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Ahsan Habib**

The Livelihoods Approach and Innovation of Small Scale Irrigation in Noakhali *Char* area in Bangladesh

Abstract

This paper identifies the rules and principles that govern small – scale irrigation, including the use of groundwater in Noakhali *char* area in Bangladesh. It focuses, not so much on the impact of technical aspects of irrigation but on the ways in which the social relations of land ownership / access directly affect farmers' access to water and their ability to innovate. Drawing upon ethnographic work on livelihoods, we suggest a renewed understanding of the notion of 'poverty'. The main argument of this paper is that 'poverty' is a state of being that can be re-read through analysis of local social relations and specific socio-political contexts. It also argues that farmers develop varied and complex livelihood strategies which are strongly influenced by networks and social relations. These are very significant in access to political and social resources, especially access to and use of water to innovate particular irrigation, though small-scale.

Introduction

In this paper we explore the relationship between social relations, insecurity and livelihoods in the context of water melon production in Noakhali *chars* (newly alluvial land) in Bangladesh. The research on which the paper is based was funded by the DFID/ESSRC and administered by the department of social anthropology, Sussex

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University The project involved a yearlong study of a *char* area (which for reasons of confidentiality we shall call Khash *char*) in Noakhali. The overarching aim has been to get an understanding of the rules (both formal and informal) for access to water for irrigation and a sense of how, these are changing.

The study particularly deals with social and political relationships that affect small irrigators' growing strategies and their ability to innovate. It contributes to existing literature which emphasises the potential of small scale irrigation¹. In Bangladesh, on average, 0.035 million hectares is irrigated by manual irrigation pumps. Elsewhere in Bangladesh, manual pumps such as treadle and rower pumps can be used for small-scale irrigation with viable economic returns (Dey *et al.*, 2013). This study therefore complements the small scale production and suggests taking into consideration the social relations of water use.

Our research methodology was basically qualitative. The main objective was to build up an ethnographic case study of the social relations of water and the relationship between these and farmers' ability to innovate. We first attempted to meet and map all the different types of farmers, to understand what they have grown, how they interrelated and what their strategies were. Sometimes this involved meeting with individuals and sometimes with groups in tea stalls, yards and in the fields in order to see ongoing activities of watering. This involved farmers and their households indicating which of the surrounding households they are related to, what are the actual distance from the ponds or hand pumps and so on.

Empirical evidence shows that they have minimal impact, largely because the water reservoirs have not been maintained according to the plan (Ahmed, 2000). Moreover we are told by one group of landless farmers that in order to grow watermelons, they have to negotiate a new contract with the landlord, who does not allow it. Growing watermelons therefore depends on political relationships as much as access to water. Landlords are not interested in investing in shallow tube wells in the fields, the group of small farmers and sharecroppers tell us. Consequently, the winter vegetable irrigation involves an innovative, adaptive technology involving plastic pipes and shallow sunk hand pumps. Some of these hand pumps are inside *baris* (homesteads); others have been sunk in the fields. The pipes are attached to the pumps by cut off plastic bottles, are brought cheaply by the farmer, and can run for

many hundreds of feet across the fields. This paper highlights this innovative nature of irrigation as alternative livelihood strategies for many 'poor' and landless farmers in Khash *char*².

Drawing upon ethnographic work on livelihoods in Noakhali *char* area, we suggest a renewed understanding of the notion of poverty. In this, detailed case studies demonstrate the complex conditions associated with innovation in livelihoods. The main argument of this paper is that 'poverty' is a state of being that can be re-read through analysis of local social relations and specific socio-political contexts. As we shall see, farmers develop varied and complex livelihood strategies which are strongly influenced by networks and social relations. These are very significant in access to political and social resources, especially access to and use of water to innovate particular irrigation, though small-scale. Later in the paper we shall describe these strategies in more detail. For now, let us start with the theoretical domain by considering debates within the development literature over the definition of poverty and 'livelihoods'. This is followed by a discussion of the context of the *char* area.

