

WBI-Vietnam ULiège projects (Gembloux & Arlon)

Joost Wellens, Nguyen Thu Phuong, Bui Hai Nam

1 October 2025 | Gembloux



... 3 projet cycles

- 2019-2021, 2022-2024 & 2025-2027 -

LIÈGE université
Arlon Campus
Environnement

The University of Liège
Faculty of Sciences
Department of Environmental Science and Management

Population vulnerability to drought and other extreme
weather events in the context of climate change – a case
study in the Central Highlands of Vietnam

Nguyen Thi Thanh Thao

Thesis presented with a view to obtaining
of the degree of Doctor of Science
July 2022

Members of the jury :

President : Dr Célia Justo, ULiège, FS
Promotor: Prof. Bernard Tychon, ULiège
Co-promotor: Prof. Dao Nguyen Khoi, Vietnam National Univ
Lecteurs : Prof. Le Hung Anh, Univ. of Industry, HCM
Prof. Luong Van Viet, Univ. of Industry, HCM
Prof. Tran Van Ty, Can Tho Univ
Secretary: Dr Joost Wellens, ULiège, FS

Academic year 2021-2022

With the support of

- Support for the establishment of a **Drought Observatory**:
 - ULiège, SPW-DGARNE, Industrial University of Ho Chi Minh City (IUH) & Vietnam National University Ho Chi Minh City (VNU-HCM)
 - Dr Nguyen Thi Thanh Thao
- Analysis of Capacity Demand for Sustainable **Water Supply for Coffee** Plantations in the Central Highlands of Vietnam
 - ULiège, SPW-DGARNE, Vietnam National Institute of Agricultural Planning and Projection (NIAPP) of Ministry of Agriculture and Rural Développement (MARD)
 - M. Bui Hai Nam
 - Mme. Nguyen Thu Phuong
- A Water-Energy-Food Nexus approach for a sustainable intensification and **development of the (irrigated) coffee sector**:
 - ULiège, SPW-DGARNE, Vietnam National Institute of Agricultural Planning and Projection (NIAPP) of Ministry of Agriculture and Rural Développement (MARD)
 - M. Bui Hai Nam
 - Mme. Nguyen Thu Phuong



1 Common context

- sustainable water management for agriculture -



- Major challenges:
 - Climate change: droughts ↗ & water stress ↗
 - Agricultural yields ↘ & food security ↗
 - Competing water use(r)s: agriculture, energy, drinking water
 - Uneven water distribution
- Response = 2 complementary projects:
 - Drought Observatory
 - Water-Energy-Food Nexus approach



- agricultural small holders -

2 Water-Energy-Food Nexus

- key activities -



- 1) Modelling water resources allocations
 - Collection of multisectoral data
 - Farmers' surveys
 - Climate & hydrological data
 - Economic trade off among water allocations scenarios
 - Development of Water-Energy-Food Nexus index
- 2) Strengthening the (irrigated) coffee sector
 - Implementation of a decision-support tool: AquaCrop
 - Testing different irrigation scenarios (water savings)
 - Establishment of an irrigation advisory service
- 3) Remote sensing monitoring
 - Mapping the evolution of coffee plantations
 - Detecting areas under water stress
- 4) Capacity building

