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# MULTIDIMENSIONAL POVERTY IN BAJHANG DISTRICT OF NEPAL

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Multidimensional poverty is currently at the heart of many theoretical, empirical and institutional debates. South Asia has the world's highest levels of poverty where 49% of people are multidimensionally poor. Poor and vulnerable households are predominantly in rural and mountainous areas of Nepal. This is a case study conducted in Bajhang district of Nepal, where we have selected five Village Development Committees to conduct our research. Well-structured questionnaires were entertained as face to face interview. This paper applies Alkire-Foster Methodology 2011 for measuring the multidimensional poverty. At poverty cut off, k=3, it was found that 49.7% of people are multidimensionally poor. Dimension wise breakdown shows that cooking fuel, flooring, nutrition, electricity, child mortality and schooling have major contributors among overall multidimensional poverty. This research is important for policy makers to provide much clearer guidance for anti-poverty policy on the basis of different dimensions, climatic zones, areas and demographic distributions.
**Keywords:** Multidimensional poverty, Alkire and Foster, poverty cut off, Bajhang

## INTRODUCTION

Poverty is a common phenomenon in developing regions like Asia and Africa. Like in other developing countries, poverty is a rampant problem in Nepal. It is a country of hills and Himalayas. Although, poverty alleviation has been one of the top priorities for the national development since 1976 (Nepal, 2007), but still poverty is widespread, persistent and also an acute problem in Nepal, where people are in a state of deprivation with regards to incomes, clothing, housing, healthcare, education, sanitary facilities and human rights. Halving the poverty by 2015 is the main agenda of eight Millennium Development Goals (MDGs) (United Nations, 2013). This goal could not be achieved by the government of Nepal as current poverty of Nepal is 25.2% (CBS, 2011) which is not that half of the poverty of 1990 which was around 33.54% (CBS, 1991).

Consumption and expenditure were the main traditional criteria for measuring poverty, but it is multifaceted (Alkire and Seth, 2015) where several empirical studies have shown that significant percentages of those who are multidimensionally deprived are not monetary poor and vice versa ( Alkire and Kumar, 2012; Ruggeri-Laderchi *et al*., 2003; Alkire and Seth, 2015). It is always possible to consider multiple and interconnected deprivations of a household, as multidimensional poverty index relies on the information from an individual household (Vijaya *et al*., 2014). Multidimensional measures provide an alternative lens through which poverty may be viewed and understood (Alkire and Foster, 2011). South Asia is the home to nearly twice as many multidimensionally poor people as the next poorest-region, Africa (Alkire and Santos, 2010). The poor people do not mean who only have low incomes but they are also deprived of basic needs such as education, health, clean drinking water and proper sanitation (Awan *et al*., 2011), so that unidimensional poverty is always unable to capture a true picture of poverty as poverty is more than income deprivation (http://www.pide.org.pk/psde/pdf/AGM30/papers/Measuring%20Multidimensional%20Poverty%20and%20Inequality%20in%20Pakistan.pdf). It is common to assert that poverty is a multi-dimensional phenomenon, yet most empirical work on poverty uses a one-dimensional yardstick to judge a person's well-being, usually expenditures or income per capita or per adult equivalent (Duclos *et al*., 2006). Ali *et al*. (2015) have studied in rural Pakistan that relatively high poverty concentration among non-farming rural households, more reduction in poverty among farming households and largest contribution to overall rural poverty can be distinguished by major cropping zones using the Poverty Equivalent Growth Index (PEGR).

The Multidimensionally Poverty Index (MPI) evaluates poverty based on a household's deprivation in three basic dimensions—education, health and living-standards. These dimensions have ten indicators: two for health, two for education and six for living standards as shown in Table 1. A person is identified as poor according to the MPI, if the person is deprived in one-third or more of the ten weighted indicators. The first characteristic is that person is identified as poor depending upon achievements of the entire household. The second is that MPI considers only the deprivations of the multidimensionally poor. This process is called censoring, since it ignores deprivations of people that do not reach the poverty cut-off, people who experience some deprivation but are not deprived in 1/3 of the weighted indicators.

