

Spatial Distribution and Correlates of Poverty in Nepal: A Microeconometric Analysis

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Motivation

- Nearly 50% of the world population lives on less than \$2.50 a day, and about 10% live on less than \$1.90 a day.
- Majority of extreme poor live in rural areas, with low education, and engaged in subsistence agriculture
- Surprisingly, most of the poor live not in low income country but in poverty pockets of middle income countries
- The world has agreed to alleviate extreme poverty by 2030 as the first SDG
- With current trend, eradicating extreme poverty by 2030 is not possible (WB 2018)
- Need to understand poverty pockets for better targeting

Objective and rationale

- **In Nepal, 80% land area is in the hills and mountain where poverty rates may be higher due to inaccessibility, lack of market access, lack of basic facilities & opportunities**
- **Geographic location may have larger role in determining poverty but general poverty measures do not consider it**
- **Objective: measuring poverty at sub-national level and understanding their correlates in Nepal**

Methods

- **Two popular methods of measuring poverty**
 - **Consumption vs Multidimensional poverty**
- **Consumption poverty**: Measures poverty based on cost of living approach, where people are considered poor if their consumption expenditure is less than a pre-defined national poverty line
- **Multidimensional poverty**: It goes beyond economic measures and considers deprivation in three dimensions (Health, education and living standards) measured by 10 indicators.
- **Modified MPI**: We added two additional dimensions and five new indicators while measuring MPI
- **Poverty cut-off point**: we used $1/3$ cut-off points to separate poor from non-poor. A household is defined as MPI poor if it is deprived in more than $1/3$ of the dimensions.

5 Dimensions & 16 Indicators for estimating MPI

Health	• <5 years child mortality in last five years	1/10
	• Child weight for age below <-2 SD	1/10
Education	• 15+ years HH member has not completed 5 years of education	1/10
	• <15 years HH member doesn't go to the school	1/10
Living standards	• HH use biomass fuel for cooking	1/30
	• HH has no access to electricity	1/30
	• HH has thatch/mud/bamboo/wood/rustic roof & sand, dung, wood planks and bamboo floor	1/30
	• HH use unsafe drinking water and walk more than 30 minutes round trip for getting water	1/30
	• HH has no toilet facilities	1/30
	• HH doesn't own more than one of these assets: radio, bicycle, motorbike, TV, freeze and car/truck	1/30
Accessibility	• Altitude of the village >1000 m	1/10
	• >1 hour travel time to reach health center/market (round trip)	1/10
Economic resources	• Household faces food shortage (eat small amount, only one or 2 times a day)	1/20
	• Household have no access to banks	1/20
	• Household doesn't have livestock	1/20
	• Household has no agricultural land	1/20

Methods (cont.)

Two estimation approaches:

A. Simple (spatial) fixed effect model (Household level analysis)

$$y = X\beta + \delta + u \quad (1)$$

B: Spatial-autoregressive model with spatial-autoregressive errors
(SARAR model) (District level analysis)

