Understanding the dynamics of household vulnerability to food insecurity: Evidence from rural India

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Identification of the poor for being eligible for food security programs always focus on calorie intake. However, no revision in the methodology was adopted given the change in dietary pattern of both rich and poor households. It was revised to a certain extent by the Rangarajan Committee by including the intake of other macro nutrients like proteins and fats in the computation of the poverty line. However, the inclusion of the consumption of vitamins, minerals etc is also required. A measure of diet diversity is the most appropriate in this context to capture the consumption of all nutrients. The diet diversity index also captures regional variation in consumption patterns, dependent on local availability, tastes and preferences, etc. Thus, if a household falls below the consumption of the recommended level or range then it will be a signal for policy makers to pay particular focus on households in that region. Focus of the public distribution program in India was to eliminate hunger, and it has been quite successfully implemented all across the country. We need to revamp food policy prescriptions to a more holistic one considering the change in demographics, taste and preferences over time. Food consumption is influenced by different factors like agricultural policies, location, trade, large agri-businesses, manufacturers and retailers, climatic changes, etc. There is confusion in food policy making in the country, and rather being driven by health motives is dependent more on short-term band-aid solutions. Policy makers in developing countries have overlooked this issue for a long time. In this paper we examine the resilience of households to food insecurity, its main determinants, and subsequent policy implications.

We provide an analysis of Indian households vulnerable to food insecurity from 2005 to 2012. We fill the gap in the literature by: (i) conceptualizing vulnerability to food insecurity based on the utility framework; (ii) provide its decomposition into poverty, aggregate, idiosyncratic and unexplained risk factors; (iii) address challenges faced in measuring vulnerability to food insecurity due to lack of household level panel data; (iv) provide an estimate of vulnerability at the state-region level, and identify different determinants; (v) analyze dietary diversity profile of vulnerable households; and (vi) identify policy implications of the same.

The extent of vulnerability is computed using the expected utility framework as in Ligon and Schechter (2003). The model assumes two situations with respect to the consumption profile of a household: (i) The risk-averse household is certain that expected consumption in period t+1 (where t denotes the current period) will be just below the threshold for deprivation, so that the

probability of vulnerability is one; and (ii) the expected mean value of consumption is unchanged. There is an equal probability that the household's consumption is just above the poverty line (above the mean), and just below the mean value. Since the household is risk averse it will prefer a certain level of consumption in the first case, though vulnerability is lower in the second case.

Key findings: Poverty is the main determining component of vulnerability for Indian households. Idiosyncratic risk also plays an important role; however, its effect is nullified by aggregate risk, which lowers the magnitude of household level vulnerability. This is supported by the fact that determinants of vulnerability and poverty are the same, and have opposite signs as that of aggregate risk. This implies that other than state-region or village or community level characteristics, household level shocks not captured by the model play a significant role in determining the level of vulnerability. Hence, the significant determinants of vulnerability are discussed. State-region level effects are adjusted for in the regression model.

Higher work participation rate leads to lowering of the level of risk faced by the household. With an increase in the price of staple food items like rice and wheat the probability of being vulnerable rises. Compared to those who do not have any fixed source of income in the rural sector, those who are self-employed in agriculture or non-agriculture, and laborers are better off with respect to terms of the level of food consumption expenditure. This is also reiterated by the fact that those in the higher income groups are better off than those with lower levels of income. Thus, livelihood and income are important determinants of the level of vulnerability and poverty. Female headed households are more susceptible to shocks than their male counterparts. Women in developing countries undertake vulnerable employment more than their male counterparts. With an increase in the level of urbanization in a state-region there is a reduction in the extent of vulnerability. Urbanization leads to more job opportunities, and helps households diversify their source of income.

As discussed in Ligon and Schechter (2004), estimates of vulnerability are robust as compared to estimates of poverty. Decomposition of vulnerability into its different risk factors will help policy makers to identify which component to lay greater emphasis on. This will facilitate to adopt cost-effective solutions. The best performing are the southern states of Karnataka, Tamil Nadu and Gujarat. Households in West Bengal, Rajasthan, and Madhya Pradesh are the most susceptible to shocks according to the estimates of vulnerability. More number of state-regions show improvement over time as evident from the pictorial representation. Overall, there is an improvement in the status of vulnerability of households. Poverty is a major risk component of vulnerability. Thus, it is expected that poor households will exhibit a similar food security profile (as measured by dietary diversity) as that of the vulnerable households. Empirical evidence supports the same. One limitation of the above methodology is that households may adopt an income smoothing approach not due to risks faced, but by choice. This might happen in case the

household's income is not insured. In such a case income poverty is due to the uninsured component of risk (Ligon, 2010). This can be improved upon by using the methodology developed by Elbers and Gunning (2004). It is a stochastic dynamic model with simulation of household income under different situations. However, it would strictly require household level panel data.