

SMALL-SCALE IRRIGATION AND NUTRITION: LESSONS FROM EAST AND WEST AFRICA

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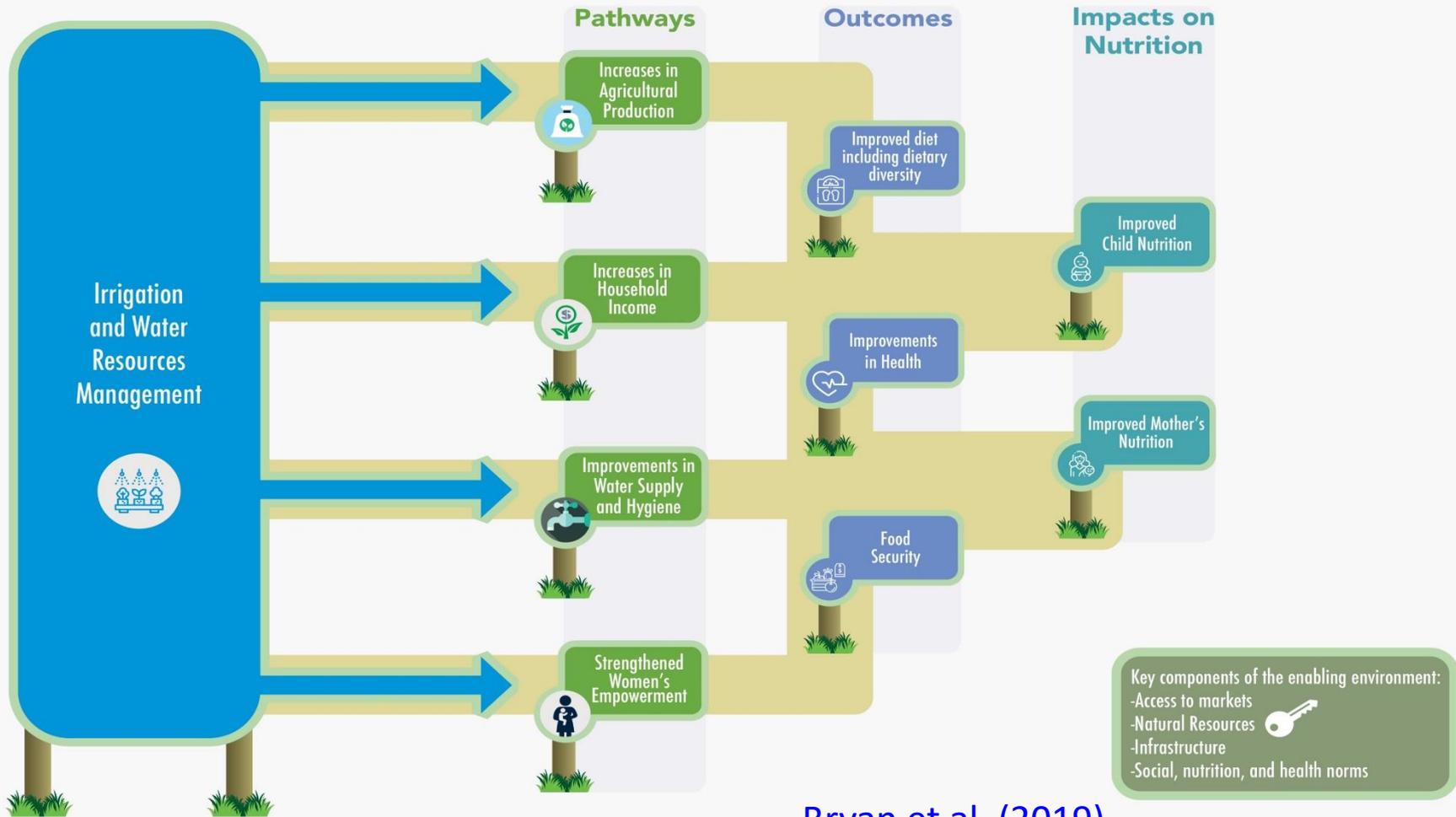
Feed the Future Innovation Lab for Small Scale Irrigation Symposium