$$y = \lambda Wy + X\beta + u \quad (2)$$

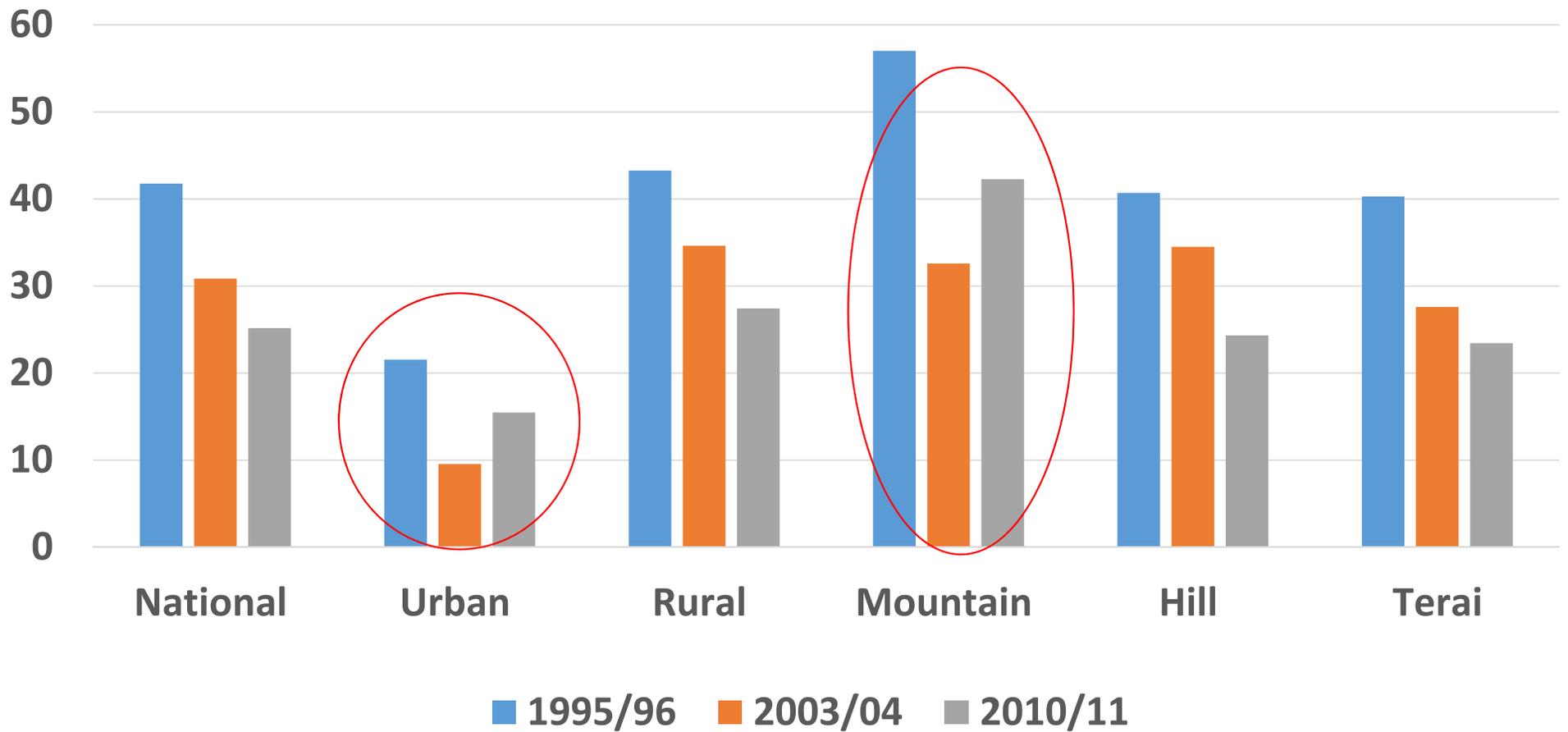
$$u = \rho Mu + e \quad (3)$$

where, y is outcome; X denotes exogenous covariates; δ refers to spatial fixed effects, W and M are spatial weighting matrices based on contiguity; λ and ρ are parameters to be estimated for spatial lag. If both are 0, then (2) & (3) reduced to simple linear regression model. In practice, (2) and (3) are estimated jointly as a system which mainly assumes that both outcome y and error term u are affected by values of the same variables in neighboring districts.