Poverty, Livelihoods and Innovation

The concept of sustainable livelihoods is increasingly important to development policy and practice across South Asia (Chambers, 1995; Scoones, 1998; Kabeer, 1996). It is also inherently anthropological in nature. It draws attention to 'the poor' as active agents, who are forging ahead in finding options and opportunities, balancing apparent risks and opportunities with the need for security, strategizing, and making use of a range of resources (or 'capitals') which include tangible things such as trees or water sharing.

Chambers (1995) argues that besides low incomes, poverty also involves – a sense of social inferiority, isolation, physical weakness, vulnerability, seasonal deprivation, powerlessness and humiliation. According to Chambers, "poverty can be defined as lack of physical necessities, assets, and income. It includes, but, is more than being income poor. Poverty can be distinguished from other dimensions of deprivation such as physical weakness, isolation, vulnerability and powerlessness".

Is poverty measured by income? World Bank defines GNP as indicator of country's development, and by correlation, poverty – i.e. countries with GNP of less than \$100 are by definition poor –

implication is that economic growth is the key to solving poverty (underlying assumption of much of development discourse). In Robert Chambers seminal paper, 'Poverty and Livelihoods, Whose Reality Counts?' however, these definitions, and the assumptions they involve, were challenged. Chambers was talking about diversifications of livelihood. He argues that besides low incomes, poverty also involves: social inferiority, isolation, physical weakness, vulnerability, seasonal deprivation, powerlessness and humiliation. He defines poverty as: lack of physical necessities, assets, and income. It includes but is more than being income poor. Poverty can be distinguished from other dimensions of deprivation such as physical weakness, isolation, vulnerability and powerlessness.

In Bangladesh, livelihood analysis has emerged as a dynamic issue, emphasising options and opportunities where livelihoods depend upon social relations and networks (Gardner, 2014; Gardner et al. 2014). These options are all too often represented in the literature as structural constraints between the powerful and the powerless. This literature stresses that we should not assume that livelihoods are fixed to one place, or that they might not change over time (seasonal, or over a household development cycle). They are far more complex (Mosse *et al.* 2002; Gardner and Ahmed, 2006). It glosses a range of complex arrangements, which are often heavily structured by both physical and socio-political risks in *char* area. Finally, when studying livelihood strategies, one needs to pay close attention to the multi-faceted relations through which diversified relations and patronage operate.

Differentiated power relations operate in farming communities in *char* areas in Noakhali, where formal relations are acknowledged, but informal ones are not (Ahmed, 2000). They also concern less studied issues, in particular the importance of social networks which is crucial for understanding livelihood scenario in *char* area (Ahmed, 2015). These are increasingly recognised as central to local livelihoods, especially for the landless farmers, forming a vital source of social capital.

To date in Bangladesh, few studies have interrogated the role of social networks when considering the dynamics of livelihood strategies on poverty. There is also scant information from an ethnographic perspective on the social relations and linkages of farming beyond economic cost-benefit approaches³. Yet, since social networks are becoming increasingly important in many areas of South Asia, where

traditional patron-client relations are central to livelihoods, this leads to an impoverished understanding of the strategic 'poor' who can appear as active agents and who are dynamic in finding opportunities in their livelihood trajectories⁴.

Above all, social relationships, access to networks, and the like demand attention for understanding the complexity of livelihoods. Central to this is the idea of innovation. Empirical data adds flesh onto this rather bald definition. In what follows we see how small farmers diversify their livelihoods, both over time, and beyond households. Innovation works as a way of coping with risks (for example the danger of drought or political relations) and / or a way of attempting to build a 'portfolio' of opportunities, thus ultimately adding to overall security in contexts of both ecological and socio-political risks. This paper aims to develop both empirical cases and theoretical analysis to address this gap. First let us start with the ethnographic context of small scale irrigation on the Khash *char*, in which our research has been carried out (Ahmed, 2015).

