Increasing SIP Utilization for Market Viability

Evidence from ICIMOD installed SIPs in Nepal Tarai

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- For SIPs to become economically viable, one needs returns on the investment to pay off:

- If C is the upfront cost and S is the governmental subsidy level, and if B is the revenue generated by the SIP, we need to achieve:

$$(C - S) < \sum_t \frac{B_t}{(1+r)^t}$$

- If this conditions is achieved, then with the required finance (another big challenge), the SIP becomes market viable.

- Once the SIP has been installed, the marginal cost of operating it is basically null.

- To achieve the greatest possible benefits, the pump should be operated whenever solar radiation is available to power it.

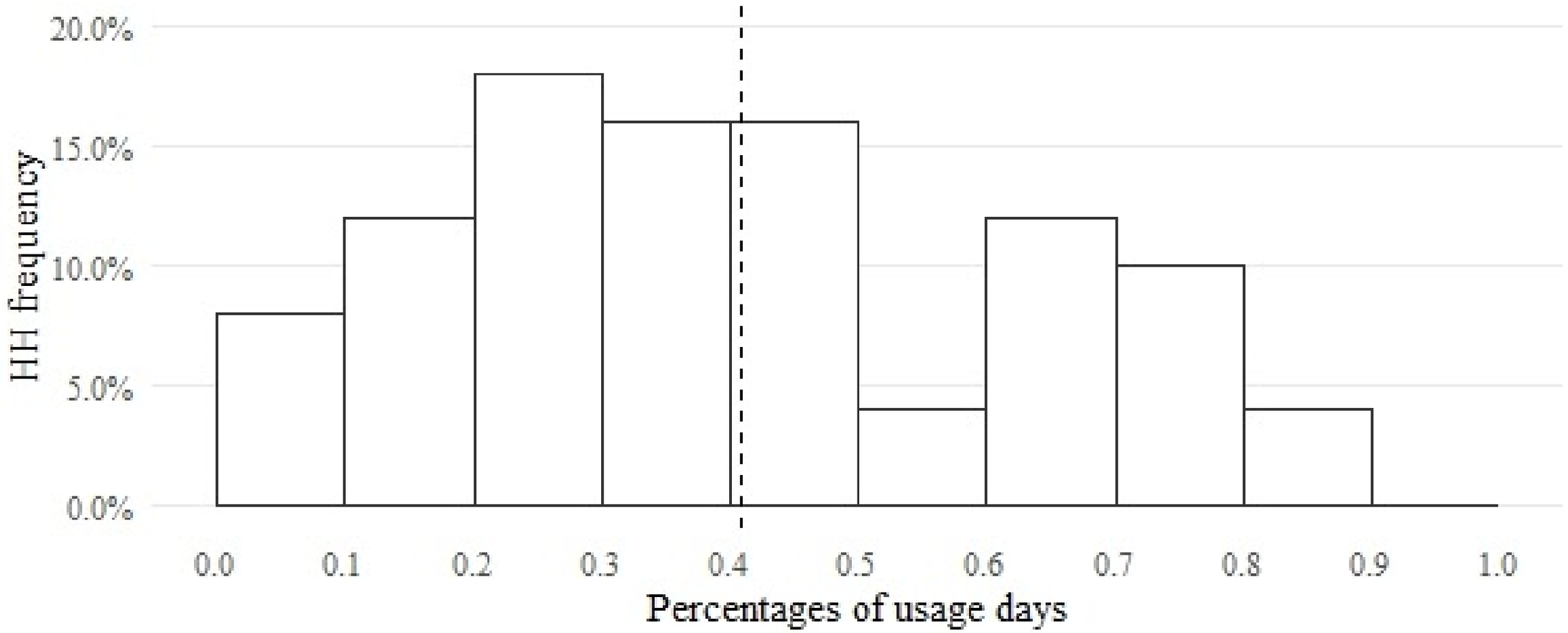
- Utilisation below this level will results in sub-optimal revenue streams, making profitability harder to achieve.

We followed a sample of 53 SIP owners using daily monitoring data on usage, by crop (hours and CM).