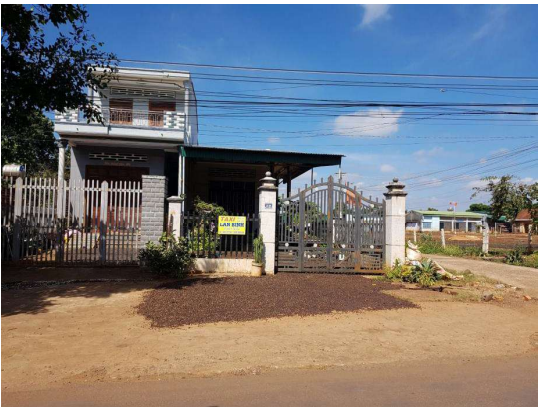
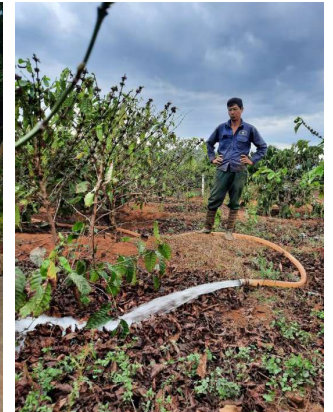
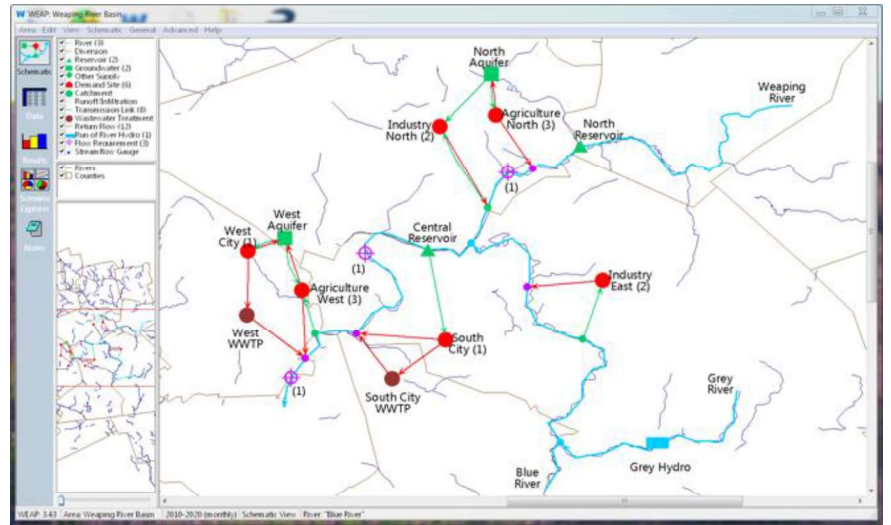
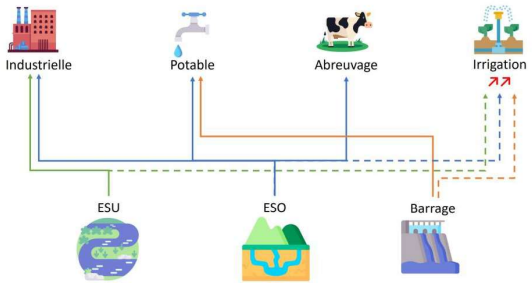


