ROYAL GOVERNMENT OF BHUTAN

BHUTAN POVERTY ANALYSIS REPORT 2017

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FOREWORD

The National Statistics Bureau (NSB) is pleased to present Poverty Analysis Report (PAR) 2017. It is based on data collected during the latest Bhutan Living Standards Survey (BLSS), which was carried out between March and April in 2017, by the NSB with support from the World Bank. A significant amount of poverty related statistics for Bhutan have been available since the 2004 PAR, which was based on BLSS 2003. In 2007, the NSB updated the baseline for poverty to establish a more accurate and reliable baseline. The 2007 and 2012 PARs contain poverty estimates at the *Dzongkhag* level, while the current Report contains poverty estimates at the *Dzongkhag* level as well as for the four existing *Thromdes*.

The main objective of this Report is to update the poverty estimates, paying close attention to the methods used to ensure consistency and comparability of poverty estimates overtime. We are pleased to inform that the poverty rate has decreased from 12% in 2012 to 8.2% in 2017.

It is encouraging to note that Bhutan was able to reduce poverty significantly in the last five years. This could be attributed to the effectiveness of the Royal *Kidu* Programme targeting the needy and the impoverished population, works by various NGOs, and the successful execution of the 11th Five Year Plan programmes.

It is our earnest hope that the Report will serve to be a useful input for the 12th Five Year Plan, and at the same time, contribute meaningfully to the formulation of policies and programmes aimed at improving the living standards of the poor and the underprivileged. Furthermore, we are hopeful that the Report will be a useful reference for development partners, civil society organizations, academia, and researchers in Bhutan and beyond.

Finally, the NSB would like to thank the World Bank for its financial and technical support in bringing out PAR 2017. The contributions, commitment, and support that we received from Dr. Hiroki Uematsu of the World Bank are highly commendable and appreciated.

Chhime Tshering
Director
National Statistics Bureau

EXECUTIVE SUMMARY

The Poverty Analysis Report (PAR) 2017 is being prepared with the objective to provide a focused picture of poverty at the National, *Dzongkhags*, and *Thromde* levels, based on the Bhutan Living Standards Survey (BLSS) 2017.

Poverty Rate

The PAR 2017 makes use of a poverty line, estimated for 2017 at Nu2,195.95 per person per month. The poverty line, representing the level of consumption needed to secure the necessities of life, is obtained by adding estimated food and non-food requirements of Nu1,473.45 and Nu722.50, respectively. Using this poverty line, an estimated 8.2% of the population is found to be poor. Thus, poverty has declined by about a third from the estimate of 12% in 2012.

Poverty in rural areas (11.9%) is significantly higher than urban areas (0.8%). Further, only 1.5% of the population is subsistence poor, i.e., persons belonging to households with per capita consumption below food requirements of Nu1,473.45. Subsistence poverty is lower than the estimate rate in 2012 of 2.8%. Poverty rates, according to PAR 2017 are observed to be high in Dagana, Zhemgang, Monggar, Trongsa, and Pema Gatshel, compared to other *Dzongkhags*, while Haa, Thimphu and Paro have the least poverty.

Household Characteristics

In both urban and rural areas, a poor household has a much larger family size than a non-poor household. On average, female-headed households are observed to be less poor than male-headed households. Persons living in households where the head is currently working have higher living standards than those living in a households whose head is either unemployed or not in the labour force. Among the employed, poverty levels are higher in households whose head works in agriculture.

Around 68% of the household heads in Bhutan are aged between 25 and 54 years, while less than 3% are below 25 years, and about 11% are 65 years and above. The poverty rate is about 2% for those household members whose household head is below 25 years of age as compared to 10% for those household members whose household head is 65 years and older. This indicates that the elderly requires social protection, given their limited capacities to engage productively in economic activity.

Basic Needs

A marked disparity in aggregate simple literacy can be observed between the poor and non-poor in 2017 with the poor having a literacy rate of 57% compared to that of the non-poor (66.8%). Disparities are further observed within urban and rural

areas: the literacy rate of the poor in urban areas is 16 percentage points lower than the rate for the urban non-poor, while in the rural areas the rate for the poor is just two percentage points lower than the rural non-poor.

Just about 50% of the non-poor adult population (15+) have not attended school/institute, compared to about 67% of the adult poor population.

Around 12% of the surveyed population reported that they had suffered from sickness or injury in the four weeks prior to the Survey, with no significant difference between the poor and non-poor. However, within this population, only a little over half (61.0%) of the poor visited a medical facility, compared to about 70% of the non-poor.

The majority (99.5%) of the population have access to improved water source with hardly any disparity between the poor and the non-poor households. At least 92% of households have access to improved sanitation; between poor and non-poor households, both in urban and rural areas, the disparity is around 8%.

Among the non-poor households, 67% have at least one smart phone, compared to only 29% among poor households. However, ordinary phone ownership among poor households (80.5%) is significantly higher than non-poor households (54.3%). Nationally, only 39% among the poor households have television, compared to 76% of the non-poor households.

Most of the poor suggest that road infrastructure, water supply, and medical facilities should be the priorities of the Government. However, in rural areas, poor households specify public transport, while in urban areas, employment creation was specified as priority concern.

Inequality

On average, a person in the top 20% of the national population consumes 6.7 times more than a person in the bottom 20% of the population. However, a person in the top 10% consumes 1.6 times more than a person in the bottom 40% of the population. The Gini index, which measures inequality, has remained almost the same at the national level (0.36 in 2012 and 0.38 in 2017).

Chapter 1.
Demographic Characteristics

1.1. Background

The purpose of this report is to provide updated poverty estimates for Bhutan using newly available data from the Bhutan Living Standards Survey (BLSS) of 2017. Poverty estimates were produced in 2003, 2007, and 2012 using corresponding BLSS data. The updated poverty estimates in this report can be used to monitor Bhutan's success in reducing poverty during the past five years since the last poverty estimates in 2012. It is also useful for broadening and deepening our understanding of the changing dimensions of Bhutan's poverty and for designing appropriate interventions for poverty reduction and monitoring efforts.

1.2. Objectives

The key objective of this report is to update poverty estimates that are as comparable as possible with the estimates prepared for 2012. This involves the following steps:

- The 2017 poverty lines are updated for inflation in food and non-food prices during the 2012-2017 period;
- New estimates of per capita household consumption are prepared that are as comparable as possible with the consumption estimates prepared in 2012;
- The per capita consumption of each household in the sample is compared to the updated poverty lines to identify the poor and to calculate the relevant poverty indicators.

Chapter one briefly describes BLSS 2017, which is the primary data source used in preparing the updated 2017 poverty estimates. Chapter two summarizes the work carried out to update the 2017 poverty lines for inflation. Chapter three presents patterns in consumption poverty. Chapter four presents an analysis of socio-economic indicators that provide an independent source of information on poverty reduction during the period 2012-2017. Chapter five provides measures of income inequality (for example, estimates of Gini coefficient). Chapter six provides the report's conclusions and recommendations.

1.3. Data Source

The data used for this report is from BLSS 2017, which is the latest, and fourth in a series of national household surveys that have been conducted by the NSB. Like in previous surveys, BLSS 2017 followed the World Bank's Living Standard Measurement Study (LSMS) methodology. The sample size has been increased to nearly 12,000, compared to about 10,000 in 2012 and 2007 and about three times the size of the survey in 2003. BLSS 2017 surveyed 11,660 households across the country from a planned sample size of 11,812. It provides greater levels of detailed information needed to prepare the updated poverty estimates. The questionnaires that were administered in BLSS 2012 and BLSS 2017 were similar.

Using the BLSS 2017 data, an aggregate of household consumption was generated and subsequently analysed. This aggregate excludes household expenditures on durables, irregular expenses, and health expenses (on consultations and hospitalization) from the total household consumption expenditures (found in the BLSS 2017 report), but includes expenses on medicines. Details on the computation of this consumption aggregate are provided in Technical Note 1 of Annex-II.

BLSS 2017 gathered data on household consumption expenditure, and as such, provides a means of assessing the level of poverty and well-being in Bhutan. Besides collecting consumption expenditure data, it also collected data on demographic characteristics of household members, household assets, credit and income, remittances, housing, access to public facilities and services, education, employment, health of household members, and prices paid for commodities. Also, it included questions on happiness and self-rated poverty.

The sample households for BLSS 2017 were selected on the basis of two mutually exclusive sampling frames for rural and urban areas. The total sample size was set to about 11,812 (more than BLSS 2012) and sample sizes of urban and rural areas were allocated across all *Dzongkhags* and strata in proportion to the number of households. The primary sampling units (PSUs) were Enumeration Areas (EAs) for urban (towns) and *Chiwogs* for rural areas while the secondary sampling units (SSUs) were the households within the selected EAs/ *Chiwogs*.

A set of household weights is needed when interpreting statistics from the BLSS 2017 household data. These weights are needed to correct for the varying area and household in the survey design. They are made up of three components: (a) a correction for the differing sampling rates of PSUs used in the strata at the area stage of sampling; (b) a correction for varying numbers of households selected in each PSU; and, (c) a correction for non-response. The survey population coverage included

all households in the country except (a) diplomatic and expatriates households; (b) institutional households, i.e., residents of hotels, boarding and lodging houses, monasteries, nunneries, school hostels, orphanages, rescue homes, those under trials in jails, and in-house patients of hospitals; and, (c) barracks of military and para-military forces, including the police.

Chapter 2.
Updating the Poverty Line

Bhutan's poverty lines, defined in 2007, consist of a single national food poverty line and non-food allowance, and refer to the monthly per capita levels of food and non-food consumption. Both the food poverty line and the non-food allowance measured in current prices must, therefore, be updated for inflation, i.e., they need to be converted into 2017 prices. This Chapter discusses the procedures used to update the 2012 poverty lines.

2.1. Updated Food Poverty Line

The poverty line, which is the minimum acceptable standard of per capita consumption needed to assure a minimum standard of living, is obtained using the Cost of Basic Needs (CBN) approach, a commonly used methodology for constructing the poverty lines in many countries. This approach estimates the food component of the poverty line as the cost of a food bundle that provides a predetermined minimum required level of food energy. The total poverty line is obtained by adding to the food component the cost of the non-food allowance.

The food poverty line is based on the estimated cost of a single national reference food bundle providing an average subsistence diet of 2,124 Kcal per day (i.e., averaged over persons of all ages and both sexes).[1] The reference food bundle was designed to reflect the actual food consumption patterns of Bhutanese in 2007 who consumed a diet yielding approximately 2,124 Kcal per day. The food basket used in this report is representative of the diet of a reference population, namely population in the second, third or fourth decile based on nominal per capita consumption. The selection of households in the second to the fourth deciles of the per capita expenditure distribution ensures that neither expensive nor cheap food items are heavily represented in the basket. After all, prices paid even of the same items could differ across the population. Although food consumption patterns differ across the country, a single food basket was used to ensure a consistent comparison of welfare levels of people living in different

1 There are 53 food items in the food bundle

areas of Bhutan. The 2012 poverty line is updated for inflation to the year 2017. The methodology used to update for inflation involves (1) updating the food poverty line using the ratio of the food information of 2017 to the food inflation of 2012, (2) using the food price data collected in BLSS 2017 to estimate spatial (regional) differences in food prices in the survey year. The Consumer Price Index (CPI) is believed to be a reliable source of information about inflation because of its rigorous collection.

Households (and their members) consuming (in real terms) less than the food poverty line, of Nu1,473.45 per person per month, are considered subsistence poor.

2.2. Updated Non-food Allowance and Total Poverty Line

The 2007 baseline non-food allowance was estimated as the per capita monthly non-food consumption of households in the reference population whose food spending was near the food poverty line. This is a conservative non-food allowance because it represents non-food consumption that is at the expense of food consumption, which could otherwise be used to achieve the reference food bundle of 2,124 Kcal per day per person.[2]

In order to update the non-food allowance for inflation in different regions, it is necessary to develop regional non-food price indices similar to the food price index. Estimates of inflation in non-food prices developed in this report are based on non-food price data collected for 2012 and 2017 inflations.

Nationwide, the non-food allowance was estimated at Nu722.50 per person per month. Adding this non-food allowance to the food poverty line yields the total poverty line, estimated to be Nu2,195.95 per person per month, at 2017 prices.

Households (and their members) consuming (in real terms) less than the total poverty line, of Nu2,195.95 per person per month are considered poor.

Table 2.1 shows the comparison of poverty lines (food poverty line, non-food allowance and poverty line) for 2007, 2012 and 2017. As mentioned, the 2017 food and nonfood poverty lines are derived from the 2012 values by adjusting for inflation that occurred between 2017 and 2012.

2.3. Spatial Price Index

Prices differ across the country and, therefore, per capita consumption expenditures (in nominal terms) across regions are not directly comparable. An important staple food like rice is found to be a lot more expensive in Gasa than in Wangdue

2 Although persons with total per capita consumption below the food poverty line would have to sacrifice some food consumption to purchase non-food items, they would presumably substitute cheaper foods for more expensive foods within the reference food bundle

Table 2.1 Poverty Lines of 2007, 2012 and 2017

Poverty lines	2007	2012	2017
Food poverty line	688.96	1,154.74	1,473.45
Non-food allowance	407.98	550.10	722.50
Total poverty line	**1,096.94**	**1,704.84**	**2,195.95**

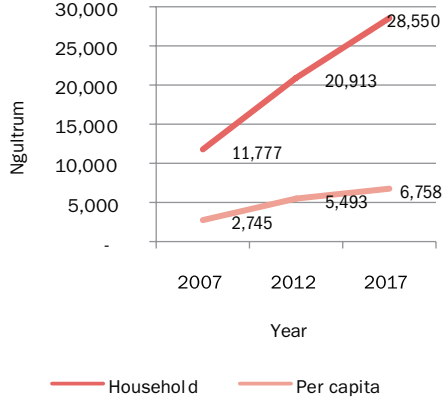
Table 2.2 Regional Price Deflator (Median of Household-level Paasche Indices), by *Dzongkhag* and Area

Dzongkhag	Urban	Rural
Bumthang	1.25	1.17
Chukha	0.94	0.97
Dagana	0.93	0.92
Gasa	1.09	1.24
Haa	1.12	1.09
Lhuentse	1.03	0.96
Mongar	1.08	1.05
Paro	1.09	1.05
Pema Gatshel	1.04	1.15
Punakha	1.20	1.13
Samdrup Jongkhar	0.93	0.72
Samtse	0.87	0.86
Sarpang	0.92	0.89
Thimphu	1.10	1.11
Trashigang	0.97	0.95
Trashi Yangtse	1.08	1.00
Trongsa	1.12	1.11
Tsirang	0.86	0.95
Wangdue Phodrang	1.08	1.02
Zhemgang	1.04	0.95
Bhutan	**1.06**	**0.99**

Phodrang, so that a household in Gasa consumes less with the same nominal consumption expenditure on rice than a household in Wangdue Phodrang. To make per capita consumption between regions comparable, values must be deflated using a cost of living index. However, no such index is available. The usual approach to controlling for spatial price differences is to use a price index that approximates the true cost-of-living index. One possible spatial price index is the Paasche index, which calculates the cost of buying a region's basket of goods using base reference prices. A Paasche index was computed with food items using the BLSS 2017 median price data. Details on these computations are provided in Technical Note 1 (d).

