

July 2015

Human Capital, Employment and Subjective-Objective Poverty: A Micro Case Study of Nepal

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<https://doi.org/10.7275/7109711> https://scholarworks.umass.edu/masters_theses_2/253

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**HUMAN CAPITAL, EMPLOYMENT AND SUBJECTIVE-OBJECTIVE POVERTY: A
MICRO CASE STUDY OF NEPAL**

A Thesis Presented

By

TEJESH PRADHAN

Submitted to the Graduate School of the University of Massachusetts Amherst in partial
fulfillment of the requirements for the degree of

MASTER OF SCIENCE

May 2015

Resource Economics

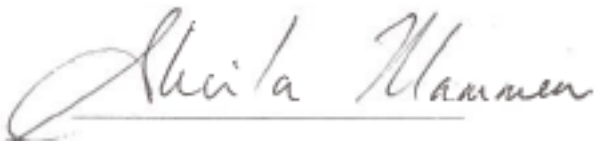
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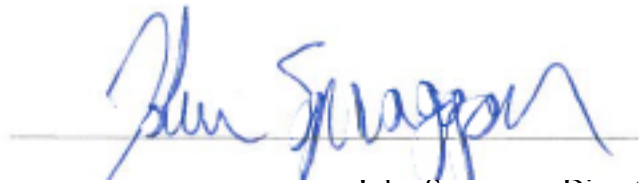
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ACKNOWLEDGEMENT

My special gratitude goes to Professor Sheila Mammen for her infinite patience, guidance, encouragement, support and supervision, without which this thesis would not have been possible. Her enthusiasm for my research gave me the confidence to take on a difficult project, while our frequent conversations provided me the practical tools I required in overcoming the challenge. In her I found a professor, employer, and advisor who, despite of her own demanding schedule, cooperated from the beginning till the very end of this project, going above and beyond her responsibilities in providing valuable ideas and feedbacks. I am very grateful to Professor Daniel Lass, who is my second reader, for providing constructive inputs that have contributed to the analytical rigor of this project.

And of course, to my family and friends, I hope you recognize your contributions and realize the affection and respect I will always have for you. Especially, to Mom, Dad and my sister for believing in me and being so proud of me, you are my strength. My achievements are yours. In everywhere I go and in all I experience, I live for you.

ABSTRACT

HUMAN CAPITAL, EMPLOYMENT AND SUBJECTIVE-OBJECTIVE POVERTY: A MICRO CASE STUDY OF NEPAL

MAY 2015

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Directed by: Professor Sheila Mammen

This thesis derives an alternative subjective-objective poverty line (SPL) using self-reported qualitative assessments of perceived adequacy for different categories of consumption namely, food, housing and clothing. Modeling the probability of reporting that actual consumption in each category is adequate, I find that actual measures of consumption are highly significant predictors of perceived consumption adequacy. The perceived adequacy for different consumption components respond more elastically to spending on the corresponding category of goods than to that on other types. The results suggest that the implied subjective poverty lines and regional profiles are different from those predicted by popular objective methods.

This thesis also estimates the effects of human capital, employment and basic facilities on household poverty status in Nepal. Delving into this topic seems very policy relevant for the country, where there is a huge need of public education and unemployment insurance programs. To investigate this causal relationship, I use the Living Standards Measurement Survey Data for the year 2010/11, which includes information on past and present educational attainment, current employment, and availability and status of infrastructure in different communities of the country. I find that higher educational attainment, employment and improved perceived status of public amenities contribute to higher subjective wellbeing and reduced likelihood of poverty, controlling for value of assets owned, socio-demographic attributes and geographic location.

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CHAPTER 1

MEASURING POVERTY IN NEPAL USING QUALITATIVE ASSESSMENTS OF CONSUMPTION ADEQUACY TO DERIVE SUBJECTIVE-OBJECTIVE POVERTY LINE FROM SELF-REPORTED PERCEIVED ADEQUACY OF CONSUMPTION

1.1 Introduction

Devising an appropriate poverty measure to achieve a better definition of the problem is a crucial step in advancing towards the eradication of poverty and improving the living conditions of the poor. Although poverty is a multidimensional concept, it is not measured from this perspective in most countries. Instead, the concept of poverty has historically been related to a lack of income or consumption level necessary to meet a certain predetermined threshold of basic needs. Such a definition has consistently influenced the statistical measures used to describe poverty conditions within and across nations. There are two major problems with this approach. First, a measure to incorporate the multidimensional nature of poverty has to extend beyond just the ability to meet a minimum level of resource needed for a predetermined level of subsistence or basic needs. It should rather reflect the concurrent deprivations that a household experiences or the lack of access to certain goods and services considered necessary for society, whether a basic need or not. Second, any concept of 'basic needs' is inherently idiosyncratic to different societies.

Subjective poverty measures, unlike the conventional monetary measures of poverty, circumvent these limitations. Commonly, subjective poverty lines (SPLs) are based on responses to minimum income questions (MIQs) – a set of survey questions aimed at determining household income in an economic sense, “the maximum consumption that is possible without depleting current wealth.” Poverty begins when income is less than the amount derived from responses to the MIQs. For reasons of consistency, adjustments are made for heterogeneity such

that people in the same income level whose responses to the MIQs vary would be considered equally well off. The key assumption with the MIQ approach is that the household responding to such questions knows its income. Applying such a method in emerging economies, especially in remote areas however is challenging, as the concept of income is not as clearly nor as consistently defined of a concept as it is in developed countries. Since it is doubtful if one could even get reasonable answers to the MIQs, there is a need to develop measures of poverty that may be adjusted to suit the conditions of developing countries.

To that end, this paper presents an alternative subjective-objective poverty line derived from qualitative assessments of perceived adequacy of consumption. Appreciating the multidimensional definition of poverty and using self-assessments of households about whether or not they are experiencing poverty, the idea of this paper as of most studies that analyze subjective poverty is not to propose that subjective measures should be used in lieu of objective poverty measures but to combine subjective and objective indicators to provide a complete measure of poverty. The focus is to estimate subjective poverty line using both reported expenditure and subjective economic welfare questions based on perceived minimum requirements of the household.

I use the Nepal Living Standard Measurement Survey data, a nationally representative household survey, for the years 1995/96 and 2010/11 (NLSS-I and NLSS-III). Applying the methodology presented in Pradhan and Ravallion (2000), I replicate their analysis to compute the SPL for NLSS-I and calculate the national and regional SPLs for NLSS-III. Furthermore, for NLSS-III, I augment the Pradhan and Ravallion framework to estimate a more holistic SPL by including an additional expenditure category. This augmentation better represents the basic consumption constraints households face in their pursuit of a satisfactory standard of living. The underlying premise of this new model is that perceived adequacy of consumption is a better measure of household poverty than MIQ.

The main finding of this paper suggests that actual measures of consumption among Nepalese households are usually significant predictors of perceived adequacy. The elasticity of perceived adequacy for food and housing are higher with respect to actual spending on corresponding categories of goods than to other kinds of spending. *Ceteris paribus*, larger households perceive their consumption as being less adequate. While demographic compositional effects are insignificant, regional effects seem to matter. The implied poverty lines and aggregate poverty measures are in agreement with those presented in Pradhan and Ravallion (2000) for NLSS-I. However, there are notable differences in national as well as geographic poverty profiles. The poverty lines and incidence measures for NLSS-III are also different from other independent objective poverty thresholds.

1.2 Literature Review

1.2.1 Subjective measures of poverty

There have been several studies on the use of subjective methods to measure poverty. It is well documented that measurement errors attributable to imperfect recall and inconsistent definitions of income and prices lead to biases in construction of poverty indices directly based on income and cost of basic goods and services (Browning et al. 2003; Deaton 1997; Deaton 2010). Concerning difficulties arise when using income-based poverty lines for comparisons across geographic regions and socioeconomic groups. It is considered potentially more reliable to collect information on poverty by simply asking households directly about their poverty status (Deaton 2010). Information from self-reported perceived poverty situation can effectively be used to make poverty comparisons over time and across regions. Subjective poverty lines are multidimensional and capture poverty in different domains of life (Van Praag & Ferrer-i-Carbonell 2006).

There is substantial evidence that supports the use of subjective measures of welfare, as they avoid many of the aforementioned problems associated with objective ones (see Ravallion 2012). Subjective assessments of household poverty, in particular, are independent of any predetermined poverty threshold and there is no requirement for assumptions pertaining to economies of scale associated with household size and varying needs of children and adults (Ravallion and Lokshin 2001). They are more likely to capture relatively longer-term measures of economic wellbeing than static income and expenditure and may reflect the effects of anticipated future shocks (Singh-Manoux et al. 2005). Subjective measures may be of even greater importance in the context of developing economies where income from small-scale activities is difficult to measure correctly (Pradhan and Ravallion 2000; Lokshin et al. 2006).

1.2.2 Poverty measurement in Nepal

Few objective profiles of poverty in Nepal have been completed after the availability of nationally representative sources of data on income and expenditure. These data sources include the Employment, Income Distribution and Consumption Patterns Survey by National Planning Commission in 1976/77, Multipurpose Household Budget Survey by Nepal Rastra Bank in 1984/85 and three waves of Nepal Living Standard Measurement Surveys in 1995/96, 2003/04 and 2010/11 (NLSS-I, NLSS-II and NLSS-III), a cooperative effort of the World Bank and the Central Bureau of Statistics Nepal (CBS). While the first two sources were targeted to collect data on income and consumption, the NLSS data are widely used to measure poverty. Each of the sources estimated a poverty line distinctly resulting in different estimates of per capita daily calorie requirement for survival and, therefore, different estimates for the per capita consumption expenditure required to intake minimum level of calorie requirement and purchase minimum level of other non-food basic necessities.

In the absence of precise scientific methods to measure poverty and to set accurate poverty lines, researchers have used different techniques over the past decades. Most measures are based on income or consumption that is plagued with problems of comparability and internal consistency of both poverty lines and estimates (Asra and Francisco 2001). Acharya (2004) uses a comparative static approach to assess Nepalese poverty for 1977-1997 and concludes that income poverty increased in Nepal during the period of observation despite a marginal increase in per capita income. The results from this paper suggest that the spatial distribution of Nepalese poverty also reveals that poverty is more pervasive among people who live in the Western hills and in the Mountainous regions of the country.