Expanding Investment in Sustainable, Small-Scale Irrigation for Agricultural-Led Growth, Resilience, and Well-Being: Lessons from 10 Years of Research

Wednesday, March 1, 2023, 8:30am - 5:00pm

Ronald Reagan Building





[Bryan et al. \(2019\).](#)



INCOME AND PRODUCTION PATHWAYS IMPROVE FOOD SECURITY AND DIETS

- First round of data collected from Ethiopia and Tanzania showed that SSI improves diet diversity in Ethiopia through the income pathway ([Passarelli et al 2018](#)). The results were not significant in Tanzania.
- In Ghana irrigators had higher household diet diversity scores than non-irrigators, greater consumption of animal source foods, fruits, vegetables, and fruits/honey ([Mekonnen et al. 2019](#))
- Irrigating households also sourced foods differently—sourcing more vegetables and meat from their own farms
- In Mali, irrigators are more likely to grow vegetables, fruits, and roots and tubers and have significantly better dietary quality and diversity than non-irrigators and greater food security (FIES) ([Nkonya et al. 2022](#))
- Thus, the production pathway also seems important in these contexts



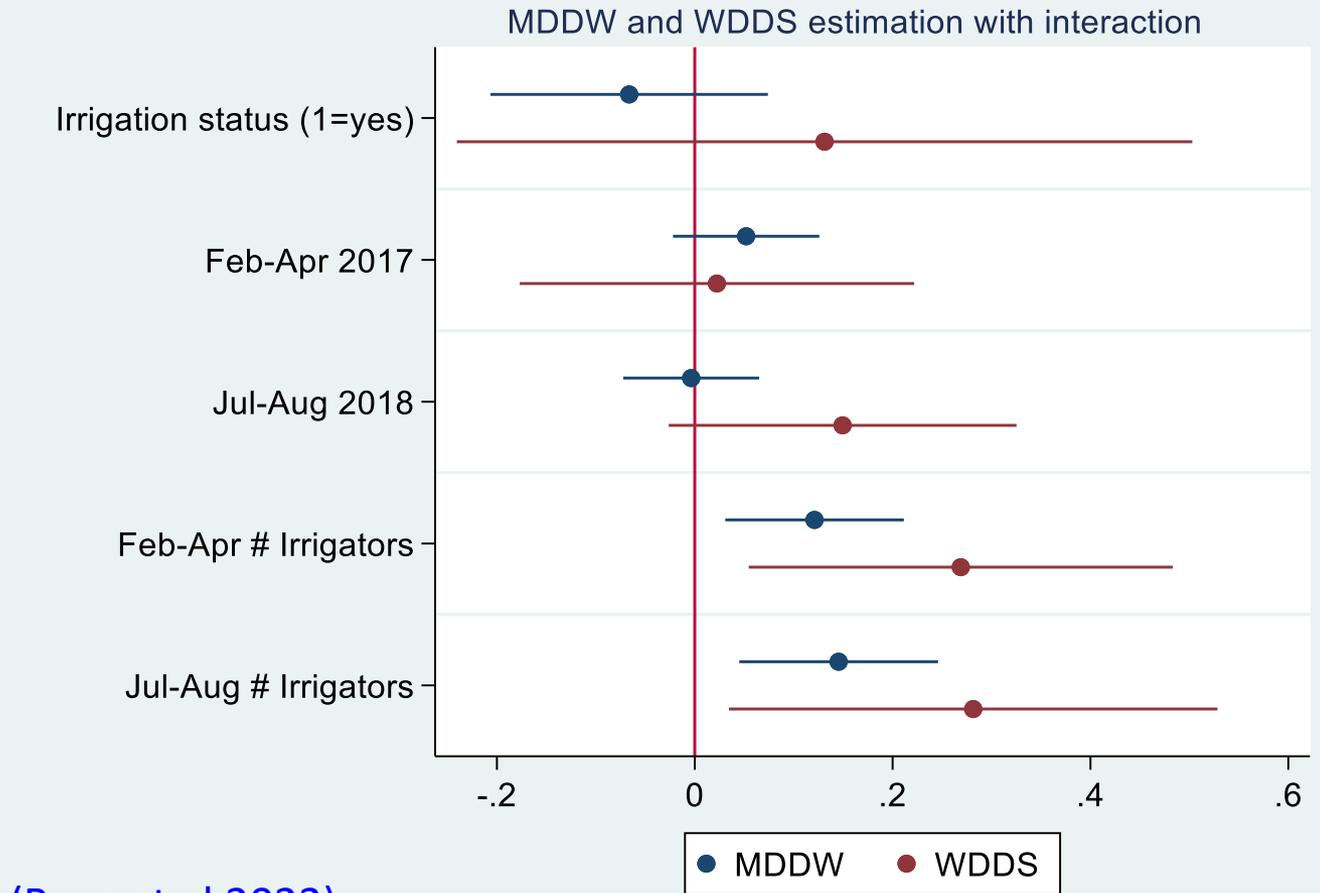
IRRIGATION BUFFERS SEASONAL DIETARY GAPS FOR WOMEN IN ETHIOPIA

Seasons covered:

Feb-Apr: Irrigation and fasting season

Jul-Aug: Lean season

Oct-Nov: Harvest season



[\(Baye et al 2022\)](#)



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IRRIGATION PROTECTS HOUSEHOLD & WOMEN'S FOOD SECURITY FROM DROUGHT SHOCKS

- Women have higher dietary diversity (WDDS) in irrigating households (Tanzania) and the benefits are even greater for women who faced drought (Ethiopia and Tanzania)
- Households facing drought in Tanzania also reported greater household dietary diversity (HDDS)
- During the 2016 ENSO drought, irrigators in Ethiopia maintained the area cultivated, share of harvest sold, and net crop income, irrigators also increased spending on food (by 72%) and maintained HDDS

