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Implementation Challenges of Rainwater Harvesting Practice Reducing Drinking Water Pollution Risks in Coastal Bangladesh – A Social Network Analysis

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Synopsis

Our study attempts to find out the role of various information sources in the implementation of the rainwater harvesting tanks to reduce water pollution risks in the coastal Bangladesh. An extensive field survey has shown that adopters of the tanks mostly have come to know the tank by interpersonal sources rather than mass media. By mapping interpersonal information networks into two elements – hearing and observation, we found adopters preferred to hear about the innovation from various sources to reduce the adoption risks, but they become quite certain about the tank through observing a limited number of tanks. Information broadly passed through mouth to mouth within a closed spatial and social group, but for observation, it crossed the group boundaries. The adoption process was dispersed and unsteady where hearing generated social networks were inadequate; the adaptation rate was steady and balanced in those neighborhoods which developed a prominent social network. The observation generated networks, however, did not influence the adoption process in a similar fashion.

Keywords: Arsenic contamination, rainwater harvesting, information flow, social networks

1. Introduction

Millions of the populations are expected to experience a slow and painful death from arsenic poisoning over the next decades unless they are provided alternatives to drinking contaminated well water (Bearak, 1998; Smith 2000; Hadi, 2003). Though the actual number of population dirking arsenic contaminated water is still unknown (Hadi, 2003), an estimated 40 million population of Bangladesh are drinking arsenic contaminated water (UNICEF: 2006), and about 70 million people of 59 districts out of 64 districts are at risk (Safiuddin and Karim, 2001). Arsenic poising is manifested primarily in skin lesions on the palms of the hands and soles of the feet and chronic exposure can cause adverse health effects including skin and lung cancer (Hopenhayn-Rich et al., 1998.). The actual causes of arsenic contamination is yet to determine, but it is widely believed that this serious water problem can be attributed to the extensive use of groundwater for drinking and irrigation purpose in the rural areas since the 1960s (British Geological Survey, 1998; Hadi, 2003). In the country of Bangladesh where 97% of the populations currently use tube-well water, it took many years to convince the people to use tube-well water which is free from pathogenic micro-organism (Hadi, 2003). Now, it is a major task to create innovative ideas and technologies to provide safe water and to encourage the people to adopt such preventive measures. Rainwater harvesting technology is considered as such an innovative technology that can reduce and prevent

arsenic contaminated risks. Therefore, the implementation and diffusion of rainwater harvesting technology on a wider scale is instrumental to reduce and prevent drinking water pollution risks in the coastal Bangladesh.

Diffusion of innovation is defined as an information seeking and information processing activity or development (Rogers, 1983; Valente, 1995). In the course of diffusion, the potential adopters create and share information to reduce uncertainty accompanied with an innovation due to its newness aspect (Becker, 1970; Rogers, 1983; Valente, 1995). Like other technological device, the rainwater harvesting tank is comprised by hardware and software components. Hardware aspects consist of physical or materials components like – shape, size, structure and materials, and software part is comprised by the information base of the tool like – function, utility, effectiveness, operating system etc (Rogers, 1983). Therefore, it is preferable for an individual to receive and share information of both hardware and software elements of an innovation to take a prudent adoption decision. Scholars (Becker, 1970; Rogers, 1983) have categorized the information sources in the diffusion process into two broad groups – mass media and interpersonal communication. Previous researches (Ryan and Gross, 1943; Coleman et al., 1957; Rogers, 1983) have found that mass media does not play effective role at small towns or villages, rather information flows through interpersonal contacts or relations. At the interpersonal level, an individual becomes informed or exposed to an innovation by hearing from others and also by observing the innovation adopted by others members of the community. Hearing, which is two-way communication process, offers an individual to learn about the software components of innovation including function, utility, effectiveness, cost etc. of an innovation. On the other hand, Observation is one-way communication process and it offers an individual to learn about the hardware components including shape, size, structure etc. In the diffusion process, sharing information (through hearing and observation) by the community members creates social networks over time (Becker, 1970; Rogers, 1983; Valente, 1995). Therefore the nature, pattern of social networks developed over time influence the adoption course. To graph the information networks generated through hearing and observation is instrumental to understand the implementation and diffusion process of an innovation.

Our study aims to address the following research question – 1) what is the differential role of mass media and interpersonal communications in the implementation of rainwater harvesting; 2) what extent do the nature and pattern of hearing and observation generated interpersonal (social) networks differ and what extent these social networks influence or contribute to the implementation of rainwater tank in a small town of coastal Bangladesh.