Khash Char: Differentiated Farming and Livelihoods

Situated only twelve kilometres from the district headquarters of Noakhali, with its huge agricultural land, Khash *char* is now a 'settled' village *par excellence*. Alongside the local inhabitants' huts of those who have been living here since the formation of these *chars*, the village is filled with in-migrant peasant farmers who had migrated from adjacent areas due to river bank erosion. A large proportion of the agricultural land in the village is cropped only once a year. This is in striking contrast with the rest of Bangladesh, where (depending upon local ecology) the land is normally cultivated twice a year (during the *aman* and *boro* rice crops), often combined with a crop of winter vegetables (*rabi*). Some fields are not farmed at all, but lie fallow, containing the salt at the surface level during dry season.

The land holding and hierarchy in Khash *char*, the study village where the main fieldwork was carried out, is directly correlated with sharecropped land. Those who originally owned some land, in general, managed to sharecrop absentee landlord's land and thus there is a high concentration of land in the area. Of the total agricultural land in Khash *char*, around 30% is owned by local land owners, whilst 70% is owned by absentee landlords. The land tenure system illustrates that the ability to be involved in agricultural production especially during the dry

season is dependent on access to land and irrigation. Getting water melon fields to sharecrop is competitive in the area. The chance is dependent on social connections such as networks and kinship or political relations such as patron-client relations or any other interests involved. The tenure agreement is done verbally. This means that if the social relations are good this can result in and secure tenure. If the relations are not good for any reason, the tenancy agreement is dropped. Since there is no written tenancy agreement in Bangladesh including char areas, the sharecroppers are vulnerable.

The role of watermelons introduces potential options for char livelihoods. Since the area is predominantly mono crop *aman* paddy cultivation, the farmers search for alternative options to grow crops for the rest of the year. Over the periods farmers were experimenting in growing new crops and new innovations. The watermelon production during dry season opens up a space for them to maintain a year round livelihood in study area.

Growing water melon is a matter of technical choice as well. Due to natural hazards involve, the decision to plant water melon may change. Nurul Hoque's (45) case illustrates that high return cash crop needs investment. If natural hazards contribute to grow water melon as high returned cash crop, what happens to those farmers who own tube wells but unable to afford the maintenance cost to irrigate in the field? Abul's case shows that having tube well does not ensure irrigation. Abul has installed a tube well in his homestead, but is unable to bear the cost of 480 feet pipes channelling to the field. Another important feature of Abul's case is that choosing water melon depends on close proximity to the water sources. Plus neighbor's crop selection puts him pressure into growing water melon.

One of the most important reasons that the poorer farmers are not able to grow water melons is due to in access to land and thus irrigation. The case of Azor illustrates this. Azor (55) is a *choto chasha* (small farmer). He sharecropped two acres of land. He planted all of his sharecropped land during *aman*. During the *rabi* season when most lands are left fallow, Azor could not manage to plant even a tiny proportion of winter vegetables of his land. He did not have close relatives in the area who can lend him money to offer to the landlords. According to Azor, after harvesting *aman*, he migrates to Chittagong as a day labourer leaving behind two daughters with his wife to survive.

The case of Amanullah (32) is also important. This year he has cultivated one acre of land and he has planted watermelon too. The owner is his neighbour. Amanullah has paid twenty thousand taka as an advance. He has also received sixty five thousand taka as a loan for buying fertilizer, seeds and pesticides. Amanullah's water melon fields are close to his homestead. Amanullah uses his cousin's pond as a source of water. His cousin and his children are helping out to channel water from the pond to the field.

Cooperation is still prevalent among farming households but it is also the case that everybody is in rush to irrigate as quick as possible. The risk is that the plants will soon die if watering delays. It is within this context that small scale irrigation during drought should be understood. In order to grow high return cash crops like water melons the poorer farmers have to be connected to the community, one needs to accrue social (one's relationships to patrons) relations. In what follows we shall see, water melon cultivation is a product of social context. Networks and relationships form the basis on which water sharing and exchange arrangements are negotiated. Let us explain this.

