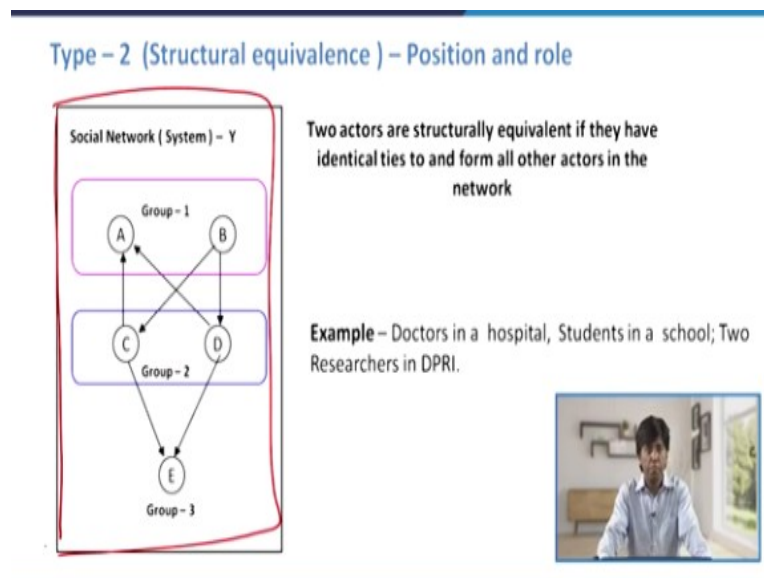


only unnecessary redundant informations and it prohibits to bring new ideas, new thoughts, new knowledge okay.

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Number 2; structural equivalents or position and role what is that? The 2 people they do not interact with each other or they may not know each other at all, but they belong to same position like in a hospital, 2 doctors, they may not meet to know each other, or they may not know actually, but they have a same position that they are a doctor in a same hospital, the hospital is very big so, they have same role and same positions.

Then people can also indirectly observe each other and compare each other and collect informations from them okay, in directly or maybe you can imagine that students in a school a researchers in IIT Roorkee, so being a they do not know each other but being in same institution in IIT Roorkee gives them a kind of same kind of socialization or training to groom up to get some kind of informations okay.

So, like here you can imagine that this is a community or society network total Y, there are five actors so, we can see the role here like A and B, they do not have direct relationship with each other, but they belong to one group why; because A and B have same interrelationship with C and D like both A; A has a relationship with C and D similarly, B has a relationship with C and D, they are not connected with any other actors in this network.

It is also true for C and D, they do not have any direct contact with each other, but they belong to one group like a doctor in a same hospital, students in the same school, researchers

in IIT Roorkee or any other Institute okay, or this group 3E, he is an isolated person because no one has this kind of network, okay.

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Role of Structural Equivalent Group -

- Social Competition

(Burt, 1933)

- Social Environment, Socialization process

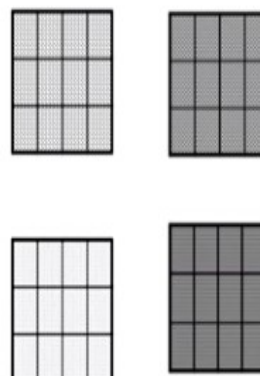
(Marsden and Friedkin, 1994)

The role of structural equivalence, it promotes competition, 2 colleagues, they are competing with each other or it kind of gives you some socialization process, you do not know your researchers in IIT Roorkee, does not matter, somebody in biology department, somebody in engineering department, somebody in a planning department but you have some kind of orientation, some kind of training, it does not matter if you do not know each other, your teachers grooming you.

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Spatial group -

- Individual's behavioral similarity can be identified on the basis of geographical proximity.



Another dimension is the spatial dimension; spatial groups, you like or not like, you need to interact with your neighbours and they influencing you, you are also influencing them so, you

need to you are interacting face to face, talking to them watching them so, direct and indirect influence always there, so people started to leave in one common place also, they have a similar kind of habit or attitude.

So, now we have 3 kinds of groups; one is cohesive, one is structurally equivalents, there is same competition position and roles and the question of spatially distribution. Now, we have also need to collect 3 kinds of informations or informations through 3 kinds of activities; one is hearing, one is observations, one is discussions. The question is as an individual, from where I should go to collect which kind of informations?

