Summary/Synopsis: This project aimed to understand and predict the factors influencing underweight women (BMI < 18.5) aged 15 to 49, particularly in 11 priority countries as identified by USAID's Feed the Future initiative. Leveraging Python code, I processed the dataset and employed a random forest regressor, optimizing it with GridSearchCV to uncover critical features such as longitude, latitude, travel time to urban centers, and socio-economic indicators. Visual tools like SHAP values and bar charts were used to interpret feature importance. This analysis provides actionable insights to help guide public health policies and targeted interventions for malnutrition reduction and improved well-being of women in these regions.