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# Feasibility of green water management and rainwater harvesting in drylands

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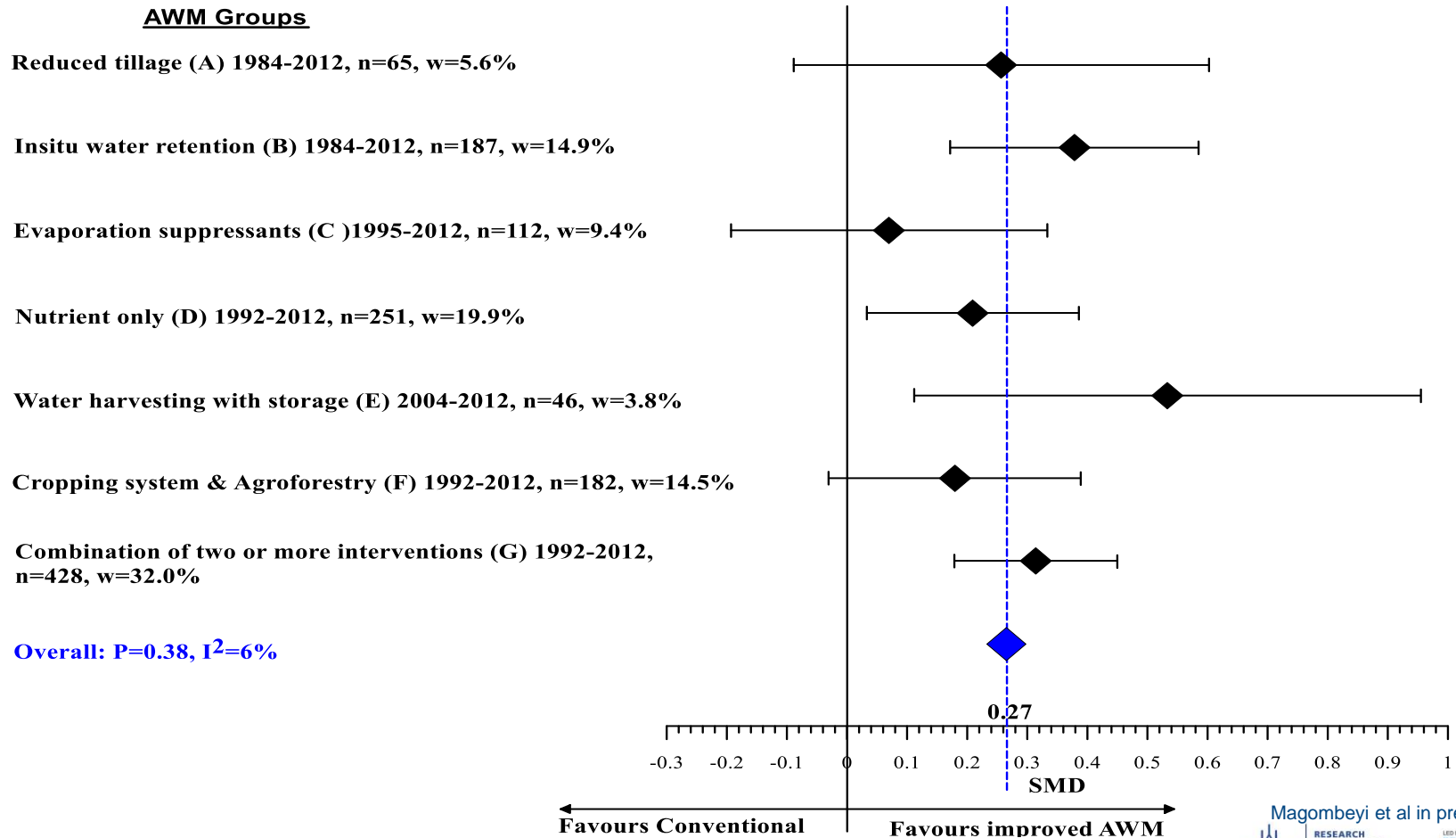
# Rainfed systems continue to be most cost-effective option to meet multiple demands

- Rainfed systems covers large areas in need for sustainable intensification for food security
- The highest potential for sustainable intensification is in currently low yielding systems
- Current and future climatic risks require better water management in rainfed systems
- Means of incentives driving adoption and scaling still poorly understood and implemented?



# Synergy between water and agronomy interventions at field scale

## Limpopo meta-analysis



Magombeyi et al in prep.



