

January 2011

Journal of Global Analysis

Women's Empowerment through Self-help Groups and its Impact on Health Issues: Empirical Evidence

Sudipta De* and Debnarayan Sarker**

Based on an empirical study in West Bengal, this paper attempts to examine whether women's involvement in the microcredit programme through SHGs makes any positive change on women's empowerment. From the assessment of various criteria of empowerment (power, autonomy and self-reliance, entitlement, participation and awareness and capacity-building), the study suggests that if women participating in the microcredit programme through SHGs sustain for some longer period (eight years or more), such programme might contribute to higher level of women's empowerment than women's empowerment under all types of control group. This paper also finds that women's earnings from saving and credit have positive and significant effect on nutritional status of the children of women members of SHGs and on the protein-intake for their household compared with that of among control groups.

Keywords: Women's empowerment, Power, Autonomy and Self-reliance, Entitlement, Participation, Awareness and Capacity-building, Nutritional Status.

Sudipta De and Debnarayan Sarker
Centre for Economic Studies
Department of Economics
Presidency University, Kolkata (INDIA)

Ph: +91-(0)33-2241 1908

e-mail: sarkar_d_n@rediffmail.com

* Sudipta De is Assistant Professor in Sivanath Sastri College, (formerly, South City College), Kolkata.

** Debnarayan Sarker is Professor and Secretary of Centre for Economic Studies, Presidency University, Kolkata.





CESRAN SARAM

STRATEJİK ARAŞTIRMALAR VE ANALİZ MERKEZİ - SARAM
CENTRE FOR STRATEGIC RESEARCH AND ANALYSIS - CESRAN

www.cesran.org

Women's Empowerment through Self-help Groups and its Impact on Health Issues: Empirical Evidence*

Introduction

Why lend to women rather than to men? Nobel laureate Prof. Yunus¹ is of the view that if the goals of economic development include improved standard of living, removal of poverty, access to dignified employment and reduction of inequality then it is quite natural to start with women. They constitute the majority of the poor, the under employed and the economically and socially disadvantaged. Hunger and poverty are more women's issues than male issue. Women experience hunger and poverty in much more intense ways than men. If one of the family members has to starve, it is an unwritten law that it has to be the mother. They are very close to children. When a destitute starts making some income, her dream invariably centre on her children. He also finds that traditional banks in Bangladesh are gender biased and do not want to lend money to women. Moreover, "a development reason to favor women", he says, "the more, I got involved, the more I realised that credit given to women brought about changes faster than when given to men"².

How does credit given to women bring about changes to women? The theme of Microcredit Summit, 1997, stressed on two issues to bring about changes to women: of reaching women and empowering them. Most of the self-help groups (SHGs) that are formed under current microcredit initiatives are those of women. There is no doubt about the fact that, given the current systems of microcredit, women have access to credit. However, empowerment is not dependent on mere access but on control of both the credit and the use to which that credit is put. Access does not automatically include control³. While evaluating the effect of microfinance programme on women empowerment, several studies yield mixed results. Some are in favour of the argument of the ability of microfinance to induce a process of economic, political and social empowerment whereas others, being more skeptical, point to a deterioration of women's overall well-being.

The term 'Microcredit' has been defined by the Microcredit Summit (1997) as "programmes that provide credit for self-employment and other finance and business services (including savings and technical assistance) to very poor persons" (Microcredit Summit, 1997, Draft Declaration and Plan of Action). The term microcredit, microfinance

* This paper is a revised version of the part of PhD. works of the first author. The authors are grateful to anonymous referees and the editors of this journal for their helpful comments, suggestions and valuable insights on the earlier draft of the article. However the usual disclaimers do apply.

1 Yunus, M, "Banker to the Poor", The University Press Limited. Dhaka, 1998

2 Yunus, M, "Banker to the Poor", 1998

3 Burra, N.; J. Deshmukh-Ranadive and R.K. Murthy (eds), "Micro-Credit, Poverty and Empowerment: Linking the Triad", Sage Publications, New Delhi/Thousand Oaks/London, 2005.



and microenterprise finance are used almost interchangeably in these days. Though they appear as connoting largely similar meanings, the theoretical perspectives underlying each of these terms can be interpreted to be distinct. The 'microcredit' evidently suggests the predominance of 'debt' or lending, while 'microfinance' points to a context wherein both credit and savings are involved.

As to women's empowerment – defined, measured and observed in a multitude of ways⁴, generally the effects of the programme are largely positive⁵. Moreover, women use a more substantial part of their income for health and education of their children⁶. They also play a very important role in reducing poverty within households⁷. Many impact studies conclude that those participating in microfinance programme are more likely to invest in their children's education and better nutrition and health practices than those not participating⁸. In this perspective based on an empirical study in West Bengal, this paper tries to measure the level of empowerment of women participating in the microcredit programme through SHGs under different criteria – power, autonomy and self-reliance, entitlement, participation and awareness and capacity-building - and to examine the effect of empowerment of women participating in SHG programme on their children's nutritional status and protein-intake of their households. The study suggests that if women participating in the microcredit programme through SHGs sustain for some longer period (eight years or more), such a programme might

- 4 Kabeer, N., "Resources, Agency, Achievements: Reflections on the Measurement of Women's Empowerment", *Development and Change*, 1999, Vol. 30, pp. 435-464.
- 5 Amin, S. and A. Pably, "Gender Inequality within Households: The Impact of a Women's Development Programme in 36 Bangladeshi Villages", *Bangladesh Development Studies*, Vol.22, No. 2 & 3, 1994, pp.121-154. Huda, S. and S. Mahmud, "Women's Control over Productive Assets : The Role of Credit Based Development Interventions". Working Paper No. 28, BRAC- ICDDRDB Joint Research Project at Matlab. Dhaka, 1998. Mahmud, S., "The role of Women's Employment Programmes in influencing Fertility Regulation in Rural Bangladesh". *The Bangladesh Development Studies*. 22 (2&3) pp93-120, 1994. Pitt, M. and S. Khandker, "Household and Intra household Impacts of the Grameen Bank and Similar Targeted Credit Programs in Bangladesh", Paper presented at Workshop on "Credit Programs for the Poor: Household and Intra-household Impacts on Program Sustainability". Dhaka: World Bank and Bangladesh Institute of Development Studies, 1995. Rahman, R.I., "Impact of Grameen Bank on the Situation of Poor Rural Women", Working Paper No. 1. Grameen Bank Evaluation Project, Bangladesh Institute of Development Studies. Dhaka, 1986. Steele, F. et al. *The Impact of an Integrated Microcredit Program on Women's Empowerment and Fertility Behaviour in Rural Bangladesh*, Policy Research Division, Working Paper No. 115. The Population Council: New York, 1998.
- 6 Pitt, M. and S. Khandker, "The Impact of Group-Based Credit Programs on Poor Households in Bangladesh: Does the Gender of Participants Matter?" *Journal of Political Economy*, 106 (5):958-996. 1998.
- 7 BIDS. (Bangladesh Institute of Development Studies), "Evolution of Poverty Alleviation Programmes in Bangladesh" (Mimco), BIDS, Dhaka, 1990. Holcombe, S. "Managing to Empower : The Grameen Bank's Experience of Poverty Alleviation", London : Zed k Press, 1995. Hossain, M. "Credit for Alleviation in Rural Poverty. The Grameen Bank in Bangladesh", Washington DC : IFPRI, 1988. Khandker, S.R. "Fighting Poverty with Microcredit : Experience in Bangladesh", Washington, D.C.: Oxford University Press for the World Bank, 1998. Otero, M. and E. Rhyne: "The New World of Microenterprise Finance ,London" : IT Publication, 1994. Remenyi, J. (1991) : "Where Credit is Due?" London IT publication. Schuler, S.R.; S.M. Hashemi and A. P.Riley. "The Influence of Women's Changing Roles and Status of Bangladesh's Fertility Transition : Evidence from a Study of Credit Programs and Contraceptive Use", *World Development*, 25 (4), 1997.
- 8 Bera, S. "Programme Design and Impact Assessments: Success' of Microfinance in Perspective". *Economic and Political Weekly*, August 9-15, 2008, XLIII (32). BIDS. (Bangladesh Institute of Development Studies), "Evolution of Poverty Alleviation Programmes in Bangladesh" (Mimco), BIDS, Dhaka, 1990. Chowdhury, O.H. and S. Khandker. "Targeted Credit Programme and Rural Poverty in Bangladesh" paper presented at the workshop on 'Credit Programmes for the Poor: Household and Intra-household impacts and Programme Sustainability' World Bank and Bangladesh Institute of Development Studies, Dhaka, 1995. Hossain, M. "Credit for Alleviation in Rural Poverty. The Grameen Bank in Bangladesh", Washington DC : IFPRI, 1988. Mahmud, S. "The Gender Dimensions of Programme Participation: Who Joins a Microcredit Programme and Why?", *The Bangladesh Development Studies*, 2000, Vol. XXV, June – September. Mustafa, S. et.al. "Impact Assessment Study of BRAC's Rural Development Programme: Final Report". Research and Evaluation Division, BRAC, Dhaka, 1995. Rani, A. S. "Does Mother's Participation in Economic Activity Influence Nutrition and Health Status of Children?" *The Indian Economic Association*, 89th IEA Annual Conference Volume, 27-29th Dec., pp. 192-204, 2006.



contribute to higher level of women's empowerment than women's empowerment under all types of control groups of this study. This paper also finds that women's earnings from saving and credit have positive and significant effect on nutritional status of the children of women members of SHGs and on the protein-intake for their household level compared with that of among control group. In order to examine the particular objective, this paper will test the following. 1) the average empowerment level of women (the procedure of measurement appears in methodology section) participating in microcredit programme for eight years or more, who are called core group/policy group of this paper (Women SHGs participating under microcredit programme for eight years or more under SHG-NGO and SHG-Non-NGO models selected for study are called core group or policy group.), is higher for both NGO-led and Non-NGO-led programme in relation to the empowerment level of women among all control groups (supporting groups), and no perceptible difference is expected at the level of empowerment of women between NGO and non-NGO led programmes under core group. 2) Empowerment of women participating in the microcredit programme through SHGs has a significant positive effect on their children's nutritional status and protein-intake of their households.

