WaterPIP
Water Productivity Improvement in Practice

Overview of WaPOR based performance assessment in Cloud

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What is the Purpose of Performance Assessment

The ultimate purpose of performance assessment is to achieve an efficient and effective use of resources by providing relevant feedback to the scheme management at all levels.

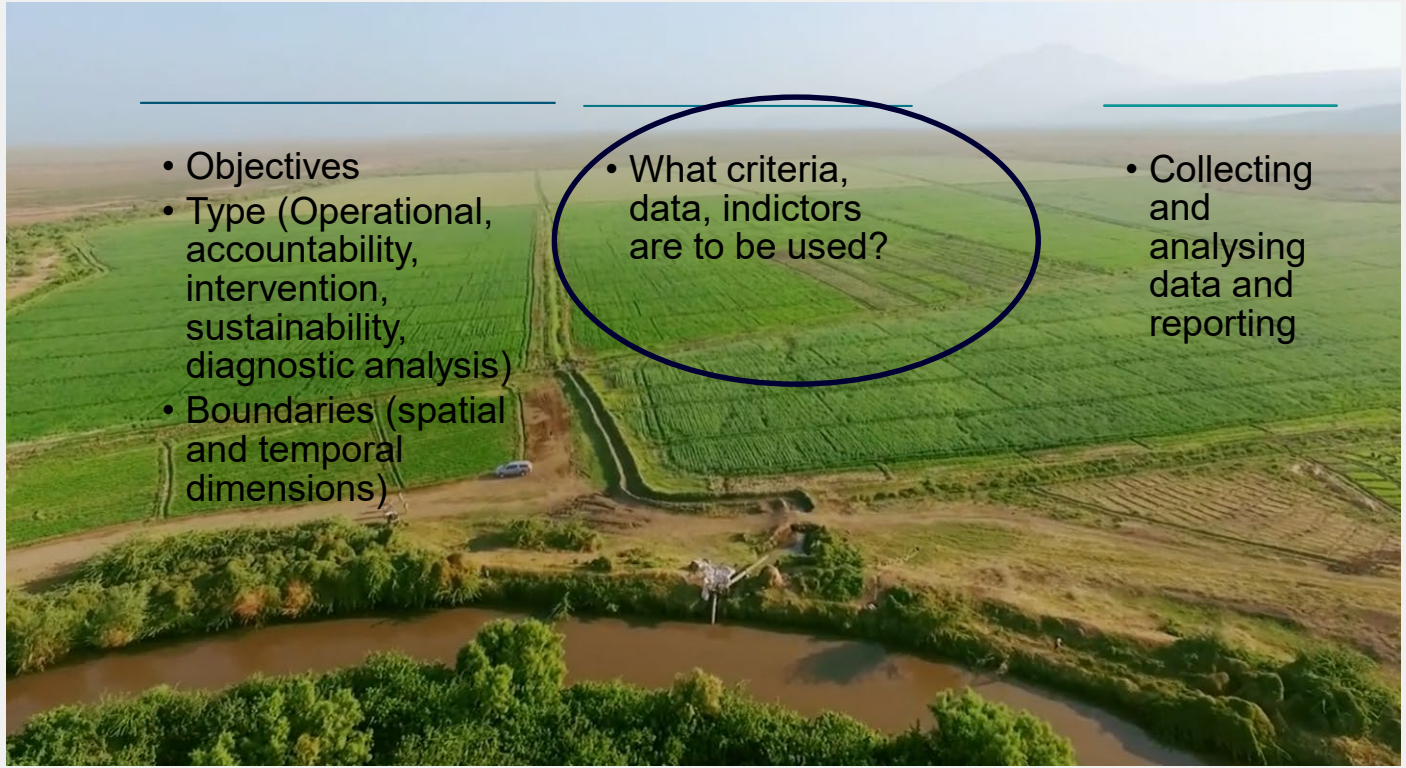
It helps to answer two questions (Murray-Rust and Snellen, 1993):

- **‘Am I doing things right?’,** a question that asks whether the intended level of service or operation that has been set (or agreed upon) is being achieved. This is the basis for good ***operational performance***.

