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INNOVATION, TRANSPARENCY AND GOVERNANCE : A STUDY OF NREGS IN ANDHRA PRADESH

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ABSTRACT

In a country like India, effectively monitoring and delivering a massive scheme like National Rural Employment Guarantee Scheme (NREGS), involving governance structures from top to bottom, is, indeed, a challenge. As such, certain leakages and loopholes in its implementation cannot be ruled out. However, with effective and innovative tools like e- governance, ICT, social audit etc., Andhra Pradesh government has been a pioneer in the implementation of NREGS effectively. All stages of NREGS work, from registration of workers to issue of job cards, preparation of work estimates, muster rolls and payments to workers have been computerised. Government of Andhra Pradesh developed an end-to-end MIS system through which job cards, work estimates and payment order are issued. While social audit is mandatory under NREGS, Andhra Pradesh government has put in place a system where an autonomous Society for Social Audit, Accountability and Transparency (SSAT), has institutionalised social audit of NREGS in such a way that it maximises government support but minimises its interference. The government of India has taken not only the social audit in A.P, but also its website as a model for evaluation. Even the administrative structure is also borrowed by some other States in India. The governance of NREGS in Andhra Pradesh and the way the State has been successful in ensuring transparency and accountability to a great extent in its implementation with the use of IT, e-governance and social audit has certainly made a difference.

Introduction

Rural employment programmes in India earlier were in the hands of private contractors and their political masters. The greatest beneficiaries of such programmes were private contractors who received 'work orders' and together with the local political bosses and officials fudged muster rolls (attendance registers that determine wages to be given) to produce inflated figures and misappropriate funds.A substantial part of the loot was recycled through the so-called "PC" (percentage) system, whereby various functionaries received fixed percentages of the amounts released.The contractors also had to satisfy their political bosses, for whom these funds came handy during election campaigns.

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** In the present paper, MGNREGA, MGNREGS, 'act', 'scheme', and 'programme' are used interchangeably to mean NREG Act- supported scheme or programme.

This is the sort of situation that led P. Sainath to say that "everybody loves a good drought" — the peak season for rural employment programmes. An important reason for this appalling scenario has been the lack of transparency and accountability in our delivery systems that have allowed corruption to proliferate unchecked.

The NREGA passed by the Union Parliament in 2005 gives legal guarantee of a hundred days of wage employment in a financial year to adult members of rural households, who demand employment and are willing to do unskilled manual work. "Unskilled manual work" means any physical work which any adult person is capable of doing without any special skill or training. The objective is to enhance the livelihood security of rural people by generating wage employment through choice of works that develop the infrastructure base of the area. However, the key issue has been how effective can this programme be, given the past experiences with Food for Work programmes. Unlike earlier public works programmes, the NREGA is supposed to be "demand-driven"; projects are to be initiated in response to people's demand for work. NREGA was renamed as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) on 2 October, 2009. The uniqueness of this Act is in the fact that it carries emphasis on issues like equality of wages for men and women, elimination of work contracting/middlemen, payment of wages only through bank and post office accounts to prevent corruption, creating transparency in workers' muster rolls etc.

NREGA is the first ever law nationally, that guarantees wage employment at an unprecedented scale. The primary objective of the Act is augmenting wage employment. Its auxiliary objective is strengthening natural resource management through works that address causes of chronic poverty like drought, deforestation and soil erosion and so encourage sustainable development. Given the scale of investment in this programme, levels of involvement of government machinery, and targeted 'poor' people, concerns have been raised about the targeting, delivery efficiency (time and resources) and reach of the benefits. Accountability in general entails more paperwork, delays in decisions and inbuilt processes of opaqueness and exclusion. However, in Andhra Pradesh, these concerns have been overcome through innovation and transparent systems. Leakages and corruption have been curtailed. Targeting is and always a challenge. In this regard, the process outcomes include strengthening grassroots processes of democracy and infusing transparency and accountability in governance through effective use of ICT and innovative social audit. The delivery system has been made accountable, as it envisages an Annual Report on the outcomes of MGNREGS to be presented by the Central Government to the Parliament and to the State Legislature by the State Government. The implementation of NREGS in Andhra Pradesh clearly specifies that the desirable aspects of governance - transparency and accountability - could be ensured by designing innovative and appropriate systems. The present paper is an attempt to depict that innovative and effective use of ICT and institutionalising social audit have facilitated transparency and accountability in the governance of NREGS in A.P.

NREGA – A Brief Overview

MGNREGS is a 'Centrally Sponsored Scheme'; the Ministry of Rural Development (MoRD) is the nodal agency for implementation of the scheme at the Central level. There is Central Employment Guarantee Council (CEGC) to advise Government of India on NREGS related matters. The Act requires every State to formulate a State Rural Employment Guarantee Scheme (SREGS), which should conform to the minimum

features specified under the Act. For the purposes of regular monitoring and reviewing the implementation of this Act at the State level, every State government shall constitute a State council to be known as the …… (name of the State) State Employment Guarantee Council.

The NREGA offers 100 days of work to unemployed families in rural areas. The two conditions for adults of a household to apply are: they must be living in a rural area and willing to undertake unskilled manual labour for which they receive the minimum wage which varies from State to State and cannot be less than ₹ 60. According to the Act, rural households have a right to register themselves with the local Gram Panchayats (GPs), and seek employment. Work is to be provided within 15 days from the date of demand, failing which the State Government will have to pay unemployment allowance at the stipulated rates. At least one-third of persons to whom work is allotted have to be women. Disbursement of wages has to be done on weekly basis and not beyond a fortnight. Work should ordinarily be provided within 5 kms radius of the village or else extra wages of 10 per cent are payable. Worksite facilities such as crèche, drinking water, shade have to be provided. Social audit has to be done by Gram Sabha, grievance redressal mechanisms are put in place for ensuring a responsive implementation process. Each State determines how implementation will occur on the ground; in many places, a Field Assistant is hired to oversee the NREGA worksite and to issue pay slips, and a Technical Assistant is hired to provide technical input and oversight of worksite processes.