Social Relations and Water Sharing

The ability to cultivate winter vegetables is dependent on access to water resources. The survey data shows that a large number of farmers grow water melons as a cash crop. For the sharecropping and poor farmers, the option to grow water melons is dependent on sharing relationships with other farmers. These can be classified into four types. The first type of relationship is typified by the close kin such as siblings where the well-off brother(s) installs a number of hand pumps and he or they lend them out to younger poorer brothers or other close kin. The second type of relationship is typified by the case where two households (neighbours or close kin) come together and cultivate watermelons together. The third type of relationship is more informal and based on moral obligation at the time of irrigation. These households are allowed to bring water from the pond for a certain period and/or are allowed to irrigate from the hand pumps installed inside the field. The final type of relationship is typified by religion, such as minority Hindu and the majority Muslim in the community.

Within the *char* area, the poorer farmers' ability to getting water melon land is associated with particular relations with the *malik* or

patron and extent of relations, all of which are associated with the ability to get involved in production. During our fieldwork, giving advance money for getting water melon land was particularly competitive. Offering ten thousand taka to twenty thousand taka for an acre of land in advance to the landlords provided the evidence. Centrally, too, this competition is turning to such agriculture which determines one's own involvement under social connections.

In most of cases, the poorer households do not want to solely rely on the tube well owners who are in rush to use. Consequently, such households prefer to install new one. They bear the expenses despite the difficulties in arranging 5000 taka at a time even under a loan agreement. Such households have no kin networks or patron/client relations in the area. For example, Moti has no close relatives with whom he can share tube well. So, he wants to install new one and allows his father and brother to use it. He did not have sufficient money to mitigate the cost, so he was unable to plant water melon seeds on time.

The opposite pattern can be found amongst the wealthier households. It is important to remember that water access is a lineage affair as well in *char* area, as one is linked only to close relatives. This was vividly illustrated to us by one of the large farmers who we became familiar with during fieldwork. Along with his four brothers he had migrated from a distant sub-district due to river erosion. He was fortunate enough to become a union council member and developed good reactions with absentee land lords to cultivate huge amount of land in the area. But his other two brothers are not lucky enough to achieve this quality. This was because of 'lack of connections' he told us; whilst they are resource less, they would not be seen to be managing sharecropped land. In Khash *char*, we came across many farmers who did not have such abilities and eventually moved to outside due to the 'state of being destitute' and needing to work as labourers.

Mizu member is an influential person and his lineage owns/sharecrops most of the land. Along with his five other brothers, he sharecrops most of the absentee landlords' land. This lineage either shares homestead pond water or hand-pumps water according to their demand or rent out the land if one is unable to cultivate. Mizu's case demonstrates exchange relations of sharing when water is needed. Five brothers with their two big ancestral ponds and two shallow tube-wells exploit the opportunity. These households are able to sow water melon plants on time compared to the other farmers who wait for a chance to

manage irrigation facilities. These advantages provide them with a very good yield, as everything goes on time. Beyond close kin, network and relations between households play a pivotal role in growing water melons.

As we have seen, ability to have access to water is correlated with one's relationship to others, and therefore, emerges as a key determinant of engaging in farming, especially for water melon production. Similarly, as we shall shortly see, the local ideology is linked to social responsibility. One farmer told us that it's a rule (*neom*) that he should allow others to access his shallow tube-well, and is happy to let others use it for a day or so, so long as he does not need it.

Yet more important than the lineage connections of the area is, we suggest, the role of socio-political relations in determining access to water in Khash *char*, where the small number of minority Hindu households intend on growing water melons. These relations are not confined to the immediate kin of Muslim community, but are shared by Hindu farmers as well. Let us look briefly at Hindu farmers who are very much involved in agriculture.