Consequently, the average monthly household consumption in 2017 for Bhutan was estimated at Nu28,550 in real terms as a result of adjustments in the differences in cost of living (with exclusion of some non-food expenditures on durable items and other irregular expenses). Average monthly per capita consumption in real terms was estimated at Nu6,758 per person per month. In 2007 and 2012, average per capita consumption in real terms was estimated at Nu2,745 and Nu5,493 per person per month, respectively (Figure 2.1).

Figure 2.1 Household and Per Capita Consumption Expenditure (in real terms) in 2007, 2012 and 2017



Chapter 3.
Patterns in Consumption Poverty

Households with per capita real consumptions below the poverty line are said to be poor and those with per capita real consumption below the food poverty line are considered subsistence poor. Subsistence poverty may be viewed as extreme poverty, i.e., those whose consumption expenditure is insufficient even to meet basic food needs even if they devote their entire consumption expenditure to food alone.

Consumption poverty in this report is measured at the household level since data from BLSS 2017 does not allow intra-household analysis. Consequently, if a household is considered poor, then all its members are considered poor. Similarly, if a household is non-poor, none of its members is poor.

Three aspects of consumption poverty are of particular interest:

- Poverty Incidence – the proportion of persons (or households) identified as poor;
- Poverty Gap (or Depth of Poverty) – the extent to which those identified as poor fall below the poverty line;
- Poverty Squared Gap (or Severity of Poverty) – a measure of the inequality among the poor.

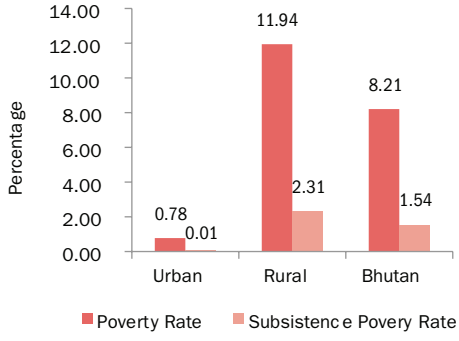
The above poverty measures are presented in this report for the country as a whole, and for certain groups of the population, such as for households in urban and rural areas, and in *Dzongkhags*, and by the sex of the household head, among others. For more information on indices of poverty, see Technical Note 4.

3.1. Poverty Rate

The food poverty line and total poverty line are used to compute subsistence and poverty incidence, respectively. Figure 3.1 illustrates subsistence and poverty rates for population across urban and rural areas. These rates are poverty head counts, i.e., the percentage of poor persons. For the year 2017, the total poverty rate[3] for Bhutan is estimated at 8.2%. This means

3 However, if we do not update the poverty line in 2017, i.e., we keep the poverty line in 2017 same as in 2012 (Nu1,704.84 per person per month), the poverty rate would be 3.2% and the subsistence poverty rate would be 0.37%

Figure 3.1 Population Poverty and Subsistence Poverty in Bhutan



that around one out of 12 persons belongs to households whose per capita real consumption is below the total poverty line of Nu2,195.95 per person per month. Poverty in Bhutan is still a rural phenomenon with about 11.9% of the rural population being poor against only 0.8% in the urban areas.

It is observed that subsistence incidence, i.e., extreme poverty, is relatively small in the country; only around 1.5% of the population in Bhutan belong to households that spend less per person per month than the food poverty line of Nu1,473.45. While nearly 0.8% of extremely poor persons in rural areas is small, it is significantly large in relation to that of the urban areas (0.01%).

The poverty and subsistence poverty statistics are shown in Table 3.1 together with their standard errors. Because the poverty incidence figures are estimates from a sample survey, it is important to consider their standard error when evaluating the precision of these estimates. The best estimate of poverty rate in Bhutan in 2017 is 8.2%. However, this estimate has a margin of error of nearly 0.5%.i.e., if we conduct a similar survey a 100 times, 95% of the time, the true poverty rate will fall between 7.3% and 9.1%. Similarly, urban poverty, estimated at 0.8% (but could range between 0.4% to 1.2%), is much lower than rural poverty of 11.9% (could range between 10.6% to 13.2%). About 97% of poor persons throughout the country reside in rural areas. Among the extremely poor, practically everyone resides in rural areas. Consequently, efforts toward poverty reduction ought to continue with a strong focus on rural development. The poverty estimates of 2017 are comparable with previous estimates of 12.0% poor and 2.8% subsistence poor in 2012. From Table 3.1, it can be derived that, of the estimated surveyed population of 692,895 persons in the country, 56,855 are estimated to be poor and 10,687 are subsistence poor.

Table 3.2 presents poverty incidence and subsistence incidence as a percent of households. About 6% of households are poor, and 1% are subsistence poor households. Out of the estimated 164,011 households, 9,424 are poor, and 1,677 are extremely poor.

A comparison of the poverty statistics in Table 3.1 and Table 3.2 indicates that poverty measures based on population are larger than those based on the number of

Table 3.1 Population Poverty and Subsistence Poverty by Area

	Poverty			Subsistence Poverty			
Area	Rate	Standard error	Contribution to National	Rate	Standard error	Contribution to National	Population share
Urban	0.78	0.20	3.16	0.01	0.01	0.23	33.45
Rural	11.94	0.70	96.84	2.31	0.29	99.77	66.55
Bhutan	**8.21**	**0.48**	**100.00**	**1.54**	**0.19**	**100.00**	**100.00**

Table 3.2 Household Poverty and Subsistence Poverty by Area

	Poverty			Subsistence Poverty			
Area	Rate	Standard error	Contribution to National	Rate	Standard error	Contribution to National	Household share
Urban	0.48	0.11	2.97	0.02	0.02	0.74	35.57
Rural	8.65	0.53	97.03	1.58	0.19	99.26	64.43
Bhutan	**5.75**	**0.34**	**100.00**	**1.02**	**0.12**	**100.00**	**100.00**

Table 3.3 Population Poverty by *Dzongkhag*

Dzongkhag	Poverty rate	Standard error	Distribution of the Poor	Distribution of Population
Bumthang	2.1	0.8	0.6	15,959
Chhukha	3.5	0.8	3.9	63,355
Phuentsholing Thromde	*0.9*	*0.4*	*0.3*	*20,560*
Other than Phuentsholing Thromde	*4.8*	*1.2*	*3.6*	*42,795*
Dagana	33.3	5.6	13.7	23,453
Gasa	12.6	5.5	0.8	3,575
Haa	0.9	0.7	0.2	10,995
Lhuentse	6.7	2.5	1.8	15,552
Monggar	17.1	3.0	12.6	41,956
Paro	0.3	0.3	0.2	36,329
Pema Gatshel	13.7	3.3	6.7	27,636
Punakha	2.6	1.3	1.2	26,724
Samdrup Jongkhar	6.2	1.4	4.0	36,154
Samdrup Jongkhar Thromde	*0.3*	*0.2*	*0.0*	*9,376*
Other than Samdrup Jongkhar Thromde	*8.3*	*1.9*	*3.9*	*26,778*
Samtse	12.3	2.1	13.6	63,132
Sarpang	12.1	1.8	8.8	41,254
Gelephu Thromde	*1.1*	*0.6*	*0.2*	*8,015*
Other than Gelephu Thromde	*14.7*	*2.2*	*8.6*	*33,238*
Thimphu	0.6	0.2	1.3	125,551
Thimphu Thromde	*0.4*	*0.2*	*0.7*	*98,148*
Other than Thimphu Thromde	*1.1*	*0.6*	*0.5*	*27,403*
Trashigang	10.7	2.6	8.9	47,102
Trashi Yangtse	11.9	2.0	3.2	15,363
Trongsa	14.0	2.6	4.4	17,768
Tsirang	4.8	2.0	1.7	20,409
Wangdue Phodrang	5.4	1.7	3.9	41,405
Zhemgang	25.1	4.2	8.5	19,224
Bhutan	**8.2**	**0.5**	**100.0**	**692,895**

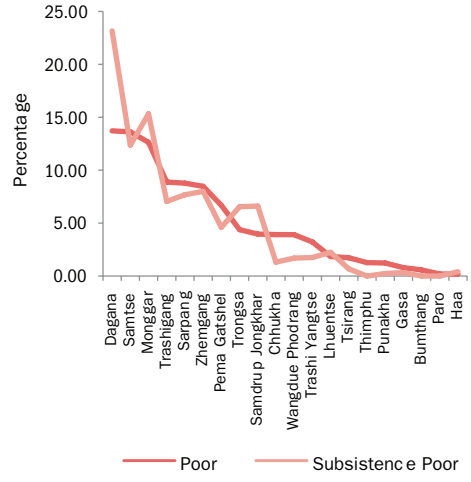
households because poor households, on average, have more household members.

Dzongkhag level estimates of poverty incidence and subsistence poverty for the population and for households are shown in Table 3.3 (together with their standard errors). Ranks for *Dzongkhags* are difficult to determine due to overlapping confidence intervals, but it is observed that poverty rates are highest in Dagana, Zhemgang, Monggar, Trongsa, and Pema Gatshel. However, the Survey shows that Haa, Thimphu and Paro have the least poverty rates. The four *Thromdes* (Phuentsholing *Thromde*, Samdrup Jongkhar *Thromde*, Gelephu *Thromde* and Thimphu *Thromde*) have poverty rates of at most 1% of their respective populations.

In terms of subsistence poverty, the highest rate is observed in Dagana with 11% of the population being extremely poor. Further, about a quarter (23.2%) of all the extremely poor in Bhutan reside in Dagana. Some *Dzongkhags* such as Bumthang, Paro and Thimphu have virtually no subsistence poverty. Among *Thromdes*, Phuentsholing *Thromde*, Gelephu *Thromde* and Thimphu *Thromde* also have no subsistence poverty (Table 3.4).

The estimated number of poor households across *Dzongkhags* is provided in Table A.1 (Annex I). These tables include the contribution of each *Dzongkhag* to total household poverty in the country. Dagana (23.7%), Zhemgang (16.3%), Monggar (14.0%) have a higher proportion of poor

Figure 3.2 Distribution of Population Poverty and Subsistence Poverty by *Dzongkhag*



households, with Dagana and Zhemgang also contributing a big share to total household poverty in the country.

It is also important to observe the distribution of the poor population (Fig. 3.2). Among the *Dzongkhags*, Dagana (13.7%), Samtse (13.6%) and Monggar (12.6%) have the highest shares of the entire poor population in country; with 40% of the poor residing in these three *Dzongkhags* alone. In terms of the distribution of subsistence poor, again the *Dzongkhags* of Dagana (23.2%), Monggar (15.3%) and Samtse (12.4%) have the highest proportion of the subsistence poor population. In fact, half of the subsistence poor live in these three *Dzongkhags*.

Table 3.4 Population Subsistence Poverty by *Dzongkhag*

Dzongkhag	Poverty rate	Standard error	Distribution of the Poor	Distribution of Population
Bumthang	0.0	0.0	0.0	15,959
Chhukha	0.2	0.2	1.3	63,355
Phuentsholing *Thromde*	*0.0*	*0.0*	*0.0*	*20,560*
Other than Phuentsholing *Thromde*	*0.3*	*0.3*	*1.3*	*42,795*
Dagana	10.6	3.2	23.2	23,453
Gasa	1.0	1.0	0.3	3,575
Haa	0.4	0.4	0.4	10,995
Lhuentse	1.5	1.2	2.2	15,552
Monggar	0.0	0.0	15.3	41,956
Paro	0.0	0.0	0.0	36,329
Pema Gatshel	1.8	1.2	4.6	27,636
Punakha	0.1	0.1	0.2	26,724
Samdrup Jongkhar	2.0	0.8	6.6	36,154
Samdrup Jongkhar *Thromde*	*0.3*	*0.2*	*0.2*	*9,376*
Other than Samdrup Jongkhar *Thromde*	*2.5*	*1.0*	*6.4*	*26,778*
Samtse	2.1	0.8	12.4	63,132
Sarpang	0.0	0.0	7.7	41,254
Gelephu *Thromde*	*0.0*	*0.0*	*0.0*	*8,015*
Other than Gelephu *Thromde*	*2.5*	*0.7*	*7.7*	*33,238*
Thimphu	0.0	0.0	0.0	125,551
Thimphu *Thromde*	*0.0*	*0.0*	*0.0*	*98,148*
Other than Thimphu *Thromde*	*0.0*	*0.0*	*0.0*	*27,403*
Trashigang	1.6	0.8	7.1	47,102
Trashi Yangtse	1.2	0.6	1.7	15,363
Trongsa	3.9	1.5	6.6	17,768
Tsirang	0.4	0.4	0.7	20,409
Wangdue Phodrang	0.4	0.4	1.7	41,405
Zhemgang	4.4	2.1	8.0	19,224
Bhutan	**1.5**	**0.2**	**100.0**	**692,895**

3.2. Depth and Severity of Poverty

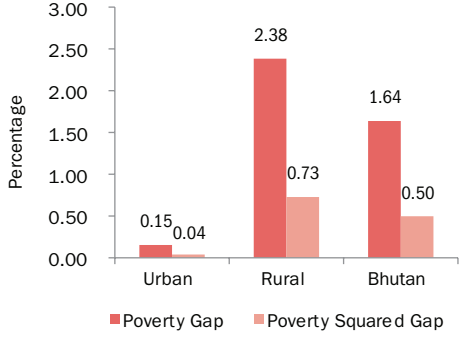
Poverty analysis is not limited to examining poverty rates and comparing the statistics across sub-groups of the population. It is important to also look into the depth and severity of poverty. The poverty gap and poverty squared gap indices measure the depth and severity of poverty, respectively. For an individual, the poverty gap is the difference between the poverty line and the actual per capita expenditure (the gap is zero for all non-poor individuals). The poverty gap index measures the average extent to which individuals in a population fall below the poverty line and expresses it as a percentage of the poverty line. The poverty squared gap index gives more weight to the very poor than those who are less poor. It is the average value of the square

of the depth of poverty for each individual measured relative to the poverty line. More explanation on these indices is available in Technical Note 4.

For both the poverty gap and poverty squared gap, as well as for poverty rate, the larger the value of the index, and the greater the degree of poverty. These poverty measures are important for planning poverty reduction programmes. All things being equal, sub-groups of the population with higher measures should receive priority for poverty reduction programmes.

Figure 3.3 shows that poverty is deeper and more severe in rural areas than in urban areas. The poverty gap in rural areas is almost 2.4% as compared to just below 0.2% in urban areas. Poverty squared gap in rural areas is a little over 0.7% while it is just 0.04% in urban areas.

