

Does Small-Scale Irrigation improve WASH outcomes? Insights from rural Ethiopia

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Small Scale Irrigation



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Irrigation → Water Supply → WASH → Health

Irrigation can influence nutrition, health outcomes and food security through several potential pathways including (Domènech, 2015; Passarelli et al., 2018).

- 1) an income pathway,
- 2) a production pathway,
- 3) a women's empowerment pathway and
- 4) a water supply pathway

- While water access can be improved through multiple means, this paper focuses on improved water access through multiple water use of irrigation sources.

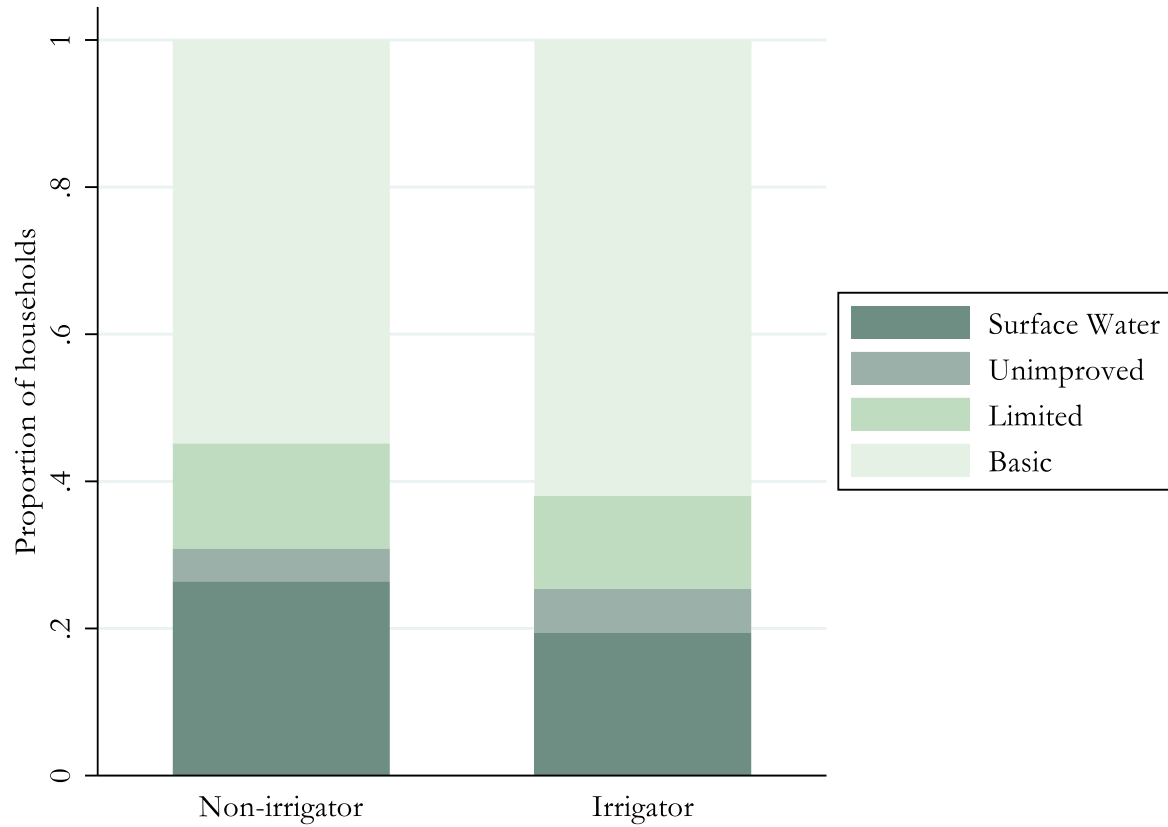
Irrigation practices affect domestic water practices

