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Social Capital and Network Externalities: *Evidence from Gender Sensitive JFM Programme in West Bengal*

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This empirical exercise examines the impact of network externalities of social capital in a gender sensitive planning on Joint Forest Management Programme in West Bengal. One impact is that the pre-existing traditional characteristics of community solidarity, mutual trust and coordinated actions are the inner dynamic of the development for higher level social capital in JFM compared with non-JFM villages after JFM situation. The positive complementary effect of network externalities is also higher for the former villages. These two effects are more pronounced in women FPC villages in general and among very poor categories of households in particular within JFM villages.

Keywords: *Social capital, joint forest management villages, forest protection committee villages, productivity, equity, sustainability.*

JEL Classification: *D78, J16, Q23, A13*

I. Introduction

A consumption externality arises if one consumer cares directly about another agent's production or consumption. Similarly, a production externality involves when the production possibilities of one firm are influenced by the choice of another firm or consumer. There is a special kind of externalities named 'network externalities' in which one person's utility for a good depends on the number of other people who consume this good ; a person's utility could depend on the identity of other user (Varian, 2003: 631). It has two types of indirect effects: when one user's demand for a thing (for

example, communication network) depends on many other users, and all are connected to the same thing, all are connected to each other. Another more indirect effect for network externalities arises with complementary goods. In this case, the demand for a good (for example, video tapes) depends on the number of its complementary goods (like VCRs), resulting in a more general form of network externalities (ibid: 637).

How does social capital act as network externalities? Social scientists have long recognized the role that social capital plays in facilitating human interactions which can never be the result of one individual's action; it requires interactions between at least two people and usually among a large group of people (World Bank, 2002: 73; Charles and Kline, 2006:583; Fafchamps and Minten, 2002:173; Coleman, 1988; Putnam et al., 1993). Social capital, defined as the commodity which individuals use in non-market social interactions to extract valuable resources (Charles and Kline, 2006: 583), is the network that helps create linkages that in turn forge rules, conventions and norms governing the development process at different levels in all societies (Putnam et al., 1993:34-45; Woolcock, 1998:151-208). It is the network of relationships between the agents within an economy; the greater the stock of social capital, the more developed is the network (Barr, 2000:539). It is argued that social capital facilitates the network of information flows or knowledge flows of interactions between economic agents and as a result of these flows among a larger number economic agents, the potential for sustained economic growth prevails (Fafchamps and Minten, 2002; Barr, 2000). The distinguishing feature of social capital as an input into development is that it ensures qualitative changes in procedures governing the development process to ensure its embeddedness and linkage with development at higher levels (Mayer, 2001: 691).

Social capital based on participatory programme in forest management programme like JFM facilitates network externalities in the form of both users and uses of social capital. Social capital in the form network externalities has two indirect effects: if all are connected with the same social network capital, all are connected with each other influencing higher level of social capital in the society; and such social network capital has complementary effect on women wellbeing, human development and social welfare resulting in a broad network of social capital in the society¹. As regards the first issue is

concerned, aggregate social capital, which is formed out of different levels of social capital possessed by individuals (Charles and Cline, 2006: 581), increases if individual level social capital increases. Social capital under JFM in forest resources first starts from individuals, and afterwards it is extended among households, groups and community. How is individual level social capital formed? Very recent literature on production on social capital emphasizes that an individual's stock of social capital is formed out of investments made in his/her separate pair-wise connections with other people in his/her social sphere (Charles and Kline, 2006: 581-585; Fafchamps and Minten, 2002: 173-4). All forms of social capital in their studies ultimately derive from individual's pair-wise connections which an individual possesses for exclusive use in social interactions (both organizational and individual) with some different persons in his/her social sphere. Social capital acts as a network multiplier- the factor by which each entrepreneur's specific knowledge is multiplied as a result of the process of reciprocal exchange to give the total amount of knowledge available to her as a member of the network (Barr, 2000: 542). As a result of this process of exchange of knowledge, each member, while retaining her specific knowledge, gains some of the knowledge belonging to all the other network members (ibid: 541). An individual's stock of social capital should be increasing if interactions with larger individuals in his neighborhood increase (Charles and Cline, 2006: 581). As regards the second issue is concerned, the complementary effect of network externalities of social capital has indirect effect on other social institutions like women welfare, human development among larger individuals of neighborhood resulting in a more general form of network externalities.