2. Background

Morrelganj town – An overview

The study area, 'Morrelganj' municipality, seemingly as an overgrown village comes under the jurisdiction of 'Bagerhat' district, is a highly arsenic prone area (Map 1). 22 thousand populations of the town earn their livelihood mainly from small trading, business, governed services and agriculture and fishing based occupations (Morrelganj Municipality Report' 2002). Muslims are the numerically dominated ethnic religious group in the town; however, a small number of Hindu communities are also observed (Samaddar

Map 1 Arsenic contaminated regions of Bangladesh

and Okada, 2007). In the present study context, it is important to note that though the town is divided into 9 administrative jurisdictions, called wards, town settlements are socially and spatially more distinctive in the name of "Para" or neighborhoods. Each "Para" is comprised by a homogeneous group of individuals who share a strong sense of belonging based on religion, kinship ties, occupation etc that separate a group of individuals from other. Each "Para" or neighborhood is occupied by a particular community, for example -'Serestadarbari': inhabitants of the Hindus; 'Kuthibari': mainly occupied by school teachers; 'Uttarsaralia': inhabitants who migrated from similar region; 'Bazarpara': meaning market place, mostly occupied by businessmen etc. Therefore, the individual's attitude and behavior is considered to be controlled and governed by the "Para" in a great extent. It was reported that 58 tube-wells in the 'Morrelganj' municipality are arsenic contaminated (Morrelganj Upazila Karjalay, 2003). Apart from the arsenic contamination of ground water, salinity intrusion due to sea level rise has brought the local community under severe threat of drinking water risks (Samaddar and Okada, 2007). Due to water salinity, using surface water like ponds, canals and rivers become risky (CARE, year not mentioned). Initiatives for securing alternative drinking water sources, like boring deep-tube-wells by the local government and NGOs is reported as failed due to the peculiar soil condition of the region (Samaddar and Okada, 2007).

Picture 1 Rainwater harvesting tank at household level, Morrelganj

Rainwater harvesting – An innovation

In 1999, a local NGO, Community Development Center (CDC), in collaboration with a national organization, namely 'NGO Forum', initiated an arsenic mitigation project. Rainwater harvesting by colleting rainwater in a mini cement tank (see Picture 1), raging from 1500 liters to 4400 liters, for single household was introduced to provide safe dirking water to the local community. The rural areas of 'Morrelganj Upazila' (sub-district) were targeted under this programme in the initial phase of the project. In 2004, when a Japan based NPO, namely "People for Rainwater" (PR) joined hands with them; the 'Morrelganj' municipality came under the programme. Under the provision of this programme, the beneficiary covers the cost of the tank and the NGO provides labor and technological support. After PR joined in the programme, the technology was upgraded and a micro-credit scheme was introduced so that economically under-privileged section of the community may gain access to the project. To promote rainwater harvesting, the NGO in the initial stage of the programme started with awareness campaigning, formulation of neighborhood committees, namely VDC (Village Development Committee) to discuss and share community's present drinking water problems and the scope and utility of practicing mini water tank as a potential alternative source of drinking water. In addition, the members of the NGO workers reached door to door of households to promote adoption of mini rainwater tanks. The cost of a tank ranges from 9000 to 14000 Taka (130 - 200 US$).

3. Methods and Filed Survey

To find out above mentioned study objectives, , the following sets of empirical data were collected - 1) Time of adoption or installation of rainwater tank - were collected from the records of the NGO and later on the data were crosschecked by asking the respondents to recall their time of rainwater tank installation. 2) Role of mass media – were collected by asking the adopters to identify the mass media, like TV, radio, newspaper, internets etc., from where they have learned about the rainwater tank prior to their adoption; 3) Hearing

generated social networks - were collected by asking the adopters to name three persons from whom they have first time heard about rainwater tank; 4) Observation generated social networks – were collected by asking the adopters to name three persons' houses from whom they have first time observed the rainwater tank. We conducted field survey in two phases both for 4 weeks duration – first phase July to August in 2007, and second phase January to February in 2008. The study covered all the 49 households who installed rainwater tank in Morrelganj municipality area till august, 2008. The heads of the households who are main household decision makers were chosen as respondents, most of them are male members, except three female respondents who expressed though they are not the head of the household, yet they took the major initiative and decision to install the rainwater tank. The interview was conducted in the home of the respondents so that respondents can express freely and also it allows other members of the households to provide additional information that could have been overlooked by the main respondent. Both structured and semi-structured interview were conducted. An in-depth observation of adaptors socio-economic condition, their social relation with others, the condition of rainwater tanks and houses of the adopters were made.

4. Results and Discussion

An overview of adopters' socio-economic characteristics

By the initiative of CDC (Community Development Center) and PR (People for Rainwater), 52 household rainwater tanks, including the 3 NGO workers' tank, were installed in Morrelganj town. The tank adopters are broadly the affluent section of the town, who have 17776 Taka (US$ 260) monthly average incomes and have an average 14 class educational attainments while the town literacy rate is only 71 percent and 40 percent of people live below poverty line. On the other hand, we found the adopters are by and large a homogeneous group of individuals in terms of household size (mean – 5; SD. – 2.5), family type (81% nuclear), income and occupation - mainly engaged as school and college teachers (47%), business (29%), pharmacist (8%) and other Govt. services (28%).

