Trends and Drivers of Poverty Reduction in Nepal

A Historical Perspective

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Abstract

Nepal made remarkable progress in poverty reduction between 1995 and 2010, a period coinciding with a decade-long violent conflict followed by tumultuous post-conflict recovery. Although improving agricultural productivity was long regarded as instrumental to lifting the living conditions of Nepal’s impoverished rural areas, a bulk of the observed poverty reduction has come as a result of exogenous improvements in economic opportunities for poor Nepalis outside Nepal’s borders. About 50 percent of the poverty reduction witnessed between 1995 and 2010 was associated with growth in labor incomes, particularly in nonagricultural activities. Private remittance receipts account for a little over a quarter of the total poverty reduction seen in Nepal. This is consistent with increased nonfarm diversification of rural households as well as the increase in nonfarm wages over the period. Household demographic changes, brought about by a sharp decline in fertility rates and the changing dependency structure as a result of migration, have also played an important role.

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Trends and Drivers of Poverty Reduction in Nepal: A Historical Perspective

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JEL: I3; I32; O15
Keywords: Poverty; Migration; Remittances; Labor Income; Demographics

¹ This paper was produced as a background piece for “Moving Up the Ladder: Poverty Reduction and Social Mobility in Nepal” (World Bank 2016a).
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1. Introduction

Nepal’s first comprehensive poverty assessment was published in 1991. The report – based on the Multi-Purpose Household Budget Survey conducted in 1984/85 – depicted dire living conditions in Nepal more than 30 years ago. Using what was considered then a very conservative poverty line, at least 40 percent of the population was deemed absolutely poor.² Except for a very few professionals and business persons, however, everyone in Nepal then would have been regarded poor by any reasonable international standard (World Bank 1991). Nepal was one of the poorest countries in the world at that time.

The report attributed Nepal’s poverty to four prominent factors. First, Nepal is landlocked, and borders on China and India, the two most populous countries in the world which were also two of the poorest countries at the time of that assessment. Second, Nepal has limited resource base and arable land. While known for its stunning natural beauty, Nepal’s mountainous and rugged terrain posed a significant challenge for rural development. Third, Nepal had a high population growth rate; the population had almost doubled between 1960 and 1990 (World Bank 2016b) and was projected to double again between 1990 and 2015 (World Bank 1991). Fourth, Nepal’s overall economic growth experience to date had been sluggish at best, presumably as a result of the aforementioned factors.

Poverty in Nepal was predominantly rural. Rural areas accounted for 93 percent of the population and 95 percent of the poor in 1984/85 (World Bank 1991; World Bank 2016b). The share of labor force dependent on agriculture was 93 percent, the highest of any country listed in the 1989 World Development Report (World Bank 1989). The overwhelming majority of poor Nepalis made their living by subsistence farming. As of 1984/85, most poor households barely met the minimum caloric requirement³ by depending heavily on rice and dal – almost 90 percent – and rarely afford vegetables and fruits, let alone meat and eggs. Due to insufficient resource base to develop non-agricultural sectors, the country was inevitably and excessively dependent on subsistence agriculture with limited arable land. Very limited accessibility in the hills and mountains made transportation cost prohibitively so expensive that it was ironically rational for rural residents to stay engaged in subsistence agriculture rather than attempting to market farm commodities let alone developing non-farm businesses (World Bank 1991). The rapid population growth exacerbated the tendency to cultivate unproductive land unsuitable for farming in rural areas (Bista 2003).

There was very little optimism about any poverty reduction strategy that could plausibly make a meaningful dent in poverty in Nepal. For example, the 1991 report emphasized the need for support programs for the poor on the ground that the poverty rate would most likely persist. At the same time, poverty reduction by means of social transfers was considered untenable, as “there are too many poor and too few resources to realistically consider large-scale transfer or subsidy programs” (World Bank 1991). Of the four factors that entrenched Nepal in chronic poverty, nothing could be done about the difficult geography or natural resource endowments. The only glimmer of hope for Nepal was to slow down population growth and formulate effective policies focused on boosting agricultural productivity in rural areas.

Much like most severely impoverished countries in Sub-Saharan Africa, the Nepali economy at that time was characterized by high population growth, sluggish economic growth, a

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² A poverty line is a threshold below which individuals are deemed poor. The poverty line used in the report was Rs. 210 per person per month in the hills and Rs. 197 in the terai, in 1988/89 prices.
³ Minimum daily caloric requirement of 2340 kcal was used in World Bank (1991).
very low level of exports and rural population dependent on subsistence agriculture, which are all common symptoms of an economy unable to make a meaningful structural transformation out of low productivity agriculture. In 1985, Nepal’s GNI per capita was the lowest among the 140 countries for which data were available; life expectancy at birth was 50.1 years and ranked 165 out of 193 countries. Sanitation facility coverage was almost entirely absent for the rural poor and very limited even in urban areas. The share of agriculture in GDP, an indicator often used as a proxy for economic development, was as high as 65 percent in the 1960s and 1970s (World Bank 1991) and remained at 52 percent in 1985, the fifth highest in the world, trailing only the poorest countries in Sub-Saharan Africa at that time (Table 1). The 1991 report concluded that poverty would most likely persist in Nepal for years to come; it projected poverty incidence to remain flat at 40 percent by 2010 under a relatively optimistic scenario of constant inequality (World Bank 1991).

Table 1: Where Nepal Ranked in Socio Economic Indicators circa 1985 and 2010

|                                | circa 1985        | circa 2010        |
|--------------------------------|-------------------|-------------------|
| GNI per capita, Atlas method   | 140, 140, 1985    | 172, 188, 2010    |
| (current US$)                  | Nepal's Rank      | Total Number of Countries | Year | Nepal's Rank | Total Number of Countries | Year |
| Agriculture, value added (%)   | 5, 113, 1985      | 10, 176, 2010     |
| of GDP                         | Nepal's Rank      | Total Number of Countries | Year | Nepal's Rank | Total Number of Countries | Year |
| Life expectancy at birth, total years | 165, 193, 1985 | 135, 200, 2010     |
| Mortality rate, infant (per 1,000 live births) | 17, 186, 1985 | 63, 192, 2010     |
| Improved sanitation facilities (% of population with access) | 159, 162, 1990 | 157, 194, 2010 |
| Primary completion rate, both sexes (%) | 63, 84, 1988 | 24, 124, 2012     |
| Youth Literacy (15 - 24 Years Old) | 18, 18, 1981 | 44, 51, 2011     |
| Adult Literacy                 | 18, 18, 1981      | 46, 50, 2011      |

Source: World Development Indicators (World Bank 2016b)

Contrary to the prediction, Nepal made significant progress in reducing poverty in a span of a decade and a half. While the poverty headcount rate had remained virtually unchanged at approximately 40 percent until 1995 (World Bank 1999), it declined to 31 percent by 2003 (World Bank 2011).

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4 According to the 1984/85 Multi-Purpose Household Budget Survey, only 1 percent and 6 percent of the poor had access to a latrine in the rural terai and hills, respectively. In urban hills and terai, approximately 50 percent and 90 percent of the poor had no access to a latrine (World Bank 1991). The earliest available national estimate of the access to improved sanitation facilities was 4 percent as of 1990 (World Bank 2016b).