With regard to the understanding of the gender aspects of social capital manifested in the groups for natural resource management (NRM) is concerned, it is increasingly well established that social capital, an important factor in building and maintaining collective action in gender differentiated social groups, is fundamental to substantial and long run changes in natural resource management (Westermann et al., 2005; Agrawal and Gibson, 1999; Baland and Platteau, 1996; Pretty and Smith, 2004). The potential consequences of such collective natural resource management based on the analysis of different and complementary roles of women and men in social capital formation is guided by the

proposition that women tend to build more relational social capital than men (Folbre, 1994; Molinas, 1998). This is due to the fact that women supposedly value collaboration, altruism and conflict resolution more highly than men, and so form stronger kinship and friendship relations than men (Agarwal, 2000; Molyneux, 2002).

Why is the study relevant in the context of West Bengal? Although National Forest Policy (1988) of the Indian government asserted “creating a massive people’s involvement with the involvement of women” as one of its basic objectives (MoEF, 1988: para 2.1), Government of West Bengal’s (GoWB) Order (dated July 12, 1989) does not make explicit mention of women as an independent entity; the membership is either joint or male/female. Beyond this, the Order is silent on women’s separate role and involvement in committee formation, micro-planning, site selection, protection, benefit sharing etc. (Sarker and Das, 2002:4410-4411). Thus, understanding that women are being deprived of their equal constitutional rights to benefits accruing from the forest, efforts have been made very recently (from the early 1990s) by the Forest Department, GoWB to establish new management system of ‘women forest committee’ (i.e. female-headed forest protection committee) in West Bengal. To these end seventeen *female* forest protection committees (FPCs) have been established primarily only in Bankura district in West Bengal (ibid: 4411). Although compared with general joint FPCs (almost male-headed FPCs) the number of female FPCs (female-headed FPCs) is insignificant, the movement has been started by the government effort, primarily, from Bankura district. . This study however tries to explore the impact of network externalities of social capital in a gender sensitive planning on Joint Forest Management Programme in West Bengal. The underlying assumption is that female-headed FPC villages have been more successful than joint FPC villages and non-JFM villages in building higher network externalities of social capital (building the level of social capital and its positive complementary effect) to the rural communities in a gender sensitive planning in JFM programme in West Bengal.

The next section presents the measurement framework of social capital of this study. Section III summarizes the data on which the research is based. Section IV outlines the key results. Section V concludes.

II. Measurement Framework of Social Capital

This study considered three generic criteria (*productivity, equity and sustainability*) along with World Bank's six common dimensions (*groups and networks, trust and solidarity, collective action and cooperation, information and communication, social cohesion and inclusion, and empowerment and political action*) for the measurement of social capital under a qualitative framework. In quantitative study the impact of the determinants of household level social capital is examined by the following linear regression model:

$$SC = a + b_1PE + b_2RB + b_3PDM + b_4SI + b_5ED + b_6C + b_7FS + b_8G + c_1D_1 + c_2D_{21} + c_3D_{22} + u$$

The measurement of development indices related to the positive complementary effect of network externalities of social capital this study also used:

Women well-being index

Human development index

Social welfare function index

III. Data Set

The data have been collected through an intensive field enquiry covering all members from FPCs/villages under JFM villages (study group villages) and non-JFM villages (control group villages) – three sample female FPCs (core group), three joint FPCs (first control group) and two non-JFM villages (second control group). In addition to the comparison on current data of after situation of JFM (period of survey), data during before situation of JFM are also collected from all the households through the *reflexive comparison method* where 'after' and 'before' scenarios are compared for all households (Ravallion, 2001; Reddy et al., 2004).

IV. Findings

At the very outset, we examine some characteristics of villages under study. More than 80 percent members of almost all FPC (both female and joint) and control group villages are either schedule caste (SC) or schedule tribe (ST); more that 75 per cent households in

each sample FPC village live below poverty line²; major part of income for households below poverty line in all FPCs and control group villages is yielded from forest source. All these might lead to low economic and social status of forest fringe communities in rural Indian society.

