



# **Addressing Climate Change and Food Security Linkages through Impact Assessments, Food Insecurity Vulnerability Analysis, Community-based Adaptation, and Improved Socio-Institutional Mechanisms: FAO's AMICAF Framework**



**Eulito U. Bautista, Ph.D.**  
National Project Manager (AMICAF)  
Food and Agriculture Organization of United Nations  
Manila, Philippines

# Introduction

AMICAF -- Assessments of Climate Change Impacts and Mapping of Vulnerability to Food Insecurity under Climate Change to Strengthen Household Food Security with Livelihoods' Adaptation Approaches





# Introduction

AMICAF is a comprehensive framework by the Food and Agriculture Organization (FAO) of the United Nations that aims to address climate change impacts and adaptation planning targeted at improving the food security of vulnerable household groups.

The AMICAF framework is currently being implemented as a project in the Philippines (in cooperation with the Department of Agriculture) and a Latin American country, with funding from the Japanese government.

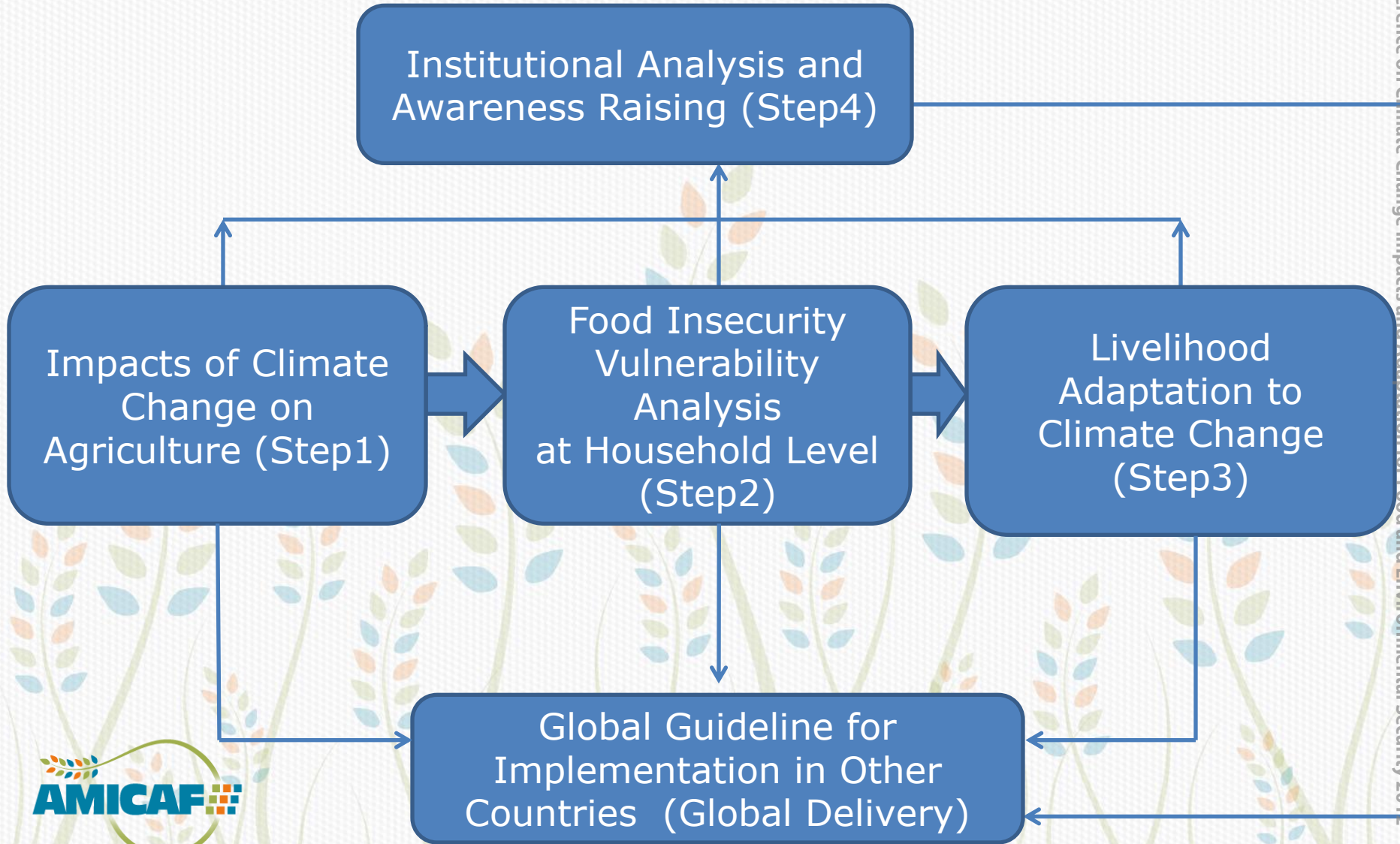


# Objectives

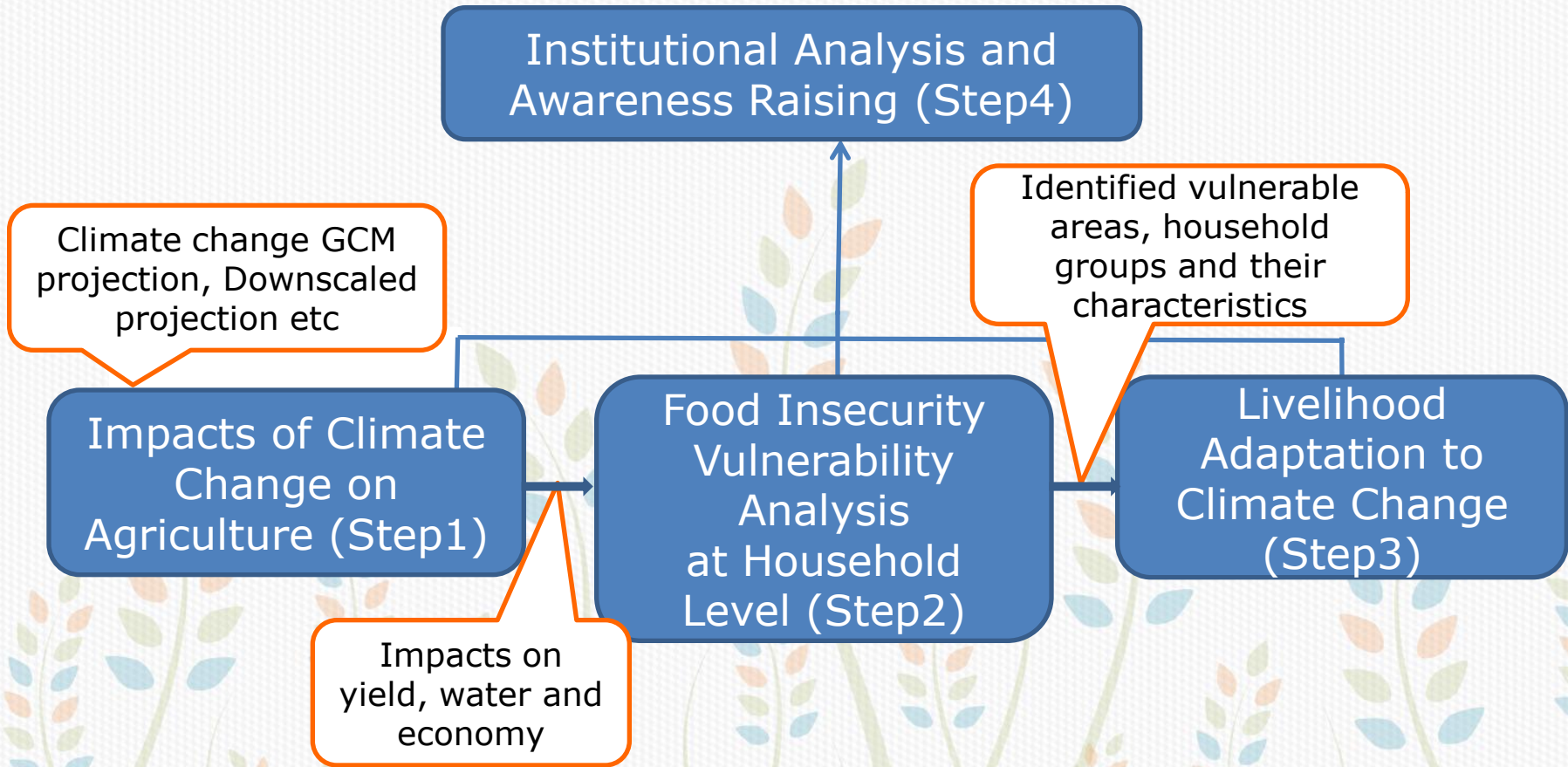
- To assist developing countries to address climate change assessment and adaptation, to improve food security through a comprehensive framework.
- This framework would bridge climate change impact assessment, food Insecurity vulnerability analysis and livelihood adaptation approaches.



