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# Improving water use for dry season agriculture by marginal and tenant farmers in the Eastern Gangetic Plains

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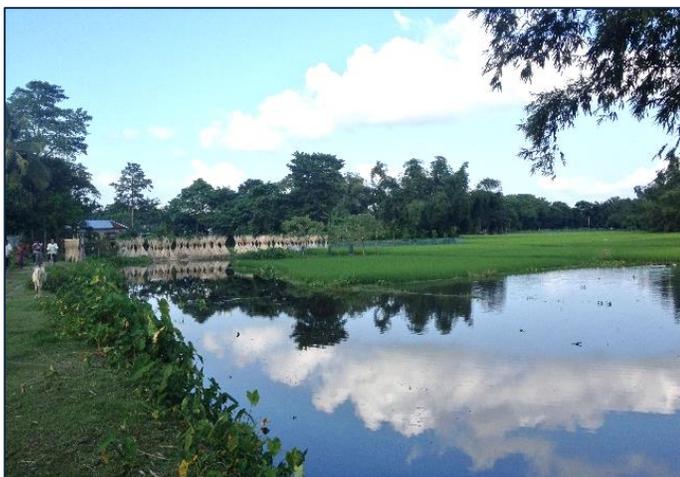
It is important to consider the progress we are making in our project which aims to improve the livelihoods of women, marginal and tenant farmers in the Eastern Gangetic Plains, through improved dry season irrigated agriculture.

Overall we can be pleased with progress. While there is still much to be done, the foundation is sound. Connect to the project web site to get examples on some of our activities on the ground. <http://dsi4mtf.usq.edu.au>

Now is a good time to reflect on how far we have come and how we are progressing towards answering our key research questions.

**Question 1: What is the existing distribution of ground and surface water, irrigation demand and extent of irrigation in the study sites? What are the technical constraints of existing irrigation systems using different energy sources?**

We are working with farmers and collectives across 12 villages in Saptari (Nepal), Madhubani and Cooch Behar (India) and NW Bangladesh, where we are evaluating existing irrigation and cropping practice and changes to farming practices, in response to a range of social and biophysical interventions.



*Pond irrigation as a potential water source*

Thirty six intervention sites are being monitored for current water use, water resources availability and irrigation practice. Mapping of sites and water resources has been completed.

Biophysical information including crops, irrigation practice, field inputs, crop production and production economics is being collected from more than 500 plots. Tubewells and ponds at each site are being monitored. All this data is being stored in a set of databases and linked to a GIS.

This information will allow an assessment of water supply and demand, water use efficiency, crop production and economic performance. We will be able to compare traditional farming methods with new approaches for dry season irrigation using improved approaches for water management, under traditional and new cropping systems.

**Question 2: What are the existing patterns of vulnerability and the social structures (e.g. land tenure, role of women and young people), institutions and policy context that determine access to ground and surface irrigation and shape livelihood outcomes in the study areas?**

We have a clear socio-economic profile of the villages and institutions and have worked closely through the partners in mobilizing the local community and developing paths for collective farming.



*Stakeholder Meeting Saptari*

A comprehensive socio-economic survey has been administered which provides useful baseline information to understand local context and assess project impacts.

An analysis of land tenure, agricultural institutions, and trends has been completed for all sites and extensive mobilization and engagement has taken place.



Different models of collective production are functioning, and regular monitoring of group performance is being carried out. Key policies in Nepal and Bihar have been reviewed and summarized.

Good progress has been made in assessing the influence of feminization in agriculture on decision making processes in water access. Sixty five in-depth interviews with female and male farmers of different caste, religion, ethnicity, age and socio-economic backgrounds as well as twenty-one focused discussion groups have been conducted to understand the impact and perceptions of migration and gendered water access and agricultural practices on women's identity as farmers. As part of this an institutional and gender review for agricultural water innovations research is well advanced in NW Bangladesh.

**Question 3: How have adaptations to ground and surface irrigation in Bangladesh addressed structural, institutional and energy constraints? How can these experiences inform policy changes in Nepal and India?**

Six villages have been selected for comparative assessment of the Bangladesh situation for water management including social, gender and institutional aspects of interventions. Monitoring equipment has been installed, field staff appointed and data collection is underway for crop production and water management practices across 18 sites comprising more than 200 fields. Data collection includes groundwater depth, field level irrigation practices, soil moisture, production inputs and costs, crop yield and system economics.

Of particular interest is the role of deep tube wells and shallow tube wells, access to electricity and pre-paid card systems and the impact of lowering groundwater levels on decisions and water management. Biophysical interventions such as alternative wetting and drying, irrigation scheduling, improved water conveyance, crop selection will be implemented next Rabi season.



*Field officer and farmers at Rangpur trial site, Bangladesh*

From an institutional, gender, equity and livelihood perspective, two villages have been selected where 25 semi-structured interviews and 9 focus group discussions have been conducted identifying the implementation process and success and potential externalities of the adoption of deep tube wells and related agricultural innovations. Insights on water markets and gendered village, district and national level institutions provide an understanding of the political economies associated with the adoption of innovations, and its influence in mediating how differently capacitated stakeholders are able to benefit from them. This analysis is hoped to also indicate the appropriateness of specific technologies to different farmer classes. Identification of relationships and trade-offs in ground water management and sustainable rural development relevant to national policy discourses.

**Question 4: What is an appropriate model for the sustainable provision of dry-season irrigation using both surface and groundwater, and energy-efficient, affordable pumping technologies?**

The processes and steps outlined above provide the framework to work with communities to explore biophysical and social interventions to improve livelihoods of marginal farmers through dry season irrigated agriculture.



*Installing shallow tubewell in Dholaguri, West Bengal*

The thirty six selected sites provide opportunities for ongoing community engagement and evaluation of different approaches to improve water access and irrigation management, including collective farming systems.

Participatory action learning is the basis for our work and partners have engaged closely with communities to understand their needs for collective management and identify technical opportunities.

Cropping calendars have been developed, training programs established and delivery is underway based on local priorities.



Data collection procedures are in place to assess changes in management practice (social and biophysical) as the project progresses. This includes records of farmer group meetings and training programs to document participation and decisions. Biophysical and economic information is being collected including water supply from tubewells and ponds, energy usage, field irrigation practices and crop production and economic data.



*First production of potatoes by woman collective farming group, Madhubani*



*Woman farmer self - help group*

### Summary

The project is at a busy and important stage of development and we look forward to continued close engagement across our regions and partners.

Of particular importance will be writing up our progress in the June 2016 annual report and preparing for the project mid-term review in September 2016.

Regular communication between partners is of critical importance. We have established a range of avenues to allow for sharing of data, ideas, photos and stories. Please see the links in the box below, and contact us if you would like to join the WhatsApp group. This newsletter and a range of other project information is available on the DSI4MTF dropbox. Please email [dsi4mtf@usq.edu.au](mailto:dsi4mtf@usq.edu.au) if you would like access to the Dropbox

**Question 5: What institutional innovations are necessary to make this model appropriate to marginal and tenant farmers, including women and potential migrants? How can this model most effectively strengthen their livelihoods and build resilience?**

The answers to this question will result from the processes outlined above. We have already developed a good understanding of the community structures and engagement process as well as broader tenant farmer, gender and institutional aspects. This will allow us to document processes for institutional innovation.

### How we connect

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