Relevance in West Bengal

Micro credit initiatives in West Bengal, as the whole of India, are getting increasingly popular as a way to mobilize poor communities through the provision of loans based on group solidarity instead of formal collateral. Both bank-led and NGO-led self-help-groups are working in the state for more than a decade. During 2002-03 to 2005-06, the number of deposit-linked SHGs increased from 35381 to 101556 i.e. by 2.87 times while that of credit-linked SHGs increased at a higher rate from 17143 (at the end of March, 2002) to 1,36,251 (at the end of March, 2006) i.e. by 7.95 times⁹. The number of deposit-linked SHGs accounted for 43.82 % of the deposit-linked SHGs during 2002-03 whereas during 2005-06 the percentage share favorably increased to 77.52- amount of credit per SHG increased appreciably from Rs.11442 to Rs. 47381 during this period¹⁰. SHGs once formed under the Government-sponsored SGSY have to be qualified to have passed Grade I to be eligible for getting revolving fund from the bank and also to have passed Grade-II, which would enable them to be linked to cash credit facilities with the financing bank. And for the SHGs to have passed Grade I and Grade II their performance has to be assessed on the basis of 16-point check list. Based on the data available from the office of the Panchayat and Rural Development Department, Government of West Bengal, it is revealed that 74.4 percent of the SHGs formed get qualified for having passed Grade I because of the stringent criteria as noted above. Again, out of the SHGs passed Grade I, only 22.56 percent passed Grade II because of the same reason. Thus only 16.8 percent of SHGs formed passed Grade II and have benefits of being credit-linked.

There is a system of grading SHGs into Grade-1 and Grade-2 for assessing the achievement of SHGs toward maturity level as per the norms stipulated under SGSY

9 NABARD. "NABARD and Microfinance- Ten years of SHG – Bank Linkage", NABARD, 2001-02. NABARD. "Progress of SHG-Bank Linkage in India, 2005-06", NABARD

10 NABARD. "Progress of SHG-Bank Linkage in India, 2005-06", NABARD



guidelines. 1st grading is done after six months from the formation of the group, i.e. SHGs that are in existence for about six months become Grade-1 SHGs as per the norms stipulated under SGSY guidelines. The grading team consists of the *Savapati* (President) of the Panchayat Samity, B.D.O. (Block Development Officer), Land Department officer and bank manager. A group successful in 1st grading receives Revolving Fund equal to the group corpus with a minimum fund of Rs. 5000/- only and maximum of Rs.10,000/- only from the DRDC (District Rural Development Cell). If a group is not able to run its microenterprise after receiving the revolving fund but requires more financial support, further doses of Revolving Fund from DRDC up to a maximum of Rs.20,000/- inclusive of previous doses may be sanctioned. 2nd grading is done after six months from receiving the Revolving Fund. If the Grade-1 SHGs are able to demonstrate the potential of viable groups (successful microenterprises) become Grade-2 SHGs as per the norms stipulated under SGSY guidelines. The grading team consists of officers from DRDC, Line Department Officer, *Savapati* (President), the Panchayat Samity, B.D.O., Bank Manager and other government officials. The group is eligible for project loan when it becomes successful in 2nd grading¹¹.

In West Bengal, the members of SHGs promoted by different agencies like NGOs, Banks, Co-operatives, and Panchayats etc. almost belong to female category. But, in particular, all the members of SHGs are women under DWCR (Development of Women and Children in Rural Areas) - SHGs linkage programme. About 90 percent SHGs are exclusively women in SHG-Bank linkage programme in West Bengal. In SHG-NGO linkage programme, more than 90 percent SHGs belong to women¹². This is also true for SHG-PACS (Primary Agricultural Credit Society) linkage project. As regards employment is concerned, SHGs of female category in West Bengal are almost working in self-employed traditional village and household / cottage industries which are agro-based like khadi, handlooms, handicraft, sericulture, coir, wool or wool silk, spinning, leather and leather product, tailoring, industries related to the processing of cereals and pulses, gur, molasses, processing of fruits etc.

The formation of SHG has been serving as decentralized channel for reaching benefits to poor women who have so far been beneficiaries rather than participants in developmental programme. Thus an attempt has been made to study empirically women's empowerment – a participatory multidimensional process (power, autonomy and self-reliance, entitlement, participation and awareness and capacity-building), whereby women may be able to organize themselves to increase self-reliance and to assert their independent rights to make choices and control resources and its effect on their children's nutritional status and protein-intake of their households.. These might assist women in challenging and eliminating their subordination, and reduce their poverty level within households based on their participatory role in the micro credit programme through their decentralized channels (SHGs) promoted by various agencies in the context of West Bengal.

11 DRDC, "District Rural Development Cell, Nadia District", website: http://nadia.nc.in/District_Rural_Development_Cel/district_ruraldevelopment_cel1.html, 2003.

12 De S. and D.Sarker, "Increasing Women's Participation and Self Employment Generation in Household Industries: An Approach through SHGs in West Bengal", *Bangiya Arthaniti Parisad* (Bengal Economic Association), Conference Volume, 2002, pp.199-216,



Survey Design

The study is based on the data obtained from field survey (Primary source) from rural West Bengal. Final survey is conducted from all villages having high concentration of SHGs (the villages having microcredit programme under SHGs belong to 25 per cent or more of total households) under four districts- Howrah, Hooghly, North 24 Parganas and Nadia – of West Bengal. Total number of villages selected for final survey works out to 19. 8 villages were selected from Howrah district. They are Kash-Khamar, Gaza-Udainerayanpur, Gaza-Ramrajatala, Bangalpur-Bagnan, Dankuni, Sibpur, Makardaha and Sahapur. 3 villages -Khanakul-Balichak, Khamargachi and Chinsurah -were selected from Hooghly district, 5 villages- Ghosepur, Chaltaberia, Natun Rasta, Daspara and Nilgaunge-from 24 parganas district and 3 villages- Birnagar, Kamalpur, and Birohihat-were selected from Nadia district. Final field survey is conducted on two types of households: core group (women SHGs participating under microcredit programme on SHG-NGO and SHG-Non-NGO models for eight years or more) and three types of control groups (supporting group). First control group has 40 households selected randomly from male SHGs participating under microcredit programme on SHG-NGO and SHG-Non-NGO models for eight years or more; second control group has 90 households selected randomly from those women and men SHGs from both SHG-NGO and SHG-Non-NGO models which have participated in the microcredit programme for at best one year; third control group has 120 households selected through 'propensity score matching' technique from the households who are eager to join the micro credit programme but have not yet joined the programme. The procedure of selecting households under core group and three control groups is in the following lines.

We conducted our field survey in Howrah, Hooghly, North 24 Parganas and Nadia districts of West Bengal, the area of our study, under two stages-preliminary stage and final stage. We undertook pilot survey at preliminary stage mainly for two reasons. i) As per the secondary data¹³, the microcredit programme are observed to be operative under two broad categories – SHG-NGO and SHG-non –NGO models- in West Bengal. Each category is further classified in three models (**For details, see Appendix 1**). But in practice, NGO as Microfinance Institution and NGO as financial intermediaries do not exist separately-they are clubbed into a single category in our study area, NGO as financial intermediaries which appears in the models of NABARD¹⁴. ii) To study the impact assessment of women borrowers' group (core/policy group) participating under SHG-NGO and SHG-non –NGO models of microcredit programme of this study, we consider those SHGs which exist in the programme for eight years or more at a stretch. But in practice, most of the SHGs which appear in the secondary source are now defunct. However, to select samples for final survey for core and control groups, we had to depend on pilot survey in some specific blocks having high concentration of SHGs under four districts- Howrah, Hooghly, North 24 Parganas and Nadia – of West Bengal.

13 Sarker, D. "A Study of SHG-NGO and SHG-non-NGO Models of Rural Micro Financing in West Bengal", Indian Journal of Agricultural Economics, July-Sept, 2001. SIPRD(State Institute of Panchayat and Rural development), Concept of Microfinance I & II – A study of West Bengal redits, self-help groups and Microfinance, SIPRD, Kalyani, West Bengal, 2000 &2001.

14 NABARD . "NABARD and Microfinance- Ten years of SHG – Bank Linkage", NABARD,2001-02.



The selection of households for each group (core or control groups) for final survey is made on sequential sampling method. First, sample of SHG, based on the procedure of SRSWOR, for each group is made from population of SHGs obtained from pilot survey, and then households for each group are also randomly selected (SRSWOR) from sample SHGs from the same group. But, the selection of SHGs for each group is made on the principle that the population of the same group for each model should be at least double of the sample. Also important is that the selection of SHGs of each model under the control group is based on the criterion of close proximity (nearest in distance) of the SHGs belonging to the respective model under core group. As regards the selection of households for core group (are participating under micro credit programme for eight years or more) is concerned, at the first stage, some SHGs have been randomly selected from all SHGs which appears from our pilot survey. At the second stage, 30 user members for each of two models under SHG-NGO category out of 15 sample SHGs and 20 user members for each of three models under SHG-non-NGO category out of 10 sample SHGs have been randomly selected (SRSWOR). The number of household for each category (SHG-NGO/ SHG-non-NGO) selected for final survey differ from each other because the number of households that appears from pilot survey is also different for different categories.. Total size of women sample borrowers (core/policy group) selected for final survey is $(30*2+20*3) = 120$.

As regards the first control group (male borrowers group participating under micro credit programme for eight years or more) is concerned, at the first stage, 10 SHGs have been randomly selected from 24 men SHGs under Tajmahal Gram Bikash Kendra of model-2 from SHG-NGO model. 5 SHGs have been randomly selected separately from 13 SHGs each of model-3 and model-5 respectively from SHG –non-NGO model. The argument behind the exclusion of SHGs from other models is that they are exclusively of women. At the second stage, for selecting households under first control group for final survey, 20 user (male) members' households are randomly selected from Tajmahal Gram Bikash Kendra under model -2 of SHG-NGO model. But for model-3 and model-5 under SHG-non-NGO led model ,10 user (male) members' households for each model have been randomly selected from the respective male SHGs selected obtained at the first stage. Total size of sample from first control group has been fixed at 40 $(20+10+10)$.