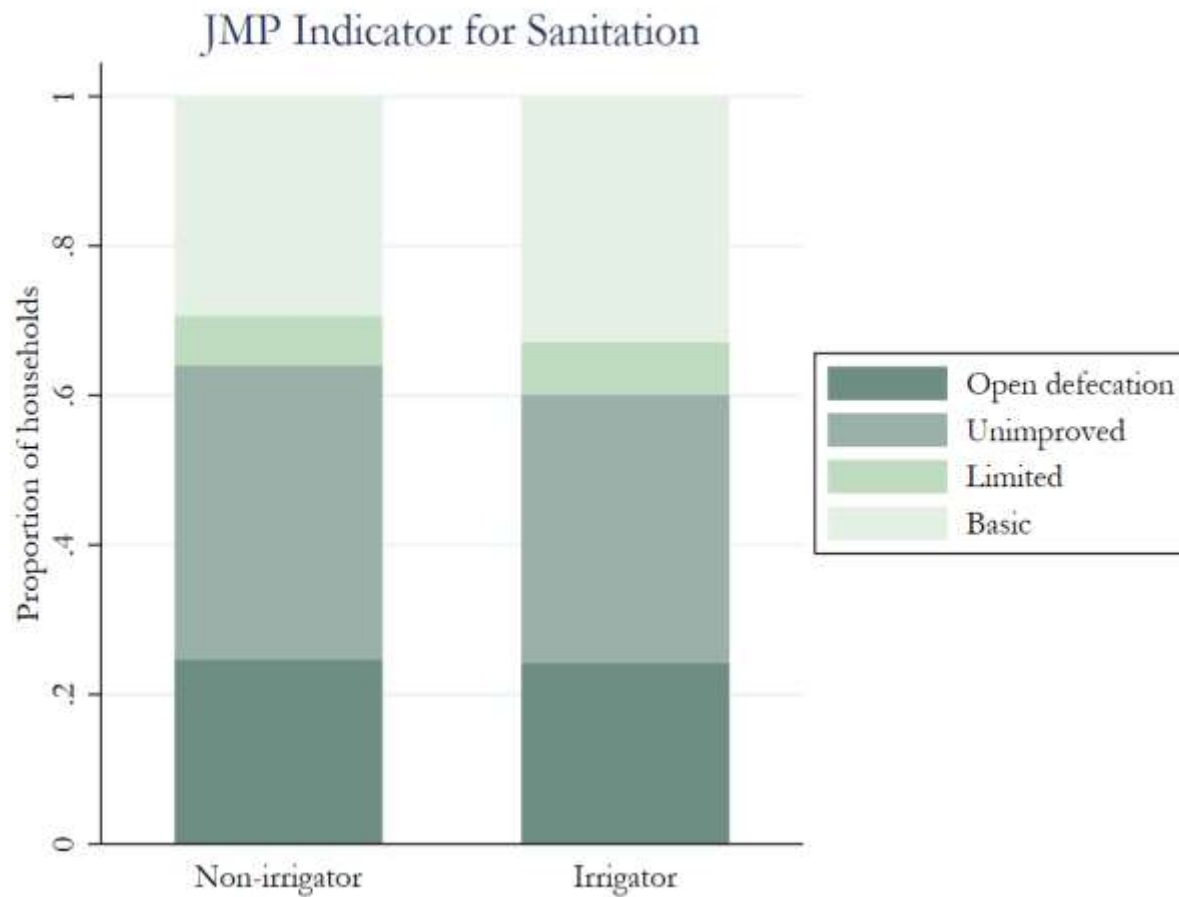
Domestic and Irrigation Water Source

Domestic			
Irrigation	Surface	Ground	Difference (std. err.)
Surface	175	192	
%	78.5	27.0	-51.5 (3.4)***
Ground	48	519	
%	21.5	73.0	51.5 (3.4)***
Total	223	711	
%	100	100	

