



Adaptation to climate change and food security

Agro-ecological zoning in support to agro-climatic monitoring and anticipatory land-use and land policies

Context

Lao People's Democratic Republic is one of the fastest growing economies in East Asia and the Pacific, and agriculture is the most important sector in the national economy and agricultural households constitute 76 percent of the total population. However, food self-sufficiency is highly uncertain and food insecurity is expected to increase due to extreme climate events such as droughts and floods as highlighted by the National Adaptation Programme of Action.

The Agricultural Development Strategy (2011 – 2020) provides a framework to promote market-integrated Agriculture and Natural Resources sectoral growth, while ensuring benefits to the rural poor, especially in lowland rainfed and/or irrigated farming system, and the upland agriculture system. Therefore the SAMIS project¹ aims at strengthening the system of data collection and analysis at national and provincial level on all food-security-related issues and improving agrometeorological monitoring, analysis and land resources information management systems and land suitability details to better inform the policy at national level and climate risk reduction at local level.

Actors and stakeholders

The Ministry of Natural Resources and Environment (MONRE), Department of Meteorology and Hydrology (DMH), Ministry of Agriculture and Forestry (MAF), Department of Planning and Cooperation (DOPC) work collaboratively to develop the national agro-ecological zoning platform, in close collaboration with provincial and local staff.



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Replicability and upscaling

Data sharing agreements have been defined to facilitate knowledge exchange and access multi-sectoral information required to address land use policies. Open-source applications have been developed in collaboration with national partners and national capacities enhanced to ensure national ownership and the sustainability of the agro-ecological zoning and land resource information system development processes.

Objectives

- Strengthen agro-climatic monitoring, analysis, communication and use of data and information for decision making in agriculture and food security.
- Strengthen institutional and technical capacity for monitoring and analysis of agriculture production Systems and development of Land Resources Information Management System (LRIMS) and Agro-Ecological Zoning (AEZ).
- Improve access to data and information in support of local applications for planning agricultural development actions.

Challenges

- Lack of climate information and services for farmers and planners.
- Limited capacities to take advantage of latest technologies on GIS, Remote Sensing and data analysis.
- Lack of bio-physical, and socio-economic data currently constrains vulnerability and impact assessments contributing to adaptation planning.

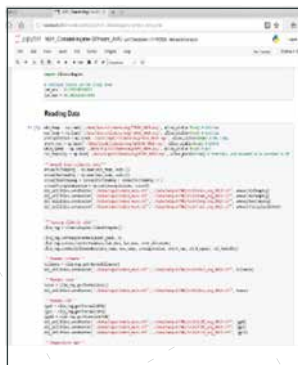
¹ Strengthening agro-climatic monitoring and information systems to improve adaptation to climate change and food security in Lao PDR (GCP/LAO/021/LDF)

Case study: Lao People's Democratic Republic

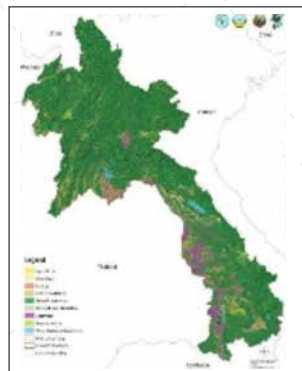
Impact

- Updated national geo-database on climate, land-use, soil and bio-physical conditions which will enhance the evaluation of the performance of the land respect to alternative uses, a multi-disciplinary geodatabase has been created with a number of layers generated by the project to cover, soil, climate, topography, land-use and farm practises in the country. These layers will be made available at shared through a dedicated web-portal.
- Innovative applications for agro-ecological zoning to ensure national ownership, replicability and sustainability, an open source application for national Agro-Ecological Zoning has been developed. It contains a series of libraries in the Python format and a set of Jupyter Notebooks and it is available through the GitHub data repository. Trainings on the principles and the use of the tools are organized to enhance national capacities in using agro-ecological zoning information.