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# Progress in rainfed systems: diverse and contextual

3 examples of rainwater management/ water harvesting scaling: India , Ethiopia , Burkina Faso

..... With variable cost sharing and benefits

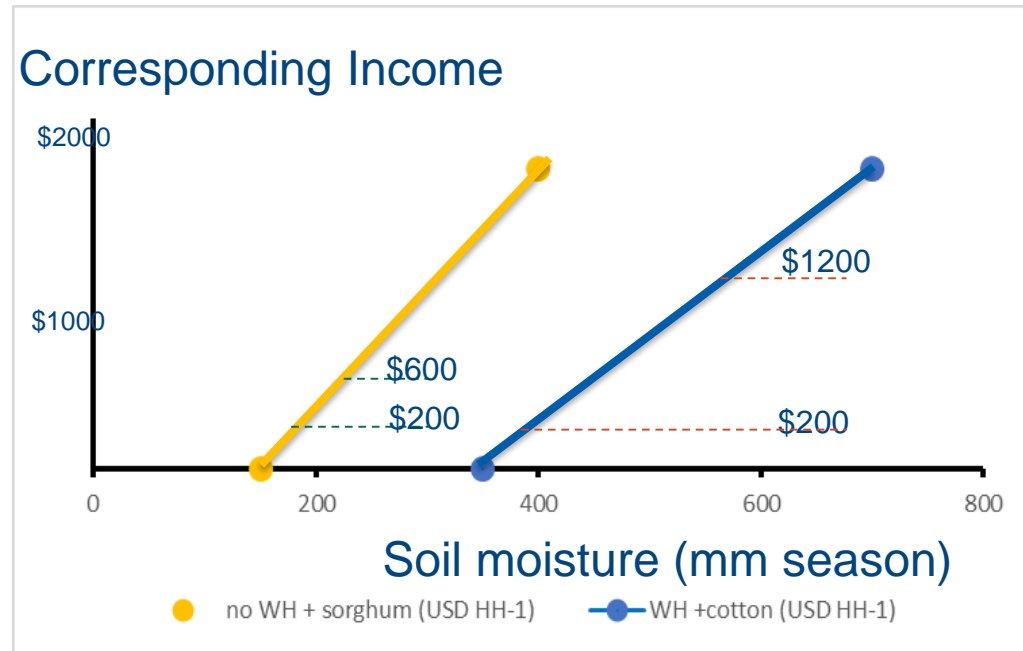
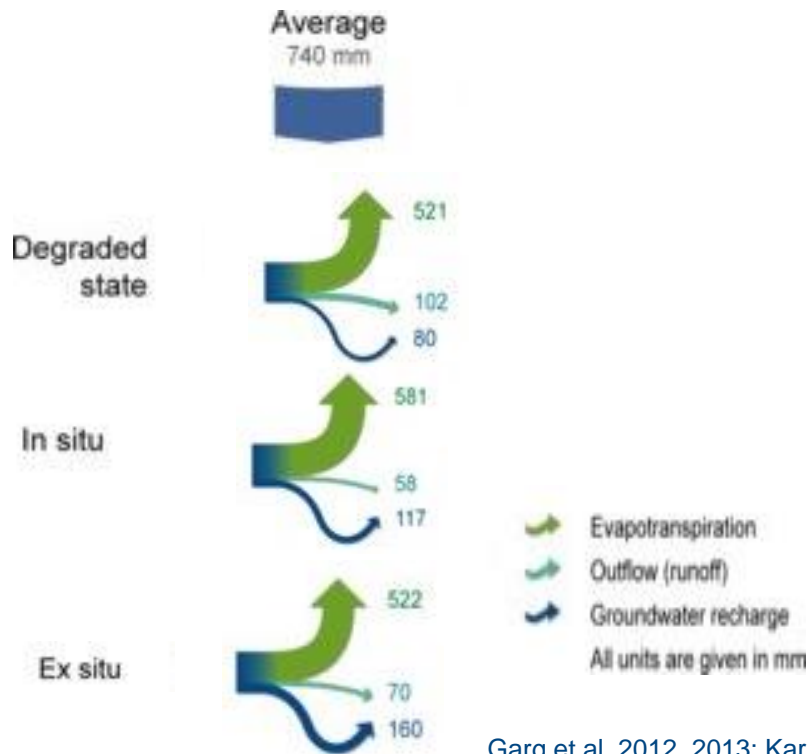
.....With variable partnerships