Figure 3.3 Depth and Severity of Poverty by Area



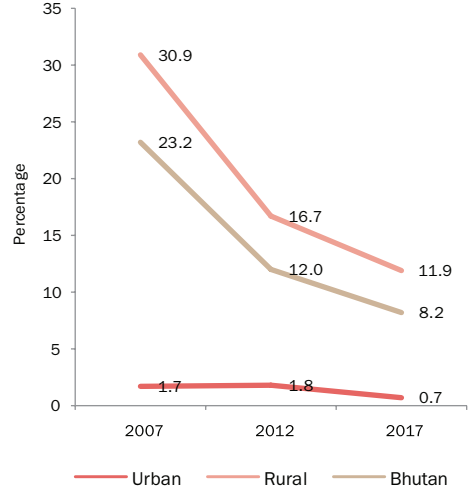
The poverty gap and poverty squared gap (with their standard errors) across *Dzongkhags* are listed in Annex I (Table A-3).

The table also includes the contribution of the *Dzongkhags* to the national poverty measures. Some *Dzongkhags* such as Monggar and Samtse have very high poverty measures (whether in terms of gap or severity) but Dagana has the highest contribution to the national poverty measures.

3.3. Poverty trend

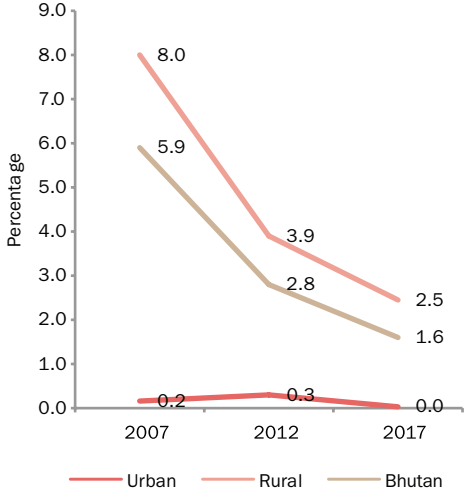
Figure 3.4 shows that the overall poverty rate in the country reduced from 23.2% in 2007 to 12% in 2012 and further to 8.2% in 2017. Rural poverty reduced from 30.9% in 2007 to 16.7% in 2012 and 11.9% in 2017. However, the proportion of poor in urban areas remained practically unchanged at about 2% between 2007 and 2012, but significantly reduced to 0.7% in 2017.

Figure 3.4 Population Povery Rates for 2007, 2012 and 2017



As shown in Figure 3.5, subsistence poverty decreased from 5.9% in 2007 to about 2.8 % in 2012. In 2017, the subsistence poverty rate further reduced to 1.6%. In the rural areas, the rate was reduced from 8% in 2007 to 3.9% in 2012, and it is 2.5% in 2017. In the urban areas, the subsistence poverty rate is significantly low (around three in 10,000 persons).

Figure 3.5 Population Subsistence Povery Rates for 2007, 2012 and 2017



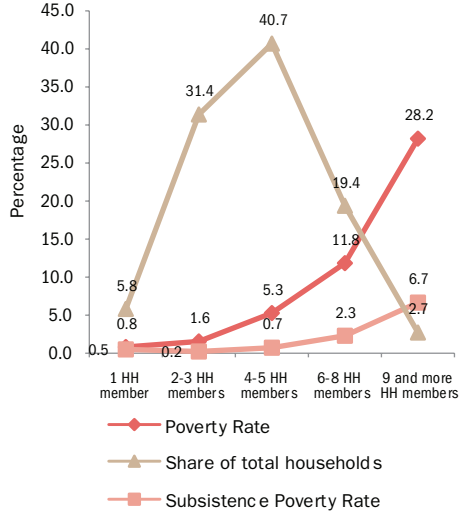
3.4. Poverty by Household Characteristics

Households differ in their demographic composition and characteristics. On average, household sizes in Bhutan are slightly larger in rural (4.4) than in urban (4.0) areas. As shown in Table 3.5, a poor household typically has a much larger family size (6.0) than a non-poor household (4.1). The difference in family sizes among poor and non-poor households is slightly larger in urban areas as compared to rural areas. The average household size is almost the same irrespective of the sex of the household head. However, the difference in household size between the poor and non-poor households is slightly larger for female-headed households.

Table 3.5 Average Household Size by Area, Poverty Status, and Sex of Head

Area/Poverty Status	Household Head		Total
	Male	Female	
Urban	**4.1**	**3.7**	**4.0**
Poor	7.1	3.4	6.4
Non-poor	4.1	3.7	4.0
Rural	**4.4**	**4.4**	**4.4**
Poor	5.9	6.3	6.0
Non-poor	4.2	4.2	4.2
Bhutan	**4.3**	**4.2**	**4.2**
Poor	5.9	6.2	6.0
Non-poor	4.1	4.1	4.1

Figure 3.6 Household Poverty and Subsistence Poverty Rates by Household Size



As shown in Figure 3.6, both poverty rates and subsistence poverty rates increase with the size of the households. The increase in poverty rate is faster than subsistence poverty rate as the household size increases. The share of households increases rapidly reaching a maximum of 41% for households with four or five members. However, the share then decreases and reaches a minimum of 3% for households with nine or more members. This indicates that, although the poverty rates are higher among households with a larger household size, the corresponding share of these households to total households is much less.

Typically, welfare and household demographic composition are observed to have a relationship with the characteristics of the household head. On average, female-headed households are observed to be less poor than male-headed households. The trend is observed to be similar in both urban and rural areas. However, the sex of the household head does not have much influence on subsistence poverty (Table 3.6).

Figure 3.7 Population Poverty Rate by Economic Activity of the Household Head

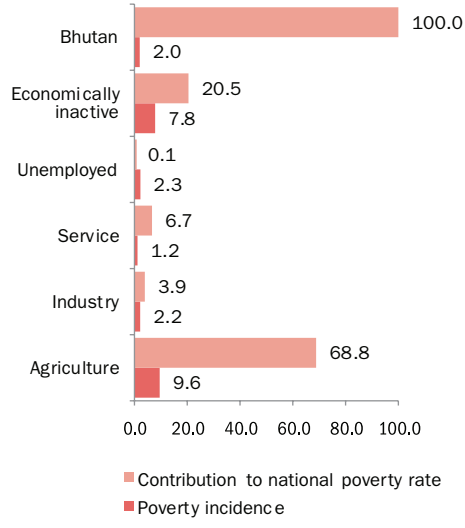


Figure 3.7 combines information on poverty, participation in the labour force, and main sectors of employment of the

Table 3.6 Household Poverty and Subsistence Poverty Rates by Area and Sex of Household Head

Area/ Household Head	Poverty Rate		Subsistence Poverty Rate		Share of Total Household Heads
	Index	Contribution to National	Index	Contribution to National	
Urban	**0.5**	**3.0**	**0.0**	**0.7**	**35.6**
Male	0.6	2.4	0.0	0.0	25.2
Female	0.3	0.5	0.1	0.7	10.3
Rural	**8.7**	**97.0**	**1.6**	**99.3**	**64.4**
Male	9.4	64.4	1.7	63.8	39.4
Female	7.5	32.6	1.4	35.4	25.0
Bhutan	**5.7**	**100.0**	**1.0**	**100.0**	**100.0**
Male	5.9	66.8	1.0	63.8	64.7
Female	5.4	33.2	1.0	36.2	35.3

households. Living standard of a person is higher among those households whose heads are currently working as compared to those whose heads are either unemployed or not in the labour force. Among the employed, poverty rates are higher in households whose heads are working in agriculture (9.6%), though this is a decrease by almost half from the 2012 (18.5%) figure for the same. Most of the poor live in households whose head is either engaged in agriculture (68.8%) or whose head is not actively participating in the labour force (20.5%).

Figure 3.8 shows household poverty rates by educational attainment levels of the household head. As expected, the higher the level of education completed by the household head, the lower the poverty rate for the household. In other words, the level of poverty decreases as the educational level of the household head increases. About 9% of the households with household heads who had not attended a school are poor. The returns to education increase considerably if the head had attended middle secondary level of education irrespective of whether the household is in an urban or rural area.

Figure 3.8 Household Poverty Rate by Educational Attainment of Household Head by Area

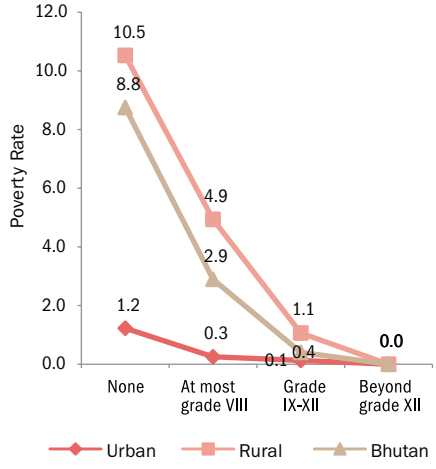


Table 3.7 shows that the poverty rates increase with the age of the household head. The poverty rate is about 2% for those below 25 years as compared to 10% for those aged 65 years and older. This

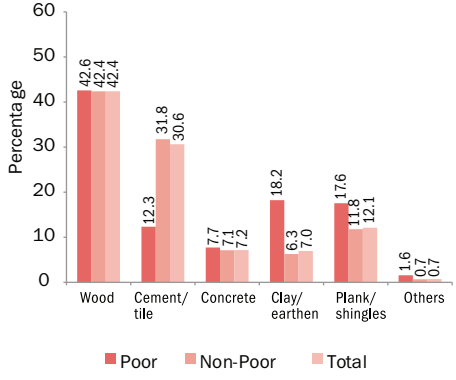
Table 3.7 Household Poverty and Subsistence Poverty Rates by Age of Household Head

Age of Household Head	Poverty Rate		Subsistence Poverty Rate		Share of Total Household Heads
	Index	Contribution to National Poverty	Index	Contribution to National Poverty	
<25	1.9	0.9	0.0	0.0	2.8
25-34	3.0	12.0	0.6	14.3	22.8
35-44	5.3	22.2	0.8	18.4	24.3
45-54	5.7	21.2	1.0	20.0	21.4
55-64	7.5	21.2	1.4	21.7	16.3
65+	10.4	22.5	2.1	25.7	12.5
All ages	**5.7**	**100.0**	**1.0**	**100.0**	**100.0**

suggests in the importance of providing social protection for elderly person. It is noticed that most household heads (68.4%) in Bhutan are aged between 25 to 54 years, while less than 3% are below the age of 25 years, and about 11% are 65 years and above.

Figure 3.9 shows the distribution of floor materials by household poverty status. There is no significant difference in the types of floor materials used by the poor and the non-poor households, except in the use of cement/tiles, clay/earthen and plank/shingles. About 12% of the poor households have cement/tile floors, compared to 32% of the non-poor households.

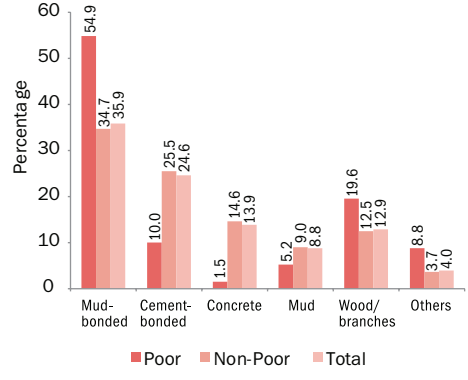
Figure 3.9 Distribution of Type of Floor by Household Poverty Status



18% of the poor households have clay/earthen floors while only 6% of the non-poor households have clay/earthen floors. A higher proportion of the poor households (17.6%) uses plank/singles for floors in their residences compared to non-poor households (11.8%). Overall, there is an increase in the use of wood (42.4%) and cement/tiles (30.6%) types of floor materials and a decrease in the use of plank/shingles (12.1%) as compared to BLSS 2012.

Figure 3.10 shows the distribution of main materials used for walls by poverty status. More than half (54.9%) of the poor households have residences with mud-bounded walls while a slightly more than one-third (34.7%) of the non-poor households have dwellings that have mud-bounded walls. Only 12% of the poor households have cement-bounded or concrete walls as compared to 40% of the

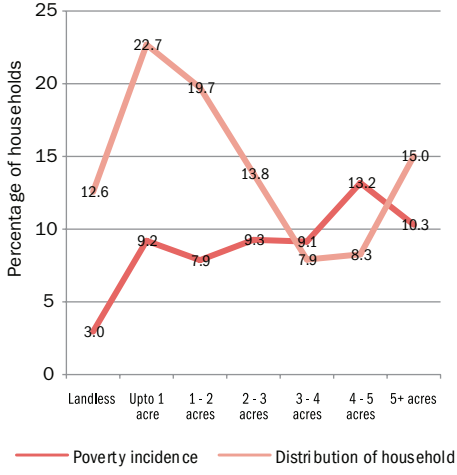
Figure 3.10 Distribution of Type of External Walls by Household Poverty Status



non-poor households. The proportion of household with wood/branches is higher in the poor households (19.6%) as compared to non-poor households (12.5%).

Figure 3.11 shows the distribution of households and poverty rates by the size of

Figure 3.11 Household Distribution and Poverty in Rural Areas



land holdings in rural areas. More than a fifth (22.7%) of rural households own up to one acre of land with the proportion of rural households owning land decreasing with the size of land holding. Compared to PAR 2012, the proportion of landless households (12.6%) and those households who own up-to one acre of land have decreased while households in other categories have increased. The poverty rate is the lowest (3.0%) for landless households

Table 3.8 Household Land ownership by Area and Poverty Status

Area	Poor	Non-Poor	Total
Urban	42.2	41.0	41.0
Rural	95.7	86.7	87.5
Bhutan	**94.1**	**69.6**	**71.0**

and the highest for those who own four to five acres (13.2%) of land. The incidence of poverty is almost similar for those who own up-to one acre (9.2%), two to three acres (9.3%) and three to four acres (9.1%) of land.

Table 3.8 illustrates land ownership in urban and rural areas by poverty status. Across the country, 71% of households own land with a higher proportion owned by poor households (94.1%). The proportion of households owning land in rural areas (87.5%) is more than two times that of urban areas (41.0%). Compared to 2012, the proportion of households in 2017 who own land has increased in both urban (32.3% in 2012) and rural (83.6% in 2012) areas, resulting in an overall increase in land ownership in the country in 2017.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Chapter 4. Basic Needs

Other non-monetary dimensions of welfare, such as health and education status, that pertain to basic needs, are complementary to consumption poverty. The health status of an individual undoubtedly determines her/his quality of life. Literacy and education attainment are widely recognized to be important for improving the living standards of the population. People with little or no education are likely to be unemployed, or if they do get employed, they often have low-paying, labour-intensive occupation, especially in the informal economy. Such vulnerable employment often put them at risk of staying poor. More education provides individuals with the basic knowledge, skills, and competence required for economic productivity, which in turn, will provide them with assets and other capabilities for further improving their living standards, and consequently, some degree of social mobility.

4.1. Education

As shown in Figure 4.1, poor persons in Bhutan have a lower literacy rate than non-poor persons; 57% of the poor are literate as compared to 69% of the non-poor. Though a disparity in literacy rates between the poor and the non-poor exists in both urban and rural areas, the disparity is much higher in urban areas. The literacy rate of the poor in urban areas is 16 percentage points lower than the urban non-poor, while in the rural areas, the literacy rate of the poor is just 2 percentage points lower than the non-poor.