Wagle (2004) recognizes in the specific context of Kathmandu that subjective concepts of economic welfare are more comprehensive with objective concepts incorporated in the analysis and measurement of urban poverty. It provides a useful framework to integrate both the approaches, although it does not build a particular poverty standard. The paper concludes that because people hold different views on what an adequate level of consumption is, both in absolute and in relative terms, subjective and objective poverty have different characteristics. The paper finds that while educational attainment consistently predicts the levels of both types of poverty, economic welfare to economies of scale associated with increasing household size and other socio-demographic characteristics such as, geographical region, religion, household head's caste and employment status and sector influence subjective economic wellbeing only.

Using a random survey sample of 625 households for the year 2003, Wagle (2006) compares poverty outcomes in Kathmandu using absolute income and consumption as well as relative income standards. The results suggest that poverty in the capital city is between 19-44% of the population depending on the type of method used. According to this paper, households with low educational attainment of household head, large household size, residing in north, central and eastern part of the city and large number of young dependents consistently predict poverty regardless of which standard is used.

1.2.3 Pradhan-Ravallion framework

Pradhan and Ravallion (2000) exemplifies the attention and intellectual effort the construction of poverty lines has received in recent poverty analyses of Nepal. Using the NLSS-I data, they demonstrate that less demanding qualitative survey questions related to self-reported assessments of perceived adequacy for different categories of consumption, such as food and housing, suffice to estimate the SPL without the MIQ. Their methodology to compute the SPL consists of two steps. The first step estimates a standard ordered probit to separately model the probability of reporting that actual consumption in each category is adequate as a function of log actual household expenditure by component, demographic composition variables, regional dummy variables and log mean expenditure in the primary sampling unit in order to allow for relative neighborhood income effects. Using the estimates from the probit regressions, the second step solves for the SPL, defined as the expenditure level at which respondents believe, on average, that their spending sufficiently meets their consumption requirements. A household is poor if and only if its total expenditure is less than the computed SPL for a household with its unique characteristics.

The following few paragraphs summarize Pradhan and Ravallion's theoretical framework that I use in this paper to compute the subjective poverty line (SPL). This qualitative model first assumes well-defined consumption baselines or needs for each individual. At the consumer's utility maximizing consumption bundle and the prevailing household income and market prices, these needs do not have to be met. The model lets \mathbf{y} denote the consumption bundle of an individual and \mathbf{z} denote the individual's corresponding consumption norm. Accordingly, the subjective basic need for good k and household i is given by:

$$z_{ki} = \varphi_k(\mathbf{y}_i; \mathbf{x}_i) + \varepsilon_{ki} \quad (k = 1, \dots, m; i = 1, \dots, n) \quad (1)$$

where φ_k ($k = 1, \dots, m$) are all continuous bounded functions, \mathbf{x} is an indicator vector of economic welfare at a given consumption bundle, and ε_{ki} are mean zero independently and identically normally distributed for all i .

The SPL is then the level of expenditure at which the subjective minimums for all goods k are reached in expectation for a given \mathbf{x} . By this definition, a household is poor if, and only if, its total expenditure is below the corresponding SPL for a household with similar characteristics. But since the foremost assumption of this alternative method is that one might not get sensible answers to the MIQs, z_{ki} is not directly observable. We do, however, have qualitative information on whether, y_{ik} , the actual expenditure on good k by the i^{th} household is below z_{ki} .

Given this, the probability that the i^{th} sampled household will report that its actual consumption of good k is adequate can be represented by a standard probit as long as the function φ_k are linear in parameters and possibly non-linear in variables. Pradhan and Ravallion (2000) assumes a standard log-linear specification for the individual subjective poverty lines, following the literature on the MIQ,

$$\ln z_{ki} = \alpha_k + \beta'_k y_i + \pi'_k x_i + \varepsilon_{ki} \quad (k = 1, \dots, m; i = 1, \dots, n) \quad (2)$$

where $y' \equiv (\ln y_1, \dots, \ln y_m)$.

If the values of z_k were observable analogously to the response to the MIQs, then it would have been possible to directly estimate a unique subjective poverty line, more specifically, an estimate for $z^* \equiv (\ln z_1^*, \dots, \ln z_m^*)$. Mathematically, the solution is given by $z^* = \mathbf{B}^{-1}(\boldsymbol{\alpha} + \boldsymbol{\pi}\mathbf{x})$ where

$$\mathbf{B} = \begin{bmatrix} 1 - \beta_{11} & \cdots & -\beta_{1m} \\ \vdots & \ddots & \vdots \\ -\beta_{m1} & \cdots & 1 - \beta_{mm} \end{bmatrix}$$

is assumed to be a nonsingular matrix.

Though the parameters in the \mathbf{B} , $\boldsymbol{\alpha}$ and $\boldsymbol{\pi}$ above, are unknown when we have only qualitative data on consumption adequacy with respect to a subjective norm, Pradhan & Ravallion (2000) demonstrates that the SPL is still identified for a general model with more than one good. This illustrates that one can, in fact, solve for the subjective poverty line without the minimum income questions as long as one has the qualitative data to estimate out $\text{Prob}(y_{ki} > z_{ki})$ for all i, k that can be obtained by asking whether the households' current consumption is adequate. Let \mathbf{B}_σ be defined as the estimable normalized matrix obtained by post-multiplying the \mathbf{B} matrix by the column vector formed by σ_k^{-1} ($k = 1, \dots, m$). Similarly, define the normalized vector $\boldsymbol{\alpha}_\sigma$ and parameter matrix $\boldsymbol{\pi}_\sigma$ to rewrite the solution for the SPLs given by the equation for z_* above in terms of the observed normalized parameters as $z_* = \mathbf{B}_\sigma^{-1}(\boldsymbol{\alpha}_\sigma + \boldsymbol{\pi}_\sigma \mathbf{x})$. This threshold value is used to identify subjectively poor households in the sample.

Considering that the adequacy questions did not span the entire consumption space, the authors propose two methods: Method (1), referred to as M1 from hereon, bases the poverty line solely on the perceived adequacy of food consumption. This method ignores adequacy with other domains of life and regresses the answers to the food adequacy question on total expenditure on consumption and the demographic and regional variables. Corresponding with objective poverty lines in which the threshold is the total expenditure or income at which spending on food is sufficient to assure nutritional adequacy for good health, this method emphasizes more on the information in household's qualitative assessments of food sufficiency rather than nutritional adequacy or quality.

Method (2), referred to as M2 from hereon, uses responses to perceived adequacy of consumption for other non-food items as well. For Nepalese households, food and housing consumption are considered 'core' and the rest is lumped into 'remainder'. In particular, this method estimates a reduced-form Engel curve for the remainder as a function of core expenditure and the demographic and regional variables to make an allowance for the remaining expenses.

This is an estimate of the expected value for an individual or a household consuming at the level of the subjective poverty line for core expenditure. Using the estimates from the ordered probit regressions for each core consumption categories in the framework allows the computation of the respective threshold values, which when added together to the predicted noncore consumption gives the poverty line. For both methods, Pradhan and Ravallion use log actual household expenditure (total for M1 and component-wise for M2), log household size, demographic composition variables and regional dummies as regressors. Both these approaches also allow for the relative income effect by including log mean expenditure in the primary sampling unit.

1.3 Data and Methods

In this paper, I use both the NLSS-I and the NLSS-III survey data. While the former encompassed 20,160 individuals and 3,373 households across the country, the latter covered 28,670 individuals and 5,988 households. These survey data have three strata: individual, household and ward¹. This paper considers a household as the unit of analysis. The NLSS collected data on income, expenditure, health, education, employment, agriculture, asset ownership, access to and status of services, housing characteristics and possession of basic amenities of life. In addition, The NLSS provides an array of self-reported opinions on households' perceived adequacy of six different consumption categories: food, housing, clothing, health care, schooling and income. For each category, the adequacy rating equals 0, 0.5 or 1 if the respondents believe that their family's consumption is "less than adequate", "adequate" or "more than adequate" respectively for their family's needs. "Adequate" means no more or no less than what the respondents consider to be the minimum consumption needs of the household. These self-reported ratings can be considered a psychological manifestation of an underlying measure of

¹ Wards are a subdivision of a local authority area, typically used for electoral purposes

household financial capacity or distress as a result of not being able to afford the desired consumption level.

Table 1.1 below shows the distribution of these adequacy ratings for both the NLSS-I and NLSS-III cohorts. There has been a significant improvement in the percentage of respondents who think their consumption was “just adequate” but there are still a large number of people who perceive their family’s consumption level to be “less than adequate” to meet their needs. I use the self-reported adequacy measures for food and housing as dependent variables for NLSS-I, plus clothing for NLSS-III in order to model the probability of reporting that actual consumption in each category to be no more or less than adequate, given a household’s socio-demographic characteristics.

Table 1.1: Distribution of perceived adequacy of consumption ratings, NLSS-I (1995/96) and NLSS-III (2010/11)

	Less than Adequate	Just Adequate	More than Adequate	Not Applicable
NLSS-I				
Food	46.61%	51.41%	1.99%	0.00%
Housing	58.91%	40.79%	0.15%	0.15%
Clothing	52.77%	46.81%	0.36%	0.06%
Healthcare	51.73%	47.58%	0.09%	0.59%
Schooling	42.34%	38.01%	0.24%	19.42%
NLSS-III				
Food	14.71%	83.08%	2.19%	0.02%
Housing	21.01%	77.49%	1.40%	0.10%
Clothing	15.76%	82.87%	1.35%	0.02%
Healthcare	17.45%	80.49%	1.34%	0.72%
Schooling	15.56%	71.24%	1.09%	12.11%

Table 1.2 shows the summary statistics for annual nominal per capita expenditure and socio-demographic variables for Nepalese households. In the survey schedule, a comprehensive consumption section preceded adequacy related questions. The expenditure aggregate for main categories of spending includes imputed values for consumption in kind as well as cash

expenditures at local market prices. For homeowners, rent is imputed for missing as well as for implausible values based on the quality of the house, facilities, and location of the residence. The imputation and aggregation of consumption measures have been conducted according to the steps prescribed in the Nepal Living Standards Survey Reports published by the Central Bureau of Statistics in Nepal for the corresponding years.