# AMICAF Framework: Addressing the Linkage Between Climate Change and Food Security



# AMICAF Framework: Addressing the Linkage Between Climate Change and Food Security



Climate and Impacts/Vulnerability Information from Providers to Users





# Step 1: Impacts of climate change on agriculture

- MOSAICC – Modeling System for Agricultural Impacts of Climate Change
- Multiple impact models (Climate downscaling, Crops, Hydrology, Economy) in one package
- Software plus training
- Newly developed Partial Equilibrium Agricultural Market Model, named PAM (Provincial Agricultural Model), is used in addition to MOSAICC's climate downscaling, crop and hydrology modules.



# Step 1: Impacts of climate change on agriculture

MOSAICC has 4 components and uses several tools:

1. **CLIMATE** - facilitates the preparation of statistically downscaled climate data using an adaptation of a portal developed by the University of Cantabria in Santander with the EU ENSEMBLES project.
2. **HYDROLOGY** - estimates water resources under future climate conditions and uses **STREAM**, a grid-based precipitation run-off model, to simulate the discharge rate in large catchment areas.



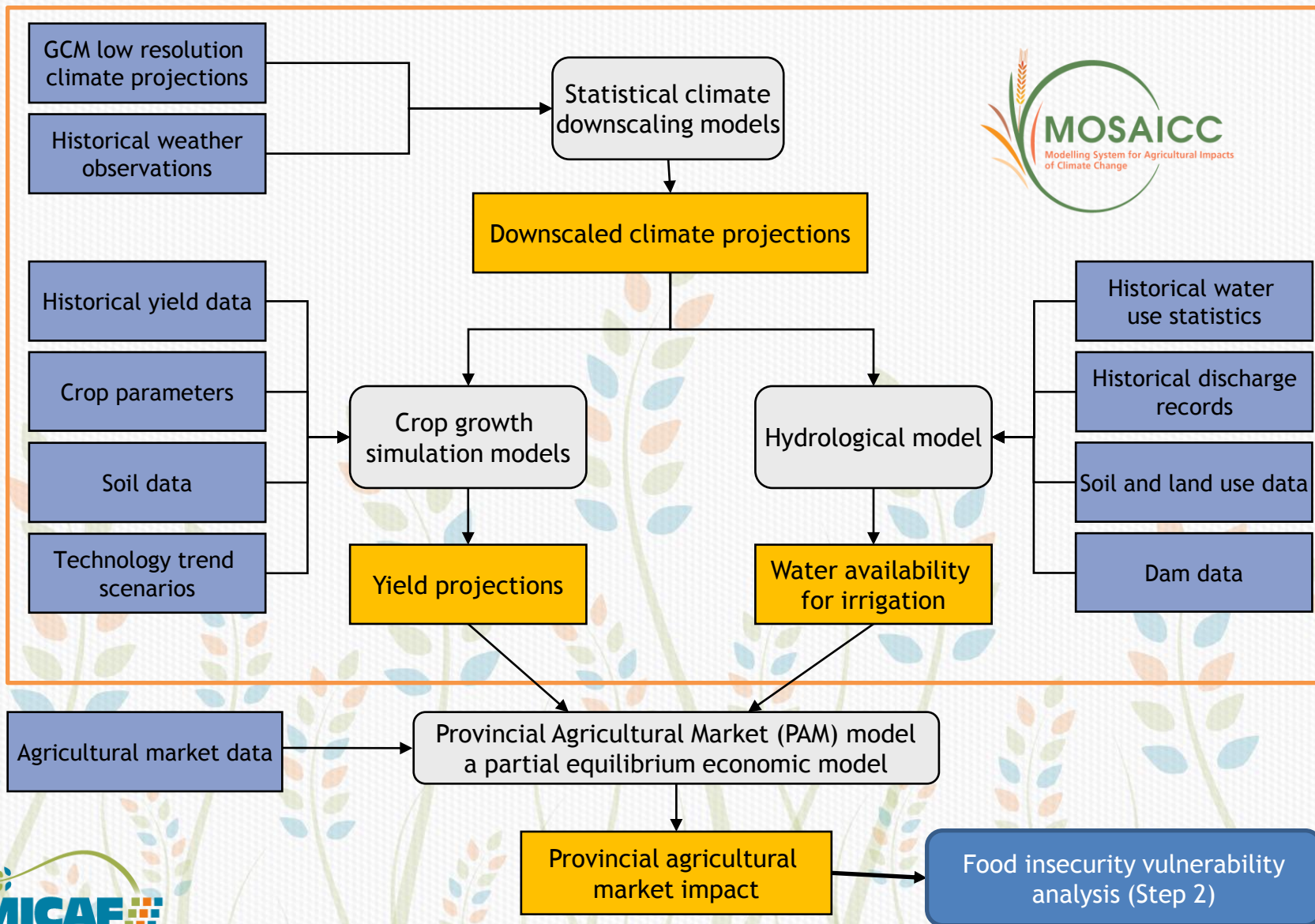


# Step 1: Impacts of climate change on agriculture

3. **CROPS** - simulates crop yields under future climate change and technological progress scenarios. It uses **WABAL** (crop specific water balance model), the industrial version of FAO's AgroMetShell.

4. **ECONOMY** - makes use of a Provincial Agricultural Market (PAM) Model to evaluate the economic impacts of future crop yields and water resources projections.

# MOSAICC with Agricultural Market Model





# MOSAICC v.0.1 customized for the Philippines, the server is hosted and maintained by DA-ITCAF



**User login**

**Username: \***

**Password: \***

- Create new account
- Request new password