Diffusion of rainwater tank – A spatial significance

Over the 39 months period of time, starting from June, 2004 to August, 2007, 49 households, excluding the NGO workers, have installed rainwater tank in 8 neighborhoods of Morrelganj town. Table – 1 shows that though the diffusion of

Table – 1: Diffusion of Rainwater tanks in the various neighborhoods of 'Morrelganj' town

Neighborhoods	2004				2005						2006	2007						Total
	Jun	Jul	Aug	Nov	Jan	Feb	Apr	Jun	Jul	Aug	Oct	Feb	Apr	May	Jun	Jul	Aug	
Kuthibari		1		-	-	1	-		2	1	-	-	3		1	1	-	10
Baruikhali	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	2
Purbasaralia	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	1	3	6
Collegepara	-	-	-	-	-	-	2	-	-	-	-	-	-		-	-		2
Uttarsaralia	-	-	-	-	-	-	-	-	1	1	-	-	-	3	1	2	1	9
Bazarpara	-	1	-	-	-	-	1	-	-	1	-	1	-	-	-	1	1	6
Swadhinpara	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	3
Serestadarbari	1	1	2	1	-	-	-	1	1	-	-	-	1		3	-	-	11
Total	3	3	2	1	1	1	3	1	4	3	1	1	4	6	5	5	5	49

the rainwater tank took 39 months in total to diffuse among 49 households excluding the NGO workers' households, yet the diffusion process or rainwater tank adoption took place in 17 phases or months and significantly in some phases, the adoption of rainwater tank is concentrated sharply in some particular neighborhood. For example, the rate of tank installation in the year 2004 in 'Serestadarbari' neighborhood is quite high, whereas, the trend of tank installation in other neighborhoods is negligible during that phase. Similarly, a good number of tanks were adopted in 'Uttarsaralia' neighborhood during May, 2007 to August, 2007. Secondly, the adoption of rainwater tank followed a steady and consistent rate of movement in some neighborhoods like 'Kuthibari', 'Serestadarbari', however, in other neighborhoods like 'Collegepara', 'Swadhinpara', 'Baruikhali' have lack of such growth. Thirdly, though few neighborhoods such as 'Swadhinpara' and 'Collegepara' started to adopt rainwater in the early phase of diffusion, but it failed to follow and maintain in the later phase of diffusion and in contrary, the neighborhoods like 'Purbasaralia' and 'Uttarsaralia' started diffusion phase quite afterward but a higher number of adoptions are observed (Table -1).

Sources of information

In Morrelganj town, only 5 adopters have reported that prior to their adoption, they observed or heard about rainwater tank from mass media like – TV, newspaper, radio etc. All the adopters have informed that they have learned about rainwater tanks from interpersonal contacts, like NGO workers, neighbors, friends, relatives etc. Therefore, our study finding supports other diffusion studies' generalization (Ryan and Gross, 1943; Coleman,1957; Rogers' 1983) that in villages and small towns, mass media has negligible impact on the diffusion of innovation or technology implementation.

Interpersonal sources of information flow

From the socio-metric data of interpersonal network of hearing and observation, derived by asking the adopters to name first three sources (person or house) from where they heard and observed the rainwater tank, it has been found that

Table 2 Interpersonal Sources of hearing and observation

	Hearing	Observation
Possible number of Ties	147 (49 adopters X 3 sources)	147 (49 adopters X 3 sources)
Ties Generated	135 (91.84%)	109 (74.15%)

Table 3 Number of persons as a source of hearing and observation

Number of sources	Sources of Hearing	Sources of Observation
Knowing from 3 Persons	43 (87.76%)	29 (59.18%)
Knowing from 2 Persons	1 (2.04%)	8 (13.56%)
Knowing from 1 Persons	5 (10.20%)	6 (12.24%)
Knowing from no one	0 (0%)	6 (12.24%)
Total Adopters	49(100%)	49(100%)

out of 147 possible ties (49 adopters X 3 ties), the number of ties actually prevail in case of hearing is much higher than the observation network (Table 2). There are 6 individuals who have not observed any tank prior to their adoption; however, not any single adopter has adopted the tank without hearing from any individual (Table 3). Similarly, Table 3 also shows that 6 individuals observed only 1 tank, and 8 individuals observed only 2 tanks prior to their tank adoption, but the number of adopters who have heard about rainwater tanks only from 1 or 2 personal sources is a few. Therefore, prior to the adoption, individuals may prefer to hear from various personal sources to become certain about the innovation, but they may need to observe the tank at various places or sources as the tank hardware components are broadly same.

