



Data-driven insights for food security simulations

SETTING THE SCENE

Economic and climate shocks can devastate communities, creating widespread food insecurity. In response to these crises, the World Food Programme (WFP) is often one of the first to act. However, reliable on-the-ground data is not always available, especially in remote or conflict-affected areas, making it challenging to quantify needs accurately and allocate resources effectively. Operating in highly volatile contexts, WFP must also model scenarios likely to materialize soon, allowing us to anticipate and plan for various possible outcomes. That's why we developed the Shock

and Assistance Platform for Economic Simulations (SHAPES).

WHAT IS SHAPES?

SHAPES is WFP's analytical tool for predicting food security outcomes amid economic and climate shocks. It combines a **climate-impact model** that predicts how weather-related events (like drought or flooding) affect crop yields and agricultural income with a **household-impact model** that adjusts household income and expenditure based on scenario inputs, estimating price and income elasticities to assess changes in food consumption across categories.

USE

SHAPES supports early warning, anticipatory action, and informed decision-making, answering critical questions such as: **How many additional people will become food insecure after a shock?** and **What food security outcomes can be expected from different levels of assistance?**



SHAPES has been deployed in 9 countries where it has provided essential insights for WFP's field operations. It was used to:

- Assess food security impacts of funding constraints
- Inform IPC discussion
- Quantify the effects of drought on crop yields, prices, and farmer income
- Evaluate the spillover effects of WFP's assistance on local economies

HOW SHAPES WORKS

SHAPES combines multiple data sources - including baseline household surveys, market prices, assistance records, and satellite data - into a unified analysis, making it uniquely powerful for modeling complex, real-world scenarios. The tool operates in three phases:

Calibration:

 SHAPES first estimates key behavioral parameters using baseline household expenditure and local market price data. This initial calibration establishes the model's foundational framework.

Adjusted Baseline (Nowcasting):

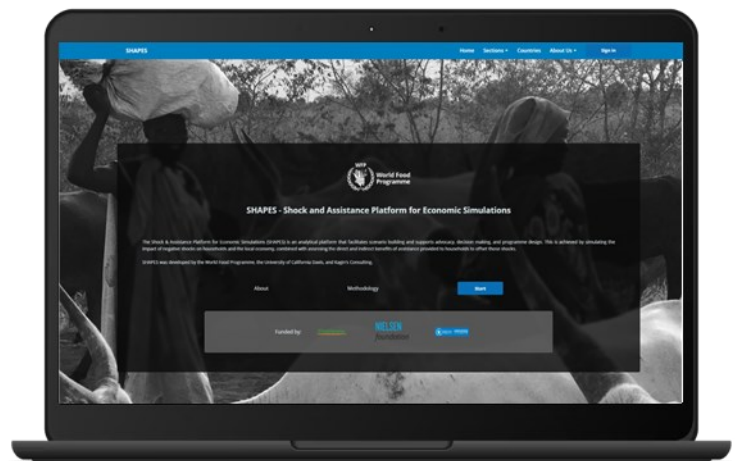
 With the calibrated model in place, SHAPES continuously updates the baseline by incorporating recent data - such as inflation rates, exchange rate changes, assistance records, and climate data. This phase provides a "nowcast" of the current food security situation through monthly

simulations, reflecting the latest information available.

Scenario Simulation:



Building on the adjusted baseline, SHAPES allows users to define potential future scenarios by inputting various economic and climate shocks alongside assistance measures, such as cash transfers or food distributions. This phase enables users to compare different scenarios and their projected impacts on household expenditures and, ultimately, food security, helping to identify the most effective response strategies.



ROLL OUT

Through a partnership with WFP's Innovation Accelerator and Google, SHAPES now operates on a streamlined, cloud-based data pipeline that enables automated data processing, reducing simulation setup time from months to days. We aim to scale SHAPES to all WFP operational countries and continue refining its models to enable WFP to base its responses on robust, timely analysis.

WE SEEK

- \$1,000,000 IN FUNDING OVER THE NEXT TWO YEARS
- TECHNICAL SUPPORT FROM DATA SCIENTISTS AND CLOUD DEVELOPERS

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