There are altogether 18 out of 22 countries which have reduced multidimensional poverty faster than income poverty. Nepal had the fastest progress whose MPI fell from 0.350 to 0.217 about 0.027 per year and the incidence (H) fell from 65% to 44% in a five year period (2006-2011) (Alkire and Roche, 2013).

After Amartya Sen's broad capability approach, limitation of monetary analysis and adoption of MDGs have converted the attention of researchers as well as policy makers towards multidimensional measurement of well being. Research about multidimensional poverty is a new concept in Nepal, especially in the rural areas where a lot poor people reside. This paper will, to our knowledge for the first time, be demonstrating that the poverty is multidimensional and we need to assess the multidimensionality of poverty to know the real pro-poor situation of the rural areas. The main objective of the paper is to apply the Alkire and Foster methodology to estimate multidimensional poverty in Bajhang district of Nepal. It is the beauty of this methodology because it helps to find out the effect of each dimension in overall poverty which is also highlighted in this study.

## MATERIALS AND METHODS

***Study area*:** Bajhang is a hilly-mountainous district of Far western development region, situated in Seti zone of Nepal. It expands over 29° 29″ North to 30° 9″ northern latitude and $80^0$ 46″ East to 81° 34″ eastern longitude. The district headquarter is Chainpur. It is one of the poorest districts with 56.8% people living below the poverty line (Central Bureau of Statistics, 2011). Politically Bajhang is divided into two constitutional areas, 11 Ilakas (a group of 4-5 VDCs) and 47 Village Development Committees (VDCs). According to census 2011, total population of the district is 195,159. Main profession of the people of Bajhang district is agriculture. Annual income per person per year is Nepalese Rupees (NRs) 4,930 which is equivalent to United States Dollar ($) 49.30 as of current exchange rate. Out of 47 VDCs; we have selected only 5 VDCs for the purpose of this research, namely Sayadi, Rayal, Parakatne, Subada and Rithapata which are shown below in the map.

***Data collection*:** The data were collected from five different VDCs of Bajhang district. Purposive sampling was conducted focusing on the poor people in the study area. A total of 300 households were surveyed and 262 valid questionnaires were used for analysis. Both primary and secondary data were gathered using the qualitative and quantitative techniques.

***Data analysis*:** The specific dimensions of poverty and measurable indicators of those dimensions were measured using the Alkire-Foster method (Alkire and Foster, 2011). This methodology is based on the Foster-Greer-Thorbecke measures (Foster *et al.*, 1984) and produces a two-