Social networks of hearing and observation sources - A comparative analysis

To graph the nature and role of social networks developed through hearing and observation activity

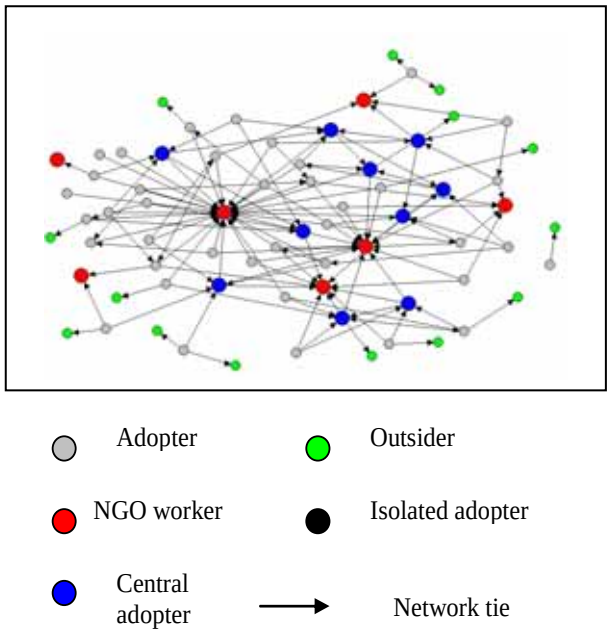


Fig. 1 The information flow through hearing rainwater tank in Morrelganj town

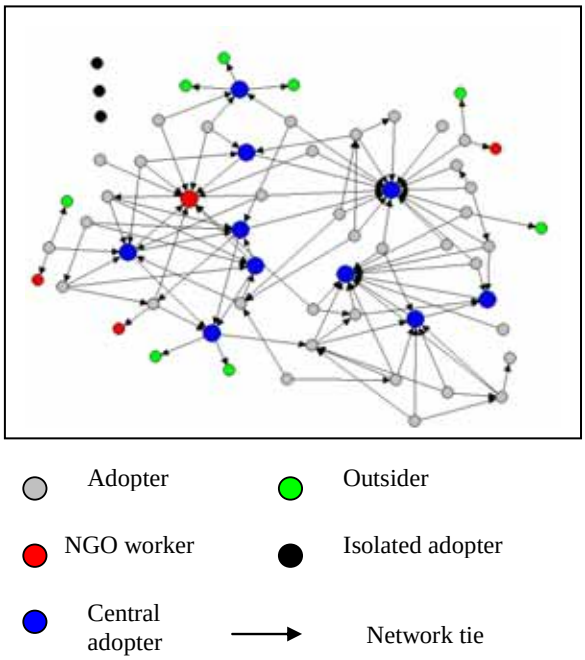


Fig. 2 The information flow through observing rainwater tank in Morrelganj town

in the diffusion of rainwater tank adoption, the socio-metric data have been schematized in Fig. 1 and 2. The following trends have been found -

Fig.1 shows that NGO persons are the central in hearing network from whom the information about the tank was passed. Some individuals are also personally informed by the outsiders of the town. Since, as a part of the programme, the NGO workers went to the households to promote rainwater tank installation, the majority of the household heads first time came to know about rainwater usage from the NGO members. However, apart from the NGO workers, there are a significant number of other social ties existing among the adopters that also render the flow of rainwater tank adoption. As a result, few of the adopters, marked as blue color in Fig. 1, are not much like the NGO workers, but are quite significantly positioned central in the networks.

In case of observation network (Fig. 2), the role of NGO workers becomes negligible, and similarly there are few outsiders, whereas, adopters within the community become the major sources of observation for the adopters. Significantly, in observation networks 3 adopters are found as isolated who were neither a source of observation and nor they observed any tank prior to their adoption.

