

Identification of poor households for targeting in Nepal

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Abstract:

The government focusses its resources targeting the people below poverty line. The level of poverty needs to be measured by sub-population to make targeting objective. This demands the level of poverty at disaggregated level to reduce leakages on targeting. The small area estimation is used to disaggregate poverty level derived from the national household surveys by space (local level) or other population sub-group. The geographic disaggregation solves the problem of focusing resources to the needy area. However; the hardcore poor may not be benefitted by geographic targeting. Targeting at the individual level is done by identifying whether the household is poor or not with some techniques.

The Proxy Means Testing (PMT) is used to assess the status of welfare at the household level. The relationship between the per capita consumption and the other correlates of the poverty (household characteristics) is the starting point of the identification of poor using regression coefficients. Poor household identification survey collected the variables, the correlates of poverty as identified by regression in Nepal Living Standards Survey data. The predicted values of per capita expenditure from the new survey was used to identify poor households. The grievance handling mechanism was applied to finally declare the household as poor for targeting. A committee of elected representatives, knowledgeable persons, secretaries at local level reviewed the list with some amendments where needed which is further verified at the central level with the support of other household characteristics and the final list of poor households was approved.

Keywords: poor, targeting, proxy means testing, per capita consumption, pro-poor programs

1. Introduction:

Planning is required when the resources are limited to achieve desired results. Many developing countries are struggling to manage for the basic needs of their citizens. For this, the practice of measuring the level of people's welfare has been initiated since long. There are various indicators of welfare, one of them is poverty, a pronounced deprivation of welfare as defined by the World Bank.

The absolute poverty is measured based on the minimum requirements of people for food, clothing and shelter as the basics of life. There are various approaches to measure the level of poverty based on the socio-economic information collected in the household surveys. Poverty can be measured both in monetary and multidimensional terms. As the outcome of the survey results, different measures of poverty provide insight to the policy makers to design pro-poor program effectively.

For poverty alleviation, the government focusses its resources targeting to the people below poverty line. The levels of poverty threshold, the poverty lines, are different for separate sub-population to make targeting more objective. This provides the level of poverty at national, regional and some major geographic areas and population group. The household survey provides information to aggregated level of population which limits the use of the welfare indicator at district or local levels. So, there is a need to generate poverty indicators to the lower level than the standard national household surveys can provide reliably.

To overcome this problem, there is a need to find a tool that provides the required indicators at the local level. There is a technique to generate indicators at the disaggregated level using the data of large scope/coverage (census) and detailed information of welfare measurement (household survey) using small area estimation. This is a tool to get the poverty indicators at geographic disaggregation (local level) or some other population sub-group. Policy makers always like to have the welfare indicators to the lowest level of disaggregation so that they can allocate their resources effectively. However; statisticians are in favor of restricting their indicators at comfortably aggregated level of population considering the level of reliability of the indicators estimated. It's a trade-off of choosing the level of disaggregation based on the demands and availability of the data.

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Availability of welfare indicators solves somehow the problem of limiting resources to the needy area or population. However; the poorest of the poor may not be benefitted by this level of integrated targeting, they are inept taking benefit from this approach. So, the targeting at the household level is the last option which can be achieved by identifying whether the individual households are poor or not with some techniques.

2. Methodology:

The identification of poor households encompasses various methods in different stages. They are poverty measurement using cost of basic needs (CBN) method, small area estimation (SAE) of poverty, and proxy means testing (PMT) in combination of grievance resolution from local level.

2.1 Cost of Basic Needs (CBN) Measure of Poverty

In Nepal, three rounds of Nepal Living Standards Surveys (NLSS) have been carried out in 1995-96, 2003-04 and 2010-11 respectively using the LSMS methodology developed by the World Bank. The CBN approach has been used to measure the poverty, comparing consumption aggregates against regional poverty lines comprising of food poverty lines based on caloric requirements and non-food poverty lines including the cost of housing. The surveys revealed that the level of headcount poverty has been reduced from 40.8 percent in 1995-96 to 30.8 percent in 2003-04 and it is further declined to 25.2 percent in 2010-11. The indicators were provided to two urban-rural groups, three agro-ecological belts, five development regions of Nepal and some combinations of geographic group in addition to the national level. This information was widely used in planning process especially to allocate the government budget to the areas based on the level of poverty.

