Regional Dimensions of Poverty and Vulnerability in Nepal

Summary Report

Discussion Paper

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Summary

Although there is some evidence that poverty has been falling in Nepal over the last two decades there are still signs of large geographical variation with much higher levels of poverty in rural and mountainous areas, especially the Mid-West and Far-West (M&FW) regions. People living in these regions are mainly self-employed in subsistence agriculture with little cultivable land and hence low productivity. Food shortage is a chronic problem and there is high prevalence of under-nutrition, both underweight and stunting in children, as well as anaemia. These regions, being remote, also lack access to basic services and amenities. Temporary migration of adult men to India is commonplace but wages are low, as are remittances.

The UK Department for International Development (DFID) commissioned this study to better understand the regional dimensions of poverty in Nepal. The study had three main parts. The first set out to establish a measure of chronic poverty and vulnerability based on indicators included in existing major datasets in Nepal. The second used these measures to explore the trends between regions as well as over time. The third set out to better understand the underlying causes of chronic poverty and vulnerability in the Mid- and Far-West (M&FW) regions. This summary report presents the major findings from this study. Details on the analysis of poverty and vulnerability and the methods used have been included as an annex to this summary. Further details can be found in the accompanying background reports.

The study presents evidence of the extent to which poverty is concentrated in the Western regions of Nepal, with the highest concentration of poverty in the Karnali region. Remoteness is an important feature of the Mid and Far-West regions, but access to public services, standard of living, literacy and women's empowerment are all substantially worse in this part of the country when compared with other regions. There are certain factors that are clearly associated with poverty in these two regions, including high dependency ratios and numbers of assets, as well as social identity. Other factors are specific to parts of the Western region, namely migration which is found to be particularly important for the Mid-West. There are also differences in poverty trends in these two regions, for example, poverty rates among Dalits has fallen in the Mid-West but has increased in the Far-West between 2003 and 2010. In clear contrast to poverty, susceptibility to risks (vulnerability) is far more evenly spread across the country.

The study has a number of implications for understanding inclusive development in Nepal. Poverty is influenced by who you are, but also by where you live. This has important implications for development planning. Firstly, there is a need to support the production of quality statistical evidence that can reflect sub-regional trends to inform evidence based policy and programming. Secondly, there is a need to think in terms of regional development strategies to respond to the need of the poor in lagging regions. This study aims to lay the basis for further collaboration between the UK Department for International Development and the Government of Nepal to develop an inclusive development strategy that is focused on the Mid and Far Western Regions.

Acknowledgement

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Summary Report

Objective and Approach

Although there is evidence that poverty has been falling in Nepal over the last two decades, it is clear that this has not been even across the country. This study set out to further the understanding of the nature of chronic poverty and vulnerability in Nepal based on national datasets. The study had three main objectives:

Defining chronic poverty and vulnerability: The study team first developed an approach to understanding chronic poverty and vulnerability in Nepal, drawing on available indicators and datasets[1].

Assessing regional trends in poverty and vulnerability: Based on these indicators, and the composite indices that were derived, an analysis of regional trend in poverty was carried out. Further analysis on the sub-regional (zonal) trends was carried out in the poorest regions of the country, the Mid and Far West (M&FW).

Determine the underlying cause(s) of chronic poverty and vulnerability in the M&FW regions: The third phase of the analysis carried out some initial exploratory work to look at the factors that were most associated with poverty at the sub-national level.

This summary report presents the key findings from these three stages of the analysis, and discussed some of the implications. Further details on the approach can be found in the annex. Interested readers can also refer to the background study reports.

Limitations

Some of the data were only available at the regional, zonal or district level and so for some of the analyses each geographical unit had to be treated as homogeneous. Trends over time using National Living Standards Survey (NLSS) cross-sectional and panel surveys were only able to use those household indicators which had been collected in both surveys. Also, the small number of households in the panel surveys did not permit analyses below the regional level.

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[1] 12 databases were used to gather the data, including the two most recent Nepal Living Standards Surveys (NLSS) (2003/4 and 2010/11)1 and 10 other databases. 57 Indicators were used to analyse the data, grouped into chronic poverty and vulnerability dimensions. For details see annex sections of this report.

Key Findings 1: Poverty Trends – The National Picture

Multi-dimensional aspects of poverty have improved in Nepal

Results from the National Living Standards Survey reveal a 16% reduction in the number of poor in Nepal between 1995/6 and 2010/11 (World Bank: forthcoming, Figure 1). The calculation of this decline in poverty has taken into account the changes in *cost of basic needs*, with a new calculation of the consumption basket being introduced in NLSS III[2]. The latest NLSS also took into account the regional variation in poverty, taking into account 12 different poverty lines to reflect differences in cost of basic needs. The actual calculation of poverty is calculated based on three measures: food poverty, non-food poverty and total poverty (see annex).

Figure 1 Percentage below the overall poverty line in the three NLSS surveys
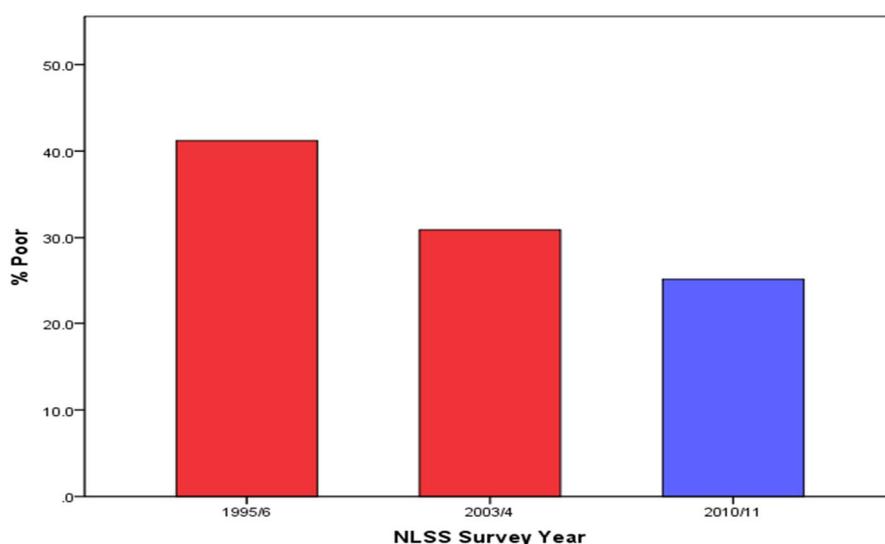
Significant improvements in many indicators were found between 2003/4 and 2010/11, particularly in electricity supply (improved from 44.6% in NLSS II having an electrical supply to 73.5% in NLSS III, a percentage point change of 28.9%) and dependency ratio (improved by 19% points), while the amount of land owned, number of assets and adult literacy all

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[2] If NLSS I (1995/6) poverty line estimates had been applied to the NLSS III (2010/11) survey only about 11% of the Nepalese population would fall below the poverty line rather than about 25% using the new method.

improved by about 10-11% percentage points (see Figure 2). Remoteness reduced and the time to reach a health post improved by 5.1% points, to a road improved by 9.0% and to a market improved by 8.5% points. However, there was little improvement in access to drinking water meeting the MDGs (0.7% improvement) and only a modest improvement in sanitation (2.4%).

