



**Food and Agriculture
Organization of the
United Nations**



European Bank
for Reconstruction and Development

Combining Remote Sensing-Based Water Productivity Assessment with Economic Analysis

Concept note and Agenda
SEPTEMBER 3, 2025
Amman, Jordan

Background

With water becoming increasingly scarce and irrigated agriculture already accounting for 70 percent of global water withdrawals, governments around the world are supporting efforts to improve the performance of water use in agriculture. Improving water productivity is often the most important route for coping with increased water demand.

While the use of remote sensing to assess and monitor agricultural water productivity is not new, the time is ripe to scale up such technologies and use them for effective policymaking, especially in irrigated areas where water is scarce. The Food and Agriculture Organization of the United Nations (FAO) and its partners have invested in developing databases and tools that apply remote sensing in agricultural water management, with a focus on low-income and data-scarce contexts. FAO developed a tool: WaPOR – Water Productivity through Open Access of Remotely Sensed Derived Data. It establishes the methodological framework used to estimate key variables that can assist decision-making on improving irrigation water management.

Most efforts to improve agricultural water management focus on increasing yields per unit of water supply—crop water productivity—on the premise that this can contribute to increasing food production and ‘save’ water for other sectors and ecosystem services. However, there are indicators beyond yield that are paramount for informed decision-making. In high-value crops such as citrus, quality and unit product value may be as important as yield to understand the value that each drop of water is generating. Similar yields can produce very different values of production per hectare depending on quality and end market conditions. Likewise, different irrigation and agricultural practices may influence unit production costs. That is why economic irrigation water productivity (EIWP) is an important indicator for policymaking.

However, calculating EIWP involves dealing with yields and irrigation practices that vary from farm to farm and from year to year, as well as large numbers of farms. In such contexts, collecting accurate field data can be difficult and expensive using traditional methods that rely on theoretical models of irrigation requirements based on hydrological, plant growth, and water use parameters. In addition, such models do not estimate the actual water supply, nor its spatial and temporal variations.

Remote sensing tools offer a powerful and cost-effective alternative to estimate actual EIWP. FAO’s WaPOR portal is one such tool that provides new opportunities for these assessments, enhancing understanding of water consumption and improving agricultural water management.

The FAO Investment Centre and the European Bank for Reconstruction and Development (EBRD) have a long-established partnership, which leverages the strengths of both institutions in mobilizing public-



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private stakeholders for improved capacity and open dialogue. One such intervention aims to improve dialogue among stakeholders on the use of irrigation water, focusing on opportunities to improve its economic productivity—i.e., to increase the economic output per drop of water. The project will build on work undertaken under the FAO WaPOR project and, in particular, will use the open-access spatial data generated through remote sensing and the methodologies applied to estimate crop water consumption and land and water productivity in citrus plantations in the Northern Jordan Valley.

The overall objective of the study in Jordan is to support dialogue and reflection among stakeholders, contributing to decision-making on improved irrigation water management.

The project will collect and analyze remote sensing data on water consumption using FAO's WaPOR portal. The data will have a spatial resolution of 20 meters and a dekadal (10-day) temporal resolution. By assessing differences in water consumption over time and space, it will be possible to identify high- and low-consumption areas and evaluate their performance in terms of water productivity. In addition, economic data will be collected for key typologies of farming systems in the region. Once analyzed, this data should contribute to the formulation of policy options to improve water use efficiency.

The specific objective is to identify concrete opportunities for improving both water efficiency and farm profitability, and enable a better understanding of:

- Where water is being used most and least efficiently;
- What agronomic and market practices are contributing to high or low water productivity;
- How this knowledge can inform investment planning, sustainable water management, water policy reform, and support farmers to maximize the value of each drop of water.

The workshop aims to:

- Present the EBRD project and collaboration with WaPOR, including its objectives and relevance to economic water productivity in citrus systems in the North Jordan Valley.
- Discuss the use of high-resolution spatiotemporal data to analyze water consumption across farming systems and years and how it can inform water policy objectives such as sustainability, improved allocation, and maximizing economic output per unit of water.
- Present preliminary findings for the NJV, including spatial analysis of water use and evapotranspiration from WaPOR and early insights into variations in water consumption, as well as an evaluation of the main drivers of value addition and water consumption in citrus production.
- Identify possible efficiency improvements in existing citrus production systems and along the value chain, alongside regional best practices on policies and technical changes to reduce water use, increase citrus value, and enhance farm profitability.
- Identify stakeholder priorities and frame the main research and policy questions, as well identify related data needs and sources.
- Map institutional roles for national partners who could:
 - Support tool development and methodological institutionalization.
 - Provide data and feedback for policy recommendations.



**Workshop Agenda- September 3, 2025
Intercontinental Hotel, Amman**

Time	Subject	Speaker
8:30 - 9:00	Registration and Welcome Coffee	
9:00 – 9:30	Opening Remarks	Nabil Assaf, FAO Representative in Jordan Mohammad Al-Hiary, Secretary General, Ministry of Agriculture Erifyli Nomikou, Associate, Corporate Advisory, EBRD Mariska Lammers, First Secretary, Embassy of the Netherlands
9:30 – 9:40	Introduction to the EBRD project and the collaboration with WaPOR phase 2 project. <i>Objectives and activities</i>	Nina Coates, Agricultural Economist, FAO
9:40 - 10:00	WaPOR Phase 2 and High-Resolution Remote Sensing Tools for Water Productivity <i>Objectives and activities</i>	Jippe Hoogeveen, Senior Land and Water Officer, FAO
10:00-10:30	West Bank Case Study: WaPOR, Ground Data & EIWP Assessment <i>Lessons learned and relevance to Jordan; Added value for decision-makers</i>	Amer Sawalha, Date Palm Value Chain and Irrigation Expert, FAO Issam Nofal, WaPOR National Project Coordinator and Water Productivity Expert, FAO Steve Goss, Irrigation Policy Expert and Economist, FAO
10:30 -11:00	Coffee Break	
11:00-11:15	Initial findings on AETI in citrus crops in NJV using WaPOR <i>Understanding temporal and spatial variations of water consumption along the NJV</i>	Prof. Jawad Al-Bakri, University of Jordan Almutaz Mohammed, Remote Sensing Expert, FAO
11:15-11:30	Main drivers of water productivity in citrus production in the Northern Jordan Valley <i>Understanding the main variables influencing water consumption and value creation citrus</i>	Dr. Emad Karablieh, University of Jordan
11:30-11:45	Regional Insights: Water Efficiency and Value Chain Improvements in Morocco’s Citrus Sector	Hisham Sabri, Citrus Value Chain and Irrigation Expert, FAO



	<i>An exploration of how Morocco improved water use efficiency and fruit quality through targeted policies and investment—highlighting transferable practices for Jordan’s citrus sector.</i>	
11:45-13:00	<p style="text-align: center;">Discussion</p> <p>Stakeholder Dialogue: Priorities, Data, and Opportunities</p> <ul style="list-style-type: none"> - Possible points of discussion could be: <ul style="list-style-type: none"> o What decisions are stakeholders currently facing in regard to water use, productivity, and investment? o What data are available (JVA, MoA, NARC, UoJ, etc.)—and what gaps exist? o What opportunities exist to integrate WaPOR and economic data in national planning? - Identifying national stakeholders. - Next steps. 	Moderated by Prof. Jawad Al-Bakri, University of Jordan
13:00-13:30	Conclusions and closing the workshop	Prof. Jawad Al-Bakri, FAO, EBRD
13:30	Lunch	