Tables 1a, 1b and 1c provide a glimpse of the measure of gross benefit of social capital for different FPC villages under our study based on productivity, equity and sustainability respectively. The study suggests that coordinated action related to productivity is successful where an underlying tendency for united action already exists in a community based on tradition and cultural values, absence or weak presence of traditional ascriptive hierarchies and endemic factionalism, strong leadership, trust among community members with active tendency to participate in community work, sense of responsibility among members and their network of relation with officials, members' ability to take decision, accountability and transparency of institution (Table 1a). Such a tradition of pre-existing community solidarity with common identity is the basic principle for the success of united action to other criteria – equity (Table 1b) and sustainability (Table 1c) – considered for measuring social capital of institutions. Aggregate results show that the change of the level of social capital is considerably high during after situation of JFM for the FPCs compared with before situation of JFM (Table 2). As regard the control group is concerned, although the level of social capital is somewhat high during after situation compared with it's before situation, the change is not so important. The comparative study between study group and control group villages shows that during after situation of JFM programme the level of social capital is considerably higher in all study group villages under JFM programme than that of among control group villages (Table 2), because all the traditional characteristics of community solidarity and coordinated action are more prevalent among each of the FPCs. The comparative study between female FPC (female-headed) and joint FPC (male-headed) under JFM villages during after situation reveals that female FPC villages is capable of building highest level of social capital under JFM programme. Categorically, the level of social capital during both after and before situations with/without JFM (Table 2) the households of landless and marginal categories register higher level than small category of households. This result

corroborates with the study of Ray (2006) who argues that while the poor have little access to other capital assets, they often do have substantial social capital, such as social networks and connections through membership of organization, clienteles, and so on, which allow them to whither subsistence crises and might even afford them the possibility of capital accumulation and a way out of poverty (p.462).

But one of the most fundamental indicators of productivity to which all joint FPCs are lacking behind all female FPCs is the active supporting role of officials (Table 1a). Although all joint FPCs have low social capital for low active supporting role of officials in relation to all female FPCs, what is more important is that all joint FPCs have higher literacy level than all female FPCs, but the former possesses lower active supporting role of officials. It is argued that where social cohesion and tradition of community solidarity are weak, effective village leadership and support of local officials can help building community solidarity that might contribute to build up high level of social capital (Evans, 1996:1122; D'Silva and Pai, 2003).

Regression results show that, four crucial factors (prior experience, rules, participation and information) are of expected sign (positive) and turn out to be highly significant predictors of social capital as did gender, study group, and landless and marginal categories of households (Table 3). Although education negatively affects the level of social capital, it is also significant predictor of the amount of social capital. In contrast, caste and family size do not prove to be significant predictors of social capital. The results also imply that gender is an important predictor of the level of social capital in such a way that higher value of gender of female category is associated with higher level social capital. Westermann *et al.* (2005) observes social capital in terms of self sustaining collective action, solidarity, conflict resolution increased with women's presence and social capital was significantly higher in the women's groups. Regression result also shows that poor (marginal farmer and landless households) has substantial level of social capital in relation to others.

The positive complementary effect of network externalities of social capital under JFM programme in this study – women well-being index, human development index and

social welfare function index – is mainly due to JFM programme because prior to this programme neither government/panchayat nor NGOs/other non-institutional organizations make any effort of public works/collective efforts among the forest fringe villages we surveyed. Almost all types of developments in these forest-dependent communities are mainly due to the existence of forest resource and the benefit that accrues from this resource. Table 4 shows that, village-wise, the change of WWI, HDI and SWFI is positive for almost all categories of households in the study group villages with negative change for these indices for almost all categories of households in control group villages. Within JFM villages, the positive change of all these indices is considerably higher in female FPC villages. Categorically, these (positive) changes are markedly higher for landless and marginal categories of households within JFM villages in general and female FPC villages in particular.

V. Conclusion

Social capital in the form of network externalities based on JFM programme suggests two indirect effects in this empirical exercise. First, the building up higher level of social capital has been more successful in JFM villages because the pre-existing traditional characteristics of community solidarity, mutual trust and coordinated actions are more existent in JFM compared with non-JFM villages after JFM situation. Although more than 75 per cent of people in the villages we surveyed live below poverty line, the food-livelihood insecurity cannot destroy the level of social capital of institutions if there already exists an underlying tendency for united actions based on all these traditional social and cultural characteristics along with common identity based on education, income and lifestyles. The dynamic of building higher level of social capital after JFM situation is more prominent in female FPC villages compared with joint FPC villages in general and among very poor categories of households in particular. But one of the most fundamental indicators of productivity to which all joint FPCs are lacking is the active supporting role of officials. So, where social cohesion and tradition of community solidarity are weak, effective village leadership and support of local officials can help building community solidarity that might contribute to build up high level of social capital.