Figure 2 Improvements (%) in multidimensional indicators between NLSS II and III
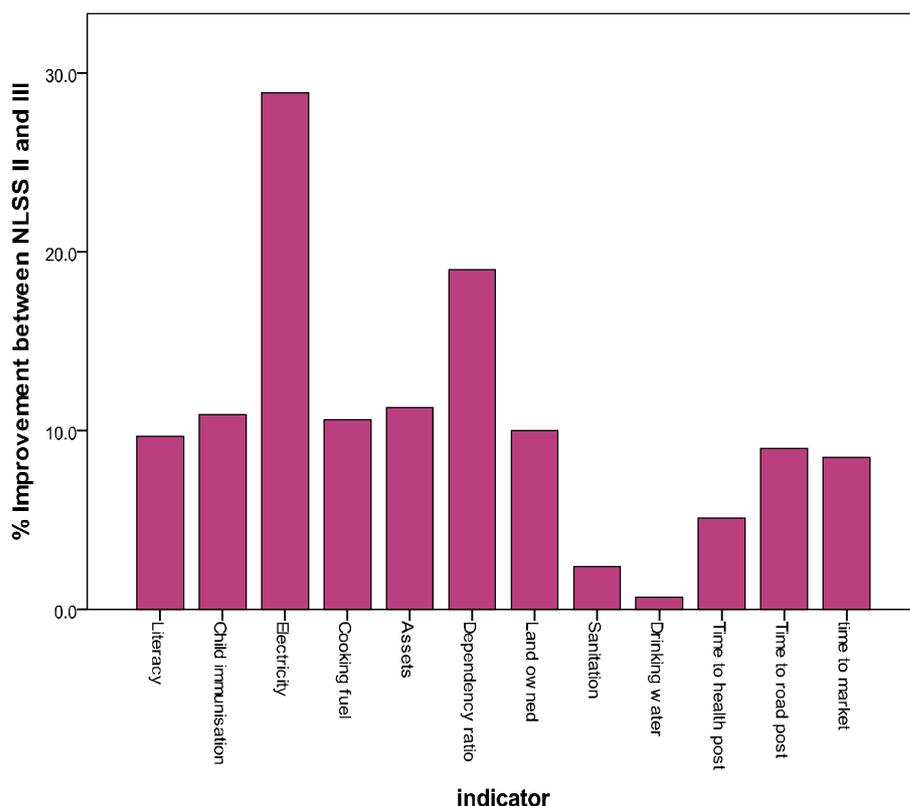
Changes in poverty status between 2003/4 and 2010/11

Just over 500 households were tracked in NLSS II (2003/4) and NLSS III (2010/11) through a panel survey to see if they had graduated out of poverty. Just over 70% were classified as not poor in both surveys, while 6.9% remained poor in both. Of the remainder, close to 10% of the panel households slipped from being non-poor to poor, while 13.3% graduated out of poverty.

Unfortunately the sample size of the panel survey was too small to test for regional (or zonal or district) variation. In addition two panel surveys is insufficient to see whether households graduate out of poverty and remain so, or slip back in poverty (churning poverty), so three or more surveys are needed to look at trends over time.

Key Findings 2: Regional Trends in Poverty

Chronic poverty is concentrated in the Mid and Far West

NLSS II (2003-4) and III (2010-11) show that M&FW regions had significantly greater chronic poverty than the rest of Nepal, as indicated by a composite index developed as part of this work. The index comprises of indicators on severity, health and nutrition, basic services and standard of living, women's empowerment and gender disparity and remoteness (Figure 3). This provides a more regionally specific representation of the extent of poverty in Nepal than standard income based poverty measures.

The composite scores, ranging from 0 (best) to 1 (worst) for each of the 38 indicators were summed within each region and the total region composite score was obtained. This total score was expressed as a percentage of the maximum (38) in order to reflect the extent of chronic poverty. The total composite score for the Far-West was 30.95 and its chronic poverty percentage was (30.95/38) * 100 = 81%. Both the M&FW regions (about 81%) had significantly worse chronic poverty than the other regions (range 21% - 35%).

Based on this approach, the M&FW need to be understood as different from the rest of the country (the Eastern, Central and Western regions together) on the basis of the high level of chronic poverty found there.

Figure 3 Chronic poverty composite index dimensions (%) by Region
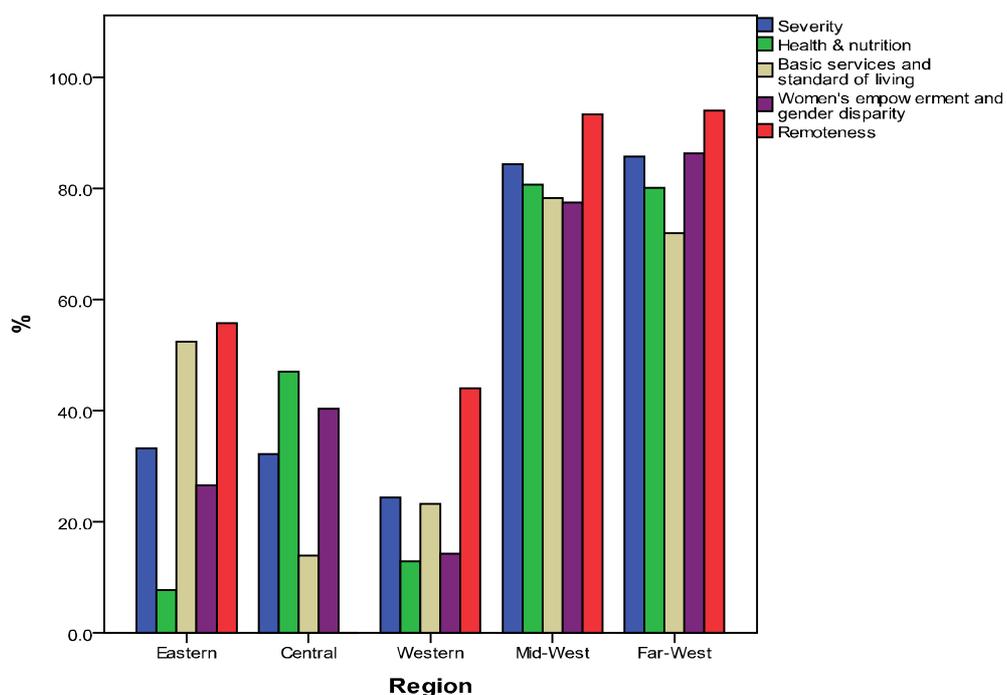
Vulnerability is more evenly spread across the country

Vulnerability showed much less inter-regional variation (Figure 4), based on the measures used in this study which included indicators of natural disasters, risk and resilience and food insecurity. When all three dimensions were combined into a single index the M&FW regions had significantly greater vulnerability (64%) compared with the other regions (range 36% - 44%), those the regional difference are clearly less marked than the case of chronic poverty.