The Government of Andhra Pradesh formulated the Andhra Pradesh Rural Employment Guarantee Scheme (APREGS)

Phase-wise Districts Implementing NREGA In Andhra Pradesh

S.No.	Phase - I Districts	Phase - II Districts	Phase - III Districts
1	Vizianagaram	East Godavari	West Godavari
2	Chittoor	Guntur	Krishna
3	Y.S.R.Kadapa	Kurnool	Visakhapatnam
4	Anantapur	S.P.S.Nellore	
5	Mahaboobnagar	Prakasam	
6	Medak	Srikakulam	
7	Ranga Reddy		
8	Nizamabad		
9	Warangal		
10	Adilabad		
11	Karimnagar		
12	Khammam		
13	Nalgonda		

under the NREGA for implementation in 13 districts from February 2006 and later extended this scheme to 19 districts in the State from April 2007. From April 2008, the APREGS is being implemented in 22 districts (excluding urban district of Hyderabad city) and 1098 mandals across the State.

NREGA - Inbuilt Transparency Safeguards

Under NREGA, rural labourers have a legal entitlement not only to work on demand but also to minimum wages. To prevent corruption, a wide range of transparency safeguards have been built into the Act, making the NREGA one of India's most unique experiments in strengthening governance systems. Decentralised planning and implementation, proactive disclosure and social audits of NREGS ensure transparency to a great extent.

Decentralisation of governance systems lies at the core of an accountable system. The NREGA draws strongly on this principle. Section 13 (1) of the NREGA mandates that the 'Panchayats at the district, intermediate and village levels will be the principal authorities for planning and implementation of the schemes'. The District Programme Coordinator and Programme Officer shall be responsible for the implementation of the scheme in the district and block level, respectively in accordance with the provisions of the Act. The State government shall make available to the District Programme Coordinator and the Programme Officers necessary staff and technical support as may be necessary for the effective implementation of the scheme.

The Act stipulates that a minimum of 50 per cent of the funds and relevant works be executed by the Gram Panchayat. To ensure that planning and works selected reflect the needs and priorities of the local citizens, section 16 (3) (4) of the Act states that 'every Gram Panchayat shall prepare a development plan and maintain a shelf of works'. The works are related to water conservation, drought proofing, irrigation canals, horticulture and land development, renovation of traditional water bodies, flood protection, rural connectivity. This shelf of works is prepared based on recommendations of the Gram Sabha. These recommendations are in turn forwarded to the Programme Officer. A similar system is followed at the intermediate and district Panchayat level.

Access to regular, reliable and relevant information is an important prerequisite for accountability, the core aspect of governance. The NREGA guidelines mandate that all levels of government maintain proper records containing information on inputs, processes, outputs and outcomes related to the NREGA. To ensure that this information is proactively disclosed and made available to citizens, the NREGA guidelines stipulate that all information will be displayed to the public through display boards and paintings on the walls of the Panchayat offices. In addition, all Gram Panchayat level NREGA accounts and summaries of these accounts are to be made publicly available for scrutiny. The guidelines also mandate that all rural households are entitled to a job card into which employment and wage details must be entered, and muster rolls are to be kept on the worksite and read out in public at the time of payments. Building on the provisions of the Right to Information Act (RTI), the NREGA stipulates that all information requests related to the NREGA be made available to the applicant within 7 days, as opposed to the stipulated 30 days in the RTI Act. To facilitate ease and access to information, an integrated Monitoring and Implementation System has also been developed. The guidelines stress that all NREGA related documents be digitised and regularly uploaded onto the MIS systems both at the State and Central government level.

A social audit is a process in which the people work with the government to monitor and evaluate the planning and implementation of a scheme or programme. The social audit process is critically dependent on the demystification and wide dissemination of all relevant information. Social audit or the process of cross verification of government records with realities on the ground completes the feedback loop in the accountability chain. It creates a platform for the poorest and most disempowered to participate in governance. The Section 17 of the NREGA mandates that regular social audits be conducted in the Gram Sabhas at least once every six months. The NREGA guidelines dedicate an entire chapter to the social audit process.

The accountability and transparency measures enshrined in the NREGA have proved to be a catalyst for some State governments and civil society organisations to take innovative steps towards developing and institutionalising accountability tools into the governance system. One of the most interesting examples of these innovations can be found in the State of Andhra Pradesh (AP) where the government has initiated a systematic process of undertaking social audits for all NREGS works across the State. The Andhra experience is unique as the government has proactively taken steps to open itself up to scrutiny by citizens. This has facilitated the conduct of social audits at an unprecedented scale and thus offers some extremely important insights into the effectiveness of a social audit as a tool to strengthen accountability systems within the State as well as for citizens to demand accountability.

Andhra Pradesh has made rapid strides towards a transparent and accountable system through strict record-keeping, institutionalised social audits and the payment of wages through post offices. In addition to these aspects, use of Information Technology (IT), the proactive role of civil society has enhanced transparency and accountability.

Use Of Information Communication Technology (ICT) For Transparency

ICT was identified as a tool that would enable the implementation of NREGS, especially as the size of the programme was very large, not only from the geographical and financial perspective but from the perspective of the size of the target group of beneficiaries as well. ICT ensures transparency and helps in information dissemination, and facilitates online monitoring and evaluation of the programme.