5 The four countries with a higher share of agriculture in GDP were Somalia, Burundi, Ethiopia and Uganda.
Bank 2006) and as low as 12 percent by 2010 (World Bank 2013),\(^6\)\(^7\) far exceeding the optimistic scenario envisaged in the early 1990s. This impressive stretch of poverty reduction record led the government to re-evaluate the poverty line established in 1995 in order to reflect the evolving living standard in today’s Nepal. Even with the revised poverty line that increased in its real value by 35 percent from the previous line,\(^8\) the poverty rate in 2010 was estimated at 25 percent (World Bank 2013). The pace of recent poverty reduction in Nepal has been so spectacular that one global poverty reduction benchmarking exercise puts Nepal in the 96th percentile of all available country episodes.\(^9\)

Many non-income dimensions also exhibited significant improvements in terms of both levels and rankings, often at a pace faster than neighboring countries such as India and Bangladesh (Table 1 and Figure 1). Life expectancy at birth was 68 years as of 2011, an improvement by 18 years since 1985. Nepal’s infant mortality rate (per 1,000 live births) was much higher than India, Bangladesh or Sub-Saharan Africa until the early 1980s, but converged to the world average by the late 2000s. Access to improved sanitation facilities is still low at 40 percent and ranks 154\(^{th}\) out of 195 countries in 2011, but a considerable improvement from 4.5 percent in 1990. Nepal’s primary completion rate was as low as Sub-Saharan Africa on average in the early 1990s, but it exceeds the world average in 2014. The adult literacy rate tripled from 21 percent in 1981 to 60 percent in 2011. The youth literacy rate (15 to 24 years old) increased by 55 percentage points, from 30 percent in 1981 to 85 percent in 2011. National Account indicators, in contrast, show much slower progress. The share of agricultural output in GDP declined to 38 percent but remains the 9\(^{th}\) highest in the world and the highest outside of Sub-Saharan Africa. GNI per capita is still one of the lowest in the world and the second lowest in South Asia after Afghanistan.

The rest of this paper sheds light on the way this unlikely but remarkable success story unfolded in Nepal. Section 2 offers a historical perspective of poverty reduction in Nepal, followed by a detailed account of changes in living standards since 1995 (Section 3). Drivers of poverty reduction and the roles of remittances are discussed in Section 4. Section 5 poses some key challenges on the country’s future path to improving living standards and building prosperity. The final section concludes.

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\(^6\) In all three rounds of the Nepal Living Standard Surveys, data collection was carried out for 12 months in order to capture a complete cycle of agricultural activities and seasonal variations. Since the data collection period always encompassed two calendar years, the NLSS are often referred to with respective calendar years such as 1995/96, 2003/04 and 2010/11 to be precise. For brevity, however, we refer to the NLSS and all statistics estimated from the NLSS as of the year in which data collection started such as 1995, 2003 and 2010.

\(^7\) The official poverty estimate was 25 percent in 2010, reflecting an upward revision to the previous poverty line set in 19995. Appendix I offers an overview of changes in poverty measurement methodology in Nepal and its implications on poverty monitoring efforts.

\(^8\) The revised poverty line is Rs.19,261 per person per year in 2010 prices (World Bank 2013).

\(^9\) Based on benchmarking methodology described in Newman, John L., João Pedro Azevedo (2013) "Setting reasonable performance targets for public service delivery," Policy Research Working Paper Series 6385, The World Bank (http://ideas.repec.org/p/wbk/wbrwps/6385.html).
Figure 1 Economic and Social Indicators for Nepal

Source: World Development Indicators (World Bank, 2016). World average not shown for GNI per capita. Sub-Saharan Africa includes only Low and Middle Income countries as of July 1st 2015.
2. Poverty Reduction in Nepal

The earliest comprehensive poverty assessment in Nepal depicted dire living conditions of the country more than 30 years ago (World Bank 1991). About 40 percent of the population was deemed poor using a very frugal definition of poverty, but any reasonable international standard would have placed almost everyone in the country in poverty. In 1985, Nepal had the lowest GNI per capita among the 140 countries for which data was available. The share of labor force dependent on agriculture was 93 percent, the highest of any country listed in the 1989 World Development Report (World Bank 1989). The 1991 report concluded that poverty would most likely persist in Nepal for years to come (World Bank 1991). By all accounts, Nepal was one of the poorest countries in the world until the early 1990s.

While neighboring countries made a step forward in poverty reduction in the early 1990s, poverty in Nepal did not change by the time the first Living Standard Survey was conducted in 1995/96.10 Furthermore, World Bank (1999) reported that poverty incidence had remained virtually constant since 1976/77 based on the Survey of Employment, Income Distribution and Consumption Patterns in Nepal, further reinforcing the notion of chronic poverty in Nepal. The 1990 prediction that poverty would persist held true; as much as 42 percent of Nepalis were deemed poor in 1995 (World Bank 1999).

Living conditions of Nepali citizens in 1995 were as ominous as they were in the earlier years. According to the 1995 NLSS Report, only 13 percent of the households had access to toilet facilities; 24 percent of the households had access to piped water supply, of which only one-third had water supply piped to the residence. More than 80 percent of Nepali women 15 years and older were illiterate. Accessibility continued to be the bottleneck to the development of rural Nepal. About 30 percent of the rural household lived at least three hours away from a paved road, and 20 percent of them from a dirt, vehicle passable road (Central Bureau of Statistics 1996).

The policy recommendations in the Poverty Assessment following the 1995 NLSS were far from auspicious and as pessimistic as in earlier years. Because “poverty in rural Nepal is too deep and too entrenched to be rapidly or widely alleviated,” the country “must improve its management of public expenditures and the climate for private investment.” In doing so, “priority must go to agriculture” (World Bank 1999).

The first sign of poverty reduction became available when the second Nepal Living Standard Survey (NLSS) was conducted in 2003. The official poverty headcount rate declined to 31 percent, a decline by 11 percentage points over an 8-year period. Due to the long interval between the two surveys, it is not possible to pinpoint exactly when poverty incidence started taking a downward trend. But it finally did so sometime between 1995 and 2003 during which the country went through political turmoil and the Maoist insurgency that disrupted the rural livelihoods (World Bank 2006). Seven years later, the poverty headcount rate further declined to 12 percent, according to the 2010 NLSS. The pace of poverty reduction accelerated during the latter half of the 2000s, from 1.4 percentage points a year between 1995 and 2003 to 2.6 percentage points between 2003 and 2010. This impressive stretch of poverty reduction record led the government to re-evaluate the poverty line established in 1995 in order to reflect the evolving living standards in today’s Nepal.

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10 The 1995 NLSS and the 1984/85 Multi-Purpose Household Budget Survey were different in design and scope, making it difficult to construct comparable poverty estimates. All available evidence, however, pointed to little to no change in poverty incidence between 1984/85 and 1995 (World Bank 1999).
In the simplest terms, a poverty line is a threshold expressed in monetary terms below which individuals are deemed poor. This threshold should pertain to the minimum amount of Nepali rupees to satisfy minimum caloric requirements and basic needs for nonfood goods and services. In 1995, the official poverty rate of 42 percent was based on the poverty line of Rs. 5,089 per person per year. In 2003, the poverty line of Rs. 7,696 was used after adjusting for inflation between the two survey rounds. This is to ensure that the same standard of living is used to identify the poor across the two survey rounds so that Rs. 7,696 in 2003 should afford the same basket of goods and services Rs. 5,089 afforded in 1995.

If the original poverty line was used to estimate poverty in 2010 after inflation adjustments, the poverty line would have been Rs. 14,316 and the resulting poverty rate would have been as low as 12.5 percent. This, however, was not adopted as the official poverty rate because of the growing perception and mounting evidence about improving living standards in Nepal. Overall economic well-being in Nepal had improved so much that the definition of what it meant to be poor in 1995 became obsolete by 2010. Some of what used to be luxury became necessity. For example, in 2010, Nepalis on average consumed more expensive food items such as meat and eggs and less on cereals than 15 years ago. They also spent more on nonfood goods and services than they did in 1995.