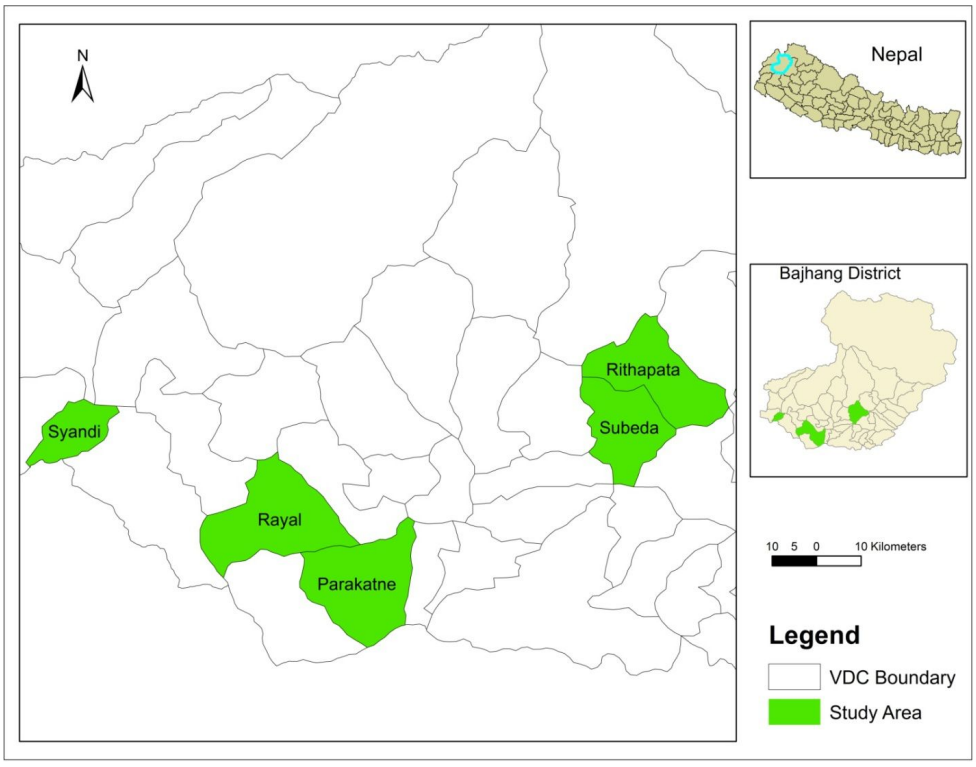


**Figure 1. Map of Nepal and study area.**

component multidimensional poverty measure.

Each indicator in the MPI or any other multidimensional poverty measure requires a deprivation cut-off. Generally, the indicators' deprivation cut-offs are noted as $z_i$, so that person *i* is considered deprived if his/her achievement in that indicator $x_i$ is below the cut-off, that is, if $x_i<zi$.

The three dimensions of MPI are equally weighted, so that each of them receives a 1/3 weight. The indicators within each dimension are also equally weighted. Thus, each indicator within the health and education dimension receives a 1/6 weight and each indicator within the living standards dimension receives a 1/18 weight $(1/3 \div 6)$[5].

Here we have noted the indicator *i* weight as w*i* with $\sum_{i=1}^{d} w_i = 1$

The deprivation score for each person lies between 0 and 1. This deprivation score is assigned to his or her deprivations in the component indicators. The score increases as the number of deprivations of the person increases and reaches its maximum of 1 when the person is deprived in all component indicators whereas, a person who is not deprived in any indicator, receives a score equal to 0. The deprivation score of each person is calculated by taking a weighted sum of the number of deprivations which is shown below in equation 1.

$$c_i = w_1 I_1 + w_2 I_2 + \cdots .. + w_d I_d \qquad (1)$$

Where, $I_i=1$ if the person is deprived in indicator $i$ and $I_i=0$ otherwise, and $w_i$ is the weight attached to indicator *i* with $\sum_{i=1}^{d} w_i = 1$. $c_i$ is deprivation score

A second cut-off or threshold is used to identify the multidimensionally poor, which in the Alkire- Foster methodology is called the poverty cut-off. In this study, the poverty cut-off is defined as the share of (weighted) deprivations a person must have in order to be considered poor, and we will note it with k. Therefore, someone is considered poor if his/her deprivation score is equal or greater than the poverty cut-off, i,e someone is poor if $c_i \geq k$.

For those whose deprivation score is below the poverty cut-

**Table 1. The dimensions, indicators, deprivation thresholds and weights of the MPI**

| Dimensions | Indicators | Deprived if… | Related to… | Relative Weight |
|---|---|---|---|---|
| Education | Years of Schooling | No household member has completed five years of schooling. | MDG2 | 1/6 |
| | Child School Attendance | Any school-aged child is not attending school up to class 8. | MDG2 | 1/6 |
| Health | Child Mortality | Any child has died in the family. | MDG4 | 1/6 |
| | Nutrition | Any adult or child for whom there is nutritional information is malnourished.* | MDG1 | 1/6 |
| **Living standard** | Electricity | The household has no electricity. | MDG7 | 1/18 |
| | Sanitation | The household´s sanitation facility is not improved (according to the MDG guidelines), or it is improved but shared with other households. ** | MDG7 | 1/18 |
| | Safe Drinking Water | The household does not have access to safe drinking water (according to MDG guidelines) or safe drinking water is more than a 30-minutewalk from home, roundtrip.*** | MDG7 | 1/18 |
| | Flooring | The household has a dirt, sand or dung floor. | | 1/18 |
| | Cooking Fuel | The household cooks with dung, wood or charcoal. | MDG7 | 1/18 |
| | Assets Ownership | The household does not own more than one radio, TV, telephone, bike, motorbike or refrigerator and does not own a car or truck. | MDG7 | 1/18 |

