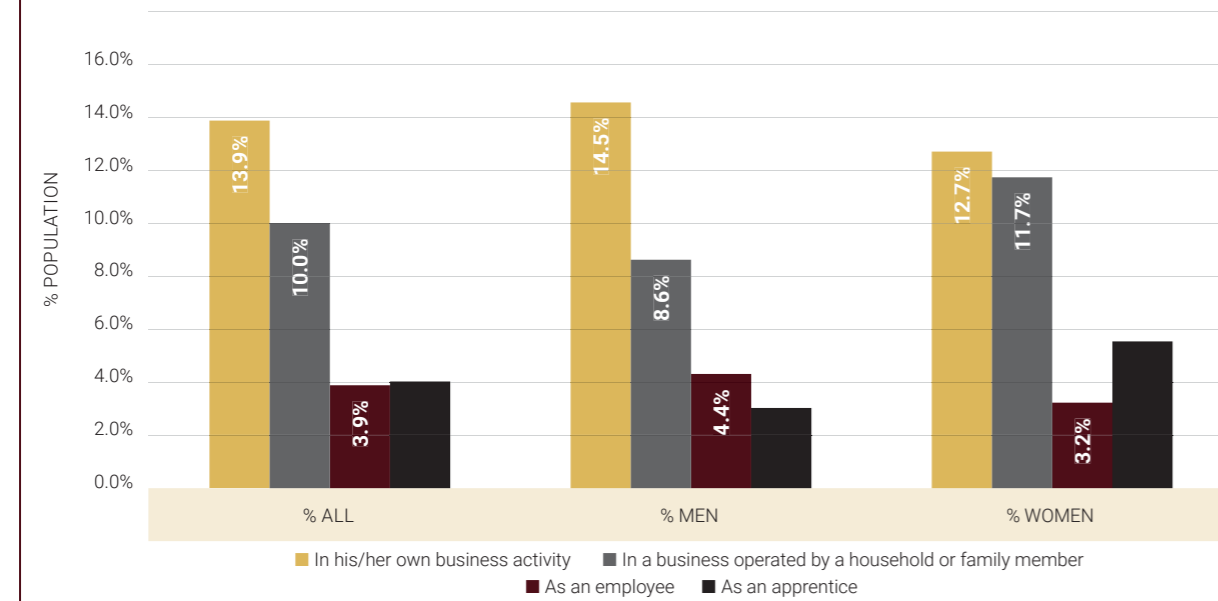
Over four-fifths (83 percent) of working people in hardship are working in agriculture. Table 9 reports the proportion of workers by industry, with less significant industries folded into the "other" category. Table 9 also reports the hardship rate by industry and the distribution of the working people in hardship across industries. Of those working, around a quarter of those in subsistence agriculture are in hardship while 15 percent of those working in market based agriculture are in hardship. As almost half the workforce is in agriculture, the "working people in hardship" are mostly agricultural workers. In contrast, those working in other industries have a hardship rate of less than 10 percent.

Table 9   Hardship rates by industry and distribution of the working people in hardship (adults aged 15-64)

	HARDSHIP RATE	PROP. OF WORKING PEOPLE IN HARDSHIP	% OF JOBS
Agriculture, market based	15.4%	27.2%	21.1%
Agriculture, subsistence*	26.1%	55.4%	25.5%
Wholesale and retail trade	2.9%	1.9%	7.8%
Education	5.6%	2.9%	6.2%
Public administration and defense	2.8%	1.3%	5.7%
Administrative and support service	4.2%	1.4%	4.1%
Transportation and storage	2.9%	1.0%	4.0%
Accommodation and food service activities	1.3%	0.5%	4.6%
Manufacturing	8.6%	2.6%	3.7%
Other	4.0%	5.7%	17.3%

*Note: For comparability with market based agriculture, this categorization is agriculture only, and does not include other forms of subsistence or home production such as fishing or handicrafts, which are not significant categories.

INCOME SOURCES

Sources of income and the consumption distribution

Labor and non-labor income increase as households move higher up the consumption distribution, except for subsistence income, which is similar across quintiles (Figure 22). Households in the lowest quintile received much lower income from business and employment than households in the top quintile. Employment income for the top quintile averages VT 896,000, compared to an average of VT 103,000 for the bottom quintile[15]. In contrast, the average income from subsistence is VT 204,000 for the top quintile which is very close to subsistence income for the bottom quintile VT 198,000. Non-labor income is comprised of property income, public transfers, gifts received, remittance income, and imputed rent. All of these components increase across the income distribution. Non-labor income for the top quintile is almost three times the level of non-labor income for the bottom quintile. Overall, the results demonstrate that households with lower consumption (such as people in hardship) are households with lower incomes.

Figure 22   Income levels by consumption quintile (VT 1,000's)