In order to reflect the evolving way of life and the current consumption patterns in Nepal, a new poverty line was estimated using consumption data from the 2010 NLSS. The new poverty line was set at Rs. 19,262, an increase in real value by 35 percent compared to the original poverty line in 1995/96. Even with the revised poverty line, the poverty rate in 2010 was estimated at 25 percent (World Bank 2013).

### Table 2: Poverty Rates and Pace of Poverty Reduction in Nepal

| Survey Year | 1995 Poverty Line | 2010 Poverty Line | Official Poverty Estimate in 2010 |
|-------------|-------------------|-------------------|----------------------------------|
|             | Poverty Headcount Rate (% of Population) |                     |                                  |
| 1995        | 41.8%             | 63.8%             |                                  |
| 2003        | 30.8%             | 49.4%             |                                  |
| 2010        | 12.5%             | 30.8%             | 25.2%                            |
| Period      | Pace of Poverty Reduction (annual percentage point change) |                     |                                  |
| 95 - 03     | 1.36%             | 1.80%             |                                  |
| 03 - 10     | 2.62%             | 2.66%             |                                  |

Source: World Bank (2013) and Estimates by the Central Bureau of Statistics and the World Bank

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11 Another adjustment was made to reflect changes in demographic composition of an “average household” to revise the minimum caloric threshold.
12 See World Bank (World Bank 2013) and Annex I for more details.
13 See Appendix I for more detailed technical issues on calculating comparable poverty trends in Nepal.
3. Improvements in Living Standards between 1995 and 2010

The poverty reduction was accompanied by an improvement of living standards across all segments of the population. Figure 2 shows changes in real per capita consumption and consumption shares across 10 components between 1995 and 2010 for the bottom 40 percent, middle 40 percent (40th to 80th percentile) and top 20 percent of Nepal’s consumption distribution in 1995 and 2010. The top panel shows that in real terms, per capita consumption of the bottom 40 percent registered a cumulative growth of 62 percent, which translates to an average growth of 4.1 percent per year between the two survey rounds. The middle 40 percent saw a slightly higher cumulative growth of 66 percent than the top 20 percent group (50 percent).

With such growth in living standards over a 15-year period, one might expect notable changes in the way households allocate their resources among competing needs and wants. However, the share of food consumption remained almost unchanged between 1995 and 2010; households in the bottom 40 percent on average spent 70 percent of the total budget on food items in both years, and those in the middle 40 percent spent 61 percent in 1995 and 57 percent in 2010. The only exception was educational expenses. All three groups more than doubled their shares on educational expenses between these two years: 4 percent to 10 percent for the top 20 percent, 3 to 7 percent for the middle 40 percent and 1 to 5 percent for the bottom 40 percent. This increase is offset by a modest decline in the shares of general nonfood items and services.14

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14 This includes items such as clothing, footwear and personal care items. See World Bank (2013) for more details.
This general improvement in living standards is corroborated by trends in ownership of private assets. The three rounds of the Nepal Living Standard Surveys asked for ownership of 15 private assets, plus ownership of computers introduced in 2003. Figure 3 summarizes asset ownership of these 16 items by three groups based on per capita consumption: bottom 40 percent, middle 40 percent and top 20 percent. Different items exhibit different paths of improvements in ownership and some items were owned by almost all households in 1995 (e.g., kitchen utensils) and others are rarely owned even in 2010 (e.g., cars and washing machines). It appears in general that a sharp increase in ownership is first experienced by the top 20 percent between 1995 and 2003, followed by the middle 40 percent and then the bottom 40 percent in later years. In 1995, few households in the bottom 40 percent and the middle 40 percent owned items such as phones, TV/VCR/VCD and fans but their ownership increased drastically by the middle 40 percent by 2010. On the other hand, ownership of more expensive items, such as motorcycle/scooter, refrigerator/freezer and computer improved but only exclusively among the top 20 percent.

The improvements in living standards along monetary measures of welfare have been accompanied by dramatic improvements in non-income dimensions of well-being. Figure 4 shows progress on reducing deprivation along measures of well-being typically used in the construction of a Multidimensional Poverty Index (MPI).\(^{15}\) Significant improvements have been made in dimensions such as education, health and access to basic services. For example, households with school-aged children (6 to 15 years old) out of school declined from 55 percent in 1995 to 16 percent in 2010. This is presumably due to improvements in accessibility to and availability of school, as households with children spending more than 20 minutes to reach primary school declined from 84 percent to 33 percent during the same period. But much of it is also likely due to increased ability to afford schools, including private schools. In 1995, almost one in every two households that experienced a childbirth did so without the presence of a medical professional. This declined to one in five by 2010. Approximately four out of five households did not have an in-home toilet in 1995. By 2010, two out of three households had one. The non-income dimensions of well-being have also improved among the poor, although the progress was not as pronounced as improvements for the overall population (see Figure 5). In particular, improvements in access to sanitation and access to reasonable cooking fuels have been much less dramatic among the poor than those for the population as a whole.

\(^{15}\) There are several estimates of Multidimensional Poverty available in Nepal from various data sources. For example, see OPHI (2013) and Mitra (2014).
Figure 3: Improvements in Asset Ownership

Source: World Bank Staff Calculation based on Nepal Living Standard Surveys 1995/96, 2003/04, and 2010/11. Question on computer ownership was not available in 1995/96. 2014/15 estimates are added when data is available in the 2014/15 Annual Household Survey.
Figure 4: Reduced deprivations in non-income dimensions between 1995 and 2010

Source: World Bank (2013)

Figure 5: Reduced deprivations in non-income dimensions among the income poor, between 1995 and 2010

Source: World Bank (2013)
4. Drivers of Poverty Reduction

What are the main drivers of the unexpected yet remarkable poverty reduction in Nepal? The answers to this question are key to continued improvements in the well-being of the Nepali citizens and those less well-off in particular. A clear understanding of the drivers of poverty reduction is particularly important in Nepal because the improvements have come during a period roughly coinciding with a decade of an active, violent and debilitating Maoist conflict, and a half a decade of tumultuous post-conflict recovery when the overall economy has sputtered in fits and starts around a mediocre growth rate of 3 to 4 percent.

The most commonly cited driver of the remarkable poverty reduction is a drastic increase in remittances received from abroad since the late 1990s (World Bank 2006; World Bank 2013; World Bank 2011). While remittances are clearly an integral driver of Nepal’s recent improvements in living standards, it would be remiss not to examine other economy wide effects of the process of migration itself. For example, the large exodus of young, productive and predominantly male population is bound to have affected local economies through their effect on labor and other factor markets. The growth in income and consumption in Nepal’s rural, largely unconnected local economies could have fundamentally altered the demand for agricultural as well as non-agricultural commodities. These changes in wages and prices of other factors as well as other outputs such as food and non-food services could in turn have generated other opportunities in rural areas that may have benefitted non-migrant households indirectly. Accounting for these spillover effects would require a greater effort to construct a fuller general equilibrium model and data to operationalize such models are not readily available. However, we can use recently developed decomposition methods to get a sense of some other factors driving Nepal’s observed poverty reduction.

In this analysis, we apply a decomposition method developed by Inchauste et al (2010) and Azevedo et al (2013). This decomposition method first expresses household consumption as a function of the consumption-to-income ratio, share of adults, share of workers, labor income, capital income and transfers, which includes remittances and public transfers. In the second step, counterfactual consumption distributions are generated by replacing each of the household consumption components from one period to another. For example, the kind of question that is asked is what would be the effect on poverty if the labor income in the second period had been exactly the “same” as the labor income in the first period. Or alternatively, what would have been the effect on poverty if everything but labor income had stayed the same across the two periods, but the labor income had changed by the observed amount. Repeating this process for each of the consumption components produces the marginal effect of change in each of consumption components to poverty reduction.16 The results of this decomposition applied to Nepal between 1995 and 2010 are presented in Figure 6.

