

Diagnosis and Challenges of Agricultural Water Management in smallholders' irrigation system in Africa

Identified factors preventing farmers and scheme management from increasing their water use efficiency in Africa: Results of applied methodologies in Burkina Faso

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Introduction

- A growing population and changing food consumption patterns are estimated to require a doubling of food production in the developing countries by 2050.
- Eighty percent of this increase would need to come from higher crop yields and greater crop intensity given limited scope for agricultural land expansion.
- Food production in Sub-Saharan Africa (SSA) is almost entirely rain-fed with irrigation playing a minor role.
- Expanding the use of efficient irrigation and agricultural water management technologies is a key part of the solution to increasing yields in a sustainable manner

Benefits of efficient irrigation technology

- **WATER** – Efficient irrigation allows farmers to (i) use less water to grow the same amount of crops; (ii) more productively farm larger areas of land by using the same amount of water; or (iii) use the same amount of water to grow higher value, more water-intensive crops
- **FERTILIZER** – Efficient irrigation reduces the amount of fertilizer needed per plant, as nutrients can be dissolved in the irrigation water for uniform application, reduced waste and lower labor input.

Benefits of efficient irrigation technology (cont)

- **ENERGY** – Efficient irrigation reduces energy use because less water is needed for a comparable area of irrigation, which in turn requires less energy for pumping this water.
- **LABOR** – Efficient irrigation decreases the amount of time required for providing water to a crop area due to the regulated flow of water in the irrigation operation.

Some results

Onion experiment

farmers	Fertizer application	apport d'eau	Yield (Kg/Ha)
savado go sayouba	100% recommended rate	No water stress	19200
savado go sayouba	50% recommended rate	No water stress	12400
sawadogo Rasmane	100% recommended rate	No water stress	24000
sawadogo Rasmane	80% recommended rate	No water stress	19200
Kiemde Adama	100% recommended rate	water stress (80%)	24000
Kiemde Adama	50% recommended rate	water stress (80%)	13400
Savado go Reguema	100% recommended rate	water stress (50%)	18240
Savado go Reguema	50% recommended rate	water stress (50%)	16320
Bado B Jacob	validation	No water stress	13280
Ouedraogo Boukare	validation	No water stress	24000
TEBDA abdou	validation	No water stress	16320

Some results

Rice

Farmers	Fertilizer treatment	Yield kg/ha
Tapsoba Jean Baptisse	100% recommended rate	5199
Tapsoba Jean Baptisse	50% recommended rate	4098
traore Lobou	100% recommended rate	5299
traore Lobou	65% recommended rate	4299
Boro Gaoussou	100% recommended rate	5665
Boro Gaoussou	80% recommended rate	5271
kone Boureima	Validation (farmer practice)	4938
Ouedraogo Ali	Validation (farmer practice)	6000
Bingo Edouard	validation (farmer practice)	4320

Key Lessons

- The production of water can be improved through the use of good cultivar
- For rice production in Burkina Faso, farmers use fertilizer beyond the economically profitable threshold.
- Adequate equipment is required for applied water measurement
- Agricultural practices greatly affect water productivity and water use efficiency
- Water losses from the irrigation canals is some time up to 40% which reduce water use efficiency

CHALLENGES AND WAYS TO IMPROVE

Barriers for improving irrigation productivity and profitability

- Incomplete irrigation infrastructure
- Governance issues (the water levy is below the guidelines and is too low to pay for effective operation and maintenance)
- Farm implements
- Access to information and knowledge on crop production

Ways to improve

- ✓ Use of certified seed varieties
- ✓ Right fertilizer, right rate, right time of application, right application method
- ✓ Homogenous levelling of plots
- ✓ Maintenance of irrigation canals to reduce losses
- ✓ Applying water with regards to the specific water requirement of each crop
- Good crop management practices 8

Thank You! Questions?