As briefly mentioned in the introduction, in this paper, I first apply the Pradhan and Ravallion framework discussed in the literature review in order to: i) compute the SPL for NLSS-I for replication purposes and ii) calculate the updated national and regional SPLs for NLSS-III, using expenditure information and self-reported perceived adequacy of consumption ratings of food and housing only. Furthermore, for the NLSS-III dataset, I augment the Pradhan and Ravallion framework to calculate a more holistic SPL that accounts for consumption constraints households face in clothing in addition to food and housing. Including clothing as an additional expenditure category more accurately reflects the cost of goods and services households incur. Specifically, the augmentation of M2 (M2A1) separately models predictors of adequacy of food, housing and clothing. Pradhan and Ravallion’s model excludes clothing due to a relatively large number of zero entries in the NLSS-I dataset that created a very weak relation between actual expenditure and perceived adequacy. By using the most recent NLSS dataset, I have avoided this practical problem.

Table 1.2: Descriptive statistics for explanatory variables, NLSS-I (1995/96) and NLSS-III (2010/11)

	Mean	Median	SD
	NLSS-I (N = 3373)		
Food	4695	3843	3397

Housing	1620	351	4168
Core	6315	4296	6432
Noncore	2348	1167	4500
Total	8663	5731	9688
Household size	5.98	6.00	2.91
Fraction men aged < 18	0.22	0.22	0.17
Fraction women aged < 18	0.20	0.20	0.17
Fraction men aged [18-60]	0.25	0.24	0.16
Fraction women aged [18-60]	0.26	0.25	0.14
Fraction men aged > 60	0.03	0.00	0.09
Fraction women aged > 60	0.04	0.00	0.12
NLSS-III (N = 5988)			
Food	21797	18713	12877
Housing	3598	2324	4024
Clothing	2757	816	5048
Core A	25396	21340	15559
Core B	28152	23353	17742
Noncore A	18086	10443	30368
Noncore B	15330	8187	28540
Total	43482	32926	39601
Household size	4.79	4.00	2.33
Fraction men aged < 18	0.19	0.20	0.18
Fraction women aged < 18	0.19	0.18	0.19
Fraction men aged [18-60]	0.22	0.20	0.19
Fraction women aged [18-60]	0.30	0.25	0.18
Fraction men aged > 60	0.05	0.00	0.12
Fraction women aged > 60	0.05	0.00	0.13

Note: The unit for expenditure is Nepalese Rupees per person per year. `Core` category includes food and housing for NLSS-I. For NLSS-III, For NLSS-III, `Core A` includes food and housing and `Core B` includes on food, housing and clothing. Noncore expenditure is total expenditure minus core expenditure. Natural log of consumption expenditures are used as regressors throughout this paper.

Pradhan and Ravallion omit schooling and health care related expenditures because of its public goods nature, for which the perception of adequacy may be different than that for private consumption. While the public goods assumption may be applicable to schooling, it does not truly hold for health care financing in a resource-poor country like Nepal where, without national

health care, people rely mostly on out-of pocket payments. These health-related expenditures are often significant and usually cause financial distress or poverty if the poor are unable to access to healthcare (MHP GON 2007). I do not separately model adequacy of health care, as unlike other expenditures, most health-related incidentals occur only as a response to health shocks. Given that there is a health shock, health expenditure is generally welfare enhancing. But the occurrence of health shocks itself is an indication of welfare reduction. Because of this peculiarity, analysis of household expenditure on health is excluded. I will be evaluating these data in future work.

1.4 Results

Table 1.3 shows the ordered probit regression results for perceived adequacy of food and housing using NLSS-I. Column (1) lists the estimates for the coefficients obtained from the regression in M1. Columns (2) and (3) show the coefficients for M2. The results align well with those shown in Pradhan & Ravallion (2000). Actual measures of consumption are highly significant predictors of perceived consumption adequacy. The perceived adequacy for food and housing responds more elastically to spending on the corresponding category of goods than to that on other types. *Ceteris paribus*, larger households have lower perceived adequacy and so do households with higher fraction of young dependents. Neighborhood expenditure has a strong negative effect on perceived adequacy and households in regions outside Kathmandu, the capital, perceive their consumption to be less adequate in comparison to those in the valley.

Table 1.3: Perceived adequacy of food and housing in Nepal using NLSS-I (1995/96)
(continued onto next page)

Column	M1	M2	
	(1)	(2)	(3)
	Food only	Food	Housing
Log food consumption		0.67*** (0.06)	0.26*** (0.06)
Log housing consumption		0.41***	0.37***

		(0.03)	(0.03)
Log total household consumption	0.85*** (0.05)		
Log of household size	-0.22*** (0.06)	-0.30*** (0.06)	-0.07 (0.06)
Fraction of males under 18	-0.46** (0.18)	-0.37* (0.18)	-0.51** (0.19)
Fraction of females under 18	-0.66*** (0.18)	-0.54** (0.18)	-0.49** (0.19)
Fraction of females from 18 to 60	0.08 (0.20)	0.04 (0.21)	-0.06 (0.21)
Fraction of males over 60	-0.03 (0.27)	-0.02 (0.28)	0.17 (0.29)
Fraction of females over 60	-0.07 (0.22)	-0.08 (0.23)	0.15 (0.23)
Log mean total consumption of cluster	-0.56*** (0.08)	-0.67*** (0.08)	-0.67*** (0.08)
Other urban	-0.56*** (0.10)	-0.39*** (0.10)	-0.12 (0.11)
Rural Nepal (west hills)	-0.84*** (0.12)	-0.48*** (0.12)	-0.91*** (0.13)
Rural Nepal (east hills)	-0.86*** (0.11)	-0.59*** (0.12)	-0.64*** (0.12)
Rural Nepal (west Terai)	-0.31* (0.13)	0.13 (0.14)	-0.63*** (0.14)
Rural Nepal (east Terai)	-0.48*** (0.11)	-0.15 (0.12)	-0.37** (0.12)
α_1	1.64* (0.75)	1.78* (0.77)	-2.12** (0.80)
α_2	4.11*** (0.75)	4.34*** (0.77)	1.04 (0.81)
Observations	3373	3373	3368

Standard errors in parentheses

* p<0.05 ** p<0.01 *** p<0.001

Table 1.4 shows the results for ordered probit regression results for perceived adequacy of food and housing using NLSS-III. The results here also have similar interpretation as that presented in Table 1.3 but with a few exceptions. Actual measures of consumption are highly significant predictors of perceived consumption adequacy. The perceived adequacy for each category of consumption responds more elastically to spending on the corresponding category of goods than to that on other types, even when running an additional regression with household

expenditure on clothing as a dependent variable. Holding everything constant, larger households have lower perceived adequacy. Neighborhood expenditure now has a statistically significant and a positive effect on perceived adequacy for housing. Unlike in Table 1.3, demographic composition of households does not have a significant effect on how adequate households perceive their consumption to be. While households in regions outside Kathmandu perceive their consumption to be more adequate in comparison to those inside the valley, those in the mountainous regions think their consumption is relatively less adequate.

Table 1.4: Perceived adequacy of food, housing and clothing in Nepal using NLSS-III (2010/11) (continued onto next page)

Column	M1	M2		M2 A1		
	(1)	(2)	(3)	(5)	(6)	(7)
	Food Only	Food	Housing	Food	Housing	Clothing
Log food consumption		0.58*** (0.05)	0.19*** (0.05)	0.56*** (0.06)	0.17*** (0.05)	0.36*** (0.06)
Log housing consumption		0.27*** (0.02)	0.21*** (0.02)	0.27*** (0.02)	0.21*** (0.02)	0.25*** (0.02)
Log clothing consumption				0.01* (0.00)	0.01 (0.00)	0.01** (0.00)
Log total household consumption	0.72***					

	(0.05)					
Log of household size	-0.41***	-0.39***	-0.24***	-0.40***	-0.25***	-0.36***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Fraction of males under 18	-0.23	-0.11	0.11	-0.14	0.10	0.00
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.14)
Fraction of females under 18	0.06	0.11	0.10	0.09	0.09	-0.05
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.14)
Fraction of females from 18 to 60	0.15	0.19	0.16	0.18	0.15	0.10
	(0.14)	(0.14)	(0.13)	(0.14)	(0.13)	(0.15)
Fraction of males over 60	-0.00	-0.00	-0.31	0.02	-0.29	-0.06
	(0.18)	(0.18)	(0.16)	(0.18)	(0.16)	(0.18)
Fraction of females over 60	-0.15	-0.13	0.26	-0.12	0.27	0.20
	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)	(0.18)
Log mean total cluster consumption	-0.11	-0.01	0.33***	-0.03	0.32***	0.14
	(0.08)	(0.08)	(0.07)	(0.08)	(0.07)	(0.08)
Other urban	0.35***	0.42***	0.33***	0.41***	0.32***	0.24**
	(0.07)	(0.08)	(0.07)	(0.08)	(0.07)	(0.08)
Rural western hills	0.05	0.27**	0.24**	0.24*	0.22*	0.12
	(0.09)	(0.10)	(0.09)	(0.10)	(0.09)	(0.10)
Rural eastern or central hills)	0.34***	0.44***	0.34***	0.44***	0.33***	0.33***
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Rural western Terai	0.13	0.26**	0.41***	0.23*	0.40***	0.13
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Rural eastern or central Terai	0.27***	0.42***	0.46***	0.40***	0.45***	0.40***
	(0.08)	(0.09)	(0.08)	(0.09)	(0.08)	(0.09)
Mountains	-0.24*	-0.15	-0.09	-0.16	-0.10	-0.25*
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)

Column	M1		M2		M2 A1	
	(1)	(2)	(3)	(5)	(6)	(7)
	Food Only	Food	Housing	Food	Housing	Clothing
α_1	5.74***	7.45***	7.14***	7.03***	6.88***	6.61***
	(0.88)	(0.92)	(0.86)	(0.93)	(0.87)	(0.94)
α_2	9.08***	10.79***	10.29***	10.37***	10.03***	10.06***
	(0.88)	(0.93)	(0.87)	(0.94)	(0.88)	(0.95)
Observations	5987	5987	5982	5987	5982	5987

Standard errors in parentheses

* p<0.05 ** p<0.01 *** p<0.001

As mentioned in the description of the Pradhan-Ravallion framework, constructing the subjective poverty line using M2 and likewise, its augmentation M2 A1, requires both the ordered probit estimation by category of consumption and the Engel curves for the ‘remainder’ consumption to make an allowance for noncore expenditures at the threshold level of core consumption. Column (1) in Table 1.5 shows the Engel curve for the NLSS-I and columns (2) and (3) show those for the original and the augmented version for the NLSS-III sample.