For hearing, whom I should depend; to my cohesive partners or my neighbourhoods, for observations whom I should observe, whose activities I should observe for discussions, more intimate subjective interpretations about the innovations, whom should I depend on so, the question is to whom we should depend for acquiring information?

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This is Bangladesh, as I said is highly contaminated by arsenic especially, the coastal areas and also water salinity issue and we conducted the survey in a small area, city, suburban areas called Morrelganj; Morrelganj town and Morrelganj villages and this is the bazaar area of this small town, people are collecting water from water pond and also from tube wells sometimes.

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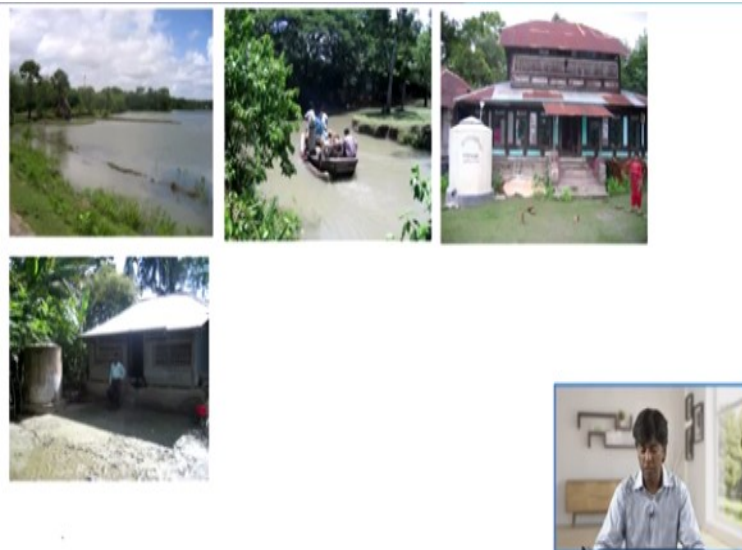
Rainwater Tank Installation at a Glance



Total Tank Installed	56
NGO workers installed Tank	5
General Tank Adopted	49
Tank Size	1500 liters, 3200 liters, 4400 liters
Tank Cost	10000 Taka ~ 14000 Taka (16000 Yen ~ 20000 Yen)
Total time of tanks installation	June, 2004 - August, 2009 = 39 months

But the people for rainwater one, Japan based NGO, they install this kind of tank in many places in the town they installed 56 such tanks in total they installed more than 250 tanks, okay.

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Now, these are some of the pictures of the area to get a glimpse; get an idea that how this area looks like, this is during high tide, and they have use canal for transportations mainly, many places the roads are disconnected and during the rainy season, so this is really to give you a glance of the area.

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Techniques Used

- Cohesive Group – Faction Methods (UCINET)
- Structural Equivalent Group – Burt Methods/ Definition (UCINET)
- Spatial Group: Neighborhood Affiliations



"Kindly name us three tank owners in Morrelaganj town with whom you often meet, talk or discuss in any issue in your daily life"

So, we use some kind of method to define cohesive networks, faction methods, another one is structural equivalent group by using Burt methods, definition in UCINET and also spatial group neighbourhood affiliations anyway, so this is not that important for these discussions but we need to collect the information through survey about people's social networks so, we asked the people that okay, kindly name as 3 persons; 3 tank owners in this area in Morrelganj area with whom you often meet, talk and discuss in any issues in your daily life.

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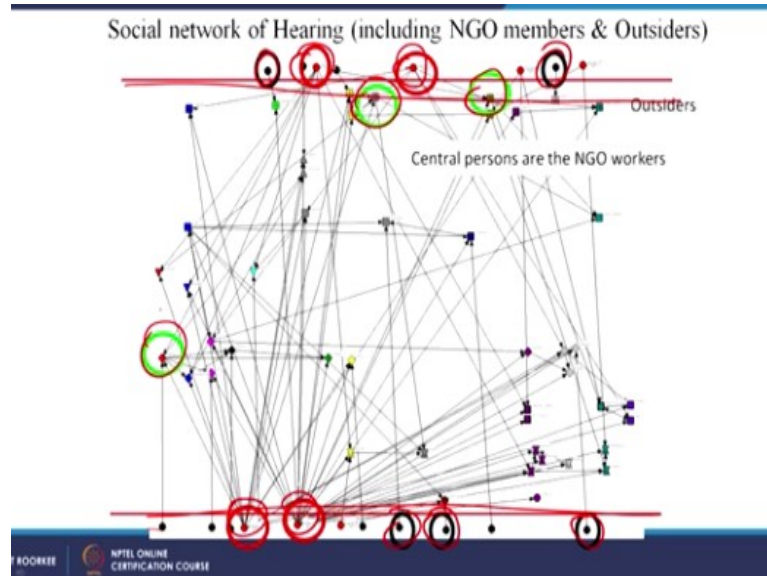
Hearing :