Figure 4.1 Literacy Rate by Area and Poverty Status

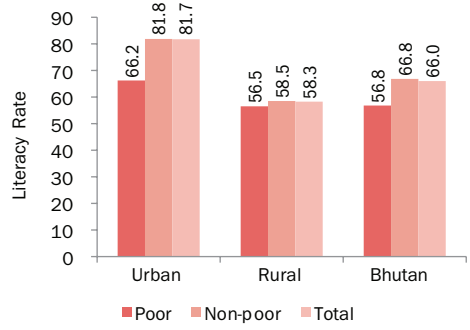
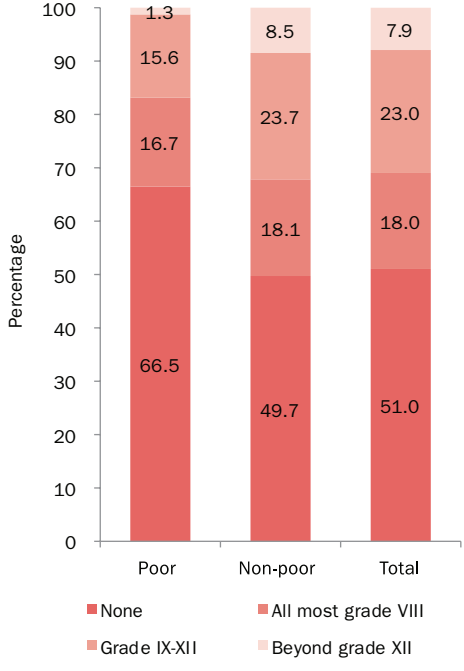


Figure 4.2 shows the distribution of educational attainment of adults aged 15 years and older by poverty status. About 67% of the poor population aged 15 years and older had never attended a school/institute as compared to just over half of the non-poor in the same age group have not attended any schooling. There are almost equal proportions of the poor and non-poor adult population that had studied

up to class eight. However, the proportion of poor persons is much smaller at higher levels of educational attainment. Just about 1% of the poor population had studied beyond the secondary school level while the adult population among the non-poor had 9% within the same educational attainment bracket.

Figure 4.2 Distribution of Adult (15+) Education Attainment by Poverty Status



4.2. Health

BLSS 2017 collected information on the health conditions and access to health services from all household members. Household members were asked whether they suffered from sickness or injury in the last four weeks prior to the Survey. Over a tenth (12%) of the population reported that they had suffered from sickness or injury in the last four weeks, with no significant difference between the poor and the non-poor (Figure 4.3). However, among those who reported some illness or injury, 61% of the poor visited a medical facility, compared to about 70% of the non-poor.

Table 4.1 shows the distribution of persons who suffered from sickness/injury during the four weeks prior to the Survey with health seeking behavior by area and poverty status. There is wide disparity between the percentage of the poor (7.0%) and the non-poor (24.3%) among those who first visited the Jigme Dorji Wangchuck National Referral Hospital (JDWNRH), when they suffered from sickness or injury in the four weeks before the Survey. Almost equal proportions of the poor and the non-poor population had visited regional referral hospitals. Just about 16% of the poor visited a district hospital, compared to 25% of the non-poor. The majority of the poor (58.9%) visited a Basic Health Unit (BHU)/Satellite clinic/Sub-post, compared to only 27% of the non-poor. The disparity is wider in urban areas.

Among women who gave birth during the 12 months prior to the BLSS 2017, a slight difference between the percentage of the poor and non-poor women who received antenatal care is observed (Figure 4.4). The difference is significant in urban areas,

Figure 4.3 Health Seeking Behaviour by Area and Poverty Status

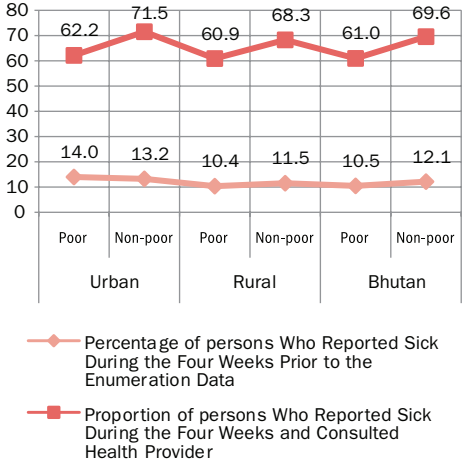


Figure 4.4 Proportion of Women Who Received Antenatal Care by Area and Poverty Status

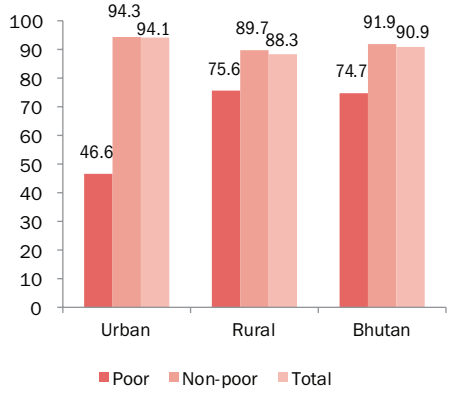


Table 4.1 Distribution of Persons who Suffered from Sickness/Injury Four Weeks prior to the Survey with Health Seeking Behaviour by Area and Poverty Status

Health Service Provider Consulted	Urban			Rural			Bhutan		
	Poor	Non-Poor	Total	Poor	Non-Poor	Total	Poor	Non-Poor	Total
JDWNRH	23.3	43.5	43.3	6.3	11.3	10.8	7.0	24.3	23.2
Regional Referral Hospital	21.3	22.6	22.6	16.6	15.5	15.6	16.8	18.4	18.3
District Hospital	5.9	15.7	15.6	16.3	31.9	30.3	15.8	25.3	24.7
BHU/Satellite Clinic/ Sub post	43.1	13.0	13.3	59.6	37.0	39.2	58.9	27.3	29.3
ORC	0.0	0.0	0.0	1.3	1.2	1.2	1.3	0.7	0.8
Private Diagnostics Centers	0.0	0.4	0.4	0.0	0.5	0.4	0.0	0.5	0.4
Indigenous centres (*Sowa Rigpa*)	0.0	0.5	0.5	0.0	0.6	0.6	0.0	0.6	0.6
Chemist/Pharmacy/Retail pharmacy shop	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1
Other private hospital/clinic	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.1	0.1
Lama/pandit/Priest (*Rimdo/Puja*)	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1
Traditional Practitioner (*Pow/Pam*,Shaman, *Terda* etc)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Indian hospital paid by Govt.	0.0	0.8	0.8	0.0	0.5	0.5	0.0	0.7	0.6
Indian hospital paid by self	0.0	0.4	0.4	0.0	0.4	0.4	0.0	0.4	0.4
Outside Bhutan hospital paid by Govt. (Other than India)	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1
Outside Bhutan hospital paid by self/private (Other than India)	0.0	0.2	0.2	0.0	0.1	0.1	0.0	0.1	0.1
Others	6.3	2.4	2.4	0.0	0.7	0.7	0.3	1.4	1.3
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

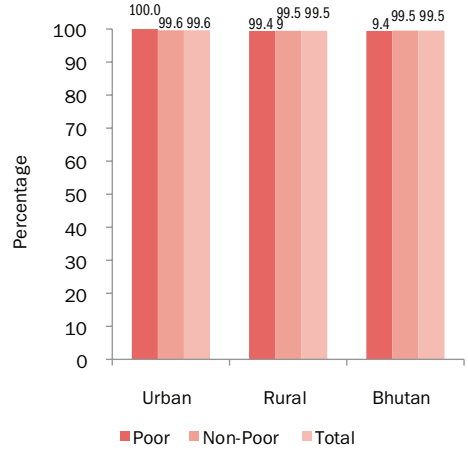
where a smaller proportion of poor women (46.6%) received antenatal care as compared to non-poor women (94.4%). In rural areas, the disparity is less wide.

4.3. Household Amenities, Assets, and Access to Services

The living conditions of a household are often highly correlated with its amenities, assets, and access to services. Household amenities, including suitable sanitation facilities, and access to safe water sources, are not only wealth indicators, but also improve welfare conditions of the household. Lack of safe water or basic sanitation affects an individual's health by increasing her/his chances of contracting diseases that are transmitted in unsanitary environments. Some assets may allow households to cope with the risks brought about by seasonal variations in incomes from farming, or other sources of vulnerability. If the head of the household suddenly becomes unemployed, or dies, or if a natural disaster occurs, the household could use its assets to smoothen consumption. Consequently, it is important to look at the amenities and assets of a household, as well as its access to basic social services to get a comprehensive assessment of its welfare conditions.

Figure 4.5 illustrates that, across the country, nearly all (99.5%) households in 2017 have access to improved water source (i.e., piped in dwelling, pipe in compound, neighbors' pipe, public outdoor

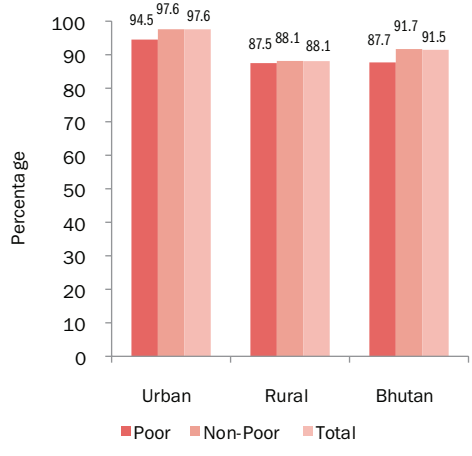
Figure 4.5 Proportion of Households with Access to Improved Water Source by Poverty Status and Area



tap, protected well, protected spring, and rainwater collection). There is hardly any disparity in access to improved water source between the poor and the non-poor.

Figure 4.6 shows that 91.5% of households have access to improved

Figure 4.6 Proportion of Households with Access to Improved Sanitation by Poverty Status and Area



sanitation (sewers or septic tanks, flush-latrines, pit with slab, or ventilated improved pit latrines). There is not much disparity in access to improved sanitation between the poor (87.7%) and the non-poor (91.7%).

BLSS 2017 found that the main source of energy for lighting throughout the country is electricity (98.6%), which is proportionally higher in urban areas (99.2%) than in rural areas (98.3%). Figure 4.7 illustrates that all poor (100.0%) and non-poor (99.2%) households in urban areas depend on electricity for lighting. However, in rural areas, only a little over 97% of the poor households have electricity as their main source of lighting.

Figure 4.7 Distribution of Households' Fuel Use for Lighting by Poverty Status and Area

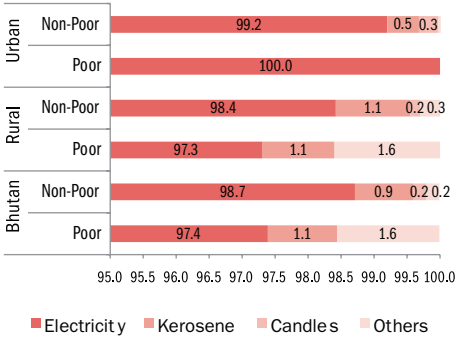
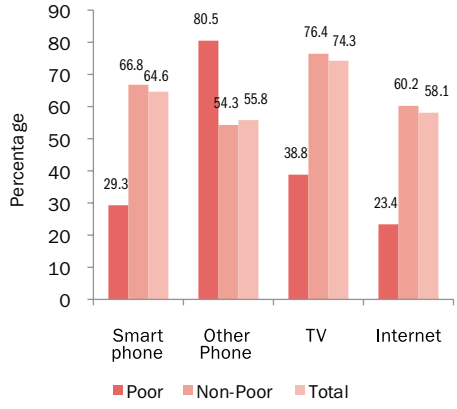


Figure 4.8 illustrates that 67% of non-poor households owns a smart phones while only 29% of poor households own the same. However, the proportion of other phone (ordinary phone) ownership is higher for poor households (80.5%) as compared to non-poor households (54.3%).

Figure 4.8 Proportion of the Population with Ownership of Mobile phone, TV and Internet Connection by Poverty Status



The disparity between the poor and the non-poor is also evident for ownership of television and for access to Internet connection in their homes. Only 39% among the poor households have television, compared to 76% for non-poor households. There is a marked increase in Internet connection at home compared to BLSS 2012 (11.6%). According to BLSS 2017, 58% of households have Internet connection at home, with a higher proportion among non-poor households (60.2%), compared to poor households (23.4%).

4.4. Perception and Priorities

In BLSS 2017, questions about the perception of poverty and happiness were asked among households interviewed. The household head was asked if he/she considered the household to be poor. This is considered to be a measure of perceived

poverty. Across the country, at least one in six (15.3%) of the household heads considers their households to be either poor or very poor. In the urban areas, the perceived poverty rate (poor or very poor) is 8.4%, which is mostly driven by the poor households (54.6%). There are at least 11% of household heads who do not consider their households to be poor, yet the analysis of survey data shows that they are actually poor. About one in seven (14%) household heads belonging to non-poor households consider their households to be poor or very poor, and the proportion is more than double in rural areas (17.6%) as compared to urban areas (8.2%).

It could be useful to develop a different poverty profile based on perceived (subjective) poverty, which is far easier and simpler to ask. It is generally true that the subjective poverty line is much higher than the poverty line. The mean per-capita expenditure (in real terms) of the perceived poor is Nu4,606, compared to Nu1,770 for the poor.

Regarding perception on happiness (Table 4.3), a majority of the household heads reported that they were moderately happy (39.2%) or very happy (36.3%). Although there is hardly any difference between the poor and the non-poor who reported to be moderately happy, the proportion of household heads who reported being very happy is much higher among the non-poor households; around 24% and 13% higher in urban and rural areas, respectively. More poor households reported being neither happy nor unhappy as compared to non-poor households in both urban and rural areas.

BLSS 2017 respondents were asked to identify an action agenda for the Government that would improve their welfare. Most of the poor, especially in the rural areas, suggest that building of roads, water supply, public transport, and

Table 4.2 Household Distribution of Subjective Poverty by Area and Poverty Status

Area/ Poverty Status	Not poor	Neither poor nor non-poor	Poor	Very poor	Don't know
Urban	**29.0**	**60.6**	**7.5**	**0.9**	**2.0**
poor	18.4	26.9	25.5	29.2	0.0
Non-poor	29.0	60.8	7.4	0.8	2.0
Rural	**15.2**	**63.7**	**16.5**	**2.6**	**2.0**
poor	11.0	53.0	28.2	7.1	0.8
Non-poor	15.6	64.7	15.4	2.2	2.1
Bhutan	**20.1**	**62.6**	**13.3**	**2.0**	**2.0**
poor	11.2	52.2	28.1	7.7	0.8
Non-poor	20.7	63.2	12.4	1.7	2.1

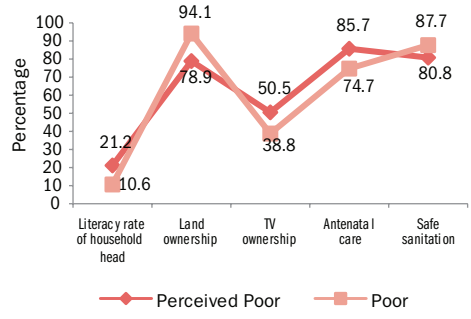
Table 4.3 Household Distribution of Subjective Happiness by Area and Poverty Status

Area/ Poverty Status	Very Happy	Moderately happy	Neither happy/ unhappy	Moderately unhappy	Very unhappy
Urban	**38.2**	**40.1**	**16.3**	**2.3**	**3.0**
poor	14.2	38.4	22.5	19.4	5.5
Non-poor	38.4	40.2	16.3	2.3	3.0
Rural	**35.3**	**38.7**	**19.2**	**4.4**	**2.4**
poor	23.4	36.5	28.2	7.3	4.5
Non-poor	36.4	38.9	18.4	4.1	2.2
Bhutan	**36.3**	**39.2**	**18.2**	**3.7**	**2.6**
poor	23.1	36.6	28.0	7.7	4.6
Non-poor	37.2	39.4	17.6	3.4	2.5

medical facilities should be the priorities of the Government. In urban areas, poor households specified job creation, water supply, roads, and medical facilities as priority concerns.