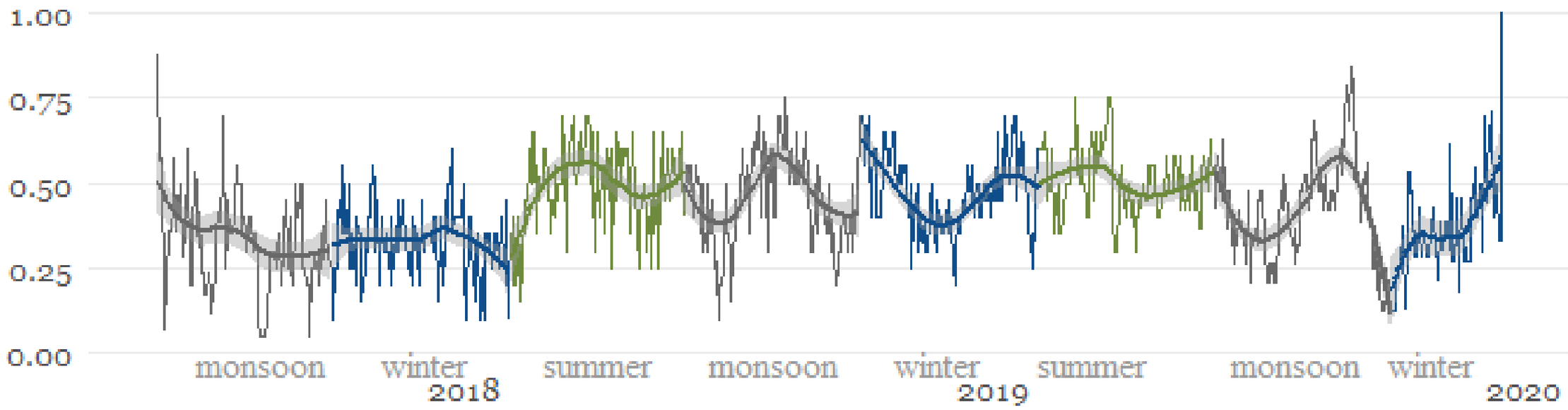
District	N	Monitoring period	SPIP installation
Saptari	23	6/2017 - 12/2019	4/2017
Rautahat, Bara and Sarlahi	30	6/2018 - 12/2019	4/2018

Crop	N	crop size area (ha)
Wheat	23	0.35
Paddy	42	0.55
Vegetables	32	0.24
Pulses	10	0.18

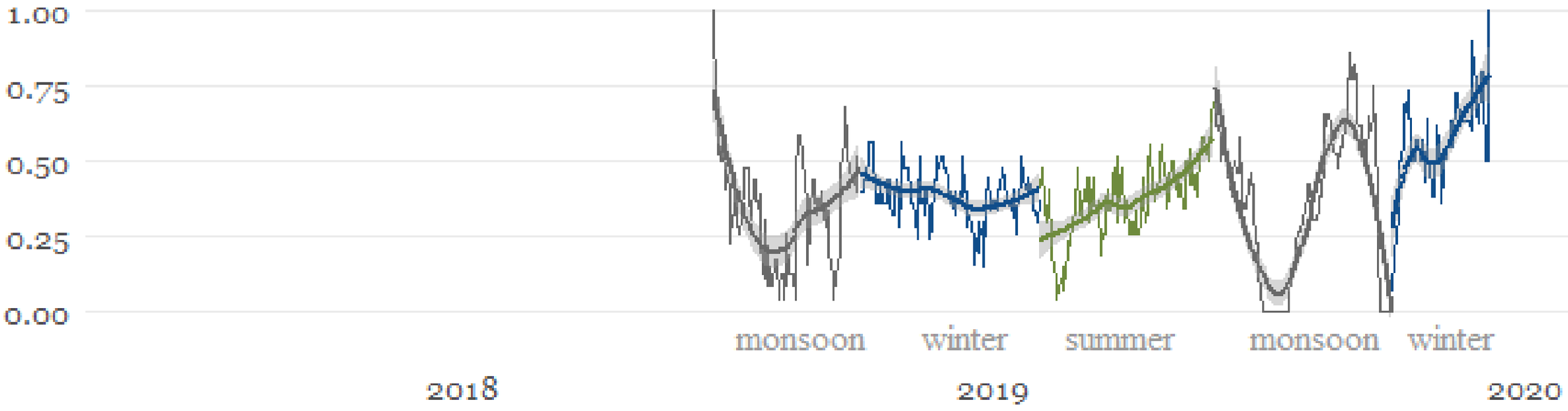
The average user operated the SIP on only 40% of the days.

