

# Food Security Early Warning System

**Published On:** 16 November 2016

**Organisation:** Office of the President, Republic of Indonesia

**Country:** Indonesia

**Level of government:** Central government

**Sector:** General public services

**Type:** Data, Digital, Methods

**Launched in:** 2016

**Overall development time:** 1 year(s)

**Like this innovation**

0 persons like this innovation

# Description

---

The Food Security Early Warning System is a multitier system that fuses satellite climate data (rainfall anomaly, and vegetation health index), crowdsourced food price data and household survey data to provide integrated visualisations of the extent of drought affected areas, impacts on market structure and pricing, and coping strategies and resilience of affected populations. The system is based within the Situation Room within the Office of the President of the Government of Indonesia.

Collecting data on rainfall anomalies and food security is not a new or unique activity for governments. But the Food Security Early Warning System is unique in that it collects this information in a higher resolution than is common within government and in a near real-time manner, through the use of remote sensing and crowdsourcing.

The system was originally developed in connection to the most recent occurrence of El Nino, but, in principle, it can be applied to any climate induced food security issue. The system's modular design also allows for easy integration of additional data sources and features. Analysing climate-induced migration from mobile network data is one example, as is the addition of SMS-based alerts for highly affected populations, such as farmers.

---

## Why the innovation was developed

- The Food Security Early Warning System was developed in order to understand the evolving nature of slow onset but medium impact phenomena like El Nino in near real-time, as well as to target better the assistance of the Government of Indonesia and the World Food Programme to high-risk populations.

---

## Objectives

Improve effectiveness, Improve efficiency, Improve service quality

---

## Main beneficiaries

Government bodies, Government staff, High-risk populations, Low-income groups

---

## Existing similar practices

### Africa RiskView

In other countries' public administrations  
African Union

By merging the traditional approaches of disaster relief and quantification with the concepts of risk pooling and risk transfer, ARC will help create a pan-African disaster response system that meets the needs of those affected in a timelier and more efficient way and provides an important step forward in creating a sustainable African-led strategy for managing extreme climate risks.

---

# Results

## Results not available yet

- The system has the potential to improve the targeting of assistance to climate-vulnerable populations, and thus to improve the efficiency and effectiveness of public assistance programmes. As the system is still in late-stage testing, it is not yet possible to verify these potentials, but fuller results will become available.

# Development

---

## Design

The idea was developed by staff within the World Food Programme and Pulse Lab Jakarta based on the potential for crowdsourcing food price data in Indonesia and the need for faster, better data on the impact of El Nino. The proof-of-concept project inspired the later conception, design and testing of the Food Security Early Warning System. Design time: 4 month(s)

---

## Testing

- The partners developed an initial experimental project, to verify the potential of crowdsourcing food price data (please refer to the attached documents). Based on the proof-of-concept the partners developed a prototype which compared opensource satellite data on rainfall anomalies with the crowdsourced food price data. The partners then targeted household surveys at the areas that the data suggested had been most affected by the drought and food price fluctuations. The data from the household surveys were then integrated into the system's data visualisation function, along with socioeconomic data and information on historical disasters, so that users could use the insights to target assistance at the most vulnerable communities. The system was recently integrated into the Office of the President of the Government of Indonesia, and is still undergoing testing, such as the 'ground truthing' of the crowdsourced food price data by civil servants.

Testing time: 8 month(s)

---

## Challenges and solutions

- A major challenge to the reliable crowdsourcing of food prices is GPS coordinate faking applications for smartphones. As citizenreporters are paid phone credit in return for the price reports, an incentive to fake reports exists. The project had to contend with this issue and to develop software to identify the use of these GPS faking apps and, by extension, false reports.
- 

## Partnerships

**World Food Programme Food and Agriculture Organisation; Premise; Pulse Lab Jakarta**

Academics and Research Bodies, Other Public Sector, Private sector

The partners contributed either sector expertise or technological expertise at each stage of the development and testing process. The blend of skills, knowledge and perspectives, was central to the success of the innovation as no partner had the capacity to deliver the project alone.

---

# Lessons Learned

---

## Lessons Learned

- Problems and solutions often come in pairs. It was not until the partners had learned from the initial proof of concept project, crowdsourcing food prices, that the Food Security Early Warning System was conceived in its current form. A linear model of design, testing and implementation does not sufficiently capture the emergent nature of this project. Patient capital and an enabling environment of research institutions is thus important for the exploration of problems and opportunities.
- 

## Conditions for success

- Political leadership is necessary for the integration and uptake of such systems within the public administration. Web development and data science skills are necessary throughout implementation. As well as resilience within the team, when early iterations of the prototype do not work as intended. Smartphone penetration within the targeted population is necessary for the crowdsourcing of food price information. Financial resources are required for much of the above.