- ‘**Am I doing the right thing?’,** a question that aims at finding out whether the wider objectives of irrigation and drainage are being fulfilled, and fulfilled efficiently. The latter is part of the process of ***assessment of strategic performance***.

Performance assessment

Purpose and Strategy → Design and plan the performance assessment → Implementation → Application of Output → Further action required?



- Objectives
- Type (Operational, accountability, intervention, sustainability, diagnostic analysis)
- Boundaries (spatial and temporal dimensions)

- What criteria, data, indictors are to be used?

- Collecting and analysing data and reporting

- Look for causes and provide corrective action for identified level of performance
- Make comparisons
- Continue with routine management

- If yes
- (i) Redefine strategic objectives and/or targets.
- (ii) Redefine operational objectives and/or targets

Protocol for WaPOR Based Performance Assessment

Data

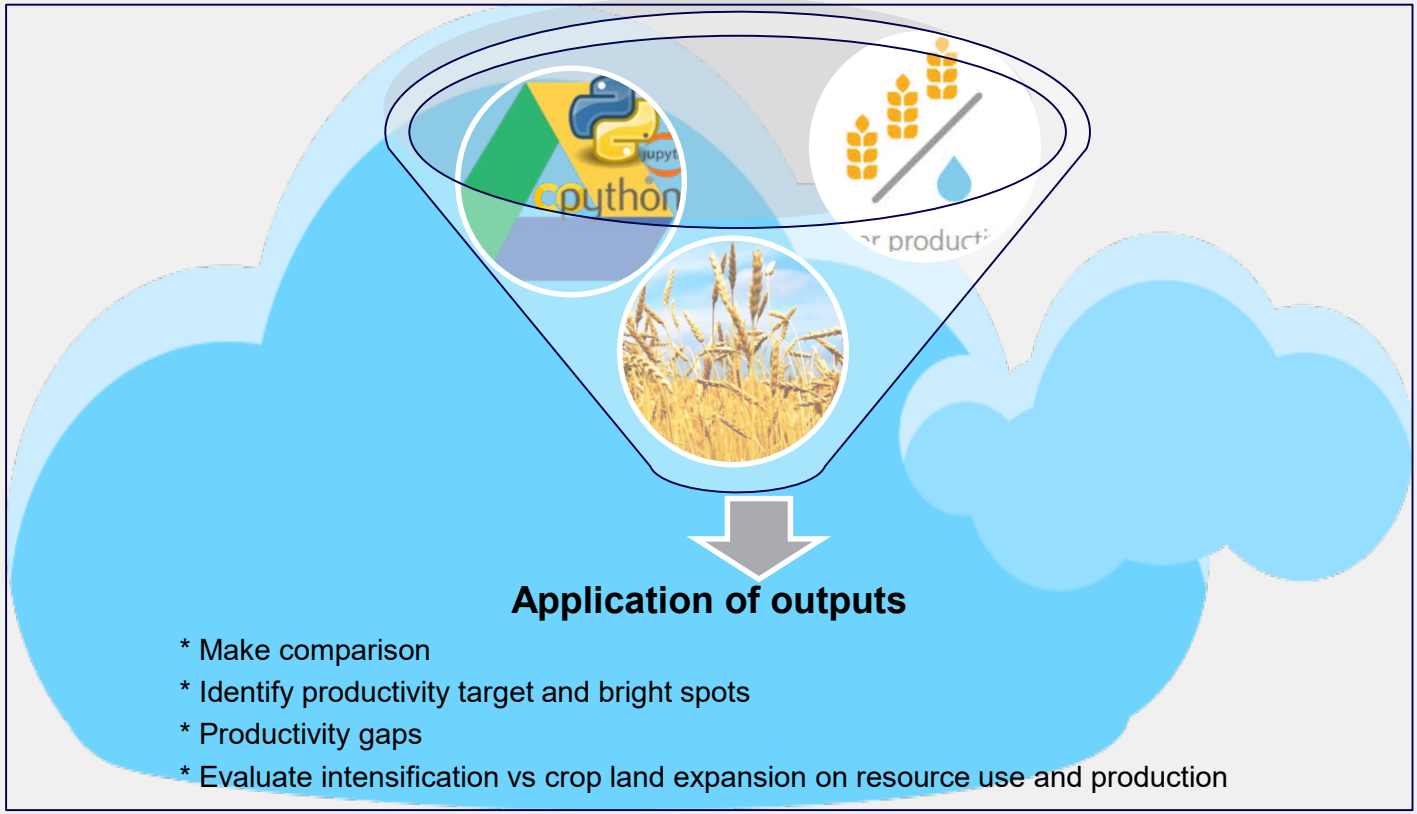
- WaPOR: E, T, ETref, NPP, PCP
- Field data: Yield, Cropping season
- Literature: kc, HI, AOT, θ