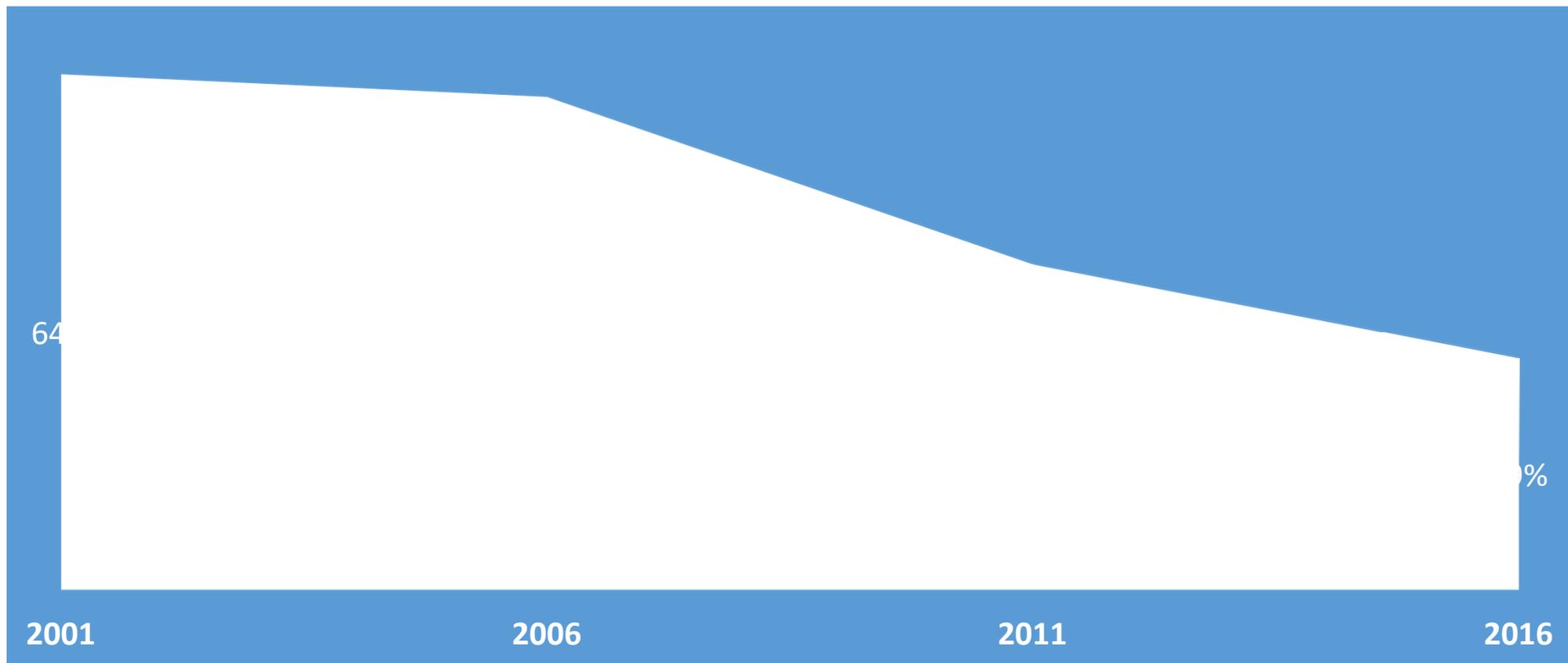
Data

- For consumption poverty estimates and related analysis, we used Nepal Living Standard Survey (NLSS) 2011
- For MPI estimates and related analysis, we used Nepal Demographic Health Survey (DHS) 2016 (it does not have income or consumption related information)
- Both survey are nationally representative covering around 6000 and 11,000 households.

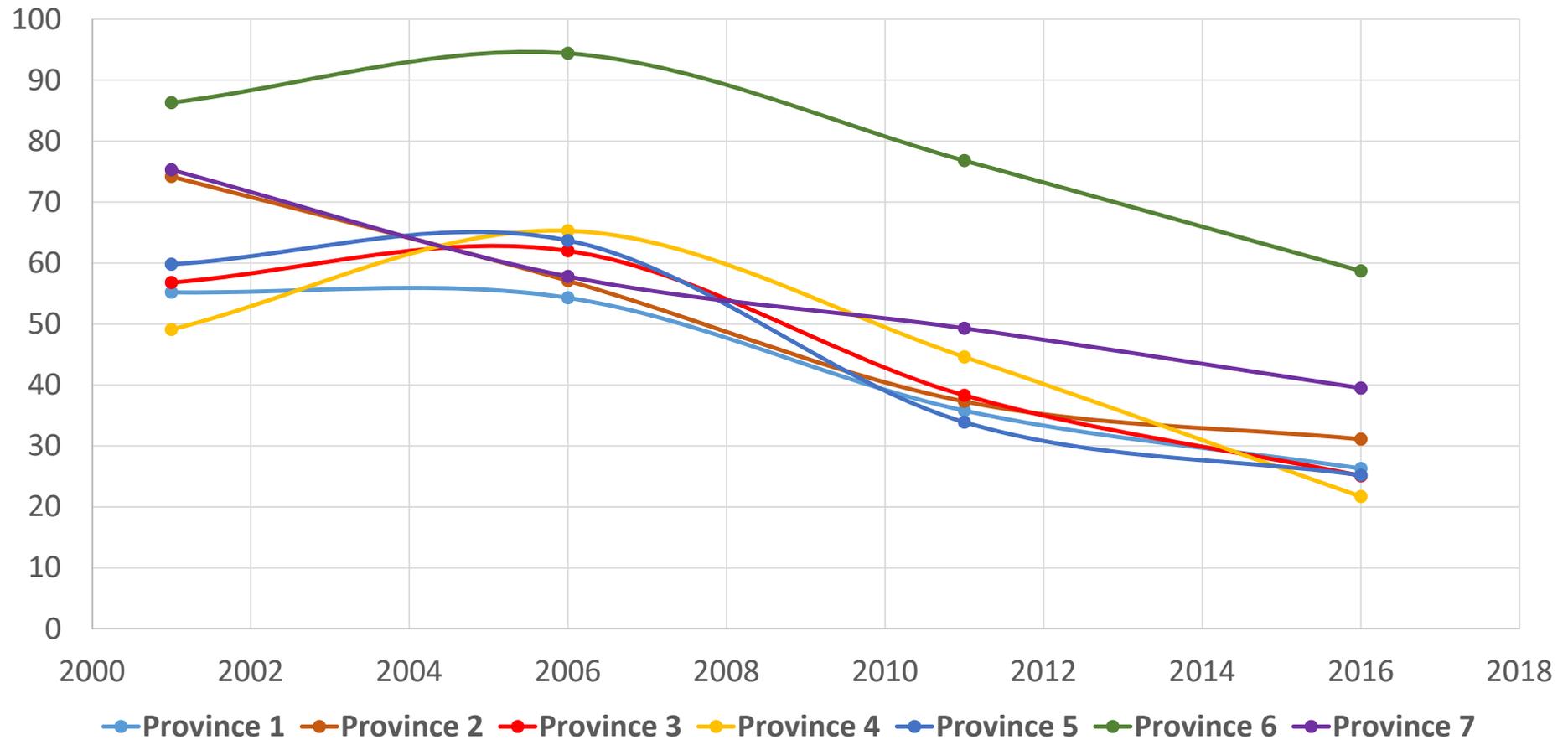
Consumption poverty trend in Nepal (1995-2011)



