

# Small-scale irrigation: the answer to ecosystem health?

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## Communal solar pumps in Mali: Curse or cure for ecosystem health?

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IWMI



# Solar PV irrigation for smallholder farming systems

- Sustainable intensification
- Food and nutrition security
- Reduce and manage emission
- Look at multiple use–benefits from water and energy



# Suitability analysis for solar powered irrigation in two countries in West Africa: Ghana, Mali

Farmers want new technology for irrigation, but need context specific solutions

(example Ethiopia technology comparison by ILSSI)

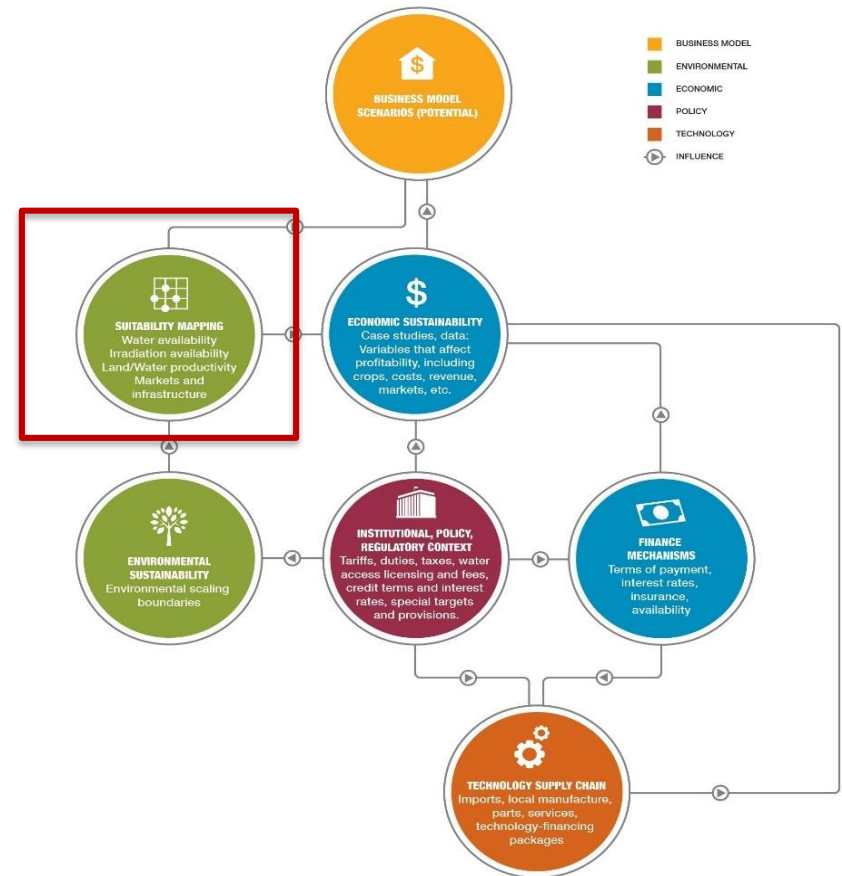
	Labor saving	Yield	Profit	Multi-purpose use
<b>Control</b>	0	0	0	0
<b>Rope and Washer</b>	0	0	-/0	+
<b>Solar</b>	++	+	++	++
<b>Motorized pump &amp; drip</b>	+/-	++	+/-	-

Summary of the opportunities and challenges related to each of the water lifting technologies towards the control (=manual water lift from surface or groundwater).

++, + and – represent a high, medium and low effect.

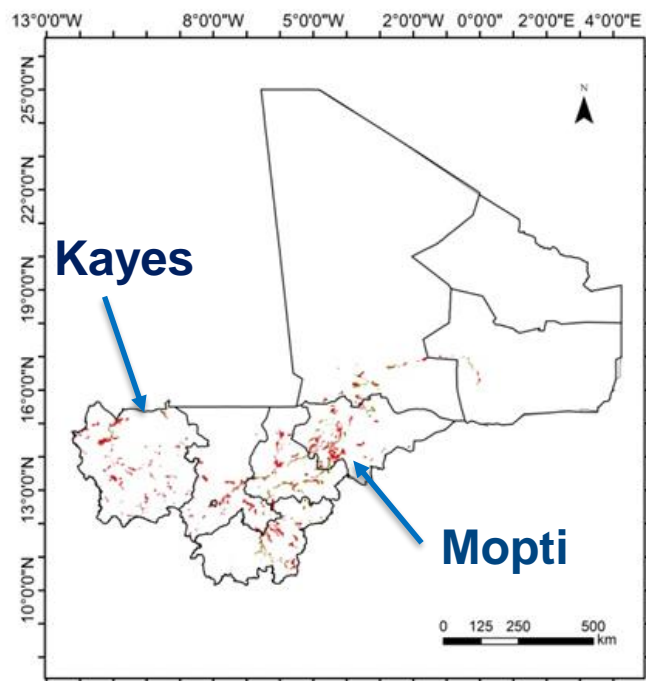
# Scoping suitability for business model approach