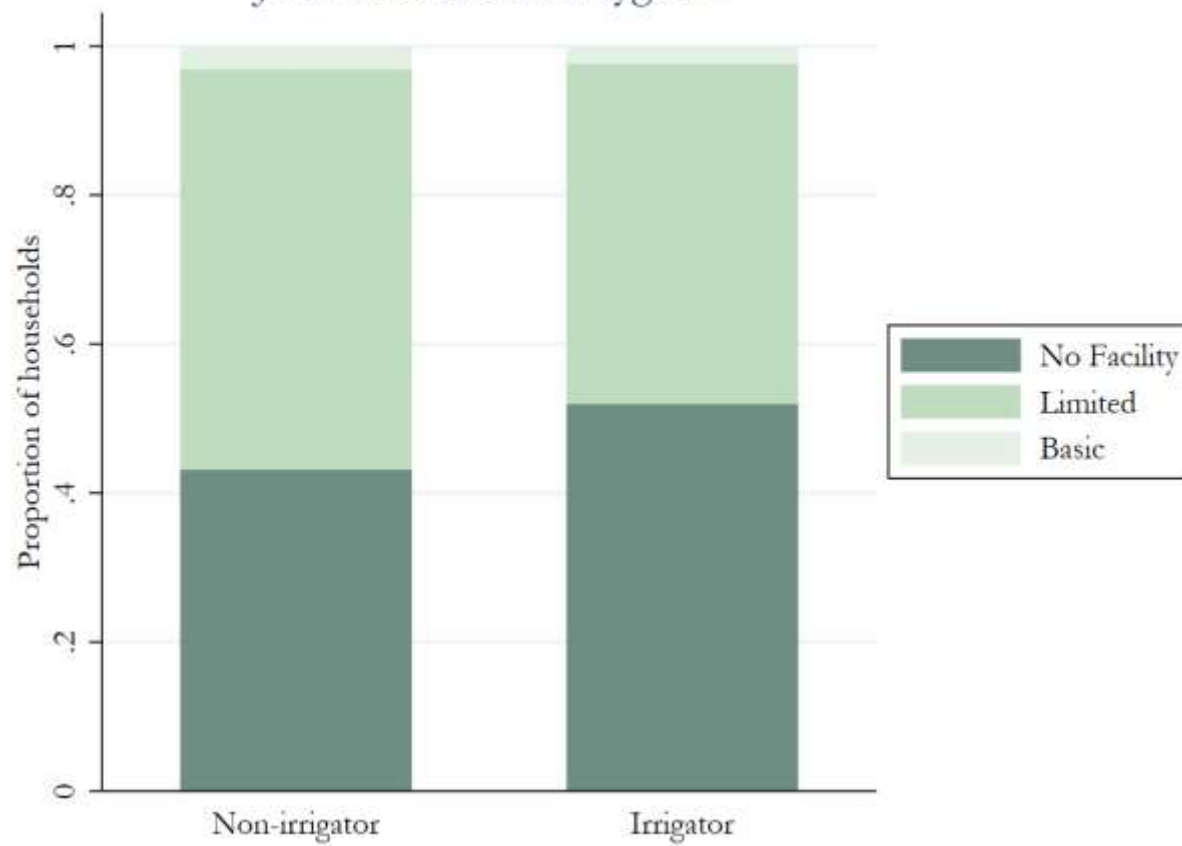
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level