Figure 4 Vulnerability composite index dimensions (%) by region
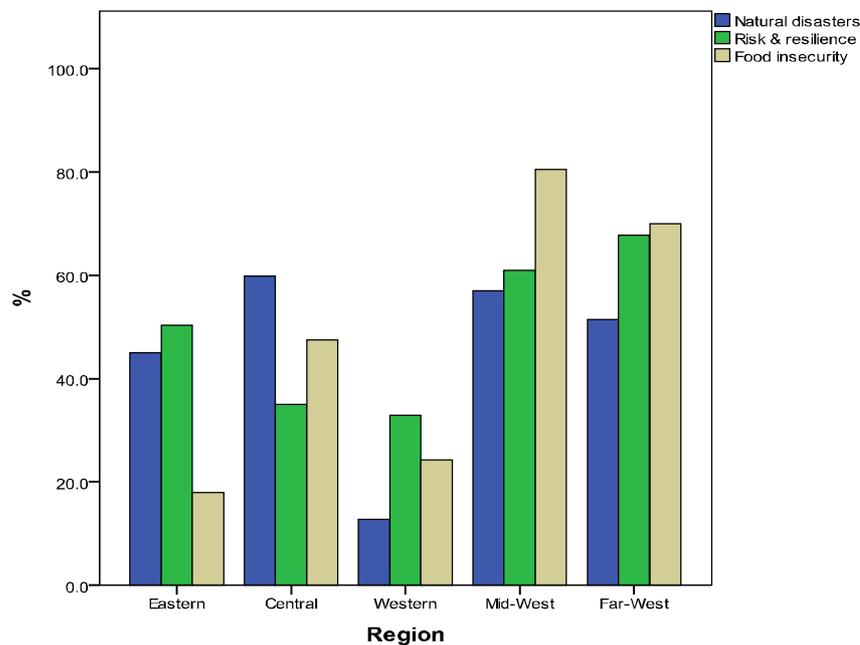
Poverty is deeper and more unequal in M&FW regions

The M&FW region not only has the highest proportion of poor, but the extent of poverty is also higher than in other regions. The depth of poverty was much greater in the M&FW regions (as measured by the mean poverty gap index) as was the extent of inequality among the poor (as measured by the squared poverty gap index; Figure 5). In 2010/11 the FW region had greater depth and inequality than the MW region mainly due to the non-food poverty gap component.

Figure 5 Mean depth of poverty (PGI) and poverty inequality (SPGI) by region
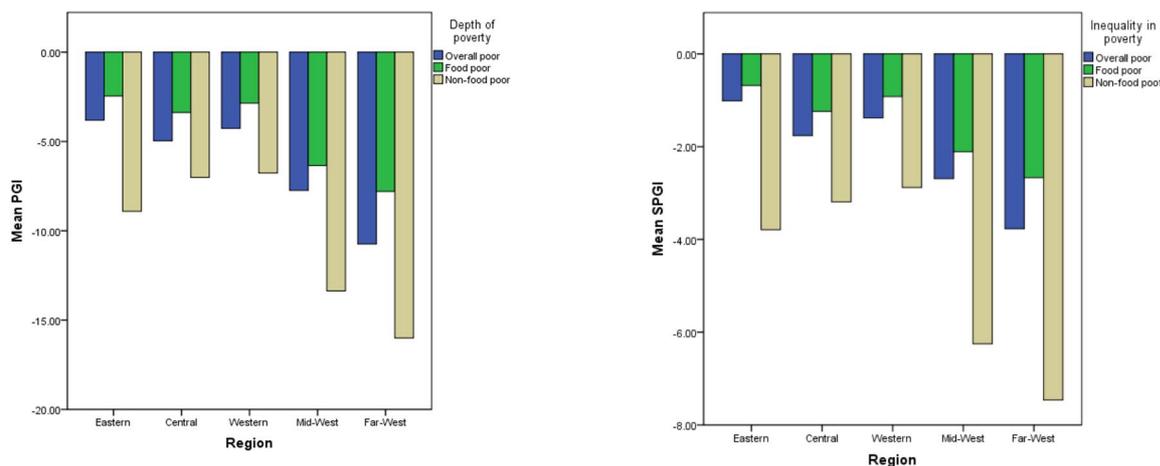
Variation within the Mid and Far West

M&FW regions are not homogeneous in the extent of chronic poverty and vulnerability and significant zonal and district level differences exist. Based on the combined index of chronic poverty, Karnali had significantly worse chronic poverty (70%) than the other zones followed by Seti (49%), Mahakali (43%), Bheri (30%) and Rapti (23%). However, as Figure 6 shows, there is a high degree of variation between the five components of the composite index, implying the factors behind poverty cannot be generalised even within regions.

Figure 6 Chronic poverty composite index dimensions (%) by zone
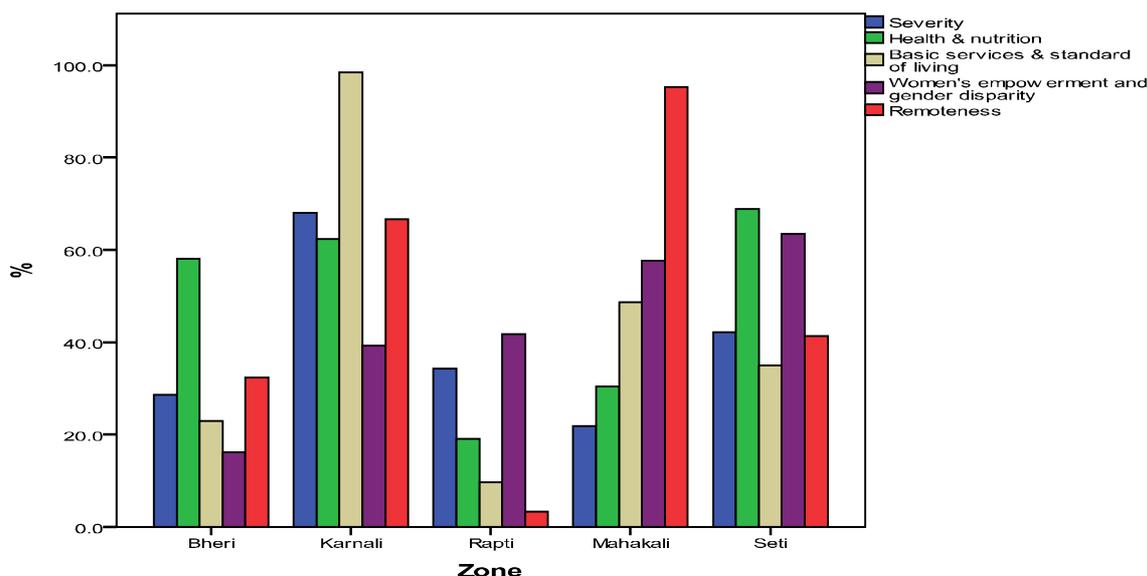
There was much less zonal variation in vulnerability indicators (Figure 7) and no significant differences were found between dimensions. When all three vulnerability dimensions were combined together, Karnali had the highest vulnerability (59%) followed by Seti (55%) where food insecurity and risk of disasters were the highest.

