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# Multidimensional Poverty
## of Farm and Herder Households
## in Tibetan Areas of Gansu Province, China

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# 1. Introduction

- Tibetan ethnic people in many pockets of China are in abject poverty

- It is important to find what factors impact poverty of Tibetan ethnic people for the policy purpose

- We calculate multidimensional poverty index to find important indicators affecting poverty

# 2. Methods

- *multidimensional poverty index (MPI)*
  - 3 dimensions and 12 indicators

| Dimensions | Indicators |
|---|---|
| Health | Self-health assessment ($x_1$) |
| | Labor availability ($x_2$) |
| Education | Adult family members received formal education ($x_3$) |
| | School-age children drop out ($x_4$) |
| Living standard | Per capita housing area ($x_5$) |
| | Housing quality ($x_6$) |
| | Home toilet type ($x_7$) |
| | Animal shed is within the house where people live ($x_8$) |
| | Sources of drinking water ($x_9$) |
| | Household electricity supply ($x_{10}$) |
| | Household fuel supply ($x_{11}$) |
| | Number of consumer durable ($x_{12}$) |

- *AF method (Alkire and Foster, 2011)*
  - We use six different methods to assign the weight:
    - the analytic hierarchy process (AHP)
    - equal weight to indicators (IEW)
    - equal weight to dimensions (DEW)
    - the entropy method (EM)
    - the principal component analysis (PCA)
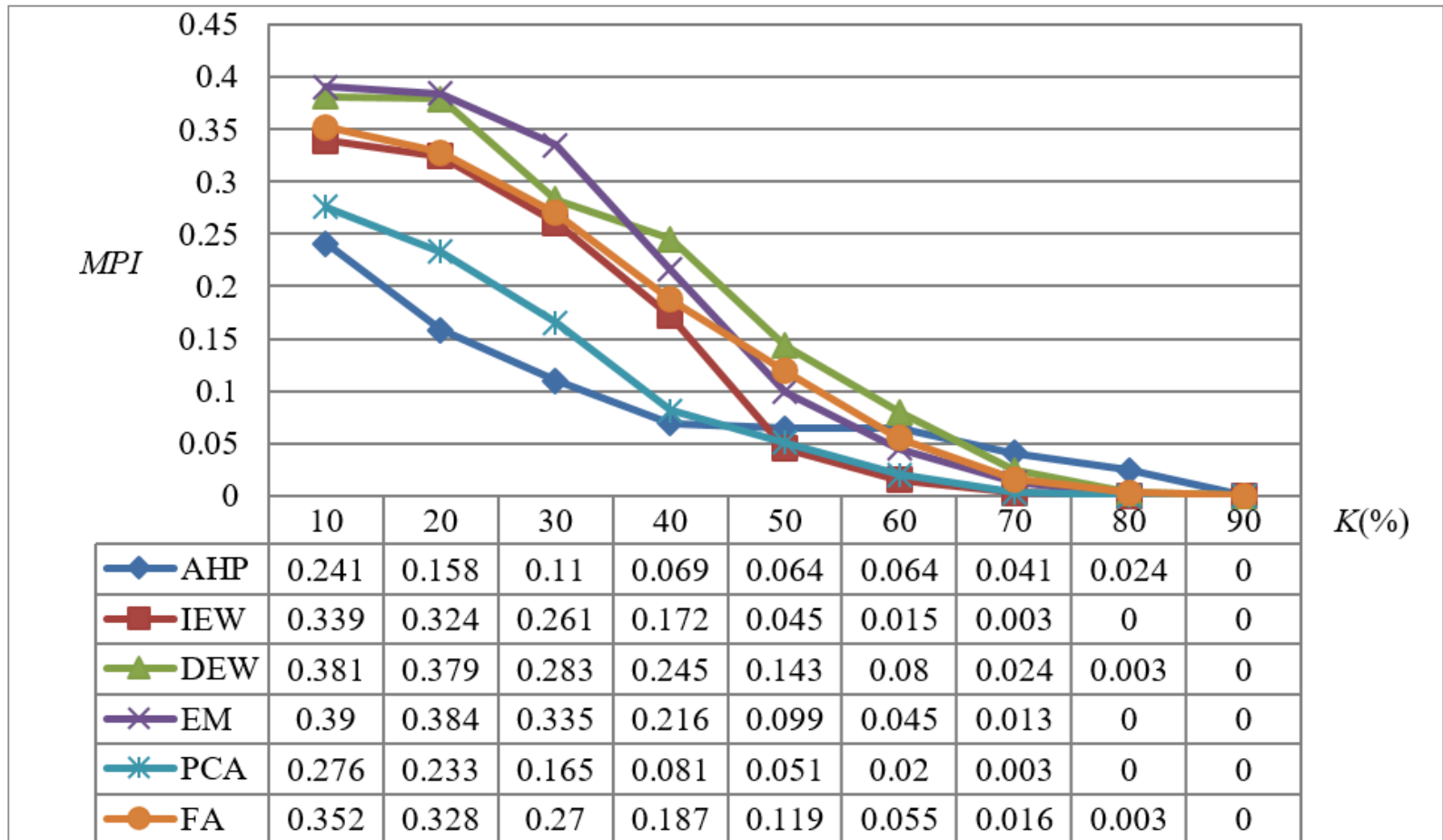    - the factor analysis (FA)