Table 1.5: Engel curves for noncore consumption

Column	Log non core consumption		
	(1)	(2)	(3)
Log core consumption	1.05*** (0.03)	1.25*** (0.03)	1.25*** (0.03)
Log of household size	0.15*** (0.04)	0.05* (0.03)	0.04 (0.03)
Fraction of males under 18	-0.13 (0.13)	0.05 (0.08)	-0.16** (0.08)
Fraction of females under 18	-0.15 (0.13)	-0.09 (0.08)	-0.29*** (0.08)

Fraction of females from 18 to 60	-0.41*** (0.15)	0.29*** (0.08)	0.23*** (0.08)
Fraction of males over 60	-0.24 (0.20)	-0.34*** (0.10)	-0.14 (0.10)
Fraction of females over 60	-0.47*** (0.16)	-0.02 (0.10)	0.07 (0.10)
Other urban	0.07 (0.07)	-0.22*** (0.04)	-0.28*** (0.04)
Rural western hills	-0.22*** (0.07)	-0.71*** (0.04)	-0.88*** (0.04)
Rural eastern or central hills)	-0.69*** (0.06)	-0.92*** (0.04)	-0.92*** (0.04)
Rural western Terai	-0.59*** (0.08)	-0.53*** (0.05)	-0.63*** (0.04)
Rural eastern or central Terai	-0.29*** (0.07)	-0.40*** (0.04)	-0.45*** (0.04)
Mountain		-0.89*** (0.05)	-0.94*** (0.05)
Observations	3,373	5,988	5,988

The national and region-specific subjective per capita per year poverty lines and the respective popular headcount ratios constructed from M1, M2 and M2 A1 are given in Table 1.6. All poverty lines were calculated on the basis of average household characteristics of the primary sampling unit. Comparing poverty trends across Nepal over the span of fifteen years indicates not so remarkable improvements in living standards, as compared to a dramatic decline in poverty incidence based on objective poverty measures. While M1 implies a 9-percentage point reduction (from 45% to 36%), M2 implies a 10% progress in poverty reduction (from 40% to 30%). Headcounts obtained from M1 imply that incidence has been and is higher in rural areas than in urban areas but those obtained from M2 paint a different picture.

Table 1.6: Subjective poverty lines for families with average characteristics and headcount ratios

	Poverty Line		Headcount Ratio	
	M1	M2	M1	M2

	NLSS-I (Food and housing)			
Nepal	6788	6370	0.45	0.40
Kathmandu	6485	7038	0.03	0.04
Other urban	9186	9408	0.28	0.38
Rural Nepal (West hills)	7227	8638	0.70	0.79
Rural Nepal (east hills)	9095	5546	0.64	0.30
Rural Nepal (west Terai)	3589	5771	0.30	0.63
Rural Nepal (east Terai)	4786	3275	0.35	0.15
	NLSS-III (Food and housing)			
Nepal	8221	32865	0.36	0.30
Kathmandu	11263	62219	0.10	0.37
Other urban	6433	47875	0.16	0.50
Rural Nepal (west hills)	9048	16554	0.58	0.12
Rural Nepal (east or central hills)	6107	23574	0.45	0.23
Rural Nepal (west Terai)	7819	20681	0.44	0.25
Rural Nepal (east or central Terai)	6632	31129	0.29	0.41
Mountain	13766	14120	0.73	0.03
	NLSS-III (Food, housing and clothing)			
Nepal		35242		0.34
Kathmandu		67834		0.41
Other urban		49659		0.53
Rural Nepal (west hills)		17855		0.16
Rural Nepal (east or central hills)		26357		0.29
Rural Nepal (west Terai)		21849		0.28
Rural Nepal (east or central Terai)		32571		0.45
Mountain		17486		0.10

Note: All poverty lines are per capita per year. Augmentation M2 includes food, housing and clothing.

The pattern in poverty incidence is consistent when using the augmented version of M2 for the NLSS-III data. The headcounts obtained from M2A1 indicates a higher occurrence of poverty across the country, suggesting that accounting for annual household expenditures on clothing in addition to that in food and housing for Nepalese households leads more of them to believe that what they are spending is less than what would be necessary to meet their needs. Subjective poverty levels in Kathmandu and in other urban areas are higher than in most of the rural regions. The regional poverty profiles as we see above vary by the method used. Recall that, M1 explains the differences in food adequacy only while M2 accounts for the variation in

housing adequacy as well. Furthermore, the augmented version of M2 for the 2010/11 data controls for differences in clothing as well. Therefore, one method may yield higher or lower headcount index depending upon how food, housing and clothing conditions are perceived in different areas of the country.

It may be observed, however, that although subjective poverty lines have increased with each additional component of household expenditure, poverty incidence has *declined* nationally. Poverty incidence is lowest in the Kathmandu valley, second lowest in other urban areas and alarmingly high in rural western and mountainous Nepal based on headcounts derived from M1. In fact, the headcount ratio is in line with the conventional approaches of measuring subjective poverty that identifies the poor as those households for which their total income or expenditure is below the level that on average is considered to be adequate to sustain a living. The limitation is that one cannot predict a priori whether the proportion of people with expenditure below the SPL are above or below the proportion of people who say that their consumption is inadequate, as there will be households above the threshold who will feel that their consumption is not adequate and vice versa, given latent heterogeneity and measurement errors.

This method yields different headcount index than previously established per capita per year “objective” poverty lines reported by the CBS shown in Table 1.7. The threshold values computed from this method depend upon how food, housing and clothing conditions are perceived in different areas of the country. However, CBS uses the cost-of-basic needs method by first specifying a reference food basket based on a nationally representative food consumption behavior that meets the daily 2,200 calories per capita requirement. The total poverty line is the average nonfood expenditure of households, whose food expenditure is within small intervals around the food poverty line, and are computed non-parametrically from the NLSS data and added to the food poverty line.

Table 1.7: Independent, previous estimates of objective poverty lines; cost of basic needs poverty lines, anchored to pre-determined nutritional requirements

	Indpt. Poverty Line	
	1995/96	2003/04
Kathmandu	20136	26832
Other urban	11304	17232
Rural Nepal (west hills)	5952	7776
Rural Nepal (east or central hills)	7452	7812
Rural Nepal (west Terai)	6192	8976
Rural Nepal (east or central Terai)	7032	9228

Previous research indicates that objective and subjective measures imply different poverty incidence levels more often than not. Lokshin et al. (2004) estimate and compare poverty levels using adequacy of consumption questions for Madagascar and assess the robustness of poverty distribution derived from subjective welfare and household income. Though they find strong overall correlation between the two measures, the measures differ substantially with respect to demographic and spatial profiles of poverty. Similarly, Alem et al. (2014) compares the persistence of subjective and objective (consumption-based) poverty in urban Ethiopia. They find that though consumption poverty declined in recent years due to rapid economic growth, subjective poverty has remained unchanged. Historically poor Ethiopian households continue to perceive themselves as poor even if their material consumption improves. Perry (2002) exemplifies a key finding of recent poverty research that there is a significant discrepancy between poverty measured using an income approach and poverty measured directly in terms of perceived deprivation. The paper finds that the mismatch is substantial and is typically in the range of 50% to 60% in case of New Zealand.

Carletto & Zezza (2006) find that sizable economics of scale in consumption is one factor that explains the differences between subjective and objective poverty profiles in Albania. An alternative clarification of the observed differences found in the literature is relative income. According to Easterlin (1974), relative rather than absolute income is what matters in explaining

perceived welfare. How well-off people perceive they are depends not only their absolute income but also on how income is distributed around them. Among other reasons, unemployment and poor health reduces self-assessed welfare measured in economic terms at equal income levels (Ravallion and Lokshin 2000).

1.5 Conclusion

While objective income or consumption measures portray a picture of the extent of poverty based on people's access to different resources, more qualitative measures of poverty that indicate the standard of living people experience are appropriate for analysis and policy planning. Identifying the determinants of peoples' perceived poverty status may be as important from a policy perspective as identifying the determinants of their objective poverty in terms of material consumption, as policymakers seek to maximize some measure of wellbeing rather than actual consumption.

Current subjective methods of measuring poverty in developing countries are mostly based on answers to variations of the minimum income question (MIQ) like "What income level do you personally consider to be absolutely minimal? That is to say that with less you could not make ends meet." Households with income less than the amount they give as an answer to this question are considered to be poor. Such methods not only assume that the respondent households (a) have the same concept of income and (b) already know their income, but also overlook the underlying heterogeneity across households, such that people at the same income level may well give different answers to the MIQ. As a result, methods based on MIQs lead to inconsistencies in the resulting poverty measures.

This paper builds upon the procedure of Pradhan & Ravallion (2000) using NLSS-I and NLSS-III datasets for the years 1995/96 and 2010/11 to model the probability of reporting that actual consumption in different consumption categories, such as food, housing and clothing is

adequate as a function of log actual household expenditure by component, demographic composition variables, regional dummy variables and log mean expenditure in the primary sampling unit. Using self-reported qualitative assessments of perceived consumption adequacy, this paper shows an alternative method of measuring subjective poverty in order to avoid inefficiencies associated with prevalent income-based as well as MIQ-based subjective methods. The implied poverty lines and consequentially, the corresponding headcount ratios are different than those implied by objective poverty measures.

CHAPTER 2

HUMAN CAPITAL, EMPLOYMENT, BASIC FACILITIES AND POVERTY: A CASE

STUDY OF NEPAL

HOW DO EDUCATION, EMPLOYMENT AND BASIC FACILITIES AFFECT

HOUSEHOLD POVERTY?