In fact the website posted by the Government of Andhra Pradesh at www.nrega.ap.gov.in provides summary data with a suite of options to capture information stretching from an overview of the programme at the State level down to the multiple transactions taking place at the level of individual wage seeker in any village. While the quality of data can only be as accurate as its entry at the point of primary transaction, the fact remains that the programme decision making both at the policy as well as grassroots levels benefits greatly from the spread of the network and speedy access to the database. Extensive computerisation of the entire scheme has been done to facilitate availability and accessibility of information up to the individual wage seeker level merely by the click of the mouse. All stages of NREGA work, from registration of workers to issue of job cards, preparation of work estimates, muster rolls and payments to workers have been computerised. The bitter experiences of Andhra Pradesh in Food for Work Programme prompted the government to take comprehensive measures in digitalising all the records ranging from vouchers, bills to pay orders which are available for scrutiny. The entire implementation process of NREGS has

also been computerised with the help of Tata Consultancy Services (TCS), the largest software company in Asia. Government of Andhra Pradesh developed an end-to-end MIS system through which job cards, work estimates and payment order are issued.

Total programme is being run through specially designed software to make the system more accountable and transparent, to minimise corruption and the time taken for various processes. Pay slips are generated in computer and distributed to the labour at their door-steps. Pay slips carry information about the amount of wages deposited in the accounts of labour. Entire information about job card holders, works, muster rolls, expenditure, and progress are put in public domain through website nrega.ap.gov.in. The above information can be accessed at district, mandal, village and household level.

Labour payments in Andhra Pradesh are increasingly being made within a week of completion of the previous week's work. By the last (sixth) day in a week's work, the measurement sheets and muster rolls of the entire week are closed and reach the mandal (sub-block) computer centre. The next day, the muster data are fed into the computer. On day eight, the pay order is generated by the computer and the cheques are prepared. By day ten, these cheques are deposited into the post office accounts of workers. The next day cash is conveyed to the post office so that on days 12 and 13, workers are able to access their wages from their accounts. All payments to labour are made only through these accounts; there are no payments in cash. Further, to ensure payment of wages within one week's time, customised application software was developed with the support of M/s. Tata Consultancy Services (TCS), provides the basis for a transparent and organised database linking the progress of the projects from the village level to the State level. TCS was selected as a partner in this engagement, to study the processes from State level to Village Panchayat and design a system which could meet the programme requirements and work in the Indian rural environment. The Tata Consultancy Services team and the Commissioner of Rural Development identified payment of wages as the weakest link in the process chain. Hence, a framework for disbursement of wages using an automated solution was designed, consisting of three distinct software components – a laptop-based one for enrolment of beneficiaries by capturing finger prints data, a Point-of-Service device for disbursement of wages by authenticating bio-metric data and a portal hosted on the data centre.

Since the computer system is tightly integrated end-to-end, any work registered in the system is alive, status-visible and amenable to tracking. Delays at any stage can thus be immediately identified and corrected. The system keeps track of the work from the day the work-ID is generated and starts flagging delays in the payment cycle as soon as they occur. Because the network secures all levels from the ground up to the State headquarters and data are transparently and immediately available on the website, a delay at any stage is instantly noticed by the monitoring system. Free availability of this information on the website also facilitates public scrutiny, thus engendering greater transparency and better social audit.

The Andhra Pradesh experience clearly shows that the TCS' ICT solution has certainly ensured effective and efficient governance of NREGS in terms of innovation, transparency and accountability. The software is the result of an extensive field study across several districts conducted by TCS in close collaboration with the Andhra Pradesh's department of rural development, involving interviews with various stakeholders in the chain. The TCS carried out a comprehensive study of the Act and the Maharashtra

experiment in implementing a similar programme. The study revealed that in the absence of any extensive use of information technology, it would be difficult to reconcile progress of work with wages leading to leakage of funds. With ICT solution, all the stakeholders' viz. citizens, media, NGOs, officials, politicians can view the data live on the Internet, and use the information for furtherance of the cause. Details of personnel and officials involved in implementation at each stage are being logged into the system increasing the accountability. The system has effectively blocked all possible leakages thereby reducing fraud to a great extent. By making available the standard schedule of rates for each locality available online, there is no possibility for excess sanction of amounts and subsequent recoveries at a much later date. A cumbersome process of preparing estimates has been simplified, duly saving several person-months of unproductive time that otherwise the field officials would have had to spend in the process. Use of this solution enabled the State to reduce overall administrative cost. Apart from accuracy, the time taken to generate work estimates has been reduced from 15–20 days to 5 minutes per estimate and the time for issuance of job cards- 3 min per card, pay order- 15 min per work.

For the first time, a programme of this magnitude and social importance is implemented using comprehensive ICT systems. The computer system uses templates for each type of work for arriving at the manpower, material requirement estimates and complete engineering calculation for the works. Computation of payment to the workers is done by the software based on out-turn of the group of workers. The entire programme is monitored using the consolidated data on internet. Data from the *mandals* is uploaded to a district/State server through data network, dial-up connection or even physical media. Irrespective of location, beneficiaries can browse for information about their villages, progress of the work and details of wage payments. Officials can monitor the programme more effectively as the NREGA portal provides features to generate reports and also analyse the data. Changes in policies, work estimation standards and payment rates during the course of implementation of the scheme based on ground realities could quickly be adapted. The programme is being closely and effectively monitored using the system. Fulfilment of 100 days guarantee for every household can be monitored. Every work and every rupee spent on EGS can be tracked. All the MIS reports required by the district, State and Central administration are readily available, reducing the effort of preparation of such reports and increasing the accuracy of data. Another unique feature is that the entire information is available on the internet both in English and the local language of Andhra Pradesh, i.e., Telugu. Officials can monitor the programme more effectively as the NREGA portal provides features to generate reports and analyse the data. By making data available for public scrutiny, the NREGA portal facilitates social auditing of the NREGA implementation under the Right to Information Act.