Figure 7 Chronic poverty composite index dimensions (%) by zone
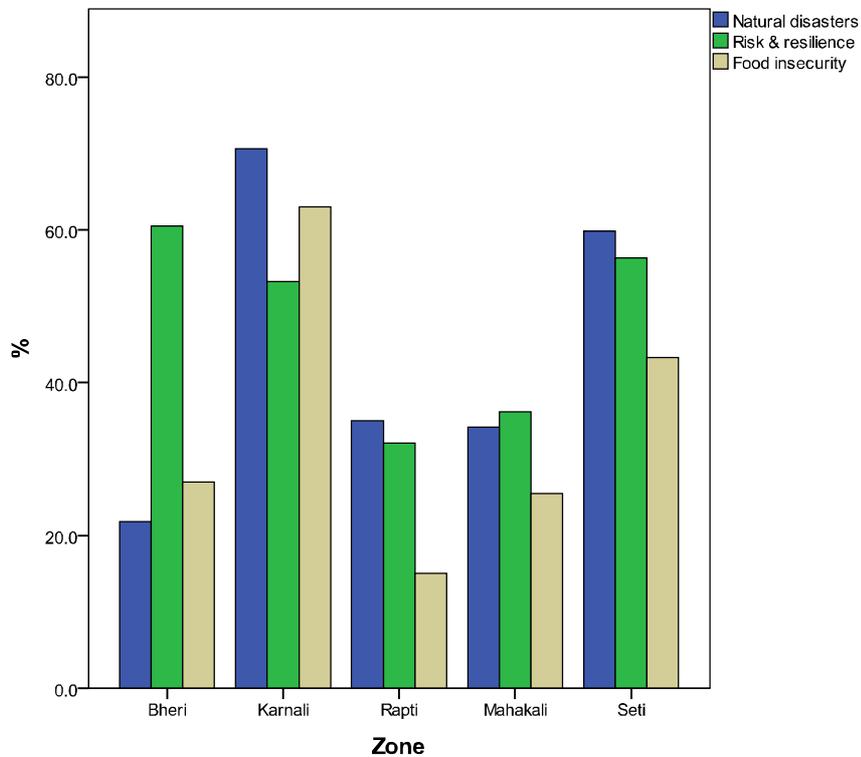
There was significant heterogeneity between districts and Humla and Kalikot were the worst two districts for chronic poverty. There was also significant heterogeneity between districts in vulnerability with Mugu being the worst district followed by Kailali. When all chronic poverty and vulnerability indicators were combined together Humla was the worst district followed by Dolpa, Kalikot and Mugu, all in Karnali zone.

Key Findings 3: Drivers of Poverty

What are the factors that are associated with, or even predict poverty? The study found a strong correlation between income poverty and multi-dimensional indicators, with some appearing more strongly associated with income poverty than others. For example, households with no assets were about 40% more likely to be income poor than households with 3+ assets. Households without assets were 4.62, 1.81 and 8.97 times more likely to fall below the overall food and non-food poverty lines respectively, compared with households with 3+ assets. There were also strong associations between depth of poverty and poverty inequality with all the household indicators. Households with 0 assets had, on average, about 10% greater depth of poverty for total poor, 8% for food poor and over 20% for non-food compared with households with 3+ assets (Figure 8).

Figure 8 Relationship between poverty (%) and mean depth of poverty with total number of assets
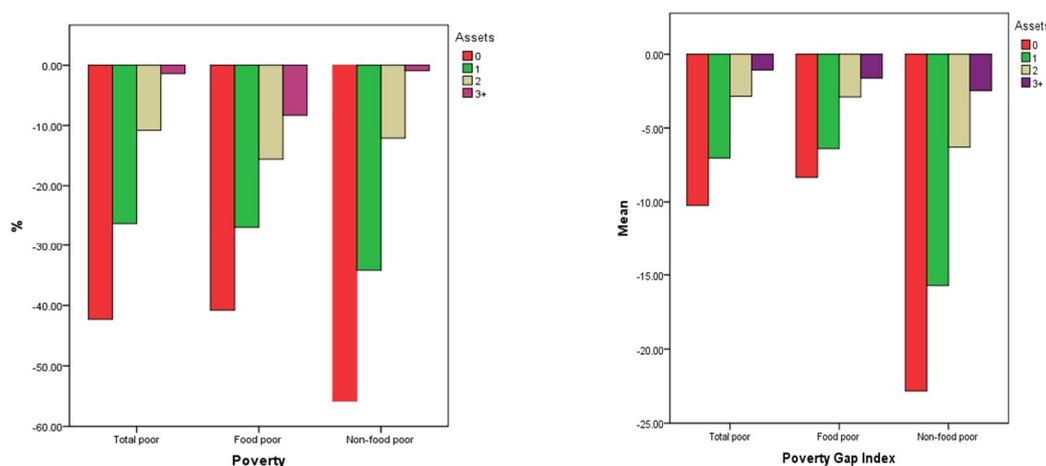
The key indicators which were associated with falling below the poverty line were total number of assets, dependency ratio, sanitation, caste, remoteness, house construction, adult illiteracy, gender of head of household, remittances, urban/rural locality, migration and region. The depth of poverty strongly associated with ten of the above eleven indicators, the only indicator which did not associate with depth of poverty was remittances.

The indicators which associated with income-based poverty are not the same in the M&FW regions

It was also possible to determine the order of importance of the indicators in predicting households below the poverty line[3]. In the MW the most important indicators of being

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[3] The predictive capacity of indicators was determined using a statistical technique called sequential binary logistic regression analysis in which households were classified as below or above the poverty line

below the poverty line were caste, dependency ratio, sanitation, total number of assets, house construction, migration, land ownership and remoteness. In the FW region the most important indicators of being below the poverty line were also caste, dependency ratio, sanitation and total number of assets but also gender of head of household, electrical supply and cooking fuel (Table 1).

Table 1 Indicators associated with being below the poverty line in the M&FW regions

Mid-West	Far-West
Caste	
Dependency ratio	
Sanitation	
Total number of assets	
House construction	Gender of household head
Migration	Electrical supply
Land ownership	Cooking fuel
Remoteness	

In both M&FW regions these different sets of indicators correctly assigned nearly 75% of poor and non-poor households.

In order to examine which variables best predicted the depth of poverty a sequential multiple regression statistical analysis was used as depth of poverty is a continuous variable. In the FW depth of poverty was best explained by five indicators namely caste, dependency ratio, total number of assets, adult illiteracy and house construction. In the MW the depth of poverty was primarily explained by six indicators, the same five indicators that were found for the FW but also remoteness. There was considerable overlap in the indicators associated with the poverty line and with the depth of poverty (caste, dependency ratio, sanitation and total number of assets).

The importance of social identity demands further explanation. For the country as a whole Dalits were significantly more likely to be poor than non-Dalits (others) and this finding was consistent across the surveys (Figure 9).