Secondly, the positive complementary effect of network externalities of social capital under JFM programme might lead to socio-economic wellbeing and broad pattern of development to the poor forest communities which are incorporated under JFM programme. This positive spillover is more pronounced among landless and marginal categories of households in general and female FPC villages in particular within JFM villages. This study, however, lends credence to the fact that women's involvement in JFMP might increase higher level of social through coordinated action and group solidarity influencing thereby to contribute to environmental sustainability and broad pattern of socio-economic development to poor forest communities.

Notes

1. The network externalities of social capital under JFM programme can be outlined with simple demand-supply model: suppose that there are I people in the market for social capital and we index the people by $P = 1, 2, \dots, I$. Let us assume r as measuring reservation price (the highest price that the given person(s) will accept and still purchase the good) for social capital by person P . Then if the price of the good (social capital) is p , the number of people who consider that the good is worth at least p is $I - p$.

This structure generates a standard downward sloping demand curve. The underlying reason may be judged by the fact that the larger network of social capital increases the availability of information and lowers its costs (World Bank, 2002:8). Whenever social capital is present, agents can economize on transaction costs or search costs because there are large number of people connected with the network of pair-wise connections (Fafchamps and Minten, 2002: 172-3), then the willingness to pay of the marginal individual is low.

Now let us look at the supply side to keep the model simple. Suppose that the good is provided by constant return to scale technology. CRS technology seems to be more pronounced because the association or group or organization like FPC under JFM programme has to bear some costs for its maintenance. The cost is autonomous, which is irrespective of the person with whom the connection is made (Charles and Kline, 2006: 584). Then the average cost for each individual might be same. The supply curve would be a horizontal line at price equals minimum average cost:

$$p = c_{\min}$$

There is one stable equilibrium point at the intersection point of demand and supply curve where price equals minimum average cost (Figure 1).

However, the network externalities may appear if the good can be provided by increasing or decreasing returns to scale taking adjustment with demand function.

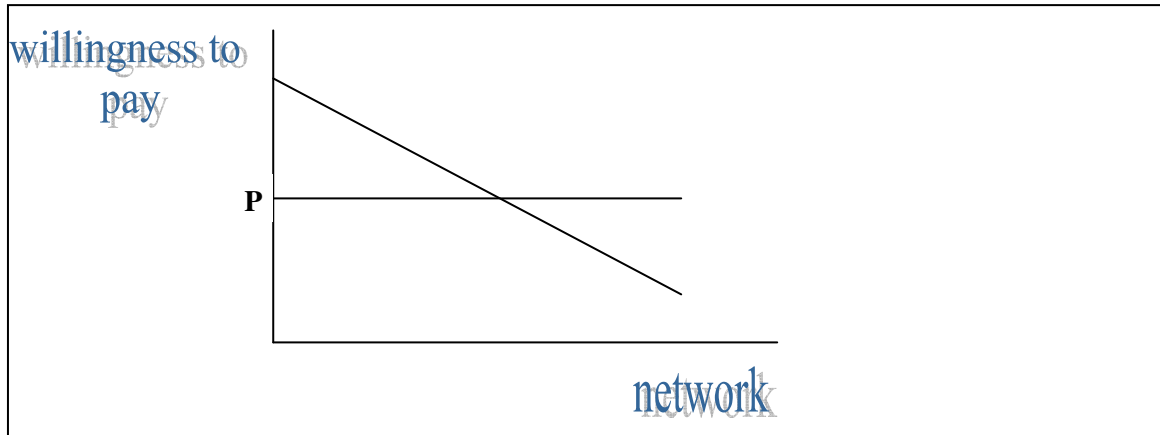


Figure 1

2. Poverty line income in rural West Bengal on the basis of PCME (per capita monthly expenditure) by NSS of 56th round (1999-00) is INR 350.17. Based on the CPIAL (Consumer Price Index of Agricultural Labour [General]) the poverty line income for the year 2005-06 is calculated as INR 394.00 approximately.

[Details of methodology and dataset will add shortly in soft version]

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