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

The power of the Marginal: Local institutions and innovations are the key

Working Paper

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1. Background

In India, of about 121 million agricultural holdings around 99 million are small and marginal (with an average land holding between <1 ha to 2 ha per capita). Marginal and small farmers constitute around 80% of the total farm households (Dev, 2012). Therefore, the future of sustainable agriculture growth and food security in India depends on the performance of small and marginal farmers (Lipton, 2006). According to World Development Report (WDR,2008), GDP growth originating in agriculture is at least twice as effective in reducing poverty as GDP growth originating outside agriculture. Additionally, the sector offers employment to 56% of the Indian workforce (Dev, 2012). However, their share of the operational land holding is only 44% which suggests substantial land inequalities. Marginal farmers strive very hard to sustain their agriculture and living. Factors contributing to improved performance in agriculture include a highly motivated household work force, low transaction cost on accessing inputs and resources which are often localized and informal (Sen, 1962). 'Non-wage family-based farming 'has some efficiency advantages that capitalist farming does not have' –Sen concluded. Singh, Kumar and Woodhead (2002) observed that their vital contribution to Indian food and agriculture economy and to their national food security results from *their responsiveness* to the public policies *and national investment in agriculture research.* A recent trend shows expanding aspirations for their children and family for which their effort is working harder and producing more (Mishra,2016). Working, under such situations, local innovations emerge as an inevitable imperative.

'Small' does not always augur well and 'beautiful' when it comes to expanding better market linkage and value chain, which necessitates high transaction costs. Accessing emerging agro-technologies, institutional credit and other institutional supports is seen as having serious constraints for them. This tends to block their aspirations and often demoralizes them for better efforts. It is pertinent also to point out that only 10% of small and marginal farmers enjoy any institutional membership (Lokniti, 2014) which may be a constraint to their accessing institutional support.

2. DSI4MTF Initiative

Seen in the context of the above, *'Dry-Season Irrigation for Marginal and Tenant Farmers' (DSI4MTF),* as an action research project, is a timely step in the right direction. The project envisages to test the efficacy of bio-physical, technological and institutional aspects in augmenting the farm productivity of small and marginal farmers in a dry season scenario, which renders the land fallow and un-irrigated/ uncultivated/under -cultivated. The idea is to assess the bio-physical and social and institutional situations, analyze them and articulate and evolve interventions- the emphasis given to farmers' participation, collectivization and institutional development. Community has been considered central and a multi-disciplinary approach, in dealing with the above, will be crucial to be able to deal with the issues of subjects and issues beyond the boundary of a single specific discipline and expertise. The project hypothesizes that the above interventions and approaches would help plan agriculture and water management to optimize productivity by bridging the irrigation and other technological inputs- gap and allow diversity. The project is also assessing and mapping the local institutional landscape and making

efforts to strengthen them –the hypothesis being – such an institutional strength would enhance farmer's capacity to access resources and inputs and make dry season agriculture a viable and profitable enterprise. As is clear from the above hypothesis and approach, the project inevitably aims at ensuring inclusion in implementing the project through assessment, analysis and articulation of interventions. The above leads to the conclusion that sharing the outcome and benefit of the project would traverse the trajectory of inclusion.

Considering the pervasive scenario of marginalization. In the Indo-Gangetic Plain (IGP), the project is designed to cover three locations –one in Nepal-(Saptari) and two in India-(Madhubani-Bihar and Cooch Behar and Alipurduwar, West Bengal) which are considered home to the small and marginal farmers. The locations also suffer various other deprivations.

2.1 The Cooch Behar sites–Dhaulaguri and Uttarchkowakheti (UC)

The Cooch Behar sites of Dhaulaguri and UC have been identified and selected based on certain bio-physical and social indicators. The two villages, however, have distinct characteristics. This may be useful to appreciate and analyze the processes and outcome of the research.

Key Characteristics	**Dhoulaguri**	**Uttarchakuakheti**
Demography	Settled Migrants from Bangladesh – shared lineage and social root	Laborers migrated from Jharkhand as tea garden laborers
Typology	Small and marginal farmers with large number of landless, land distribution uneven	Small marginal with few farmers own very large land -50 bigha. Land holding among the small –marginal even –nobody has less than five bigha of land
Gender relations	Women enjoy freedom and sense of equality –most of whom are fully involved in agriculture. Some of them are also farm laborers and receive a differential wage rate. Their contribution in agriculture is not loudly and clearly acknowledged.	Women enjoy freedom and sense of equality –most of whom are fully involved in agriculture. Some of them are also farm laborers and receive a differential wage rate. They also work in the forest and sand mining. Their contribution in agriculture is not loudly and clearly acknowledged.
Sources of livelihoods	Agriculture and petty trade . Migration –seasonal and no case of prolonged migration	Agriculture, Minor forest produce and sand mining. Some seasonal and prolonged migration.
Bio-physical	Plain agriculture land with river and ponds-water table high. Soil is alluvial clay	Plain but stony and forest around. Sandy loam and sandy
Irrigation availability	River and ponds plus rain	Pond, river-water retention low in pond, rocky terrain obstruct drilling of well

