POVERTY AND INEQUALITY TRENDS IN BHUTAN

2017 - 2022

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> **Note:**
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> The technical details and comprehensive analysis of the drivers of poverty reduction will be provided in a World Bank poverty and equity assessment report that will be published later in 2024.

1   Introduction

In this paper, we examine the dynamics of poverty and inequality in Bhutan over the past five years, based on the Bhutan Living Standards Survey (BLSS) 2017 and 2022. This is no easy task, empirically, as the trend of the official consumer price index (CPI) is not consistent with the increase in the cost of living faced by the poor, as estimated from the survey data: consequently, updating the poverty line using the official CPI would inevitably lead to biased estimates. Therefore, the paper suggests a new method to identify the trend, based on the estimation of a survey-based poor-specific price index. The new price index is used to back-project the official 2022 poverty line to 2017: we find that between 2017 and 2022, the incidence of poverty decreased from 28 percent to 11.6 percent. Poverty remains mainly a rural phenomenon in Bhutan, but most of the decline is due to a dramatic improvement in living standards in rural areas (from 38.9 percent to 16.5 percent), while in urban areas, the improvement is not as dramatic and is not robust to the choice of the poverty line.

When it comes to investigating the drivers of poverty reduction, lack of data severely limits the scope of the analysis, and construction of Comparable Nominal Consumption Aggregates. The BLSS is a nationwide household survey conducted by the National Statistical Bureau (NSB), which has been carried out every five years since 2003. It is the main source of information on household living conditions in Bhutan and focuses on household expenditures, within the framework of the World Bank's Living Standard Measurement Surveys (LSMS).

Changes in survey implementation over time are a potential threat to the comparability of estimates (Beegle et al. 2012) and to the estimation of inequality and poverty trends between 2017 and 2022. **Error! Reference source not found.** describes the main characteristics of BLSS questionnaires in 2017 and 2022, focusing on the sections that record household expenditures. Overall, the two surveys are remarkably similar: they have the same overall structure and sequence and roughly the same level of detail. However, a few changes are significant in the context of welfare measurement. First, the list of food items is more detailed in 2022 with respect to 2017 (items that were previously recorded as unspecified aggregates, for example, other fruit, are later spelled out individually, for example, peach, plum, and lemon). Second, the module recording durable goods is more detailed in 2017 with respect to 2022: information like the year of purchase of the durable and its original purchase price is no longer available in the most recent BLSS wave.

It is difficult to assess the impact of the first difference—the detail of the food list—on final estimates, but overall, the change (from 132 to 148 items) does not seem radical enough to warrant a serious discounting of trends. Regarding the second difference—the module on durables—it can be addressed by modifying the composition of the consumption aggregate.

To allow for the accurate estimation of trends, household consumption—the welfare measure of choice in Bhutan's case—must also be comparable across the two BLSS. Official poverty estimates published for 2017 and 2022 are based on consumption aggregates (CAs) that were constructed independently, so the two sets of estimates are not directly comparable. Differences between the two official CAs are summarized in the first two columns of Table1.

Two new comparable CAs have been computed for each year (third column of 1). In particular, (a) the purchase price of durable goods was subtracted from 2017, (b) the consumption flow from durable goods was subtracted from 2022, and (c) health expenditures were added to 2017.

Table 1. Composition of CAs

| | **Official CA** | | **Comparable CA** |
| | **2017** | **2022** | **2017 and 2022** |
	(1)	**(2)**	**(3)**
Food expenditure	Purchases, in-kind receipts, own consumption, and FAFH	Purchases, in-kind receipts, own consumption, FAFH	Purchases, in-kind receipts, own consumption, FAFH
Durable goods	Includes purchase price of some goods (cars, motorcycles, and so on purchased in last 12 months)	Includes consumption flow	Not included
Housing	Actual and self-reported	Actual and self-reported	Actual and self-reported
Health	Includes only medicine and dentist	All included	All included
All other nonfood	Purchases and in-kind receipts	Purchases and in-kind receipts	Purchases and in-kind receipts

Note: In 2017, hedonic predictions were used to impute missing values and outliers of rent expenditures. In 2022, this was not necessary.

2   Identification of the poverty trend

We develop an analytical framework for identifying the poverty trend with no reliance on the official CPI, which—we argued—underestimates the inflation faced by the poor over the period at hand. The proposed method anchors the trend to the official FPL for 2022: this means that the end point of the poverty trend will be close to the official point estimates for 2022 (NSB 2022), a feature that is commonly desired in practice, to minimize the potential confusion arising from the circulation of multiple poverty estimates.[1]

The method consists of calculating the change in the monetary value of a *fixed* reference food basket, which can be interpreted as a basic-needs basket consistent with the consumption pattern of poor households in Bhutan.[2] The cost of the basket can be used as the basis for calculating a food cost-of-living index. As

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[1] There is, in fact, a small discrepancy between the 2022 poverty estimates presented in this paper and the ones published in NSB (2022): the reason is that the consumption aggregate and UBPL used for trend estimation have been computed to maximize comparability with 2017 (see section 3).