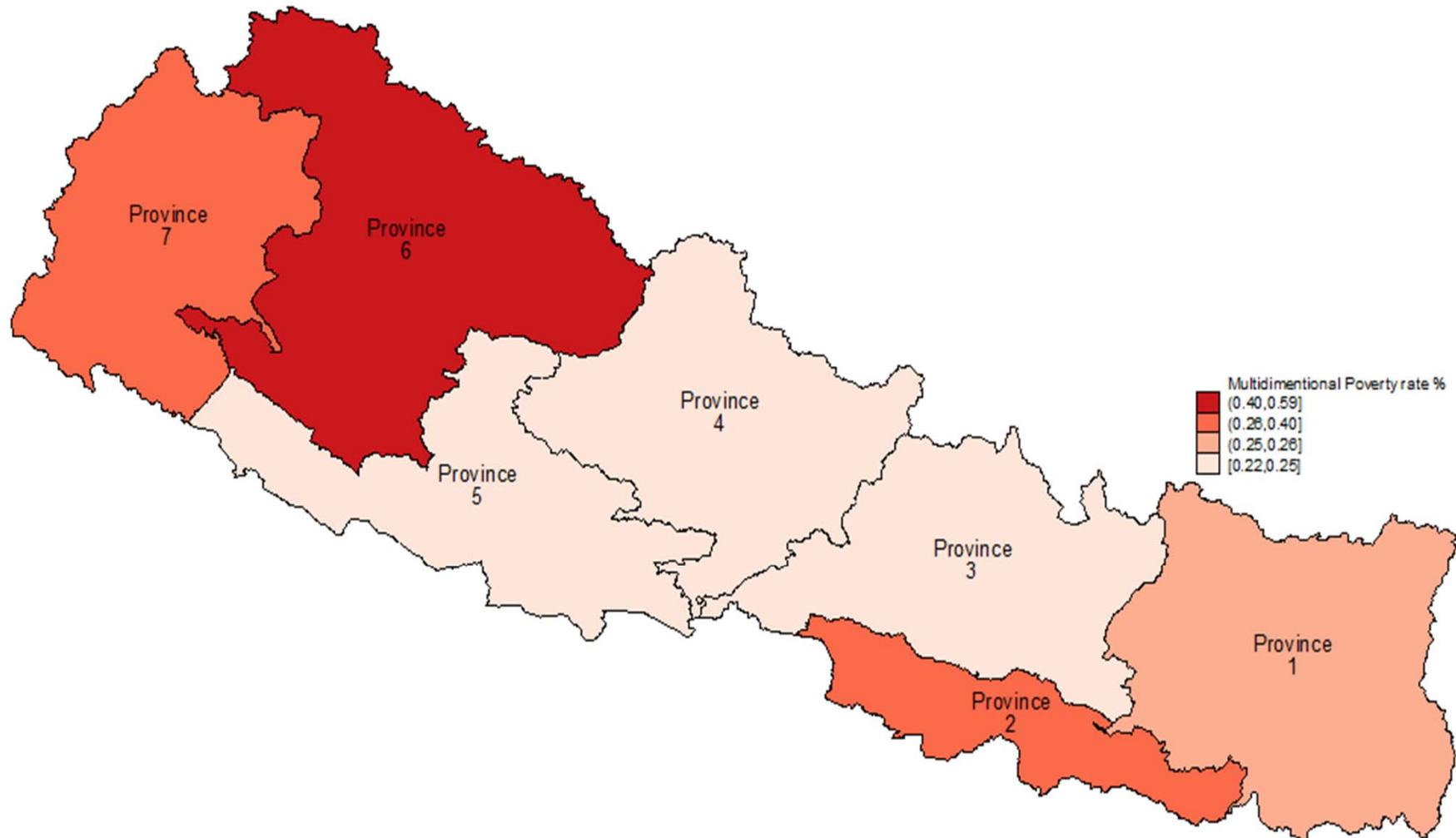
Multidimensional poverty trend