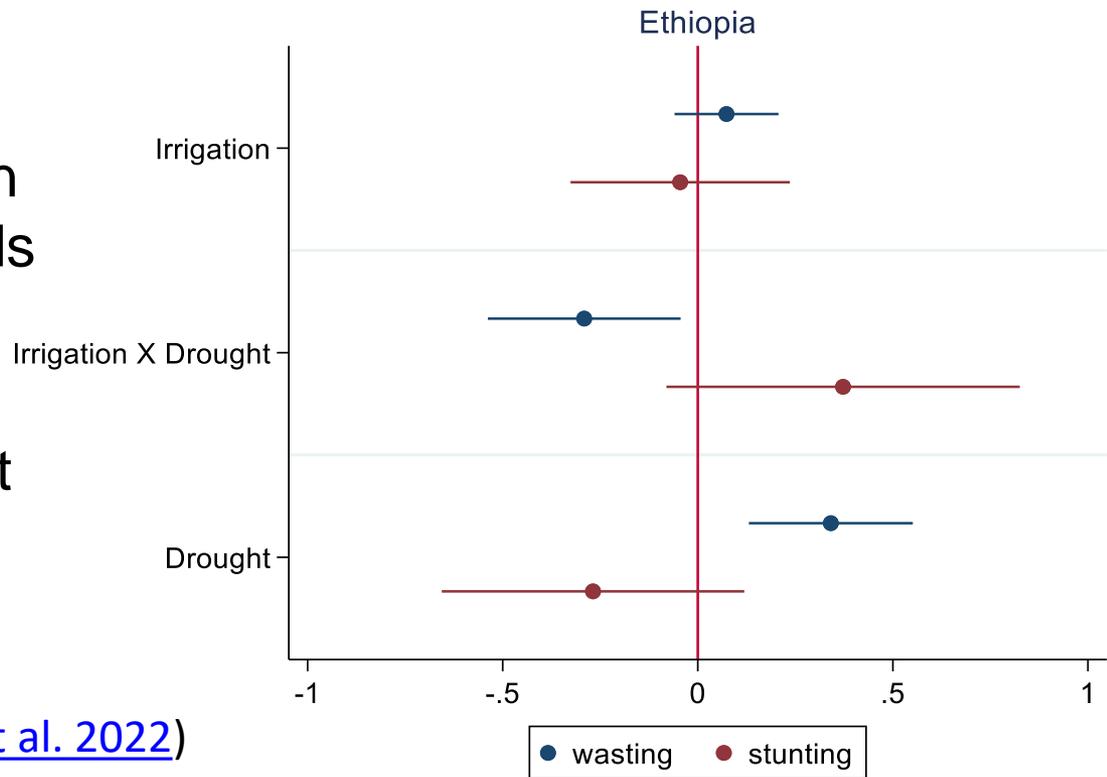


([Mekonnen et al. 2022](#); 2023)



IRRIGATION IMPROVES NUTRITION OUTCOMES FOR CHILDREN

- Children in irrigating households in Ethiopia higher weight for height scores than that of children in non-irrigating households (WHZ +0.87 SD)
- Children in irrigating HHs that experienced a drought had higher WHZ scores in Tanzania (+0.62 SD)



([Mekonnen et al. 2022](#))



DOES IRRIGATION IMPROVE THE WASH ENVIRONMENT?

- The irrigation-WASH pathway has potential to improve nutrition (less evidence)
- Emerging results show that households with irrigation are also more likely to have sufficient domestic water and improved sanitation facilities
- Multiple use systems are more feasible when groundwater is the irrigation source
- Hygiene practices are not associated with irrigation but rather the source of domestic water (van Biljon et al. under review)



IRRIGATION AFFECTS WOMEN'S EMPOWERMENT IN BOTH POSITIVE AND NEGATIVE WAYS

- Outcomes for women depend on the technology, intervention design, social-environmental context, etc. ([Bryan and Lefore 2021](#))
- In order for irrigation to directly benefit women, constraints related to women's access to resources and lack of agency need to be overcome ([Theis et al. 2018](#))
- When women are empowered to participate in SSI this may lead to other well-being outcomes, e.g. nutrition





LESSONS FROM A MOTOR PUMP INTERVENTION IN GHANA



Image: Focus group discussion

- Motor pumps provided to men and women farmers for SSI did not increase measures of women's empowerment but did increase overall household ownership of assets ([Bryan and Mekonnen 2023](#))
- Qualitative evidence suggests the benefits of the motor pump intervention for women are indirect, including increasing household asset holdings and allowing women to shift time to more preferred activities sourcing irrigated crops from their own production ([Bryan and Garner 2022](#))