[2] The exact composition of the reference food bundles is detailed in the appendix.

detailed below, the construction of such an index is equivalent to the calculation of a Laspeyres-type price index based on the consumption basket of poor households. The index is then used to 'move' the 2022 FPL back in time, which provides an anchor for estimating a new UBPL.

Table 2 shows the estimates for both FPL and total UBPL values.

Table 2. New comparable poverty lines (current Nu/person/month)

	2017	2022
FPL	1,737	2,852
UBPL	3,448	5,786

Note: The official 2022 FPL was projected back to 2017 by using the food CPI estimated based on the 2017 basic-needs basket.

3   Inequality Trends

Table 3 shows that, according to a vast array of inequality measures, inequality has gone down dramatically in Bhutan between 2017 and 2022. The Gini index has gone down by a full 10 points: a staggering decrease, by all standards. Even more dramatic falls are shown by indexes that are relatively more sensitive to changes in the left tail of the distribution.

Table 3. Selected inequality indices, Bhutan 2017–2022

	Gini	GE(0)	GE(1)	GE(2)	A(0.5)	A(1)	A(2)
2017	37.0	22.6	24.4	40.0	11.0	20.2	34.6
2022	28.1	13.1	13.8	17.7	6.5	12.3	22.5

Regarding the composition of inequality, table 4 shows the results of an urban/rural breakdown of the key indexes. Both in 2017 and 2022, inequality does not seem to be a feature of urban or rural areas, specifically, as the value of the subgroup indexes remain stable. Additive decompositions show that overall inequality is mostly attributable to inequality within each area (the within component) rather than to differences between the average standard of living in rural and urban areas (the between component).

Table 4. Inequality decomposition by urban/rural

		Gini	GE(0)	GE(1)	GE(2)	A(0.5)	A(1)	A(2)
2017	**Urban**	31.9	16.9	18.8	32.8	8.4	15.5	27.4
	Rural	34.6	19.5	21.7	32.8	9.7	17.7	30.1
	within component		18.6	20.3	35.6	9.1	16.7	28.8
	between component		3.9	4.1	4.3	2.1	4.2	8.1
2022	**Urban**	26.2	11.3	12.6	17.4	5.8	10.7	19.1
	Rural	28.4	13.2	13.6	16.3	6.5	12.4	22.7
	within component	—	12.5	13.2	17.1	6.2	11.6	21.1
	between component	—	0.6	0.6	0.6	0.3	0.7	1.7

Using the Mookherjee and Shorrocks (1982) framework, inequality *changes* can be additively decomposed into (a) 'pure' inequality changes, (b) changes resulting from changes in the population shares of urban/rural areas, and (c) changes resulting from changes in the relative incomes (Jenkins 1995). Table 5 shows that two-thirds of the nationwide decline in inequality (as measured by the mean log deviation, GE(0) in table 4) is attributable to a decline in inequality within urban and rural areas and most of the remaining one-third to convergence between the two areas. Changes in population shares have a negligible role.

Table 5. Mookherjee and Shorrocks inequality decomposition of GE(0), urban versus rural

Effect due to changes in within-subgroup inequality	−6.0288
Effect due to changes in population shares of within component	−0.1161
Effect due to changes in population shares of between component	0.1224
Effect due to relative changes in subgroup means	−3.4217
Total	−9.4443

The magnitude of the gap detected in all inequality measures between 2017 and 2022 suggests the use of some caution in interpreting the results at face value: the literature points to the sensitivity of most inequality indexes to extreme observations (Cowell and Flachaire 2007), and in most practical applications, analysts do not have full control on a number of routine checks and edits that the 'raw' data go through before being released for analysis. Any significant differences in the way data were handled in 2017 versus 2022 may potentially be clouding the comparisons presented in this section.

For this reason, the sensitivity of inequality measures to the presence of extreme values is checked, by detecting outliers of the CAs and producing the statistics of interest again, without the flagged observations. Outliers are detected via the Stata command `outdetect`, as described in Belotti, Mancini, and Vecchi (2022) (default settings). The results suggest that the inequality trend estimated for Bhutan does not appear to be driven by any 'rogue' observations. Fewer outliers are detected for 2017 than for 2022 (0.36 percent and 0.98 percent of total observations, respectively); neither of the two aggregates display a high sensitivity to outliers: 'trimming' the aggregates (for example, excluding observations flagged as outliers from

calculations) produces Gini indexes that are not too far from the 'raw' ones (36.0 for 2017 and 26.8 for 2022).

4. Poverty Trends

The poverty trends presented below are based on the identification strategy discussed earlier and on the 'comparable' poverty lines that were estimated for this purpose. Table 6 presents results on the so-called 'food poverty', that is, households whose food expenditure is below the FPL. Nationally, the incidence of food poverty experienced a drop of almost 10 percentage points (about a 40 percent decrease from the 2017 level), and both the depth and severity of poverty were cut in half. There is a strong polarization between urban and rural areas: while very little change is detectable among urban households (especially when it comes to the incidence of poverty), rural households experienced strong poverty reduction, across all metrics.