.... With variable timescale and impact



# Example India (micro) watershed: water harvesting with shift in crop, enhance farmers' income

- PPP : public sector, IFIS , farmers >40 years ... and emerging private sector



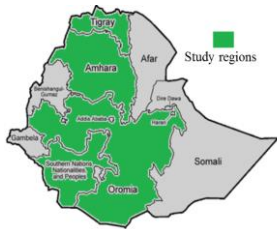
Garg et al, 2012, 2013; Karlberg et al 2015

L. Karlberg et al./Agricultural Systems 136 (2015) 30–38

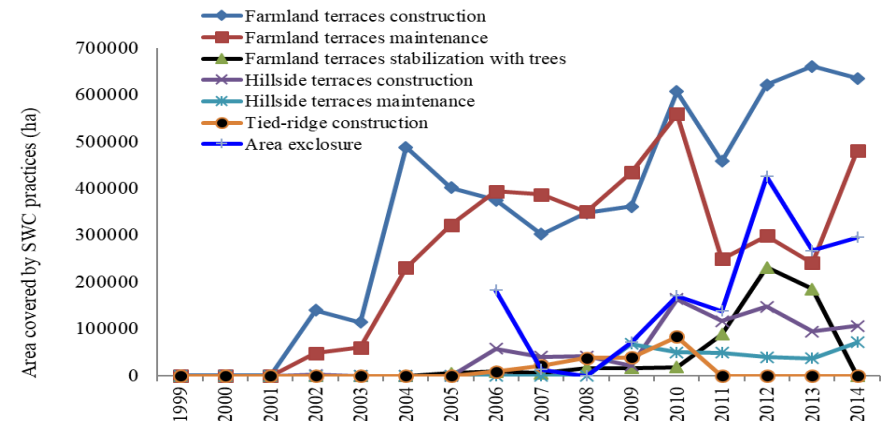


# Example Ethiopia: green water management investments realised through manual labour

- PPP : public sector , IFI and farmers since at least 70
- Example investments in 4 Ethiopia states (Adimassu et al forthcoming)



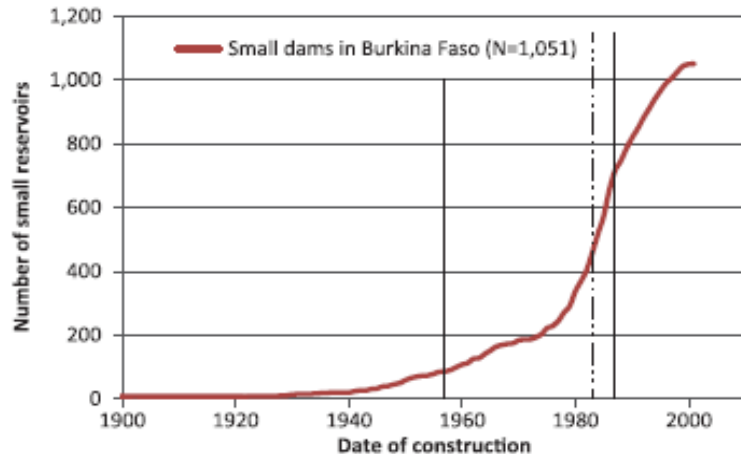
Region	Investments in SWC practices	
	Person days (million y-1)	Labor value (USD million y-1)
Amhara	1120	1120



# Example Burkina Faso: landscape rainwater harvesting requires safeguard and re-investment?

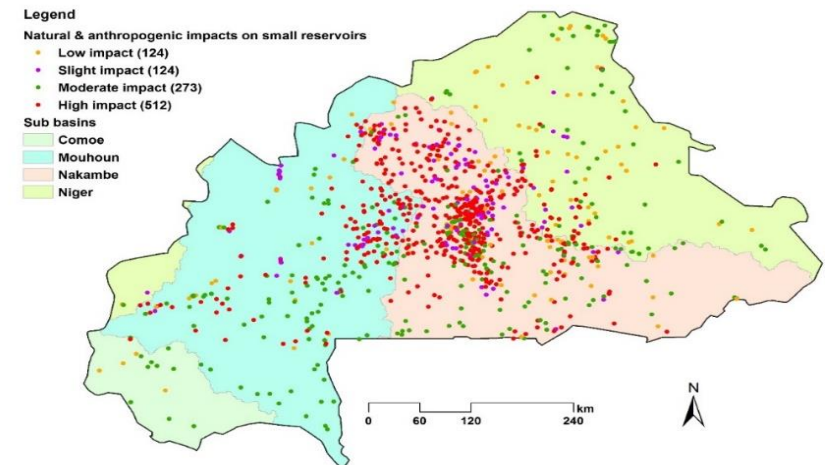
Many SRs constructed in 80s and 90s, now at and of technical life length

.. In addition more demand and subject to more anthropogenic pressures



Source: DGRE database. Construction date is available for 1,051 out of 1,190 records (e.g., 90%).