2.2 Small Area Estimation (SAE) of Poverty

The term "small area" denotes any subpopulation for which direct estimates with adequate precision cannot be produced. According to Lanjouw (2007), small area estimation is defined as any of the several statistical techniques involving the estimation of parameters for small sub-populations.

The widely used SAE technique promoted by the World Bank poverty group is based on regression model (multiple linear regression technique). This estimation makes use of the rich source of information in the sample survey with the power of coverage in the census to produce poverty estimates for small area in all parts of the country (World Bank 2005).

The SAE is used in Nepal to generate estimates of poverty, caloric intake and measure of malnutrition (stunting, wasting and under-weight) in 2006. The data from population census of Nepal 2001 and NLSS 2004 were used to derive poverty and caloric intake indicators at district, Ilaka, municipalities and large or aggregated Village Development Committees (VDCs). Similarly, the malnutrition measures were derived combining population census of Nepal 2001 and Nepal Demographic and Health Survey (NDHS) datasets. This is extended in 2013 to combine of population census of Nepal 2011, NLSS 2011 and NDHS 2011 to provide poverty, caloric intake and measure of malnutrition at district, Ilaka, Municipality and VDC levels.

2.3 Proxy Means Testing (PMT)

The Proxy Means Testing (PMT) methodology has been adopted to assess the level of poverty to individual household. The PMT is a statistical model that estimates the consumption level of households using the proxy variables with characteristics of being available in household questionnaires, country specific, easily observable and verifiable and not being easily manipulated.

The government of Nepal has established Poor Households Support and Coordination Board (PHSCB) in 2011 to identify the poor households using household survey, distribute identity cards to the poor households and recommend programs related to social protection and services targeted to the poor. For the first phase, 26 poor districts were selected to implement the poor identification program.

The identification of poor households made use of NLSS 2011 dataset with derived variables created in poverty assessment. A multiple linear regression was employed using per capita consumption as response variable and household characteristics as explanatory variables. The Poor Households

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Identification Survey (PHIS), 2013 was implemented to all the households of 26 districts. The survey questionnaire included potential predictors of poverty variables collected in NLSS 2011.

Before running a regression for PMT, it was ensured that the all the predictor variables were identical in NLSS 2010-11 and PHIS 2013 in terms of definitions, categories and their distribution.

2.4 Regression Modelling

The regression model of (logarithmic) per capita consumption is developed and estimated on a set of variables in the NLSS 2011 dataset, provided these explanatory variables also exist in the PHIS 2013 data. Single (national) model was applied after the series of regional models were tested with regression diagnostics. The nominal per capita consumption was converted to real one using regional price indices. Belt and Region dummies were used to correct regional influences of the variables.

Forward stepwise regression with population weight was run on natural logarithm of real per capita consumption on the explanatory variables collected from 5988 households in NLSS 2011. There are 18 indicators with 57 categories identified as the determinants of poverty through statistically significant regression coefficients (not shown due to word limits).

Source	SS	df	MS		
				Number of obs	= 27514367
				F(57, 27514309)	> 99999
Model	4231559.32	57	74237.8828	Prob > F	= 0.0000
Residual	4178074.24	27514309	0.15185096	R-squared	= 0.5032
				Adj R-squared	= 0.5032
Total	8409633.56	27514366	0.305645188	Root MSE	= 0.38968

The value of F-test, measure of overall fit of the model is reasonably high with level of significance with 4-digit 0 after decimal and R squared value of more than 0.5 meaning the more than 50 percent of variability of the consumption were explained by the explanatory variables, the model seems acceptable in view of regression diagnostics.

Demographic/Human capital characteristics (4)

- household size, education of household head, enrolment of children in private school and absentee member (potential remittance sender) at household

Physical housing characteristics (4)

- housing ownership, type of roof, floor and foundation

Household amenities (4)

- source of drinking water, type of lighting fuel, cooking fuel and toilet

Household facilities (3)

- access to landline phone, cable television and internet

Ethnic/Geographic group: (3)

- caste/ethnic group, development region, ecological belt

The regression coefficients so obtained from NLSS 2011 data were planted to PHIS 2013 data to predict the per capita consumption of each household. Both cluster and idiosyncratic errors could not be adjusted here as usually done in SAE due to the absence of cluster variables in the modelling.