Figure 4.9 shows the difference for some indicators among the poor and those who perceived themselves as poor. The literacy rate of the household heads (10.6%), TV ownership (38.8%), and access to antenatal care (74.7%) are lower for the poor than for the perceived poor while land ownership (94.1%) and safe sanitation (87.7%) are higher for the poor as compared to the perceived poor.

Figure 4.9 Rate of Characteristics for Perceived Poor and Poor Households



Chapter 5. Inequality

Poverty indicators focus on the population or households at the bottom of the per capita consumption distribution, but it is also important to look at the spread of consumption over the entire population using inequality indicators. There is much interest in measuring inequality since high levels of inequality may contribute to, if not exacerbate, poverty. Growth is known to be important for poverty reduction. High inequality may result to lower subsequent and sustained economic growth and, consequently, in less poverty reduction. A high level of inequality may make it difficult for the poor to have a substantial share of the benefits of subsequent economic growth. Inequality indicators attempt to measure the deviation of a given consumption distribution from the ideal distribution, called perfect equality.

5.1. Consumption Quintiles

Typically, the population is ranked by ascending order of per capita consumption and the distribution is divided into fifths, i.e., 20% of the population wor equivalent quintiles. In Bhutan, the share of national consumption of the poorest quintile (6.7%) [4] is only one sixth that of the share of the richest quintile of the population (Figure 5.1). Although the shares of the poorest quintile in urban and rural areas are almost similar, the share of the richest quintile in the rural areas is higher than that of the urban areas.

Figure 5.1 Per Capita Consumption Quintiles

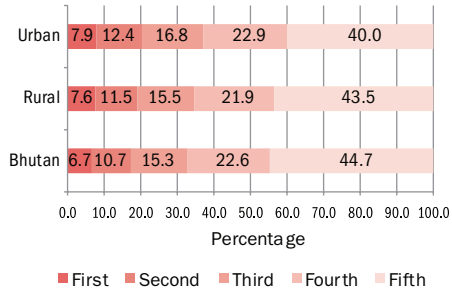


Table 5.1 shows that a person belonging to the richest 20% of the national population consumes on average 6.8 times more than a person belonging to the bottom 20% of the population. This difference is similar to the estimates in PAR 2012, suggesting that there are no improvements in

4 The consumption aggregates for the poverty analysis is different than the one reported in the BLSS Report 2017 and therefore the share may not exactly correspond. Refer Technical Note 1 of this Report for further information.

Table 5.1 Average Monthly Real Per Capita Consumption (Nu), Share in National Consumption, Average Share of Food to Total Consumption, Average Household Size by Consumption Quintile

Indicator	Lowest	Lower Middle	Middle	Upper Middle	Upper	Overall
Average Per Capita Consumption	2,443.8	4,075.6	5,928.2	8,769.2	16,733.1	6,758.0
Share of National Consumption	6.7	10.7	15.3	22.6	44.7	100
Average Share of Food Consumption to Total Consumption	61.5	59.4	55.4	51	45.4	54.5
Average Household Size	5.4	4.6	4.1	3.8	3.2	4.2

consumption inequality. A person in the top 10% consumes 1.6 times more than a person in the bottom 40% of the population (which is also referred to as Palma ratio). As is to be expected from Engel's Law, the proportion of total consumption allocated to food tends to decrease as the level of per capita real consumption increases.

5.2. Gini Index

Consumption inequality can also be examined using graphical tools such as the Lorenz curve, which maps the cumulative consumption share on the vertical axis against the distribution of the population on the horizontal axis. If each household had the same consumption, the resulting curve would be a 45-degree line known as the line of perfect equality. Figure 5.2 illustrates the Lorenz curve of total household consumption in Bhutan. The further the Lorenz curve is from the line of perfect equality, the higher the level of inequality. The Lorenz curve here indicates that inequality in urban and rural areas is very pronounced. The degree of inequality is similar in urban and rural areas. This similarity may be the result of in-country remittances, or households residing in 'rural' areas that have some members who are earning in 'urban' areas, thereby, contributing to the inequality observed. In addition, it may suggest the need to examine the current definition of urban and rural areas.

The Gini coefficient, measured by the ratio of the area between the line of perfect equality to the Lorenz curve, to the area (of the triangle) under the line of perfect equality, is a commonly used indicator of inequality. The Gini index ranges between 0 and 1 (with zero meaning perfect equality and one meaning perfect inequality). The typical values of the Gini

Figure 5.2 Lorenz Curve of Per Capita Consumption by Area

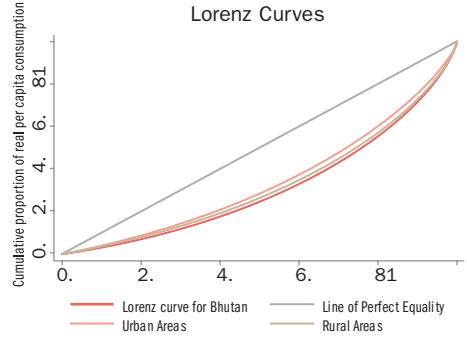
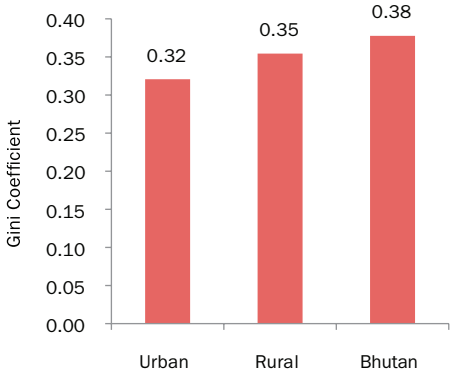


Figure 5.3 Gini Coefficient by Area



coefficient range between 0.2 and 0.5. While comparisons with previous estimates and international figures may be carried out, but such comparisons should be done with much caution. Comparisons are more meaningful across groups within the country. Figure 5.3 provides the Gini index at the national level and within urban and rural areas. The Gini at the national level (0.38) is observed to be higher than that of urban (0.32) or rural (0.35) areas.

Chapter 6. Conclusion

The Royal Government of Bhutan has been, over the past years, implementing sustainable development activities with the focus of increasing the living standards of its citizens. The 10th FYP in particular aimed to alleviate poverty under the theme, 'Poverty Reduction.' The 11th FYP also had plans and programmes geared towards the reduction of poverty. The Millennium Declaration, signed by the global community in 2000 at the United Nations, was a commitment to ensuring that poverty is reduced to half its 1990 status by 2015. The Sustainable Development Goals (SDGs) further reaffirmed the global commitment to poverty reduction.

This is the fourth Poverty Analysis Report produced by the NSB. From 2007 onwards, poverty indicators were produced at the *Dzongkhag* level. The poverty rates have been decreasing consistently from 31.7% in 2003 to 23.2% in 2007 and 12.0% in 2012.

Besides providing comparable and updated poverty profiles, PAR 2017 also presents a spatial distribution of poverty in Bhutan at the *Dzongkhag* level, and includes the four *Thromdes*. Updated information about the conditions of the poor presented in this Report conveys information necessary to guide the implementation of plans and programmes aimed at eradicating poverty and improving the living standards of the poor in Bhutan. This Report shows that poverty in Bhutan is still very much a rural phenomenon, and that living standards vary considerably across the *Dzongkhags*.

While understanding drivers of poverty reduction requires extensive data analyses, our preliminary analyses show that most of the poverty reduction between 2012 and 2017 was due to increasing non-food consumption with no major change in food consumption patterns. For example, surveyed households on average spend more on transportation, clothing, and recreation in 2017, compared to 2012, after adjusting for inflation. The NSB plans to conduct a thorough assessment of poverty reduction in the near future.

The pace of poverty reduction appears to have slowed down between 2012 and 2017, relative to the period between 2007 and 2012. However, an analysis using the World Development Indicators by the World Bank shows that Bhutan's poverty reduction over the last 10 years is still remarkable from a global perspective. Of

the 38 countries for which there are more than three national poverty estimates since 2005 [5], Bhutan ranks 7th in terms of the rate of poverty reduction (23.2% to 8.2% in 10 years or 9.9% reduction in poverty headcount rate every year).

Using the same dataset, but looking at the two episodes (2007-2012 and 2012-2017) separately, Bhutan's poverty reduction ranked in the 85th percentile between 2007 and 2012, and in the 67th percentile between 2012 and 2017. Even a seemingly slowed rate of poverty reduction between 2012 and 2017 outperformed approximately two thirds of all available episodes since 2005.

Poverty is an important concern not only for those who are poor but also represents a social problem that requires joint efforts by the Government, the private sector, and the development partners in addressing it. Development plans should promote sustained, broad-based inclusive growth, speeding up growth in lagging regions, and reducing poverty in more deprived population groups. There is a need to learn from the successes and failures in poverty reduction of other countries, and customize plans for Bhutan. It is hoped that this report will help all development stakeholders to understand the living conditions of the poor in the country, and to listen to their often unheard voices in order to generate informed discussions and policy actions.

5 This also excludes countries in Europe and Central Asia region where many countries use relative poverty lines to track national poverty

Annex I: Additional Statistical Tables

Table A.1 Household Poverty by *Dzongkhag*

Dzongkhag	Poverty rate	Standard error	Distribution of the Poor	Distribution of Households
Bumthang	1.7	0.6	0.7	3,836
Chhukha	2.2	0.5	3.5	14,865
Phuentsholing *Thromde*	*0.7*	*0.4*	*0.4*	*5,125*
Other than Phuentsholing *Thromde*	*3.0*	*0.7*	*3.1*	*9,740*
Dagana	23.7	4.5	15.0	5,974
Gasa	7.4	3.0	0.7	873
Haa	1.1	0.7	0.3	2,752
Lhuentse	5.2	1.9	2.1	3,754
Monggar	14.0	2.5	13.4	9,049
Paro	0.2	0.2	0.2	8,969
Pema Gatshel	10.1	2.4	7.0	6,536
Punakha	1.8	0.6	1.2	6,450
Samdrup Jongkhar	4.5	1.1	4.1	8,502
Samdrup Jongkhar *Thromde*	*0.5*	*0.4*	*0.1*	*2,379*
Other than Samdrup Jongkhar *Thromde*	*6.1*	*1.5*	*3.9*	*6,123*
Samtse	8.5	1.5	13.1	14,503
Sarpang	8.4	1.2	9.4	10,537
Gelephu *Thromde*	*1.1*	*0.7*	*9.1*	*2,506*
Other than Gelephu *Thromde*	*10.7*	*1.6*	*0.4*	*8,031*
Thimphu	0.3	0.1	1.1	30,147
Thimphu *Thromde*	*0.2*	*0.1*	*0.6*	*24,266*
Other than Thimphu *Thromde*	*0.8*	*0.5*	*0.5*	*5,882*
Trashigang	7.8	1.9	9.3	11,228
Trashi Yangtse	8.7	1.5	3.9	4,228
Trongsa	9.6	2.1	4.0	3,899
Tsirang	2.6	1.2	1.4	5,074
Wangdue Phodrang	3.0	1.0	2.8	8,847
Zhemgang	16.3	3.0	6.9	3,988
Bhutan	**5.7**	**0.3**	**100.0**	**164,011**

Table A.2 Household Subsistence Poverty by *Dzongkhag*

Dzongkhag	Poverty rate	Standard error	Distribution of the Poor	Distribution of Households
Bumthang	0.0	0.0	0.0	3,836
Chhukha	0.1	0.1	1.7	14,865
Phuentsholing Thromde	*0.0*	*0.0*	*0.0*	*5,125*
Other than Phuentsholing Thromde	*0.3*	*0.3*	*1.7*	*9,740*
Dagana	7.0	2.1	25.1	5,974
Gasa	0.6	0.6	0.3	873
Haa	0.5	0.5	0.9	2,752
Lhuentse	0.9	0.7	2.0	3,754
Monggar	3.2	0.9	17.5	9,049
Paro	0.0	0.0	0.0	8,969
Pema Gatshel	1.1	0.6	4.2	6,536
Punakha	0.4	0.4	1.5	6,450
Samdrup Jongkhar	1.4	0.5	6.9	8,502
Samdrup Jongkhar Thromde	*0.3*	*0.2*	*0.2*	*2,379*
Other than Samdrup Jongkhar Thromde	*2.5*	*1.0*	*6.4*	*6,123*
Samtse	1.0	0.4	9.0	14,503
Sarpang	1.3	0.4	7.9	10,537
Gelephu Thromde	*0.0*	*0.0*	*0.0*	*2,506*
Other than Gelephu Thromde	*2.5*	*0.7*	*7.9*	*8,031*
Thimphu	0.0	0.0	0.0	30,147
Thimphu Thromde	*0.0*	*0.0*	*0.0*	*24,266*
Other than Thimphu Thromde	*0.0*	*0.0*	*0.0*	*5,882*
Trashigang	1.1	0.6	7.6	11,228
Trashi Yangtse	1.0	0.5	2.5	4,228
Trongsa	2.5	1.1	5.7	3,899
Tsirang	0.2	0.2	0.6	5,074
Wangdue Phodrang	0.2	0.2	1.0	8,847
Zhemgang	2.7	1.1	6.4	3,988
Bhutan	**1.5**	**0.2**	**100.0**	**164,011**