Venot et al 2012



# Conclusions from cases: even if WH technologies are the same, scaling is context-specific

- PPPs required for scaling solutions, public investments and policy matters
- Labour is a significant cost
- Economic returns and value chains and change in agronomy
- Re-investments needed to maximise benefits?





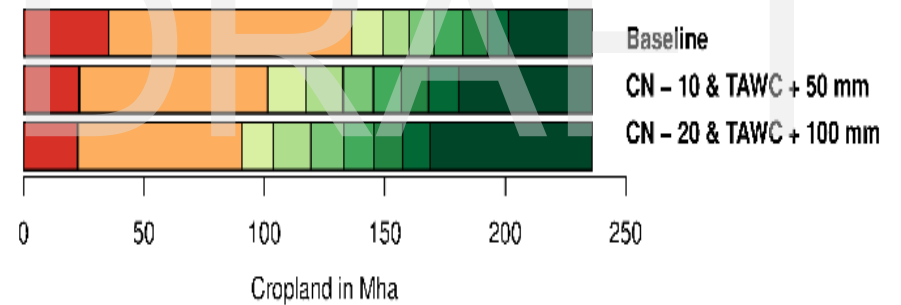
# Limits of effective WH: Where will it be beneficial to invest ?

Yield chances within a growing window of 90 days

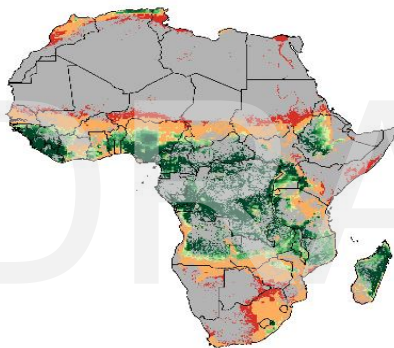
- ≥ 25% risk of failure
- < 25% risk of failure and < 75% chance for full yield

Length of growing window in days with ≥ 75% chance for full yield

- 90–105
- 105–120
- 120–135
- 135–150
- 150–165
- 165–180
- >180



Baseline



Heinke, Barron ,  
Lannerstad draft

# Proposed approach: models of investments for rainfed systems sustainable intensification

- **Role of PPPs** in rainfed systems and sharing farmers costs
- **New models of (re) investments** in rainfed systems needed
- Providing **incentives for farmers** : new crops, new agronomy to maximise value
- **Climate risks and building resilient, productive and sustainable rainfed systems**

Solar Water Pumping for Irrigation: Business model scenarios and suitability for Ethiopia  
Authors: Milan Otoo, Nicole Lefter, Petra Scheitler, Gebremichael Seligebabir





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# THANK YOU

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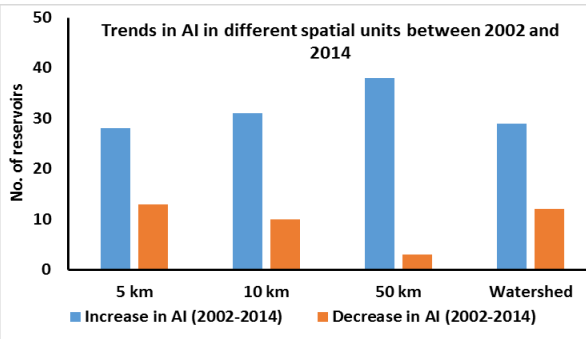
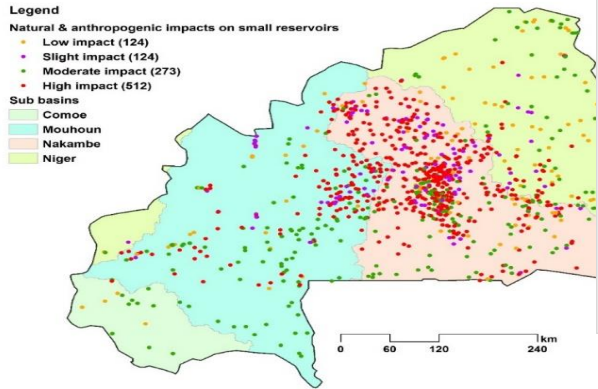


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# Burkina Faso anthropogenic risks map



(Forkor et al in prep)