Agriculture	Paddy, wheat, potato, tomato and other vegetables.	Paddy, maize, vegetable, wheat on small scale. Betel nut and now black pepper (just on trial)
Vulnerabilities	Drought-long spell of dry ,rain, frost and a rampaging bull which has religious and cultural sanction to freely graze	Drought, long spell of rain, stray and wild animals including wild elephant
Institutions	School, Panchayat, SHGs, farmers club, religious club. Institutions are not strong and well governed	School, Panchayat, SHGs, farmers club, religious club. Institutions are not strong and well governed
Leadership	There are well recognized farmer leaders acknowledged for their agriculture and insights. They are also socially acknowledged. Leadership is growing and expanding	There are well recognized farmer leaders acknowledged for their agriculture and insights. They are also socially acknowledged. Leadership is growing and expanding. Leadership in this village is more grounded and natural-showing and respecting democratic values
Entrepreneurship	There are some-not substantial	There are some-not substantial
Innovators	A group of farmers are innovators	Evolving
State support and interventions	UBKV considers this as their field lab –has been active but project based missing consistency and continuity.	UBKV ,once called this village as adopted but has no significant presence. Some of the farmers frowned this approach. Forest department has their occasional programs.
Response to DSI4MTF	Introduced through the UBKV initial response was wild showing dependency A sense of partnership is evolving. Collectivization is strategic	Initially subdued because of late entry Now steep rise in enthusiasm and sense of partnership. A natural reception to the technology and idea of collectivization. Shows great potential for –collectivization.

2.1.1 Progress after two years and looking beyond

It has been a momentous period marked by iterative thinking through reflection, planning and articulation. The mid- term review (MTR) offered its feedback and proved quite constructive. We, however, need to be more reflective and searching within ourselves. Looking at the activities significant milestones seem to have been covered overtly.

The intention of this write-up is to share our own understanding of where we are, what we have achieved and what needs to be attended to sustain the pace and quality of what has been suggested and planned.

An empathetic community engagement strategy helped building collaboration: from the first visit, after inception workshop in Kathmandu, we have been insisting on our approach of the project-this is a research project and you (the community) are the knowledge partner in this. Although this was in conflict with the entrenched expectations that they had learned over time there has been respectable relationship built between the community and the research team. This has not been a smooth walk however. We have multiple partnerships in this project with each partner having one's own background and disciplinary biases. Collective reflections and clear stand often helped in appreciating each other's' view points and approaches. We successfully, made appropriate site selection and agreed on the approach and process of interventions. The community appreciated our approach and the environment of transparency helped greatly.

Response to technology and ownership: In a limited and scarce resource and dependency scenario, anything that comes for free is welcome. In DSI4MTF we have proposed technology as an intervention to test certain hypotheses. We have tried to explain this position clearly and convincingly. We have shallow tube wells, solar pumps and micro-irrigation infrastructure as interventions. As a first test we have passed selection of site issue and the site for the installation is decided collectively. The last technology assessment mission has confirmed their technical appropriateness based on certain technical indicators. This season they are also being used for the Rabi crop. The following concerns need to be allayed:

1. **Governance structure for the management-**Managerial responsibilities, cost recovery, maintenance, rotational bases and also maintenance. Suppose the solar pump breaks down during a peak season. How soon that can be repaired and put in place? Once the breakdown prolongs it will not only harm the crop but would also de-motivate the farmers.
2. **Non-member use of the facility:** The above may be relevant for the collective. But the systems would be used beyond collective. Consideration needs to be given on how to calculate and realize the maintenance and operational costs from individuals outside the collective benefiting from the infrastructure.

The reason these need to be understood are the followings:

At the end of the project when we write the report recommending certain prescriptions for sustaining dry season agriculture we will need to factor in such scenarios. These, in Cooch, Behar does not seem to be clearly delineated. There is a need to learn from other locations.

Collectivization on test: After the irrigation systems were put in place the first initiative was collective farming. The paddy was planned in Dhoulaguri following a collective mode. The farmers got involved and the process witnessed heightened sense of enthusiasm. It showed significant collective ownership. The analysis, after the harvest, did not show an inspiring economic result and scope for sustainability. The collective social analysis and audit suggested a cautious approach for the future especially when it comes to the principal crop which defines

survival of the farmers. As a result when it came to trying the same formula for Rabi it did not find favor with the land holders. Even the landless were not favorably inclined as:

1. For the land owners potato was the only crop which ensured their survival for the next of the year. They could not take the risk of sharing the opportunity,
2. For the laborers who were earlier the partners in the collective farming of paddy their involvement would amount to much more time than what could be compensated for by the share they might get.
3. This, however, should not be explained in simple profit and lost analysis. The literature on collective farming does not offer a uniform explanation of what can work and what not. Also collectivization and its impact should not be explained in the context of one specific area of collaboration-in this case collectivization is in the context of cultivation. Collectivization needs to be understood against a wider canvas of collective and shared goods and opportunities. To realize that level a deep and comprehensive social engineering context and framework will have to be understood and pursued.