Legend: ■ Lowest 0% - 20%   ■ 20% - 40%   ■ 40% - 60%   ■ 60% - 80%   ■ Highest 80% - 100%
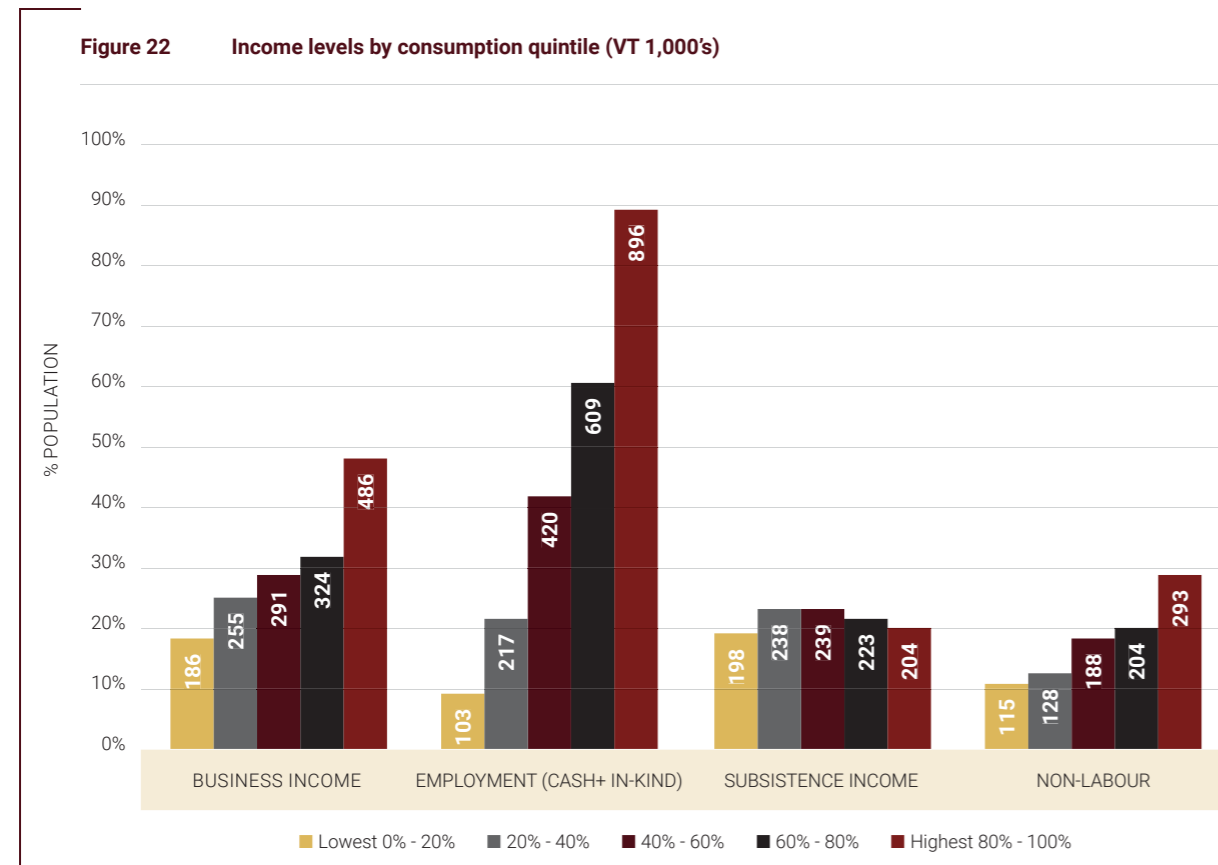
Labor income shares

The main source of labor income changes markedly as households get wealthier, as well as by strata. Figure 23 reports the proportion of income from each type of labor, by quintile, and strata (with non-labor income, which is the remaining share of income, not shown). As households move up the welfare distribution, the share of labor income shifts away from businesses and subsistence and towards employment, showing

a decreasing likelihod of being self-employed (mainly in agriculture) and an increasing likelihood of being in formal employment. Households in the first quintile, which roughly corresponds to those who are in hardship, generate about 45 percent of their income from home production and only 8 percent of their income from employment (Figure 23). In contrast, households in the top quintile generate 20 percent of their income from home production and 41 percent from employment. Similar differences can also be seen clearly between households in rural areas compared to urban areas, reflecting the gap in employment opportunities. Both Port Vila and Luganville have employment income shares well over 50 percent, while people in hardshipest provinces, Torba and Tafea, have employment income shares of 9 percent and 10 percent, respectively.

Figure 23   Labor income decompositions by consumption quintile and strata

Legend: ■ Non-labor income (Property, Transfer, Remittance, Gifts, Imputed Rents)   ■ Subsistence income   ■ Employment (cash + in-kind)   ■ Business income
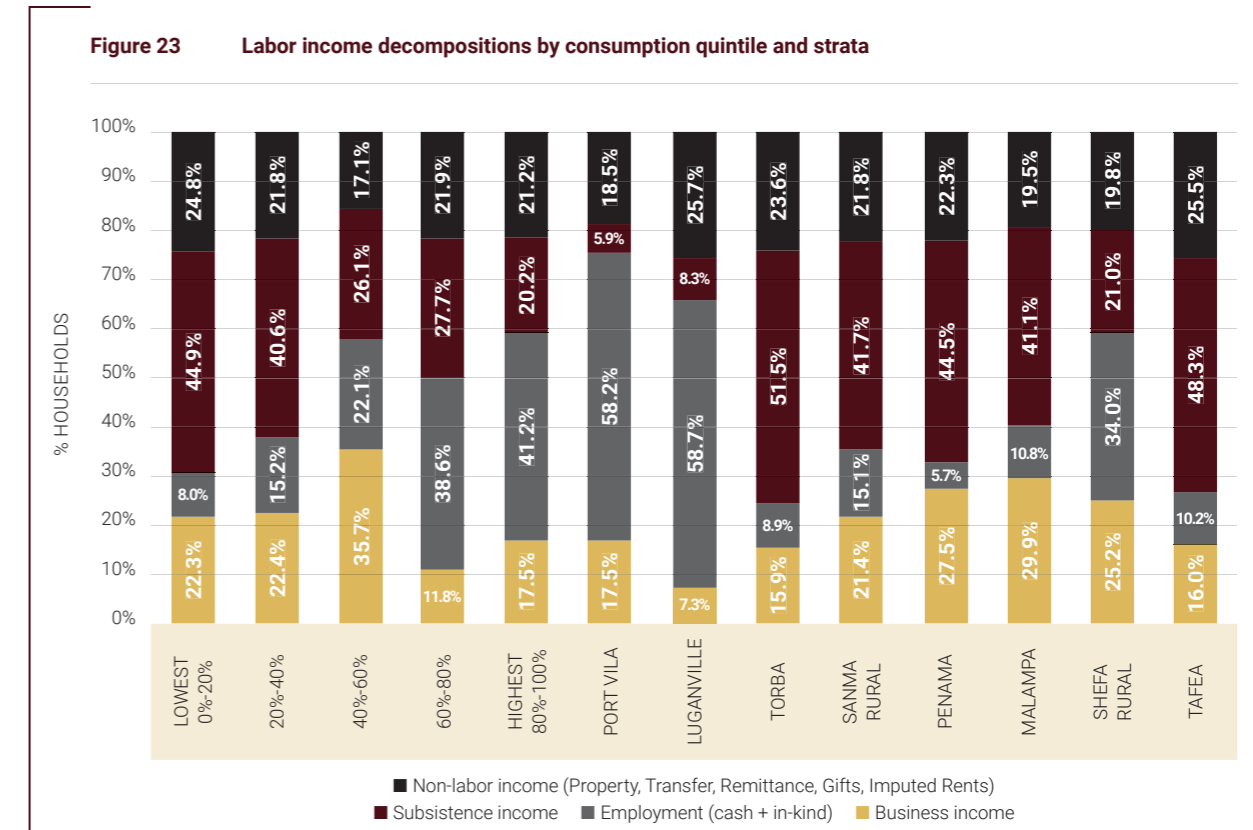
Non-labor income shares