Aged 36, Bishu has two daughters, one is eight years old and another one is at five. With his two children his family members are eight. He has been living here for more than 25 years. Due to river erosion he has migrated with his three brothers from Ramgoti into this area. Bishu borrowed money from a local NGO and money lenders. After harvest, he will repay this loan. He has just started to grow water melon. He estimates that about 26 thousand taka has been spent for half an acre of land. If the harvest is good, the saleable amount would be nearly seventy thousand taka. As Bishu narrates, "Watermelon needs much water, at least twice in the cycle. It is hard to access to water. Both canals and ponds become dry." At the initial stage, he had to irrigate by hiring a hand pump machine. For half of the land he had to pay one thousand taka as cost.

Himangshu's case also shows that water can be shared when necessary irrespective of class and religion. He lives in a Hindu dominated homestead but goes to Muslim neighbours to share water. As Himangshu explains, "My Muslim neighbours have ponds and tube-wells, but I should maintain good social relation with them. I am loyal to the owner of those water resources. During dry season I go to them in order to use water and to survive as well. In my neighbourhood, there are six ponds. This means that in Hindu dominated homesteads, every

ten households have access to one pond. All the households have to keep good relations with one another.

In short, water melon cultivation is a product of social context. Networks and relationships form the basis on which water sharing and exchange arrangements are negotiated. But these arrangements are not static; they change according to the circumstances and the intensity of relations in a particular time and space. What is needed is to understand how relationships are formed beyond the households cut across social economy, kinship, region and even religion.

Conclusions

To restate our argument: economic, political and environmental risks in *char* areas have contributed to survival strategies for the majority of the small producers. We have seen that connectedness to the socio-political domains are considered as virtually the only avenue for finding alternative option after immediate harvest of *aman* paddy. This is closely associated with the political relations of water access. Social relations, in the form of relationships with those who have established links with the landlords, is a vital resource for the poorer households, for is only through richer relatives that they can gain access to water use. Within this context, the engagement with water melon production is crucial, for not only does it mark one as being part of the lineage or community, but it also affects one's chances of getting access to other necessities for their uncertain livelihoods. A livelihood's approach may be useful in order to help us to understand poverty – this better captures the varied strategies of poorer people than the term 'income' or asset ownership alone. From the ethnographic data we see how farmers in *char* area diversify their livelihoods¹⁰, both in terms of economic and socio-political relations. Diversification may be a way of coping with uncertainties (for example, growing water melon production as cash crop) attempting to build a 'portfolio' of opportunities, thus, ultimately adding to overall security in contexts of mono crop *aman* production.

The material presented in this paper would appear to indicate that the livelihood strategies in *char* area are innovative and adaptive. The ethnographic data shows that not all farmers have access to this irrigation or are growing watermelons. As we have seen, the livelihood strategies in *char* area draws our attention to 'the poor' as active agents, who are forging ahead in finding opportunities, balancing apparent risks

and opportunities with the need for security, strategizing, and making use of a range of social relations or 'capital' in economists' terms (such as patron-client; *malik-bargadar*; wealthier and poorer households; Hindu and Muslim farmers), which include tangible things such as land, water use, but may also include social relationships (through which access to resources may be maintained/helped through patronage etc).

Notes

1. The role of small scale irrigation in agriculture and in food self-sufficiency of Bangladesh is critical. In Bangladesh, the growing body of minor irrigation (small-scale irrigation) is a vital component of the Government's agriculture strategy. It is estimated that irrigation through major canals (large-scale irrigation) covers only 6 percent of the total irrigated area, the remainder being classed as small scale irrigation consisting of low lift pumps.
2. Whilst many were originally settled via a process of land-grabbing, violence and patronage, in which local elites used landless people to occupy land which they themselves 'owned', in other instances *khas* (government) land was distributed via local government to landless people arriving from other areas, which they now hold legal titles to. The history and politics of settlement of *chars* (newly alluvial land) is complex and varied.
3. Empirical work adds flesh onto this rather bald understanding of livelihood. For example, internal seasonal migration into prosperous overseas migrant areas in Sylhet in Bangladesh is the part of household strategy whereby some members stay behind and farm and others move seasonally in search of wages.
4. Dfid definition (based on work at IDS) of livelihood is: A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future while not undermining the natural resource base.

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