The NREGS-AP software and website have been recognised as one of the best ICT solutions in the country and world-wide. Thus, TCS was able to provide a comprehensive solution that successfully automated the MGNREGS- AP and the project has won many national and international awards.

* Award for Excellence in e-governance 2006
* Manthan award for best e - content website 2007
* Finalist Global Knowledge Partnership Awards, Kuala Lumpur, Malaysia, December 2007

* Bronze Medal for best website National e-governance award -2008

* Commendation Stockholm Challenge Award, Stockholm, Sweden, May 2009

* NASSCOM Social Innovation Honours Award, 2011

Andhra Pradesh is the first State to implement an automated solution for the Rural Employment Guarantee Scheme. It provides total accountability and transparency in implementing the scheme and is a role model for the rest of the country. The website, which is both in English and Telugu, facilitates social audit and programme monitoring effectively. It facilitates transparency and visibility of all transactions to all the stakeholders, increases accountability, reduction in fraud and administrative costs due to the use of IT and automation wherever possible. Accurate and faster wage payments, through the use of automation and biometric authentication and effective programme monitoring, through the centralisation of data and generation of MIS reports is ensured.

Civil Society And Social Audit – A New Dimension

It is a fact that only a vigilant public can make use of the Information Technology as a support system in an effective and meaningful way. Andhra Pradesh provides us a remarkable example of civil society action enriching mainstream politics. Social activists in India have historically played a watchdog role, raising questions and reflecting the concerns of the most vulnerable sections. This has generally brought them into conflict with State agencies. The Mazdoor Kisan Shakti Sangathan (MKSS) led by Aruna Roy, one of the architects of NREGA, introduced the concept of social audit into development practice nearly two decades ago. But even in Rajasthan, where MKSS started its work, mainstreaming social audits has remained a distant dream. There has been violent resistance from the vested interests threatened with exposure and State support has been uncertain many times.

In Andhra Pradesh, the MKSS and the government are supporting each other to ensure transparency and accountability. An MKSS activist is working full-time within the government as Consultant and Specialist, NREGA social audit. The credit for this must, of course, go to the State government that has set up a separate unit exclusively for social audit, which enjoys great freedom of action. The work of this remarkable unit of dedicated people has culminated in the truly historic rules recently passed by the Andhra Pradesh Cabinet (2008) drawn upon the experience in the State over the last two years. The new rules approved by the Andhra Pradesh Cabinet promise full support to "any independent initiative of wage seekers to carry out additional social audits." This is a historic step in the direction of institutionalising social audit that civil society can take forward. Effective social audit requires demanding, alert and responsible community, civil society and proactive public servants.

The constructive engagement between State and civil society which began at the planning and strategy phase has continued to the implementation stage. At every step, civil society has offered its expertise, experience, insights and skills to the government to experiment with social audits. In the long run, this partnership can go a long way in guarding against cooption of the social audit process by the State.

Special Institutional Arrangements For Capacity Building In Social Audit In Andhra Pradesh

Andhra Pradesh is the only State which established a full-fledged Social Audit Unit at the State level with exclusive Staff. The unit

works independently and reports to Government. AP has put in place a system where an autonomous Society for Social Audit, Accountability and Transparency (SSAAT), led by a social activist (and not a government servant) has institutionalised social audit of MGNREGA in such a way that maximises government support but minimises its interference. Importantly, it has kept up a separation of the implementing and auditing bodies and proved that ordinary labourers when imparted with the right skills can conduct effective social audits. Today, social audits are done regularly in all districts of AP. Social audit teams are selected from among villagers based on a randomised process and trained by district resource persons, themselves selected and trained by SSAAT. They are then allotted villages to conduct the social audits, thus avoiding the pitfalls of Gram Sabha selection, auditing in one's own village etc. SSAAT established in 2009 is registered as a society under societies Act. All operational staff are drawn from the social activists and support staff are from government. The Commissioner, Rural Development of the State enters into a MoU with SSAAT for conduct of social audit on the basis of a calendar prepared for the same. This model has proved to be very successful.

The successful implementation of social audit in Andhra Pradesh was primarily achieved through capacity building of all stakeholders from top management to those working in the grassroots through a series of activities and training programmes. A number of training manuals and guides were created to achieve this and put in place a robust institutional structure for undertaking social audits across the State. In addition to the three training modules and three training films, a step-by-step procedure for undertaking social audit of works under NREGS (AP) and a social audit questionnaire were also prepared. The capacity building activities include the following :

* *State Level Social Audit Unit :* The Rural Development Department, Government of Andhra Pradesh put together a team of people who were from different work backgrounds but who all invariably had experience of working at the grassroot level on rights of the poor people. People from administration worked closely with those from non–government groups. Expertise was drawn from other places where social audits had been carried out previously. The team was kept small and manageable.

* *State Level Resource Persons (SRPs):* Resource Persons were trained through a Training of Trainers (ToT) programme in social audit methodology. The resource persons were selected from civil society groups with not less than 10 years of grassroots experience.

* *District Level Resource Persons (DRPs):* A cadre of trainers and resource persons were developed at the district level to further undertake trainings at mandal and village level. District Resource Persons coordinate social audit activities at the district level.

* *Village Level Social Auditors (VSAs) :* To undertake the actual social audits at the village level and also to educate the community on the benefits and entitlements of the scheme, DRPs identify a few energetic literate youth in every village who usually belong to the families of NREGA workers themselves to operate as village social auditors. Using Village Social Auditors who are literate youth from wage seekers families was arrived at after much brain storming and trials as to who would actually undertake social audits in the village.