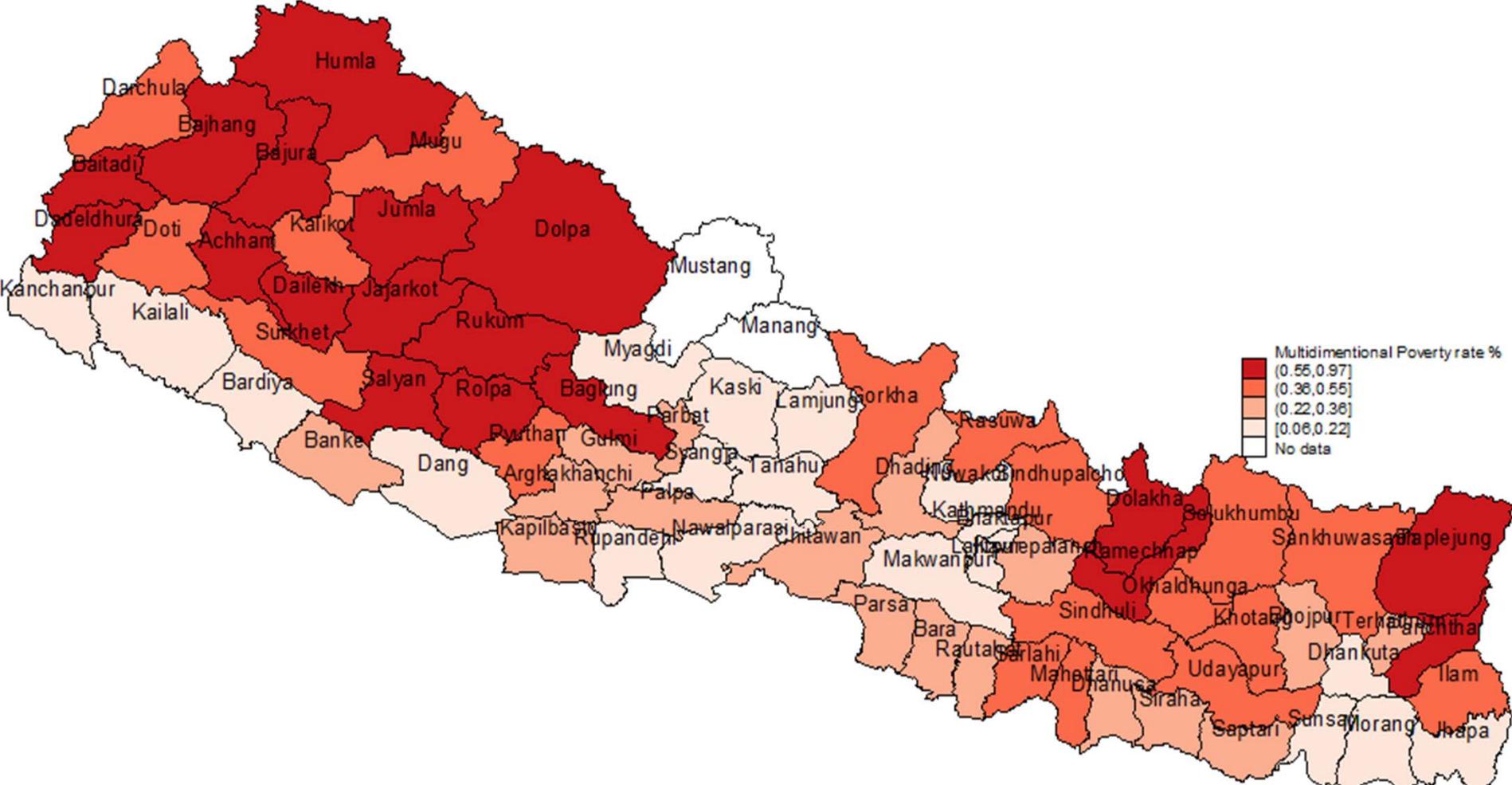
Multidimensional poverty trend – province level