In Uttarchakwakheti collectivization, early summer, has been notional. But for the Rabi, owing to a vigorous social mobilization, there is an environment in favor of collectivization. The situation over here differs from Dhaoulaguri in the sense that all the farmers have land –there is no landless farmers. Another reality is the social structure. The tribal community has a strong sense of collectivization and sharing. This explains also the structure as a determining variable for collectivization.

Monitoring, documentation and sharing for cross site comparison and reflection: Exciting activities are going on at all the project cites. Cooch Behar has also picked up technology installation-solar power, protected farming, cropping system innovation and planning. Each set of activity has its complexities. Being a research project we need to have data/insights on all that we do? At the end of the day we will need to generalize our findings which we cannot do based on intermittent observations and use of other qualitative methods. A case study prepared post events can act to substantiate or reject but we need to have longitudinal time series data/observation related to a program and process. The qualitative monitoring frame work as developed by the project envisages regular and systematic collection of data to be consolidated and used to guide future action.

Some of the important aspects to be captured and analyzed may include the followings:

The gender relationship: The time management analysis of women farmers at home and at the fields. Also what are they involved in? Are they given opportunity to deal with the technology? What are the perceived areas /domain of discrimination? These questions would need to be observed, documented and shared across sites.

The landless at the margin and women headed households: What is the level of their (landless) involvement in the project activities? How do they gain?

Analyzing the dynamics of collectivization: As has been indicated collectivization is not linear relationship –it follows a complex dynamics. The following needs to be analyzed:

1. Relationship between the landless and land owners in a collective framework? Who decides and controls and what is the dynamics of cost benefit sharing?
2. In the scenario where the collaborators have land but enjoy a higher social position, his/her contribution to the process and his role needs to be understood before we try touching and explaining exclusion and inclusion dynamics and
3. Scenario of economic viability-what can make the collective farming a viable and at the same time inclusive opportunity.

2.1.2 Building on the Power of Marginal: Imperatives for DSI4MTF

Dukha Oraon (UC) is always on the move to experiments -his power of innovation speaks loudly!

We began with appreciating the potentials of the marginal and small farmers. Some of the factors that enhance their potential are said to include a highly motivated household work force, low transaction cost and rising aspiration for education of their children wellbeing of the family. The factors that limit their capacity may include missing membership to and affiliation with the existing institutions which could ensure their access to credit, technology and other inputs. Even with their ownership of 44% of operational land holding they offer employment for 56% of Indian work force. This sounds and speak of immense clout this sector enjoys. But at the same time their yearning for crossing the boundary of marginalization is blocked and deterred by missing institutional linkage for credit, technology and appropriate value chain.

DSI4MTF, mid-way**,** has acquired relevant learning which might suggest a framework and strategy for building the power of the marginal and small farmers and thereby attempting poverty reduction, marginalization and exclusion. Learning through our exposure to some of the insights from the field and good practices we may propose a frame work which touches upon an institution, innovation and collectivization. One may feel dismayed at the prospect of these seemingly non-technical/non-scientific elements as determinants of empowerment of the marginal groups. On closer examination, however, one may find an inevitable role these

factors can play in building the power and clout of the marginal farmers and communities as elaborated below.

Institution building: Much of the opportunity – technology, credit, and value addition -is located beyond the domestic boundary of the individual marginal farmers. One needs to have collective and institutional ratchet to steadily move toward accessing those opportunities and resources which are rightfully available for them. Government has provided for such opportunities but with certain conditions and norms which bind people together as joint liability entities. This is consciously done to ensure and maintain norms using peer pressure. This is what the institutions are-***'a collective of individuals with shared goals and norms '***. Being part of this collective one enhances ones credibility and clout to be valued and trusted by others including institutions resources and inputs –technology, credit and market linkages.
In the case of DSI4MTF we have several institutional variants -(1) Farmers club,(2) Self-help groups,(3) Joint liability groups,(4) Producers groups and (5) Farmers' Cooperatives. Being part of these institutions necessitates following certain norms and assuming responsibilities. This is what institutional strengthening would entail. DSI4MTF exposure to this process and successful demonstration of how institutional strengthening/building can materialize equips it to suggest how the small and marginal farmers can evolve strong institutions which can help them access opportunities from outside.