* *Training of Officials :* The officials of the State machinery like Mandal Parishad Development Officers (MPDO), Village Administrative Officers (VAOs), officers of the District Water Management Agencies (DWMAs), Engineers of the Panchayat Raj Department etc., were also trained in social audit to get them on board and support and cooperate with the community in undertaking the social audits.

* *Training of Political Executive :* Political representatives like the elected members of the Panchayat, Mandal Parishad Territorial Constituency (MPTC) Members, Zilla Parishad Territorial Constituency (ZPTC) Members etc., were also provided training to actively participate in social audits.

Social Audit Process - Innovative Feature Of NREGA In Andhra Pradesh

NREGA mandates the regular conduct of social audits for all aspects of the scheme. A social audit is the process of reviewing official records and determining whether State-reported expenditures align with money spent on the ground. The first step in a social audit is the procurement of official records. Once procured, these records are studied and made accessible to the general public. Next, evidence is gathered through interviewing individual participants in development programmes, panchayat members, and local officials. The social audit process in Andhra Pradesh begins with filing of applications for NREGA records under the Right to Information Act by District Resource Persons (DRPs) designated by the government. This is done at least a fortnight before the social audit commences. The rules passed by the Andhra Pradesh Cabinet stipulate that "concerned officials shall provide the information requested for without fail within seven days of the receipt of the application." The trained Village Level Social Auditors form into teams and go door-to-door authenticating muster rolls, check out worksites, record written statements of workers and conduct a series of meetings in each village.

The social audit process culminates in a massive public meeting at the mandal headquarters attended by people from every village, their elected representatives, the media, the NREGA functionaries concerned, and senior government officers. At this meeting, village-wise social audit findings are read out, workers testify and the officials concerned respond to the issues raised by giving an explanation about their actions under complaint. Officials are also required to specify the nature of remedial action they will take in what time period. Senior officials affix responsibility and a number of corrective or disciplinary actions are taken during the meeting itself. Social audit rules specify that an "action taken report shall be filed by the Programme Officer within a month of the social audit being conducted and the same shall be communicated to the Gram Sabha." In addition, there is a rigorous follow-up where social audit teams go back to their villages every 15 days after the mandal public meeting to ensure that the decisions taken are actually enforced. Immediate corrective action is taken on the gaps and lapses. Administration does not interfere at any stage in the social audit process.

Social audit has been proved very effective. As of June 30, 2010, ₹ 82 crore worth of misappropriated funds have come to light, of which around ₹ 15 crore has been recovered; 33,807 field-level functionaries have been implicated; 3,842 staff have been dismissed based on the social audit findings and 1,430 suspended. A total of 548 FIRs have been lodged and 1,220 departmental enquiries have been initiated. All this has been possible by 60,000 village social auditors (wage earners trained in social audit) trained

by 700-odd district and State resource persons largely drawn from civil society organisations and 22 technical resource persons. Nothing could establish with more clarity, the benefits of institutionalising social audit in an open and participatory way. Andhra Pradesh's initiatives and its outcomes silence in one stroke all the opponents of social audit in the rest of the country. It is noteworthy that this approach to social audit is expounded in the 'NREGS-AP Conducting of Social Audit Rules' adopted in 2008, based on the very recommendations of the MoRD working group which is facing clandestine resistance at the Central and other State levels. Andhra Pradesh, according to the Rural Development Ministry, is the only State which has drafted social audit rules and had even set up a separate organisation for framing them. They have gone to the extent of inducting a civil society activist for heading the organisation something which has paid rich dividends and is borne out by the fact that while in Andhra Pradesh misappropriation to the tune of ₹ 88 crore has been detected so far (Feb 1, 2011), it is not even ₹ 8 crore in the rest of the country. Besides, about 5,000 officials have been removed on charges of corruption and other irregularities.

The discussion on the AP social audit experience would be incomplete without appreciating the central role of the AP government in facilitating this process. The most striking feature of the Andhra model for conducting social audits is that the State government has willingly opened itself up for scrutiny and done so by proactively mobilising citizens to monitor its programmes. This has important ramifications on current conceptualisations of State civil society relationships and their individual roles in addressing accountability deficits.

Transparency And Governance Through Social Audit In Andhra Pradesh

The Social Audit Punishment of Corrupt Practices Ordinance passed by AP government in August 2011 stipulates that action has to be taken on the people found guilty. The ordinance proposed to set up special mobile criminal courts per district or group of districts with 1st class Judicial Magistrates. The mobile courts would go to the villages to try cases for quick justice. Jail sentence of up to 2 years is awarded for fraudulent records, misappropriation, non-disbursal of payments and abetment of the above. But apart from administrative action, what is interesting is that in village after village after the social audit was done, corrupt officials have gone back to the workers and returned the money that was taken from them. It was found, for instance, that there is a growing nexus between the field assistants who maintain the muster rolls and the technical assistants who are responsible for the measurement of work done and the local post-master. The most common type of corruption noted was that the number of days worked as shown against the name of a worker is increased and the additional dues are transferred into the post office accounts of the workers. However, since most labourers are illiterate, they have no idea what has been entered in their job cards or in the passbooks. They merely sign their names on the withdrawal slips. They are paid for the work they did legitimately and the additional money is shared between the field assistants, technical assistants and post-masters.