The straight forward way would be to compare the predicted per capita consumption with poverty lines to identify whether the household is poor or not. As the reliability of predicted consumption at the individual household level could not be assessed, different approach of identification was employed.

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For this, poverty head count rates at district level derived from SAE was utilized as the reliability of those estimates was fairly high. The percentage of the households to be poor for PHIS 2013 was determined by the SAE estimates of 26 districts. So, households in the lowest ranking of the predicted consumption were identified as poor matching them with district poverty headcount rates.

2.5 Validation of Poor Households List

The preliminary list of the poor households should pass through the validation with grievance handling mechanism at the local level (ward, the lowest administrative structure of the country) to be eligible poor for targeting. Some sample wards were selected to validate the list by the survey team at the centre. This includes observation, interview with the household heads, civil society, knowledgeable persons and VDC secretaries. VDC secretaries were working as VDC representatives as the tenure of elected representative were over at that time and the local election was delayed due to political instability.

The preliminary list of the poor households was published at the ward office of each Municipality and VDC with a notice to make any complaint in the list. The households which were not listed may apply to Municipality/VDC within 15 days of notice for the inclusion by filling a form that reflects the PMT indicators. The Municipality/VDC with investigation, forwards the applications to Poor Households Identification District Coordination Committee (PHIDCC) chaired by the Chief District Officer (CDO). The PHIDCC with further investigation at district level, forwards the complaints to the PHSCBS under the Ministry of Cooperatives and Poverty Alleviation (MoCPA).

The PHSCBS verifies the complaints with the information stored on the server of Poor Households Identification Management Information System (PHIMIS) which holds the scanned copies of the filled-in questionnaire. The verification includes consistency of the variables used for PMT with other characteristics of the households, response on self-reported poor. The level of predicted consumption is compared against the ownership of land and assets of the households to verify the complaints. The complaints filed file other individuals, concerns raised by media and potential errors on data entry were considered on verification.

The final list of the 391, 831 poor households was approved by the Council of Ministers. The final list of the households was sent to the Municipality/VDC for distributing Identification Cards to the heads of the poor households as provisioned in poor households ID card distribution guidelines.

3. Result:

The final list of the poor households has been prepared as given in the table. This turned out to be 40.8 percent of the population against the national average of 25.2 percent poor. From the total poor, bottom 50 percent were classified as extreme poor, 30 percent were mid-poor and top 20 percent were general poor based on their predicted consumption rankings.

District	Extreme Poor	Mid Poor	General Poor	Total Poor	Non Poor	Total HHs	Pov Rate
Khotang	4,469	2,823	1,963	9,255	29,000	38,255	32.5
Bhojpur	4,040	2,558	1,818	8,416	26,896	35,312	32.2
Siraha	18,657	12,520	8,855	40,032	78,798	118,830	41.8
Rautahat	18,596	11,803	8,242	38,641	77,181	115,822	42.4
Ramechhap	4,679	2,930	2,002	9,611	29,383	38,994	33.7
Sindhuli	9,499	5,983	4,257	19,739	33,116	52,855	46.9
Gorkha	5,833	3,717	2,494	12,044	47,017	59,061	28.6
Tanahun	4,600	2,829	1,846	9,275	55,798	65,073	21.1
Baglung	5,472	3,321	2,408	11,201	41,007	52,208	29.9
Rukum East	1,448	949	606	3,003	6,377	9,380	40.9
Rolpa	4,803	2,962	2,113	9,878	29,357	39,235	32.7
Pyuthan	6,705	4,350	2,983	14,038	30,159	44,197	41.7
Arghakhanchi	5,543	3,582	2,543	11,668	30,141	41,809	37.5