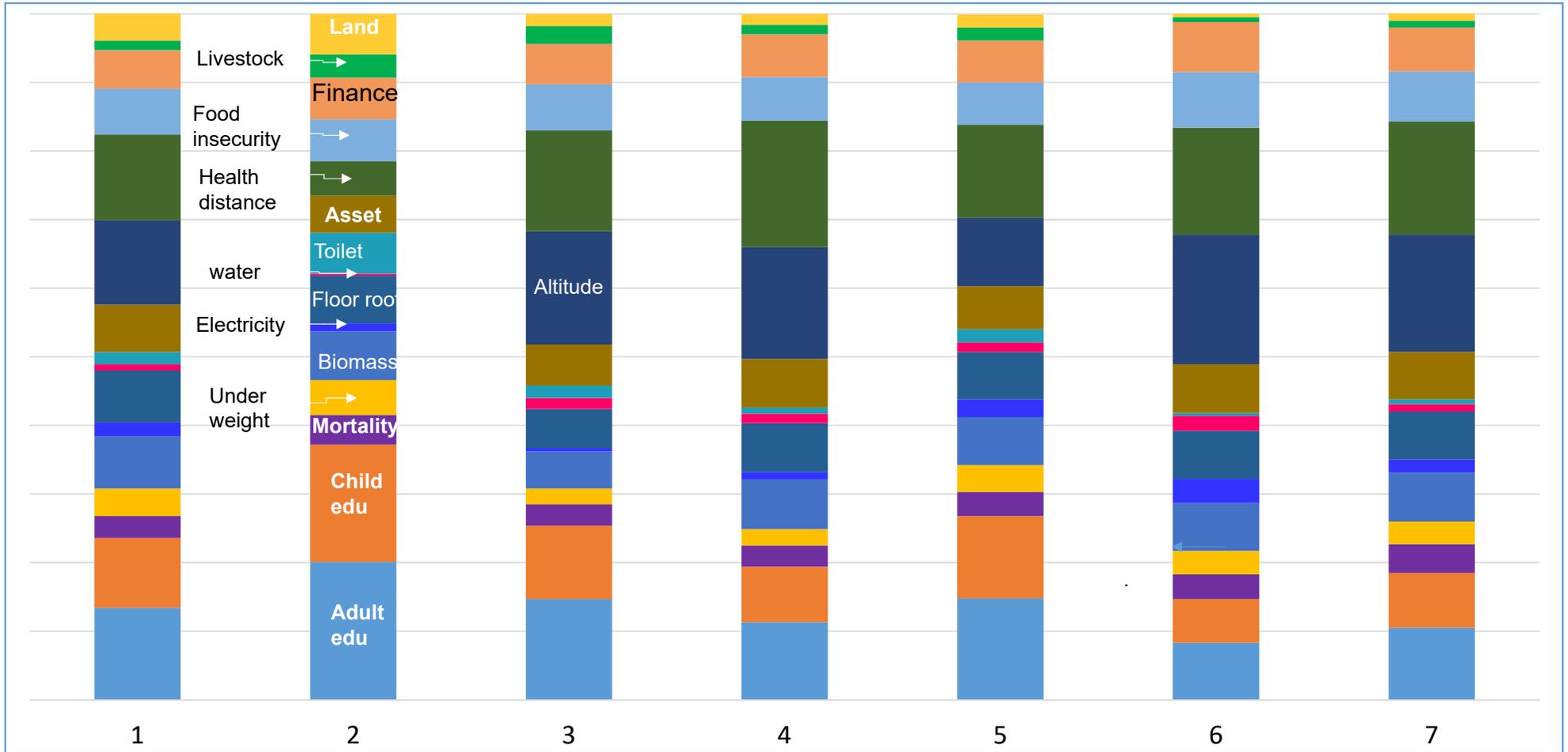
Where the poor people live in Nepal?



