



Limitations to Effective Weed Management under Zero Tillage Systems in the Eastern Gangetic Plains



New Learnings for Policy Makers to Consider (turn over for more detail)

- Indications are that ZT is women friendly and should be supported by governments, not just because it has agronomic and economic benefits, but because it can also enable equitable development.
- Herbicide use as part of a CASI system can be seen as enabling diversification, and renewed efforts should be put into supporting these diversifications (both agricultural and livelihood) that emerge for saved time and money. These may have substantial impacts for ZT using households that enable livelihood transformation towards many of the sustainable development goals.
- Further capacity development of extension officials is needed to extend safe herbicide practices to farmers. Particularly for Maize systems, extension systems should focus on herbicide use and management techniques to ensure the full benefits of ZT are reached, and that herbicides are used safely to both people, animals and the environment.

Prepared as part of the projects:

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Photo Credit: Connor Ashleigh

What is the Issue?

- Conservation Agriculture based Sustainable Intensification (CASI) systems are currently practiced in about five million hectares in South Asia, yet its adoption in the Eastern Gangetic Plains (EGP) has been minimal.
- Transitioning from traditional cultivation to a CASI system involves replacing tillage with herbicides use requiring new knowledge to effectively manage crops, particularly in the early weeks of crop establishment.
- Because of this, weed management has been commonly identified as a constraint to the wider scaling of CASI (and thereby Zero Tillage) systems. Yet there has been to date limited evidence to suggest what the actual constraints are beyond perception of weeds as an issue.
- While farmers in the Eastern Gangetic Plains (EGP) are spending less time in weeding under ZT cultivation systems, there remains a lack of comprehensive knowledge of weed control and management that is delaying sustainable intensification adoption process.

Farmer's experience of weed management under conservation agriculture: Insights from the Eastern Gangetic Plains.

Suri, B., Timsina, P., Brown, B., Karki, E., Chaudhary, A., Sharma, A., Sharma, R., and Gartaula, H. (2021; *In preparation*).

Methods:

249 semi-structured interviews with household heads selected using snowball sampling to collect responses from a mix of ZT users and non-users with the objective of understanding farmers perceptions and knowledge around ZT use and ZT weed management practices and its impact on gender relations in a household.

Key findings:

- Herbicides are in use for a long time in the region, specially Malda, Cooch Behar, Rangpur and Rajshahi, irrespective of the decision to adopt conventional tillage or zero tillage. But dis-users or new users of ZT commonly report negative perceptions about ZT which can be traced back to ineffectiveness of herbicides, misinformation about herbicides or farmer preference for traditional methods of weeding.
- Spraying of herbicides is becoming men's responsibility, partly due to the spray tank weight and design which makes it less feasible for female use. This "male-friendly" aspect of ZT could have further implications on gendered labor allocations, especially for rural migrant households where women are in-charge.

Conclusions:

For a region challenged with low literacy and high poverty levels, focussed extension efforts to create more awareness and literacy around proper weed management using herbicides under CASI are required. Research findings also open up areas that need further probing to explore in detail the socio-economic and gendered impacts of weed management under CASI.

Herbicides and Zero Tillage in South Asia: Are we creating a gendered problem?

Brown, B. Karki, E., Sharma, A., Suri, B., and Chaudhary, A. (2021: *Under review*)

Methods:

Targeted in-depth study using quantitative, qualitative, and visual data collection methods with 25 ZT adopting households, with both male and female respondents for each household across the early planting period.

Key findings:

- Weed management aligns positively with reduced time and no reallocation of roles or burden when herbicides are used.
- ZT saves substantial time in India and Nepal, and on balance more so for women.
- Low knowledge of weeds exists, though use of non-selective herbicides may mean this is not problematic.
- No changes in weeds dynamics is (yet) present from those transitioning to CASI systems.

Conclusions:

Findings indicate that ZT can be considered inclusive based on substantial time savings in India and Nepal, no reallocation or increased burden of roles and responsibilities on women and balanced spousal knowledge of weed management practices in all localities. This research suggests that there may be less concern about inequality in the promotion of herbicide based ZT systems in South Asia than experienced in other geographies.

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