Figure 9 Percentages below the poverty lines by social groups
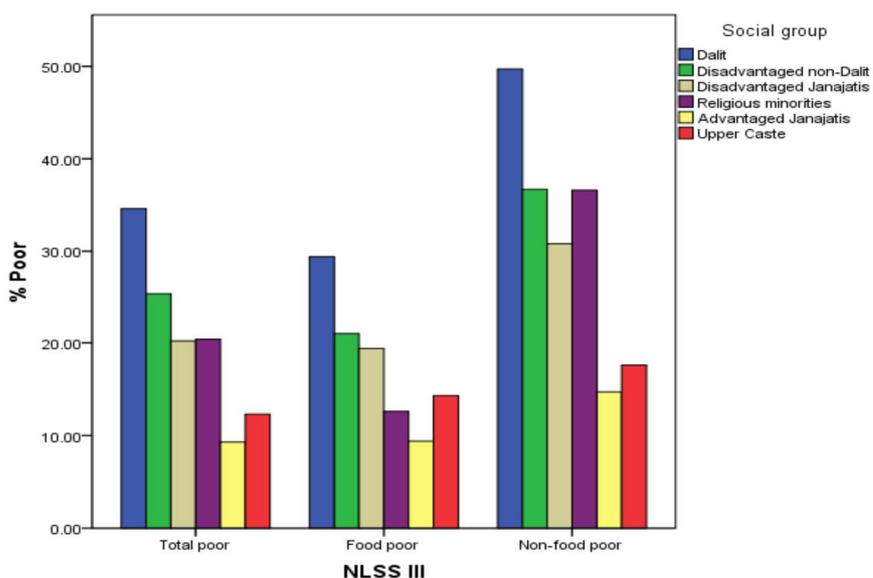
However, a regional perspective reveals important variation. In the MW the percentage of Dalits below the poverty line was well above the Dalit national level in NLSS II (2003/4) but had fallen to just below the Dalit national level in NLSS III (2010/11) survey. The falls in the percentage below the poverty line between the two surveys were more for Dalits (14.3%) than non-Dalits (6.9%). The difference in the percentage below the poverty line fell from 19.9% to 12.5% between Dalits and non-Dalits across the two surveys (Figure 10). In the FW region there was an increase in poverty of about 6% in both Dalits and non-Dalits.

Figure 10   Change in percentage poor for Dalits and non-Dalits between surveys for the M&FW regions
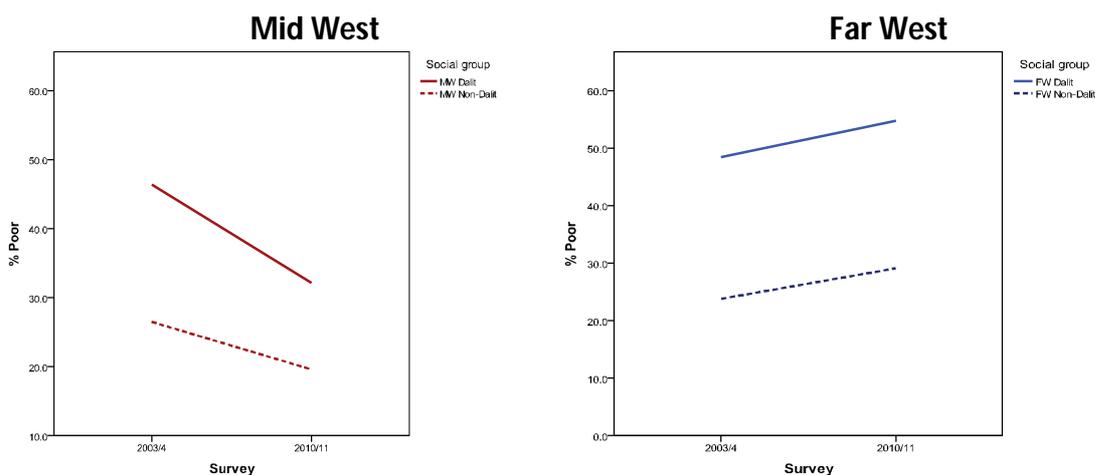
Implications

Poverty levels have declined significantly in Nepal since the first National Living Standards Survey (1995/6). The last round (2010/11) shows that approximately one-quarter of the population are classified as poor. This rapid decline in poverty has undoubtedly been influenced by inflows of remittances, as well as increased public infrastructure, urbanisation and social protection (World Bank: forthcoming). However, as this study shows, the rates of decline have not been even across the country and there is clear evidence that the M&FW regional is lagging behind in term of poverty reduction; with a clear concentration of poverty in the Karnali zone.

Measuring poverty is complex and contested. The NLSS adopts an income based measure of well-being that aims to reflect the international poverty line of $1.25. Other measures of poverty have been developed that aim to reflect the multi-dimensional aspect of poverty, including indicators on human development and standard of living. One such important measure is the Multidimensional Poverty Index (OPHI 2013) which estimates the rate of poverty as far higher, though with similar evidence of decline from 67.7% (2006) to 44.2% (2011). This study constructed a unique index using indicators from a range of major surveys and enables a more detailed account of the components of poverty and vulnerability and their 'drivers', as well as the regional analysis.

This study presents evidence of the complex of issues of inclusion in Nepal's development. Looking from the national level, the decline in poverty has been accompanied by significant improvements in a range of key development indicators, including access, literacy, assets and immunisation. Disaggregating these result shows that inequality is not only defined by who you are, but where you live; with clear indications that chronic poverty is concentrated both regionally and at the sub-regional level. The study also shows that the trends in social aspects of inequality are not even, with different trajectories between Dalit and non-Dalit groups evident between the Mid-West and the Far Western Regions. Vulnerability, in contrast, is far more evenly spread indicating that the challenges of safeguarding development gains needs is common across regions.

The evidence presented in this study demonstrates the importance of adopting a regional approach to development planning in Nepal. This evidence suggests the need to target resources more effectively to lagging regions and to address the specific challenges of delivery in these areas. Issues of access remain critical, driving up the costs of delivery and creating additional challenges for citizens to access services. Equally important is the need to recognise the variations in the trajectory and drivers of poverty reduction. The latter part of this summary has presented preliminary analysis of the factors associated with poverty. While there are some common variables (namely social group, assets and dependency ratios), not all drivers are common across the neighbouring regions; notably, migration and remoteness which are found to be significant only in the Mid-Western Region. Together with the evidence on the different trajectories of inclusive development, there is cause to question the effectiveness of national programme designs to respond needs at the regional level.

This study has been carried out using national data sources, of which the National Living Standards Survey is an important part. This periodic study is critical to understanding rapidly developing trends in poverty and development in Nepal, but has certain limitations in terms of disaggregation to the district level, tracking changes from panel data, and in comparability with other data sets being generated. Improving the quality of national statistics in Nepal can help the policy and planning process, and needs to remain as a development priority for the Government of Nepal and development partners.

This study has provided an initial analysis of the regional picture on inclusive development in Nepal and aims to provide a basis for further work to both track trends over time and, most importantly, to inform policies for inclusive development. The Department for International Development is committed to ensuring that development resources reach those who need them the most. This evidence based analysis aims to inform the development of a broader inclusive growth strategy for the Mid and Far Western Region, in partnership with the Government of Nepal and other development partners.

Annex One: Concepts and Measurement of Poverty and Vulnerability

1. Measuring Poverty

i. Absolute poverty and the poverty line

The most commonly used measure of poverty is the headcount index (World Bank, 2009). The headcount index is the proportion of the population for whom is less than the poverty line. The poverty estimation used in Nepal follows the Cost of Basic Needs approach (CBN) in which the poverty line is defined as the expenditure value in Nepal Rupees (NR) required by an individual to fulfil his/her basic needs in terms of both food and non-food items. In Nepal the three Living Standard Surveys (NLSS) carried out in 1995/6 (NLSS I), 2003/4 (NLSS II) and 2010/11 (NLSS III) are the source of data officially used for poverty estimation. The national poverty line was defined as 19,261 NR for NLSS III (2010/11); the overall (per capita per year) of which the food poverty line was 11,929 NR and the non-food poverty line was 7,332 NR (World Bank, 2012). Non-food expenditure excluded items related to health, repair and maintenance of home and home construction, taxes, fines, marriage, dowries, funerals, durable goods, firewood but included expenditure on kerosene oil, candles, clothes, footwear, soap, toothpaste, public transport, light bulbs and household cleaning.

ii. Depth of poverty and inequality in poverty

The headcount index assumes that all poor are in the same situation and ignores variation in the extent of well-being between different poor households. The headcount index does not take into account the intensity of poverty and it is insensitive to differences in the depth of poverty of the poor. Assuming the poverty line is 125 NR per person per day, as the example below shows (Table A1), 50% of the population in both regions A and B are poor, although poverty is greater in region A than region B.