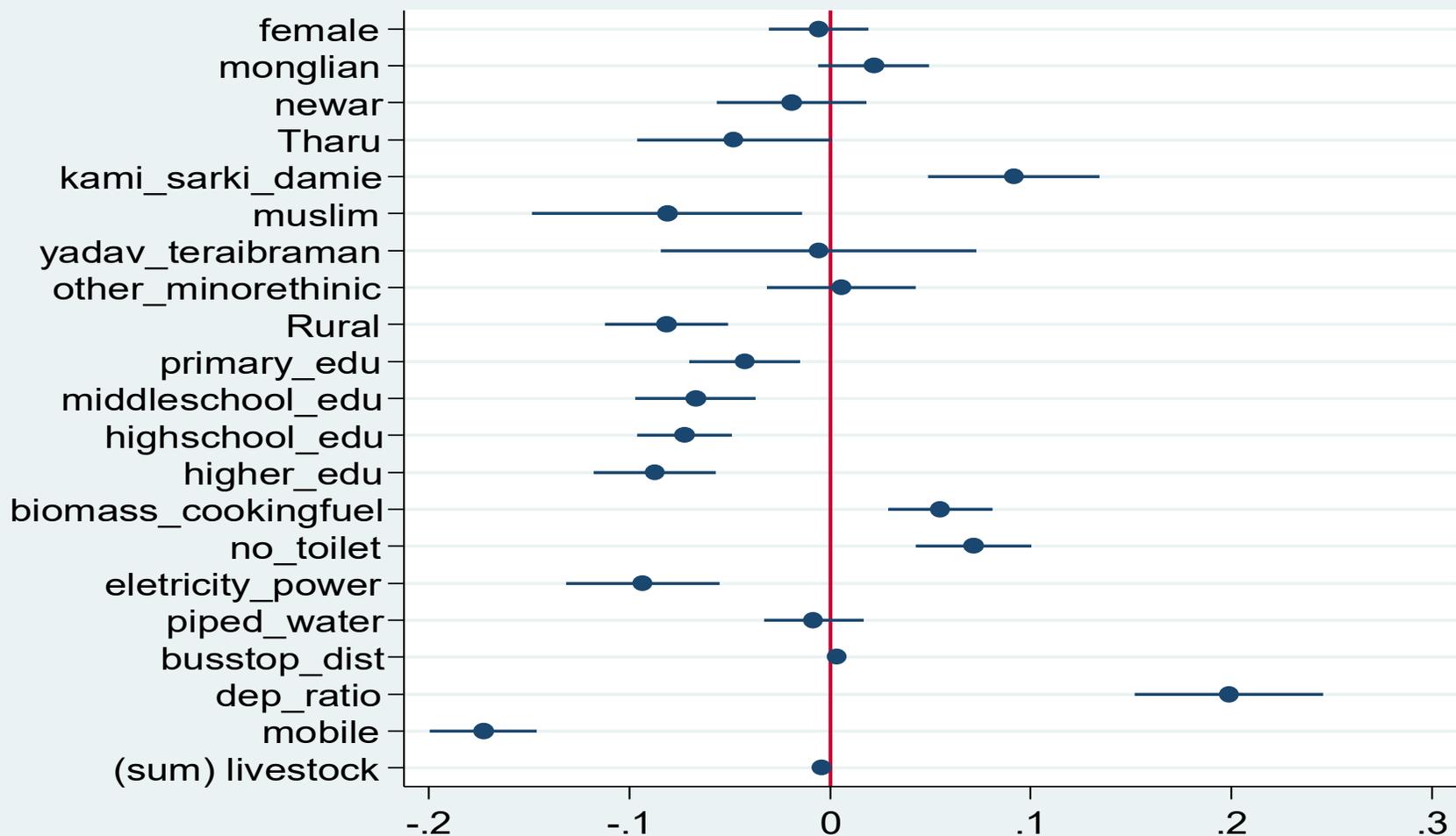
Poverty pockets in Nepal



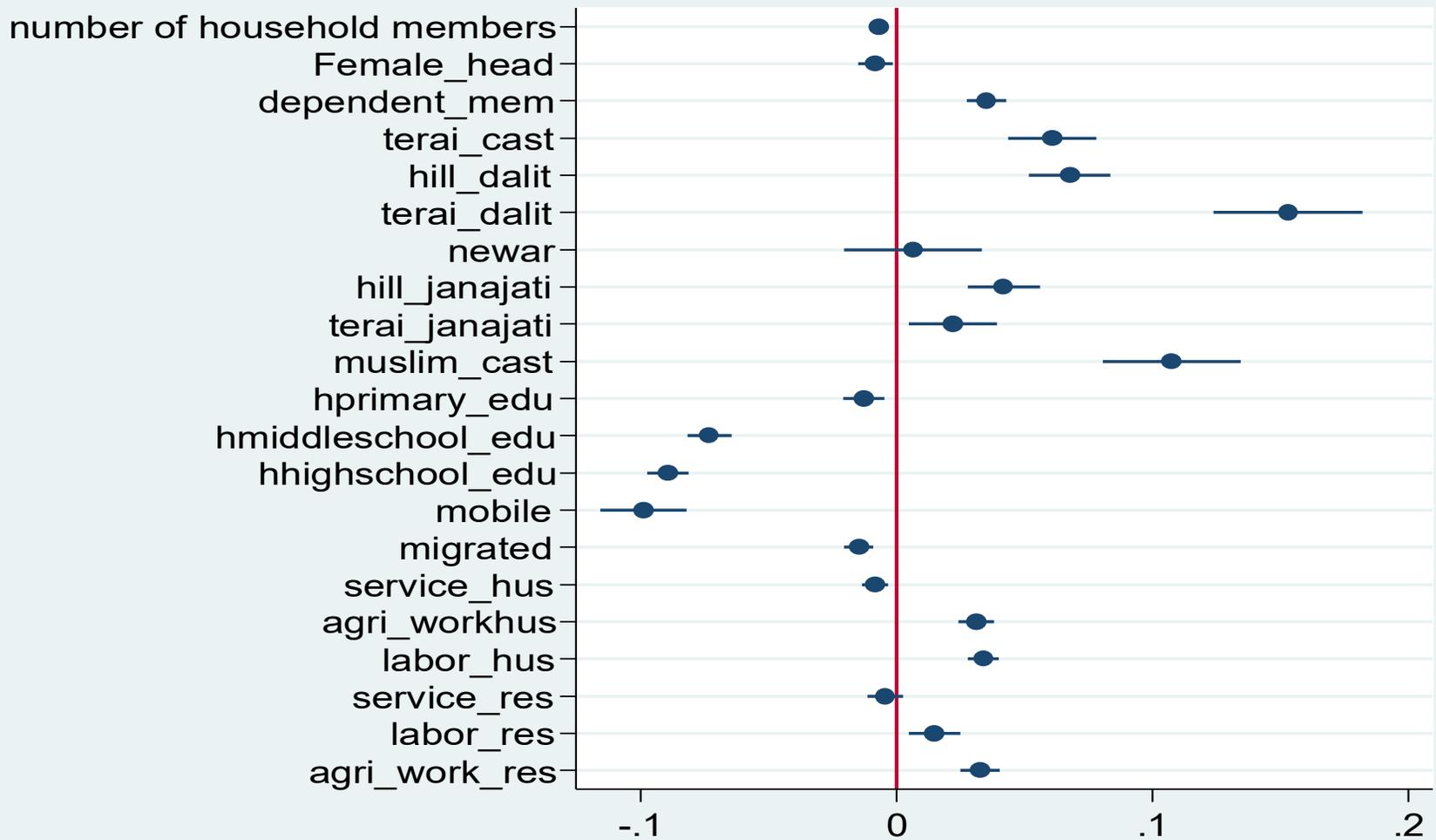
Contribution of each indicators in provincial MPI