Gift income is a significant source of non-labor income. While imputed rent is the greatest source of non-labor income, it is a derived value based on dwelling characteristics and is not "income" in the traditional sense, so it is not reported in Figure 24, which reports by strata and categories of non-labor income. The most significant of these non-labor sources is gift income, which accounts for around 9 percent of income in rural Sanma and 8 percent in Penama, but only 3 percent in Torba and 2 percent in Port Vila. Gift income may reflect a form of informal social safety nets. However, given that the variation in gift income across locations does not neatly correspond to urban-rural differences, with the two Provinces with the highest rates of hardship (Tafea and Torba) each having less than 5 percent of income coming from gifts, it does not seem that gifts are a widespread buffer that mitigates hardship. The only province where gift income is not the main source of non-labor income is Port Vila, in which property income is the leading source, at 3 percent.

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15   Note that household size increases across the consumption distribution. Mean household size is 5.7 for the first quintile, 4.8 for the middle quintile and 3.8 for the top quintile. Therefore, the differences in per capita income by quintile would be even greater than the differences at household level.

Figure 24   Non-labor income decompositions by strata

Figure 24   Non-labor income decompositions by strata
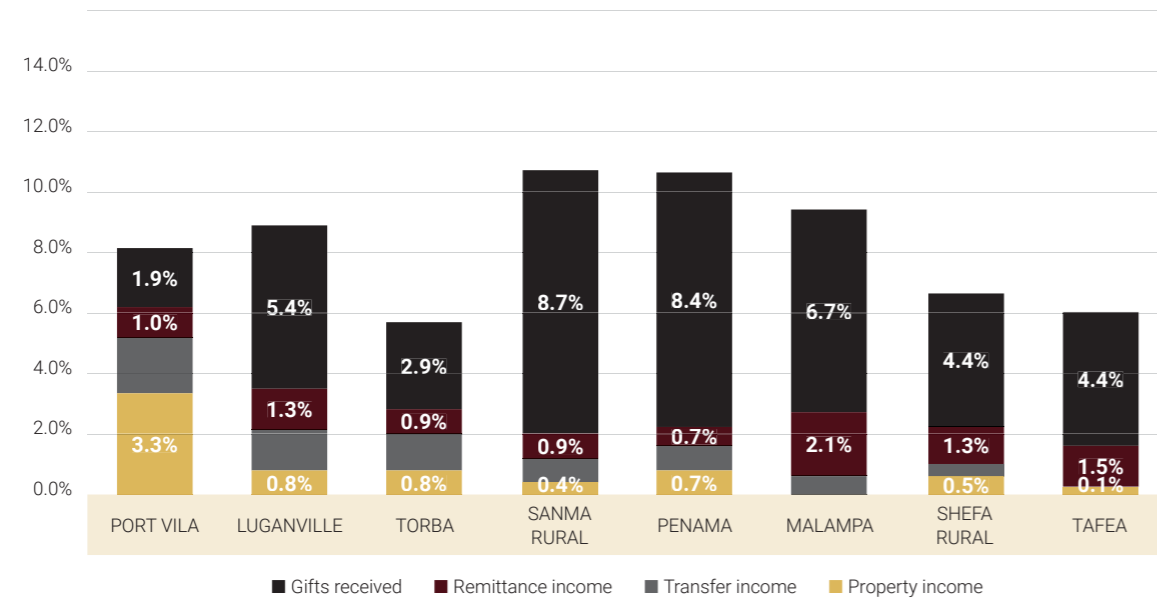
Remittances are not an important income source for households in Vanuatu, comprising just 1 percent of gross income nationally. However, there are differences in the proportions of households receiving remittances across strata, and differences in the average amount of remittances by strata (Figure 25). Approximately 30 percent of households receive remittances in both Malampa and rural Shefa, while only 16 percent of households in rural Sanma receive remittances. In absolute terms, mean remittance income is highest in both Port Vila and rural Shefa, at over VT 15,000 annually.