**Note:** MDG1 is Eradicate Extreme Poverty and Hunger; MDG2 is Achieve Universal Primary Education; MDG4 is Reduce Child Mortality; MDG7 is Ensure Environmental Sustainability. *Adults are considered malnourished if their BMI is below 18.5 $m/kg^2$. Children are considered malnourished if their z-score of weight-for-age is below minus two standard deviations from the median of the reference population. **A household is considered to have access to improved sanitation if it has some type of flush toilet or latrine, or ventilated improved pit or composting toilet, provided that they are not shared. ***A household has access to clean drinking water if the water source is any of the following types: piped water, public tap, borehole or pump, protected well, protected spring or rainwater, and it is within a distance of 30 minutes' walk (roundtrip).

**Source:** Alkire and Santos (2010)

off, even if it is non-zero, this is replaced by a "0"; what we call censoring in poverty measurement. To differentiate between the original deprivation score from the censored one, we use for the censored deprivation score the notation $c_i(k)$. Note that when $c_i \geq k$, then $c_i(k)=c_i$, but if $c_i<k$, then $c_i(k)=0$. $c_i(k)$ is the deprivation score of the poor.

The MPI combines two key pieces of information: (I) the proportion or incidence of people (within a given population) who experience multiple deprivations and (II) the intensity of their deprivation: the average proportion of (weighted) deprivations they experience. The first component is called the multidimensional headcount ratio (H) which is shown below in equation 2.

$$H = q/n \qquad (2)$$

Where, q is the number of people who are multi-dimensionally poor and n is the total population.

The second component is called the intensity (or breadth) of poverty (A). It is the average deprivation score of the multidimensionally poor people and can be expressed as shown below in equation 3.

$$A = \sum_{i=1}^{n} c_i\,(k)/q \qquad (3)$$

Where, $c_i(k)$ is the censored deprivation score of individual *i* and q is the number of people who are multidimensionally poor.

The MPI is the product of both: MPI = H × A.

We chose the weighting scheme proposed by Alkire and Foster (2007) to ensure that we could use the global MPI (Alkire and Santos, 2010) as a benchmark for our findings. For the same reason, we followed Alkire and Santos in setting the number of deprivations (k) that are required for a household to be defined as multidimensionally poor at k = 3.

## RESULTS

Although, all the regions did not improve at the same pace, all the VDCs showed an improving trend across different indicators. For example, the share of multi-dimensionally poor people who are deprived of electricity is still large in Syandi, Rayal and Parakatne VDCs. Likewise, Rithapata VDCs lacks road facility. The high contribution to multidimensional poverty of the standard of living in the study area is in line with the findings of Alkire and Santos (2010), where the standard of living was the biggest contributor to multidimensional poverty in 55 countries out of 104.

Results show that at cut off, k=3, it was found in the study area that 49.7% (nearly 50%) of people are MPI poor. According to the MPI, this means that they are in acute poverty. They are deprived at least either a) all the indicators of a single dimension or b) a combination across dimensions such as being in a household with a malnourished person, no clean water, a dirt floor and un-improved sanitation. It was also found that on average the poor here are deprived in 46.7% of the weighted indicators.

The MPI of the study area was calculated to be 0.023 which is less as compared to that of the nation, which is 0.350 (Alkire *et al*., 2011), it means that slightly more than 2% of the population was deprived with regard to at least three of those indicators. It might be because here the sample size is small and we have taken the respondents from only five VDCs within one district only.