The results show that remittances account for 27 percent of total poverty reduction between 1995 and 2010. In addition, labor income contributes to a larger share of the total change, explaining 52 percent of the overall poverty reduction (Figure 6 (a)). The role of labor income is even more pronounced once labor income is disaggregated into agricultural and non-agricultural

16 See Annex II for a detailed description of the methodology.
The impacts of labor income and transfers are higher in rural areas than in urban areas. In addition to these two factors, the contribution of the demographic variables in turn suggests the positive role played by a declining dependency ratio over the period.

**Figure 6: Drivers of Poverty Reduction between 1995 and 2010**

(a) By labor and other sources of income

* Household demographics is a sum of share of adults and share of workers.

** Other factors include consumption-to-income ratio and capital income.

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17 An important caveat to this methodology is that it fails to satisfy the independence property. Dividing an income component into multiple components (e.g., labor income into farm and non-farm labor income) results in the total income effect different from the sum of the effects of the multiple income components (World Bank 2014).

18 The significant effect of labor income on poverty reduction is consistent with Inchauste et al. (2013), who conducted the same decomposition exercise using international poverty lines of $1.25 and $2.50 for 16 countries including Nepal.
An important caveat in this analysis is that one cannot attribute causality of the results of the decomposition results on poverty reduction. For example, an increase in remittances (as a result of a household member migrating abroad) could simultaneously lower labor income for the rest of the household members if other household members do not participate in the labor market. A growth in labor income driven by higher labor market participation might make the household ineligible for other public transfer programs. Accordingly it would be incorrect to interpret the changes in labor income or remittances as strictly “causing” the observed poverty reduction. Nevertheless, this accounting exercise is useful in identifying empirical regularities and focusing attention on factors that are quantitatively more important in describing distributional changes. The rest of the section attempts to put into perspective magnitudes of changes in the three identified main drivers of poverty reduction: remittances, labor income, and demographic factors.

**Migration and remittances**

Nepal has experienced a drastic increase in remittances received from abroad since the late 1990s (World Bank 2006; World Bank 2013). While work-related emigration is not a new phenomenon in Nepal, what characterizes Nepal’s emigration pattern in recent years is the massive outflow of labor force to destinations other than India, which had been by far the most popular destination for Nepali migrant workers since the beginning of the 19th century (Seddon 2005). Based on data from...
multiple rounds of Nepal’s population census, only about 3 percent of the population was abroad in 2001, an increase of 0.7 percentage points since 1981. By 2011, over 7 percent of the population was abroad. In terms of households, one in four households had a migrant abroad and almost a fifth (18 percent) of the households had migrants outside India.

The majority of the migrant population is young males. In 2011, about 90 percent of the migrants outside India is male. The fraction of males is only slightly lower (85 percent) for India migrants. The median age of migrants is only 25 years old and almost 90 percent of migrants are aged between 15 and 45 years. Absentee males are 13 percent of the resident male population. Since migrants are mostly of working age, more than a fifth (22 percent) of the national male population aged 15-45 are outside the country. The educated migrants, especially outside India, earn and remit more money to their families in Nepal. Most of the migrants went for work. In particular, over 97 percent of the migrants to Malaysia and the Gulf countries migrated for work. The share of work-related migration is a bit lower at about 85 percent, for India and other destinations.

The pace at which remittances from abroad have increased in Nepal is unprecedented. Until the late 1990s, personal remittances received were less than 1 percent of GDP, lower than that for Bangladesh or India. The first half of the 2000s saw a drastic increase in this share, from 2 percent in 2000 to 15 percent in 2005, 22 percent in 2010 and as much as 29 percent in 2014, while the neighboring countries experienced an increase at a much more modest rate (Figure 7, panel b).\(^{19}\) Expressed in per capita terms in current US dollars, Nepalis on average received less than $5 of remittances from abroad in 2000 but it reached $205 by 2014, by far the highest in South Asia and more than twice as much as Bangladesh (94 dollars).\(^{20}\) Foreign exchange earned from migration exceeds the sum of export receipts and official aid (World Bank 2011).

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Figure 7: Personal Remittances Received in Nepal and Selected Countries

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\(^{19}\) Personal remittances received as percent of GDP is 8.7 percent for Bangladesh and 3.4 percent for India as of 2014.

\(^{20}\) Even this figure may be an understatement of the prevalence of remittances from abroad as it includes the population working abroad in calculating the per capita value.
The benefit of the growth in remittances appears to have percolated deep into the economy. In 1995, approximately one in four households received some form of remittances. This became one in three by 2003 and more than one in two by 2010. Figure 8 shows the incidence of remittances at different points of the consumption distribution in 1995, 2003, and 2010. It is remarkable that the rapid increase in remittance receipts occurred at every spectrum of the consumption distribution. Not only did more Nepali households start receiving remittances, the average amount received also increased.21

![Figure 8: Remittance Incidence](source)

Source: Nepal Living Standard Surveys 1995, 2003 and 2010

**Labor Income**

In addition to households directly benefitting from remittances sent by migrant members, non-migrant households also benefitted from the spillover effects of migration. The decomposition exercises suggest that growth in labor incomes explain as much as 50 percent of the observed

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21 The share of remittances in total income increased from 6 percent in 1995 to 16 percent in 2010. See Table A2 in the Appendix.
decline in poverty. This growth came in the form of higher wages and a demand-led growth of farm and off-farm self-employment incomes.

Between 1995 and 2010, the share of labor income in total income remained mostly unchanged, while the share of remittances increased significantly. Figure 9 summarizes changes in income component shares between 1995 and 2010, where total income is classified into four categories: agricultural income, non-agricultural income, remittances and capital income.\(^{22}\) The remittance share nearly tripled from 6 percent to 16 percent for the whole population and a similar magnitude of increase is observed when analyzed by urban/rural, income levels, and geographical regions, which underscores the widespread incidence of remittances in 2010 as seen in Figure 8.

**Figure 9: Income component shares between 1995 and 2010**

| Income Share | 1995 | 2010 |
|--------------|------|------|
| Remittances  | 23%  | 16%  |
| Capital Income| 23%  | 14%  |
| Non-Agricultural Income | 48%  | 34%  |
| Agricultural Income | 14%  | 36%  |

Source: World Bank Staff Calculation based on Nepal Living Standard Surveys 1995/96 and 2010/11

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\(^{22}\) Agricultural income includes agricultural wages and net farm income. Non-agricultural income is a sum of non-agricultural wages and self-employment income. Capital income includes housing and non-agricultural rental income and also subsumes other miscellaneous incomes.
On average, agricultural income decreased and non-agricultural income increased in their shares, while the share of labor income, a sum of the two shares, remained stable between the two survey years. At the national level, the labor income share was approximately 70 percent of total income in 1995 and 2010. While the share of agricultural income declined from 48 percent in 1995 to 36 percent in 2010, the non-agricultural income share increased from 23 percent to 34 percent. This shift from agricultural income to non-agricultural income mainly came from rural areas, as these shares were almost unchanged in urban areas.

There were two distinct evolutions of income component shares in rural areas. In the hills, the labor income share increased primarily because of an increase in non-agricultural income. In terai regions, on the other hand, the labor income share decreased, because of a sharp decline in the agricultural income that more than offset a sizable increase in the non-agricultural income share. The shift from agricultural to non-agricultural labor incomes in rural areas underscores the prominent role of the non-agricultural labor income in poverty reduction shown in Figure 6.