Table A.3 Population Poverty Gap and Poverty Squared Gap by *Dzongkhag*

Dzongkhag	Index	Standard error	Contribution to total	Index	Standard error	Contribution to total	Distribution of Population
Bumthang	0.2	0.1	0.3	0.0	0.0	0.2	15,959
Chhukha	0.7	0.2	3.7	0.2	0.1	3.0	63,355
Phuentsholing *Thromde*	*0.1*	*0.1*	*0.2*	*0.0*	*0.0*	*0.1*	*20,560*
Other than Phuentsholing *Thromde*	*0.9*	*0.2*	*3.5*	*0.2*	*0.1*	*2.8*	*42,795*
Dagana	9.1	2.1	18.7	3.2	0.9	21.5	23,453
Gasa	1.7	0.7	0.5	0.3	0.2	0.4	3,575
Haa	0.2	0.2	0.2	0.1	0.1	0.2	10,995
Lhuentse	1.4	0.7	1.9	0.5	0.4	2.4	15,552
Monggar	3.6	0.7	13.2	1.0	0.2	12.6	41,956
Paro	0.0	0.0	0.1	0.0	0.0	0.1	36,329
Pema Gatshel	2.3	0.8	5.7	0.6	0.3	5.1	27,636
Punakha	0.4	0.2	0.9	0.1	0.0	0.7	26,724
Samdrup Jongkhar	1.4	0.4	4.4	0.5	0.1	4.8	36,154
Samdrup Jongkhar *Thromde*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.3*	*9,376*
Other than Samdrup Jongkhar *Thromde*	*1.8*	*0.5*	*4.3*	*0.6*	*0.2*	*4.5*	*26,778*
Samtse	2.2	0.4	12.1	0.7	0.2	12.4	63,132
Sarpang	2.3	0.4	8.5	0.6	0.1	7.6	41,254
Gelephu *Thromde*	*0.2*	*0.1*	*0.1*	*0.0*	*0.0*	*0.1*	*8,015*
Other than Gelephu *Thromde*	*2.9*	*0.5*	*8.4*	*0.8*	*0.2*	*7.5*	*33,238*
Thimphu	0.1	0.0	0.9	0.0	0.0	0.5	125,551
Thimphu *Thromde*	*0.1*	*0.0*	*0.6*	*0.0*	*0.0*	*0.5*	*98,148*
Other than Thimphu *Thromde*	*0.1*	*0.1*	*0.2*	*0.0*	*0.0*	*0.1*	*27,403*
Trashigang	2.2	0.7	9.0	0.7	0.4	10.2	47,102
Trashi Yangtse	1.9	0.4	2.6	0.5	0.2	2.4	15,363
Trongsa	3.4	0.8	5.3	1.1	0.3	5.9	17,768
Tsirang	0.6	0.3	1.1	0.2	0.1	1.0	20,409
Wangdue Phodrang	0.8	0.3	2.9	0.2	0.1	2.1	41,405
Zhemgang	4.7	1.0	8.0	1.3	0.3	7.2	19,224
Bhutan	**1.6**	**0.1**	**100**	**0.5**	**0.1**	**100**	**692,895**

Table A.4 Population Subsistence Poverty Gap and Subsistence Poverty Squared Gap by *Dzongkhag*

Dzongkhag	Index	Standard error	Contribution to total	Index	Standard error	Contribution to total	Distribution of Population
Bumthang	0.0	0.0	0.0	0.0	0.0	0.0	15,959
Chhukha	0.0	0.0	0.7	0.0	0.0	0.2	63,355
Phuentsholing Thromde	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*20,560*
Other than Phuentsholing Thromde	*0.0*	*0.0*	*0.7*	*0.0*	*0.0*	*0.2*	*42,795*
Dagana	1.7	0.7	24.1	0.4	0.2	21.8	23,453
Gasa	0.0	0.0	0.0	0.0	0.0	0.0	3,575
Haa	0.1	0.1	0.4	0.0	0.0	0.2	10,995
Lhuentse	0.4	0.4	4.2	0.1	0.1	4.8	15,552
Monggar	0.4	0.2	10.4	0.1	0.1	8.9	41,956
Paro	0.0	0.0	0.0	0.0	0.0	0.0	36,329
Pema Gatshel	0.3	0.2	4.6	0.0	0.0	3.0	27,636
Punakha	0.0	0.0	0.6	0.0	0.0	1.0	26,724
Samdrup Jongkhar	0.2	0.1	5.5	0.1	0.0	4.5	36,154
Samdrup Jongkhar Thromde	*0.1*	*0.1*	*0.6*	*0.0*	*0.0*	*1.0*	*9,376*
Other than Samdrup Jongkhar Thromde	*0.3*	*0.1*	*4.9*	*0.1*	*0.0*	*3.5*	*26,778*
Samtse	0.4	0.2	15.4	0.1	0.1	16.7	63,132
Sarpang	0.2	0.1	5.5	0.0	0.0	3.0	41,254
Gelephu Thromde	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*8,015*
Other than Gelephu Thromde	*0.3*	*0.1*	*5.5*	*0.0*	*0.0*	*3.0*	*33,238*
Thimphu	0.0	0.0	0.0	0.0	0.0	0.0	125,551
Thimphu Thromde	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*98,148*
Other than Thimphu Thromde	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*27,403*
Trashigang	0.4	0.3	11.8	0.2	0.2	23.1	47,102
Trashi Yangtse	0.3	0.1	2.5	0.1	0.1	3.4	15,363
Trongsa	0.7	0.3	7.6	0.1	0.1	5.7	17,768
Tsirang	0.1	0.1	1.2	0.0	0.0	1.2	20,409
Wangdue Phodrang	0.0	0.0	0.2	0.0	0.0	0.0	41,405
Zhemgang	0.4	0.2	5.2	0.1	0.0	2.4	19,224
Bhutan	**0.2**	**0.0**	**100.0**	**0.1**	**0.0**	**100.0**	**692,895**

Table A.5 Population Poverty Gap and Poverty Squared Gap by Area

	Poverty Gap			Poverty Squared Gap			
Area	Index	Standard error	Contribution to Total	Index	Standard error	Contribution to Total	Distribution of Population
Urban	0.2	0.1	3.1	0.0	0.0	2.6	231,805
Rural	2.4	0.2	96.9	0.7	0.1	97.4	461,090
Bhutan	**1.6**	**0.1**	**100.0**	**0.5**	**0.1**	**100.0**	**692,895**

Table A.6 Population Subsistence Poverty Gap and Subsistence Poverty Squared Gap by Area

Area	Poverty Gap			Poverty Squared Gap			Distribution of Population
	Index	Standard error	Contribution to Total	Index	Standard error	Contribution to Total	
Urban	0.0	0.0	0.6	0.0	0.0	1.0	231,805
Rural	0.4	0.1	99.4	0.1	0.0	99.0	461,090
Bhutan	**0.2**	**0.0**	**100.0**	**0.1**	**0.0**	**100.0**	**692,895**

Table A.7 Household Poverty Rate, Poverty Gap and Poverty Squared Gap by Area and Sex of Household Head

Area/Sex of Household Head	Poverty Rate		Poverty Gap		Poverty Squared Gap		Distribution of Households
	Index	Contribution to Total	Index	Contribution to Total	Index	Contribution to Total	
Urban	**0.5**	**100.0**	**0.1**	**100.0**	**0.0**	**100.0**	***58,333***
Male	0.6	82.0	0.1	76.2	0.0	63.7	41,373
Female	0.3	18.0	0.1	23.8	0.0	36.3	16,960
Rural	**8.7**	**100.0**	**1.7**	**100.0**	**0.5**	**100.0**	***105,678***
Male	9.4	66.4	1.8	65.6	0.6	66.4	64,691
Female	7.5	33.6	1.5	34.4	0.4	33.6	40,987
Bhutan	**5.7**	**100.0**	**1.1**	**100.0**	**0.3**	**100.0**	***164,011***
Male	5.9	66.8	1.1	66.0	0.4	66.4	*106,064*
Female	5.4	33.2	1.1	34.0	0.3	33.6	*57,947*

Table A.8 Household Poverty Rate Poverty Gap and Poverty Squared Gap by Area and Age of Household Head

Area/Age of Household Head	Poverty Rate		Poverty Gap		Poverty Squared Gap		Distribution of Households
	Index	Contribution to Total	Index	Contribution to Total	Index	Contribution to Total	
Urban	**0.5**	**100.0**	**0.1**	**100.0**	**0.0**	**100.0**	**58,333**
< 25	0.0	0.0	0.0	0.0	0.0	0.0	2,802
25-34	0.3	18.5	0.0	14.5	0.0	9.8	20,805
35-44	0.4	22.9	0.1	30.0	0.0	28.2	16,071
45-54	0.6	26.3	0.1	17.2	0.0	11.8	11,502
55-64	1.6	25.3	0.3	24.1	0.1	21.6	4,535
65 +	0.7	6.9	0.3	14.3	0.2	28.7	2,618
Rural	**8.7**	**100.0**	**1.7**	**100.0**	**0.5**	**100.0**	**105,678**
< 25	4.9	1.0	0.6	0.6	0.1	0.4	1,821
25-34	6.5	11.8	1.3	11.7	0.4	11.6	16,503
35-44	8.5	22.2	1.6	21.7	0.5	20.2	23,723
45-54	8.2	21.0	1.6	21.0	0.5	20.0	23,567
55-64	8.7	21.0	1.7	20.8	0.5	22.2	22,214
65 +	11.8	23.0	2.4	24.2	0.8	25.6	17,851
Bhutan	**5.7**	**100.0**	**1.1**	**100.0**	**0.3**	**100.0**	**164,011**
< 25	1.9	0.9	0.2	0.6	0.0	0.4	4,623
25-34	3.0	12.0	0.6	11.8	0.2	11.5	37,308
35-44	5.3	22.2	1.0	21.9	0.3	20.4	39,793
45-54	5.7	21.2	1.1	20.9	0.3	19.8	35,069
55-64	7.5	21.2	1.4	20.9	0.5	22.2	26,749
65 +	10.4	22.5	2.2	23.9	0.7	25.7	20,469

Table A.9 Household Poverty and Subsistence Poverty Rate by area and Household Size

Area/ Household Size	Poverty Rate		Subsistence Rate		Distribution of Households
	Index	Contribution to National	Index	Contribution to National	
Urban	**0.5**	**3.0**	**0.0**	**1.3**	***58,333***
1	0.0	0.0	0.0	0.0	3,814
2-3	0.2	0.4	0.1	0.7	19,417
3-4	0.4	1.0	0.0	0.6	26,235
5-8	1.1	1.0	0.0	0.0	8,034
9+	7.3	0.6	0.0	0.0	833
Rural	**8.7**	**97.0**	**1.6**	**98.7**	***105,678***
1	1.4	0.8	0.8	2.7	5,729
2-3	2.4	8.1	0.3	6.3	32,043
3-4	8.5	36.4	1.2	29.6	40,524
5-8	15.5	39.0	3.1	43.9	23,752
9+	33.0	12.7	8.2	16.3	3,630
Bhutan	**5.7**	**100.0**	**1.0**	**100.0**	***164,011***
1	0.8	0.8	0.5	2.7	*9,543*
2-3	1.6	8.5	0.2	7.0	*51,460*
3-4	5.3	37.4	0.7	30.1	*66,759*
5-8	11.8	39.9	2.3	43.9	*31,786*
9+	28.2	13.4	6.7	16.3	*4,463*

Table A.10 Population Literacy Rate for Aged Six Years and Above by *Dzongkhag* and Poverty Status

Dzongkhag	Poor	Non-poor	Total
Bumthang	89.4	85.2	85.3
Chhukha	50.1	66.9	66.3
Phuentsholing *Thromde*	*72.5*	*83.3*	*83.2*
Other than Phuentsholing *Thromde*	*47.9*	*58.8*	*58.3*
Dagana	65.1	66.1	65.8
Gasa	65.9	63.9	64.1
Haa	42.9	59.8	59.6
Lhuentse	0.0	62.9	62.6
Monggar	52.4	63.2	61.4
Paro	60.0	63.0	63.0
Pema Gatshel	60.7	65.4	64.8
Punakha	41.2	61.4	60.8
Samdrup Jongkhar	58.4	68.8	68.1
Samdrup Jongkhar *Thromde*	*0.0*	*78.7*	*78.5*
Other than Samdrup Jongkhar *Thromde*	*59.2*	*65.1*	*64.6*
Samtse	54.0	62.1	61.1
Sarpang	58.2	69.5	68.1
Gelephu *Thromde*	*60.0*	*85.7*	*85.4*
Other than Gelephu *Thromde*	*58.1*	*64.9*	*63.9*
Thimphu	74.7	80.2	80.2
Thimphu *Thromde*	*75.9*	*84.2*	*84.2*
Other than Thimphu *Thromde*	*73.1*	*66.3*	*66.4*
Trashigang	49.1	58.4	57.5
Trashi Yangtse	50.3	60.3	59.1
Trongsa	60.4	66.3	65.5
Tsirang	55.4	63.2	62.8
Wangdue Phodrang	47.1	45.7	45.7
Zhemgang	61.1	73.7	70.5
Bhutan	**56.8**	**66.8**	**66.0**

Table A.11 Proportion of Women (15-49 years) Who Received Antenatal Care by *Dzongkhag* and Poverty Status

Dzongkhag	Poor	Non-poor	Total
Bumthang	0.0	83.5	83.5
Chhukha	100.0	88.7	89.1
Phuentsholing *Thromde*	*0.0*	*93.1*	*93.1*
Other than Phuentsholing *Thromde*	*100.0*	*84.0*	*85.2*
Dagana	100.0	70.8	74.5
Gasa	100.0	100.0	100.0
Haa	0.0	92.0	92.0
Lhuentse	0.0	84.9	84.9
Monggar	80.0	98.1	95.3
Paro	0.0	95.0	92.6
Pema Gatshel	50.0	72.2	67.6
Punakha	0.0	92.5	92.5
Samdrup Jongkhar	100.0	97.8	97.8
Samdrup Jongkhar *Thromde*	*0.0*	*91.7*	*91.7*
Other than Samdrup Jongkhar *Thromde*	*100.0*	*100.0*	*100.0*
Samtse	100.0	100.0	100.0
Sarpang	76.9	96.9	95.1
Gelephu *Thromde*	*0.0*	*94.8*	*86.5*
Other than Gelephu *Thromde*	*100.0*	*97.5*	*97.7*
Thimphu	0.0	95.3	95.3
Thimphu *Thromde*	*0.0*	*96.6*	*96.6*
Other than Thimphu *Thromde*	*0.0*	*84.0*	*84.0*
Trashigang	75.0	95.6	93.9
Trashi Yangtse	100.0	100.0	100.0
Trongsa	100.0	100.0	100.0
Tsirang	0.0	79.0	79.0
Wangdue Phodrang	100.0	60.6	66.2
Zhemgang	0.0	83.8	59.7
Bhutan	**74.7**	**91.9**	**90.9**

Table A.12 Proportion of Population Who Reported Sick/Injured Four Weeks Prior to the Survey by *Dzongkhag* and Poverty Status