Dimension wise break down shows that expect improved sanitation and safe drinking water, other indicators have a

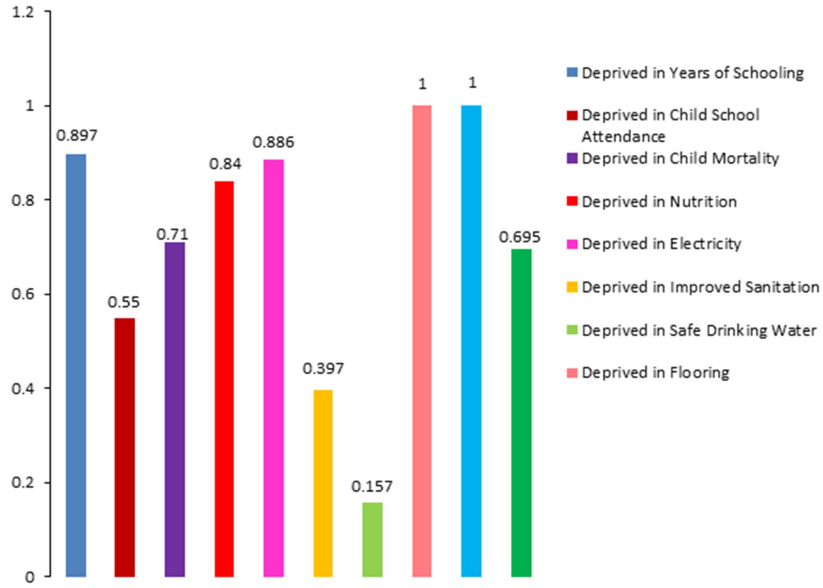


**Figure 2. Contribution of each dimension at k=3.**
**Source:** Authors' own calculation

significant share in multidimensional poverty. It means that the people of the study area lack health, education and other living standard facilities like electricity, cooking fuel, flooring and assets. Cent percent people depend upon firewood for cooking and also 100% floor or house was built up dung, mud and stones which can be seen above in Figure 2.

In the case of assets ownership, 83.75% had radio as shown in Venn diagram below in Figure 3. As radio is the most popular means of communication in rural areas, the use of radio in communicating news and entertainment is common in the rural areas. Although in the age of science and technology, the telephone/mobile users were 36.25% and television users were the least just 11.25%. It shows how poor the condition of the respondents was?

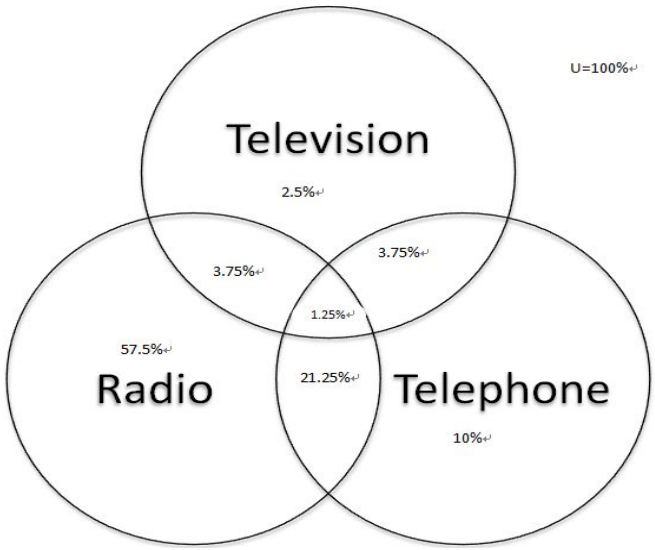


**Figure 3. Assets ownership.**
**Source:** Authors' own calculation

As compared to (Alkire, 2007; Ravallion, 2011; United Nations Development Program, 2003; Bader *et al*., 2015) the poverty was seen as a multidimensional phenomenon that involved a lack of material as well as non-material resources in the study area.

The details about multidimensional poverty across sub-national regions can be clearly seen below in Table 2.

## DISCUSSION

The analysis of the data suggests that the incidence, depth and severity of poverty are higher in the study area because there are lack of economic activities, low employment opportunities, high illiteracy rate and lack of infrastructure. Likewise, Farooq (2013) and Ul-Allah *et al*. (2014) suggested that poverty in Pakistan is thought to be synonymous with rural areas due to lower chances of employment opportunities but with population growth, the number of the urban poor seemed to increase as unemployment rate in urban areas is increasing. This problem was also seen in the study area.