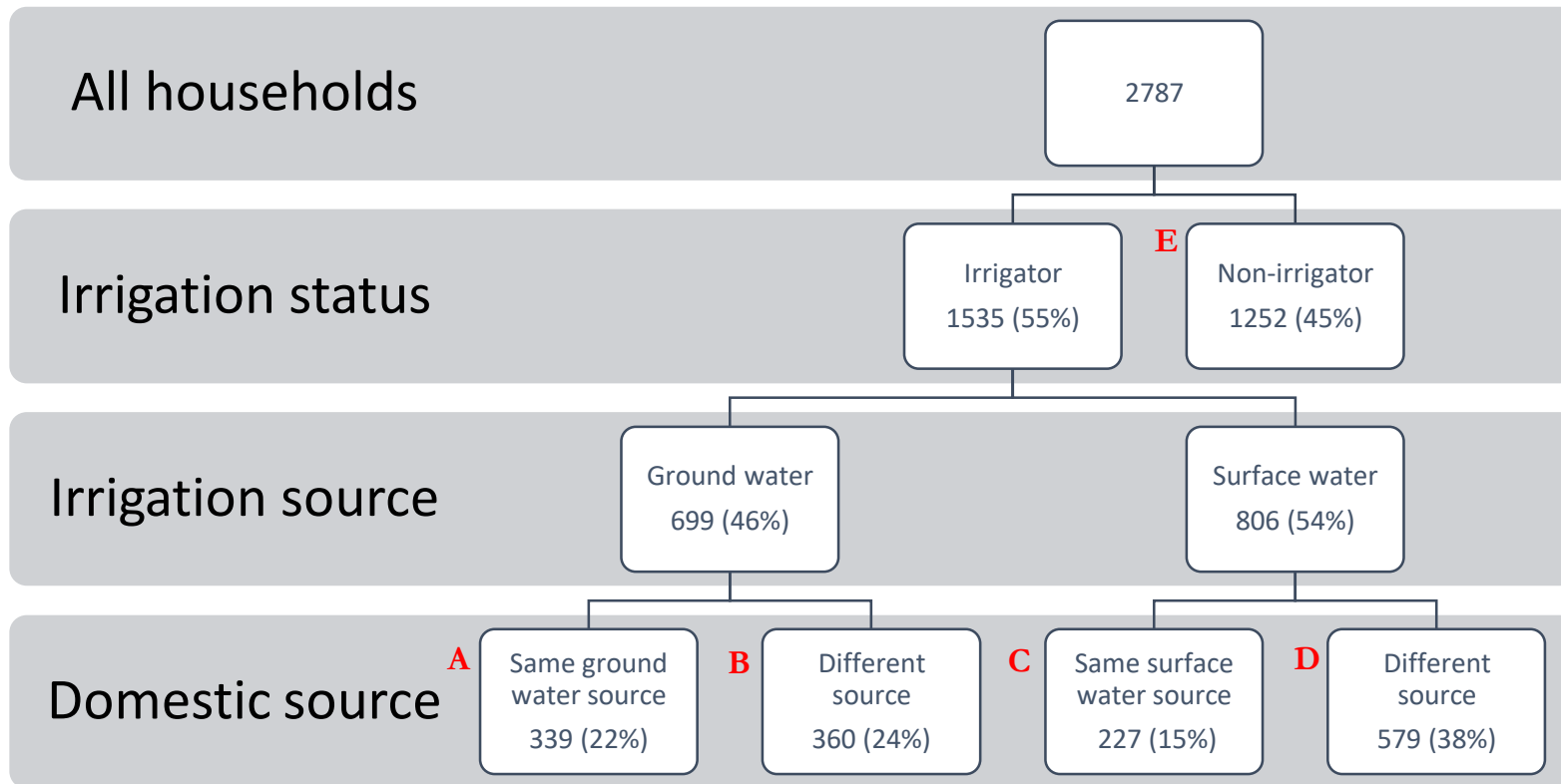
JMP Indicator for Water Supply





JMP Indicator for Hygiene





Methodology: Three different models used

*Variable of interest: **Multiple Water Use Status***

Outcomes:

- *Total time spent per week fetching water,*
- *Sufficient water available for domestic use,*
- *Hand washing practices,*
- *Hand washing facilities,*
- *Sanitation facility,*
- *Diarrhea in children.*