Figure 25   Proportion of households receiving remittances and annual remittance income by strata
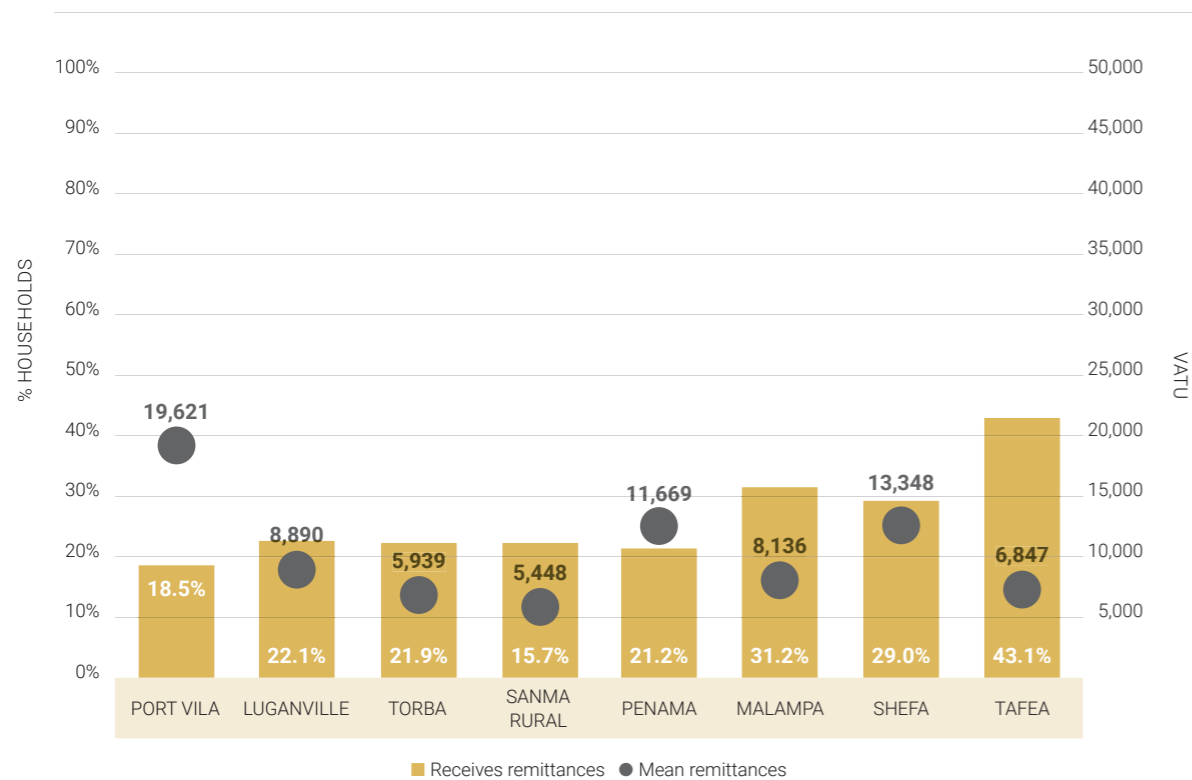
TYPOLOGIES OF PEOPLE IN HARDSHIP IN VANUATU

Based on the previous analysis, a distinct typology of people in hardship in rural areas emerges across Vanuatu, albeit with varying degrees of provincial concentration. The rural nature of hardship in Vanuatu is difficult to overstate as rural areas account for 96.7 percent of the total population in hardship. People in hardship in rural areas largely work in agriculture, with agricultural workers accounting for 83 percent of working people in hardship. In terms of geography, hardship rates are highest for the rural provinces of Torba (31 percent) and Tafea (35.3 percent). In absolute terms, the number of people in hardship is the greatest in Tafea (14,000), Malampa (9,000) and rural Sanma (8,700). Together, these three rural areas account for 67.4 percent of all people in hardship in Vanuatu.

Rural households in hardship derive less income from employment, have fewer adults working outside of the household, and are less connected to public services. Table 10 compares characteristics of households in hardship to averages for all households in rural areas and all households in urban areas, for Torba, Rural Sanma, Malampa and Tafea. Across the aforementioned areas, the household size for households in hardship is greater than the averages of rural and urban areas. This is in stark contrast to the average number of household members working in employment outside of the household, which ranges from 0.07 in Malampa to 0.17 in Torba, much lower than the national average of 0.62. Correspondingly, the employment income share of households in hardship is low, ranging from 4 percent to 7.5 percent, compared to the national average of 26.6 percent. Rural households in hardship also lack access to critical services such as connections to public water and the electricity grid. While the urban averages are high for public service access, the rural averages are generally low. For example, while 29.6 percent of Malampa households in hardship have a water connection, the rural average is only 18.5 percent. Only one percent of Tafea and Torba households in hardship have access to a flush toilet, lower than the rural average of 13.4 percent which is itself substantially lower than the urban average of 86.5 percent. Econometric analysis (OLS regression analysis) of the log of household consumption per adult equivalent (and household hardship status) reveals that the factors reported in Table 10 are all significantly related to low levels of consumption (and to being in hardship).

Table 10   Characteristics of rural households in hardship by province, compared to national averages

	TORBA-HARDHIP	SANMA-RURAL HARDSHIP	MALAMPA-HARDSHIP	TAFEA-HARDSHIP	RURAL-ALL	URBAN-ALL
HH size	5.3	5.7	5.3	5.9	4.7	4.8
Subsistence income share	54.4%	49.6%	56.0%	52.6%	39.1%	6.4%
Employment income share	7.5%	7.0%	4.0%	7.0%	15.7%	58.3%
Number of persons employed in own/or household business	0.13	0.27	0.14	0.38	0.37	0.18
Number of persons who are employees	0.17	0.10	0.07	0.14	0.28	1.29
Number of persons who are in other employment	0.00	0.06	0.00	0.00	0.07	0.05
Has water connection	0.9%	2.3%	29.1%	26.6%	18.5%	93.0%
Has flush toilet	1.0%	1.2%	4.3%	0.9%	13.4%	86.5%

Electricity grid connection	0.0%	1.0%	3.8%	4.7%	10.7%	85.2%

People in hardship in rural areas have lower levels of education, which are likely related to reduced employment earnings and lower rates of employment. Table 11 reports the maximum education level achieved within rural households in hardship and the national average. Of rural households in hardship in Torba, Tafea, Sanma and Malampa, about 40 percent have no one in their household with education beyond primary grade 6. This is in contrast to the rural average of 26.5 and the urban average 4.6 percent. People in hardship in rural areas also have lower rates of secondary school completion and lack higher education. Based on econometric analysis, people in hardship may be missing out on the higher levels of income that are associated with higher levels of education. However, lower levels of education need to be considered relative to local economic conditions, with livelihood opportunities in rural areas being limited (e.g. the dominance of agriculture).