*"Kindly Name us three persons from whom you
have first time heard about the rainwater tank
"*

This will give us the idea of the social networks that prevails within the tank owners so, this is structural equivalent group and for the hearing, from where they collected depends the first time about the rainwater harvesting tank, we said to the people hey, please name us 3 persons from where you first time heard about rainwater harvesting tank for your drinking water purpose.

So, if you; then we generate this; here is an example of this one, if you look into here, the circles are the; this red circles are the NGO partners.

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So, this is actually the community boundary okay, community boundary. So, people here; the red one actually they are the central person, they receive a lot of people collecting informations from them, they are actually the NGO people those who are promoting this rainwater harvesting tank and also some outsiders, you can see some of the outsiders that is they do not belong to this Morrelganj area, we will also collect informations from them.

But also, there are some key players inside the community okay, they actually played a critical role to disseminate informations about the rainwater harvesting tank.

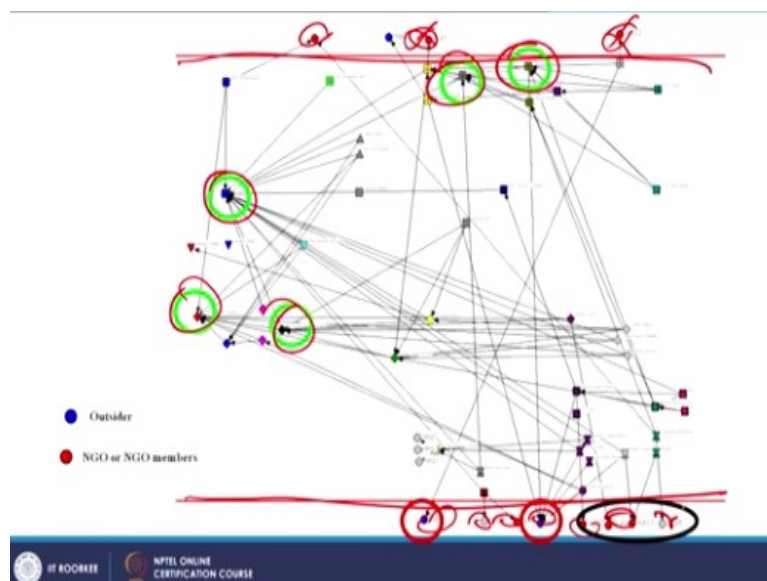
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Observation :

" Did you observe rainwater tank before your adoption? If Yes, Kindly name us three tank adopters or places where you have first time observed the rainwater tank "

Also the observations; for observation network, we ask people that who was the first three persons where you saw first time this rainwater tank and so here also basically, you can see that outsiders or NGO people are negligible, they did not.

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So, it is actually there, the inside the people, they are the key source of informations for that within the community boundaries all belong to within the community boundaries so, outsiders have very little; a little influence okay.

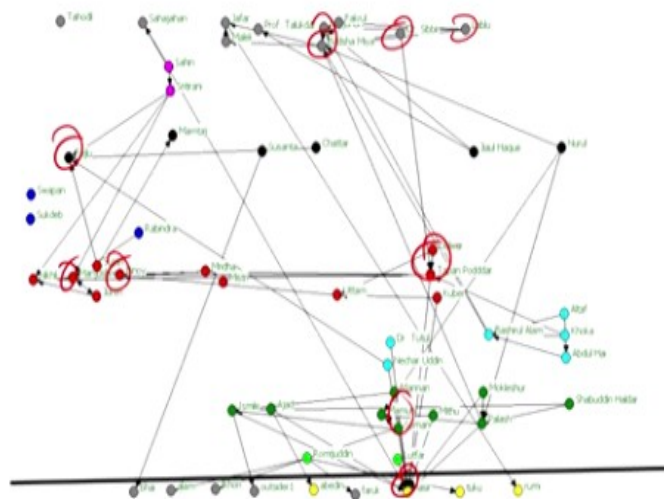
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Discussion

"Kindly name us three persons with whom you have discussed about the tank before making final decision of tank installation"

Now discussions; with, whom they discussed about before they decided to install, we asked them to name 3 persons.