2.1 Introduction

The lack of educational opportunities is one of the causes and effects of poverty, particularly in developing countries where educational equity in terms of access and quality are essential to the process of sustainable development and poverty reduction (UNESCO 2002). Poverty is often associated with lower educational attainment; individuals with more human capital will be better off than their less educated counterparts since education plays a critical role in empowering people to improve their financial status and household economic security. Filmer (2000) suggests that subsistence level income coupled with incomplete credit markets and other limited community resources make it difficult for the poor to finance educational investments. Poor, rural households face considerable financial and social constraints when deciding whether or not to enroll their children in school.

Even with higher educational attainment, poverty reduction and economic growth are difficult to achieve without adequate labor opportunities to effectively utilize human capital resources. In fact, developing countries are characterized by lack of productive employment – in addition to simply a lack of employment opportunities – that allow workers to lift their families out of poverty. The majority of the poor work but the employment opportunities are largely in informal sectors that may have terrible employment conditions, limited possibilities for career advancement, and inadequate returns. Access to jobs provides the poor with the ability to market

their skills and to directly partake in sustainable rural development. Lanjouw (2001) finds that while the rural poor are mainly agricultural workers and marginal farmers, nonfarm activities are also critical and account for a significant proportion of rural income and employment for the poor but as a means of last resort. Similarly, Lanjouw (2004) shows that non-farm income accounts for a noteworthy percentage of rural household income in India and plays a direct role in poverty reduction. Lanjouw concludes that growth in particular nonfarm sectors lead to strong increase in agricultural wage rates as well. This is also the case in Ecuador (Lanjouw 1999).

Allocating public funds in rural communities in Nepal, especially to improve human capital, is of paramount importance for poverty alleviation. Efforts to increase private and/or public investments in education, unemployment insurance programs, and expansion of access to basic services for the most vulnerable families in Nepal might not only assist them from the hardships of poverty but also compensate for their lost future productivity and earnings attributable to the lack of appropriate education and employment opportunities. It is these issues that this paper explores with a focus on micro-level determinants of household poverty. Specifically, the purpose of this research is to estimate the degree to which human capital, employment and access to government-provided basic services such as, education, healthcare, piped water etc. enable poverty alleviation. Using the data from Living Standards Measurement Survey data for the year 2010/11 (NLSS-III), I find that higher educational attainment and employment of the household head, and the most educated mother and father of the family, as well as improved perceived status of public amenities contribute to higher subjective wellbeing and reduced likelihood of poverty, controlling for value of assets owned, socio-demographic attributes and geographic location.

2.2 Literature Review

2.2.1 Poverty in Nepal

Arguing for aggressive anti-poverty policy interventions is of increasing importance because poverty has been a long existing economic problem in Nepal. Despite recent progress in poverty reduction, Nepal remains one of the poorest countries in the world with a Human Development Index of 0.463 and is ranked 157th among 187 countries included in the 2013 Human Development Report (HDR) published by the United Nations Development Program (UNDP 2013). The report shows that Nepal's deprivation-led multi-dimensional poverty index (MPI) still remains high at 44.2 percent, decreasing from as high as 65 percent reported in HDR 2011. According to the 2010/11 Nepal Living Standards Measurement Survey report published by the Central Bureau of Statistics (CBS), 25.2 percent of the Nepalese population are under the national poverty line of NPR 54 per day (USD 0.56). Over 30 percent of Nepalese live on less than USD 14 per person per month. Poverty rates are worse at the regional level with 45 percent and 46 percent in the Mid-Western and Far-Western development regions, respectively. Such depth and persistence of poverty in Nepal has resulted in a grave problem of food insecurity. The International Food Policy Research Institute in 2012 categorized Nepal as a nation with an alarming Global Hunger Index (GHI) of 20.3 and ranked it 100th hungriest out of 120 developing economies and economies in transition in terms of adequacy of nutrition. The Nepal Demographic Health Survey (2011) reported that 29% of all Nepalese children under five are underweight and that 42% of children under five in rural districts are stunted compared to 27% in urban areas. This is an indication of chronic malnutrition.

Over the past few decades the government of Nepal has consistently identified poverty alleviation as a major goal of development and, yet, millions of poor Nepalese still experience impoverished living situations day-to-day. Since the 10th five-year development plan, which was prepared as the Poverty Reduction Strategy Paper (PRSP), all subsequent plans have directly

made poverty reduction their main objective. Multilateral donors such as the World Bank, Asian Development Bank, International Monetary Fund, and United Nations Development Program along with other bilateral donors have directly assisted with the implementation of PRSP and facilitated the Poverty Reduction and Growth Facility (PRGF) as well as the Poverty Alleviation Fund (PAF) among others. These efforts of poverty alleviation though have largely remained unfelt by the extremely poor. While sluggish economic environment, poor governance, corrupt bureaucracy and lack of resources are hindrances to the implementation of such programs, the very nature of the programs might also have been slowing their effectiveness in reducing poverty. The emphasis of most of the interventions targeted at poverty alleviation is on adequate provision of physical infrastructure but there has been insufficient consideration of the acquisition of human capital and even less so for the development of public facilities that are necessary for development of the poor (IMF 2003).

The education system in Nepal is characterized by a stark divergence between emerging, relatively better private schools for the privileged but inferior public schools for the underprivileged. According to the 2012 report published by the Ministry of Education, eight percent of children enrolled in the first grade drop out and 23 percent of them have to repeat a grade. Only 70 percent of the original first grade cohort completes primary school and less than a third reaches the tenth grade. In 2011, 46 percent of the students from public schools who appeared in the national School Leaving Certificate (SLC) examinations passed in contrast to 90 percent of those from private schools. The cost of this difference in education quality is disproportionately borne by the students of government school, mostly from poor families. Not enough has been done to bridge this gap. Even though it is encouraging that the education budget more than doubled between 2007/08 and 2011/12, the level of budget allocation for public education in Nepal (shown in parentheses) remains below the global standard of 5% (3.8%) of GDP and 20% (17%) of the total budget. As a consequence, the poor have continually been

marginalized from actively participating in the decision-making process of poverty alleviation programs and related issues that affect their welfare.

Government provision of poor quality education extends to the higher education system as well. In order to meet an optimistically increasing demand for higher education, six universities and three autonomous medical institutions deemed as universities have already been established (three more regional universities are in the building stage). State funded schools are facing the problem of acute cost recovery, mismanagement of limited financial resources, political interference and student unrest, lack of sufficient and competent faculty, and sub-standard courses and curricula, to list a few. According to the 2012 report published by the University Grants Commission, the Gross Enrolment Ratio (GER) in higher education was only 14% in 2010, slowly increasing over the last 30 years. The report indicates that the overall pass rate from Nepalese higher education institutions is only about 35% on average based on the examination data for the year 2007 to 2010. In spite of this poor performance, the percentage of the government's total education budget dedicated to higher education has dropped from 15.6% in 2001 to 8.1% in 2011.

Given the inadequately developed and underutilized Nepalese human resource base, it is inevitable that Nepal will not reach the Millennium Development Goals' target of "achieving full and productive employment and decent work for all, including women and young people" by 2015. According to the Nepal Labor Force Survey (2008), about a third of the entire labor force will not have sufficient earnings to lift their families over the national poverty line. Over half of them will fall under the international poverty line of USD 1.25 per day. According to the survey report, with an estimated 400,000 new entrants who join the labor market every year, the majority can only look forward to appalling and unstable earnings from subsistence agriculture, which has remained a central source of livelihood of the poor. Lack of appropriate training, modern technology, and farming in marginal lands has greatly reduced farm productivity. As an insurance

mechanism against crop failure, many rely on off-farm work, which is not readily available. This dismal picture is harsher for half of the labor force that is Nepalese women who are twice as likely to be illiterate, compared to men and three times less likely to hold a paid formal job. As a result, women earn a fraction of what men do. Inadequate in-country employment opportunities to absorb the available workforce has led many of the overlooked, underprivileged segments of the country to pursue employment in foreign countries in hopes of finding better jobs, only to find themselves contracted into slavery and appalling working conditions. Additionally, there is no statutory provision of unemployment insurance to support the unemployed poor.

Besides insufficient and inferior quality government provision of public education, limited employment opportunities and a lack of unemployment safety-net programs, the under provision of quality basic facilities in remote areas of the country have also hindered poverty reduction in Nepal. Studies have shown that rural roads improve households' welfare measured by land values, consumption growth, poverty reduction, or agricultural income growth (IFPRI 2011). Similarly, Jacoby (1998) discovered that extensive rural road networks resulted in significant benefits for the poor than for the non-poor. However, according to CBS (2011), only slightly more than half of the households are within half an hour reach to the nearest paved road. The survey report also shows that, though almost all households have easy access to primary schooling and drinking water, only 21%, 45%, 66%, 57%, and 40% of the households are within half an hour of the nearest health post or sub health post, market center, post office, police station and commercial banks, respectively (CBS 2011). The NLSS-III asked households using eight government facilities (education, healthcare, electricity, drinking water, road, telephone and post offices) to rate them as "bad", "fair" or "good" based on their use over the last 12 months 33%, 17%, 25%, 41%, of the households rate the government services as "poor" for roads, healthcare, drinking water and electricity, respectively. On the whole, the absence of services fundamental to satisfactory standards of living renders rural development in Nepal even more challenging.

Although there is some literature on the analysis of the trends and profile of poverty and inequality (Nepal and Bohra 2009; Wagle 2009), there is a dearth of empirical studies aimed at understanding their specific determinants and dynamics, which is a critical aspect of policy analysis and formulation of effective poverty reduction mechanisms. There are some instances of studies that investigate the determinants of poverty in Nepal (Bhatta and Sharma 2006; Nepal and Bohara 2009). These studies do not explicitly regard capabilities derived from human capital as determinants of poverty.

2.2.2 Human capital and poverty status

Education and employment are together the necessary and important components of people's human capital endowment that makes them productive and raises their living standards, thus playing a vital role in development. That education has provided a dependable platform for economic progress in developing countries has been well documented in the literature. Both a social and a private good, education is an investment that has some positive externality and is an essential prerequisite for poverty alleviation (Abdulahi 2008; Jaiyeoba 2007; Raji 2004). Abdulahi (2008) suggests that the rural poor face four major problems: lack of productive employment opportunities in farm and non-farm activities, limited educational opportunities, inadequate nutrition and inadequate health care, and poor infrastructure required for promoting rural interests. Persistent inequality in human capital accumulation arose from such problems create poverty traps that have lasting effects for many generations and exacerbate the already unequal initial distribution of human capital (Ceroni 2001).