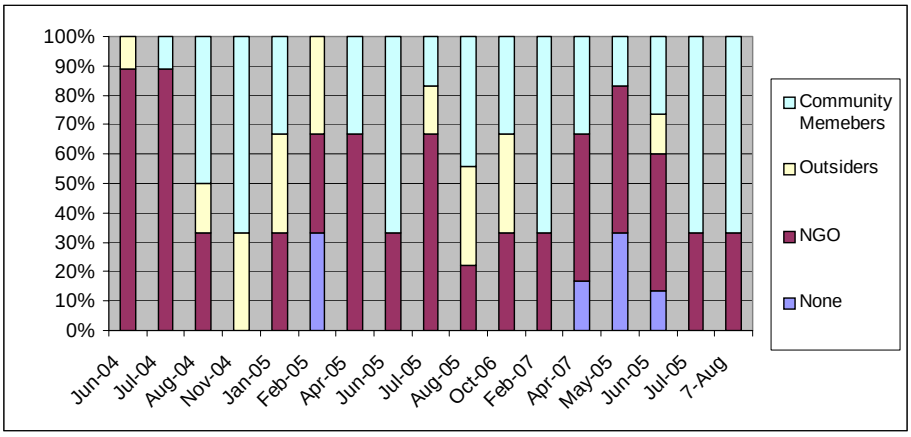
The above mention results have shown that adopters are not necessarily a passive recipient of information, but the adopters pass information to their peers and also their adopted tanks become a source of observation for others. However, now the questions are why some adopters are isolated and some are well tied, and how does it affect the process of the diffusion of rainwater tank adoption. Adopters' distribution in social networks over time and the pattern and nature of social networks, hearing and observation, in relation to spatial distribution of adopters may help us to reveal such answers.

Relation between social networks and implementation of rainwater tank

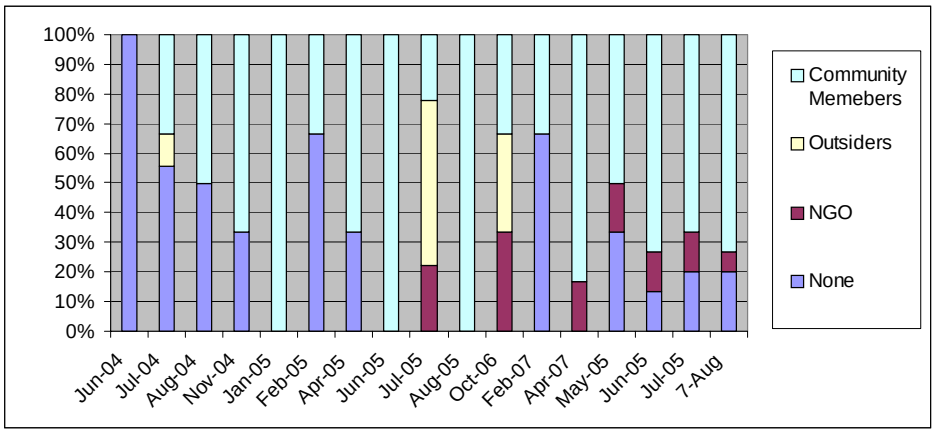
To systematically visualize the relation between social networks and the implementation of rainwater tanks, we drew up the Fig. 3 and Fig.4 by excluding the NGO workers and outsiders. The following findings can be drawn from these two network figures -

1) All the innovators or pioneers in hearing (Fig. 3) and observation (Fig. 4) generated networks stand alone in receiving information. For hearing generated network, early adopters were informed

Graph 1 The sources of information from where adopters heard about rainwater tank in Morrelganj town



Graph 1 The sources of information from where adopters observed rainwater tank in Morrelganj town



broadly by the NGO workers and from a few outsiders (see Graph 1). In case of observation generated networks, all early adopters adopted the tank without seeing the tank anywhere else (see also Graph. 2). Therefore, the pioneers are those who brought information from the change agent like – NGO or from the outside of the town and may or may not diffuse the information among their community members. Pioneers are radical in a sense that without seeing any model of the tank, they adopted it.

2) The presence of NGO worker ties in hearing network can be observed throughout the diffusion, however, with the progress of tank diffusion, the proportion of ties among the community members broadly increased (though few exceptions are there) in both cases – hearing and observation generated information networks(See Fig, 3 and 4; Graph 1 and 2). Therefore, NGO workers were active throughout the implementation process to convince community members to adopt rainwater tanks, simultaneously; the social networks prevailed and acclimated that eventually help to flow the information among the mass.

3) As mentioned above that though the

Table 4 Distribution of sources of information within community members

Sources of information within the community	Hearing	Observation
Same ward	33 (64.71%)	47 (54.02%)
Different Ward	18 (35.29%)	40 (45.98%)
Total	51 (100%)	87 (100%)

proportion of information networks among the community members increased with the progress of diffusion process, yet there are some exceptional phases where the proportion of community ties decreased, particularly in case information networks of hearing. The reason behind that the tank adoption did not start in all neighborhoods at the same time. An adopter who is quite late adopter in respect of the whole town, but he is quite early adopters in respect of his/her neighborhood. Like the town level early adopters, the neighborhood level early adopters also depended on NGO members or outsiders of town as a source of hearing. For example, in *'Uttarsaralia'* neighborhood, the adoption started quite late and the early adopters of this neighborhood were informed by NGO or outsider sources and afterward the information has flown within the neighborhood members. The similar trend can be observed in case of *'Purbasaralia'*. Hearing networks is more spatially closed, but for observation it disseminated between different neighborhood communities, as a result most of the neighborhood early adopters prior to their adoption could observe the tank in other neighborhoods where the tank had already been adopted, instead of relying on outsiders or NGO workers or other sources.