Concerning to the selection of second control group (both male and female SHGs participating in the microcredit programme for at best one year), 15 women borrowers' households from each model under SHG-NGO category, are randomly selected from each 7 SHGs under respective model ; 10 women borrowers' households from each model under SHG-non- NGO category are randomly selected from each 5 SHGs under respective model. However, total female borrowers under second control group is $(15*2+10*3) = 60$. Similarly, the selection of male borrowers under second control group is made following the same criteria used in selecting women borrowers under second control group. It needs mentioning that non-existence of male SHGs, operating at best one year within close proximity (nearest in distance) of the SHGs under core group, the sample of male borrowers under second control group is less in relation to the female borrower under the same control group. Thus,10 men borrowers'



households have been randomly selected for each of Model 2, Model 3 and Model 5 from 7 men SHGs under each model. Total male sample under second control group is $10 \times 3 = 30$.

The third control group was selected through 'propensity score matching'. 120 households have been selected randomly from 250 households, who are eager to join the micro credit programme but have not yet joined the programme, obtained from data of pilot survey. However, combining core group and three types of control groups (first, second and third control group) together, total sample size taken for final survey is 370 [120(core group) +40(1st control group)+90(2nd control group) +120(3rd control group)]. The Preliminary (pilot) survey and final surveys have been conducted between March, 2006 and August, 2007. However the required primary data of final survey are collected from 370 households with the help of specially designed schedule of questionnaire, capable of yielding objective answers, through the survey method during the 2007-08.

The propensity score is a conditional probability that an individual is assigned to the treatment group¹⁵. Generally, it is estimated by using logistic regression (i.e. logit model) with the covariates collected from the participants as X and the participant's status on the treatment variable as Y ¹⁶. The covariates in the logit model are non-treatment variables such as the participant's background characteristics. The estimated propensity score abstracts the information of these covariates.

The true propensity score (P) is the conditional probability that an individual belongs to the treatment group¹⁷. It is functionally related to the covariates (X , in a vector format), noted as the *logit model* of $\ln\left(\frac{P}{1-P}\right) = \beta'X$, indicating the natural logarithm of the odds (i.e., the ratio of P to $1-P$) is a linear combination of covariates, X . The propensity score estimated by a function of $\hat{P} = (1 + e^{-\beta'X})^{-1}$, summarizes the distribution information of all potential covariates¹⁸. Using estimated propensity scores, a participant from the treatment group can be matched with a participant from the control group so that treatment group and control group can be balanced. This approach can significantly reduce bias in observational study¹⁹.

The aim of matching is to find the closest comparison group from a sample of non-participants to the sample of programme participants. 'Closest' is measured in terms of observable characteristics.

15 Rosenbaum, P.R. and D.B.Rubin, "The Central Role of the Propensity Score in Observational Studies for Causal Effects", *Biometrika*,1983, 70: 41-55.

16 Rosenbaum, P., "The role of a second control group in an observational study", *Statistical Science*, (with discussion), Vol 2., No. 3, 292-316.,1987.

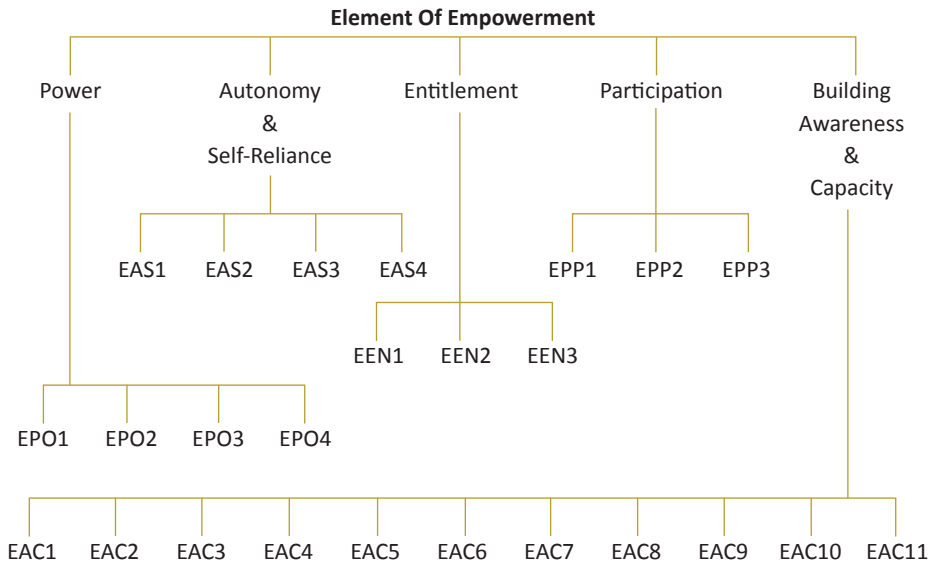
17 Rosenbaum, P.R. and D.B.Rubin, "The Central Role of the Propensity Score in Observational Studies for Causal Effects", *Biometrika*,1983, 70: 41-55

18 Rosenbaum, P.R. and D.B.Rubin., "Constructing a Central Group Using Multivariate Matched Sampling Methods that Incorporate the Propensity Score", *American Statistician*,39,pp. 35-39, 1985.

19 Rosenbaum, P., "The role of a second control group in an observational study",1987 Rosenbaum,P.R., "Matching in Observational Studies. Quoted in *Applied Bayesian Modeling and Causal Inference from Incomplete-Data Perspectives*", eds, A. Gelman and X-L Meng (pp. 15-23). Hoboken: Wiley,2004 . Rosenbaum, P.R. and D.B.Rubin. "Constructing a Central Group Using Multivariate Matched Sampling Methods that Incorporate the Propensity Score",1985. Rubin, D.,and N. Thomas. "Characterizing the Effect of Matching Using Linear Propensity Score Methods with Normal Covariates", *Biometrika* 79,pp. 797-809, 1992.

Methodology

Empowerment is a multidimensional on-going process. In view of its operationality and ability to capture the level and process of women’s empowerment, five broad elements - power, autonomy and self-reliance, entitlement, participation and awareness and capacity-building-have been taken into account. A scheme representation of elements together with its various indicators for assessing empowerment of women are presented in the following Structure:



Indicators of ‘power’ (I) element:

1. Ability to take decision at the household level (EPO 1)
2. Ability to control resources (EPO 2)
3. Ability to control sources of power (EPO 3)
4. Ability to challenge societal power relation (EPO 4)

Indicators of ‘Autonomy and Self-reliance’ (II):

1. Freedom of action (EAS 1)
2. Possession of critical elements to effectively and efficiently undertake desired activity (EAS 3), Level of sense of self (EAS 3)
3. Absence of unsolicited influence in decision-making (EAS 4)

Indicators of ‘Entitlement’ (III):

1. Rights to equitable share of resources i.e. ‘Exchange entitlement’ (EEN 1)
2. Rights to equitable share of inherited property i.e. ‘Inheritance and Transfer entitlement’ (EEN 2)
3. Rights to equitable access to resources (EEN 3)



Indicators of 'Participation' (IV):

1. Level of influencing decision (EPP 1)
2. Level of providing material, labour, finance and management input to the project/ programme (EPP 2)
3. Level of acceptance of responsibilities/ consequences of decision (EPP 3)

Indicators of 'Building of awareness and capacity' (V):

1. Ability to manage productive resources (EAC 1)
2. Ability to develop alternative economic structures locally (EAC 2)
3. Ability to create alternative employment at local level (EAC 3)
4. Ability to interact effectively in public sphere (EAC 4)
5. Ability to participate in non-family group (EAC 5)
6. Action to bring gender equality (EAC 6)
7. Legal and political awareness (EAC 7)
8. Ability to organize struggle (EAC 8)
9. Ability to fight injustice (EAC 9)
10. Ability to transform institutions (family, education, religion) (EAC 10)
11. Ability to transform structures (legal, political, economic and social) (EAC 11)

Every indicator of each element has been measured by four- point scale: high (4), medium (3), fair (2) and low (1). This scale depends on the evaluation related to the assessment of indicators (**The evaluation of assessments for all indicators appears in the appendix 2**). For the sake of simplicity, all indicator of each element of empowerment in the exercise have been treated as having equal weights, though in practice, the weights tend to differ across indicators. There are four indicators of 'Power' (EPO), four indicators of 'Autonomy and Self-reliance' (EAS), three indicators of 'Entitlement' (EEN), three indicators of 'Participation' (EPP) and eleven indicators of 'Awareness and Capacity building' (EAC). An individual who scores "high" on all indicators of "power" element, she has a total score of 16 (4 multiplied by 4), while that who scores "low" on all indicators of "power" element, has a total score of 4 (1 multiplied by 4). But the average score (simple arithmetic mean) for the former is 4 (total score divided by total indicators of power), while the latter is 1 ((total score divided by total indicators of power). The average score of a particular element of empowerment represents its level i.e. the highest level an individual may score from 'power' is 4, the lowest score being 1. Similarly, the mean (A.M.) of all elements' level indicate the empowerment value of the selected women. However, the highest empowerment level for an individual woman is 4, whereas the lowest is 1.

In order to assess the health and nutritional status of children (whose age is below 15 years) the suggested outcome measures include anthropometric measures, clinical signs of malnutrition, biochemical indicators and physical activity. Among the nutritional



outcome measures, anthropometric measures are considered to have an advantage over others. Anthropometric measures [weight –for – age (underweight), height –for – age (stunted) and weight –for – height (wasted)] are used for the assessment of nutritional deprivation among children. ‘Stunted’ is an indicator of chronic deficiency, ‘wasted’ is an indicator of acute under nutrition and ‘underweight’ is a composite measure which takes into account of both chronic and acute under nutrition²⁰. For this reason only weight-for-age index is considered. The three indices of nutritional status are expressed in standard units (z-scores) from the median for the international reference population. Children who are more than 2 standard deviations below the reference median on this index are considered as underweight. The formula for the calculation of z-score is: z-score (or SD score) = (observed value - median value of the reference population)/standard deviation of reference population.