The MPI values for Nepal is 0.350 (Alkire *et al*., 2011) among the 104 countries, where other countries like Bangladesh, Cambodia, Laos and Kenya fall into the same MPI class. Nepal, Rwanda, Bolivia, India and Colombia showed statistically significant changes in all indicators, where Nepal did best in areas such as nutrition, child mortality, electricity, improved flooring and assets (Alkire *et al*., 2013).

Our results are similar with Bader *et al*. (2015) for Laos where we found a marked reduction in the multidimensional poverty headcount ratio over the study area. Agriculture sector plays an important role like in other developing countries, but unemployment is higher particularly in rural areas is due to fewer industrial units (Akhtar *et al*., 2015).

***Conclusion and recommendation*:** There has been a practice

**Table 2. Multidimensional poverty across sub-national regions.**

| Region | MPI (H x A) | H (Incidence) k ≥ 33.3% | A (Intensity) | Percentage of Population Vulnerable to Povertyk = 20%-3.3% | In Severe Povertyk ≥ 50% | Destitute | Inequality Among the MPI Poo | Population Share |
|---|---|---|---|---|---|---|---|---|
| Nepal | 0.217 | 44.2% | 49.0% | 17.4% | 20.8% | 19.9% | 0.186 | 100% |
| Urban | 0.069 | 15.4% | 44.8% | 15.9% | 4.7% | - | | 12.8% |
| Rural | 0.238 | 48.4% | 49.2% | 17.6% | 23.2% | | | 87.2% |
| Central Region | 0.233 | 46.2% | 50.4% | 15.6% | 23.5% | | 0.214 | 32.5% |
| Eastern Region | 0.177 | 37.4% | 47.3% | 19.4% | 15.9% | | 0.140 | 23.7% |
| Far-Western Region | 0.281 | 57.7% | 48.8% | 21.1% | 27.8% | | 0.161 | 10.3% |
| Mid-Western Region | 0.299 | 59.1% | 50.6% | 18.3% | 29.2% | | 0.197 | 12.4% |
| Western Region | 0.156 | 33.4% | 46.9% | 15.5% | 13.7% | | 0.182 | 21.0% |

Source: Oxford Poverty and Human Development Initiative, 2015

of addressing poverty on the basis of income only, but this present study deals with various dimensions. Massive poverty exists in Nepal (Bharadwaj, 2012), and it is concentrated in the remote villages, uplands and mountains, the landless, Dalits (or Scheduled Castes) and small and marginal farmers. It is known that Bajhang is a poor district with 56.8% people living below the poverty line next to Bajura (64.1%) and Kalikot (57.9%), whereas the poverty rate of Nepal is 25.2% (CBS, 2011) and the people there are not unidimensionally, but multidimensionally poor. The findings of the present analysis indicate that the poverty could be reduced by improving health, education, household incomes and livelihoods and living standard through different activities like income generation activities, agriculture and forestry activities.

The MPI was introduced as a new and more holistic way to measure human poverty (Alkire and Santos, 2010). It is known that multidimensional poverty measures are based on normative decisions about the most important dimensions of poverty and the best indicators for these dimensions. Nepal needs to strengthen its institutional capacity to deliver accessible services to the poor, vulnerable and marginalized groups. Sustain and consolidate past achievements in reducing poverty and other millennium development goals should be given emphasis in future. Poverty in rural areas of the country is still much higher than urban areas and also incidence of poverty in the far western development region is the highest where this research was conducted, so the government, policy makers and other stakeholders should work hands in hands to really reduce poverty in Nepal. MPI has captured the attention of researchers and policymakers. A dimension level breakdown of poverty analysis will help policy makers to design proper targeted policy of poverty alleviation on the basis of area, demographic distributions, ethnicity and gender. It is hoped that the findings of this research are important for decision-makers to identify areas of intervention and choose the best measures to reduce poverty. New research is always necessary to optimize the linkage poverty and other deriving factors of poverty as the blue-print approach will simply not work only!

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