In Cooch Behar the institutional scenario does not demonstrate a matured status. The farmers clubs are still not fully functional and the SHGs are yet to develop clout to access credit and at the same time voice the gender concerns. How the women groups can initiate and conduct a gender audit of the project with reference to participation, inclusion and sharing of opportunities? How the groups can address the questions of inequalities within the project. The project needs to demonstrate the wherewithal and that can be a concrete contribution to the building of the power of the marginal.

Collectivization: For various structural reasons there has been sharp fragmentation of society. The fragmentation can be witnessed across caste/class/ religion and gender. Any effort at collectivization around certain economic and livelihoods domain may not prove effective if we do not examine and analyze the core dynamics of trust deficit. How can this be done? Is it achievable? Boasting of return of 'sanity and good will' by a stroke of rules and incentives would be preposterous and Machiavellian in thought and action. Restoring faith in each other, developing empathy and solidarity would follow a gradual process. A careful ethical engagement has the intent of sprouting trust in each other. Collectivization, inevitably, would require this ethical engagement. We have witnessed how farmers have started appreciating each other's perspective and how a collaboration is evolving between the researchers and the farmers. This process can help consolidating collectivization and also institution building.

This does not, however, happen mechanically. There are processes and tools that have worked better and positive in our case. We can share these tools and offer learning opportunity to the marginal farmers to build the power of collectives and in the process be able to access opportunities for their development and wellbeing.

DSI4MTF need to first consolidate its learning before generalizing its formulation. This would mean that we synthesize all our learning from across the sites and analyze what makes certain strategies and tools to work better in given contexts and milieus.

Innovation: Innovation is doing and acting differently from the established methods deviating from set protocols. Innovation involves elements of risks. The small and marginal farmers are usually risk averse which means they prefer risk secured agricultural enterprise. The risk aversion blocks exploring new ideas. Innovation can be in terms of

Sowing the seeds of innovation – Dhoulaguri farmers on trialing of emerging technologies

approach content, process, practice. In the dynamic world adjusting with the changes are needed-those who change may succeed and prosper those not would not stagnate. There has been diverse literature on the subject and they examine a wider spectrum of risk behavior. One common element indicates that risk taking is mediated by perceived/real support system available. In India such support system can be found in policy prescriptions and insurance against loss due to various factors including trialing and experimenting with new ideas and practices.

But then access to such insurance provisions would require institutional affiliation and collateral. Also collectivization helps disperse and spread losses due to innovations. Once the shield is or foreseen to be available then tendency to innovate and take risk increases.

In case of DSI4MTF, with the availability of irrigation through improved technology, farmers may need to trial new crops. They can also move to emerging technologies, for example, zero tillage technologies which can enhance productivity and help reduce cost. Also with the availability of new produce they can move to new farm based enterprises. Dhoulaguri produces huge quantity of potato and tomato which may sometimes face market glut. An entrepreneur may try processing and marketing of potato chips. Uttar Chakuakheti farmers are already trying improved variety of betel nuts and black peppers. Such innovations need to be carefully encouraged.

It would be advisable to keep encouraging such innovations, which are often farmers driven, and keep capturing \the dynamics of innovation. Consolidating the learning and sharing with others may lead to up-scaling of innovations and thereby building their power.

Let us consider the following:

The above factors connect constructively with each other. The collectivization is essential for a strong institutional development and the two together offer opportunities for innovation. There is no specific order in which they operate and function. The need is to pick up the functional elements from each of the above at appropriate time and space and try linking them together to optimize opportunities for the small and marginal farmers.

2.1.3 DSI4MTF's possible strategies and path ways for empowering the marginal

DSI4MTF is not an initiative to offer physical and material support. DSI4MTF is a research enterprise with focus on inclusive knowledge transaction which inevitably involves facilitating the process of knowledge transaction involving all who matter most. Farmers are one of the most important knowledge partners who are contributing to the knowledge generation and also applying the knowledge in their respective fields. There may be bio-physical and social variation and that is where their native knowledge helps in adaptation of the knowledge and analyzing how the knowledge works in the changed scenario. The cycle would expand and cover more territories and farmers. Our learning can go a long way in triggering innovations and helping the farmers relate with them. This would require careful design of a dissemination strategy. Let us consider the followings:

1. Incubation and trialing – for example new crops and methods at different locations,
2. Capturing the learning specific to different locations-monitoring
3. Comparing and synthesizing the learning
4. Theory building
5. Knowledge expansion
6. Knowledge adoption by others

The efficacy of our efforts at empowering the small and marginal farmers would depend upon the well-orchestrated knowledge infrastructure with the scope of lateral and vertical sharing and dissemination of knowledge thus generated. This knowledge, needless to repeat, may relate to institutional development, collectivization and innovation. The knowledge transaction and sharing can pass through publications and other interactional events.

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