- water resources allocations between ≠ use(r)s -

2.i Modelling water resources allocations

- WEAP* -

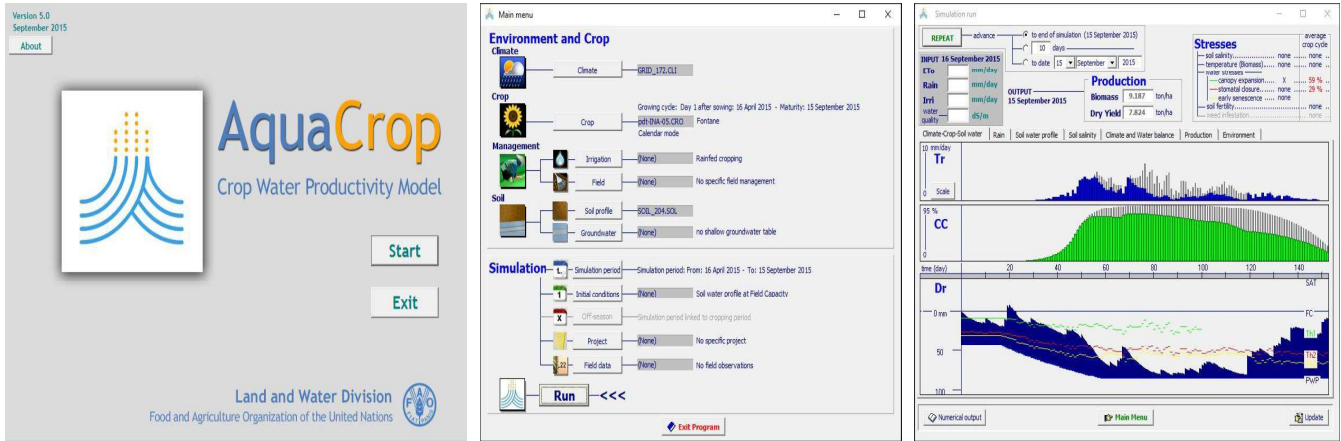
* Water Evaluation & Planning System



- intensification of (small holders) agriculture -

2.ii AquaCrop

- bridging the gap between farmer and modeler (?) -



- Parcel level
- Root vegetables
- Fruits & grains
- Leafy vegetables

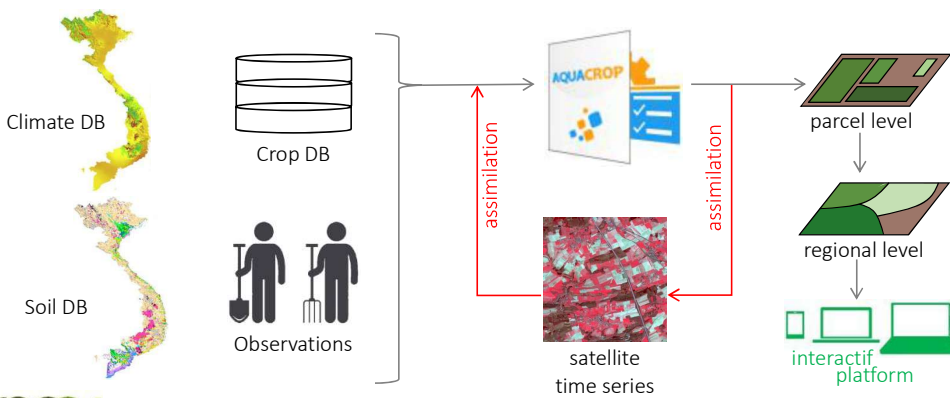
Impact: soil / plant / climate / management

↕
water demand & consumption

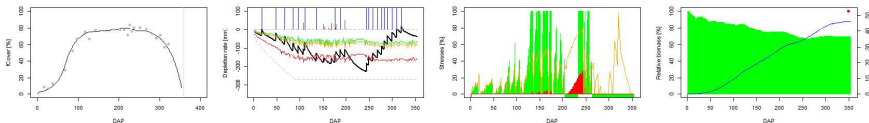


2.ii AquaCrop → PROCY

- towards a regional approach -



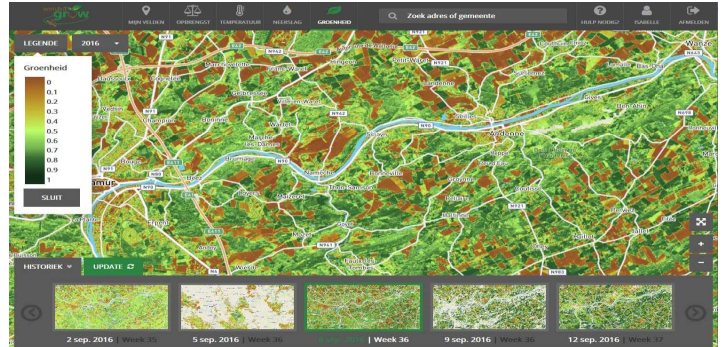
proccy processing chain dashboard
processing chain for parcel & regional crop yield modeling



With a support of:



2.iii AquaCrop → PROCY - applications -



- co-learning -

3.i Capacity building - AquaCrop training -



3.ii Capacity building - AquaCrop training -



Thank you!



Wallonie - Bruxelles
International.be



land &
water



LIÈGE université
Sciences et gestion
de l'environnement



LIÈGE université
Gembloux
Agro-Bio Tech