Welcome to **FAO-MOSAICC** (for **MO**delling **S**ystem for **A**gricultural **I**mpacts of **C**limate **C**hange), the system of models designed to carry out each step of the impact assessment from climate scenarios downscaling to economic impact analysis at national level.

FAO-MOSAICC is being developed in the framework of the EC/FAO Programme on "**Linking information and decision making to improve food security**" (GCP/GLO/243/EC), theme 3 "Climate change and food security". More information on [www.foodsec.org](http://www.foodsec.org).

- The project manager and the expert users can take advantage of this system to carry on the following tasks:
- custom data management (upload, download, layout control and update)
  - custom module management (upload and update)
  - run the installed modules with the available data for multiple experiments
  - geo-processing
  - publish their experiments to be used from everybody



# Menu containing the different functions/tools of MOSAICC including the built-in spatial data interpolation tools (e.g. Kriging, AURELHY)



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS  
Working to build a world without hunger

**MOSAICC** PHI, v. 0.1  
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Home

Functions

Data

Tools

Documents

Study area

Climate downscaling

PET Hargreaves

PCA

Data Interpolation

PLD

WABAL

AQUACROP

STREAM calibration

STREAM simulations

roberto

My account

Log out

## CCI - User Functions

The FAO-MOSAICC User Interface is designed around a few concepts:

- A. Data Type
- B. Module
- C. User Function

Several Data Types are defined, but basically we can trace them back to some general types:

- Grid / Raster data
- Polygon-related Data
- Point-related Data

Those general data types define the different methods the modules work with them and then the concept of "**Work Mode**" has been defined.

