COMPARISON OF RESULTS FROM TWO FOOD INSECURITY AND VULNERABILITY ASSESSMENT METHODOLOGIES

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Introduction

Identifying and classifying food insecure people are necessary for designing and implementing actions to improve their situation and reduce their number. In this study, comparison of results obtained from FIVIMS (Food Insecurity and Vulnerability Information Mapping System) and IPC (Integrated Humanitarian Phase Classification) was done to explain the potentials and drawbacks of each methods and improvements needed for better interventions.

Materials and Methods

Analysis on food insecurity and vulnerability was conducted in Galle, Matara and Hambantota districts in the southern province at divisional secretariat level, due to the unavailability of data at lower spatial units. The methodology outlined in the FIVIMS manual of operation was used for the analysis (FAO/FSAU, 2006). Major source of data was the Department of Census and Statistics (Census of Agriculture, 2002 and Census of Population and Housing, 2001). The crude birth rate, and crude death rate were calculated using the data from the office of Registrar General for births and deaths. The road length, as an indicator of food accessibility, was taken from the southern provincial Road Development Authority. All the indicators collected were classified into four categories as food availability, accessibility, other related variables, and health status, as given below.

(a) Food availability based on production
- Midyear population (V1)
- Number of Agriculture holdings (V2)
- Number of households involved in fishing (V3)
- Extent under paddy (V4)
- Extent under fruit crops (V5)
- Extent under other perennial crops (V6)
- Number of cattle and buffalo (V7)
- Number of Goat and swine (V8)
- Number of poultry (V9)
- Daily milk production (V10)

(b) Food accessibility and affordability
- Type C and Type D Road length (Km) (V1)
- Percentage household heads aged 5 years and over no schooling (V2)
- Percentage of household heads passed G.C.E.O/L (V3)
- Percentage of household heads passed G.C.E.A/L (V4)
- Employed percentage of population aged 10 years and over (V5)
- Unemployed percentage of population aged 10 years and over (V6)

(c) Variables on other related factors

Percentage housing units with safe drinking water (V5)
Percentage housing units with toilet facilities (V6)
Percentage housing units lighting by electricity (V7)
Percentage according to type of cooking fuel (V8)
Number of households with permanent housing units (V9)
Number of housing units with permanent materials for walls (V10)
Number of housing units with permanent materials for floor (V11)
Number of housing units with permanent materials for roof (V12)
Number of beds in hospitals (per 1000 population) (V13)

(d) Health and nutritional status
Infant mortality rate (V1)
Rate of low birth weight infants (V2)
Maternal death rate (V3)
Live birth rate (V4)
Percentage people with safe drinking water (V5)
Percentage housing units with toilet facilities (V6)
Prevalence of dysentery (V7)

Microsoft Excel and SPSS statistical software packages were used for data analysis. Correlation analysis was done to eliminate the highly correlated variables and factor analysis was used to reduce the total set of variables to a few independent factors.

FIVIMS method

Vulnerability index was calculated (Equation 1) for each category of indicators, separately. A composite index was calculated (Equation 2) by giving weights to the categorical indices.

$$a_i = \frac{\lambda_i}{\sum \lambda} \qquad \text{(Eq. 1)}$$

where,
a_i = Weight of the i^{th} Factor
a_i = Eigen value of i^{th} Factor

$$\text{OVI} = \sum a_i \left(X_j * F_{ij} * P \right) \qquad \text{(Eq. 2)}$$

where,
OVI = Overall Vulnerability Index
a_i = Weight of the i^{th} Factor
X_i = Rank value of the j^{th} Category of the Province
F_{ij} = i^{th} Factor loading of j^{th} Rank value of Category
P = Constant for separate categories

Based on the OVI, the ARC GIS software classified the area into five vulnerability classes using the FIVIMS method.

IPC method

The IPC method used the criteria described in famine magnitude scale of Howe and Devereux (FAO/FSAU, 2006). The Crude Mortality Rate (CMR) <0.2/10,000/day and wasting <2.3% was taken as a food security condition. The CMR >=0.2/10,000/ day, but <0.5/10,000/day or Wasting >=2.3% but <10% was regarded as a food insecurity condition. Depending on the levels of food insecurity, each DS division was given a score according to the IPC reference table. Accordingly, the area was classified into six basic vulnerability classes.

Results and Discussion

Maps representing level of food insecurity in each DS division in southern province were obtained. Relative vulnerability based on food production decreased from coastal belt towards the countryside. Food imports from the outside market and food exports to other DS divisions were ignored in FIVIMS method (De Silva, 2006).

According to the maps obtained, vulnerability to food security based on food accessibility and affordability revealed an increasing trend towards the countryside. It also revealed that educational qualifications were the governing factor of food affordability and purchasing power of people in the area. Food security based on other related variables depicted a similar trend. Vulnerability to food security based on health and Nutritional status showed a similar pattern with critically affected variables such as infant mortality rate and live birth rate. It indicated that improvements in health facilities are important to upgrade the food security condition in southern province.

Except the capital cities of Galle, Matara and Hambantota districts, all other areas were classified under the category of "food secure" depending on the crude mortality rate, using the IPC method. Accordingly, the spatial distribution of IPC criterion among three districts was found to be minimum. Major limitations associated with the IPC method used were the lack of data available at the lower administrative levels and not defining a specific data analysis procedure.

Conclusions

According to the maps representing the relative vulnerability to food insecurity, both FIVIMS and IPC methods can be applied to analyze the vulnerability levels. However, chosen IPC criterion cannot show a better spatial distribution as shown by the FIVIMS method.

Depending on the classification method used (IPC/FIVIMS) categorization results can vary for the same location. Computation of the categorical vulnerability index would assist in identifying the factors that contribute mostly, to the food insecurity.

References

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