Table A1   **Headcount Poverty Index example**

Region	Expenditure for each individual in region				Headcount
Individual	1	2	3	4	
A	100	100	150	150	50%
B	124	124	150	150	50%

Over time, the index does not change if individuals below the poverty line become poorer or richer, as long as they remain below the line.

The Poverty Gap (PG) is the average, over all people, of the gaps between poor people's living standards and the poverty line (the blue shaded area in **Figure 1**). It indicates the average extent to which individuals fall below the poverty line (if they do). The Poverty Gap Index (PGI) expresses the poverty gap as a percentage of the poverty line (World Bank, 2009).

Figure A1   Illustration of the Poverty Gap (PG)
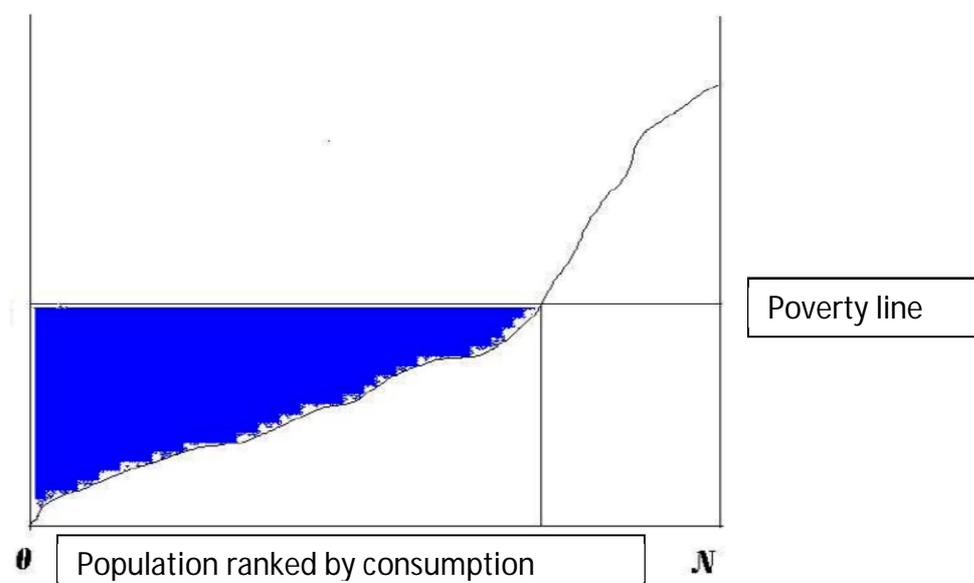
The PG or the PGI can be interpreted as the average shortfall of poor people. They show how much would have to be transferred to the poor to bring their expenditure up to the poverty line, and present it as an average (PG) or in terms of the poverty line (PGI).

The PG and PGI do not capture differences in the severity of poverty amongst the poor and ignore "inequality among the poor". For example (Table A2, where poverty line = 125 NR per person per day) the individuals in regions A and B have the same PG and PGI, although it can be argued that poverty is worse in B, because of an extremely poor member.

Table A2   Poverty Gap and Poverty Gap Index Examples

Region	Expenditure of each individual in region				Sum	PGI
Individual	1	2	3	4		
A	100	100	150	150		
PG	25	25	0	0	50	
(PG/poverty line)	0.20	0.20	0	0	0.40	(0.4/4)=0.10 or 10.0
B	80	120	150	150		
PG	45	5	0	0	50	
(PG/poverty line)	0.36	0.4	0	0	0.40	(0.4/4)=0.10 or 10.0

The Squared Poverty Gap Index (SPGI) is a weighted sum of the poverty gaps (as a proportion of the poverty line), where the weights are the proportionate poverty gaps themselves (like the PG, but with weights given to each observation). The SPGI takes inequality among the poor into account (World Bank, 2009). A transfer from a poor to an even poorer would reduce the Index; a transfer from a very poor to a less poor would increase the Index (Table A3).

Table A3   **Squared Poverty Gap Index example**

| Region	Expenditure for each individual in region				Sum	SPGI
A	100	100	150	150		
(PG/poverty line)	0.20	0.20	0	0	0.40	
Squared poverty gap	0.04	0.04	0	0	0.08	0.08/4=0.02 or 2.0
B	80	120	150	150	12.5	
(PG/poverty line)	0.36	0.04	0	0		
Squared poverty gap	0.1296	0.0016	0	0	0.1312	0.1312/4= 0.0328 or 3.28

In Nepal all three PGIs and three SPGIs have been calculated based on overall, food and non-food depth of poverty and the same number of inequalities, making a total of nine income-based poverty measures.

b. Chronic poverty and vulnerability

i. Chronic poverty

Poverty is neither a homogeneous nor static state and individuals and households can be categorised as always poor, usually poor, churning poor, occasionally poor or never poor (Hulme and Shepherd, 2003).

Figure A2   **Categorisation of the chronic poor, transient poor and non-poor** *(Adapted from Jalan and Ravallion, 2000)*
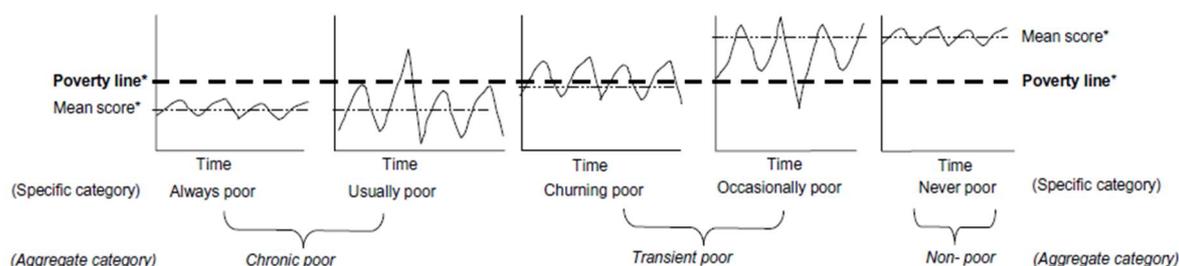
Depending on data availability poverty could be assessed in terms of household expenditure, income, consumption, a nutritional measure, a poverty index, a poverty scale or an assessment of assets/capitals.

These categories can then be further aggregated into the chronic poor (always poor and usually poor, the transient poor (churning poor and occasionally poor) and the non-poor (the never-poor continuing through to the always wealthy, Figure A2).

