

Introduction

India faces many risks from climate change and drought. Climatic change and drought adversely affect India's economy by declining agricultural production and purchasing power thereby increasing rural unemployment which ultimately affects household food security. A micro-level vulnerability analysis helps to identify the most vulnerable sections of the population of a particular region.

Objectives

- To quantify the climate change vulnerability of rural households that are prone to climate change (CC) and drought.
- To evaluate the food security situation of CC and drought affected households.
- To investigate the influence of adaptive capacity and exposure to CC and drought on food security of rural households.

Conceptual framework

- IPCC dimensions of climate change vulnerability.
- FAO dimensions of food security.

Study area



Figure 1. Map of the study area- Odisha

Materials and Methods

- Multilevel sampling process.
- Data from 157 drought affected households were collected during March – June 2015.
- Climate change vulnerability index (CVI).
- Polychoric factor analysis.
- Food security index (FSI).
- Multiple regression analysis.

Results

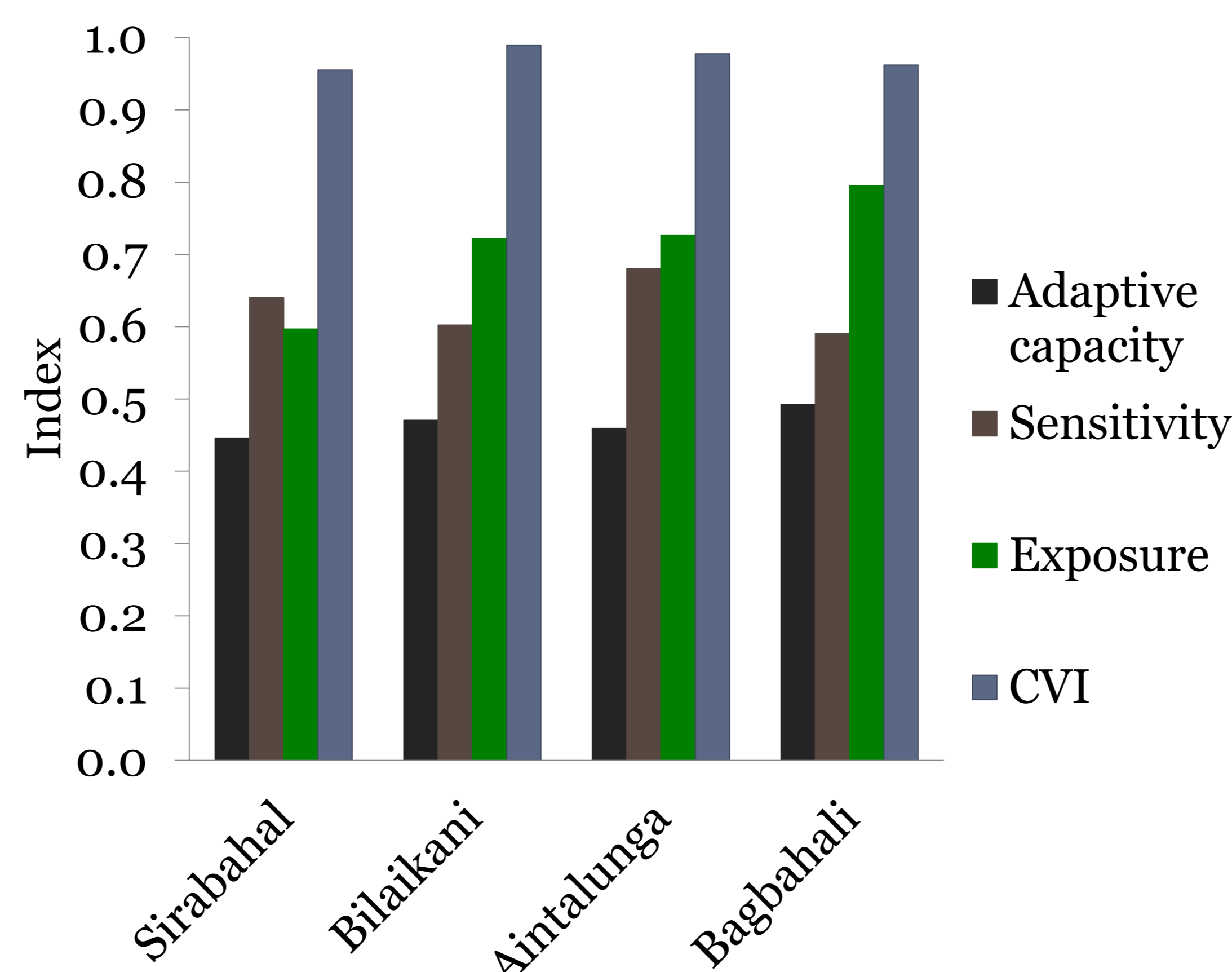


Figure 2. Index values of climate vulnerability dimensions & CVI of study villages