The level of protein consumption of a household has been measured in terms of the number of days the household consumes protein. Maximum protein intake of a household indicates that the household consumes egg, fish or meat in 3 days or more in a week. An index representing protein intake by household has been constructed.

With a view to studying the effect of women’s empowerment under micro credit programme through SHGs on nutritional status of children, protein intake of household and standard of living of household ,separate OLS regressions have been employed. The dependent variable, in three regressions are standardized z-score of weight-for-age of children, number of days the households consume protein and standard of living index respectively .The explanatory variables include some main variables - the empowerment level of women, income of women from micro credit and the nature of micro credit programme along with some control variables which are also the determinants of the explained variables.

Results and Discussion

Five important elements namely – power, autonomy and self-reliance, entitlement, participation and awareness and capacity-building- have been adopted to measure the level of women’s empowerment of this study. As mentioned in the methodology chapter, every indicator corresponding to each element has been measured by four point scale with equal weight. The range of women’s empowerment level lies between 4 (the highest level of empowerment) and 1 (the lowest level of empowerment).

We first attempt to measure the level of women’s empowerment based on each element of empowerment. Power is the key element of empowerment because it is the ability, actual and potential, to exercise command and control over resources and ideology (Pant, 2000:93). As regard ‘power’ is concerned, out of highest average score 4, the average score of ‘power’ received by all female borrower groups in all models – NGO and non –NGO – ranges between 2.33 and 2.80 (Table1.1). It implies that all female

20 Arnold, F.,P. Nangia and U. Kapila. “ Indicators of Nutrition for Women and Children in India: Current Status and Programme Recommendations”, presented at Workshop on National Family Health Survey, Centre For Economic Studies, Hyderabad, 2003.Gillepsie,S, and G. McNeill. “Food, Health and Survival in India and Developing Countries”, Oxford University Press, 1994.



borrower groups (core group) receive the level of 'power' which is more than their median level (Table 1.1). This is also true for other elements of empowerment, namely, 'autonomy and self-reliance' (Table 1.2), 'entitlement' (Table 1.3), 'participation' (Table 1.4) and 'process of building awareness and capacity' (Table 1.5). The performance of scores is the highest for 'participation' element of empowerment (Table 1.4), and much better for 'autonomy and self-reliance', compared to the elements of 'power', 'entitlement' and 'process of building awareness and capacity'. On the other hand, for all elements of empowerment (Table 1.1-1.5), the average level of scores is much lower than their median level for first control group (male borrower group participating in the microcredit programme for at least eight years), second control group (male and female participating in the micro credit programme for at best one year) and third control group (female have not at all participated in the microcredit programme but have the potential to join the programme) compared with female borrower group (core group of study). No significant difference is observed regarding average level of scores among three control groups.

Combining all elements together, Table 2 shows that the level of women's empowerment under female borrower group is considerably higher (ranging between 2.50 and 2.84) than either of the first control group (women's empowerment in the male borrower groups) -ranging between 1.52 and 1.77-or of the second control groups (women's empowerment in both male and female SHGs participating in the microcredit programme for at best one year ranging between 1.36 and 1.54) or of the third control group (women's empowerment for female who have not at all participated in the microcredit programme but have the potential to join the programme ranging between 1.16 and 1.28) .

However concerning to the level of women's empowerment among three control groups are concerned, there are somewhat differences in the level of women's empowerment among three control groups (ranging between 1.16 and 1.77) . The third control group (women's empowerment for female who have not at all participated in the microcredit programme but have the potential to join the programme) scores the lowest level of empowerment (ranging between 1.16 and 1.28), whereas the first control group (women's empowerment in male borrower groups participated in the microcredit programme for eight years or more) has scores between 1.52 and 1.77 and the second control groups (women's empowerment in both male and female SHGs participating in the microcredit programme for at best one year), between 1.36 and 1.54 . Thus the lowest score for the third control group compared with the other two, however, lends credence to some positive impact for involvement of SHG-led microcredit programme for the latter in relation to the former (women's empowerment for female who have not at all participated in the microcredit programme but have the potential to join the programme).

But as regards the level of empowerment for core group is concerned, no perceptible difference is observed at the level of empowerment between NGO and non-NGO led programme under female borrower group participating in the microcredit programme for eight years or more (core group). It is said that 'Delivering to the microcredit to the



poor and the poorest still is primarily an NGO activity²¹. This result, however, does not lead credence to the fact that NGO activity is the superior vehicle for the expansion of outreach of microcredit through SHGs as compared with Non-NGO activity in the particular empirical context of Indian perspective. This study, thus, seems to support **Hypothesis 1**.

However concerning to the level of women's empowerment among three control groups are concerned, there are somewhat differences in the level of women's empowerment among three control groups (ranging between 1.16 and 1.77). The third control group (women's empowerment for female who have not at all participated in the microcredit programme but have the potential to join the programme) scores the lowest level of empowerment (ranging between 1.16 and 1.28), whereas the first control group (women's empowerment in male borrower groups participated in the microcredit programme for eight years or more) has scores between 1.52 and 1.77 and the second control groups (women's empowerment in both male and female SHGs participating in the microcredit programme for at best one year), between 1.36 and 1.54 . Thus the lowest score for the third control group compared with the other two, however, lends credence to some positive impact for involvement of SHG-led microcredit programme for the latter in relation to the former (women's empowerment for female who have not at all participated in the microcredit programme but have the potential to join the programme) .

As regards the second objective is concerned, in order to examine whether empowerment of women participating in the microcredit programme through SHG has a significant positive effect on their children's nutritional status and protein-intake of their households, first, we compare the level of health status of households between core group and control group under our study. To measure the level of health status of household, two separate indices are constructed for two aspects: nutritional status of children and protein-intake by household. Table 3.1 (sample size 250 households) and Table 3.2 (sample size 370 households) show that the children of women belonging to borrower group have high standardised z-scores of weight-for-age compared to the children of women under control group. However, in keeping with the first objective (the empowerment level of women belonging to core group is relatively high compared to the control groups), this study also suggests that nutritional level for the children of women belonging to core group is higher than that of among children belonging to control group. Similarly, Table 4.1 (sample size 250 households) and Table 4.2 (sample size 370 households) show that the protein – intake indices for household belonging to women borrower group is higher than that of among households under control groups. This study, however, seems to suggest that the higher empowerment level for women participating in the micro credit programme for eight years or more (women borrower group / core group) has higher level of indices for both nutritional level for their children and protein – intake for their household as compared with women participating in the control group of households.

21 Yunus, M. Grameen Bank, Microcredit and Millennium Development Goals, Economic and Political Weekly, Vol. XL, September 4, pp.4077-4080, 2004.



Hence the relevant issue might be if the higher empowerment level for women participating in the micro credit programme for eight years or more (women borrower group / core group) has higher level of health indices as compared with the control groups, then it is pertinent to examine whether empowerment of the former has a significant positive effect on their children's nutritional status and protein-intake of their households. To this end, we examine the effect of important factors including empowerment level of women affecting both nutritional status for their children of households and protein – intake at the household level for women belonging to both core group and control group with the help of separate OLS regression model. Table 5.1(for 250 households) and Table 5.2(for 370 households), representing the effect of the important factors affecting the nutritional status for the children of households, show that the empowerment of women participating in the microcredit programme (core group) has direct and highly significant effect (the level of significance being at 1 per cent and of positive sign, as expected) on the nutritional status for their children. Similarly, mother's earnings from micro credit programme have positive and highly significant effect on the nutritional status for their children (in Table 5.1 and Table 5.2). The results might suggest that if empowerment level of women participating in the micro credit programme increases, they may spend a considerable part of their income from micro enterprises for purchasing such foodstuff which might yield higher nutritional level for their children. Among other important factors, mother's age at the time of giving birth has highly positive and significant effect (significant at 10 per cent level) and mother's primary education is positive and somewhat significant (significant at 23.3 per cent and 16 per cent level in Table 5.1 and Table 5.2 respectively) effect on the nutritional status for their children .

As regards the effect of important factors including empowerment affecting protein – intake at household level is concerned, Table 6.1 (for 250 households) shows that like nutritional status of children of households (Table 5.1, where sample size 250 households) the empowerment of women participating in the micro credit programme (core group) is of expected sign (positive) and has highly significant effect (significant at 13.3 per cent level) on the protein – intake at their household level. Similarly, women's earnings from micro credit programme have positive and highly significant effect on the protein – intake for their household level and this is also in conformity with the findings of Table 5.1. Among other important factors, duration of women in the micro credit programme has also significant effect for the protein – intake of their household level. These results (Table 5.1 and Table 6.1) however, seem to confirm that higher level of empowerment for women participating in the microcredit programme (core group) significantly influencing higher health status for their households (nutritional status for their children and the protein – intake for households); similarly, higher duration of micro credit programmes for core group has a significant effect on health status for them. Among others, women's higher basic education, higher age at marriage and higher age of their giving birth have also positive and significant influence on health status of their households.



The findings that appear in Table 6.1 (Determinants of protein-intake of households) for 250 households do not differ when the sample size is extended to 370 households (Table 6.2). Table 6.2 (taking 370 households) suggest that the empowerment level of women participating in the microcredit programme, mother's earnings from microcredit and duration of microcredit programme have individual positive and highly significant effect on the protein-intake of their household level. It is worthwhile to mention that as the sample size increases, the significance level of the 'empowerment level of women' affecting the protein-intake of households increases from 13.3% (Table 6.1, where sample size 250 households) to 3.6% (Table 6.2, where sample size 370 households). This study however suggests that 'empowerment of women' participating in the micro credit programme has a positive and significant effect on their children's nutritional status and protein-intake of their households (Hypothesis 2 is supported).

Admittedly, the regression equation does not lead to strong exogeneity of the impact of women's empowerment on their health aspects. The existing equation only implies the significant positive effect of women's empowerment on their health aspects. It does not rule out the case that health issues might have a significant effect on women's empowerment. Strong exogeneity of women's empowerment on their health aspects requires that the current and lagged health variables do not explain the significant effect on women's empowerment (no feedback relationship). To examine these issues it is necessary to have the data for the entire period of women microcredit beneficiaries under SHGs (i.e. for eight years or more). As the data of this study works out to only a little more than one year period (between March, 2006 and August, 2007), the lack of examining strong exogeneity is, no doubt, a limitation of this study.