Chronic poverty is commonly defined as 'a state of poverty where individuals, households or regions are trapped in severe and multi-dimensional poverty for an extended period of time, perhaps even across generations' (Hulme et al., 2001). Duration, multidimensionality and severity are therefore the key characteristics of chronic poverty, and these are mutually reinforcing characteristics. To this established set of chronic poverty characteristics, a fourth characteristic has been added which is highly relevant to Nepal, namely, location. Most national household survey data show a significant geographical dimension to the prevalence

of poverty, with greater proportions of poorer households living in remote or less favoured areas of Nepal. Chronic poverty therefore tends to be spatially concentrated, rather than evenly spread (Bird et al., 2010). A fuller description of definition of chronic poverty and vulnerability is provided in the **Background Reports (Report 1).**

The four key characteristics of chronic poverty are:-
1. **Long/extended duration.** This is often referred to as the distinctive and defining feature of chronic poverty. Poverty that is both severe and multi-dimensional, but does not last over an extended period, is likely to be transient but not chronic. There has been some discussion about the length of time required for someone to be considered in a state of chronic poverty as opposed to poverty. Some researchers have suggested a period of five years but this is an arbitrary cut-off (CPRC, 2004). Poverty can be chronic in shorter timeframes (during particular seasons of the year) and of course in longer ones (attached to life cycles).The key point about duration is that over time poverty eats into, and may completely erode, assets and networks, thus undermining people's livelihoods profile, their resilience and their voice. Finally, it is important to note that chronic poverty may be transmitted over and across generations. Not only do the livelihood strategies of one generation have an impact on the strategies of future generations but given the persistent nature of chronic poverty, it may be the case that any prospect of upward mobility can only realistically be experienced by future generations.

2. **Multidimensionality**. It is now increasingly accepted that poverty is a multidimensional concept (ADB, 2006; Alkire and Santos, 2010). So although a lack of income may adversely affect livelihoods, people can still suffer acute deprivations even if they possess adequate incomes. Multidimensional approaches set out to capture a fuller range of deprivations (physical, economic, social, cultural etc.) that constitute poverty, and also to incorporate key life capacities such as agency, participation and voice which conventional poverty measures overlook. The main challenge for multidimensional approaches is that they deal with a greater number of attributes, some of which may be quite context specific (greater variability in non-monetary indicators); and that it is not always easy to establish the relative weight of the different dimensions based on any objective standard. For some therefore, multidimensional approaches lack the precision and comparability of income/consumption measures. In the context of chronic poverty, the number of dimensions in life that are affected, the extent to which they are affected, and the negative impact the depletion of one dimension can have on others, are likely to increase. There is evidence for example that the overlap between income and non-monetary indicators is actually quite modest (Baulch and Masset, 2003) while others have found that non-income indicators (e.g. food poverty) are more reliable and meaningful measures of chronic poverty (Kabeer, 2010).

3. **Severity.** Technically severity is measured by poverty gaps (i.e. the distance of poor people below national poverty lines) but there is no reason why this cannot be equally applied to multidimensional indicators. Understanding the severity of poverty is important because it allows insights into the various trade-offs people make between the different dimensions of their poverty (e.g. chronically poor may forego health treatment in order to satisfy household food consumption needs), as well as time preferences (e.g. for the chronically poor the task of satisfying immediate needs restricts options related to

future planning such as saving). Both of these aspects are as much indicators as they are determinants of chronic poverty.

4. **Remoteness.** Chronic poverty tends also to have its own spatial characteristics, often reflecting high levels of covariant risks and compound disadvantages. Poverty can be triggered or worsened because people find themselves in geographically remote areas (e.g. far from the centres of political and economic activity), low potential or marginal locations (e.g. ecologically vulnerable areas that have low agricultural potential or few natural resources), less favoured areas (e.g. in politically disadvantaged or conflict zones), or poorly integrated locations (e.g. where market linkages are weak or the quality of social services is poor and expensive) (Bird et al., 2010). Importantly, areas where there are higher concentrations of poor people are also more likely to have higher concentrations of chronic poor. Physical remoteness is often matched by policy remoteness so that those living in chronically poor areas are also more likely to be marginalised from policy decision making. This political remoteness increases people's overall vulnerability to chronic poverty. Remoteness is thought to be an important contributor to chronic poverty in Nepal.

ii. Defining Vulnerability

By definition, poor people are exposed to higher levels of risk in life and normally have fewer resources to cope with shocks and hazards. Vulnerability refers to the likelihood (actual and perceived) that individuals, households or communities will fall face a shock or other event that adversely affects their well-being. Vulnerability manifests itself externally (risk and shocks) as well as internally (sense of powerlessness or insecurity) (McCulloch and Calandrino, 2003), and concerns itself with both the immediate and longer term impacts of risk exposure (Wagle, 2005).

There are a number of external livelihood threats including natural shocks such as droughts, or economic shocks such as currency depreciation or shifts in marketability of commodities (Devereux et al., 2006). Resilience instead relates to 'coping strategies' which again can be found at the individual, household, community and national levels. People therefore protect themselves against livelihood risk in a number of ways including diversifying income, building a mixed portfolio of assets, managing money by saving or reducing expenditures, building social networks, and so on. If these risk coping mechanisms fail, the threat of chronic poverty becomes stronger. Although vulnerability and poverty have traditionally been treated as distinct concepts, there is now a resurgent interest in the links between vulnerability and chronic poverty (Hulme and Shepherd, 2003; Prowse, 2003).

It is now recognised that reducing vulnerability is an effective way of helping people lift themselves out of poverty. Vulnerability therefore can be seen as cause (e.g. living in ecologically fragile areas increases vulnerability and may result in longer term poverty), symptom (e.g. those living in chronic poverty are by definition more vulnerable than the non-poor), and a constituent element of poverty (e.g. higher levels of vulnerability increasingly seen as part of the very definition of poverty). The latter two understandings of vulnerability in particular highlight the mutually reinforcing nature of vulnerability and chronic poverty, and invite a more nuanced understanding of vulnerability.

iii. Defining Food Security

Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, World Food Summit, 1996). This widely accepted definition captures the following four dimensions of food security (FAO, 2006):

1. **Food availability** – the availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid).

2. **Food access** – access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources).

3. **Utilisation** – utilisation of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security.

4. **Stability** – to be food secure, a population, household or individual must have access to adequate food at all times. They should not risk losing access to food as a consequence of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity). The concept of stability can therefore refer to both the availability and access dimensions of food security.

Food insecurity is both a cause and symptom of chronic poverty, and depending upon duration and recurrence, food insecurity can be chronic or transitory. Chronic food insecurity is a long-term lack of secure access to enough food, whereas transitory food insecurity is a temporary loss of access to food caused by a relatively unexpected loss of production such as through drought, flood, or crop pest infestation, price hike of food commodities, and inability to absorb nutrients due to health problems. Although chronic poverty is mostly measured by income indicators, there is some evidence that food insecurity may be a more robust indicator of chronic poverty (Kabeer, 2010).

c. Time trends

The two NLSS surveys conducted in 2003/4 and 2010/11 were used to examine the changes in poverty over time (% below the poverty lines, PGI and SPGI) as well as any improvements or deterioration in the multidimensional indicators.

d. Data sources and methodology

Use was made of 12 recent (2001 onwards) existing datasets to capture the multidimensional nature of poverty in Nepal (Table A4). A total of 57 indicators were identified of which 38 were chronic poverty related and 19 vulnerability related (Table A4). Within chronic poverty five dimensions were defined; severity (10 indicators), health and nutrition (7 indicators), access to basic services and standard of living (11 indicators), women's empowerment and gender disparity (8 indicators) and remoteness. Vulnerability was organised under natural disasters (5 indicators), risk and resilience (11 indicators) and

food insecurity (4 indicators) dimensions. Full details of the methodology used are provided in **Appendix 1**. More information on the indicators used and the data sources are presented in the **Background Reports (Report 2).** A preliminary discussion note has been drawn up which suggests ways in which the basis for assessing chronic poverty and vulnerability could be improved through national systems and improved donor coordinated support (**Background Reports, Report 9)**.