Researchers in the last few decades have shown that education has a positive influence on the advancement of rural individuals and communities resulting in reductions in poverty, income inequality, and unemployment (Navaratnam 1986). Echevarria (1998) supports this point of view by concluding that an improvement in education quality increased local development prospects in

Latin America and the Caribbean. Cloutier et al. (2008), in the light of extreme cuts to public spending on education in Vietnam, presents a static CGE model to evaluate the impact of a reduction in public subsidies on higher education. The paper highlights lessons on the education-poverty link, concluding that subsidy cuts have a strong effect on household income; specifically, the overall household income falls by over 0.5% as a result of the increase in the costs of higher education and more than one percent decrease in net-of-education household costs. They find that in addition to increased poverty, cuts in public subsidies to higher education cause reduction in the share of skilled labor, increase in the skilled labor wage premium, and decrease in overall welfare. There is plenty of other evidence that indicate that levels of education and economic development are highly correlated although the channel through which education influences development varies greatly (Oxaal 1997).

It is only recently that academics have looked into the causal effect of education on micro level rural poverty reduction and other economic outcomes in developing and less developed economies. Awan et al. (2011), estimating a logistic regression model for probability of being poor on experience and level of education, finds that there is a negative relation between poverty status of employed people and education level and experience. They also demonstrate that for lower levels of education, the negative effect of education on poverty remains significant but declines sharply. Similarly, Tilak (2007) examines whether post-elementary education has any impact on development in India and concludes that secondary and higher education does in fact contribute to economic development via increased individual earnings, reduction in absolute and relative poverty, and increased life expectancy. The author admits the limitation of the statistical approach taken in the study in that the conclusions indicate more of an interrelationship between education and poverty than causality. Wedgwood (2007) qualitatively reviews financial and nonfinancial returns to education and checks whether such returns translate into reduction in poverty level. The paper argues that enrolling children in school, by itself, is insufficient for

poverty reduction. It further concludes that the impoverished public education system has rendered people incapable of realizing the potential benefits of education, therefore, inhibiting the majority of the poor from being able to find a pathway out of poverty. Duryea et al. (2002) analyzes what policies aimed at human capital development can and cannot do for reducing poverty in Latin America. They estimate that the median returns to one year of primary, secondary and tertiary schooling is 7 percent, 9 percent and 16 percent respectively. They recognize that such large returns to investment in education are a necessary but not sufficient condition for education to have a significant effect on earnings.

There are few studies on how education affects the poverty situation in Nepal. Most studies on the topic of education are limited to exploring the effectiveness of the public education system and finding the determinants of household school enrolment and attendance decisions. Stash and Hannum (2001) stratify school-attending Nepalese according to gender, caste, and ethnicity. They show that the educational gender gap in Nepal did not decline during the period of study, despite large expansion in education programs. Even when girls who enrolled in schools performed equally well through the primary grades as their male counterparts, gender continued to condition entry in school for school-aged children, especially for girls from the lower castes. Contrary to the general expectation of the gender and development literature, Stash and Hannum find that neither urbanization nor belonging to a higher-caste family with an educated household head was associated with improved opportunities for girls. Such ground level gender differential has contributed to men from higher castes holding influential positions across the public and private sectors in Nepal.

2.3 Data and Method

The data employed in this analysis come from the Nepal Living Standards Measurement Survey 2010/11 (NLSS-III), a cooperative effort of the World Bank and the CBS. The survey

encompassed 28,670 individuals and 5,988 households across Nepal. There are three strata of data in the dataset: individual, household, and ward. Wards are a subdivision of a local authority area, typically used for electoral purposes. This paper considers household as the unit of analysis.

The NLSS-III provides an array of self-reported opinions on households' perceived adequacy of six different consumption categories: food, housing, clothing, health care, schooling, and income. For each category, the adequacy rating equals 0, 0.5 or 1 if the respondents believe that their family's consumption to meet their family's needs is "less than adequate", "adequate" or "more than adequate" respectively. "Adequate" means no more or no less than what the respondents consider to be the minimum consumption needs of the household. These self-reported ratings can be considered a psychological manifestation of an underlying measure of household financial capacity or distress as a result of not being able to afford the desired consumption level. Table 2.1 below shows the distribution of these ratings.

Table 2.1: Distribution of perceived adequacy of consumption

	Percentage			
	Less than	Just	More than	Not
Food	14.71	83.08	2.19	0.02
Housing	21.01	77.49	1.40	0.10
Clothing	15.76	82.87	1.35	0.02
Healthcare	17.45	80.49	1.34	0.72
Schooling	15.56	71.24	1.09	12.11
Income	46.49	51.54	1.29	0.68

The perceived adequacy ratings are used to derive the dependent variables for the study. I use two different measures of poverty. The first is a simple household wellbeing index (WBI). This index is an average of the perceived adequacy of consumption ratings for the aforementioned categories of consumption. The second dependent variable is a binary poverty indicator for whether or not a household is poor. The value of this dichotomous variable is one (zero) for households that lie below (above) a subjective poverty line (SPL) based on qualitative

assessments of perceived adequacy of consumption. I derive this SPL for the NLSS-III data using the methodology shown in Pradhan and Ravallion (2000).² First, I estimate a standard ordered probit to separately model the probability of reporting that actual consumption in each category (food and housing) is adequate as a function of log actual household expenditure by component, demographic composition variables, regional dummy variables and, to allow for relative neighborhood income effect, log mean expenditure of the primary sampling unit. Using the estimates from the probit regressions, the second part of the method solves for the SPL, defined as the expenditure level at which respondents believe, on average, that their spending suffices their consumption requirements. A household is poor if, and only if, its total annual expenditure is less than the computed SPL for a household with its characteristics.

As independent variables, two measures are of central interest: educational attainment and employment activity. I use education and employment information of the household head and that of the mother and father in separate models. For multigenerational households, information for the most educated mother and father in the family is considered. The education variable has five categories, namely “none” (base group), “grade 10 or below”, “passed School Leaving Certificate (SLC) exam”, “intermediate level (Grade 11-12)” and “bachelor’s degree or higher”. The employment variable has five categories as well: “unemployed” (base group), “wage job in agricultural sector”, “wage job in non-agricultural sector”, “self-employment in agricultural sector” and “self-employment in non-agricultural sector”. Definitions for employment status comply with that used by the Central Bureau of Statistics Nepal whereby a person is defined as

² Derive a subjective poverty line from qualitative assessment of welfare using

$$z^* = \mathbf{B}_\sigma^{-1}(\mathbf{a}_\sigma + \boldsymbol{\pi}_\sigma \mathbf{x})$$

where, \mathbf{z}^* is the estimate of subjective poverty line, \mathbf{x} is the vector of indicators of economic welfare such as income or consumption, and \mathbf{B}_σ , \mathbf{a}_σ , and $\boldsymbol{\pi}_\sigma$ are normalized coefficient matrices.

“currently employed” if he or she is either employed for at least one hour during the previous seven days, or has a job attachment if temporarily absent from work, or is available to work if work could be found. On the other hand, a person is “currently unemployed” if he or she did not work during the last seven days but was looking for work, or was waiting to hear from a prospective employer or to start a new job or could not find work or did not know how to look for work.

Even before estimating the model, there is an important endogeneity concern that requires attention. First, education is potentially endogenous because low socioeconomic status may cause low accumulation of education. As an attempt to partially address this issue, I initially consider estimating both the fixed effects and binary probit regression models using parental education levels as additional controls. The most direct explanation of the link between parental education attainment and their children’s academic achievement depends on the assumption that schooling influences parents’ educational practices at home, for instance, using more complex language with their children, which predicts better language and reading skills of the child (Hoff 2003). Highly educated parents also have higher expectations for their children’s education, which predicts better education attainment for their children (Alexander et al. 1994). Other explanations for the relation between parents’ education and children’s educational outcomes link them indirectly through parental income, according to which, peoples’ education influences whom they marry, the types of jobs they will have, their earning potential and, thus, the types of residence and schooling opportunities they can offer their children (see Coleman 1987; Furstenberg et al. 1999). Furthermore, controlling for income and wealth, Filmer (2000) finds that rural parents with lower levels of education tend to be less likely to educate their children, in part, due to financial constraints and because they may undervalue the importance of education or lack the aptitude to augment their children’s education. Studies have also found that mother’s educational attainment have a greater influence on children’s education than the father’s (Eccles

and Davis-Kean 2005). Since fathers are often the heads of households in Nepal, the low education of mothers may reduce their bargaining power within the family, in terms of education decisions, if parents disagree about their children's education. Although controlling for parental educational attainment will not eliminate the endogeneity concerns completely, it will help reduce the effect of omitted variables bias, informing us to some extent about the private returns to education in a developing country such as Nepal.

The NLSS-III has information on the perceived quality of government-provided basic community facilities. I use as one of the covariates an index for the status of basic infrastructure available to different households. This Basic Facility Status Index (BFSI) is an average of the qualitative self-assessment of status of local health, education, drinking water, electricity, road, postal service, and telephone facilities. For each category, a score of 0 is bad, while a score of 0.5 and 1 are fair and good respectively. In addition to the independent variables relevant to education, employment and basic facilities, I use control variables for the socio-demographic characteristics of the households, consisting of household size, caste, and composition by age group and gender. The specification includes location dummies that account for observed and unobserved determinants of poverty that vary across regions but are constant over time. I also control for value of household assets owned by including dummies for the local asset value quintile in which each household lies.