Demography

High population growth was one of the major contributing factors to long-standing poverty in Nepal. Nepal’s population had almost doubled between 1960 and 1990 (World Bank 2016b) and was projected to double again between 1990 and 2015 (World Bank 1991). The population growth reached the peak in the early 1990s at around 2.7 percent, almost equivalent to the average figures for the Sub-Saharan Africa region at the time. It has taken a steep downward turn since then to 2.4 percent in 1996 and eventually settled at around the global average of 1.2 percent a year in the late 2000s (Figure 10). The latest population estimate for Nepal is 28.2 million, a 50 percent increase since 1990. The projection that Nepal’s population would double between 1990 and 2015 turned out to be unfounded.

Figure 10: Population Growth in Nepal and Selected Countries

Source: World Development Indicators (World Bank 2016b). Sub-Saharan Africa includes only low and middle income countries as of July 1st 2015.
The slowdown in population growth rate has been preceded by a sharp decline in fertility rates (Figure 11). The number of births of an average Nepali woman declined from over 6 in the 1970s and over 5 in the 1990s to around 2 in 2014. Demographers have variously attributed this fertility transition in Nepal to the spread of mass education, increasing female labor force participation, and mechanization of agriculture (Bhandari and Ghimire 2013; Axinn and Barber 2001). Another potential driver is the increase in urbanization. The share of urban population has been increasing steadily, from 3 percent in the 1960s, to 9 percent by 1990, and to 18 percent by 2014 (World Bank 2016b). Nepal’s urban population growth has been the fastest in the region, although the country remains the least urbanized in South Asia today (Muzzini and Aparicio 2013). More recently, the social and economic changes, brought by the increase in the migration of overwhelmingly male population together with an increase in educational attainment of girls, have led to delayed marriage and reduction in total fertility (Shakya and Gubhaju 2016).

Figure 11: Population and Population Growth in Nepal

![Graph showing population and population growth in Nepal from 1960 to 2014.](source: World Development Indicators (World Bank 2016b))

The dramatic fertility transition in the last two decades and the reduction in average household sizes accompanied by the declining dependency ratio had a significant effect on the observed
poverty reduction. Figure 12 summarizes the age composition and average household size by percentiles of per capita consumption using the 2010 NLSS data. Poorer households tend to have a larger household size with more children and fewer working-age adults. On the other hand, wealthier households tend to have fewer members but more working-age adults and fewer children. The contrasting demographic composition of the wealthy and the poor underscores the important role of population dynamics in poverty reduction and economic development.

Figure 12: Age Composition and Average Household Size by Consumption Percentile

Source: Nepal Living Standards Survey 2010
5. Challenges for Future Poverty Reduction

Poverty reduction in Nepal since 1995 has been impressive, especially given the dire living conditions in the early 1990s. Yet thinking about potential sources of future poverty reduction in Nepal, significant challenges come to the fore. How does Nepal cement these recent gains, make them sustainable and shift the policy discourse gradually from one that is dominated by discussions of absolute poverty to one that speaks to prosperity in general? How sustainable is the de facto migration-remittance based development model in terms of generating growth for the economy as well as for those that constitute the bottom 40 percent? What implication does that have for future investments in human capital, development of skills and the overall development of Nepal’s domestic labor market? How long can the improvement in living standards be sustained without productivity improvements that lead to robust, job-creating growth at the macroeconomic level?

The first challenge is to ensure that all sections of the Nepali society have the opportunity to benefit from the growth processes driving improvements in living standards. For example, despite the improvements on average, a closer examination of poverty trends at the sub-national level reveals sizeable spatial heterogeneity in progress (Table 3). At the national level, the poverty headcount ratio declined from 42 percent in 1995 to 12.5 percent in 2010 under the old poverty line, equivalent to an 8.4 percent reduction every year. Urban areas exclusive of Kathmandu valley experienced a much faster poverty reduction at 12 percent a year, followed by Rural Western Terai region at 10 percent. Rural Eastern Hill region is the only region that significantly lagged behind in reducing poverty from the rest of the country. While its poverty rate was below the national average in 1995, the sluggish pace of poverty reduction at 4 percent a year made Rural Eastern Hill the poorest and the second poorest region under the old and new poverty lines, respectively.

Table 3: Subnational poverty and pace of poverty reduction

| Poverty Rate | Old Poverty Line | Proportional Change per year | New Poverty Line |
|--------------|------------------|-----------------------------|------------------|
| Survey Year  | NLSS 1995        | NLSS 2010                   | NLSS 2010        |
| Kathmandu    | 4.3%             | 1.3%                        | 8.5%             | 11%              |
| Other urban  | 31.6%            | 5.4%                        | 12.4%            | 17%              |
| R-W Hill     | 55.0%            | 17.1%                       | 8.1%             | 32%              |
| R-E Hill     | 36.1%            | 18.9%                       | 4.4%             | 30%              |
| R-W Terai    | 46.1%            | 15.2%                       | 7.7%             | 27%              |
| R-E Terai    | 37.2%            | 8.7%                        | 10.1%            | 22%              |
| National     | 41.8%            | 12.5%                       | 8.4%             | 25%              |

Source: Nepal Living Standard Surveys 1995 and 2010

There is also a notable regional disparity in terms of the average depth of poverty. Figure 13 summarizes average per capita consumption of the poor in 1995 and 2010, expressed in 2010 prices. The poor in Kathmandu valley, the least-poor region in both years, on average had the highest per capita consumption in all regions. Other urban areas, where the pace of poverty reduction was the fastest, saw the largest increase in per capita consumption among the poor. The average consumption in Rural Eastern Hill region was approximately at the same level as the national average in 1995, but due to the slowest pace of poverty reduction, the poor in the region had the lowest average per capita consumption in 2010. Note that the poverty headcount rate was
almost halved even in Rural Eastern Hill between the two survey years, a remarkable accomplishment in and of itself. The uneven progress in poverty reduction, however, can translate into widening inequality and, combined with the regional disparity in the depth of poverty, could possibly become the genesis of yet another social unrest that has plagued the country since the mid-1990s. This is an integral part of Nepal’s vigorously debated agenda on economic and social inclusion.23

The second key challenge facing Nepal’s future is the extent to which the success in lifting people out of poverty translates into moving them into a secure middle class where the risk of falling back into poverty is minimal. How big is the size of this middle class in Nepal? Is it growing or shrinking? What are the characteristics of individuals that constitute this group? These are important questions that have started to emerge in Nepal. World Bank (2016) examines the dynamics of living standards movements across generations as well as within generations to examine long-run economic and social mobility as well as transitions in and out of poverty, vulnerability and the middle class.

Figure 13 Average per capita consumption of the poor (Rs. 2010 Prices)

A vocal, dynamic and assertive middle class can be the foundation for a social contract that can catalyze reforms to both generate and share growth. Postwar Western Europe, post-revolution China, post land reform Republic of Korea, and the United States under the New Deal all bear

23 This is also a topic of an in depth exploration in the forthcoming report, “Moving up the ladder: poverty reduction and social mobility in Nepal” (World Bank, 2016).
testament to the fact that durable socioeconomic progress requires a sound base of public education, health and infrastructure. Alternatively, a growing vulnerable group that is technically non-poor but fundamentally insecure about its economic prospects is likely to be in opposition to key reforms that may sacrifice short term benefits for longer term gains. A vocal and assertive middle class that opts into public services is also likely to demand better services which will indirectly benefit the poor. On the other hand, if the middle class opts out of the public system, the poor will likely suffer as quality is likely to deteriorate. How large is Nepal’s middle class and how fast has it been growing? What are the characteristics of this middle class? These are questions with important bearing on the speed with which Nepal will move towards exiting from its low-income country status in the coming decades.