Dzonkhag	Poor	Non-poor	Total
Bumthang	2.3	15.4	15.2
Chhukha	3.1	7.8	7.6
Phuentsholing *Thromde*	7.0	14.4	14.4
Other than Phuentsholing *Thromde*	2.7	4.5	4.4
Dagana	3.2	3.1	3.1
Gasa	38.5	18.3	20.9
Haa	0.0	7.5	7.5
Lhuntse	16.3	10.8	11.2
Monggar	27.3	20.8	21.9
Paro	16.7	13.1	13.1
Pema Gatshel	5.2	11.2	10.4
Punakha	16.4	12.2	12.3
Samdrup Jongkhar	9.2	8.1	8.2
Samdrup Jongkhar *Thromde*	0.0	4.6	4.5
Other than Samdrup Jongkhar *Thromde*	9.3	9.4	9.4
Samtse	9.7	15.2	14.6
Sarpang	8.3	12.4	11.9
Gelephu *Thromde*	0.0	6.9	6.8
Other than Gelephu *Thromde*	8.5	14.0	13.1
Thimphu	13.9	14.0	14.0
Thimphu *Thromde*	18.7	15.4	15.4
Other than Thimphu *Thromde*	7.4	9.0	9.0
Trashigang	13.8	10.9	11.2
Trashi Yangtse	10.8	11.5	11.4
Trongsa	16.5	12.1	12.7
Tsirang	6.3	12.1	11.8
Wangdue Phodrang	5.9	12.0	11.7
Zhemgang	0.3	4.0	3.1
Total	**10.5**	**12.1**	**12.0**

Table A.13 Proportion of Population with Access to Improved Water Source by *Dzongkhag* and Poverty Status

Dzongkhag	Poor	Non-Poor	Total
Bumthang	100.0	99.8	99.8
Chhukha	100.0	99.5	99.5
Phuentsholing *Thromde*	*100.0*	*100.0*	*100.0*
Other than Phuentsholing *Thromde*	*100.0*	*99.3*	*99.3*
Dagana	100.0	100.0	100.0
Gasa	100.0	100.0	100.0
Haa	50.0	100.0	99.5
Lhuentse	100.0	100.0	100.0
Monggar	98.2	99.7	99.5
Paro	100.0	99.6	99.6
Pema Gatshel	100.0	100.0	100.0
Punakha	100.0	99.3	99.3
Samdrup Jongkhar	100.0	99.3	99.3
Samdrup Jongkhar *Thromde*	*100.0*	*99.0*	*99.0*
Other than Samdrup Jongkhar *Thromde*	*100.0*	*99.4*	*99.4*
Samtse	100.0	98.7	98.8
Sarpang	98.0	99.7	99.6
Gelephu *Thromde*	*100.0*	*100.0*	*100.0*
Other than Gelephu *Thromde*	*97.9*	*99.6*	*99.5*
Thimphu	100.0	99.5	99.5
Thimphu *Thromde*	*100.0*	*99.4*	*99.4*
Other than Thimphu *Thromde*	*100.0*	*99.8*	*99.8*
Trashigang	100.0	99.6	99.6
Trashi Yangtse	100.0	100.0	100.0
Trongsa	100.0	98.8	98.9
Tsirang	100.0	99.2	99.2
Wangdue Phodrang	100.0	100.0	100.0
Zhemgang	100.0	99.2	99.3
Bhutan	**99.4**	**99.5**	**99.5**

Table A.14 Proportion of Population with Access to Improved Sanitation by *Dzongkhag* and Poverty Status

Dzongkhag	Poor	Non-Poor	Total
Bumthang	57.9	92.8	92.3
Chhukha	74.5	91.7	91.3
Phuentsholing *Thromde*	*100.0*	*100.0*	*100.0*
Other than Phuentsholing *Thromde*	*71.4*	*87.3*	*86.8*
Dagana	97.8	89.1	91.1
Gasa	100.0	76.2	77.9
Haa	100.0	78.7	78.9
Lhuentse	88.2	92.2	92.0
Monggar	96.4	99.5	99.0
Paro	100.0	88.5	88.5
Pema Gatshel	95.7	96.4	96.3
Punakha	0.0	73.9	72.6
Samdrup Jongkhar	91.0	95.6	95.4
Samdrup Jongkhar *Thromde*	*100.0*	*91.0*	*91.0*
Other than Samdrup Jongkhar *Thromde*	*90.7*	*97.4*	*97.0*
Samtse	91.9	98.1	97.6
Sarpang	72.0	92.2	90.5
Gelephu *Thromde*	*100.0*	*98.6*	*98.6*
Other than Gelephu *Thromde*	*71.1*	*90.0*	*88.0*
Thimphu	89.7	97.0	97.0
Thimphu *Thromde*	*81.4*	*98.0*	*98.0*
Other than Thimphu *Thromde*	*100.0*	*93.0*	*93.0*
Trashigang	85.3	89.0	88.7
Trashi Yangtse	76.7	85.1	84.4
Trongsa	64.9	78.4	77.1
Tsirang	61.5	89.1	88.4
Wangdue Phodrang	93.8	82.8	83.1
Zhemgang	100.0	95.9	96.6
Bhutan	**87.7**	**91.7**	**91.5**

Table A.15 Proportion of Population using Solid Fuels by *Dzongkhag* and Poverty Status

Dzongkhag	Poor	Non-Poor	Total
Bumthang	11.6	7.8	7.9
Chhukha	59.4	24.4	25.2
Phuentsholing *Thromde*	*0.0*	*0.6*	*0.6*
Other than Phuentsholing *Thromde*	*66.7*	*37.2*	*38.1*
Dagana	47.3	11.5	19.9
Gasa	53.8	35.5	36.9
Haa	100.0	17.0	17.8
Lhuentse	58.8	25.6	27.4
Monggar	51.0	22.3	26.3
Paro	0.0	1.9	1.9
Pema Gatshel	32.0	27.2	27.7
Punakha	44.4	7.8	8.5
Samdrup Jongkhar	79.6	36.7	38.6
Samdrup Jongkhar *Thromde*	*100.0*	*0.0*	*0.5*
Other than Samdrup Jongkhar *Thromde*	*78.9*	*51.8*	*53.4*
Samtse	94.6	49.4	53.2
Sarpang	57.0	20.0	23.1
Gelephu *Thromde*	*0.0*	*0.0*	*0.0*
Other than Gelephu *Thromde*	*58.8*	*26.9*	*30.3*
Thimphu	20.6	3.3	3.3
Thimphu *Thromde*	*17.0*	*0.1*	*0.2*
Other than Thimphu *Thromde*	*25.0*	*16.4*	*16.4*
Trashigang	72.3	37.8	40.5
Trashi Yangtse	24.8	19.1	19.6
Trongsa	25.7	9.7	11.2
Tsirang	84.6	28.9	30.4
Wangdue Phodrang	62.5	14.6	16.0
Zhemgang	8.2	14.0	13.1
Bhutan	**54.2**	**19.8**	**21.8**

Table A.16 Proportion of Households Who Have TV by *Dzongkhag* and Poverty Status

Dzongkhag	Poor	Non-Poor	Total
Bumthang	53.7	86.1	85.6
Chhukha	49.1	77.3	76.7
Phuentsholing *Thromde*	*100.0*	*92.8*	*92.8*
Other than Phuentsholing *Thromde*	*42.9*	*69.0*	*68.2*
Dagana	45.1	61.4	57.5
Gasa	76.9	61.3	62.4
Haa	50.0	81.2	80.9
Lhuentse	58.8	69.1	68.5
Monggar	27.7	61.0	56.3
Paro	0.0	91.0	90.8
Pema Gatshel	47.1	63.9	62.2
Punakha	0.0	82.7	81.3
Samdrup Jongkhar	22.6	66.4	64.4
Samdrup Jongkhar *Thromde*	*0.0*	*93.9*	*93.4*
Other than Samdrup Jongkhar *Thromde*	*23.4*	*55.0*	*53.1*
Samtse	25.7	66.4	62.9
Sarpang	41.6	74.7	71.9
Gelephu *Thromde*	*20.0*	*91.9*	*91.2*
Other than Gelephu *Thromde*	*42.3*	*68.7*	*65.9*
Thimphu	60.6	91.9	91.8
Thimphu *Thromde*	*69.1*	*95.4*	*95.4*
Other than Thimphu *Thromde*	*50.0*	*77.3*	*77.1*
Trashigang	29.9	69.4	66.4
Trashi Yangtse	51.9	67.3	65.9
Trongsa	51.4	71.0	69.1
Tsirang	53.8	72.1	71.6
Wangdue Phodrang	43.8	78.9	77.9
Zhemgang	48.7	64.1	61.6
Bhutan	**38.8**	**76.4**	**74.3**

Annex II: Technical Notes

Technical Note 1 (Measuring Aggregate Consumption)

Aggregations of consumption and expenditure data were made following the recommendations by A. Deaton and S. Zaidi (2002). Most of the information below is quoted from their paper.

a) Income versus consumption

In most industrialized countries, living standards and poverty are assessed with reference to income, not consumption. The empirical literature on the relationship between income and consumption has established, for both rich and poor countries, that consumption is smoother and less-variable than income. Observing consumption over a relatively short period, even a week or two, will tell us a great deal more about annual–or even longer period–living standards than will a similar observation on income. Although consumption has seasonal components they are of smaller amplitude than seasonal fluctuations in income in agricultural societies.

There are several other reasons why it is more practical to gather consumption rather than income data. Where self-employment, including small business and agriculture, is common, it is notoriously difficult to gather accurate income data, or indeed to separate business transactions from consumption transactions.

b) Food consumption

Households consume food obtained from a variety of different sources, and so in computing a measure of total food consumption to include as part of an aggregate welfare measure, it is important to include food consumed by the household from all possible sources. In particular, this measure should include not just (i) food purchased in the market place, including meals purchased away from home for consumption at or away from home, but also (ii) food that is home-produced, (iii) food items received as gifts or remittances from other households, as well as (iv) food received from employers as payment in-kind for services rendered.

BLSS 2017 food consumption module questionnaire contains separate sets of questions on: (a) purchased imported; (b) purchased domestic; and (c) non-purchased food items. BLSS 2017 food purchases module contains questions on purchases of a fairly comprehensive list of food items during a relatively short reference period, i.e., last seven days, last 30 days, and last 12 months. Data are collected on the total amount spent on purchasing each food item, and also on the quantities purchased, during the specified recall period.

Calculating the food purchases sub-aggregate involved converting all reported expenditures on food items to a uniform reference period—one month—and then aggregating these expenditures across all food items purchased by the household.

The 'last 30 days' data measure over the 'last 7 days' or the 'last 12 months' has the advantage of being closer to the concept that we want—usual consumption—over what actually happened in the last 7 days, which could have been unusual for any number of reasons—and reduces problems of seasonality, but suffers from measurement error if respondents find it difficult to calculate a reasonable answer. The last '12 months' may be too long a recall period to reveal accurate data. Thus, we prefer the 'last 30 days' data. If there are no available '30 days' data, we use the 'last 7 days' data and rescale the results. If there are no available '30 days' or 'last 7 days,' we use the 'last 12 months' data and rescale the results.

BLSS 2017 questionnaire also asks explicitly about the total value of meals taken outside the home by all household members; this amount is included in the food consumption aggregate as part of purchased consumption.

The questionnaire contains a separate set of questions on consumption of home-produced food items. Data are collected on both the value and quantity of consumption of each home-produced food item. The home-production food sub-aggregate can thus be calculated by adding the reported value of consumption of each of the home-produced food items in a manner analogous to that followed in the case of food purchases.

Consumption of food derived from payment in-kind, as well as in the form of gifts, remittances, etc., is added to the overall food aggregate. All quantities are reported in standard units. Analysis is performed on the quantities and unit prices to treat missing data and identify inconsistent data. Cases are noted where a household had declared consuming a non-zero quantity of a particular item, or households reported consumption values, but no corresponding information on quantities. Others had inconsistent data on quantities, or values (yielding outliers of unit prices). In such instances, median regional unit prices are used to make imputations. Median prices are preferred to mean prices, as they are less sensitive to outliers. When median price is not available at the lowest geographic level, we use prices reported by other households in the same *Dzongkhag*, depending on whichever is the next higher level of aggregation for which price information is available. Medians of unit price are computed and used separately for purchased and home-produced items.

c) Non-food consumption

Unlike many homogeneous food items, most non-food goods are too heterogeneous to permit the collection of information on quantities consumed, so BLSS 2017 collected data only on the value of non-foods purchased over the reference period. Data on purchases of non-food items are collected for two different recall periods, i.e., over the 12 months, or the last 1month, depending on how frequently the items concerned are typically purchased. Constructing the non-food aggregate thus entails converting all these reported amounts to a uniform reference period, one year, and then aggregating across the various items.

Not all non-food expenditures are included in the consumption aggregates. Also, some 'expenditures' require imputations.

1) Housing

What is required is a measure in monetary terms of the flow of services that the household receives from occupying its dwelling. Because house purchase is such a large and relatively rare expenditure, under no circumstances should expenditures for a housing purchase be included in the consumption aggregate.

Expenditure on house repairs and improvements were also excluded from the consumption aggregates.

In the hypothetical case where rental markets function perfectly and all households rent their dwellings, the rent paid is the obvious choice to include in the consumption aggregate. Whenever such rental data are available, they were used for constructing the housing sub-aggregate and the consumption total.

In most cases, however, households own the dwelling in which they reside and do not pay rent as such. Others are provided with housing free of charge (or at subsidized rates) by their employer, a friend, a relative, government, or other such entities. Non-renter households are asked how much it would cost them if they had to rent the dwelling in which they reside, and this 'implicit rental value' is used in place of actual rent.

2) Taxes

Expenditures on taxes and levies are not part of consumption, and are not included in the consumption total.

3) Repayment of debt and interest payments

All purchases of financial assets, as well as repayments of debt, and interest payments are excluded from the consumption aggregate.

4) Education

Education expenditure paid by the households is included in households' consumption.

5) Health

Expenditure on health is to a large extent a lumpy expenditure. One argument for exclusion is that such expenditure reflects a regrettable necessity that does nothing

to increase welfare. By including health expenditures for someone who has fallen sick, we register an increase in welfare when, in fact, the opposite has occurred. The fundamental problem here is our inability to measure the loss of welfare associated with being sick, and which is (presumably) ameliorated to some extent by health expenditures.

Including the latter without allowing for the former is clearly incorrect, though excluding health expenditures altogether means that we miss the difference between two people, both of whom are sick, but only one of which pays for treatment. It is also true that some health expenditures—for example cosmetic expenditures—are discretionary and welfare enhancing, and that it is difficult to separate 'necessary' from 'unnecessary' expenditures, even if we could agree on which is which. It is also difficult without special health questionnaires to get at the whole picture of health financing. Some people have insurance, so that expenditures are only 'out of pocket' expenditures which may be only a small fraction of the total, while others have none, and may bear the whole cost. Simply adding up expenditures will not give the right answer.

Expenditure on hospitalizations, consultations, and analyses are excluded from the household consumption. Purchase of medicine is, however, included.

6) Remittances

Another group of expenditures are charitable contributions, and remittances to other households. Their inclusion in the consumption aggregate would involve double-counting if, as one would expect, the transfers show up in the consumption of other households. We therefore excluded them from household consumption.

7) Other lumpy expenditures

While almost all households incur relatively large expenditures on relatively infrequent expenditures such as marriages and dowries, births, and funerals at some stage, only a relatively small proportion of households are likely to make such expenditures during the reference period typically covered by the survey. Ideally, we would want to "smooth" these lumpy expenditures, spreading them over several years, but lacking the information to do so—which might come, for example, by incorporating multi-year reference periods for such items— we left them out of the consumption aggregate.