Performance Assessment Indicators

- Uniformity
- Equity
- Beneficial fraction
- Adequacy
- Land productivity
- Water productivity

Application of output

- Make comparisons
- Productivity target and bright spots
- Evaluate the land, water and production implication of intensification vs crop land expansion strategy
- Look for causes and provide corrective action for identified level of performance



WAPORWP: Standard protocol for the land and water productivity analyses

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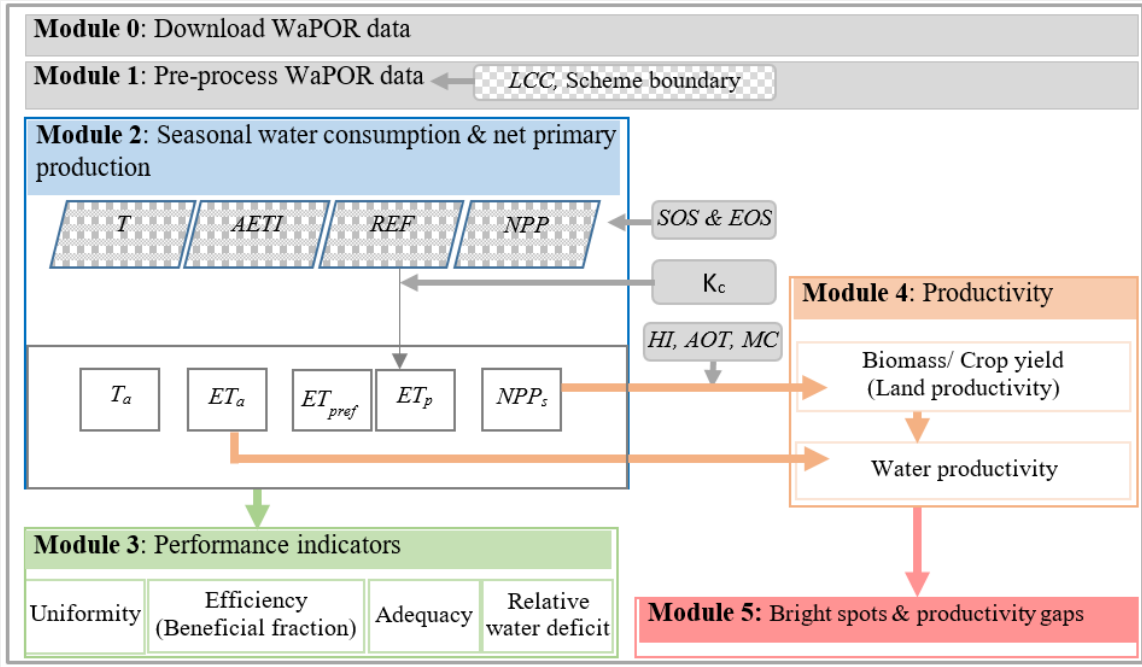
Standardized protocol for land and water productivity analyses using WaPOR

https://github.com/wateraccounting/WAPORWP

It provides Jupyter Notebooks in python which can be used to calculate land and water productivity and other performance indicators such as uniformity, efficiency (beneficial fraction), adequacy, relative water deficit as well as estimating productivity gaps at a project area.