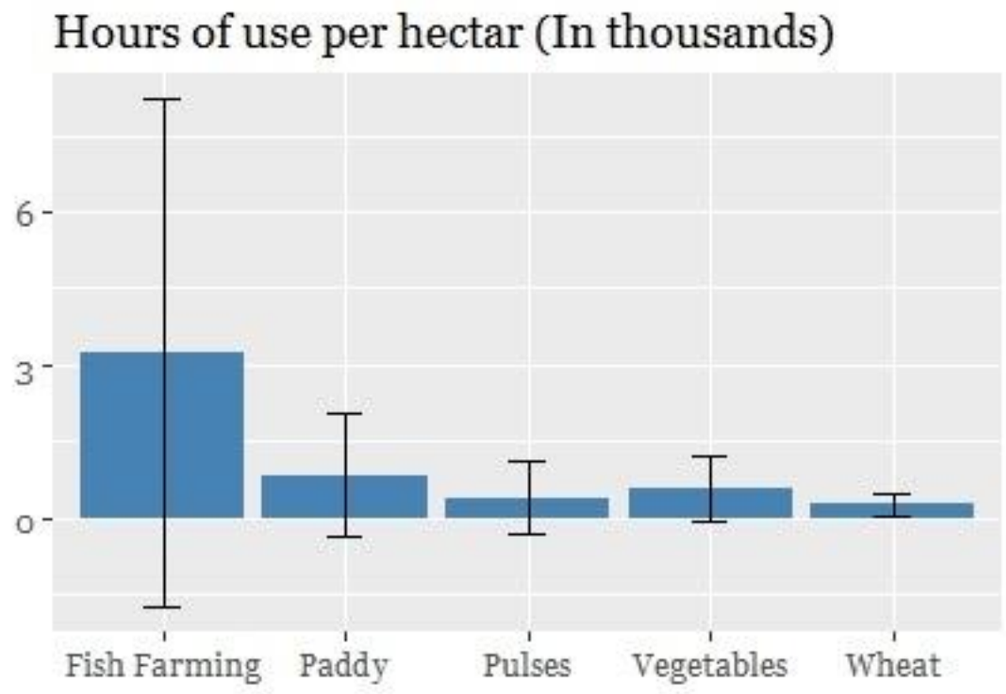


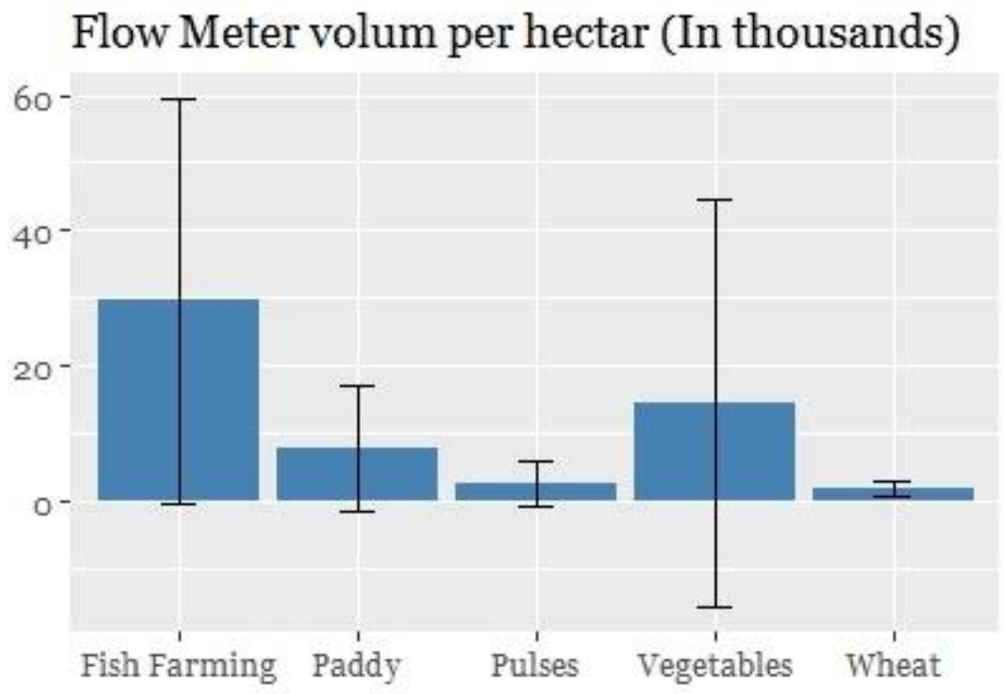
Saptari

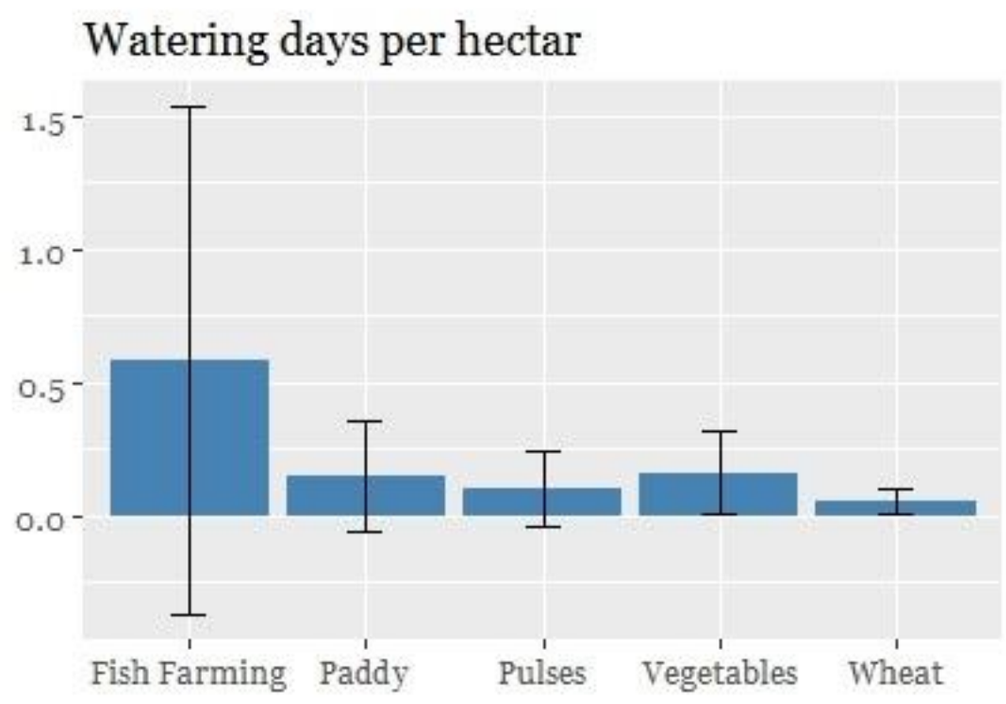


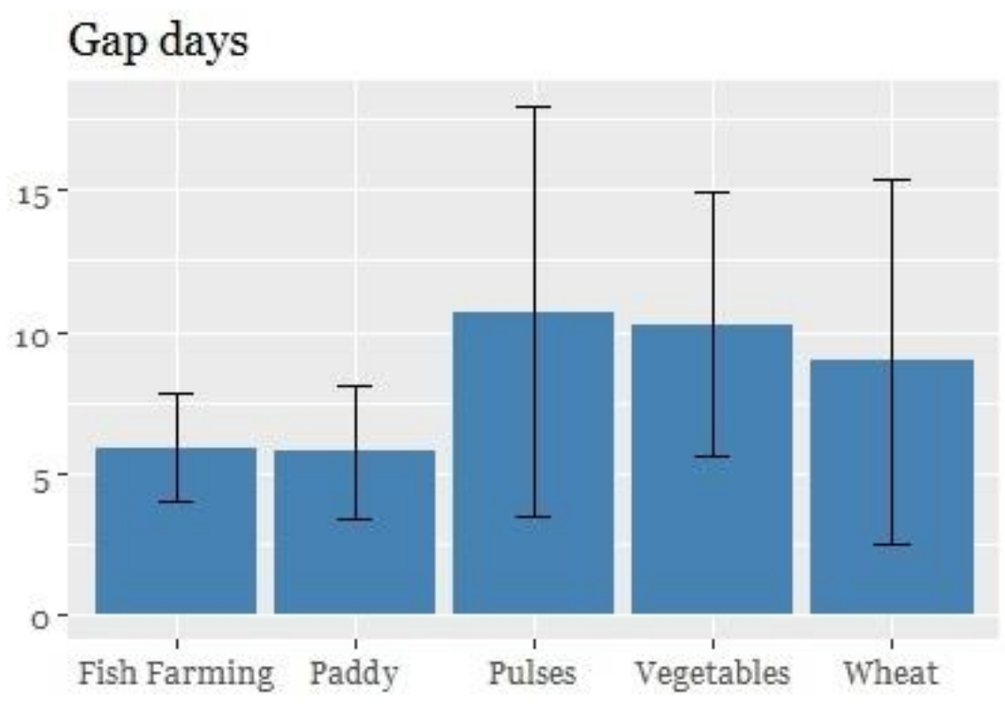
Rautahat Bara Sarlahi




Hours of use per hectar (In thousands)
6
3
0
Fish Farming
Paddy
Pulses
Vegetables
Wheat


Flow Meter volum per hectar (In thousands)
60
40
20
0
Fish Farming
Paddy
Pulses
Vegetables
Wheat


Watering days per hectar
1.5
1.0
0.5
0.0
Fish Farming
Paddy
Pulses
Vegetables
Wheat


Gap days
15
10
5
0
Fish Farming
Paddy
Pulses
Vegetables
Wheat

- What can go wrong?
  - There is no value to be derived from additional water.
  - Why?
    - Water from other sources is sufficient (precipitation).
    - Land is fully irrigated with crops with the highest returns to water.

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  - There is no value to be derived from additional water.
  - Why?
    - Water from other sources is sufficient (precipitation).
      - Store water.
    - Land is fully irrigated with crops with the highest returns to water.
      - Hard to imagine.
      - Sell to neighbouring farmers.

Conclusion

- Farmers utilise the SIP very partially
- Land is not fully irrigated, certainly not with high value crops.
- Very little water selling (only 7 farmers).
- Could water market and crop market frictions hamper SIP profitability?
- Need for more work.

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land irrigated by SIP (from diary)

Total land irrigated by all sources (from hh survey)