Increasing SIP Utilization for Market Viability

Evidence from ICIMOD installed SIPs in Nepal Tarai

Dipendra Bhattarai
Ram Fishman
Nabina Lamichhane
Aditi Mukherji
Dan Oziel

*Authors in alphabetical order
• 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 result 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).

<table>
<thead>
<tr>
<th>District</th>
<th>N</th>
<th>Monitoring period</th>
<th>SPIP installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saptari</td>
<td>23</td>
<td>6/2017 - 12/2019</td>
<td>4/2017</td>
</tr>
<tr>
<td>Rautahat, Bara and Sarlahi</td>
<td>30</td>
<td>6/2018 - 12/2019</td>
<td>4/2018</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Crop</th>
<th>N</th>
<th>crop size area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>23</td>
<td>0.35</td>
</tr>
<tr>
<td>Paddy</td>
<td>42</td>
<td>0.55</td>
</tr>
<tr>
<td>Vegetables</td>
<td>32</td>
<td>0.24</td>
</tr>
<tr>
<td>Pulses</td>
<td>10</td>
<td>0.18</td>
</tr>
</tbody>
</table>
The average user operated the SIP on only 40% of the days.
• 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.
• What can go wrong?

• 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.

Funding by ICIMOD gratefully acknowledged
Total land irrigated by all sources (from hh survey)

land irrigated by SIP (from diary)

Area size (in ha)

Rautahat_Bara_Sarlahi

Saptari

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