Colab version of the WAPORWP

https://github.com/wateraccounting/WAPORWP

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Data	Module_0 tested 16 July 2021	3 months ago
Modules	Update WaPOR module: fix dekadal multiplier for LCC and PHE, cached c...	19 days ago
Notebooks	Module_0 tested 16 July 2021	3 months ago
ReadmeIMG	Readme updated	7 months ago
.gitignore	update WaPOR: catalog attribute error	6 months ago
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- WAPORWPColabVersion.zip

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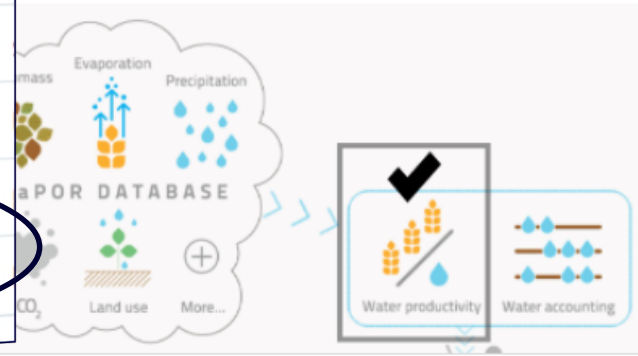
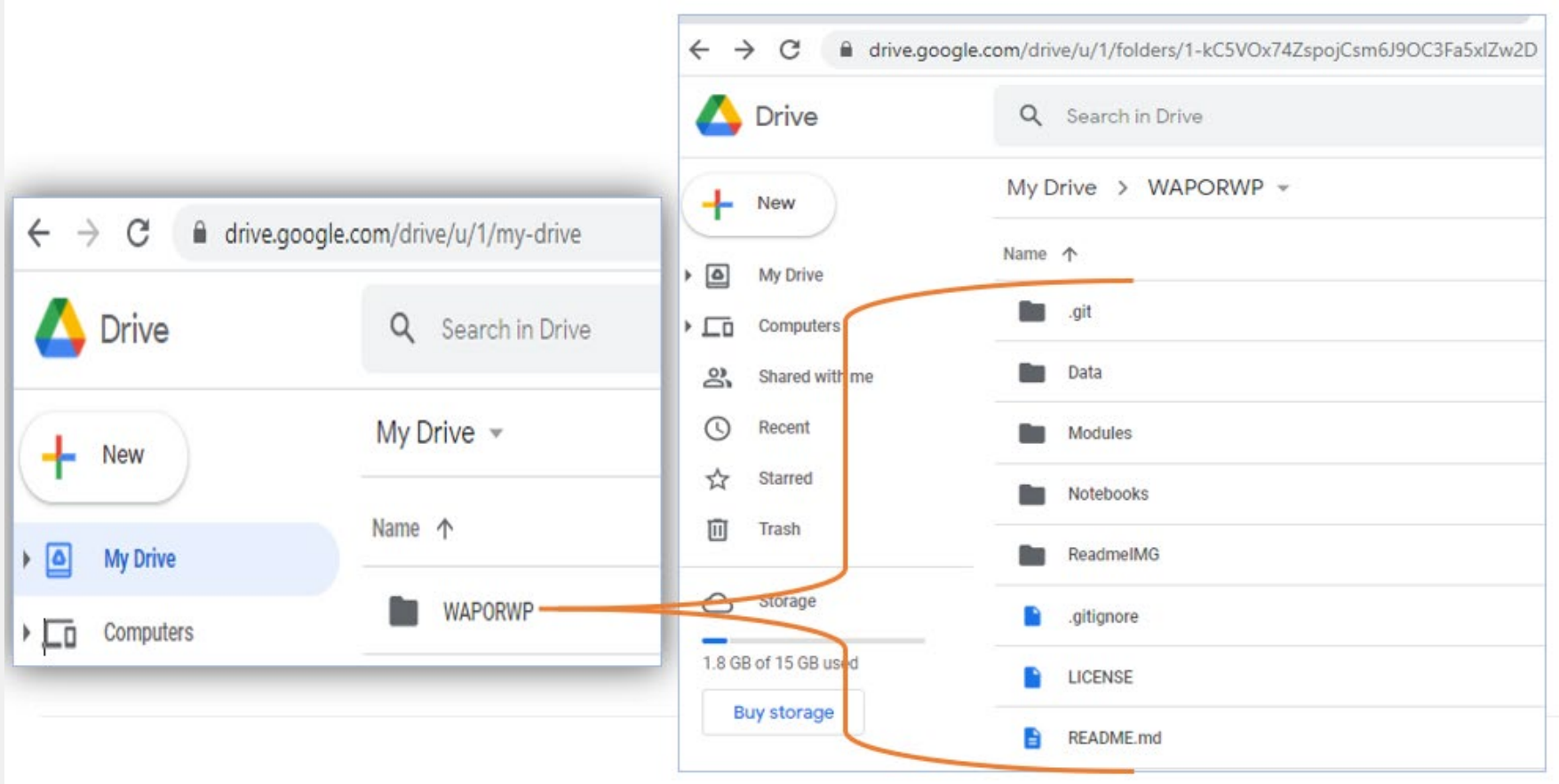