4) Therefore, social ties of hearing among the adopters is noticeably localized or closed in the spatial distribution of adopters rather than the inter-neighborhood ties, except a very few cases (Table 4 and Fig. 3). The higher number social ties of observation are also intra-neighborhood, but the proportion of inter-neighborhoods is quite higher than the hearing networks (Table 4 and Fig. 4). As we mentioned in the earlier section that in small town like *'Morrelganj'*, people mingle quite often with each other and shares their views and opinions in different aspects, however, there may be some strong sense of belonging or decisive factors like religion, kinship ties, occupational and cultural homogeneity etc that separate a group of individuals from other groups of Individuals and which may reflect the spatial distribution of the

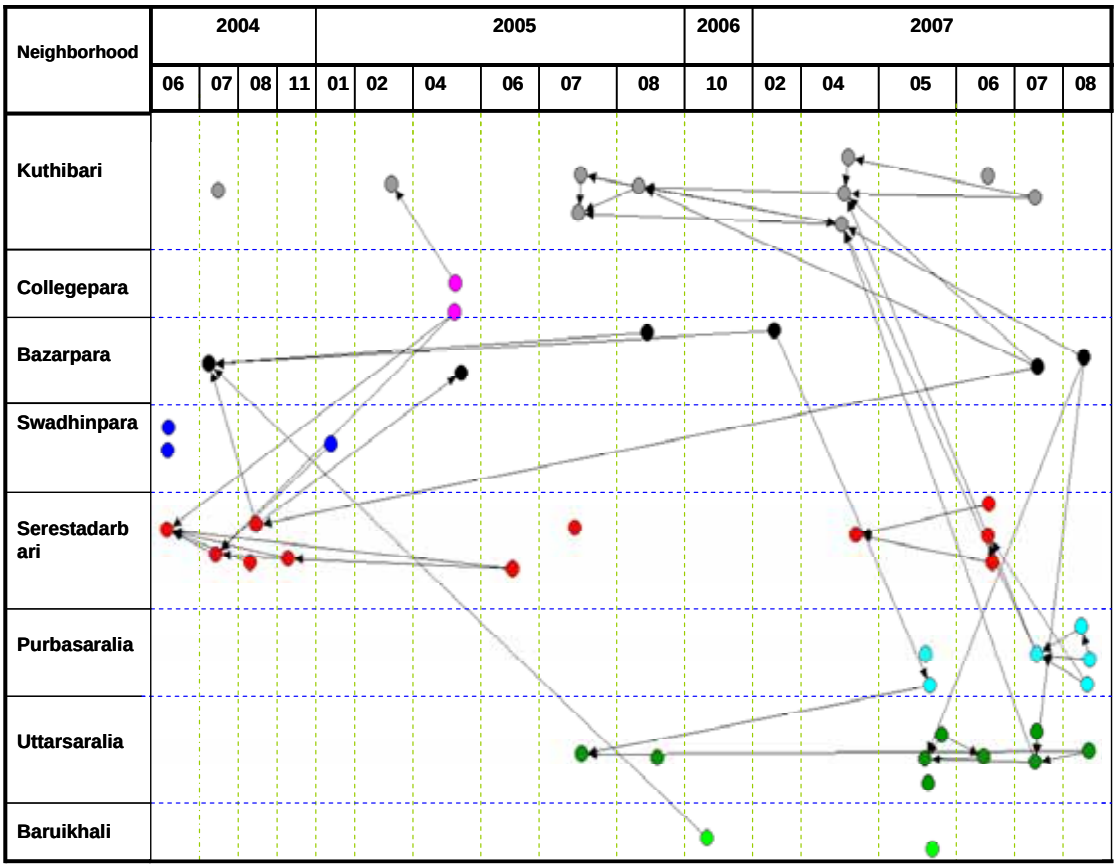


Fig. 3 The spatial distribution of hearing related social networks (excluding NGO workers and outsiders) in relation to diffusion of rainwater tanks in Morrelganj town.

community and their network ties. Therefore, adopters prefer to inform about an innovation within their own neighborhood or the potential adopters relay much on their neighbors than foreign neighborhood members. For observation, due to some location or geographical reason, the potential adopters may come to know about the innovation accidentally or incidentally, therefore more inter-group ties have been generated.

