Abstract

Food insecurity is the incapability of households/individuals to obtain enough, nutritious, and socially acceptable food to a healthy life. The problem is determined by the level of their exposure to hazards and their ability to cope with the changing of situation. In the 2000s, 2011 and 2015 estimated 15, 8.5 and 10.1million people of Ethiopia were highly threatened by drought respectively. The problem varies from one area to another depending upon the agroecology, topography, and availability of the natural resources. Complex sets of factors are responsible for food insecurity. i.e. high population pressure, land fragmentation, erratic rainfall, rugged topography, over cultivated land, deforestation, limited off-farm employment, and deteriorating socio-economic conditions. Climate change with inconsistency in rainfall and temperature increases the exposure of the people to food insecurity, poverty and health risks. Since agriculture is the most promising means of livelihood strategy, soil degradation also plays a key role by reducing the average agricultural outcome and increasing the farmer's exposure to food insecurity. Millions of tons of productive soil and nutrients depleted due to soil degradation especially from the highland part of the country where the study area is situated. This, in turn, cause for the decline of crop productivity and enforce farmers to affect other ecosystems in search of productive farmlands. To reduce the problem of food insecurity and achieve the goal of zero hunger in 2030, understanding the multidimensional nature (availability, utilization, access, and stability) of food insecurity is unquestionable. It cannot be evaluated and addressed using one or two drivers and an indicator. Therefore, this study proposed to evaluate the level and dynamics of food insecurity in Lake Tana sub-basin, Ethiopia by linking various drivers to capture the multidimensionality of the problem: household's socio-economic, physical and climatic drivers. HFIAS, DDS, and CSI will be employed to understand the level of farming household food insecurity conditions in various dimensions. To address the impact of climate change, and soil degradation on the wellbeing of households in the study area and identify exposed areas, Remote sensing plays a significant role. It suggests a series of returns like a fairly near real-time report, consistent data, and source of spatially explicit data together with ground truth to assess and monitor hazards. To accomplish the objective various type of time-series satellite images, meteorological data, household surveys, and soil samples will be used to address the problem. Different indices of drought (SPI and SMDI), non-parametric tests, model (Daily based Morgan Morgan Finney model) and statistical analysis will be used to assess the spatial and temporal aspect of drivers, to estimate the loss of soil, and understand the linkage between factors and evaluate their contribution to the household food insecurity in the study area. In that way, the study will contribute a lot to how to use different types of food security indicators to capture all the dimensions, drought index, model, and satellite images in the assessment of food insecurity. In addition, It will add significant value to food security literature in the country.

Key words: SPI, SMDI, DDI, HFIAS, CSI, Daily based Morgan Morgan Finney Mode