Conclusions and Policy Implications

This study lends credence to the fact that women's own involvement and participation in the microcredit programme through SHGs contribute to the higher level of empowerment as compared with the samples under all control groups. Male's participation does not point to any significant improvement to the women's empowerment level (first control group). Rather the male SHGs, which participate in the microcredit programme for at least eight years (first control group), or both male and female SHGs participating in the microcredit programme for at best one year (second control group), or both male and females who have not at all participated in the microcredit programme but have the potential to join the programme (third control group), does not seem to provide equal space for women in the process of women's empowerment. All these facts, however, might be an indication that if women participating in the microcredit programme through SHGs sustain for some longer period, such a programme might contribute to higher level of women's empowerment. No perceptible difference is observed at the level of women's empowerment between NGO and non-NGO led programmes under female borrower group (core group). Secondly, this study also suggests that the nutritional level for the children of women belonging to core group and the protein – intake indices for households belonging to the same group are higher compared with that of among households under control groups. Thirdly, the results obtained from this study highlights the fact that the empowerment level of women participating in the



micro credit programme (core group) has positive and highly significant effect on the nutritional status for their children compared with that of control group. Finally, this study also finds that women’s earnings from microcredit programmes has positive and significant effect both on the nutritional status of the children of women participating in the microcredit programme and on the protein-intake for their household level in relation to that of among control groups.

This study, however, seems to suggest that women’s microcredit programme through SHGs supported by various agencies ,irrespective of SHG- NGO or SHG-Non-NGO led progrmmme, needs not only to be established under comprehensive community development programme in all areas of West Bengal, but also to be continuously nursed to make them sustain for some longer years . This might help those SHGs as one of the most important means of empowering women in challenging and eliminating their subordination in all spheres of life and also help women utilize their own knowledge and skills as full partners in the developmental process. Such a programme would also contribute to augmenting nutritional status of the children of women participating in the microcredit programme and on the protein-intake for their household level.

Table 1.1: Level Of ‘Power’ Element

Indicators of ‘power’	Female borrower group					Control group				
	NGO-led		non-NGO-led							
	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
EPO 1	2.83	2.93	2.80	2.60	2.60	1.35 [1.01]	2.20 (1.85) [1.70]	1.60 (1.90) [1.75]	1.60 [1.40]	1.65 (1.70) [1.55]
EPO 2	2.80	2.43	2.30	2.10	1.95	1.40 [1.13]	1.20 (1.45) [1.20]	1.30 (1.50) [1.19]	1.40 [1.10]	1.30 (1.20) [1.05]
EPO 3	2.93	2.87	3.55	2.45	2.80	1.85 [1.25]	2.00 (2.05) [1.70]	1.85 (2.10) [1.55]	2.00 [1.50]	1.75 (1.40) [1.20]
EPO 4	2.60	2.57	2.65	2.15	2.35	1.15 [1.05]	1.90 (1.40) [1.30]	1.25 (1.50) [1.05]	1.40 [1.15]	1.35 (1.20) [1.00]
AVERAGE LEVEL	2.79	2.70	2.80	2.33	2.43	1.40 [1.11]	1.83 (1.69) [1.48]	1.50 (1.75) [1.39]	1.60 [1.29]	1.51 (1.38) [1.20]

Source: sample survey

The figure in () represents the figure corresponding to control group 1 (male borrower group)
The figure without bracket represents the figure corresponding to control group 2 (those who have joined at best 1 year).

The figure in [] bracket represents the figure corresponding to control group 3 (those who have not joined at all but have the potential to join the microcredit programme).



Table 1.2: Level Of 'Autonomy & Self-Reliance'

	Female Borrower Group					Control Group				
	NGO-led		non-NGO led							
Indicators of 'autonomy & self-reliance'	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
EAS 1	2.83	2.87	2.85	2.85	2.65	1.50 [1.15]	2.30 (1.45) [1.50]	1.70 (2.30) [1.55]	1.90 [1.50]	1.70 (1.70) [1.45]
EAS 2	2.83	2.83	3.04	2.65	2.40	1.95 [1.67]	1.60 (2.30) [1.90]	1.75 (2.10) [1.30]	2.10 [1.70]	2.25 (1.80) [1.55]
EAS 3	3.03	3.03	3.25	2.90	2.90	2.10 [1.70]	2.30 (2.20) [1.45]	2.20 (2.80) [1.80]	2.60 [1.20]	2.55 (2.60) [1.50]
EAS 4	2.77	3.03	2.70	2.60	2.60	1.35 [1.20]	2.10 (1.75) [1.35]	1.55 (1.90) [1.30]	1.60 [1.20]	1.65 (1.70) [1.50]
AVERAGE LEVEL	2.87	2.94	2.96	2.75	2.64	1.70 [1.43]	2.10 (1.93) [1.55]	1.80 (2.30) [1.49]	2.05 [1.58]	2.04 (1.95) [1.56]

Source: sample survey

The figure in () represents the figure corresponding to control group 1 (male borrower group).

The figure without bracket represents the figure corresponding to control group 2 (those who have joined at best 1 year).

The figure in [] bracket represents the figure corresponding to control group 3 (those who have not joined at all but have the potential to join the microcredit programme).

Table 1.3: Level Of 'Entitlement' Element

	Female borrower group					Control group				
	NGO-led		non-NGO led							
Indicators of 'entitlement'	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
EEN 1	3.30	3.20	3.35	3.05	2.60	1.30 [1.09]	1.50 (1.85) [1.30]	1.50 (1.80) [1.25]	1.70 [1.30]	1.55 (2.20) [1.75]
EEN 2	1.13	1.30	1.05	1.05	1.00	1.00 [1.00]	1.00 (1.00) [1.00]	1.00 (1.00) [1.00]	1.10 [1.05]	1.05 (1.30) [1.00]
EEN 3	3.23	3.33	3.10	3.20	2.80	1.30 [1.15]	1.50 (1.85) [1.40]	1.40 (2.00) [1.25]	1.50 [1.20]	1.30 (2.30) [1.15]
AVERAGE LEVEL	2.55	2.61	2.50	2.43	2.13	1.20 [1.08]	1.33 (1.57) [1.23]	1.30 (1.60) [1.17]	1.43 [1.18]	1.30 (1.93) [1.30]

Source: sample survey

The figure in () represents the figure corresponding to control group 1 (male borrower group).

The figure without bracket represents the figure corresponding to control group 2 (those who have joined at best 1 year).



The figure in [] bracket represents the figure corresponding to control group 3 (those who have not joined at all but have the potential to join the microcredit programme).

Table 1.4: Level Of 'Participation' Element

Indicators of 'participation'	Female borrower group					Control group				
	NGO-led		non-NGO led							
	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
EPP 1	3.40	3.27	3.50	3.25	3.15	1.30 [1.10]	1.20 (1.55) [1.25]	1.30 (1.90) [1.35]	1.30 [1.20]	1.35 (1.30) [1.25]
EPP 2	3.63	3.37	3.20	3.60	3.05	1.40 [1.25]	1.60 (1.00) [1.15]	1.45 (1.80) [1.20]	1.50 [1.35]	1.30 (1.70) [1.20]
EPP 3	3.30	3.57	3.45	3.55	3.05	1.35 [1.10]	1.10 (1.05) [1.00]	1.20 (1.70) [1.30]	1.10 [1.00]	1.20 (1.60) [1.30]
AVERAGE LEVEL	3.44	3.40	3.38	3.47	3.12	1.35 [1.15]	1.30 (1.20) [1.13]	1.32 (1.80) [1.28]	1.30 [1.18]	1.28 (1.53) [1.25]

Source: sample survey

The figure in () represents the figure corresponding to control group 1 (male borrower group).

The figure without bracket represents the figure corresponding to control group 2 (those who have joined at best 1 year).

The figure in [] bracket represents the figure corresponding to control group 3 (those who have not joined at all but have the potential to join the microcredit programme).

Table 1.5: Level Of 'Building Awareness And Capacity (Eac)'

Indicators of EAC element	Female borrower group					Control group				
	NGO – led		non – NGO- led							
	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
EAC 1	2.97	2.80	2.60	2.55	2.65	1.45 [1.20]	1.50 (1.70) [1.01]	1.70 (1.70) [1.10]	1.40 [1.15]	1.35 (2.10) [1.20]
EAC 2	1.20	1.87	1.00	1.10	1.00	1.00 [1.00]	1.00 (1.00) [1.00]	1.05 (1.00) [1.00]	1.30 [1.20]	1.10 (1.10) [1.05]
EAC 3	2.23	2.40	2.35	2.40	2.05	1.05 [1.00]	1.00 (1.00) [1.00]	1.00 (1.00) [1.00]	1.20 [1.00]	1.00 (1.10) [1.00]
EAC 4	2.97	2.97	3.10	2.95	2.60	1.15 [1.00]	1.10 (1.25) [1.09]	1.05 (2.00) [1.00]	1.10 [1.00]	1.10 (2.10) [1.00]
EAC 5	2.27	2.27	2.20	2.20	2.05	1.00 [1.00]	1.20 (1.15) [1.10]	1.05 (1.10) [1.00]	1.20 [1.00]	1.10 (1.10) [1.10]



	Female borrower group					Control group				
	NGO – led		non – NGO- led							
Indicators of EAC element	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
EAC 6	2.80	2.90	2.85	2.65	2.65	1.05 [1.05]	1.10 (1.20) [1.00]	1.00 (1.70) [1.00]	1.30 [1.05]	1.10 (2.00) [1.00]
EAC 7	3.20	3.30	3.20	2.90	2.55	1.85 [1.20]	1.70 (1.60) [1.10]	1.70 (2.10) [1.10]	1.40 [1.20]	1.75 (2.60) [1.07]
EAC 8	1.53	2.47	2.20	2.10	1.95	1.00 [1.00]	1.00 (1.10) [1.00]	1.00 (1.40) [1.10]	1.10 [1.05]	1.05 (1.60) [1.02]
EAC 9	2.20	2.37	1.90	1.75	1.75	1.10 [1.00]	1.00 (1.05) [1.00]	1.00 (1.50) [1.00]	1.00 [1.00]	1.00 (1.60) [1.00]
EAC 10	1.60	3.43	1.65	1.50	1.45	1.00 [1.00]	1.00 (1.10) [1.00]	1.00 (1.20) [1.00]	1.10 [1.00]	1.05 (1.30) [1.00]
EAC 11	1.70	2.40	1.15	1.45	1.30	1.05 [1.00]	1.00 (1.05) [1.00]	1.00 (1.00) [1.00]	1.20 [1.05]	1.10 (1.20) [1.00]
AVERAGE LEVEL	2.24	2.56	2.20	2.14	2.00	1.15 [1.04]	1.15 (1.20) [1.03]	1.14 (1.40) [1.03]	1.21 [1.06]	1.15 (1.62) [1.04]

Source: sample survey

The figure in () represents the figure corresponding to control group 1 (male borrower group). The figure without bracket represents the figure corresponding to control group 2 (those who have joined at best 1 year). The figure in [] bracket represents the figure corresponding to control group 3 (those who have not joined at all but have the potential to join the microcredit programme).