Table 11 Maximum education in households in hardship by province

	TORBA-HARDHIP	SANMA-RURAL HARDSHIP	MALAMPA-HARDSHIP	TAFEA-HARDSHIP	RURAL-ALL	URBAN-ALL
Class 0-6, primary	42.7%	30.7%	35.8%	41.9%	26.5%	4.6%
Class 7-9, primary	29.1%	43.1%	27.9%	40.6%	25.4%	11.3%
Class 10-12, junior. sec.	20.2%	17.9%	29.4%	13.8%	32.2%	40.8%
Class 13-14, senior sec.	6.9%	7.3%	7.0%	0.0%	9.4%	20.3%
Diploma/non uni. tertiary	1.1%	1.1%	0.0%	3.7%	4.7%	12.8%
University degree	0.0%	0.0%	0.0%	0.0%	1.7%	10.4%

ANNEX 1.
METHODOLOGY NOTES

Introduction

The analytical methods applied to the Vanuatu 2019-20 NSDP baseline (HIES) data are in line with the latest international and regional guidance from the Pacific Statistics Methods Board, on consumption aggregate construction and hardship measurement. This annex details the World Bank approach to the key analytical choices that need to be made that impact hardship measurement. Prior to the hardship analysis, the consumption aggregate was finalised by VNSO in consultation with SPC, with guidance provided by the World Bank on non-food consumption, particularly asset use values and the imputation of rent, which were not considered in previous HIES based hardship assessments.

Background to hardship measurement

Measuring hardship in monetary terms is best achieved with detailed household level consumption data, typically from a Household Income and Expenditure (HIES) or similar survey. The estimation of hardship requires three major steps:

1. Constructing a single dimensional, measurable welfare indicator that can be used to rank the population according to an international concept of well-being (the "welfare aggregate"). Each household has its own consumption aggregate that is constructed based on a range of food and non-food items consumed. It is typical to exclude some categories of consumption for which there is data, such as lumpy/once off expenditures (e.g. purchase of expensive durables). In contrast, some consumption such as accommodation (e.g. imputed rent), may not be directly measurable but must be accounted for. The consumption distribution graphs the consumption aggregates of all households.

2. Constructing an appropriate threshold of welfare that can be used to classify individuals as in hardship or not in hardship (the "poverty line")

    I. A food poverty line needs to be selected based on a local food basket (identified using the consumption patterns of a reference group of the population) and a minimum caloric intake for the country. There may be only one food basket and poverty line for a country (national poverty line), or there may be subnational poverty lines (e.g. for areas such as provinces).

    II. A non-food component needs to be constructed to calculate a basic needs poverty line (which includes both food and non-food consumption). The basic needs line (or national monetary poverty line) would be inclusive of and always higher than the food poverty line. This poverty line should be contextually appropriate and allows policymakers to understand relative hardship within the country. In contrast, while the international poverty line allows countries to understand their relative level of hardship compared to the rest of the world, it is not based on local patterns of consumption or local needs.

3. Combine the welfare indicator with the poverty line to describe the hardship status of the population

(the "hardship rate"). The poverty line crosses the consumption distribution and all those living below the poverty line are considered to be in hardship. The hardship rate is always relative to the line used, with the national poverty line often being different to the international poverty line.

Sample used for hardship measurement

Consumption aggregates were constructed for the whole sample of the NSDP baseline (4549 households). However, reported food consumption was particularly low for some households due to suspected enumerator error in Torba and Tafea (one enumerator out of a team of three in Torba, and one enumerator each from the two survey teams in Tafea). Imputation of consumption is one option for mitigating potential bias in the sample. As there was also some evidence of enumerator error in the data that would typically be used to estimate consumption (e.g. underreported assets), imputation was not considered appropriate. The enumeration areas covered by the three problematic enumerators were also covered by other enumerators, so the next best solution was to drop these households from the sample for the hardship analysis, leaving 4121 households. The remaining households in Torba and Tafea were re-weighted to maintain the total weights by strata.

Consumption aggregates

Consumption aggregate construction for the 2019-20 HIES was based on the latest recommendations of the Pacific Statistics Methods Board (PSMB). Deviations from the recommended method are due to limitations of the NSDP Baseline Data for Vanuatu. This section outlines 1) the construction of the food consumption component of the aggregate, 2) the non-food component, and 3) spatial deflation applied for the purposes of hardship measurement.

1.   Food consumption

The total monetary value of food consumption was not directly recorded in the survey, only the value of the most recent transaction for each food type, and total quantity consumed over the past 7 days. Therefore, the monetary value of food consumption for each food type needed to be estimated by first converting reported quantities into standard units, and then multiplying these by a price from a market survey where data was available, or a price estimated by VNSO. Only food consumed by the household was included, whether purchased in cash transactions, home-produced, or received as a gift. The consumption aggregate does not include food purchased or produced by the household but given away as a gift to another household, in order to prevent double counting of expenditures between households.

