Enhancing water security through improved agricultural water productivity: new knowledge, innovations and applications

RS derived FAO-WaPOR dataset for water productivity improvement and irrigation performance assessment



Performance Assessment Irrigation moderniza tion

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Freshwater and land available to agriculture per person is declining

Drivers:

population, economic growth, climate change, resource degradation



Scope for productivity improvement



World average yield



Performance assessment Identify bright spots



• Field data: Yield, Cropping season

Data

• Literature: kc, HI, AOT, θ





https://github.com/wateraccounting/WAPORWP



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Case: Sugarcane, Xinavane in Mozambique



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Data



Data





- 387 georeferenced fields: Centre pivot(~1,055 ha), furrow(~3,343 ha) and sprinkler irrigation (~3,629 ha).
- Field level growing period
- Sugarcane yield: 2015 to 2018 harvesting year
- Crop parameters (Kc, HI, MC)



Uniformity, equity and adequacy



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Land and water productivity



Productivity targets and bright spots



Productivity targets and bright spots



Limitations/ opportunities

- 1. RS data
- 2. In situ measurement (field observation to look for causes and provide corrective action for performance improvement).

Sustainable improvement of productivity/intensification additionally requires

- 1. Input/supply chain and market link
- 2. Collaboration: multidisciplinary research and all relevant stakeholders particularly farmers
- 3. Attracting new generations/technologies to the sector: (automation, APP..)
- 4. Irrigation informatics collecting and analyzing data to support planning, operation and modernizing irrigation.









Lesson learned

- There is not one irrigation method that stands out as the best in all indicators as other factors than irrigation methods (such as operator, inputs, market, policy) affect performance.
- This study shows the potential use of RS-derived products of FAO WaPOR and cloud computing to monitor irrigation performance, assess productivity targets and identify bright spots from which best farmer/management practices could be identified and scaled up. Yet, in addition to demystifying the quality and role of RS data, determining the limiting/reducing factor for performance and productivity improvement require in situ observation and engagement of stakeholder including farmers, government and researchers.