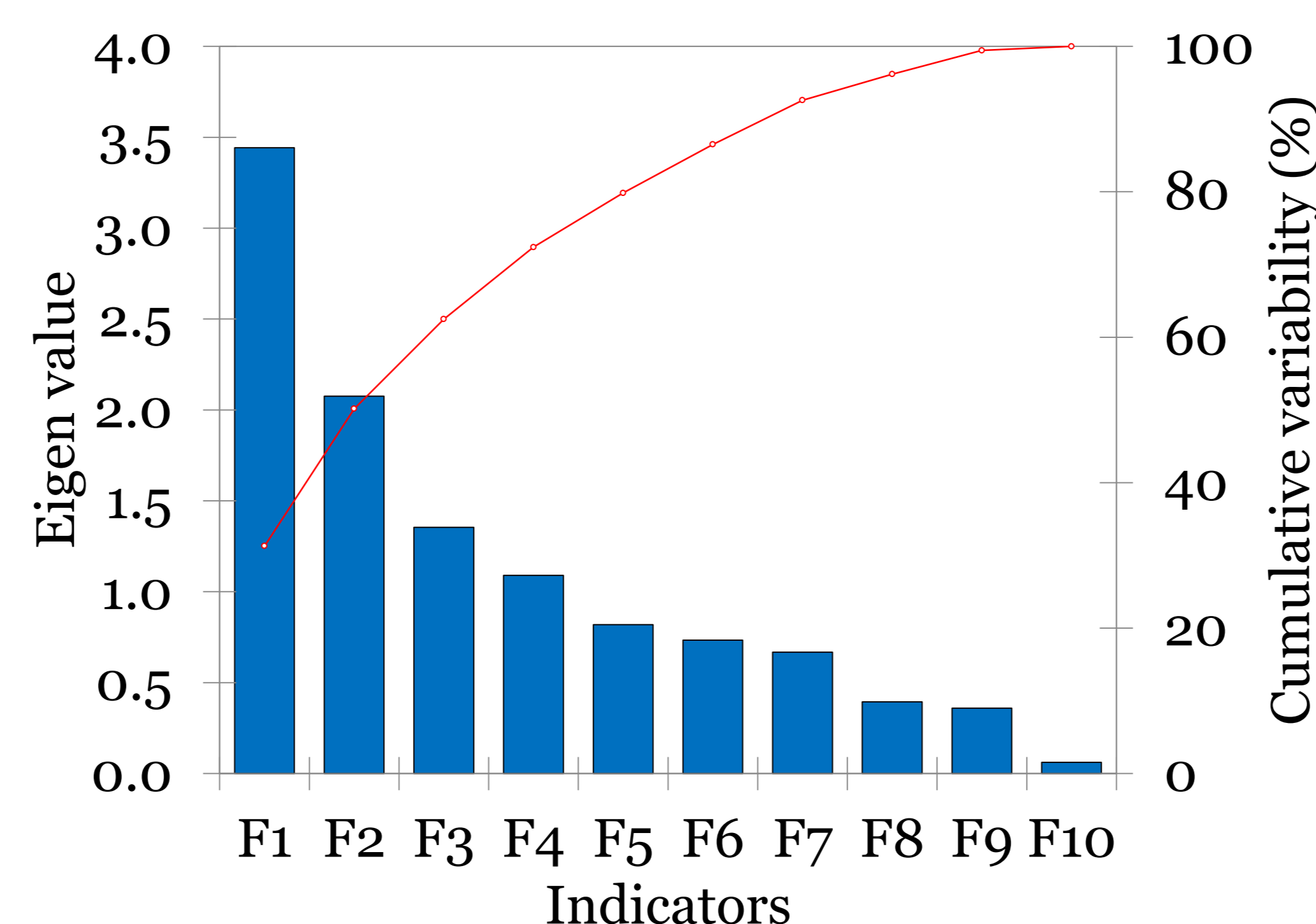


Figure 3. Screen plot of food security indicators

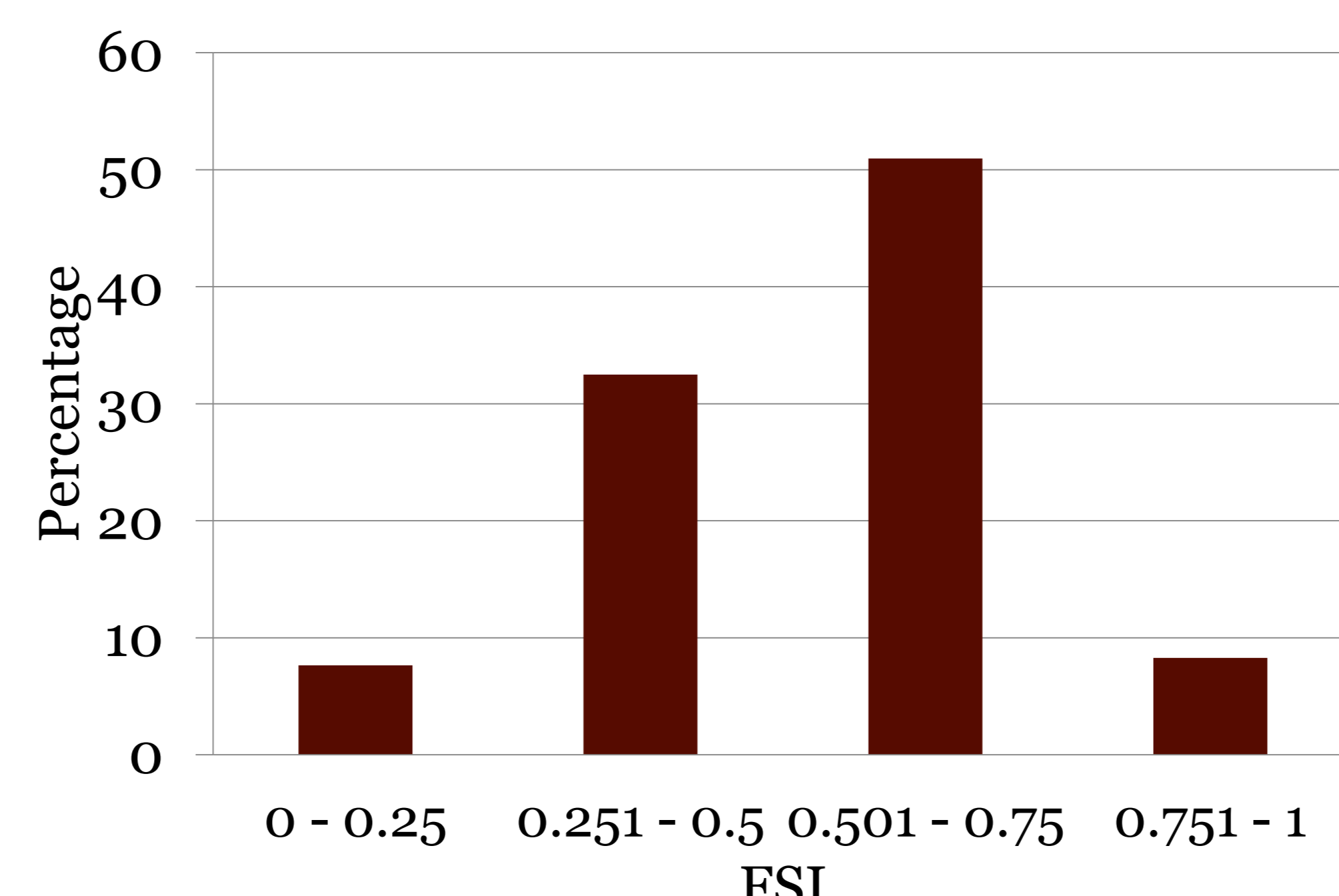


Figure 4. Distribution of respondents according to FSI

| Variables | Mean | SD | B | t |
|-----------------------------------|------|------|--------|-----------|
| (Constant) | | | 0.495 | 5.398*** |
| Family Type | 0.53 | 0.50 | 0.059 | 2.131** |
| Education of mother | 0.50 | 0.50 | 0.086 | 3.044*** |
| MGNREGA | 0.81 | 0.39 | -0.070 | -1.986** |
| Migration | 0.64 | 0.48 | 0.113 | 3.403*** |
| Durable assets | 2.02 | 1.01 | 0.030 | 2.033** |
| Housing structure | 0.37 | 0.48 | 0.063 | 2.047** |
| Health insurance | 0.08 | 0.27 | 0.111 | 2.105** |
| Climate variations on agriculture | 0.67 | 0.47 | -0.054 | -1.925* |
| Stress | 0.57 | 0.49 | -0.106 | -3.494*** |
| Unemployment | 0.51 | 0.50 | -0.084 | -2.478** |

***, **, * = 0.01, 0.05 and 0.1 significance levels, respectively

Table 1. Multiple regression estimates of the determinants of FSI.

Discussion

- Female-headed households are more vulnerable due to poor literacy rates and lack of networking ability among them.
- Agriculture is highly dependent on nature. A slight variation in climate adversely affects production.
- Migration is considered an ex-ante risk management strategy, but migration of Bagbahali villagers is distress migration.
- Most respondents were self-subsistence farmers, and crop loss/yield reduction has direct impact on food security.
- Social institutions, social networking and societal integration play significant role in improving food security.

Conclusions

- Diversification of livelihood: provide opportunities for at least one member of the household to earn an income outside of a natural resource-dependent activity.
- Local drought disaster management plans need to be developed in conjunction with local communities.
- The recommendations of this study will find applicability in other natural resource-dependent countries with similar socio-economic profiles.

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