Table 2: Level Of 'Empowerment Of Women'

Elements of Empowerment	Female Borrower Group					Control Group				
	NGO-led		non-NGO-led							
	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
Power	2.79	2.70	2.80	2.33	2.43	1.40 [1.11]	1.83 (1.69) [1.48]	1.50 (1.75) [1.39]	1.60 [1.29]	1.51 (1.38) [1.20]
Autonomy & Self-reliance	2.87	2.94	2.96	2.75	2.64	1.70 [1.43]	2.10 (1.93) [1.55]	1.80 (2.30) [1.49]	2.05 [1.58]	2.04 (1.95) [1.56]
Entitlement	2.55	2.61	2.50	2.43	2.13	1.20 [1.08]	1.33 (1.57) [1.23]	1.30 (1.60) [1.17]	1.43 [1.18]	1.30 (1.93) [1.30]

	Female Borrower Group					Control Group				
	NGO-led		non-NGO-led							
Elements of Empowerment	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
Participation	3.44	3.40	3.38	3.47	3.12	1.35 [1.15]	1.30 (1.20) [1.13]	1.32 (1.80) [1.28]	1.30 [1.18]	1.28 (1.53) [1.25]
Building Awareness & Capacity	2.24	2.56	2.20	2.14	2.00	1.15 [1.04]	1.15 (1.20) [1.03]	1.14 (1.40) [1.03]	1.21 [1.06]	1.15 (1.62) [1.04]
Empowerment level of Women	2.78	2.84	2.77	2.60	2.50	1.36 [1.16]	1.54 (1.52) [1.28]	1.40 (1.77) [1.27]	1.52 [1.26]	1.46 (1.68) [1.27]

Source: sample survey

The figure in () represents the figure corresponding to control group 1 (male borrower group). The figure without bracket represents the figure corresponding to control group 2 (those who have joined at best 1 year).

The figure in bracket represents the figure corresponding to control group 3 (those who have not joined at all but have the potential to join the microcredit programme).

Table 3.1: Nutritional Status of Children (Index)

	Nature of microcredit programme	Normal nutrition (in percentage)		Moderate malnutrition (in percentage)		Severe malnutrition (in percentage)	
		female	male	female	male	female	male
Female borrower group	NGO-led	83.33	83.72	16.67	9.30	0	6.98
	Non-NGO led	67.57	74.19	24.32	16.13	8.11	9.68
	Control group (1& 2)	39.29	25.00	51.79	61.76	8.93	13.23

Source: sample survey

Number of observations: 250 (Core group +Control group 1 &2)

Table 3.2: Nutritional Status of Children (Index)

	Nature of microcredit programme	Normal nutrition (in percentage)		Moderate malnutrition (in percentage)		Severe malnutrition (in percentage)	
		female	male	female	male	female	male
Female borrower group	NGO-led	83.33	83.72	16.67	9.30	0	6.98
	Non-NGO led	67.57	74.19	24.32	16.13	8.11	9.68
	Control group (1,2& 3 combined)	38.00	26.37	49.25	60.67	12.75	12.96

Source: sample survey

Number of observations: 370 (Core group +Control group 1, 2 &3).



Table 4.1: Protein –Intake of Household (Index)

	Nature of microcredit programme	Maximum intake (in percentage)	Minimum intake (in percentage)	No intake (in percentage)
Female borrower group	NGO led	71.67	28.33	0
	Non-NGO led	51.67	48.33	0
	Control group (1 & 2)	26.92	58.46	13.07

Source : sample survey

Number of observations: 250 (Core group +Control group 1 &2)

Table 4.2: Protein –Intake of Household (Index)

	Nature of microcredit programme	Maximum intake (in percentage)	Minimum intake (in percentage)	No intake (in percentage)
Female borrower group	NGO led	71.67	28.33	0
	Non-NGO led	51.67	48.33	0
	Control group (1,2 & 3 combined)	24.33	56.67	19.00

Source : Sample survey

Table 5.1: Determinants of Nutritional Status of Children

Independent variable	Estimated coefficient in OLS regression	Standard error	t-value	Significance level
Constant	-3.55	0.519	-6.85	0.000 ***
Age of father	-2.29E-03	0.017	-0.13	0.894
Age of mother	-3.00E-02	0.022	-1.36	0.176
Education of father				
primary	0.102	0.059	1.75	0.081 **
secondary	0.139	0.133	1.047	0.296
above secondary	-1.51E-02	0.225	-0.07	0.947
Father's earnings	-2.87E-05	0.000	-0.60	0.547
Education of mother				
primary	0.239	0.200	1.195	0.233
secondary	0.175	0.200	0.876	0.382
above secondary	-3.3E-02	0.291	-0.11	0.910
Mother's earnings(from micro credit)	2.225E-04	0.000	2.448	0.015 ***
Empowerment level of mother	0.452	0.150	3.006	0.003 ***
Age at marriage of mother	3.746E-02	0.025	1.5	0.135 *
Mother's age at the time of giving birth	5.174E-02	0.016	3.208	0.002 ***
Girl child=1, boy child =0	0.234	0.111	2.103	0.036 ***
Borrower group =1,Control group =0	0.250	0.168	1.507	0.133 *
Amount of food expenditure in the family	4.483E-05	0.000	0.675	0.500



Source : sample survey

Dependent variable : children’s weight –for-age (z-scores)

Number of observations : 250 (Core group +Control group 1&2)

***, ** and * indicate that the coefficients are significant at 5%, 10% and 15% respectively.

Table 5.2: Determinants of Nutritional Status of Children

Independent variable	Estimated coefficient in OLS regression	Standard error	t-value	Significance level
Constant	-3.245	0.495	-6.558	0.000 ***
Age of father	-1.314E-02	0.017	-0.753	0.452
Age of mother	-2.402E-02	0.021	-1.129	0.259
Education of father				
primary	0.107	0.067	1.608	0.109 **
secondary	4.483E-02	0.133	0.338	0.736
above secondary	5.156E-02	0.213	0.242	0.809
Father’s earnings	-1.352E-05	0.000	-0.253	0.801
Education of mother				
primary	0.279	0.198	1.408	0.160
secondary	0.221	0.195	1.132	0.258
above secondary	0.152	0.299	0.510	0.611
Mother’s earnings(from micro credit)	2.214E-04	0.000	2.157	0.032 ***
Empowerment level of mother	0.635	0.143	4.444	0.000 ***
Age at marriage of mother	2.084E-02	0.026	0.789	0.430
Mother’s age at the time of giving birth	5.395E-02	0.017	3.143	0.002 ***
Girl child=1, boy child =0	0.248	0.101	2.454	0.015 ***
Borrower group	0.228	0.200	1.141	0.254
Control group (1&2 combined)	0.103	0.139	0.740	0.460
Amount of food expenditure in the family	1.998E-05	0.000	0.269	0.788

Source : Sample survey

Dependent variable : children’s weight –for-age (z-scores)

Number of observations : 370 (Core group + Control 1,2 & 3)

***, ** and * indicate that the coefficients are significant at 5%, 10% and 15% respectively.

Table 6.1: Determinants of Protein–intake of Household

Independent variable	Estimated coefficients of OLS regression	Standard error	t - value	Significance level
Constant	1.303	0.552	2.359	0.019
Age of head of household	-1.00E-02	0.013	-0.76	0.45
Education of head of household :				
primary	0.397	0.33	1.203	0.23
secondary	0.349	0.345	1.011	0.313
above secondary	0.752	0.453	1.658	0.099 **



Independent variable	Estimated coefficients of OLS regression	Standard error	t - value	Significance level
Income of head of household:	1.54E-04	0.000	3.24	0.001 ***
Age of borrower:	5.135E-03	0.016	0.325	0.746
Education of borrower				
primary	-0.348	0.310	-1.123	0.263
secondary	-4.54E-02	0.311	-0.146	0.884
above secondary	-0.33	0.438	-0.752	0.453
Income of borrower from microcredit	5.464E-04	0.000	4.169	0.000 ***
Duration of woman in microcredit programme	9.561E-02	0.066	1.448	0.149 *
Empowerment level of woman	0.346	0.23	1.506	0.133 *
Borrower group=1, Control group=0	0.364	0.418	0.872	0.384

Source : sample survey

Number of observations : 250 (Core group +Control group 1 &2)

Dependent variable : protein–intake of household

***, ** and * indicate that the coefficients are significant at 5%, 10% and 15% respectively.

Table 6.2: Determinants of Protein –intake of Household

Independent variable	Estimated coefficients of OLS regression	Standard error	t - value	Significance level
constant	0.958	0.439	2.180	0.030 ***
Age of head of household	-1.026E-02	0.011	-0.910	0.363
Education of head of household:				
primary	0.401	0.277	1.447	0.149 *
secondary	0.390	0.283	1.378	0.169
above secondary	0.738	0.354	2.084	0.038 ***
Income of head of household:	1.656E-04	0.000	4.044	0.000 ***
Age of borrower:	6.466E-03	0.013	0.499	0.618
Education of borrower				
primary	-0.141	0.237	-0.596	0.551
secondary	-9.588E-03	0.233	-0.041	0.967
above secondary	-0.199	0.342	-0.583	0.560
Income of borrower from microcredit	5.271E-04	0.000	4.587	0.000 ***
Duration of woman in microcredit programme	9.951E-02	0.058	1.720	0.086 **
Empowerment level of woman	0.368	0.174	2.109	0.036 ***
Borrower group	0.494	0.396	1.247	0.213
Control group (1&2 combined)	0.173	0.174	0.998	0.319