Nepal’s progress on reducing poverty and improving social sector indicators has been a rather surprising counterpoint to an otherwise unremarkable story of economic growth which has sputtered in fits and starts around a mean rate of around 4 percent a year over the last couple of decades. Agriculture accounts for a significantly lower share of the overall Nepali economy as well as employment today but the workers leaving agriculture have not done so in response to a demand-pull of a more productive industrial/manufacturing sector. In fact, anemic growth of domestic jobs in the productive industrial sector - which peaked around 23 percent of the GDP before the onset of the Maoist conflict circa 1996 and has since declined to 16 percent of the GDP – represents an enormous challenge. International labor markets have provided a much-needed safety valve. But they expose the country to the vagaries of the global economic environment: opportunities that have been extremely favorable to poor Nepali workers may turn sour at any moment in the future. In a somewhat perverse way, the remittances generated by overseas migrants have also eroded Nepal’s export competitiveness (by causing appreciation of the real effective exchange rate).

In order to ensure continued improvements in the wellbeing of those at the bottom of the distribution and particularly to ensure that the success in lifting people out of poverty is taken the additional mile to move them robustly above the vulnerable category, it is important to expand employment opportunities, particularly wage employment opportunities in productive sectors outside agriculture. This will require a two-pronged strategy of (a) relieving the investment and infrastructure bottlenecks that stymie the growth of jobs in manufacturing and higher value services and (b) devising innovative ways of channeling migrants/returnee’s resources and ideas into scalable small and medium enterprises. A healthy, dynamic and growing domestic labor market is probably the surest way of cementing the progress on poverty Nepal has witnessed and cementing the foundation of a prosperous society.

Finally, there is certain urgency to this as Nepal’s growing youth bulge holds the promise of a potential opening for a demographic dividend. Barring a major reversal in the declining population growth and fertility, Nepal will have a large window of opportunity to realize the demographic dividends, a period during which the potential for economic growth is large due to a growing working age population. As shown in Figure 14, the base of Nepal’s population pyramid already started contracting as of 2011. The youth bulge is currently at around 5 to 15 years old and they are mostly literate and at least completed or will complete primary education. This group is about to reach the working age and, to the extent that labor markets, domestic or foreign, can absorb this group with productive jobs, there is a good scope for utilizing this demographic tailwind for economic development in Nepal for years to come.
6. Conclusions

The earliest records of poverty in Nepal indicate that the country was one of the poorest in the world at least until the early 1990s. Poverty in Nepal was chronic and plagued by high population growth, sluggish economic growth, a very low level of exports and rural population dependent on subsistence agriculture. The only glimmer of hope for poverty reduction at that time was to slow down population growth and formulate effective policies focused on boosting agricultural productivity in rural areas, which accounted for 95 percent of the poor population.

Contrary to the prediction, there was a remarkable reduction in the poverty rate in Nepal in a span of a decade and a half between 1995 and 2010. While the poverty headcount rate remained virtually unchanged at approximately 40 percent until 1995, it declined to 31 percent by 2003 and as low as 12 percent by 2010. Many non-income dimensions also exhibited significant improvements, often at a pace faster than neighboring countries in South Asia. The impressive poverty reduction record led the government to revisit and raise the poverty line in order to better reflect the living standards of contemporary Nepal. Even with the revised poverty line that increased in its real value by 35 percent from the previous line, the poverty rate in 2010 was estimated at 25 percent.

While improving agricultural productivity was long regarded as instrumental to lifting the living conditions of Nepal’s impoverished rural areas (World Bank 1991; World Bank 1999), a bulk of the observed poverty reduction appears to have come as a result of an exogenous improvement in economic opportunities for poor Nepalis outside of Nepal’s borders. International migration increased dramatically in the last 15 years; a daily average of 1,500 young Nepalis
migrates to the Middle East, Malaysia and the Republic of Korea for work. Well over half of the households received remittances in 2010 compared to only one-quarter in 1995, while the real value of average remittance per household increased six-fold over the same period.

In addition to households directly benefitting from remittances sent by migrant members, non-migrant households also benefitted from the spillover effects of migration. Decomposition exercises suggest that growth in labor incomes, non-agricultural income in particular, explained more than 50 percent of the observed decline in poverty. The country also benefitted from a steady decline in fertility rates and population growth, which helped lower the dependency ratio over time.

Yet significant challenges remain to sustain this impressive stretch of poverty reduction record. How sustainable is the de facto migration-remittance based development model in terms of generating growth for the economy? What implications does that have for future investments in human capital, development of skills and the overall development of Nepal’s domestic labor market? How long can the improvement in living standards be sustained without productivity improvements that lead to robust, job-creating growth at the macroeconomic level? The 2015 earthquakes and the trade disruptions in the aftermath of the long-awaited adoption of a new constitution exposed the shaky grounds on which the country has begun to build prosperity.

In order to ensure continued success in lifting people out of poverty and reducing vulnerability among those who have barely escaped poverty, it is important to expand employment opportunities, particularly wage employment opportunities in productive sectors outside agriculture. A healthy, dynamic and growing domestic labor market is probably the surest way of cementing the progress on poverty Nepal has witnessed and cementing the foundation of a prosperous society. Barring a major reversal in the declining population growth and fertility, Nepal will have a large window of opportunity to realize the demographic dividends. To the extent that labor markets, domestic or foreign, can absorb the young generation with productive jobs, there is a good scope for utilizing this demographic tailwind for economic development in Nepal for years to come.
7. Annexes

I. Calculating comparable poverty trends in Nepal

Poverty in Nepal has been measured using surveys of living standards conducted periodically by the Central Bureau of Statistics (CBS). Three rounds of the Nepal Living Standards Survey (NLSS) had been conducted in 1995/96, 2003/04 and 2010/11. Poverty headcount rates were 42 percent in 1995, 31 percent in 2003, and 25 percent in 2010. While the estimates from the first two rounds of the NLSS are comparable, the same is not true for the most recent estimate. This is due to two reasons: refinements introduced to the survey instrument in the 2010 NLSS and methodological changes in the way the poverty lines were calculated in 2010.

The most important change introduced in the 2010 NLSS was the way food consumption data were collected. In addition to asking the households about their consumption of food items during a “typical month” (as in the first two rounds of the NLSS), the 2010 NLSS also enquired about food consumption during “the last 7 days”. This focus on the most recent consumption was in accordance with international best practice to minimize the so-called “recall bias” in estimating food consumption (Beegle et al. 2012). This had direct implications on the way poverty is measured. While the official estimates for 1995 and 2003 were based on a “30 day recall” for food consumption, the 2010 estimate relied on a shorter, “7-day recall” horizon.

Second, there was a major revision in the way poverty lines were calculated following the 2010 NLSS. In simplest terms, a poverty line is a threshold expressed in monetary terms below which individuals are deemed poor. This threshold pertains to the minimum amount of Nepalese Ruppe to satisfy minimum caloric requirements and basic needs for nonfood goods and services. In 1995, the official poverty rate of 42 percent was based on the poverty line of Rs. 5,089 per person per year. In 2003, the poverty line of Rs. 7,696 was used after adjusting for inflation between the two survey rounds. This is to ensure that the same standard of living is used to identify the poor across the two survey rounds so that Rs. 7,696 in 2003 should afford the same basket of goods and services Rs. 5,089 afforded in 1995.

If the original poverty line was used to estimate poverty in 2010 after inflation adjustments, the poverty line would have been Rs. 14,316 and the resulting poverty rate would have been as low as 12.5 percent. This, however, was not adopted as the official poverty rate because of the growing perception and mounting evidence about improving living standards in Nepal. Overall economic well-being in Nepal had improved so much that the definition of what it meant to be poor in 1995 became obsolete by 2010. Some of what used to be luxury became necessity. For example, in 2010, Nepalis on average consumed more expensive food items such as meat and eggs and less cereals than 15 years ago. They also spent more on nonfood goods and services than they did in 1995.