Several research studies showed that social audit was a real revelation to State officials managing NREGA as well as for the labourers who had no idea of how the State was being defrauded. In village after village, labourers have testified against fraud and the government has taken remedial action. The studies revealed that before the practice of social audit started, labourers used to take it for granted that there would be cuts in their wages and commissions would have to be paid to middlemen and contractors. After the social audit, they realised that they did not have

to give any cuts to anyone and they have started questioning this practice. Although the Government of Andhra Pradesh organised mass awareness programmes prior to the implementation of NREGA and members of Self-Help Groups played a major role in building awareness, people in many villages reported that their awareness about NREGA really grew after the social audit process started. For the first time they fully understood that this was a guarantee and a right and that the contractors were forbidden to take on works. Interestingly, as a result of the social audit process, their awareness about pay slips and the method of calculation of wages and the fact that wages were to be paid through post office or bank accounts rose by more than 50 per cent. In the past, there was very little understanding of the procedures and rules governing any schemes. However, once the social audit process started and the verification of muster rolls and job cards began, people started to understand how fraud was taking place. Now this was no longer a process of verification in isolation but a matter of their wages and their accounts.

It was realised that corruption in NREGA in Andhra Pradesh is mostly at the lower level and amongst staff, which is responsible for maintaining records and making payments. Corruption at higher levels in NREGA has not been reported. The social audit reports provide detailed information, village by village, of what is happening; who is being paid what; for how much work. The credibility of social audit is enhanced due to use of IT. There is exclusive website for social audit – www.socialaudit.ap.gov.in and the link provided in NREGS website. All social audit reports are now available in the public domain. Social audit has a significant and lasting effect on citizens' awareness levels, improves the implementation process, enhances citizens' bargaining power and offers them a never before opportunity to address petty grievances. In this process, it increases the confidence and self-respect of the poorest and disempowered.

The most remarkable element in NREGS in AP is that rural development department has played a very supportive role in this entire process. The social audit team is given complete autonomy by the department in its every-day operations. To ensure the smooth conduct of the audit and the full support and cooperation from local level officials, the government from time to time, issued various orders detailing rules and processes related to the audit. These orders are essential as they have given the social auditors easy access to government records as well as made it incumbent on local officials to participate in the public hearings and respond to social audit findings.

Conclusion

India's past experience with welfare programmes to the poor have been greatly affected by corruption and poor delivery system. The same concerns were raised with regard to NREGS. But, the innovations the government of Andhra Pradesh has made in governance to implement NREGS has belied these experiences. Andhra Pradesh is unique in having institutionalised the social audit process through an autonomous State unit which makes a huge difference to the quality of governance of the programme, has a good MIS (designed by TCS), and is spending more than 4 per cent on administration of the programme, using its own resources to pay for the excess amount. Rapid evacuation of information on the works taken up under NREGA, and the awareness that there is a larger section of monitors of each of the activity has helped in reducing, if not obliterating, the regular concerns of corruption, wrong targeting and delays. The innovation is that it has reduced paperwork, without reducing the information flow.

For the success of any scheme, governance aspect is crucial. Though NREGA has made strict provisions for checking corruption and mismanagement, AP government has set an example in innovation and transparency in terms of governance. Andhra Pradesh, known for its e-governance initiatives in different departments of the government, is technically advanced enough to effectively implement NREGS with ICT. Social audit with the help of ICT complements financial audit, assesses performance and unpacks decisions. Social audit combined with financial audit can present the true picture of spending, policy implementation, gaps and leakages in policy execution and outcomes of NREGS.

The governance structures and the associated officials have extended the needed cooperation in this regard. The innovation, transparency and governance with reference to National Rural Employment Guarantee Scheme (NREGS) in Andhra Pradesh deserve appreciation. Even Shri Jairam Ramesh, Union Minister for Rural Development showered accolades on AP for its model implementation of NREGS. He said that the social audit conducted in AP was acknowledged and adopted in several other States. Aruna Roy, social activist and member of National Advisory Council also recommended adoption of the Andhra model for the rest of the country. The launch of mobile courts for trying the accused in the misappropriation of NREGS funds was also unique to the State. The MGNREGA Sameeksha - an anthology of independent research studies and analysis on the Mahatma Gandhi National Rural Employment Act, from 2006 - 2012 also mentioned that social audits in AP have significantly increased awareness and identified fraud. Besides the TCS offering a comprehensive ICT solution to NREGS in AP, the dynamic partnership between State and civil society which is a new dimension makes Andhra experience unique. The innovations made by Andhra Pradesh Government in the implementation of NREGS has certainly facilitated transparency and enhanced the accountability and credibility of government in the eyes of the beneficiaries of the scheme. The NREGS – AP by streamlining service delivery systems through innovative mechanisms has ensured that transparency and accountability are intrinsic part of governance.

References

1. Centre for Budget and Governance Accountability (2006), 'Report on Implementation of NREGA in Andhra Pradesh, Chhattisgarh, Jharkhand and Madhya Pradesh In May and June 2006', 15 September 2006, New Delhi.

2. Mihir Shah & Pramathesh Ambasta, 'NREGA: Andhra Pradesh Shows the Way', *The Hindu,* September 8, 2008.

3. Sowmya Sivakumar, ' No Guarantees Anymore', *The Hindu,* October 2, 2010.

4. 'NREGA May Include Skill Development', *The Hindu,* June 28, 2011, [Special Correspondent].

5. CH. Ravi Kumar, D. Rakesh Kumar and S. Seethalakshmi, National Rural Employment Guarantee Act in Andhra Pradesh, Claims and Questions in Operationalisation (2007-08), NREGS_AP_WASSAN.doc.