Table 6. Food poverty (food expenditure < FPL)

		H	PG	PG2
2017	**Bhutan**	23.40	5.80	2.10
	Urban	10.90	2.40	0.80
	Rural	29.70	7.50	2.80
2022	**Bhutan**	14.00	3.00	1.00
	Urban	10.00	2.00	0.60
	Rural	16.60	3.70	1.30
2022/2017	**Bhutan**	0.60	0.52	0.47
	Urban	0.92	0.84	0.76
	Rural	0.56	0.49	0.45

The patterns that emerge from Table 7 are by and large confirmed by table 7, which reports measures of poverty obtained by comparing households' total PCE to the CBN UBPL. The incidence of poverty more than halved in Bhutan between 2017 and 2022, and the depth and severity of poverty experienced even more dramatic decreases. The urban-rural polarization pattern is still present, pointing to the concentration of poverty reduction among rural families—even though poverty decreased in urban areas, as well. This is especially impressive, considering that the rural population is estimated at 66 percent of the total in 2017 and at 61 percent in 2022.

Table 7. Poverty (total expenditure < UBPL)

		H	PG	PG2
2017	**Bhutan**	28.0	7.6	2.9
	Urban	6.2	1.2	0.4
	Rural	38.9	10.8	4.2
2022	**Bhutan**	11.6	2.4	0.8
	Urban	3.7	0.7	0.2
	Rural	16.5	3.5	1.1
2022/2017	**Bhutan**	0.41	0.32	0.26
	Urban	0.59	0.54	0.50
	Rural	0.43	0.32	0.27

5. Changes in the structure of poverty

In this section, we dig deeper into the changes that occurred in Bhutan between 2017 and 2022, by exploring the characteristics of the poor and their variation over time. It is important to note that the 2022 BLSS does not include information on the labor market status of household members; therefore, it is not possible to explore the link between poverty and these characteristics. The analysis of poverty profiles must therefore necessarily be limited to geographical and demographic variables, sources of income, and educational levels. Table 8 shows how the incidence of poverty varies by Dzongkhag (district): a few cases of spectacular poverty reduction (Dagana and Sarpang) stand out.

Table 8. Poverty incidence by Dzongkhag, 2017–2022

Dzongkhag	Headcount ratio (%)		Poverty share (%)		Population share (%)	
	2017	2022	2017	2022	2017	2022
Bumthang	15.6	8.3	1.3	1.7	2.3	2.4
Chhukha	24.9	13.9	8.1	10.3	9.1	8.6
Dagana	69.4	8.1	8.4	2.7	3.4	3.8
Gasa	30.6	8.4	0.6	0.4	0.5	0.5
Haa	7.1	9.7	0.4	1.2	1.6	1.5
Lhuentse	26.3	13.5	2.1	2.5	2.2	2.2
Monggar	44.3	16.4	9.6	7.6	6.1	5.4
Paro	8.7	7.1	1.6	4.1	5.2	6.7
Pema Gatshel	45.3	16.9	6.5	4.7	4.0	3.2
Punakha	17.2	2.7	2.4	0.8	3.9	3.5
Samdrup Jongkhar	27.3	19.4	5.1	7.9	5.2	4.7
Samtse	37.3	17.5	12.1	12.9	9.1	8.5
Sarpang	37.0	6.1	7.9	3.3	6.0	6.4
Thimphu	4.9	1.7	3.2	3.2	18.1	22.2
Trashigang	37.0	19.9	9.0	9.8	6.8	5.7
Trashi Yangtse	36.1	15.3	2.9	2.9	2.2	2.2
Trongsa	48.6	21.9	4.5	3.9	2.6	2.0
Tsirang	34.8	19.2	3.7	5.4	2.9	3.3
Wangdue Phodrang	20.2	16.0	4.3	6.7	6.0	4.8
Zhemgang	65.7	39.4	6.5	7.9	2.8	2.3
Bhutan	**28.0**	**11.6**	**100.0**	**100.0**	**100.0**	**100.0**

References

Belotti, F., G. Mancini, and G. Vecchi. 2022. "Outlier Detection for Welfare Analysis." World Bank Policy Research Working Paper 10231, World Bank, Washington, DC.

Cowell, F. A., and E. Flachaire. 2007. "Income Distribution and Inequality Measurement: The Problem of Extreme Values." *Journal of Econometrics* 141 (2): 1044–1072.

Jenkins, S. P. 1995. "Accounting for Inequality Trends: Decomposition Analyses for the UK, 1971-86." *Economica* 62 (245): 29–63.

Mookherjee, D., and A. Shorrocks. 1982. "A Decomposition Analysis of the Trend in UK Income Inequality." *The Economic Journal* 92 (368): 886–902.

NSB (National Statistical Bureau). 2017. *Bhutan Poverty Analysis Report 2017*. National Statistics Bureau of Bhutan and Royal Government of Bhutan: Thimphu.

NSB. 2022. *Poverty Analysis Report Bhutan 2022*. National Statistics Bureau of Bhutan and Royal Government of Bhutan: Thimphu.