Despite the clear synergy between food security and politics, economic policy frameworks have not given adequate attention to the political economy of income diversification as a means of improving food security. To determine the drivers of rural income diversification for enhancing food security in Ghana, the study analyzed the income diversification activities of 500 rural households using cross-sectional data. Results from the Count index, Simpson’s diversification index (SDI), Tobit, Poisson and multiple linear regression, revealed that the long-term income diversification measure proxied by the Number of Economic Activities (NEA), undertaken by rural households ranged from 1 to 10. Moreover, using the short-term income diversification measure, the Simpson diversification index, averaged 79.6% with a range of 41% to 89%. The findings suggest that the average NEA required to improve food security in Northern region was 7. Although total expenditure on food increased with increasing SDIs, diversification beyond 89% led to a decline in food security. The relationship between income diversification and the age of respondents also resembled a U-shaped curve implying that age impacts negatively on income diversification opportunities in the initial stages. A possible explanation is that people below a certain age are predominately dependent on relatives for their economic livelihoods. However, once they reached a certain age or turning point, there was increasing income diversification. Technical education was found to be the most important variable affecting the Simpson Index with a standardised parameter value of 1.171, which was three times more influential in diversification than its nearest rival variable, formal education (0.330).