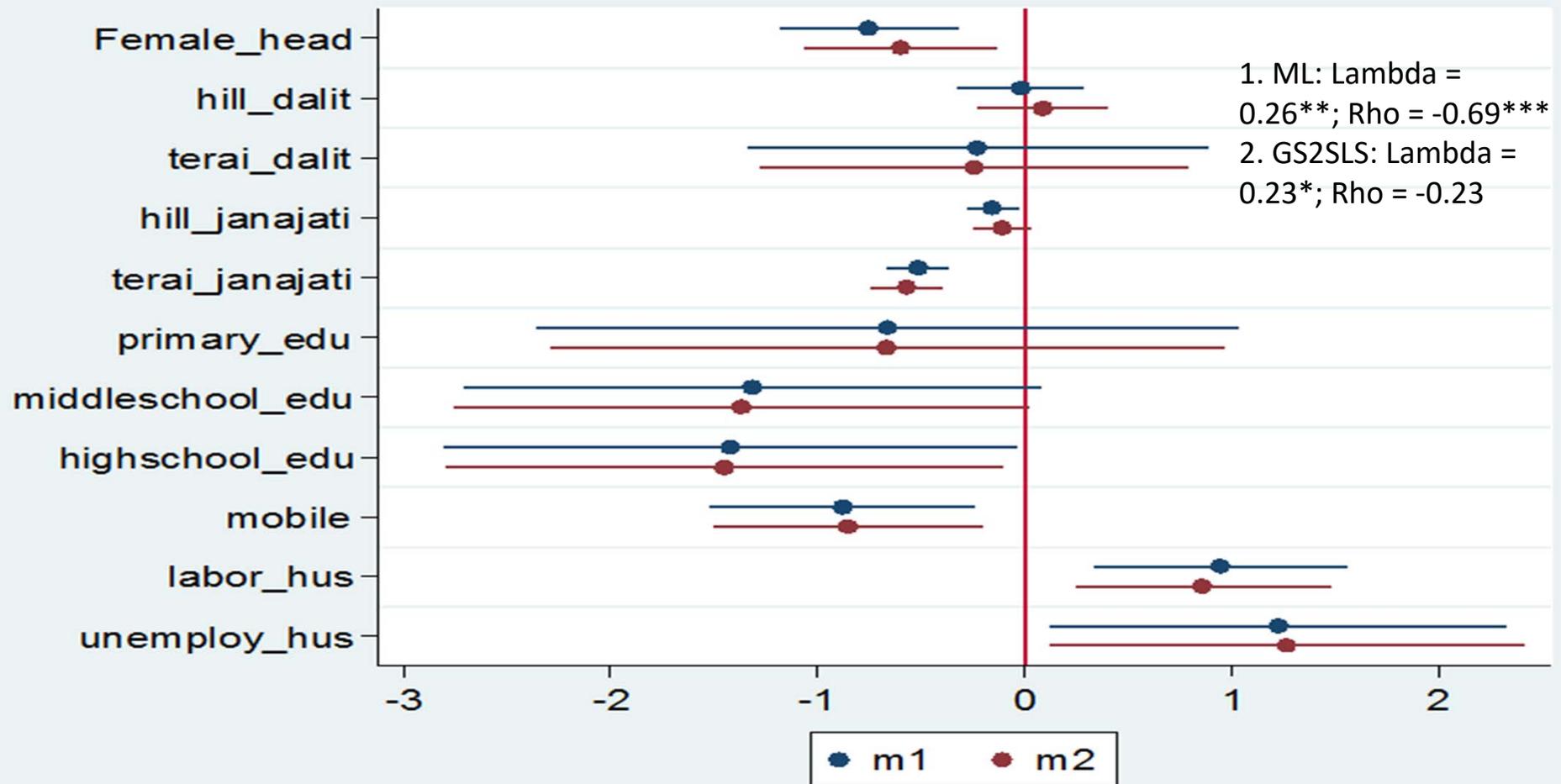
Determinants of consumption poverty



Determinants of Multidimensional poverty



Spatial-autoregressive model with spatial-autoregressive errors



Main findings

- Both MPI and consumption poverty in Nepal are declining over time but the rate of reduction has been slowed down
- Poverty is high in **province 6** and several other **mountain districts** due to inaccessibility and lack of basic infrastructure
- After controlling for several covariates including district fixed effects, and accounting for spatial autocorrelation, we found that **education, mobile phone, and access to basic facilities and employment outside agriculture** have strong relationship with poverty reduction.

What to do for reducing poverty?

- Our analysis clearly suggest that **high school and above education helps reducing poverty** after taking into account geographical features and relationship between districts
- **Ownership of mobile phone and employment outside agriculture** are other factors that help reducing poverty.
- Therefore,
 - focusing on creating employment opportunities outside traditional subsistence agriculture;
 - providing education up to high school level; and
 - providing basic facilities such as electricity, drinking water and healthcare services would help reducing poverty in Nepal