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Kapilbastu	13,888	8,513	5,834	28,235	55,451	83,686	42.3
Bardiya	10,822	6,703	4,846	22,371	56,631	79,002	35.2
Dolpa	1,338	922	656	2,916	4,101	7,017	52.3
Mugu	2,059	1,301	917	4,277	5,199	9,476	54.1
Humla	2,109	1,420	1,031	4,560	3,975	8,535	63.2
Jumla	4,286	2,773	2,088	9,147	10,338	19,485	57.6
Kalikot	5,877	3,872	2,684	12,433	9,556	21,989	63.9
Jajarkot	4,767	3,096	2,078	9,941	17,063	27,004	42.6
Rukum West	2,859	1,759	1,221	5,839	19,795	25,634	28.2
Bajura	6,393	4,228	2,998	13,619	8,092	21,711	71.1
Bajhang	7,842	4,921	3,456	16,219	13,073	29,292	62.8
Achham	10,071	6,454	4,319	20,844	23,772	44,616	54.9
Kailali	21,577	13,465	9,587	44,629	91,310	135,939	39.3
Total	188,232	119,754	83,845	391,831	832,586	1,224,417	40.8

4. Discussion, Conclusion and Recommendations:

Different countries have employed different methodologies to identify poor households for targeting. In some countries, simple score is provided for asset indicators and score threshold is applied to identify poor households. Some countries take some variables of welfare to include or exclude from poor households while the others use PMT scores.

Nepal completed identification of poor households in 26 out of 77 districts in the first phase. The PMT tool was based on comparable NLSS 2011, statistically significant variables in a regression comes from 16 questions of household characteristics and two regional dummies.

The primarily identified poor households' verification is a bit challenging, especially for the households of the boarder lines of welfare status. Though measurable, observable and verifiable (MOV) indicators of PMT were chosen, it is sometimes hard to collect the data accurately. The respondents tend to report in a way that their households be identified as poor. There needs to be developed a mechanism to verify the information with other household characteristics.

Some households may not like to be tagged "poor" due to their social status though they are eligible. Identified poor households need to be addressed immediately with some interventions to make identification meaningful.

Some social protection programs for poor households were recommended and their burden to the government is calculated for implementation. They include income generation programs, health insurance, scholarship to the students, subsistence food security, employment-oriented skill development training, housing improvement program, replacement of solid fuels by improved ones, etc.

The health insurance premium payment was implemented immediately to the poor households, other programs were on limbo due to the delay of distribution of ID cards to some local levels. This list works well to provide compensation in mass disasters including earthquake, COVID-19 pandemic, etc.

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References

- CBS (2005). **Poverty Trends in Nepal between 1995-96 and 2003-04**; Central Bureau of Statistics; Kathmandu, Nepal.
- CBS (2006). **Small Area Estimation of Poverty, Caloric Intake and Malnutrition in Nepal**; Central Bureau of Statistics, United Nations World Food Programme, and The World Bank; Kathmandu, Nepal.
- CBS (2012). **Measuring poverty in Nepal: Methodological review of poverty estimation based on NLSS III**; Central Bureau of Statistics & The World Bank; Kathmandu, Nepal.
- CBS (2013). **Small Area Estimation of Poverty**; Central Bureau of Statistics and The World Bank; Kathmandu, Nepal.
- Elbers, C., J. Lanjouw and P. Lanjouw (2002). **Micro-Level Estimation of Poverty and Inequality**; Development Research Group, The World Bank; Washington D.C.
- Gaihre R. H., Chandrasiri J. & Samarakoon L. (2009). **Building Local Capacity in Poverty Mapping: A Technical Manual**; Geoinformatics Centre, Asian Institute of Technology; Thailand.
- Gaihre, Ram Hari (2010). **Deriving Poverty in the Absence of Living Standards Survey, NEPSA Digest**; Vol. 1 (127-148).
- Margaret E. Grosh and Judy L. Baker (July 1995). **Proxy means tests for targeting social programs: simulations and speculation**. The World Bank
- Peter Lanjouw, Giovanna Prennushi and Salman Zaidi (1998). **Poverty in Nepal Today**; The World Bank; Washington D.C.
- Rao, J.N.K. (2003). **Small Area Estimation**; Wiley Series in Survey Methodology; John Wiley & Sons, Inc.; Hoboken, New Jersey.
- Ravallion, Martin (February 1992). **Poverty comparisons: A guide to concepts and methods**, Living Standards Measurement Study Working Paper No. 88, The World Bank, Washington D.C.
- Sharif, Iffath A. (August 2009). **Building a Targeting System for Bangladesh based on Proxy Means Testing**. The World Bank
- The World Bank (August 2014). **Introduction to Poverty Analysis**; World Bank Institute; Washington D.C.