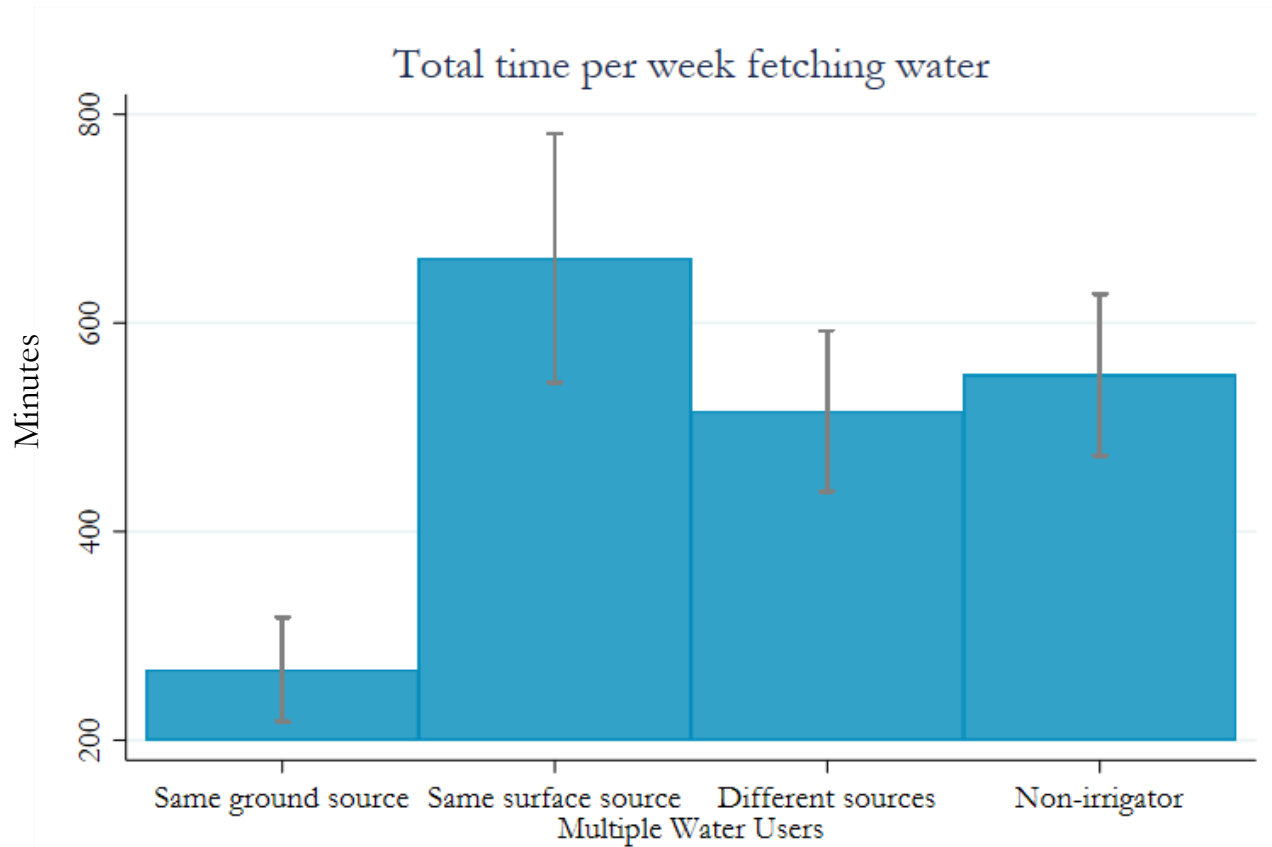
Models:

- 1) Pooled OLS / Linear Probability
- 2) Household Fixed Effect
- 3) Instrumental variable
 - Time to closest water source