# 3. Study area and data collection



Gansu Province, China

- The data used in this paper are from the interview survey conducted by the authors in July-August of 2016.

- The stratified random sampling methods have been adopted to select samples.

- In total, 559 household heads were interviewed which make up the sample of this study.

# 4. Results



| | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|---|---|---|---|---|---|---|---|---|---|
| AHP | 0.241 | 0.158 | 0.11 | 0.069 | 0.064 | 0.064 | 0.041 | 0.024 | 0 |
| IEW | 0.339 | 0.324 | 0.261 | 0.172 | 0.045 | 0.015 | 0.003 | 0 | 0 |
| DEW | 0.381 | 0.379 | 0.283 | 0.245 | 0.143 | 0.08 | 0.024 | 0.003 | 0 |
| EM | 0.39 | 0.384 | 0.335 | 0.216 | 0.099 | 0.045 | 0.013 | 0 | 0 |
| PCA | 0.276 | 0.233 | 0.165 | 0.081 | 0.051 | 0.02 | 0.003 | 0 | 0 |
| FA | 0.352 | 0.328 | 0.27 | 0.187 | 0.119 | 0.055 | 0.016 | 0.003 | 0 |

$K(\%)$

***MPI* calculated by six weighting methods**

## Contribution of each indicator to *MPI* when *K=30%*

| Dimensions | Indicators | AHP | IEW | DEW | EM | PCA | FA | Mean | Ranking of Mean |
|---|---|---|---|---|---|---|---|---|---|
| Health | $x_1$ | 0.173 | 0.069 | 0.128 | 0.053 | 0.137 | 0.131 | 0.115 | 4 |
| | $x_2$ | 0.053 | 0.122 | 0.265 | 0.124 | 0.264 | 0.121 | 0.158 | 2 |
| Education | $x_3$ | 0.195 | 0.2 | 0.333 | 0.241 | 0.044 | 0.287 | 0.217 | 1 |
| | $x_4$ | 0.388 | 0.027 | 0.05 | 0.017 | 0.015 | 0.038 | 0.089 | 5 |
| Living standards | $x_5$ | 0.008 | 0.095 | 0.038 | 0.09 | 0.052 | 0.113 | 0.066 | 7 |
| | $x_6$ | 0.028 | 0.033 | 0.012 | 0.022 | 0.111 | 0.025 | 0.039 | 10 |
| | $x_7$ | 0.04 | 0.192 | 0.078 | 0.233 | 0.164 | 0.093 | 0.133 | 3 |
| | $x_8$ | 0.041 | 0.051 | 0.021 | 0.04 | 0.084 | 0.001 | 0.040 | 9 |
| | $x_9$ | 0.042 | 0.085 | 0.028 | 0.077 | 0.015 | 0.072 | 0.053 | 8 |
| | $x_{10}$ | 0.006 | 0.019 | 0.007 | 0.012 | 0.038 | 0.009 | 0.015 | 11 |
| | $x_{11}$ | 0.023 | 0.098 | 0.036 | 0.087 | 0.062 | 0.103 | 0.068 | 6 |
| | $x_{12}$ | 0.002 | 0.011 | 0.004 | 0.005 | 0.014 | 0.008 | 0.007 | 12 |

# 5 Conclusions

- 1) Single indicator poverty: the adult family members with formal education ($x_3$), the home toilet type ($x_7$), and the labor availability ($x_2$) show a higher incidence of poverty.

- 2) Multidimensional poverty: many farm and herder households (FHH) in the Tibetan areas of the Gansu Province are facing multidimensional poverty but the proportion of extreme poverty is very small.

- 3) By contribution rate: the adult family members received formal education ($x_3$), the labor availability ($x_2$), the home toilet type ($x_7$), the self-health assessment ($x_1$), and the school-age children drop out ($x_4$) occupied the top five place.

Thanks for your attention!