2.   Non-food consumption

a.   Non-durables

Like food consumption, the consumption of non-food non-durable items was calculated as the annualized value of reported transactions for individual and household expenditures in the CAPI modules, with varying time periods reported for different types of consumption. For example, health expenses were asked to be recalled for the past three months, while expenses on cosmetics for each households member were asked to be recalled for the past twelve months. There was some concern that the time period of education expenses may be inconsistent across households as the question was somewhat ambiguously worded asking about the school year, rather than the past twelve months. However, there was no evidence that the month of the interview was related to the level of education expenses, therefore inconsistency across households was ruled out. All education expenditures and health expenditures were included in the consumption aggregate.

b.   Durables

Durables are defined as items that are infrequently purchased by the household and have a lifetime that spans multiple years, e.g., motor vehicles or major household appliances such as televisions, computers, and refrigerators. The PSMB guidance recommends the calculation of "annualized use values" for durable items owned by the households, regardless of whether the items were purchased in the past year. In order to obtain the use value of each individual durable, an estimated current value of the durable needs to be multiplied by an estimated depreciation rate applicable to that type of durable. Differing information was collected on three groups of durables (household items, vehicles, telecommunications devices and computers). These allowed for the calculation of use values for vehicles, computers and telecommunications devices but not for household items such as furniture and appliances. For items that no credible use value could be calculated directly, either the most appropriate use value from a similar class of item was used, or a mean of the calculated use values was used. The depreciation rates used, and their sources, are listed below.

Table A1   Depreciation rates of durables

DURABLE	DEPREC. RATE	SOURCE
car	0.1206	HIES price data- car
van	0.1751	HIES price data- van
two wheel vehicle	0.0461	HIES price data- two wheel vehicle
inboard motor boat	0.0539	HIES price data- inboard motor vehicle
outboard motor boat	0.0757	HIES price data- outboard motor vehicle
other vehicle	0.1367	HIES price data- other vehicle
mobile phone	0.2634	HIES price data- mobile phone
tablet	0.2029	HIES price data- tablet
laptop computer	0.1938	HIES price data- laptop
lounge furniture (couch and table)	0.1409	HIES price data average
dining table	0.1409	HIES price data average
bed	0.1409	HIES price data average
matress	0.1409	HIES price data average
cabinet	0.1409	HIES price data average
water tank	0.1409	HIES price data average
refrigerator or freezer	0.1409	HIES price data average
cooking stove (gas, electric, kerosen)	0.1409	HIES price data average
microwave oven	0.1409	HIES price data average
washing machine, clothes dryer	0.1409	HIES price data average
air conditioner	0.1409	HIES price data average
generator	0.1409	HIES price data average
solar power unit	0.1409	HIES price data average
water heater	0.1409	HIES price data average
water pump	0.1409	HIES price data average
rice cooker	0.1409	HIES price data average
food processor	0.1409	HIES price data average
toaster	0.1409	HIES price data average

sewing machine	0.1409	HIES price data average
electric fan	0.1409	HIES price data average
television	0.2029	HIES price data-tablet
radio	0.2029	HIES price data-tablet
DVD/Blu-ray	0.2029	HIES price data-tablet
stereo/home cinema	0.2029	HIES price data-tablet
game console	0.2029	HIES price data-tablet
photo equipment	0.2029	HIES price data-tablet
computer desktop	0.1938	HIES price data- laptop computer
printer scanner	0.1938	HIES price data- laptop computer
grass cutter lawn mower	0.0461	HIES price data-two wheel vehicle
chainsaw	0.1409	HIES price data average
power drill/sander	0.1409	HIES price data average
other asset	0.1409	HIES price data average

The quantity owned of each type of household durable is known. However, only the age of the most recent item in each category is known for most durables. For mobile phones, tablets and computers there is age information for multiple items per household but not multiple items per person. If household owns more than one durable of a certain type (e.g. more than one television), the additional durable must be older as the item with recorded data is by definition the most recently purchased. The current value of additional durables in each category needs to be estimated in order to obtain use values. This can be assumed to be a function of value of the most recent durable of that type in the household (assuming households buy items of similar quality over time, on average) which is known, and the increased age of the durable, which is not known.

An arbitrary assumption is made that each additional item is an additional year older than the last (e.g. the second television in a house is one year older than the most recently purchased, while a third television would be two years older). While making such an arbitrary assumption for the age all different durable categories is crude, there is no way of reliably estimating ages using data. While not directly comparable, the increased age of each additional telecommunications device / computer was estimated in an OLS regression to be about 0.5-1 year. While this age difference is consistent with the arbitrary assumption made, it should be noted that for different types of durables, the frequency of purchase is likely to be different (e.g. vehicles vs mobile phones), and therefore, the age gaps between them. Making a different assumption about age would have a very minor impact on the use value, and therefore only a minor impact on the consumption aggregate.

c. Semi-durables

Semi-durables are a sub-category of durable items that have utility for multiple years, but not as long as durables. Semi-durables tend to be purchased more frequently and are not as expensive as durables. There is no strict guidance on semi-durables in the PSMB recommendations. SPC and VNSO opted to include semi-durables in the consumption aggregate for Vanuatu. The exception being semi-durables such as fishing nets which were count as intermediate expenditure.

a. Imputed rent

The "imputed rent" component of income was computed for owner-occupied housing using a predictive

"hedonic" model, which is based on a range of variables selected using a stepwise regression. The variables included in the predicted model were tenure, physical dwelling characteristics (number of rooms, building materials for walls, floor, roofing, water connection, flush toilet, electricity grid connection, fuel for cooking and fuel for lighting) and location characteristics (province, urban/rural) characteristics. The model was based on rental expectations from the non-renting households in the sample. This was for two reasons, firstly only 8 percent of households were renting nationally, a sample too deemed too small for an imputation model in isolation. Secondly, expected rent of non-renters was systematically higher than the rent of renters. This was substantiated using an OLS model with a dependent variable of rent & rental expectations, controls for household characteristics, and a dummy variable for renter/non renter status (the later proved to be highly statistically significant meaning that actual rents and rental expectations should not be combined).

The final predictive model had an R-squared score of ~0.45, which is not high, but not far off imputed rent models used in other countries. For consistency across renter and non-renter households, the imputed rent from the model was used for all households, and actual rents were not used in the consumption aggregate.

Deductions were made from the imputed rent for maintenance costs (outlier corrected for 2 standard deviations). The one area of expenses that were categories under "maintenance costs" in the survey, but more accurately described as lumpy expenditure for long term investment in dwelling structures, was for renovations and expansion of the dwelling.