3) In hearing-generated networks, where the pioneers after their adoption passed the information to their neighborhood members, the rate of adoption in those neighborhoods are much higher than the neighborhoods where the early adopters after their adoption did not pass on the information. For example, the two members of *'Swadhinpara'* neighborhood adopted the rainwater tank in the early phase of diffusion process, but since the social network is absent in this cluster (or we can say that the pioneers did not pass the information), there is no consequent adopter in this cluster. The same trend can be observed in the case of *'Collegepara'*. In the contrary, in *'Uttarsaralia'*, where adoption started quite afterward in respect of the whole Town's adoption, the number of adopters in this zone is considerably higher since the early adopters in of this community pass the information to its community members. Information flows through mouth to mouth among the community members and eventually this hearing generated social networks render or provide the condition of innovation process in a positive way.

However, in the case of observation generated network, there is no such link between social networks and diffusion of the tank. For example, in all neighborhoods, observation networks are present, but the rate of tank adoption varies among the neighborhoods.

5) The temporal dimension of social networks along with the spatial dimension can also be observed in the present study. Figure 3 shows (information networks of hearing) that in the case of neighborhood *'Serestadarbari'*, an early adopter, both in respect of town and neighborhood, relied on

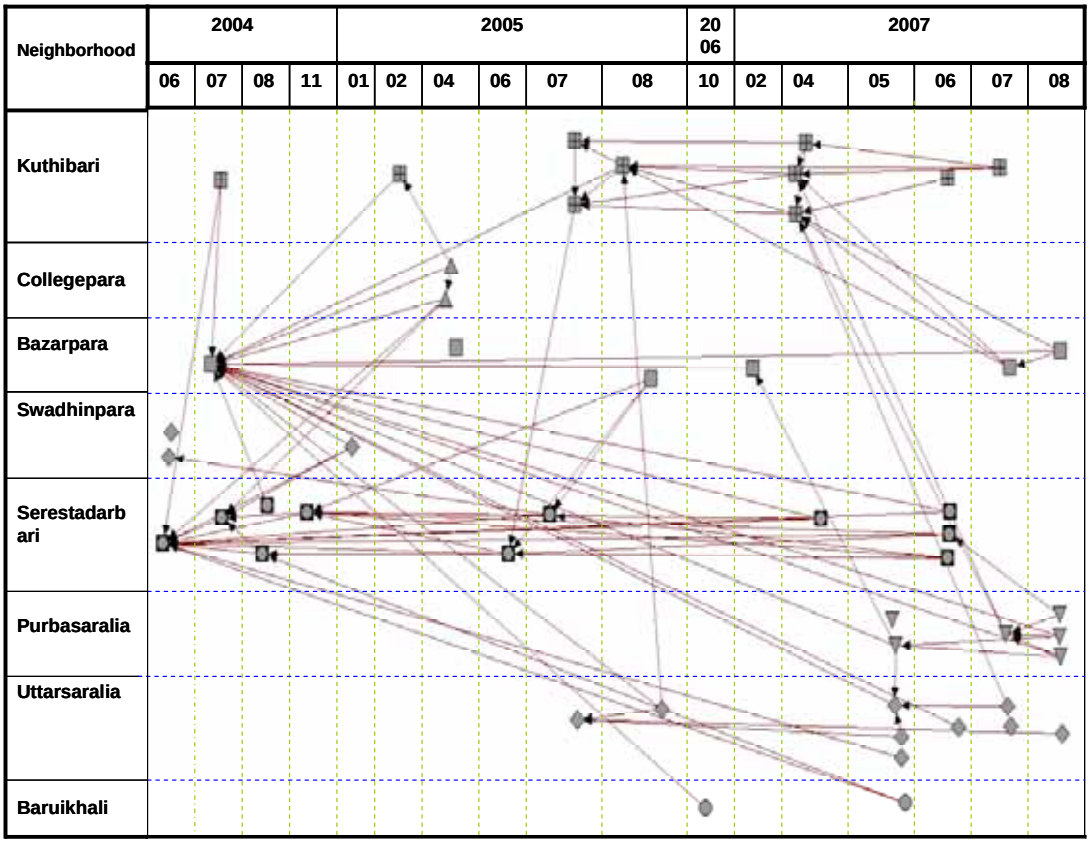


Fig. 4 The Spatial distribution of observation related social networks (excluding NGO workers and outsiders) in relation to diffusion of rainwater tanks in Morrelganj town.

the NGO workers and also on the outsider for seeking information, and that once an individual adopted the tank and then passed this information to some other individuals who adopted the tank afterward. And then the new adopter also passed the information to the next adopter and so on. But after a certain phase, the diffusion process of rainwater tank adoption which is considered the process of innovation came to stop, and the development of social network halted. In the second phase of adoption, there was only one adopter who has no connection with community members and adopted the tank by relying outside the community to collect information. In the last phase of this diffusion, depending on the information of NGO workers, again an adopter initiated to adopt the tank and passed the information to his network partners which contributed positively to the growth of adoption. Therefore, in each phases of diffusion, the first adopters depended on the outside world for information and then they passed out this information to their network partners. But, such relation can not be found in case of information networks of observation (Fig.4) where ties exit between early adopters and late adopters. It may be concluded that social network of hearing may sustain until a certain period of time and again a new social network emerge in a community and this changing nature of social networks has strong influence on the process of innovation because we have found that the late adopters in the third phase of adoption of 'Serestadarbari' depended on the social network support of their immediately earlier adopters instead of adopters of the fist phase, seemingly an innovators, of adoption process.