Source : sample survey

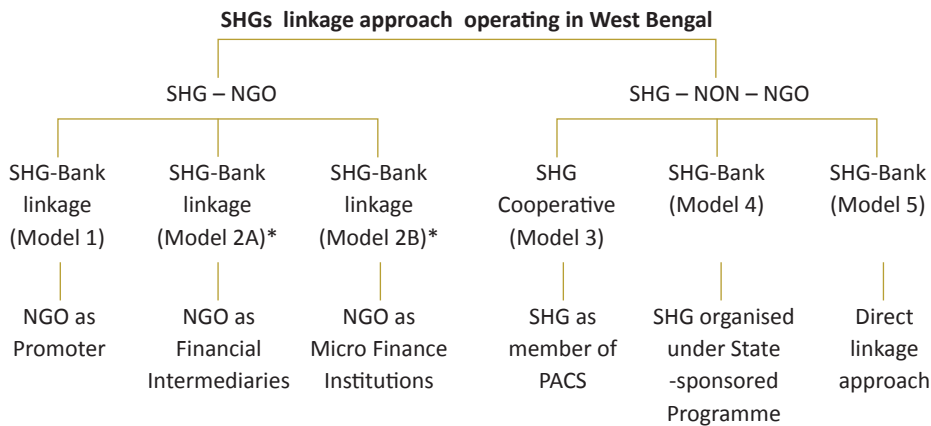
Dependent variable : number of days of protein –consumption by household

Number of observations : 370 (Core group + Control 1,2 &3)

***, ** and * indicate that the coefficients are significant at 5%, 10% and 15% respectively.

Appendix 1

Broadly, there are mainly two different models which have emerged under the SHG-linkage approach operating microfinance activities in West Bengal. Each of the two different models is further classified into three linkage approaches in the following (as per Secondary Data).



* While we undertook pilot survey at preliminary stage in order to examine whether all models exist in practice, we found NGO as Microfinance Institution and NGO as financial intermediaries did not exist separately. Therefore, Model 2A and Model 2B have been clubbed together into a single category termed as Model 2 (NGO as Financial Intermediaries).

Appendix 2

INDICATORS FOR THE ASSESSMENT OF THE ‘POWER’ELEMENT

Criteria for evaluation

INDICATORS OF ‘POWER’ ELEMENT OF EMPOWERMENT	HIGH (4)	MEDIUM (3)	FAIR (2)	LOW (1)
EPO 1: Power to make decision at household level	a) Equal or more say in acquiring, using & divesting fixed assets	–		a) Very little or no say in acquiring, using & divesting fixed assets
	b) Equal or more say in routine income& expenditure	b) Equal or more say in routine income & expenditure	–	b) Very little or no say in routine income& expenditure



INDICATORS OF 'POWER' ELEMENT OF EMPOWERMENT	HIGH (4)	MEDIUM (3)	FAIR (2)	LOW (1)
	c) Equal or more say in selecting employment	c) Equal or more say in selecting employment	–	c) Very little or no say in selecting employment
	d) Equal or more say in children's education, health etc.	d) Equal or more say in children's education, health etc.	a) Equal or more say in children's education, health etc.	d) Very little or no say in children's education, health etc.
EPO 2: Ability to control resources	Complete ownership of resources.	Equal ownership of resources.	Partial ownership of resources.	No ownership of resources.
EPO 3: Ability to control sources of power	Ability to be head of the local body/ institution.	Ability to make someone head of the local body/ institution.	Ability to be member of the local body/ institution.	Inability to be member of the local body/ institution
EPO 4: Ability to challenge societal power relations.	Ability to mobilize the public in public forum .	Ability to resist issues individually in the public forum.	Ability to raise issues In the public forum .	Inability to raise a voice in public forum.

INDICATORS OF THE 'AUTONOMY & SELF-RELIANCE'

Criteria for evaluation

INDICATORS OF 'AUTONOMY & SELF-RELIANCE'	HIGH (4)	MEDIUM (3)	FAIR (2)	LOW (1)
EAS 1: Freedom of action & mobility	a) Purchase assets without consulting with husband /any male member	a) Purchase assets after consulting with husband / any male member	–	a) Very little or no freedom to purchase assets.
	b) Full freedom to purchase household chores.	b) Full freedom to purchase household chores.	a) Freedom to purchase household chores after consulting with husband	b) Very little or no freedom to purchase household chores .
	c) Work outside the village (sole decision)	c) Work outside the village after consulting with husband	–	c) Very little or no freedom to work outside the village .
	d) Freedom in deciding number of children they can have & adopting family planning measure	–	–	d) No freedom in deciding number of children they can have & adopting family planning measure



INDICATORS OF 'AUTONOMY & SELF-RELIANCE'	HIGH (4)	MEDIUM (3)	FAIR (2)	LOW (1)
	e) Freedom in choosing life partner	–		e) Nofreedom in choosing life partner
	f) Visits bank, NGO office alone	f) Visit bank, NGO office (not alone)		f) Nofreedom to visit bank, NGO office
	g) Visits health centre alone	g) Visit health centre (not alone)		g) can't visit health centre
	h) Visits natal home (sole decision)	h) Visits natal home after consulting with husband	Visits natal home after consulting With husband	h) No freedom to visit natal home (sole
EAS 2: Possession of critical elements... [Panda,(2000)]	a) woman's level of education –secondary or above	a) woman's level of education –primary	a) woman's level of education –primary	a) woman is illiterate or can sign only
	b) woman is experienced for 7-8 years	b) woman is experienced for 1-2 years	b) No experience	b) No experience
	c) woman is fully trained	c) woman is partially trained	c) No training	c) No training
	d) health-good	d) health-good	d) health-not good	d) frequently sick
EAS 3:Sense of self [Panda,(2000)]	a) woman protests alone&f necessary informs to local P.S.	–	–	a) Very little or no ability to protest.
	b) feel the importance of education &training for women.	a) feel the importance of education &training for women.	–	b) Very little or no feelings
	c) feel the need of safe & protected shelter & sanitation for women	b) feel the need of safe & protected shelter & sanitation for women	a) feel the need of safe & protected shelter & sanitation for women	c) Very little or no feelings
	c) feel the need of equal amount of food for women.	c) feel the need of equal amt.of food for women.	–	d) Very little or no feelings
EAS 4: Absence of unsolicited influences in decision making.	a) None can influence woman's decision making.	a) Only husband can influence woman's decision making.	a) Any elder member of family can influence woman's decision making.	a) Anyone can influence woman's decision making.



INDICATORS OF 'ENTITLEMENT'

Criteria for evaluation

INDICATORS OF 'ENTITLEMENT'	HIGH (4)	MEDIUM (3)	FAIR (2)	LOW (1)
EEN 1: Exchange Entitlement	a) women get same type of job.	a) women get same type of job.	a) women get inferior type of job.	women get no job.
	b) women earn more or equal by selling non-labour asset	b) women earn equal by selling non-labour asset	women earn equal by selling non-labour asset	women earn lower by selling non-labour asset
	c) women earn more or equal by selling labour asset & her power of management is high/ equal	c) women earn equal by selling labour asset but power of management is low.	women earn low by selling labour asset & power of management is low	women earn low by selling labour asset & power of management is low
	d) Cost of purchasing of resources is equal or low.	d) Cost of purchasing of resources is equal.	Cost of purchasing of resources is equal.	Cost of purchasing of resources is more.
	e) Value of the product that she can sell is equal /more.	Value of the product that she can sell is low.	Value of the product that she can sell is low.	Value of the product that she can sell is low
	f) women & men get same wage.	women get low wage	women get low wage	women get very low wage
	g) women & men receive equal social benefit & pay equal tax.	women & men receive equal social benefit & pay more tax.	women receive lower social benefit & pay more tax.	women receive lower social benefit & unable to pay taxes
EEN 2: Inheritance & Transfer Entitlement	Women & men inherit property equally & selling power of the property is equal.	Women & men inherit property equally & selling power of the property is lower for women.	Women & men inherit property but not equally & selling power of the property is low.	Women & men inherit property not equally but selling power of the property is nil
EEN 3: Access to resources	a) Equal access to immovable property	–	–	Nil
	b) Equal access to durable & movable property	Equal access to durable & movable property	–	Nil
	c) Equal financial access	Equal financial access	–	Nil
	d) Equal access to personal health care.	Equal access to personal health care	Equal access to personal health care	Nil



INDICATORS OF 'PARTICIPATION'

Criteria for evaluation

INDICATORS OF 'PARTICIPATION'	HIGH (4)	MEDIUM (3)	FAIR (2)	LOW (1)
EPP 1: Level of influencing decision in a project	women influence decision at the stage of 'conception', 'implementation' & 'operation'	women influence decision at any two stage of project life.	women influence decision at any one stage of project life.	women never influence decision.
EEN 2: Level of providing material, labour, finance&management to the project/ programme.	women provide all four inputs.	women provide material, labour & finance	women provide material+ labour or finance+ labour.	women provide labour but not adequately.
EEN 3: Level of acceptance of responsibility/ consequences of decision	always follow the decision held in the meeting& accordingly perform their duty.	women sometimes follow the decision.	women follow the decision in a few cases only	women have no responsibility.

INDICATORS OF 'BUILDING AWARENESS &CAPACITY'

Criteria for evaluation

INDICATORS OF 'BUILDING AWARENESS &CAPACITY'	HIGH (4)	MEDIUM (3)	FAIR (2)	LOW (1)
EAC 1: Ability to manage productive resources	women themselves use resources for the desired purpose	Sometimes women use &sometimes men use but women supervise it.	Only men use the productive resources ,women supervise it but power of supervision low	women never use &never supervise it.
EAC 2: Ability to develop alternative economic structure locally	women form cooperative at the village level &it runs successfully	women have formed cooperative but they don't always get cheap inputs or marketing facility.	women form cooperative at the village level but it does not run successfully	No formation of cooperative by women.