Why?/How?: colab version of the WAPORWP

It helps users to use free resource (Google's cloud computer) and avoid the hassle of installing Python dependencies (packages) on their local machine (PC or laptop). Users can run the colab version of WAPORWP in two steps:

Step 1: Load the colab version of the WAPORWP folder in your google drive (My Drive)

Step 2: Connect Google Colab with Google Drive and run the python scrips in cloud. (refer the readme for the colab version of WAPORWP).



Scope/limitation of WAPORWP

1. The protocol is tailored to biophysical productivity: water productivity with respect to consumed water use, and land productivity [biomass(B): yield=(HI?*B)].
2. The protocol is developed for agricultural areas with a single crop and same cropping season, which can vary between years.
3. Implementing the protocol beyond fields/ scheme level such as a river basin and country levels, which could fall in different agro-climatic zones, require normalization for climate variation – which is outside the scope of the protocol.
4. WaPOR data

A Framework for Irrigation Performance Assessment Using WaPOR data: The case of a Sugarcane Estate in Mozambique

monitor performance of irrigation schemes is vital to improve land and water...
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Abstract. The growing competition for the finite land and water resources and the need to feed an ever-growing population requires new techniques to monitor the performance of irrigation schemes and improve land and water productivity. Datasets from FAO's portal to monitor Water Productivity through Open access Remotely sensed derived data (WaPOR) is increasingly applied as a cost-effective means to support irrigation performance assessment and identifying possible pathways for improvement. This study presents a framework that applies WaPOR data to assess irrigation performance indicators including uniformity, equity, adequacy and land and water productivity differentiated by irrigation method (furrow, sprinkler and centre pivot) at the Xinavane sugarcane estate, Mozambique. The WaPOR data on water, land and climate is near-real-time and spatially distributed, with the finest spatial resolution in the area of 100 m. The WaPOR data were first validated agronomically by examining the biomass response to water, then the data was used to systematically analyse seasonal indicators for the period 2015 to 2018 on ~8,000 ha. The WaPOR based yield estimates were found to be comparable to the estate-measured yields with ±20 % difference, root mean square error of 19 ± 2.5 ton/ha and mean absolute error of 15 ± 1.6 ton/ha. A climate normalization factor that enables the spatial and temporal comparison of performance indicators are applied. The assessment highlights that in Xinavane no single irrigation method performs the best across all performance indicators. Centre pivot compared to sprinkler and furrow irrigation shows higher adequacy, equity, and land productivity, but lower water productivity. The three irrigation methods have excellent uniformity (~94 %) in the four seasons and acceptable adequacy for most periods of the season except in 2016, when a drought was observed. While this study is done for sugarcane in one irrigation scheme, the approach can be broadened to compare other crops across fields or irrigation schemes across Africa with diverse management units in the different agro-climatic zone within FaO WaPOR coverage. We conclude that the framework is useful for assessing irrigation performance using the WaPOR dataset.

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Water Productivity Improvement in Practice

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