6) The adoption process is dispersed or unsteady where hearing generated social network ties are inadequate, in such neighborhood communities as – 'Swadhinpara', 'Collegepara', and 'Baruikhali'. The adaptation rate is steady and balanced in those neighborhoods which have developed a prominent social network. The observation generated, however, did not influence the adoption process in a similar fashion.

5. Conclusion

Based on the above results and discussion, the following implications have been derived.

In Morrelganj town, the effect of mass media on the adoption decision behavior has not been found significant, rather interpersonal ties help the adopters to hear and to observe the tank. Three major interpersonal information sources have been observed – 1) NGO workers, 2) outsiders and 3) community members. These three sources helped the adopters to hear and to observe the tank prior to their adoption. The adopters may prefer to hear about the innovation from various personal sources to reduce adoption risks, but they may need not to observe the tank at various places because the hardware components of the tank are broadly the same. NGO workers played a crucial role throughout the implementation process to flow tank information, however, with the progress of tank diffusion, the proportion of ties among the community members broadly increased in both cases – hearing-generated and observation-generated information networks. The early adopters mostly received information from on NGO workers or outsiders, and they installed the tank without observing any tank. The higher number of tanks has been implemented in those neighborhoods where the early adopters passed the information to potential adopters. Hearing related networks are more spatially closed, and observation related networks disseminated across the neighborhoods. Seemingly, potential adopters relay information much on their neighbors than foreign members. However, for observation, due to some location or geographical basis, the potential adopters accidentally or incidentally may come to know about the innovation inside and outside their neighborhoods.

The temporal dimension of hearing generated networks is also observed. Social network of hearing sustained until a certain period of time and again a new social network emerged in a community and this changing nature of social networks strongly influences the implementation of rainwater tank. But, such relation can not be found in observation related networks, rather observation ties exit between the early and late adopters.

Finally, we found the hearing generated networks significantly influence the trend and pattern of implantation or diffusion of rainwater

tank. For example - the adoption process is dispersed or unsteady where hearing generated social network ties are inadequate; the adaptation rate is steady and balanced in those neighborhoods which have developed a prominent social network. The observation generated, however, did not influence the adoption process in a similar fashion.

We have broadly discussed the nature of various interpersonal sources and their impact on the implementation of rainwater harvesting tank in a coastal town of Bangladesh. Though our study tried to find the out difference between different interpersonal networks in relation to implementation of tank, however, the present study is limited to find out the causes of the variation of interpersonal networks and its impacts in the implementation process. Our study has also limitedly assumed that each community is rather homogeneous in respect of adoption by households with no much difference in income, educational attainment, and exposure to mass media, etc. May be, in case of more heterogeneous individuals having differential choices and socio-economic capacities, the degree innovativeness as well inter personal interaction may vary in a more complex dimension which the present study is unable to explore. Further research will be conducted to deal with such extended cases.

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バングラデシュ沿岸部における，飲料水の汚染低減を目的とする雨水貯水タンクの設置実施の意思決定に関する研究－社会的ネットワーク分析

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要　旨

当研究では，バングラデシュ沿岸部において行われている，飲料水汚染の低減を目的とした雨水貯水タンクの導入にあたって，各種の情報源がもつ役割を明らかにすることを試みる。雨水貯水タンクを導入した住民は，マスメディアよりもむしろ個人間の口頭でのコミュニケーションによって、タンクのことを知るようになっていった。個人間の情報ネットワークは大きく二つに分けられる。口頭でのコミュニケーションと観察である。タンクを導入した住民は，タンク導入におけるリスクを軽減するため，さまざまな情報源からタンク導入に関する情報を聞くことを好む。しかし，彼らは限られた観察を通して，タンクに大きな信頼を寄せるようになる。情報は，空間的および社会的に閉じた集団の中で，口頭でのコミュニケーションによって広範囲に伝わっていったが，観察というでは，集団相互間でも伝達されていった。タンクの導入具合は，口頭でのコミュニケーションがあまり密に行われていない地区では，一様ではなかったが，卓越した社会的ネットワークを形成している地区では安定していた。観察はネットワークを発生させた一方，タンクの導入の進展具合には影響を与えなかった。

キーワード：ヒ素汚染，雨水利用，情報伝達，社会ネットワーク