In order to reflect the evolving way of life and the current consumption patterns in Nepal, a new poverty line was estimated using consumption data from the 2010 NLSS. The new poverty line was set at Rs. 19,262, an increase in real value by 35 percent compared to the original poverty line in 1995. The poverty rate using the new poverty line was 25 percent in 2010. This is based on

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24 Another notable change in the 2010/11 NLSS was the introduction of 12 Analytical Domains to stratify the population, in contrast to 6 strata previously used in the 1995/96 and 2003/04 NLSS.
25 Another adjustment was made to reflect changes in demographic composition of an “average household” to revise the minimum caloric threshold.
26 See World Bank (World Bank 2013) and Annexes for more details.
the new poverty line and an improved consumption aggregate derived from a 7-day recall of food expenditure. As such, it is not comparable to any of the earlier official estimates and doing so would be technically incorrect.

Figure A1: Poverty Trends in Nepal since 1995

Source: World Bank (2013)

In light of constructing comparable poverty estimates over time, what is of interest is the poverty rates in the earlier years had we used the “new” poverty line and considered total consumption comparable to the 30-day recall versions. The appropriate trend for this version would require a recalculation of poverty for all three rounds of the NLSS using the new poverty line and new consumption aggregate based on the 30-day recall. Under this approach, the poverty rate in 2010 would be 30.8 percent. In the earlier rounds, poverty rates were 63.8 percent in 1995 and 49.4 percent in 2003. Regardless of the choice of methodology and poverty lines, poverty declined significantly between 1995 and 2010.

Some may argue that even the new poverty line may be too parsimonious and the resulting poverty estimates too low. One in four Nepalis were unable to afford basic minimum needs for food and nonfood items that cost only Rs. 1,605 a month. At the same time, the government deserves much praise in its decision to raise the poverty line and its renewed commitment to poverty reduction as this change significantly increased the poverty rate as well as the number of poor.
II. The Poverty Decomposition Methodology

Overview

In order to understand drivers of poverty reduction in Nepal between 1995 and 2010, we employ the decomposition methodology developed by Inchauste et al. (2014) and Azevedo et al. (2013).27 The standard decomposition methodology such as the Datt-Ravallion decomposition (1992) and the Ravallion-Huppi method (1991) rely on summary statistics to explain changes in poverty. The major advantage of the method proposed by Inchauste, et al. (2014) and Azevedo, et al. (2013) is that it utilizes all possible permutations of counterfactual income distributions to estimate the contributions of income components and individual and household characteristics to changes in poverty. Although it does not allow for causal interpretation of poverty changes, this method is a useful accounting exercise to describe empirical regularities that can shed light on certain factors that are quantitatively more important in describing distributional changes.

We apply this method to decompose changes in the poverty headcount rate in Nepal between 1995 and 2010. Due to a major revision to the official poverty lines in 2010, the national poverty rate of 25 percent in 2010 is not comparable to the earlier estimates in 1995 or 2003. To construct comparable poverty estimates over time, two alternative trends are presented in Figure A1. This exercise uses the “upper” trend in Figure A1, i.e., the trend based on the new poverty line and the consumption aggregate that uses the 30-day recall food consumption. The poverty headcount rate declined from 64 percent to 31 percent between 1995 and 2010 according to this trend.

Model

Two alternative specifications of income are implemented to assess robustness of the results. In the first specification, per capita consumption is defined as follows:

\[
PCEXP_h = \theta_h \left[ \frac{n_h^A}{n_h} \left\{ \frac{n_h^W}{n_h} \left( \frac{1}{n_h} \sum_{i \in A} y_{i,h}^L \right) + \frac{1}{n_h} \sum_{i \in A} y_{i,h}^{NL} \right\} \right]
\]  

(1)

where \( PCEXP_h \) is per capita consumption expenditure of household \( h \), \( \theta_h \) is ratio of consumption to income, \( n_h \) is household size, \( n_h^A \) number of adults in household \( h \),28 \( n_h^W \) number of workers in household \( h \),29 \( y_{i,h}^L \) is labor income of individual \( i \) in household \( h \), \( y_{i,h}^{NL} \) is non-labor income of individual \( i \) in household \( h \).

The second specification divides total income into three components, agricultural income, non-agricultural income, capital income and remittances received as in equation (2) below:

27 We use adecomp, a user-written Stata command developed by Azevedo et al. (2012).
28 Anyone who is older than 15 years old is considered an adult in this exercise.
29 A worker is an adult household member who reported as working in the last 12 months either as wage workers or self-employed.
\[
\text{PCEXP}_h = \theta_h \left[ \frac{n_h^A}{n_h} \left( \frac{n_h^W}{n_h^A} \frac{n_h^R}{n_h^W} \left( \frac{1}{n_h} \sum_{i \in FW} y_{i,h}^F \right) + n_h^N \left( \frac{1}{n_h^N} \sum_{i \in NW} y_{i,h}^N \right) \right) + \frac{1}{n_h} \sum_{i \in A} y_{i,h}^C \right] + \frac{1}{n_h} \sum_{i=1}^{n_h} y_{i,h}^R
\]

where \(y_{i,h}^A\), \(y_{i,h}^{NA}\), \(y_{i,h}^C\) and \(y_{i,h}^R\) are respectively, agricultural income, non-agricultural income, capital income and remittances received earned by individual \(i\) in household \(h\).

The essence of this methodology is to generate a series of counterfactual income distributions in the second period, or 2010 in the current context, by substituting the observed level of the variables in the first period (1995) in the income equation one at a time and calculate statistics of interest, such as poverty headcount rate, for each iteration. For example, one iteration would generate a counterfactual income distribution in 2010 under the assumption that labor income in 2010 had been exactly the “same” as in 1995 in real terms, holding everything else constant. Another iteration may generate a counterfactual income distribution that keeps labor income and household characteristics at the level of 1995, while holding constant of everything else. This exercise is repeated for \(k!\) times, where \(k\) is the number of variables in the income equation.

Cumulative decomposition effect is calculated by taking the average effect for each component. The average effect for each variable is also known as the Shapley-Shorrocks estimate of each component.\(^{30}\)

Equation (1) has 6 variables and thus it requires 720 iterations while the number of iterations in Equation (2) increases to 3,628,800 for 10 variables. By calculating all possible paths of income changes in a given income equation, this method is free from path-dependence, which is one of the major limitations in much of the micro-decomposition literature. An important caveat to this methodology is that it fails to satisfy the independence property in that dividing an income component into multiple components (e.g., labor income into farm and non-farm labor income) results in the total income effect different from the sum of the effects of the multiple income components (World Bank 2014).

**Data and Results**

We use two rounds of the Nepal Living Standard Survey (NLSS) in 1995 and 2010. The NLSS is a multi-topic household survey that follows the World Bank’s Living Standard Measurement Survey (LSMS) format on topics related to the levels and determinants of living standards in Nepal. The NLSS interviewed 3,373 households in 1995 and 5,988 households in 2010.

In order to construct equations (1) and (2) above, we use the per capita consumption expenditure to draw the poverty trend in Figure A1 and the household-level income aggregate and its components harmonized across three rounds of the NLSS. All rounds of the NLSS allow us to break down income by wage (agricultural and non-agricultural), enterprise income (net farm income and non-agricultural enterprise income), rental income (housing and non-agricultural rental), remittances and other sources. Table A1 shows how income components are classified in

\(^{30}\) Due to Shapley (1953) and Shorrocks (1999).
Equations (1) and (2). In order to eliminate potential impacts of abnormal observations on the decomposition effects, we remove one percentile of household per capita income and per capita consumption expenditure in each tail. Summary statistics of variables used in this analysis are presented in Table A2. Table A3 summarizes the decomposition results.