Table 2.2: Summary statistics

	Mean	SD	Median
Wellbeing index (WBI)	0.42	0.15	0.50
Poverty Indicator	0.43	0.50	0.00
Uneducated	0.45	0.50	0.00
Grade 10 or below	0.39	0.49	0.00
SLC	0.07	0.26	0.00
Intermediate	0.04	0.20	0.00
Bachelor's or higher	0.04	0.20	0.00
Unemployed	0.02	0.13	0.00
Wage job in agricultural sector	0.03	0.18	0.00
Wage job in non-agricultural sector	0.21	0.41	0.00
Self-employment in agricultural sector	0.57	0.50	1.00
Self-employment in non-agricultural sector	0.18	0.38	0.00
Basic Facility Status Index (BFSI)	0.39	0.17	0.36
Log asset value	13.6	1.68	13.6
Household size	4.79	2.33	4.00
<i>Brahmin</i>	0.16	0.37	0.00
<i>Chettri</i>	0.18	0.38	0.00
<i>Newar</i>	0.10	0.30	0.00
Others	0.56	0.49	1.00
Male household head	0.73	0.44	1.00
Males under 14	0.15	0.17	0.13
Females under 14	0.14	0.17	0.00
Males [14 to 55]	0.25	0.21	0.25
Females [14 to 55]	0.33	0.19	0.33
Males over 55	0.07	0.14	0.00
Females over 55	0.07	0.16	0.00
Kathmandu	0.14	0.35	0.00
Other urban	0.19	0.39	0.00
Rural (western hills)	0.17	0.37	0.00
Rural (eastern or central hills)	0.14	0.35	0.00
Rural (western Terai)	0.12	0.33	0.00
Rural (eastern or central Terai)	0.16	0.37	0.00
Rural (mountains)	0.07	0.25	0.00

Note: WBI, the wellbeing index, is an average of the perceived adequacy of consumption ratings for food, housing, clothing, health care, schooling, and income. BFSI is an average of the qualitative self-assessment of the status of local health, education, drinking water, electricity, road, postal service, and telephone facilities.

Descriptive statistics for the household level sample are presented in Table 2.2 above. The mean WBI is 0.39, suggesting that an average household perceives their overall basic consumption to be less than satisfactory for their requirements. The mean value for the binary poverty indicator is 0.43, indicative of the fact that 43% of the households lie below the SPL. Forty five percent of the household heads do not have formal education. Only 15% have attained educational degrees of SLC or higher. Over half (57%) of the heads of households are self-employed in the agricultural sector. The average facility index of 0.39 suggests that the respondents think the status of community facilities they use is mostly poor. Forty four percent of the households belong to the privileged Brahmin-Chettri-Newar caste. Majority of the households (73%) have male heads. On average, working age women account for 33% of the households among whom about 54% are employed. Thirty three percent of the total households live in urban areas including the capital Kathmandu and 67% live in rural Nepal.

2.4 Results and Discussion

In a multipronged approach, I conduct several econometric analyses to explore the relationship between education level, employment activity, perceived quality of basic facilities and household poverty status. I estimate a fixed effect ordinary least squares model for the WBI. For the poverty indicator analysis, a probit model predicts the ‘probability of being poor’. For ease of interpretation, the marginal probit regression coefficients at the means of the independent variables are reported. In both specifications, I control for value of assets owned, household socio-demographic characteristics, and geographic location. Table 2.3 shows the coefficients from these analyses using education and employment information of the heads of households. While the first column uses the WBI as the dependent variable, the second uses the indicator variable for whether the household is poor with respect to the SPL derived by the approach shown in Pradhan and Ravallion (2000). For each column, the second sub-columns control for parental

education. The coefficients on the parental educational variables are excluded for the sake of brevity.

The parameter estimates for the fixed effects show the importance of human capital in enhancing perceived household wellbeing. WBI is positively associated with educational attainment; higher degrees of education obtained by heads increase perceived wellbeing with respect to having no formal education. No particular welfare-enhancing effect of household head's employment activity is seen. In fact, having a household head whose primary occupation is a wage job in agriculture reduces the wellbeing index. Better perceived status of government-provided communal facilities and higher value of assets owned relative to the bottom quintile of the local asset value distribution statistically significantly increase perceived wellbeing. The coefficients on the socio-demographic control variables indicate that household size has a statistically significant and negative effect on household wellbeing. The proportion of working age female member in the family is positively associated with wellbeing. Households in rural Western Nepal and in the mountains are relatively worse off and those in rural eastern and central Terai are relatively better off than the families in Kathmandu.

The coefficients on the same regressors for the probit model indicate that higher educational attainment for household head increasingly reduces the household's probability of being poor in comparison to an uneducated head. Each educational degree has a greater effect on reducing the probability of household poverty than the previous level. Specifically, having completed grade school, SLC, intermediate and bachelor's degree or higher reduces the probability of being poor by 10, 17, 23 and 34 percentage points, respectively. As with the WBI, employment activity does not influence the probability of being poor. Improved perceived status of basic facilities and falling in higher quintiles of value of assets owned reduces the likelihood of poverty incidence. Falling in the 3rd, 4th and 5th quintile of the asset value distribution of the

primary sampling unit reduces the probability of household poverty by 12, 18 and 27 percentage points relative to the bottom quintile.

The results for the probit analysis imply that household caste, size, and composition matter too. Households who belong to the privileged Brahmin-Chettri-Newar ethnic group are less likely to be poor compared to other castes (by 18, 9 and 8 percentage points, respectively). Increasing household size and, more importantly, the proportion of working aged women in the family decreases the probability of being poor (by 18 percentage points). Young dependents have the opposite effect. Relative to that for the households in Kathmandu, the probability of being poor is lower for households in other urban areas, and in eastern and central hills and higher for all other rural regions. Households in the mountains, especially, are more than twice as likely to be poor than households in the capital valley.

Table 2.3: Human capital and employment of the household head and household poverty (continued onto next page)

	Wellbeing index		Poverty indicator	
Grade 10 or below	0.02*** (0.00)	0.01** (0.00)	-0.10*** (0.02)	-0.10*** (0.02)
SLC	0.03*** (0.01)	0.03** (0.01)	-0.17*** (0.04)	-0.17*** (0.04)
Intermediate	0.02 (0.01)	0.01 (0.01)	-0.23*** (0.05)	-0.23*** (0.06)
Bachelor's or higher	0.02* (0.01)	0.02 (0.01)	-0.34*** (0.05)	-0.33*** (0.06)
Wage job in agricultural sector	-0.05** (0.02)	-0.04* (0.02)	-0.00 (0.09)	0.03 (0.09)
Wage job in non-agricultural sector	-0.01 (0.02)	-0.00 (0.02)	-0.07 (0.08)	-0.07 (0.08)
Self-employment in agricultural sector	-0.01 (0.02)	0.00 (0.02)	-0.01 (0.08)	0.00 (0.08)
Self-employment in non-agricultural sector	-0.00 (0.02)	0.01 (0.02)	-0.16 (0.08)	-0.15 (0.08)
Basic Facility Status Index	0.03*** (0.00)	0.03*** (0.00)	-0.15*** (0.01)	-0.14*** (0.01)
Asset Value (Quintile 2)	0.03*** (0.01)	0.03*** (0.01)	-0.03 (0.03)	-0.03 (0.03)
Asset Value (Quintile 3)	0.05*** (0.01)	0.05*** (0.01)	-0.12*** (0.03)	-0.13*** (0.03)
Asset Value (Quintile 4)	0.05*** (0.01)	0.06*** (0.01)	-0.18*** (0.03)	-0.18*** (0.03)
Asset Value (Quintile 5)	0.05*** (0.01)	0.05*** (0.01)	-0.27*** (0.03)	-0.27*** (0.03)
<i>Brahmin</i>	0.01 (0.01)	0.01 (0.01)	-0.18*** (0.03)	-0.18*** (0.03)
<i>Chettri</i>	-0.01 (0.01)	-0.00 (0.01)	-0.09*** (0.03)	-0.09*** (0.03)
<i>Newar</i>	0.01 (0.01)	0.01 (0.01)	-0.08* (0.04)	-0.10* (0.04)
Log household size	-0.02*** (0.00)	-0.02*** (0.01)	0.58*** (0.02)	0.55*** (0.03)
Males under 14	0.00 (0.01)	-0.00 (0.01)	0.28*** (0.06)	0.28*** (0.07)

	Wellbeing index		Poverty indicator	
Females under 14	-0.00 (0.01)	0.00 (0.01)	0.29*** (0.06)	0.28*** (0.07)
Females [14 to 55]	0.03* (0.01)	0.03* (0.01)	-0.19** (0.07)	-0.18* (0.07)
Males over 55	-0.02 (0.02)	-0.02 (0.02)	-0.05 (0.08)	-0.04 (0.09)
Females over 55	0.01 (0.02)	0.01 (0.02)	0.01 (0.08)	-0.08 (0.09)
Other urban	0.01 (0.01)	0.01 (0.01)	-0.12*** (0.03)	-0.13*** (0.04)
Rural (western hills)	-0.02** (0.01)	-0.03** (0.01)	0.35*** (0.04)	0.34*** (0.04)
Rural (eastern or central hills)	0.01 (0.01)	0.01 (0.01)	-0.12*** (0.04)	-0.13** (0.04)
Rural (western Terai)	-0.01 (0.01)	-0.01 (0.01)	0.30*** (0.04)	0.29*** (0.04)
Rural (eastern or central Terai)	0.03*** (0.01)	0.03*** (0.01)	-0.06 (0.04)	-0.07 (0.04)
Rural (mountains)	-0.08*** (0.01)	-0.07*** (0.01)	0.56*** (0.04)	0.56*** (0.04)
Constant	0.29*** (0.02)	0.28*** (0.02)		
Parental educational controls	No	Yes	No	Yes
Observations	5254	4560	5254	4535

Standard errors in parentheses

* p<0.05 ** p<0.01 *** p<0.001

Appendix Table A.1 presents coefficients from a similar set of analyses as above but with human capital and employment data for mothers and fathers of the household. While the variable for educational attainment reflects the highest level of formal education completed by the parents in the household, the variable for employment activity has a different interpretation. The employment variable on the household level represents instead whether the household has a mother or father whose primary occupation is one among unemployed or self-or-wage-employed

in agricultural/ non-agricultural sector. The results are in line with those presented previously in Table 2.3 in case of household heads. Father's education level statistically increases perceived household wellbeing. A father who has completed grade school, SLC, intermediate and bachelor's degree or higher reduces the probability of being poor by 10, 15, 17 and 29 percentage points, respectively. More importantly, a mother who has completed SLC and an intermediate level education lessens the probability of poverty by 17 and 37 percentage points, respectively. With respect to employment, a father whose primary job is self-employment in non-agricultural sector reduces the probability of being poor by 14 percentage points. As in Table 2.3, as household size and perceived status of basic facilities improve, wellbeing increases and probability of the household experiencing poverty declines. Chettris and Newars are less likely to be poor than other underprivileged castes. While young males contribute significantly to alleviate poverty, elderly dependents increase the likelihood of being poor. How geographic location affects chances of poverty is also similar as before.