3.   Spatial and temporal deflation

In order to account for regional differences in costs of living and enable direct comparisons of household welfare across regions, a "deflator" was applied to the nominal consumption aggregates. The spatial deflator is calculated by comparing regional and seasonal differences in the prices of food goods (assuming that these differences are consistent between food and non-food goods), weighted by the importance of those goods to the consumption basket. The spatial disaggregation used was survey strata.

The reference population used for the consumption basket is individuals in the 6th to 30th percentiles, which is the same reference population used to estimate the poverty line. In order to capture the "real" reference population rather than the nominal one, the deflators were estimated using an iterative approach, where households are re-ranked after deflators are applied, and the deflation is repeated (on the nominal aggregates) using the consumption shares of the "new" 6th to 30th percentile. This iterative process is repeated until the households in the reference population stabilize. In the case of Vanuatu, due to the relatively small deflator values, only two iterations were required to stabilize the reference population.

Törnqvist deflators were used in order to better account for outlier prices and consumption shares, though in the case of Vanuatu, the final choice of deflator would not have made a large difference (Table A2 below). The spatially deflated aggregates are rescaled in order to keep the same values for national averages and totals. Temporal deflators were not applied to the consumption aggregate, as the price data used in the consumption aggregate was not temporally specific. The market surveys, though collected at different times, did not contain enough data by location to for seasonal prices.

Table A2   **Spatial deflators**

STRATA	LASP. INDEX	LASP. RANK	PAAS. INDEX	PAAS. RANK	TORN. INDEX	TORN. RANK	FISH. INDEX	FISH. RANK
A COMPARISON OF DEFLATORS FOR REF. POP. 06-30								
Port Vila	1.00	2	1.00	3	1.00	1	1.00	2
Shefa - rural	0.99	3	0.96	5	0.97	2	0.97	5
Penama - rural	1.10	1	1.00	2	0.95	3	1.05	1
Luganville	0.94	5	1.02	1	0.93	4	0.98	4
Torba - rural	0.97	4	1.00	4	0.87	5	0.98	3
Sanma - rural	0.92	7	0.79	8	0.81	6	0.85	7
Tafea - rural	0.93	6	0.86	6	0.81	7	0.89	6
Malampa - rural	0.89	8	0.80	7	0.75	8	0.85	8

Poverty line methodology

A new Basic Needs Poverty Line (BNPL) was constructed for the 2019-20 HIES data, due to methodology changes from the last HIES (2010). This new BNPL will be used for future rounds of hardship analysis, with the application of appropriate inflation adjustments. This section outlines, 1) the use of adult equivalency scales, 2) issues with the construction of the food poverty line and 3) issues in non-food poverty line selection and 4) sensitivity analysis.

1.   Adult equivalency scales

In order to compare welfare measures, which are often recorded at the household level, it is necessary to account for differences in household composition. Two alternative ways to do this are: 1) per capita measures, which divide the household-level welfare aggregate by the number of household members, and 2) adult equivalent measures, which assign different weights to the household members depending on their age or sex. In the Pacific, countries that apply adult equivalent measures typically utilize a simple scale, where household members aged 0-14 (children) are given a weight of 0.5, with all other household members given a weight of 1, with no differentiation by sex. The welfare aggregates and poverty lines in the Vanuatu 2019-20 hardship analysis use this simple adult equivalency scale.

2.   Issues in food poverty line construction

A single national food poverty line is constructed by computing the amount of monetary expenditure required to consume a daily calorie target using the real consumption patterns of a reference population. An expanded basket of 40 goods was used which covers over 95 percent of food expenditure. This is in comparison to a narrower basket of 30 goods in previous hardship report using the 2010 HIES data.

The calorie target was set at 2,100 calories per day per adult equivalent (children aged 0-14 count as half an adult), which is the same as was assumed in the last hardship analysis for Vanuatu. This is in line with the recommendation of the PSMB is that for countries that do not have the data available on the weight and height distribution of the population, as well as solid evidence on the level of activity of people in hardship and vulnerable, 2100 calories per day can be considered the default. The other alternative would

be to use the minimum daily requirements set by FAO, but these have historically been deemed too low by Pacific Island Countries (e.g. Vanuatu is 1,730 calories per day). The cost per calorie of food items was computed using nutritional values (calories per 100g) from the FAO food composition tables for the Pacific and unit values (Vatu per 100g) for each food item calculated based on the price/ unit value assumed in the consumption aggregate.

The reference population chosen is households in the 6th to 30th percentile based on real (deflated) per adult equivalent consumption.

3.   Issues in non-food poverty line construction

The non-food poverty line is computed as a multiplier of the food poverty line. For comparison both a regression method and the non-parametric Ravallion lower bound and Ravallion upper bound lines were used to calculate the multiplier based on the food vs. non-food consumption patterns of the population as they move up and down from the food poverty line. The Ravallion lower bound method has the advantages of yielding robust results that are similar to those of other methods while being straightforward to explain to policymakers and other non-technical audiences. This is the method used, based on the advice of the PSMB.

4.   Sensitivity analysis: comparing reference populations and BNPLs

For sensitivity analysis, 5 reference populations were checked with each of the three non-food poverty line methods (regression, Ravallion upper and Ravallion lower). Table A3 reports the poverty lines by method and reference population, followed by Table A4 which reports the hardship rates with each combination of reference population and NFP method. The hardship rates are very stable across reference groups, with the regression method yielding a hardship rate consistently about half a percentage point lower than the Ravallion lower line. As expected, the hardship rate with the Ravallion upper line are much higher and yield a hardship rate consistently more than double that of the Ravallion lower line. In line with the PSMB recommendations, the Ravallion lower bound method is recommended for Vanuatu. A reasonable alternative would have been the regression method but the difference in the hardship rate is not statistically significant.