INDICATORS OF 'BUILDING AWARENESS & CAPACITY'	HIGH (4)	MEDIUM (3)	FAIR (2)	LOW (1)
EAC 3: Ability to create alternative employment at local level	Create at least 3 alternative employment.	Create at least 2 alternative employment	Create at least 1 alternative employment	Create no alternative employment
EAC 4: Ability to interact effectively in public sphere	Ability to interact effectively in most of the public spheres.	Ability to interact effectively in a few public spheres.	Ability to interact effectively only in local club/SHG	Inability to interact effectively in any public sphere.
EAC 5: Ability to participate in non-family group	Participate in Gram-Panchayat, Mahila Samiti, SHG, NGO, club & cooperative.	Participate in SHG, NGO, club & cooperative	Participate in SHG & club	Only club member or no membership.
EAC 6: Action to bring gender equality	a) protest against violence of women	–	–	No Protest
	b) protest against wage discrimination for male-female	a) protest against wage discrimination for male-female	–	No Protest
	c) protest against unequal educational opportunity for male & female	b) protest against unequal educational opportunity for male & female	a) protest against unequal educational opportunity for male & female	No Protest
EAC 7: Legal awareness	a) woman knows the name of M.P., M.L.A., C.M., P.M. & Panchayat Pradhan	a) woman knows the name of Panchayat Pradhan only		knows nothing
	b) woman knows the benefit of registering marriage	b) woman knows the benefit of registering marriage		knows nothing



INDICATORS OF 'BUILDING AWARENESS & CAPACITY'	HIGH (4)	MEDIUM (3)	FAIR (2)	LOW (1)
	c) woman knows the law regarding inheritance	c) woman knows the law regarding inheritance	c) woman knows the law regarding inheritance	knows nothing
EAC 8: Ability to organise struggle	Organise struggle collectively at village level & among different communities also.	Organise struggle collectively at village level but it is limited to its community.	Organise struggle collectively at local area under a village level only for her community.	Can't organise struggle.
EAC 9: Ability to fight injustice	women take direct action, file complaint & inform police	women take direct action & file complaint only.	No direct action but file complaint only.	nil
EAC 10: Ability to help the process of egalitarian system within the family health, education, religion)	a) able to help the process of egalitarian system in health b) able to help the process of egalitarian system in education c) able to help the process of egalitarian system in religion	a) able to help the process of egalitarian system in health b) able to help the process of egalitarian system in education	able to help the process of egalitarian system in health / education	No ability to help the process of egalitarian system
EAC 11: Ability to help the process of egalitarian system outside the family (legal, political, economic & social)	Ability to help the process of egalitarian system in at least 3 sectors	Ability to help the process of egalitarian system in at least 2 sectors	Ability to help the process of egalitarian system in at least 1 sector	Inability to help the process of egalitarian system in any sector



Bibliography

Amin, S. and A. Peibly, "Gender Inequality within Households, The Impact of a Women's Development Programme in 36 Bangladeshi Villages", *Bangladesh Development Studies*, Vol.22, No. 2 & 3, pp.121-154., 1994.

Arnold, F., P. Nangia and U. Kapila, " Indicators of Nutrition for Women and Children in India: Current Status and Programme Recommendations", presented at Workshop on National Family Health Survey, *Centre For Economic Studies, Hyderabad*, 2003.

Bera, S, "Programme Design and Impact Assessments: Success' of Microfinance in Perspective". *Economic and Political Weekly*, August 9-15, 2008, XLIII (32).

BIDS, "Bangladesh Institute of Development Studies", *Evolution of Poverty Alleviation Programmes in Bangladesh* (Mimco), BIDS, Dhaka, 1990.

Burra, N.; J. Deshmukh-Ranadive and R.K. Murthy (eds), "*Micro-Credit, Poverty and Empowerment : Linking the Triad*", Sage Publications, New Delhi/Thousand Oaks/ London, 2005.

Chowdhury, O.H. and S. Khandker, "Targeted Credit Programme and Rural Poverty in Bangladesh" paper presented at the workshop on 'Credit Programmes for the Poor: Household and Intra-household impacts and Programme Sustainability' *World Bank and Bangladesh Institute of Development Studies*, Dhaka, 1995.

De S. and D.Sarker, "Increasing Women's Participation and Self Employment Generation in Household Industries: An Approach through SHGs in West Bengal" , *Bangiya Arthaniti Parisad*(*Bengal Economic Association*), Conference Volume, , pp.199-216, 2002.

DRDC, "District Rural Development Cell , Nadia District", website: http://nadia.nc.in/District_Rural_Development_Cel/district_ruraldevelopment_cel1.html , 2003.

Gillepsie, S, and G. McNeill, "*Food, Health and Survival in India and Developing Countries*", Oxford University Press, 1994.

Holcombe, S., "*Managing to Empower : The Grameen Bank's Experience of Poverty Alleviation*", London : Zed k Press, 1995.

Hossain, M., "*Credit for Alleviation in Rural Poverty. The Grameen Bank in Bangladesh*", Washington DC : IFPRI, 1988.

Huda, S. and S. Mahmud, "*Women's Control over Productive Assets : The Role of Credit Based Development Interventions*". Working Paper No. 28, BRAC- ICDDR Joint Research Project at Matlab. Dhaka, 1998.

Kabeer, N, "Resources, Agency, Achievements: Reflections on the Measurement of Women's Empowerment", *Development and Change*, Vol. 30 ,pp. 435-464. 1999.

Khandker, S.R, "*Fighting Poverty with Microcredit : Experience in Bangladesh*", Washington, D.C.: Oxford University Press for the World Bank, 1998.

Mahmud, S., "The Gender Dimensions of Programme Participation: Who Joins a Microcredit Programme and Why?", *The Bangladesh Development Studies*, ,Vol. XXV, June – September. 2000.



Mahmud, S, "The role of Women's Employment Programmes in influencing Fertility Regulation in Rural Bangladesh". *The Bangladesh Development Studies*. 22 (2&3) pp. 93-120 , 1994.

Mustafa,S.et.al . *Impact Assessment Study of BRAC's Rural Development Programme: Final Report*. Research and Evaluation Division, BRAC, Dhaka, 1995.

NABARD . "NABARD and Microfinance- Ten years of SHG – Bank Linkage", *NABARD*, 2001-02.

NABARD . "Progress of SHG-Bank Linkage in India, 2005-06", *NABARD*

Otero,M. and E. Rhyne: *The New World of Microenterprise Finance* ,London : IT Publication, 1994.

Panda,S.M. "Women's Empowerment Through NGO Interventions: A Framework for Assessment", *Working Paper 145, Institute of Rural Management, Anand*, 2000.

Pitt, M.and S. Khandker, " *Household and Intra household Impacts of the Grameen Bank and Similar Targeted Credit Programs in Bangladesh*", Paper presented at Workshop on "Credit Programs for the Poor: Household and Intrahousehold Impacts on Program Sustainability". Dhaka: World Bank and Bangladesh Institute of Development Studies, 1995.

Pitt, M. and S. Khandker , "The Impact of Group-Based Credit Programs on Poor Households in Bangladesh: Does the Gender of Participants Matter?" *Journal of Political Economy*, 106 (5),958-996.1998

Purushothaman, S. *The Empowerment of Women in India : Grassroots Women's Networks and the State*, Sage Publications . New Delhi, 2002.

Rahman, R.I. *Impact of Grameen Bank on the Situation of Poor Rural Women*, Working Paper No. 1. Grameen Bank Evaluation Project, Bangladesh Institute of Development Studies . Dhaka, 1986.

Rani, A. S. "Does Mother's Participation in Economic Activity Influence Nutrition and Health Status of Children?" *The Indian Economic Association*,. 89th IEA Annual Conference Volume, 27-29th Dec., pp. 192-204, 2006.

Remenyi,J. *Where Credit is Due?* London IT publication, 1991.

Rosenbaum, P. R. , " *Matching in Observational Studies*. Quoted in *Applied Bayesian Modeling and Causal Inference from Incomplete-Data Perspectives*", eds, A. Gelman and X-L Meng (pp. 15-23). Hoboken: Wiley,2004.

Rosenbaum, P., "The role of a second control group in an observational study", *Statistical Science*, (with discussion), Vol 2., No. 3,,1987: 292–316.

Rosenbaum, P.R. and D.B.Rubin. "Constructing a Central Group Using Multivariate Matched Sampling Methods that Incorporate the Propensity Score", *American Statistician*, 39,pp. 35-39, 1985.

Rosenbaum, P.R. and D.B.Rubin , "The Central Role of the Propensity Score in Observational Studies for Causal Effects", *Biometrika*, 70: 41-55. 1983.



Rubin, D., and N. Thomas. "Characterizing the Effect of Matching Using Linear Propensity Score Methods with Normal Covariates", *Biometrika* 79, pp. 797–809, 1992.

Sarker, D. "A Study of SHG-NGO and SHG-non-NGO Models of Rural Micro Financing in West Bengal", *Indian Journal of Agricultural Economics*, July-Sept, 2001.

Schuler, S.R.; S.M. Hashemi and A. P.Riley. "The Influence of Women's Changing Roles and Status of Bangladesh's Fertility Transition : Evidence from a Study of Credit Programs and Contraceptive Use", *World Development*, 25 (4), 1997.

SIPRD, *Concept of Microfinance I & II – A study of West Bengal credits, self-help groups and Microfinance*, SIPRD, Kalyani, West Bengal , 2000 &2001.

Steele, F. et al. *The Impact of an Integrated Microcredit Program on Women's Empowerment and Fertility Behaviour in Rural Bangladesh*, Policy Research Division, Working Paper No. 115. The Population Council: New York, 1998.

Yunus, M. *Banker to the Poor*, The University Press Limited. Dhaka, 1998.

Yunus, M. Grameen Bank, Microcredit and Millennium Development Goals, *Economic and Political Weekly*, Vol. XII, September 4, pp.4077-4080, 2004.