Substantial part of the available micro-development literature has focused on analysis of the positive effects of literacy and primary education on poverty status and has concluded that both literacy and primary education have significant effects on poverty reduction (see Kadzamira and Rose 2003; Tilak 1989; Tilak 2002). Most studies on rates of returns to education have found that primary education yields higher returns than secondary and higher education. Based on this, development efforts of national governments, non-governmental organizations, international development communities, bilateral aid organizations and international financial institutions confine themselves in the realm of education to primary level as an instrument for poverty alleviation. Contrarily, the findings from this paper imply increasing returns to educational attainment; higher degrees of formal education result in greater increase in wellbeing as well as greater reduction in likelihood of poverty. This result is consistent with more recent studies that exclusively focus on the role of secondary and higher education in development in Asian

countries (see Mathur and Mamgain 2004; Self and Grabowski 2004; Tilak 2003; Tilak 2004; Wedgwood 2007).

This analysis shows that self-employment of fathers in non-agricultural sector significantly reduced the probability of being poor. Bhatta et al. (2007) has similarly found that income from non-farm activities play a vital role with high share in household income (37%), contributing to lower poverty headcounts for household with some form of non-farm employment (5.56% on average) compared with those without it (67.65% on average). It has been well established that off-farm income stabilizes household income in the presence of uncertain agricultural returns. Non-agricultural activities have been a reliable strategy for the betterment of rural livelihoods (Eapen 1994). Entrepreneurial approach could be an effective measure of poverty reduction, which involves helping poor people get involved in small, micro-enterprises along with increasing access to the markets.

In addition to better education and self-employment opportunities, this paper confirms some existing theses on the role of asset accumulation on poverty reduction. The negative relationship between poverty and wealth has been widely covered in the development literature (World Bank 1996). Not only are households with more assets more capable of smoothing their consumption in the lack of credit but also they are also better able to maintain their consumption by borrowing against their assets, especially after negative income shocks (Jalan and Ravallion 1998).

Perceived quality of government-provided basic communal facilities such as, health, education, drinking water, electricity, road, postal service, and telephone facilities, plays an important role in enhancing household welfare and reducing poverty. IFPRI (2011) has previously highlighted the importance of infrastructure and extension services for the rural poor in Nepal. Nepal has seen great improvement in expanding access to such facilities across the country over the past few decades. It is vital to continue to reform and upgrade existing

infrastructure and develop new ones to adequately meet the needs of the growing poor population.

From a policy perspective, household caste is also shown to be one of the potential factors of wellbeing and poverty status. Poverty rates for Brahmins, Chettris and Newars (the three castes that comprise over 30% of the population and dominate most of the politics and economy of Nepal) are lower than for other marginalized groups (CBS 2010). Among the more than hundred castes that comprise Nepal, such underprivileged groups have been historically discriminated against and excluded from the socio-economic and political process in the country. Evidence based on former studies suggests that the situation in Nepal is similar to the higher poverty rates among ethnic minorities observed in other developing countries (see Baulch and Masset, 2003; Van de Walle and Gunewardena 2001).

2.5 Conclusion

The purpose of this paper has primarily been to demonstrate the contribution of human capital to poverty reduction. The human capital aspect is a relatively overlooked component of poverty studies in Nepal, both in terms of research and consequentially, policy initiatives. In the lack of comprehensive empirical poverty studies in Nepal, the results from this paper are in accordance with the well-accepted theory in the context of other developing countries that human capital is a critical determinant of household poverty. For poverty alleviation, a high priority must be allocated to human capital through investments in expanding formal education. Investment in human capital is an essential condition to remove economic deprivation and to promote opportunities and help people prepare themselves to take inventive approaches to solve the problems that challenge them.

Formal educational attainment of the likely decision makers of the household such as, the head or educated fathers and mothers, in addition to self-employment in the non-agricultural

sector, improved status of government-provided basic facilities and higher number of working age female to household size ratio are found to be apparent contributors to reduction of household poverty, controlling for household assets, socio-demographic attributes and geographic regions. The findings from this study have important implications for poverty alleviation policies in Nepal, considering the results are robust to different definitions of subjective poverty. Given the complexity and diversity, it is difficult to simply explain Nepal's poverty problem. However, policymakers ought to pay special attention to the availability of free education, financial scholarships, meals, uniforms and other needs to children of vulnerable households. In conjunction, the government should provide increasing employment opportunities for adults, especially in the non-agricultural sector as a source of income diversification, and improve the status of public facilities including healthcare, schooling, roads etc. with the aim of more immediately improving households' economic condition. These are only few of the measures that can be taken to improve the living standards of the poor. It is obvious that the multidimensional nature of poverty requires multi-targeted efforts that overlap different disciplines encompassing not just socioeconomic but also other broad political and institutional factors.

APPENDIX

SUPPLEMENTAL TABLES

Table A.1: Household poverty and human capital and employment of mother and father

	Wellbeing index		Poverty indicator	
Father's education: Grade 10 or below	0.02*** (0.01)	0.02** (0.01)	-0.10*** (0.03)	-0.09** (0.03)
SLC	0.05*** (0.01)	0.05*** (0.01)	-0.15** (0.05)	-0.10 (0.06)
Intermediate	0.05** (0.01)	0.04* (0.02)	-0.17** (0.07)	-0.17* (0.08)
Bachelor or higher	0.04* (0.02)	0.04 (0.02)	-0.29** (0.10)	-0.25* (0.12)
Mother's education: Grade 10 or below	0.01 (0.01)	0.01 (0.01)	-0.05 (0.03)	-0.06 (0.03)
SLC	-0.01 (0.01)	-0.00 (0.02)	-0.17* (0.07)	-0.19* (0.08)
Intermediate	0.00 (0.02)	0.02 (0.02)	-0.37*** (0.10)	-0.39*** (0.12)
Bachelor or higher	0.00 (0.03)	0.00 (0.03)	-0.26 (0.17)	-0.29 (0.19)
Father: wage job in agricultural sector	-0.04 (0.02)	-0.04 (0.02)	-0.09 (0.09)	-0.04 (0.10)
Wage job in non-agricultural sector	-0.01 (0.01)	-0.01 (0.01)	-0.07 (0.05)	-0.06 (0.06)
Self-employment in agricultural sector	-0.02 (0.01)	-0.02 (0.01)	0.00 (0.06)	0.03 (0.06)
Self-employment in non-agricultural sector	0.00 (0.01)	-0.00 (0.01)	-0.14* (0.06)	-0.15* (0.06)
Mother: wage job in agricultural sector	-0.00 (0.02)	0.01 (0.02)	0.09 (0.09)	-0.00 (0.10)
Wage job in non-agricultural sector	-0.01 (0.02)	-0.01 (0.02)	-0.03 (0.08)	-0.06 (0.09)
Self-employment in agricultural sector	0.01 (0.02)	0.02 (0.02)	0.08 (0.07)	0.04 (0.09)
Self-employment in non-agricultural sector	-0.00 (0.02)	-0.00 (0.02)	-0.02 (0.07)	-0.05 (0.08)

	Wellbeing index		Poverty indicator	
Basic Facility Status Index	0.03*** (0.00)	0.03*** (0.00)	-0.14*** (0.01)	-0.14*** (0.01)
<i>Brahmin</i>	0.03*** (0.01)	0.03*** (0.01)	-0.06 (0.03)	-0.06 (0.04)
<i>Chettris</i>	0.04*** (0.01)	0.05*** (0.01)	-0.10** (0.03)	-0.12*** (0.04)
<i>Newars</i>	0.05*** (0.01)	0.05*** (0.01)	-0.23*** (0.04)	-0.24*** (0.04)
Log of household size	0.04*** (0.01)	0.04*** (0.01)	-0.26*** (0.04)	-0.27*** (0.04)
Males under 14	0.00 (0.01)	-0.00 (0.01)	-0.20*** (0.04)	-0.21*** (0.04)
Females under 14	-0.01 (0.01)	-0.01 (0.01)	-0.07 (0.04)	-0.04 (0.04)
Females [14 to 55]	0.01 (0.01)	-0.00 (0.01)	-0.05 (0.05)	-0.07 (0.06)
Males over 55	-0.02** (0.01)	-0.03** (0.01)	0.65*** (0.04)	0.68*** (0.05)
Females over 55	0.01 (0.02)	0.02 (0.02)	0.33** (0.10)	0.31** (0.11)
Asset Value (Quintile 2)	0.02 (0.02)	0.02 (0.02)	0.46*** (0.10)	0.39*** (0.11)
Asset Value (Quintile 3)	0.04 (0.03)	0.04 (0.03)	-0.23 (0.12)	-0.33* (0.13)
Asset Value (Quintile 4)	0.03 (0.03)	-0.00 (0.04)	0.00 (0.15)	0.04 (0.17)
Asset Value (Quintile 5)	-0.01 (0.04)	0.06 (0.05)	-0.13 (0.18)	-0.38 (0.23)
Other urban	0.00 (0.01)	-0.00 (0.01)	-0.24*** (0.06)	-0.20** (0.06)
Rural (western hills)	-0.03 (0.01)	-0.04* (0.01)	0.23*** (0.06)	0.27*** (0.06)
Rural (eastern or central hills)	0.01 (0.01)	0.01 (0.01)	-0.27*** (0.06)	-0.24*** (0.07)
Rural (western Terai)	-0.00 (0.01)	-0.01 (0.01)	0.19*** (0.06)	0.24*** (0.07)
Rural (eastern or central Terai)	0.04** (0.01)	0.03* (0.01)	-0.19** (0.06)	-0.15* (0.07)
Rural (mountains)	-0.11*** (0.02)	-0.11*** (0.02)	0.38*** (0.05)	0.43*** (0.06)

Constant	0.30***	0.29***		
	(0.03)	(0.03)		
Observations	2971	2519	2971	2512

Standard errors in parentheses

* p<0.05 ** p<0.01 *** p<0.001

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