Appendix Tables

Table A1: Definition of household income components

| Equation (1) - simple decomposition | Equation (2) - detailed decomposition |
|-----------------------------------|--------------------------------------|
| **Labor Income**                  | **Agriculture income**               |
| Wage income from agriculture      | Wage income from agriculture         |
| Wage income from non-agriculture  | Wage income from non-agriculture     |
| Non-agricultural enterprise income| Non-agricultural enterprise income    |
| Net income from farming           | Net income from farming              |
|                                  |                                      |
| **Non-labor income**              | **Non-agriculture income**           |
| Housing rental income             | Housing rental income                |
| Non-agricultural rental income    | Non-agricultural rental income       |
| Remittance                        | Remittance                            |
| Other income                      |                                      |

Source: NLSS-I and III
Table A2: Descriptive Statistics

|                                | Mean 1995 | Mean 2010 | Difference | Annual Growth |
|--------------------------------|------------|------------|------------|---------------|
| **Household Characteristics**  |            |            |            |               |
| Number of adults               | 3.82*      | 3.53**     | -0.06      |               |
|                                | (2.07)     | (1.73)     | (0.10)     |               |
| Number of workers              | 3.17*      | 2.80*      | -0.77****  |               |
|                                | (1.77)     | (1.45)     | (0.08)     |               |
| Share of adults                | 0.55***    | 0.61***    | 0.03***    |               |
|                                | (0.19)     | (0.21)     | (0.01)     |               |
| Share of workers               | 0.47**     | 0.49**     | -0.10***   |               |
|                                | (0.19)     | (0.21)     | $0.00      |               |
| Number of agriculture workers  | 2.61       | 2.06       | -0.97***   |               |
|                                | (1.85)     | (1.62)     | (0.08)     |               |
| Share of agriculture workers   | 0.80***    | 0.70*      | -0.13***   |               |
|                                | (0.31)     | (0.40)     | (0.01)     |               |
| Number of non-agriculture workers | 0.56     | 0.75       | 0.19***    |               |
|                                | (0.90)     | (1.12)     | (0.03)     |               |
| Share of non-agriculture workers | 0.2      | 0.3        | 0.13***    |               |
|                                | (0.31)     | (0.40)     | (0.01)     |               |
| **Share in total income (in percent)** |           |            |            |               |
| Labor income                   | 71.10***   | 69.93**    | -5.36***   |               |
|                                | (25.02)    | (28.98)    | (0.72)     |               |
| Non-labor income               | 28.9       | 30.07      | 5.36***    |               |
|                                | (25.02)    | (28.98)    | (0.72)     |               |
| Capital income                 | 23.23      | 13.69      | 0.87       |               |
|                                | (21.40)    | (15.77)    | (0.58)     |               |
| Remittances                    | 5.67       | 16.38      | 4.49***    |               |
|                                | (15.65)    | (26.33)    | (0.52)     |               |
| Agriculture income             | 48.35      | 35.8       | -10.59***  |               |
|                                | (30.34)    | (31.35)    | (0.82)     |               |
| Non-agriculture income         | 22.75      | 34.12      | 5.23***    |               |
|                                | (29.30)    | (33.32)    | (0.84)     |               |
Table A2: Descriptive Statistics continued

| Income | Mean | Difference | Annual Growth Rate |
|--------|------|------------|-------------------|
|        | 1995 | 2010 |       |                  |
| Ratio of per capita expenditure to per capita income | 1.27 | 1.23 | -0.05* |
| Per capita consumption expenditure, 1995 prices | 7101.95 | 11328.86 | 2781.01*** |
| Labor income, 1995 prices | 42374.08 | 73836.8 | 74.25*** | 3.7 |
| Labor income per adult, 1995 prices | 10180.41 | 18268.8 | 79.45*** | 3.9 |
| Non-labor income, 1995 prices | 13978.91 | 21254.37 | 52.05*** | 2.79 |
| Non-labor income per adult, 1995 prices | 3195.79 | 5228.74 | 63.61*** | 3.28 |
| Non-labor income, Capital, 1995 prices | 11271.61 | 10548.66 | -6.41 | -0.44 |
| Non-labor income, Capital, per adult 1995 price | 2690.59 | 2576 | -4.26 | -0.29 |
| Non-labor income, Remittances, 1995 prices | 2707.3 | 10705.3 | 295.44*** | 9.17 |
| Non-labor income, Remittances, per adult 1995 price | 505.2 | 2652.74 | 425.09*** | 11.06 |
| Agriculture income, 1995 prices | 19737.75 | 24998.02 | 26.65*** | 1.58 |
| Agriculture income, per adult 1995 price | 9028.11 | 12948.96 | 43.43*** | 2.4 |
| Non-agriculture income, 1995 prices | 22636.33 | 48838.77 | 115.75*** | 5.13 |
| Non-agriculture income, per adult 1995 price | 17088.17 | 35514.36 | 107.83*** | 4.88 |

*p<0.05, **p<0.01, ***p<0.00. Standard errors in parentheses
## Table A3: Decomposition Results: Contribution to Total Poverty Change (2010-1995)

|                  | All          | Urban        | Rural        |
|------------------|--------------|--------------|--------------|
|                  | FGT(0) | FGT(1) | FGT(0) | FGT(1) | FGT(0) | FGT(1) |
| **Equation (1)** |            |            |            |        |        |        |
| Consumption-income ratio | -3.62*** | -1.13*** | -1.12*** | -.9**  | -3.68*** | -1.45*** |
| Share of adults   | -5.87*** | -2.32*** | -4.68*** | -2.09*** | -5.26*** | -1.9*** |
| Share of workers  | .67***   | .87**    | -2.38** | -1.31*** | 0.19    | 0.64    |
| Labor income      | -17.39*** | -9.6***  | -6.56*** | -3.23*** | -16.18*** | -9.17*** |
| Capital income    | 1.85***  | 1.96***  | -0.35   | -0.01   | 3.28***  | 2.55***  |
| Remittances       | -9.2***  | -5.08*** | -4.69*** | -2.11*** | -10.4*** | -5.8***  |
| Total effect      | -33.57   | -15.31   | -19.77  | -9.65   | -32.05  | -15.13  |
| **Equation (2)** |            |            |            |        |        |        |
| Consumption-income ratio | -2.78*** | -1.22*** | .69** | 0.72 | -1.68*** | -0.13  |
| Share of adults   | -6.6***  | -2.71*** | -5.85*** | -2.94*** | -5.67*** | -2.19*** |
| Share of workers  | .5**     | .59**    | 1.02    | 0.44    | .61***  | 0.42    |
| Share of agriculture workers | 0.02 | 0.06 | -1.25*** | -0.04 | -0.14 | 0.06 |
| Share of non-agriculture workers | -0.25 | -0.06 | .05* | 0.15 | -0.27*** | 0.08 |
| Agriculture income | -5.27*** | -2.21*** | -6.74*** | -3.12*** | -7.12*** | -3.28*** |
| Non-agriculture income | -14.51*** | -7.01*** | -7.96*** | -3.28*** | -13.85*** | -7.04*** |
| Capital income    | 1.25***  | 1.24***  | -1.81*  | -0.15   | 2.18***  | 1.51***  |
| Remittances       | -5.49*** | -2.81*** | -2.48*** | -0.79*** | -6.4***  | -3.46*** |
| Total effect      | -33.13   | -14.13   | -24.34  | -9.01   | -32.32  | -14.03  |

*p<0.05, **p<0.01, ***p<0.00.

Source: World Bank Staff Calculation using 1995 and 2010 NLSS
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