6. Jean Drèze, 'NREGA: Dismantling the Contractor Raj', *The Hindu,* November 20, 2007.

7. Andhra Pradesh Shows the Way for NREGA Social Audit State Institutes Independent and Autonomous Body for Facilitating Conduct of Social Audit by the Rural Poor, Brajesh Kumar, New Delhi, September 30,2010[http://governancenow.com/news/regular-story/andhra-pradesh-shows-way-nrega-social- audit]

8. Vidya Subrahmaniam,'Social and Political Dividends from NREGA', *The Hindu,* October 18, 2009.

9. NREGA in Andhra Pradesh - Field Diary Tuesday 7 July 2009. [http://www.indiadevelopmentblog.com/2009/07/nrega-in-andhra-pradesh-field-diary.html]

10. Social Audit NREGA [http://www.nrega.ind.in/social-audit-nrega.htm]

11. Civil Society Groups to do NREGA Audit Again , Devesh Kumar, ET Bureau Feb 1, 2011, 03.20am IST[http://articles.economictimes.indiatimes.com/2011-02-01/news/28425251_1_social-audit-civil-society-sarpanches]

12. Gujarat,Tamil Nadu Making Progress in NREGA Audit : Govt Published : Tuesday, Nov 8, 2011, 20:46 IST | Updated : Tuesday, Nov 8, 2011, 20:56 IST Place: New Delhi | Agency: PTI [http://www.dnaindia.com/india/report_gujarattamil-nadu-making-progress-in-nrega-audit-govt_1609608

13. Karuna Vakati Aakella, Sowmya Kidambi, 'Social Audits in Andhra Pradesh : A Process in Evolution', *Economic & Political Weekly,* November 24, 2007.

14. Neera Burra, Transparency and Accountability in Employment Programmes : The Case of NREGA in Andhra Pradesh, knowledge.nrega.net/235/2/Transparency_accountability.pdf

15. Yamini Aiyar, Salimah Samji, 'Transparency and Accountability in NREGA, A Case Study of Andhra Pradesh', Accountability Initiative Working Paper, No. 1, February 2009.

16. Central Employment Guarantee Council, Ministry of Rural Development (2010), Report of the Working Group on Transparency and Accountability, New Delhi.

17. Centre for Good Governance (2009), 'Best Practice Notes on Social Accountability Initiatives in South Asia Social Audit of NREGS (AP) in Andhra Pradesh', Hyderabad.

18. Aruna Roy and Nikhil Dey, Much More than a Survival Scheme, The Hindu, August 31,2012.

Journal of Rural Development, Vol. 32, No. (2) pp. 121 - 138
NIRD, Hyderabad.

LINEAR DISCRIMINANT ANALYSIS OF MULTIPLE GROUPS IN RURAL SETTLEMENTS OF AKWA IBOM STATE, NIGERIA

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ABSTRACT

This study examined the levels of stock of social infrastructure and the spatial pattern of development in rural areas of Akwa Ibom State, Nigeria. Empirical and theoretical approaches were employed in the investigation and data on 21 social indicator variables/surrogates were collected from 50 villages in the State using questionnaire and field observation as research tools. An index of social infrastructure stock was evolved and hierarchical cluster analysis statistics was applied on the stock of social infrastructure in order to group the communities on the basis of social infrastructure profiles. The single linkage cluster analysis was employed to illustrate the linear combination of the communities in rural areas that were found to fall into low (Group 1), fair (Group 2), moderate (Group 3) and high (Group 4) performance patterns of social infrastructure stock. The result shows that the study area is characterised by many vulnerable communities that are very weak in stock of social infrastructure. The multiple linear discriminant Analysis (MLDA) technique was used to assess the optimality of earlier groupings of settlements in the study area. The result showed that MLDA correctly classified 97.6 per cent of the settlements. The technique correctly classified most of the Group one settlements with a few misclassifications but correctly classified all the remaining groups of settlements without any misclassification. In addition, health infrastructure was identified as the single most important independent variable that discriminated the four groups of settlements obtained earlier, thus highlighting its contribution to improving the social infrastructure in the study area.

Introduction

Social infrastructure covers such basic services as education, health, water, electricity, communication and transportation services, housing and other social services needed to facilitate industrial and other socio-economic development[1,2&3]. Providing infrastructure services to meet the demand of households, industry and other users is crucial in modernisation[4] while lack of it reduces rural-urban linkages and impedes sustainable growth[5]. In Nigeria, most rural areas characterise low level infrastructure than the urban areas. According to the World Bank[6], the growth of farm productivity and non-farm rural

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employment in the rural areas where most of the poor reside, is linked to the extent and quality of social infrastructure.The use of basic social infrastructure as a development strategy forms the World Bank's parameter for assessing the level of prosperity or poverty anywhere in the world.Therefore, is the need to adopt social planning framework as a powerful and result- oriented planning strategy not only for solving humanity's social problems but also economic problems[7].

Social infrastructure development is a cardinal issue in the Millennium Development Goals (MDGs) to address socio-economic needs of the poorest economies in the world. Some of the indicators of the MDGs include halving extreme poverty, increasing access to safe drinking water, education and healthcare facilities for all by the year 2015[8]. More interestingly, the seventh goal of the MDGs focuses on the need to ensure environmental sustainability.This goal provides the framework for a more robust approach in the context of sustainable human settlements development in Nigeria. Considering that Nigeria subscribes to the MDGs as a member of the comity of Nations, it is envisaged that sustainability of our enviornment and human life will not be achieved unless, among other things, human settlements in both rural and urban areas are made economically buoyant, socially vibrant and environmentally sound through the instrumentality of social infrastructure networking.

Akwa Ibom was selected for this study because it is one of the major oil producing States in Nigeria and for this reason receives far more revenue from the Nigeria's federation account than the non-oil producing States. Despite this high revenue, preliminary investigation has shown that the level of rural infrastructural development in the State is indisputably low, although the pattern of development from the perspective of social infrastructure distribution has not been substantively established.

Located in the Niger Delta region of Nigeria (Fig.1) Akwa Ibom is a major oil producer, yet it is characterised by rising waves of youth restiveness typical of States in the region. It is the second most populated State in the region with an average density of 634 persons per square kilometer[9]. Aster[1] applied cluster analysis to group 50 rural settlements in the State on the basis of social infrastructure stock without further investigation to explain or identify factors that were useful in the classifications.