- Decision-making support tool
- Address direct and indirect cost and benefit, incl gender, environment sustainability, market barriers
- Guide investments, policy and regulatory context
- Better understanding of
  - Scalability
  - Sustainability

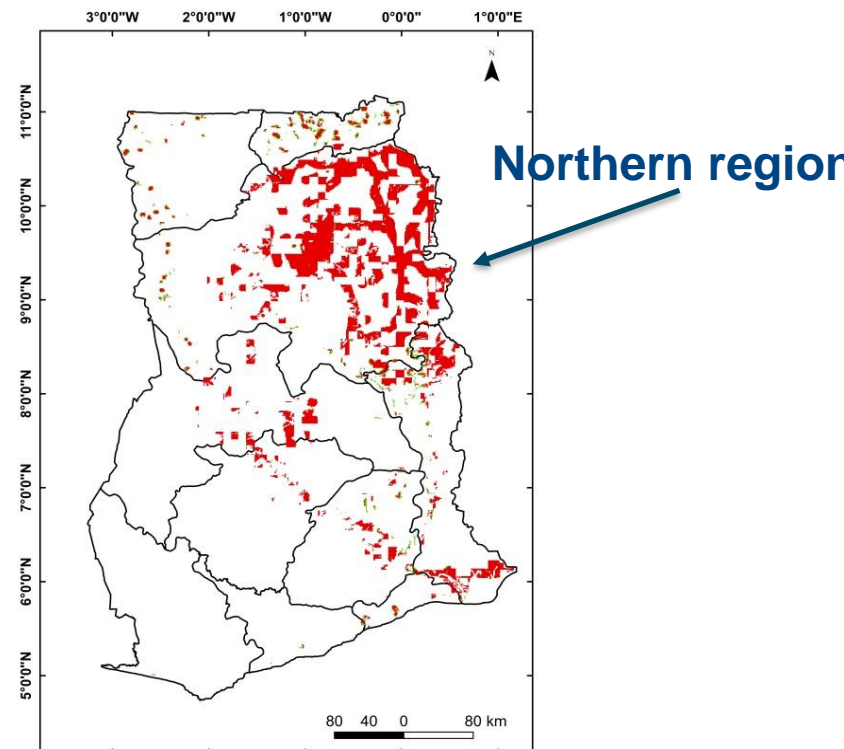


# Results Mali and Ghana Solar PV irrigation suitability

**Mali:** GW  $\leq$  7 m & rivers/small reservoirs 2,079,600 ha of crop land



**Ghana:** GW  $\leq$  7 m & rivers/small reservoirs 2,342,900 ha of crop land



# Key messages: Recommendations for ensuring small-scale irrigation and ecosystem health

- Solar PV irrigation suitability show great potential in Mali and in Ghana
- The issue of price is challenging for smallholder farmers to invest
- Community based PV pumping has been piloted (e.g., FAO) but with limits to garden irrigation
- Special design in business for solar PV irrigation is needed for inclusion of women and youth
- Sustainability, especially on deep groundwater use, and groundwater quality must be further explored



# Thank you

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# Benefits to women farmers from solar pumps

Women farmers in Ethiopia preferred solar pumps to other water lifting technologies (based on in-depth interviews in two states):

- Fixed at or near the home so does not need to be carried
- Offers multiple use services: domestic, irrigation, livestock
- Less labor and time than other technologies
- Provides access to 'clean' drinking water across seasons
- Suitable for homestead irrigated cultivation of crops women prefer





# Constraints to access SSI for women and disadvantaged farmers

Disadvantaged farmers have lower access to SSI technologies:

- Adoption of SSI by farmers is skewed toward higher income males
- Lower income farmers lack access to information, credit and technology sources/markets
- Credit is generally not suited to purchase SSI technologies

Women farmers have added disadvantages:

- Lower access to all forms of information (extension, credit, technologies, complementary practices/tools)
- Lower access to credit sources (administrative, social barriers)
- Tend to 'lose' technologies once in the household – SSI technologies are large assets
- Tend to lack control over income gained from irrigated production in the household

