



Strengthening Asia-Pacific
agricultural practices with

**Agro-
Ecological
Zonation**

Development of
PyAEZ
Python Package

FAO Regional Office for Asia-Pacific and the Asian Institute of Technology's Geoinformatics Center recently developed a modern tool for AEZ implementation. The resulting Python Package tool for AEZ (PyAEZ) provides a standard framework for land resource inventory and appraisal adhering to the established FAO Land Evaluation Framework. PyAEZ's underlying algorithm uses numerous data inputs in simulated crop cycles to assess suitability and productivity of selected crops, and additionally estimates maximum yield under particular climate, soil, and terrain conditions.

What is **Agro-ecological Zonation**?

AEZ facilitates the realization of land suitability maps which aid in understanding of:

- ☀ How land with varying potentials and constraints are distributed in countries ?
- ☀ Matching Crop recommendations based on land type and location
- ☀ How potential yields vary by location
- ☀ Finding Balance between land availability and population demand



Data

- Climate Data
- Soil Data
- Terrain Data
- Soil Parameters



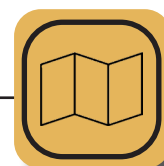
Model

- Crop Simulation
- Biomass Calculation
- ETo Calculation
- Crop water Requirement Calculation
- Thermal Screening



Constraints

- Climate Constraints
- Soil Constraints
- Terrain Constraints



Results

- Thermal Climate
- Thermal Zone
- Temp Profiles
- Multi-crop Zone
- Growth Period
- Yield Estimates
- Suitability Classes



Core modules:

In the PyAEZ tool package, empirical and deterministic models included:

- ☀ Calculate total biomass (A.H. Kassam, 1977)
- ☀ Calculate crop yield (with Harvest Index)
- ☀ Calculate effects of water limitations on rice yield (with ET calculations, water balance calculations, and Crop water requirement)
- ☀ Thermal screening – apply reduction factors or get rid of area / crop cycles based on temperature profiles

Additional modules:

- ☀ Evaluate the effects of Pest and Diseases/ Workability etc. (Climatic Constraints)
- ☀ Evaluate the effects of Soil based on Soil Qualities (Soil Constraints)
- ☀ Evaluate the effects of Terrain based on slope and FI (Terrain Constraints)
- ☀ Climate profiles such as Thermal Climate, Thermal Zone, Length of Growing period, and Multiple Cropping Zone.

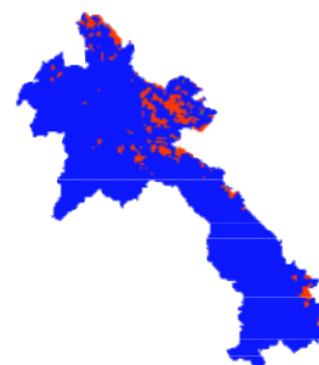
Intermediate Outputs

Thermal Climate



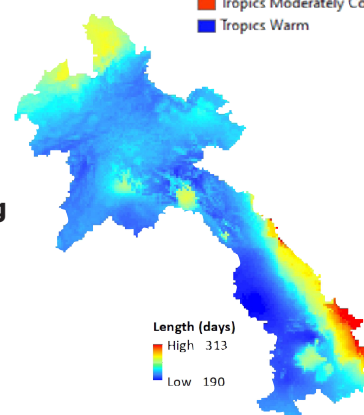
■ Subtropics Summer Rainfall
■ Tropical highland
■ Tropical lowland

Thermal Zone



■ SubTropic Moderately Cool
■ SubTropic Warm
■ Tropics Moderately Cool
■ Tropics Warm

Length of Growing Period



Length (days)
High : 313
Low : 190

PyAEZ Generated Sample result maps of rice for Lao PDR