One of the aims of FAO-MOSAICC is to create a proper user interface for each module, trying to generalize them in order to limit the number of interfaces to develop and maintain. The modules can easily be classified and the concept of "**Module Type**" has been defined. Some functions can be used in different modes, such as "Calibration" and "Simulation": the concept of "**Function Mode**" has been defined to handle those modes.

The concept of "**User Function**" combines the different ideas reported above and extends them to some functionalities of the system that don't require to run an external module. More precisely, the User Function provides a general method to provide the parameters to a module and allows to specify the following information:

- the work mode, i.e. main type of data the module will work on
- the function mode, i.e. the way a module works with the data
- the module parameters, that depend on the work and the function modes

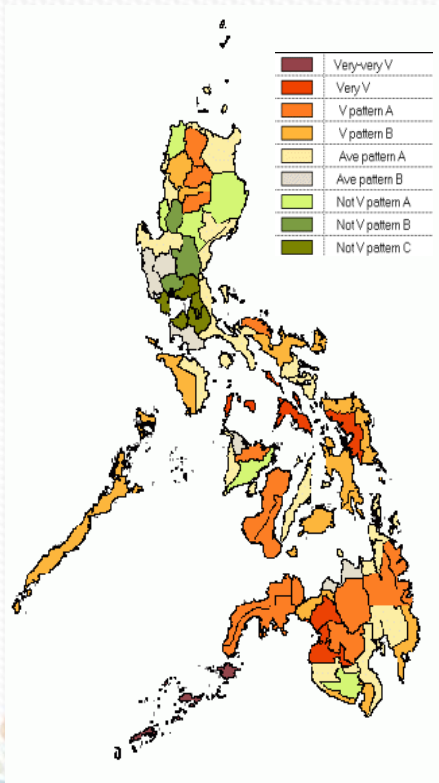




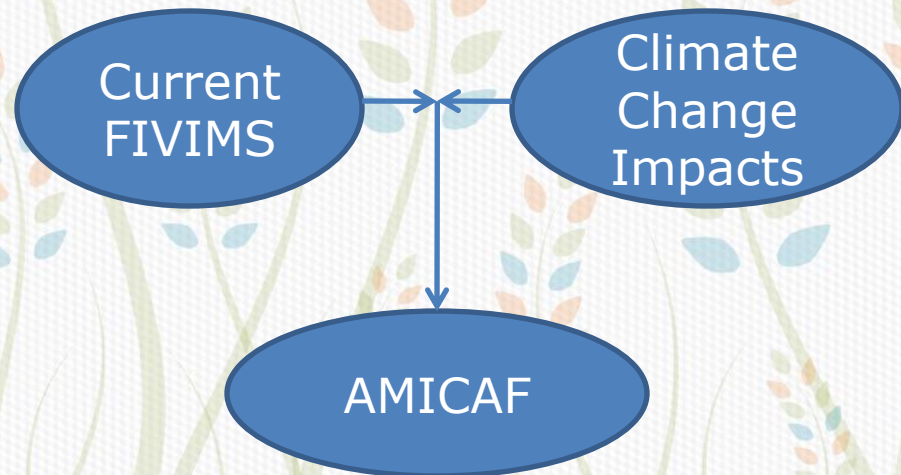
# Step 2: Food Insecurity Vulnerability Analysis

- Develops an analytical econometrics model with the best available national household datasets
- The choice of models heavily depends on data availability (a variety of socio-economic data at smaller administrative units, preferably geo-referenced)
- Characterizing vulnerability and identifying variables associated with highest levels of vulnerability

# Current FIVIMS (Food Insecurity and Vulnerability Information and Mapping System) in the Philippines



Step 2 will be built upon past work on analysis and mapping of food insecurity by incorporating climate change-related factors.