8) Durable Goods

Another important group of items to consider are items such as consumer durables whose useful life typically spans a time-period greater than the interval for which the consumption aggregate is being constructed. From the point of view of household welfare, rather than using expenditure on the purchase of durable goods during the recall period, the appropriate

measure of consumption of durable goods is the *value of services* that the household receives from all the durable goods in its possession over the relevant time period.

d) Computing regional price deflators

Before our measure of consumption could be used to compare standards of living of individuals residing in different parts of the country, it is necessary to take into account differences in cost of living. To convert total expenditure into money metric utility, the price index must be tailored to the household's own demand pattern, a demand pattern that varies with the household's income, demographic composition, location, and other characteristics. The calculation of money metric utility thus requires that the nominal values be deflated by a Paasche price index, in which the weights vary from household to household.

Data collected by the BLSS 2007 were used to construct the regional price deflators.

The Paasche price index for household h is given by:

$$P_p^h = (\sum w_k^h (p_k^0 / p_k^h))^{-1}$$

where p_k^0 is the reference unit price for good k, p_k^h is the unit price paid for good k by household h, and w_k^h is the share of household h's budget devoted to good k. The weights used for the price index are the quantities consumed by the household itself and, therefore, differ from one household to another. In other words, these indexes involve, not only the prices faced by household h in relation to the reference prices, but also household h's expenditure pattern, something that is not true of a Laspeyres index.

The reference price vector p^0 was inevitably selected as a matter of convenience. To ensure that the vector is not very different from prices actually observed, we chose to take the median of the prices observed from individual households as reference. The use of the national median price vector ensures that the money metric measures conform as closely as possible to national income accounting practice, as well as eliminating results that might depend on a price relative that occurs only rarely or in some particular area.

Quantities and unit values were available at the household level only for foods items. For non-foods, data is not available at the household level. The Paachse price indices were thus computed for food items only.

Technical Note 2 (Food Poverty Line)

The Food Poverty line for 2017 is updated from 2012 using the food inflation between 2012 and 2017. BLSS 2007 collected data on 118 different food items. Consumption data is available in standard quantity units for all these items. For 94 of them, calories intake data is available, and of these items,

53 items are used to create a reference food basket. These items are used to compute the food poverty line since the most frequently consumed food items by the reference population (i.e., the second to the fourth deciles of the nominal per capita consumption distribution). These 53 goods accounted for 80% of the food consumed by the reference population. The quantities of each item in the food basket are established by considering the consumption pattern of the reference population. The quantities are scaled up in such a way that the resulting basket provides a total of 2,124 Kcal. The cost of the basket is calculated using the national median unit prices for each item.

Table A.17 Food Bundle and Costs of Nutritionally Adequate Food Bundle Per Person Per Day, 2007

Items		Unit	Calories per units (kcals)	Daily quantity consumed (units)	Daily calories provided (kcals)	Price per unit	Cost
Cereals and Pulses							
101	Rice Bhutanese	Gram	3.5	92.3	319.3	0.0	2.3
102	Rice fine	Gram	3.5	59.8	208.8	0.0	0.8
103	Rice FCB	Gram	3.5	110.2	381.4	0.0	1.5
104	Processed rice (zaw, sip)	Gram	3.3	9.6	31.2	0.0	0.3
105	Maize (kharang)	Gram	3.4	93.0	318.0	0.0	1.0
106	Ata, Maida	Gram	3.4	9.8	33.2	0.0	0.2
107	Noodles	Gram	3.5	12.1	42.1	0.0	0.5
108	Confectionery	Gram	2.5	0.2	0.5	0.3	0.1
109	Biscuits	Gram	3.6	4.7	17.0	0.1	0.4
110	Pulses	Gram	3.4	11.5	39.3	0.0	0.3
Dairy Products							
201	Liquid milk	Ml	0.7	19.1	12.8	0.0	0.5
202	Milk powder	Gram	5.0	6.5	32.3	0.2	1.1
203	Local butter	Gram	7.3	10.4	76.1	0.2	1.6
204	Local cheese	Gram	4.7	12.4	58.5	0.1	1.4
205	Egg	Gram	1.7	3.7	6.4	0.1	0.3
Meat							
301	Fresh fish	Gram	0.1	2.3	2.2	0.1	0.2
302	Dried fish	Gram	2.6	11.2	28.6	0.1	0.8
303	Fresh beef	Gram	1.1	7.2	8.2	0.1	0.4
304	Dried beef	Gram	2	1.8	3.5	0.2	0.4
305	Fresh pork	Gram	1.1	4.1	4.7	0.1	0.4
306	Chicken	Gram	1.1	2.9	3.2	0.1	0.3

Items		Unit	Calories per units (kcals)	Daily quantity consumed (units)	Daily calories provided (kcals)	Price per unit	Cost
Fruits							
401	Apple	Gram	0.6	0.7	0.4	0.0	0.0
402	Orange	Gram	0.5	21.2	10.2	0.0	0.3
403	Mango	Gram	0.7	0.5	0.4	0.0	0.0
404	Banana	Gram	1.2	18.1	21.0	0.0	0.1
405	Cucumber	Gram	0.1	6.0	0.8	0.0	0.1
406	Sugarcane	Gram	4.0	2.7	10.7	0.0	0.1
407	Guava	Gram	0.5	2.4	1.3	0.0	0.0
408	Walnut	Gram	6.9	3.9	26.9	0.0	0.0
409	Other fruits	Gram	0.5	0.6	0.3	0.0	0.0
Vegetables							
501	Fresh beans	Gram	1.6	17.4	27.4	0.0	0.4
502	Tomato	Gram	0.2	17.8	4.1	0.0	0.4
503	Spinach	Gram	0.3	32.9	8.6	0.0	0.4
504	Cabbage	Gram	0.3	20.4	5.5	0.0	0.2
505	Potato	Gram	0.1	60.6	58.8	0.0	0.7
506	Pumpkin	Gram	0.3	4.4	1.1	0.0	0.0
507	Radish	Gram	0.2	26.5	4.5	0.0	0.3
508	Cauliflower	Gram	0.3	8.1	2.4	0.0	0.2
509	Brinjal	Gram	0.2	5.5	1.3	0.0	0.1
510	Gourd	Gram	0.1	2.7	0.3	0.0	0.0
511	Fresh mushroom	Gram	0.3	2.0	0.5	0.2	0.4
512	Fern (damru)	Gram	0.3	6.3	2.1	0.0	0.1
513	Mustard oil	Ml	9	14.1	127.0	0.1	0.9
514	Dalda oil	Ml	9	3.1	27.6	0.1	0.2
515	Refined oil	Ml	9	6.6	59.5	0.1	0.4
Spices, Seasonings and Pastes							
601	Fresh chili	Gram	0.3	21.3	6.2	0.0	0.6
602	Dried chili	Gram	2.5	6.2	15.2	0.1	0.6
603	Haldi, Jeera	Gram	3.5	0.8	2.9	0.1	0.1
604	Coriander leaves	Gram	0.4	6.2	2.7	0.0	0.2
605	Salt	Gram	0	8.8	0	0.0	0.1
607	Sugar/gur	Gram	4.0	16	63.7	0.0	0.5
Beverages							
701	Beer	Ml	0.4	3.9	1.4	0.1	0.2
702	Juice	Ml	0.5	4.4	2.0	0.1	0.2
TOTAL PER DAY					**2,124 Kcal**		**Nu 22.49**

Technical Note 3 (Non Food Adjustment to the Poverty Line)

Having set the food poverty line, a non-food component must be added to obtain an overall poverty line that incorporates overall needs. As M. Ravallion and Bidani (1992, 1999) suggest that the total poverty line is obtained by scaling up the food poverty line to allow for the purchase of some essential non-food items to reach a final poverty line. The non-food needs must be consistent with the consumption behavior of households who can just afford basic food needs.

A number of methodologies have been proposed for making this non-food adjustment, including the use of another basket of non-food items. The best solution is to measure what is the typical value of non-food spending by a household that is just able to reach its food requirements. This will equal the lowest level of non-food spending for households that are able to acquire the basic food bundle. It can thus be considered a minimal allowance for non-food goods.

What we use here is a non-parametric estimate of the non-food consumption of households in the reference population whose food consumption is close to the food poverty line. First, we calculate the mean per capita non-food expenditures of households in the reference population whose food spending lies within a plus or minus 1% bandwidth of the household whose food consumption is nearest the food poverty line. We increase the bandwidth to 2% and recalculate the average non-food per capita expenses, and keep iterating up to a plus or minus 10% bandwidth. Then we take an average of all these mean per capita non-food expenditures and use this as our non-food adjustment. In effect, the resulting non-food adjustment is a weighted average of non-food expenses of households whose food expenses are near the food poverty line, with the highest weight on the households whose food spending are closest to the food poverty line (and with weights that decline as the food spending goes farther from the food poverty line).

Similar to the Food Poverty Line, the Non-food Poverty Line for 2017 is updated from 2012 using the non-food inflation between 2012 and 2017.

Technical Note 4 (Poverty Measures)

Incidence of Poverty (P_0)

The incidence of poverty is the proportion of the population that is poor (percentage of the total population below the poverty line). The percentage of households below the poverty line may also be computed (since poor households usually have a smaller size, the proportion of poor households is usually lower than the proportion of poor population).

$$P_0 = q / n$$

where P_0 is the proportion of

population deemed to be poor (poverty headcount), q is the number of poor people (below the poverty line), and n is the total population.

The fact that poverty calculations are based on a sample of households, or a subset of the population, carries implications. Samples are designed to reproduce the whole population, but they can never be as exact as information that covers everybody in the country. They carry a margin of error, as do poverty rates calculated from these sample surveys. When monitoring the incidence of poverty over time, it is crucial to remember that the figures are based on samples. Instead of considering one figure, it is better to use confidence intervals.

Poverty Gap Index (P1) and Income Gap Ratio

The poverty incidence alone will not provide a complete picture of poverty. It is also important to look into the depth of poverty. For one individual, the depth of poverty is the proportion by which that individual is below the poverty line (it has a value of 0 for all individuals above the poverty line).

The poverty gap index is the average depth of poverty for the population. This is the sum of the depth of poverty of each individual, divided by the total number of individuals in the population. This gives a good indication of the depth of poverty, in that it depends on the distances of the poor below the poverty line. Also, this index multiplied by total population may be thought of representing the total cost of poverty reduction assuming perfect poverty targeting.

The poverty gap index can also be written as

$$P_1 = H * (z - y^p) / z$$

where $(z - y^p) / z$ is referred to as the 'income gap ratio' (mean depth of poverty as a proportion of the poverty line).

The income gap ratio is not a good poverty measure. To see why, suppose that someone just below the poverty line is made sufficiently better off to escape poverty. The mean of the remaining poor will fall, and so the income gap ratio will increase. And yet one of the poor has become better off, and none are worse off; one would be loathe to say that there is not less poverty, and yet that is what the income gap ratio would suggests. This problem doesn't arise if the income gap ratio is multiplied by the head count index to yield P_1 .

The poverty gap index doesn't tell us how the poverty is distributed among individuals; it may not convincingly capture differences in the severity of poverty. The poverty gap will be unaffected by a transfer from a poor person to someone who is less poor. However, when the poverty gap index is multiplied by the total population and the result further multiplied to the poverty line, we obtain the aggregate gap. This represents the cost of eliminating poverty

assuming perfecting targeting and no targeting costs.

Poverty Squared Gap Index (P_2)

The Poverty Severity Index (P_2) gives a weight to the poverty gap (more weight to very poor than to less poor). It is the average value of the square of depth of poverty for each individual. Poorest people contribute relatively more to the index.

While this measure has clear advantages for some purposes, such as comparing policies, which are aiming to reach the poorest, it is not easy to interpret. For poverty comparisons, however, the key point is that a ranking of dates, places or policies in terms of P_2 should reflect well their ranking in terms of the severity of poverty. It is the ability of the measure to order distributions in a better way than the alternatives that makes it useful, not the precise numbers obtained. The poverty incidence, poverty gap and poverty squared gap measures all belong to a family of measures proposed by Foster, Greer, and Thorbecke (1984).

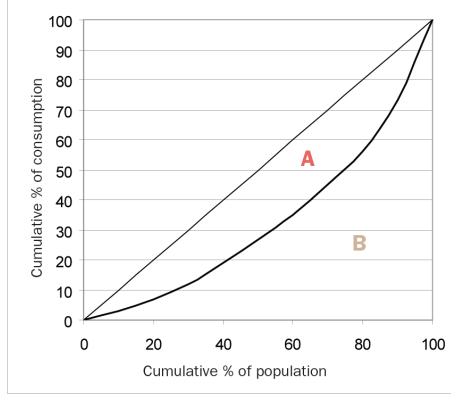
$$P_\alpha = (1/n) \sum_{i=1}^{q} \left(\frac{z - y_i}{z} \right)^\alpha$$

where $\alpha$is some non-negative parameter, z is the poverty line, y denotes per capita consumption, i represents individuals (or households), n is the total number of individuals (or households) in the population (or household population), and q is the number of individuals (or households) with per capita consumptions below the poverty line.

Technical Note 5 (Inequality Measures)

a) Gini

Graphically, the Gini coefficient can be easily represented by different areas of the Lorenz curve, a cumulative frequency curve that compares the distribution of a specific variable such as per capita expenditure with the uniform distribution that represents equality. To construct the Gini coefficient, graph the cumulative percentage of households (from poor to rich) on the horizontal axis and the cumulative percentage of consumption-expenditure on the vertical axis. This gives the Lorenz curve as shown below. The diagonal line represents perfect equality. The Gini coefficient is calculated as the area A divided



by the sum of areas A and B, where A and B are as shown on the graph. If A=0 the Gini coefficient becomes 0 which means perfect equality, whereas if B=0 the Gini coefficient becomes 1 which means complete inequality.

Formally, let x_i be a point on the X-axis, and y_i a point on the Y-axis. Then

$$Gini = 1 - \sum_{i=1}^{N} (x_i - x_{i-1})\,(y_i + y_{i-1}).$$

When there are N equal intervals on the X-axis this simplifies to

$$Gini = 1 - \frac{1}{N} \sum_{i=1}^{N} (y_i + y_{i-1}).$$

The Gini coefficient of inequality varies between 0, or complete equality of expenditures, and 1, or complete inequality (one person has all the expenditure, all others have none).

b) Quintile Dispersion Ratio

A simple measure of inequality is the quintile dispersion ratio, which represents the ratio of the average consumption of the richest 20% of the population divided by the average consumption of the bottom 20%. This ratio can also be calculated for other percentiles (for instance, dividing the average consumption of the richest 5%– the 95th percentile– by that of the poorest 5%– the 5th percentile). The quintile dispersion ratio is readily interpretable, by expressing the consumption of the top 20% as a multiple of that of those in the poorest quintile. However, it ignores information about consumptions in the middle of the consumption distribution, and does not even use information about the distribution of consumption within the top and bottom quintiles.

c) Palma Ratio

It is also a measure of inequality. It is the ratio of the average consumption of the richest 10% of the population divided by the average consumption of the poorest 40%.