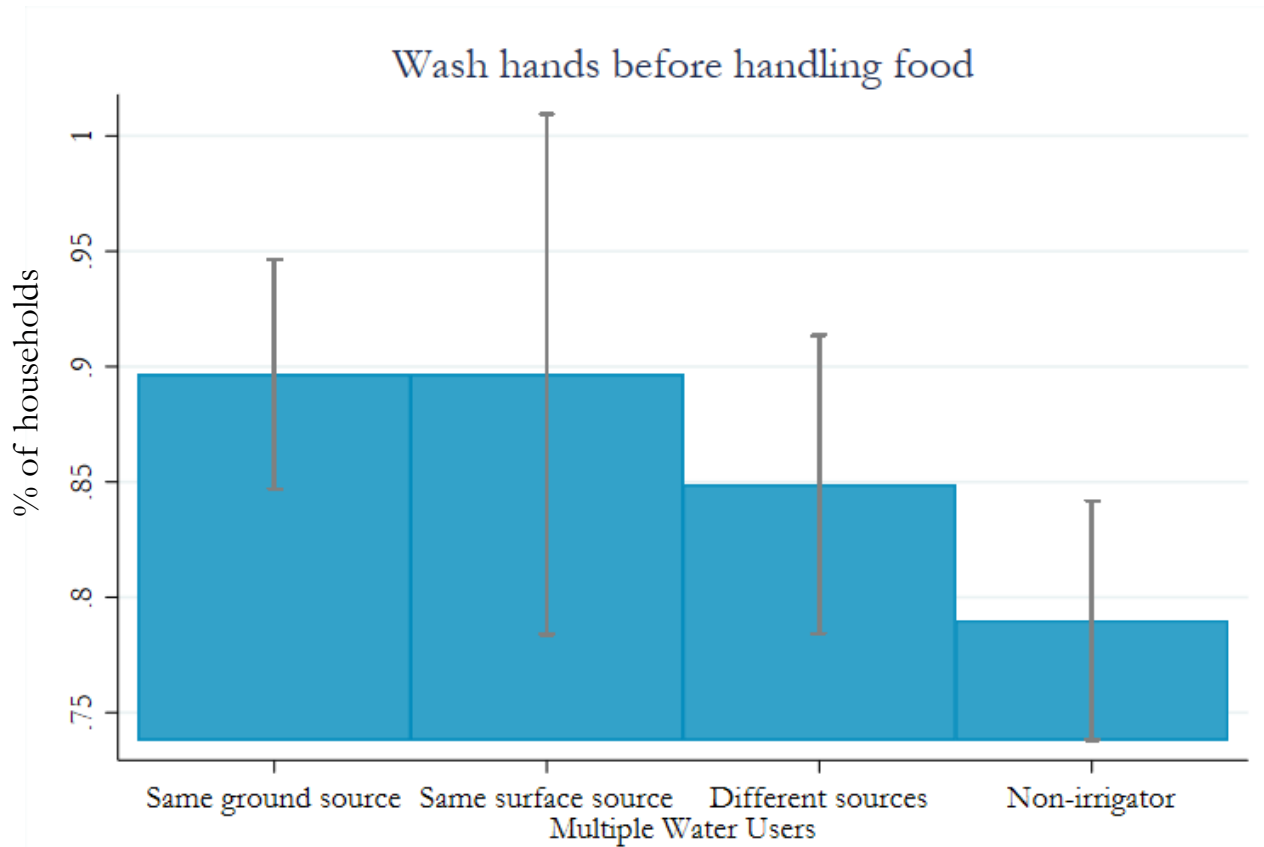
Controls:

- *Education of HH Head*
- *Education of Spouse of HH Head*
- *HH size*
- *Number of children in HH*
- *Number of adult women in HH*
- *HH monthly expenditure*
- *Time*
- *Kebele*
- *HH shocks*
- *Drought*
- *Asset Ownership*
- *Land Ownership*

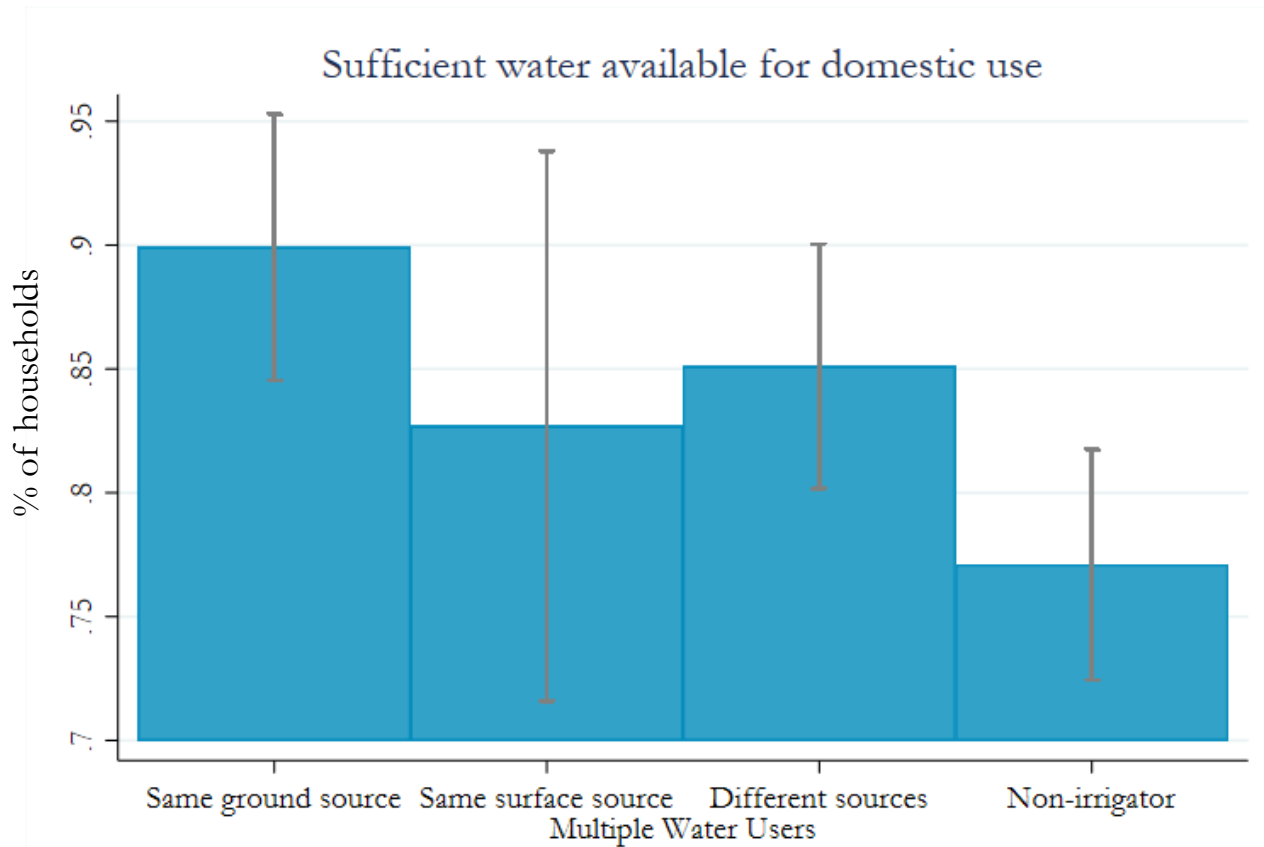
Ground water irrigators spend less time fetching water