- The intervention had negative effects on women from households that did not receive pumps
- Better planning and implementation of irrigation interventions is needed to support women's empowerment





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Entry Points for Improved Nutritional Outcomes

The current body of evidence on the links between irrigation, water management, and nutrition provides important clues as to what nutrition sensitive enhancements are needed to achieve greater impacts on early child nutrition. The following approaches are recommended to increase the nutritional impact of irrigation and water management investments.

1 Incorporate nutritional considerations at concept stage

2 Maintain and improve the natural resource base

3 Equip cooperatives, extension, and WUAs on nutrition and dietary considerations

4 Leverage community platforms to deliver nutrition messaging

5 Engage women in irrigation interventions

6 Promote nutrient-dense crops and incorporate home gardens

7 Design formal multiple-use water systems that are culturally appropriate and safe

8 Integrate irrigation investments into rural service delivery and social safety nets

[Bryan et al. \(2019\).](#)



CONCLUSION

- Irrigation is shown to have a strong effect on household food security and diet diversity through increasing economic access to food and changes in production
- Irrigation also improves the diets and nutritional outcomes of women and children
- SSI should be promoted on its merit to improve nutrition, in addition to its potential for higher income and yield
- The irrigation-WASH pathway needs further exploration and is unlikely to have dramatic impacts on nutrition without intentionality (MUS)
- Irrigation can potentially benefit women and facilitate their empowerment, but this requires careful design/implementation
- Measures to make irrigation more nutrition and gender-sensitive should be selected to suit the local context