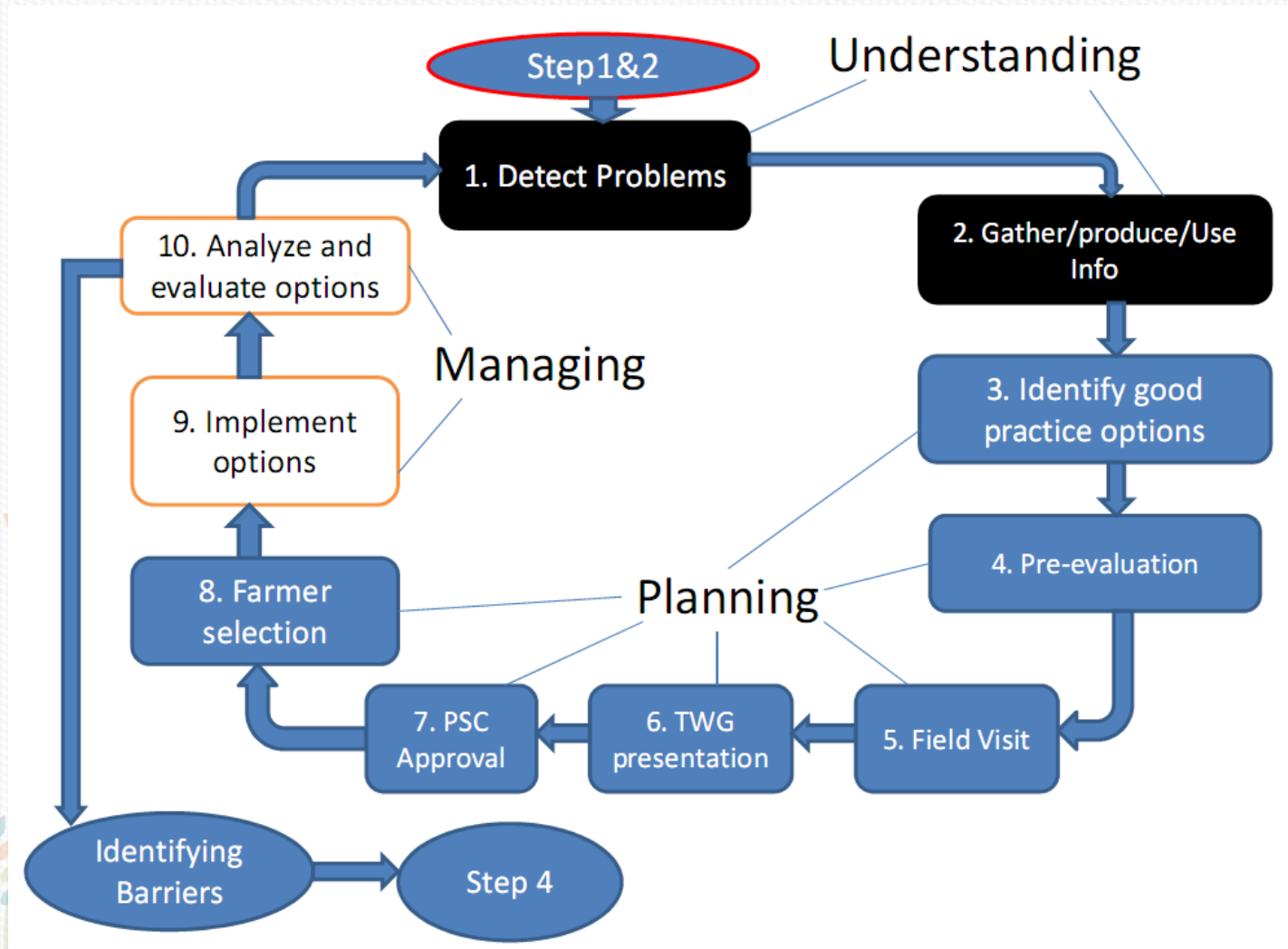


# Step 3 Livelihood Adaptation to Climate Change

- Community-based adaptation making best use of information from Steps 1 and 2
- Identification, validation, field-testing, and evaluation of good adaptation practices at local context through participatory processes and capacity development.
- In the Philippines, field-testing sites are Camarines Sur, Luzon Island and Surigao del Norte, Mindanao Island
  - Drought; Flooding and Saline Intrusion