Given that the reference population does not seem to alter the rates much, using the 6th percentile to the 30th percentile, seems most appropriate as for that reference population a considerable share of people in hardship are included regardless of NFPL method. For example, the reference population of p6-25 would not include as much of people in hardship measured by the Ravallion upper line, while the reference population of p11-30 would only include less than 10 percent of people in hardship as measured by the Ravallion lower line.

Table A3   **Daily Food poverty line and Basic Needs poverty lines by ref. pop. and method (VT)**

Ref pop	FPL	NFPL Regress	BNPL Regress.	NFPL Rav-Lower	BNPL Rav-Lower	NFPL Rav-Upper	BNPL Rav-Upper
DAILY FOOD POVERTY LINE AND BASIC NEEDS POVERTY LINES BY REF. POP. AND METHOD (VT)							
p.06-25	291	101	393	108	399	316	608
p.06-30	295	103	398	110	405	322	618
p.06-35	299	103	400	111	408	324	621
p.11-30	299	104	404	112	411	326	625
p.11-35	300	105	405	112	412	328	628

Table A4   hardship rate, by method and ref. population

DAILY FOOD POVERTY LINE AND BASIC NEEDS POVERTY LINES BY REF. POP. AND METHOD (VT)				
NFPL METHOD	**REF. POP.**	**MEAN**	**[95% CONF. INT.]**	
Rav. upper	06-25	38.7%	36.9%	40.5%
Rav. lower	06-25	15.5%	14.1%	17.0%
Reg. method	06-25	14.7%	13.3%	16.1%
Rav. upper	06-30	39.6%	37.8%	41.4%
Rav. lower	06-30	15.9%	14.4%	17.4%
Reg. method	06-30	15.4%	13.9%	16.8%
Rav. upper	06-35	40.2%	38.4%	41.9%
Rav. lower	06-35	16.1%	14.6%	17.6%
Reg. method	06-35	15.6%	14.2%	17.1%
Rav. upper	11-30	40.8%	39.1%	42.6%
Rav. lower	11-30	16.4%	15.0%	17.9%
Reg. method	11-30	15.8%	14.3%	17.2%
Rav. upper	11-35	41.1%	39.4%	42.9%
Rav. lower	11-35	16.5%	15.0%	17.9%
Reg. method	11-35	15.9%	14.4%	17.4%

ANNEX 2. REGRESSIONS TO ESTIMATE THE DETERMINANTS OF CONSUMPTION AND HARDSHIP

HOUSEHOLD CHARACTERISTICS	PER AE CONSUMPTION	LIKELIHOOD OF HARDSHIP
Sanma - rural	0.140**	-0.107**
	(0.0617)	(0.0501)
Penama - rural	0.203***	-0.165***
	(0.0649)	(0.0535)
Malampa - rural	0.000870	-0.0837*
	(0.0570)	(0.0485)
Shefa - rural	0.185***	-0.152***
	(0.0611)	(0.0492)
Tafea - rural	-0.0302	-0.00636
	(0.0668)	(0.0573)
Luganville	0.222***	-0.143***
	(0.0618)	(0.0484)
Port Vila	0.338***	-0.191***
	(0.0585)	(0.0455)
(count) sex	-0.0905***	0.0388***
	(0.00531)	(0.00450)
Prop. adults 15-30	-0.533***	0.329***
	(0.0607)	(0.0489)
Prop. adults 31-64	-0.371***	0.254***
	(0.0659)	(0.0497)
Prop. Adults 64+	-0.551***	0.257***
	(0.0825)	(0.0649)
Sex of household head	-0.0300	0.0172
	(0.0194)	(0.0156)
Prop. male	0.231***	-0.142***
	(0.0712)	(0.0542)

Max. Edu. class 3-5	0.0505	-0.122
	(0.128)	(0.118)
Max. Edu., class 6, primary	0.212*	-0.266**
	(0.127)	(0.113)
Max. Edu., class 7-9, primary	0.235*	-0.257**
	(0.125)	(0.112)
Max. Edu., class 10-12, junior. sec.	0.408***	-0.371***
	(0.127)	(0.112)
Max. Edu., class 13-14, senior sec.	0.515***	-0.389***
	(0.129)	(0.113)
Max. Edu., diploma/non uni. tertiary	0.544***	-0.368***
	(0.130)	(0.115)
Max. Edu., university degree	0.776***	-0.393***
	(0.132)	(0.113)
Main activity HH Head- Agriculture, Fishing, Handicrafts	-0.403***	0.331**
	(0.138)	(0.151)
Main activity HH Head-, Working in another sector/activity (government or private sector, business)	-0.242*	0.295**
	(0.141)	(0.150)
Main activity HH Head- Looking for work	-0.361**	0.312*
	(0.155)	(0.162)
Main activity HH Head-, Taking care of the household or family	-0.403***	0.333**
	(0.141)	(0.152)
Main activity HH Head- Voluntary work [village, church, etc.]	-0.310**	0.256
	(0.146)	(0.156)
Main activity HH Head- Retired or old person	-0.350**	0.246
	(0.149)	(0.154)
Main activity HH Head- Other	-0.218	0.259*
Main activity HH Head- Agriculture, Fishing, Handicrafts	(0.144)	(0.153)
# Emp.- Family/hh business	0.0165	0.00820
	(0.0485)	(0.0457)
# Emp.- employees	0.0626***	-0.0469***
	(0.0143)	(0.00906)
# Emp.- apprentice	0.0528*	-0.0375
	(0.0295)	(0.0238)
# Emp.- other	0.305***	-0.135***
	(0.0481)	(0.0186)
Observations	4,061	4,061
R-squared	0.399	0.164

*Note: standard errors reported below coefficients in parentheses. * p<0.05, ** p<0.01, *** p<0.001, constant not reported*