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And we also found that they are depending on outsiders and also insiders okay, like here you can see a lot of networks, a lot of there.

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Group Criteria		Hearing	Observation	Discussion
Cultural group	Religion	-0.002	0.020	0.002
Economic group	Income	0.001	0.001	-0.001
	Occupation	0.013	0.012	0.021
Spatial group	Neighbourhood	0.048	0.090*	0.061*
Social network group	Cohesive	0.080**	0.072**	0.081**
	Structurally equivalent	0.027	0.001	0.018
R-Square		0.084	0.070	0.088

** $p < 0.01$, * $p < 0.05$

We used Quadratic Assignment Procedure (QAP), a multi regression technique, provided by UCINET Social Network Software 6.0 Version 1.00 (Borgatti et al. 2002) to find out the actors' social referents for each kind of information-seeking activities. This approach is similar to ordinary multiple regression. However, it enables analysis of matrix data.

So, now look and we conducted a regression analysis so, we have three one, one is the hearing, observations and discussions okay, now we want to know that from where people collected, one is cultural group like religion, if they have asking it from religious, economic, spatial, social okay and if we see the hearing, we can see that people depends on their cohesive group partners that it means their friends.

Now, a little bit extends to their neighbour, no other are significant, in case of observations where they first time observed, it is the neighbourhood partners who played a big role that means, they watch in their neighbourhood but also the cohesive group partners like could be that some of the neighbours are there, cohesive group partners. In case of discussion that is the final decisions, they depend on again cohesive group partners, okay.

And also their neighbourhoods, so cohesive group partners and neighbours are the main source of informations.

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- Higher the degree/ frequency of ties, higher is the information sharing tendency.
- Neighborhoods member/ Spatial Group – Source of Observation

So, higher the degree and frequency of ties and network, higher is the information sharing tendency and neighbourhood members or a spatial group source of observations for most of the people.

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Policy Implications

- Planners or NGO workers might take advantage of satisfied tank owners to talk to individuals in close group meetings and workshops organized in a neighborhood.
- The success stories and personal opinion of existing tank adopters could be documented and distributed in brochures, newsletters, or video promotion for potential adopters to accelerate the social contagion of adoption.
- Potential adopters are affected by cohesive group partners under these groupings: religious, political, and cultural. These groups and organizations then should be involved in the dissemination process like promoting rainwater tanks during cultural and religious festivals and by direct communications with religious gurus and local leaders.
- Another strategy to convince potential tank adopters would have the satisfied tank adopters share their experiences adopting the innovation. Our results show that individuals share information among cohesive group partners. Therefore, if the tank owners are satisfied with the tank, penetration of the technology happens more smoothly.

Then, what is the policy implication of this, we can do one thing, the planners and NGO workers might take this advantage that who those who are satisfied with the users of this tank owners, they can come and talk, give a talk to the individuals who have not adopted yet and especially by conducting neighbourhood meeting or workshops in a particular neighbourhood.

The success stories; someone's adopted their personal opinion of the tank okay, adopters and could be documented, and distributed in a brochure to potential adopters and potential

adopters are affected by cohesive group partners, so under this like religious, political and cultural groups these are actually cohesive groups so, we can use these groups for dissemination.

Another strategy to convince potential tank adopters would have satisfied tank adopters to share their experience into other 3 members okay, they can also tell us that the 3 or 4 members they can promote.

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- A cohesive group helps the diffusion process only within the group and it sometimes produces redundant information and restricts new information and knowledge from entering the group. One way to overcome this bottleneck is to use NGO workers to find the opinion leaders in the promotional program.
- Observation is a method of learning closely linked with geographical proximity and popularity. Therefore, more model tank demonstrations are needed at various public and popular places including schools, religious centers, clubs, and markets.
- Moreover, door-to-door campaigns by NGO workers are recommended to accelerate the promotion of rainwater tank adoption.

So, these are some of the; also we can conduct some door to door campaign with this so, thank you very much for all listening this talk, I will continue in same on this and the role of pioneer adopters on promoting disaster preparedness and information sharing.

Thank you very much.