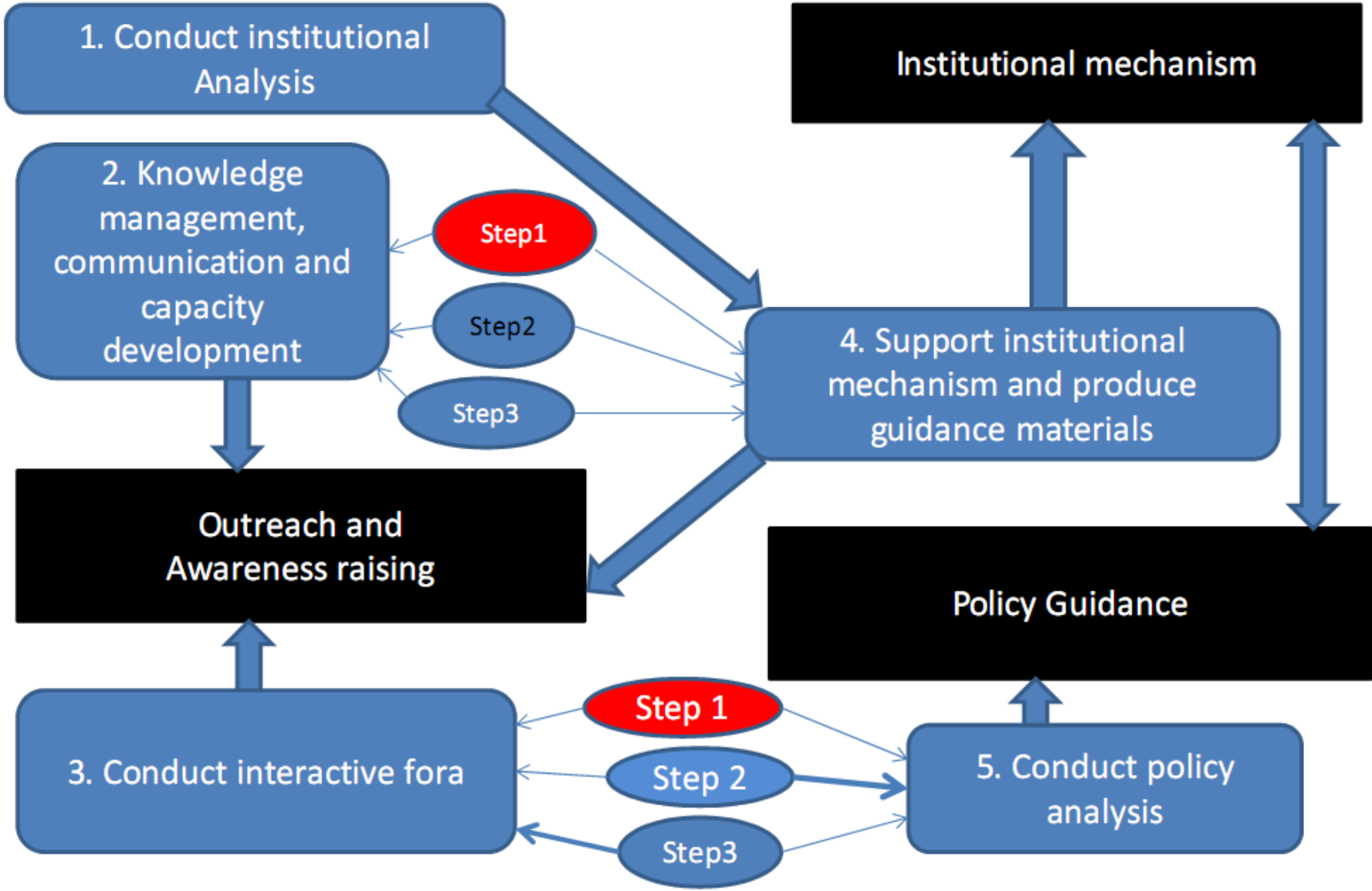
# Process of Adaptation (Step3)





# Step 4 Institutional analysis and awareness raising

- Institutional analysis
- Knowledge management, communication and capacity development
- Interactive fora
- Institutional mechanisms and production of guidance materials
- Policy analysis



# Activities and outputs of Step 4





# Thank you