Jupyter Notebook

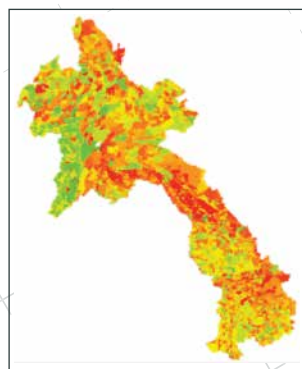


Agricultural crop-type of Lao People's Democratic Republic



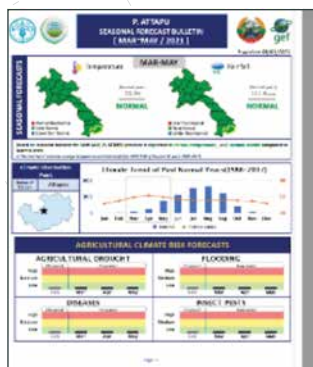
Source: SAMIS 2021 modified to comply with UN. 2020. Map of the World

Soil Ph in topsoil



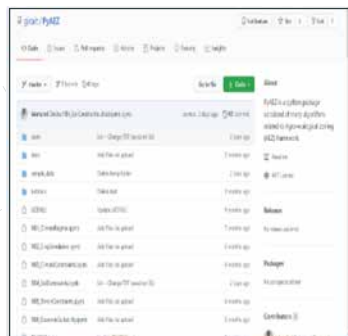
Source: SAMIS 2021 modified to comply with UN. 2020. Map of the World

Seasonal forecast bulletins



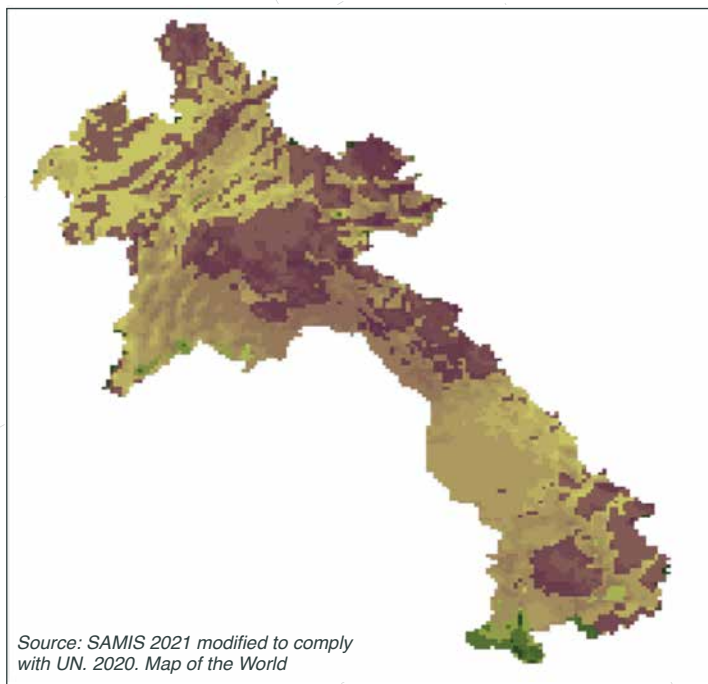
Source: Lao Climate Service for Agriculture (LACSA), 2021

GitHub code repository



- Updated information about crop productivity. While rice is the main resource for farmers in Lao People's Democratic Republic, national stakeholders are evaluating the suitability of alternative crops under historical and projected climate scenarios. Traditional and commercial varieties of maize, cassava, coffee and banana are being evaluated. The results will support the Government to anticipate the effects of climate change on main crops, to develop land policies that account climate and land information.

Agro-climatic productivity of maize – early variety, irrigated, high input level, historical.



Source: SAMIS 2021 modified to comply with UN. 2020. Map of the World

Related resources

SAMIS home-page

<http://www.fao.org/in-action/samis/ru/>

pyAEZ GitHub Code Repository

<https://github.com/gicait/PyAEZ>

Practical handbook for agricultural land cover mapping in the Lao People's Democratic Republic

<http://www.fao.org/publications/card/en/c/CA9960EN/>

FAO and IIASA.

Global Agro-Ecological Zones version 4 (GAEZ v4)

<http://www.fao.org/gaez/>

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