Table A4   **Indicators by chronic poverty and vulnerability dimensions**

Chronic Poverty	Indicator
Severity	**Poverty (cost of basic needs method) Total (%)**
	Poverty (calorie method) Total (%)
	Poverty – food poor (%)
	Poverty – non-food poor (%)
	Income male
	Income female
	Adult illiteracy rate (%)
	Remittances
	Population growth (2001 to 2021)
	Population density
Health and nutrition	**Child mortality – all (%)**
	Child immunisation – no (%)
	Child stunting (%)
	Child underweight (%)
	Child wasting (%)
	Maternal BMI <18.5 (%)
	Maternal haemoglobin – anaemia (%)
Access to basic public services and standard of living	**Health institutions/1000 population**
	Access to basic services
	Electricity – no (%)
	Drinking water not MDG (%)
	Drinking water not MDG and > 30 minutes (%)
	Sanitation not MDG (%)
	Floor construction – poor (%)
	Wall construction – poor (%)
	Roof construction – poor (%)
	Cooking – poor (%)
	Assets – none (%)
Women's empowerment & gender disparity	**Literacy status female (%)**
	Years of schooling female (years)
	Female headed (%)
	Women participation in local elections
	Women in professional occupations
	Women in administrative occupations
	Gender-related development index
Remoteness	**Remoteness health post > 60 minutes (%)**
	Remoteness road head > 60 minutes (%)
	Remoteness market > 60 minutes (%)
Vulnerability	
Natural disasters	**Landslide**
	Drought
	Earthquake (mean magnitude)
	Flooding
	Climate vulnerability index
Risk & resilience	**Child (<5 years) ARI/1000 population**
	Child (<5 years) Diarrhoea/1000 population
	Malaria/1000 population
	Tuberculosis/1000 population
	HIV hotspots
	Caste – Dalit (%)
	Rural (%)
	Dependency ratio (%)
	Loans (%)
	Migrants – from abroad (%)
Food insecurity	**Agricultural land (persons per hectare)**
	Area of Irrigated land (%)
	Food insecurity summer
	Food insecurity winter

Sources: CBS 2002 National Sample Census of Agriculture 2001/2 Central Bureau of Statistics, Nepal, NDHS 2001 Nepal Demographic and Health Survey 2001, NDHS 2006 Nepal Demographic and Health Survey 2006, NLSS 2003/4 National Living Standard Survey 2003/4, NLSS 2010/11 National Living Standard Survey 2010/11, NSET 2009 Earthquakes in Nepal, National Seismology Center 2009, UNDP 2009 Nepal Human Development Report 2009, State transformation and human development, WFP 2006 Comprehensive Food Security and Vulnerability Analysis 2006, WFP 2008 Multi Agency Flood Impact Assessment 2008, WFP 2009 , A Sub-Regional Hunger Index for Nepal 2009, WFP 2010 VAM data 2010

Annex Two: Details on Methodology

1.1 Composite Index (CI)

The extent of multidimensional poverty was captured by computing the Composite Index (CI) (also called the zero-to-one transformation). The CI is a means of grouping indicators together in a standardised way and it provides a means of summarising complex or multidimensional data. The advantage of the CI is that all values are free from the unit of measurement.

Table 1 presents the headcount poverty percentages in the 5 regions based on NLSS III (2010/11). The best region is set to 0 (Eastern) and the worst region to 1 (Far-West). Where a higher value of the indicator indicates a worse region CI = (x - min)/(max-min), where x is the value of the indicator and max and min denote the maximum and minimum percentages, respectively over the 5 regions.

Calculation of Composite index

Indicator	Eastern	Central	Western	Mid-West	Far-West
Poverty (%)	21.4	21.7	22.3	31.7	45.6
Composite index (CI)	0	0.012	0.037	0.426	1

The CI for Central region = 21.7-21.4/45.6-21.4 = 0.012
CI for Western region = 22.3-21.4/45.6-21.4 = 0.037
CI for Mid-West region = 31.7-21.4/45.6/21.4 = 0.426

If a higher percentage (value) of the indicator refers to a more developed region
CI = (max - x)/(max-min).

The CIs were then summed for each dimension to give an overall mean. Higher means are indicative of greater chronic poverty and vulnerability. Because the number of indicators varies by dimension, the percentage of the maximum CI on each dimension was also calculated by region.

1.2 Poverty Gap, Poverty Index and Squared Poverty Gap Index

The Poverty Gap (PG) measures the shortfall in consumption of each household below the poverty line (defined by NLSS as the cost of basic needs, CBN) setting a zero gap for all those households above the CBN. It is usually expressed as the average amount per household. The Poverty Gap Index (PGI) expresses the PG as a percentage of CBN and provides a measure of the depth of poverty and the PGI measures how far, on average, a household falls below the poverty line.

$PGI = 1/n (\Sigma(CBN- y_i)/CBN$

Where yi is the actual consumption of each household. The larger the PGI the greater the poverty gap.

The Squared Poverty Gap Index (SPGI) is a measure of the degree of inequality among the poor themselves and is the weighted sum of the individual household poverty gaps where the weights are the proportionate poverty gaps themselves (i.e. the square). The act of squaring the poverty gap gives greater weight to the poverty gap of the poorest houses since their poverty gap will be larger. The larger the SPGI the greater the degree of inequality.

1.3 Statistical analyses of cross-sectional data

NLSS II and III survey data were combined to create a single database. Standard univariate analyses were undertaken to test for the association between households defined as absolute (or total) poor, food poor and non-food poor with the multidimensional indicators of chronic poverty and vulnerability. Binary logistic regression analyses were used to test how well the multidimensional indicators predicted absolute poor, food poor and non-food poor households.

Non-food expenditure excludes items related to health, repair and maintenance of home and home construction, taxes, fines, marriage, dowries, funerals, durable goods, firewood but includes expenditure on kerosene oil, candles, clothes, footwear, soap, toothpaste, public transport, light bulbs and household cleaning. A further complexity is that the most recent NLSS survey (NLSS III, 2010/11) used twelve analytical domains (12 different poverty lines) to reflect differences between urban and rural areas as well as between Mountains, Hills and Terai, compared with only five domains used in previous NLSS surveys.

The relationship between the PGIs and SPGIs and the multidimensional indicators was analysed using standard t-tests or analysis of variance. Multiple regression analyses were used to test which multidimensional indicators best explained the variation in the PGIs and SPGIs.

1.4 Statistical analyses of panel data

In NLSS II and III some of the households were studied in both surveys (panel). Paired statistical tests were used to assess the changes between the two surveys only at the national or regional levels. In addition households were reclassified as poor in both surveys, poor in NLSS II but not in NLSS III (better), non-poor in NLSS II but poor in NLSS III (worse) and non-poor in both surveys. Analyses were undertaken to see whether there were differences in the multidimensional indicators between households classified as worse or better.

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