Non-irrigators have poorer hygiene



Ground water users are more likely to have sufficient water available



Evidence of multiple uses of productive and domestic water sources

- We find evidence of multiple uses of productive and domestic water sources,
- particularly for groundwater irrigators who use the same groundwater source for domestic purposes.

Non-irrigators have worse hygiene

- Ground source households have better hand washing practices than non-irrigators.
- It's possible that irrigators have better hygiene
 - More evidence is needed.

Irrigation contributes to improved water access

- Our results indicate that households that use groundwater for both irrigation and domestic uses spend the least amount of time fetching water on a weekly basis due to the closeness of the irrigation well to the homestead.
 - However this results is not robust to model specification.
- At the same time, non-irrigators are more likely than any other group to have insufficient water for domestic purposes
- and that more than 90% of households that irrigate report sufficient water for domestic purposes.
- This results suggests that irrigation contributes to improved water access for households.

Thank you!

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WHO and UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene criteria

Ladder	Characteristics
WATER	
Surface water	River, dam, lake, pond, stream, canal, or irrigation canal
Unimproved	Unprotected dug well or unprotected spring
Limited	Improved source ¹ and collection time exceeds 30 min
Basic	Improved source ¹ and collection time is no more than 30 min for roundtrip
Safely managed (not included in analysis in this paper)	Improved source ¹ and available on premises and available when needed and free from fecal and chemical contamination ²

¹Improved sources of drinking water include piped water, tube well, borehole, protected spring or protected well, rainwater, tanker truck, cart with small tank, or bottled water. ²Data on fecal and chemical contamination and disposal of extra excreta were not available

WHO and UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene criteria

SANITATION	
Open defecation	Disposal of human feces in fields, forests, bushes, open bodies of water, beaches and other open spaces, or with solid waste
Unimproved	Pit latrines without a slab, hanging latrines, or bucket latrines
Limited	Improved facilities ³ and shared between two or more households
Basic	Improved facilities ³ and not shared with other households
Safely managed (not included in analysis in this paper)	Improved facilities ³ and not shared with other households and extra excreta are safely disposed in situ or transported and treated off-site ²
HYGIENE	
No facility	No handwashing facility on premises
Limited	Handwashing facility on premises without soap and water
Basic	Handwashing facility on premises with soap and water

²Data on fecal and chemical contamination and disposal of extra excreta were not available. ³Improved sanitation facilities include flush/pour flush, piped sewer system, septic tanks, pit latrines, ventilated pit latrines, composting toilets, or pit latrines with slab.