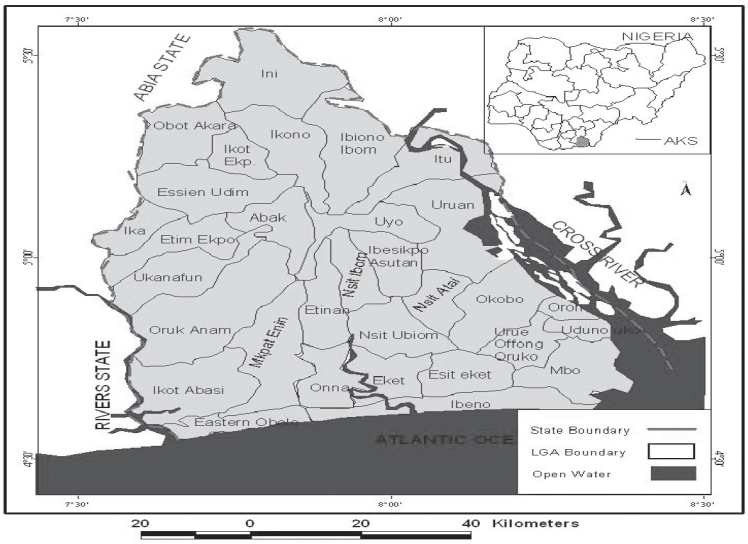
The objective of this study is to provide a more effective development strategy based on the proper understanding of the State's rural space.This will be achieved by classifying fifty sampled rural communities in the State on the basis of social infrastructure stock and to proceed to identify the major variables which discriminate these communities.The aim is to provide planners with the appropriate variables to consciously target in their attempt to plan the development of spatially distinct areas.This will make rural development efforts more specific and rewarding rather than the current efforts of applying a blanket planning strategy to the entire rural areas of the State.

Study Area and Method

Akwa Ibom is located in the southeastern coast of Nigeria.The State is wedged between Rivers, Abia and Cross River States and the Republic of Cameroon to the southwest, north, east and southeast, respectively while the Bight of Bonny bordered the State to the south. The State has 31 Local Government Areas with Uyo, Eket, Ikot Ekpene, Abak, Etinan, Ikot Abasi and Oron being the most developed urban centres. According to the 2006 National Population Census result, Akwa Ibom had a total population of 3920208 persons out of

whom 87.89 per cent constituted rural population while 12.11 per cent formed the urban population[10].The large rural component of the population makes it expedient to assess the levels of stock of social infrastructure in rural areas of the State.

Figure 1 : Map of Akwa Ibom State



To achieve this, map of Akwa Ibom drawn on a scale of 1cm representing 2.5 km was divided into grid squares (quadrates) of 0.5 cm sq to provide a framework for selection of units of observations. The use of grid squares is not new as Abiodun[11] applied grid squares as units of observations to analyse industrial growth patterns in Nigeria between 1962 and 1974 and had valid conclusions. A total of 500 quadrates were subsequently numbered serially and sampled using table of random numbers. A total of 50 rural communities were sampled. Data on 21 social indicator variables or surrogates were obtained from each community using direct field observation by 28 research assistants as well as the use of structured questionnaire administered to 400 household heads. The sample size of 400 was statistically determined using Taro-Yamane formula for finite population in order to establish the minimum size of sample for generalisation of result thus :

$$n = \frac{N}{1+N(e^2} \qquad \frac{177743}{1+177743 \times (0.05)^2}$$

Where

n = sample size $\quad 1+177743 \times (0.0025)$

N = Finite Population $\quad \frac{177743}{445}$

e = Level of significance (0.05)

I = Unity $\quad = 400$

Uzoagulu[12]

Since the 50 rural communities differ in terms of population, proportional representation was adopted and systematic random sampling was employed to select household heads proportionately in all the 50 communities for questionnaire administration using variables indicated in Table 1.

Table 1: Indicator Variables of Social Infrastructure

Sector		Variables	Unit of measurement	Standard required (expected)
1	Water (W)	(a)Major source	Borehole(3), well(2), stream/river/pond(1)	Borehole[13]
		(b)Distance	Time	30 minutes[13]
		(c)Borehole	Number / community	1/250 population
2	Health (H)	(a)Types	Hospital(4), Health centre(3), Clinic (2), Disp.(1)	Base on population of community
		(b)Ownership	Government(3), community (2), private(1)	Government ownership
		(c)Hospital beds	Number / health facility	Base on population of community
		(d)Doctors	Number / health facility	Base on population of community
		(e)Nurses	Number / health facility	Base on population of community
		(f)Distance	Kilometers	Base on type of health facility/ community
3	Education(E)	(a)Primary	Number	1/3000 population[14]
		(b)Secondary	Number	1/12000 population[15]
		(c)Distance to primary	Kilometers	2.5 kilometers as maximum
4	Road (R)	(a)Category	Federal(3), State(2), Local(1)	Federal
		(b)Types	Paved(1), unpaved(0)	Paved
		c)Mode of transport	Motorised(3), bicycle(2), on foot(1)	Motorised
		(d) Usage intensity	High(3), Moderate(2), Low(1)	High

(Contd.)

Table 1: *(Contd.)*

5	Others (O)	(B)Nearness to bank	<500m(5), 500-1km(4), 1.1km-3kms(3), 3.1kms -5kms(2), >5kms(1)	<500m
		(P)Nearness to police		
		(M)Nearness to market		
		(E)Electricity supply	Available(1), not available (0)	Availability
		(T)Telephone (GSM)	Available(1), not available (0)	Availability
Water Index		Level of achievement for a, b, c = observed + expected x 1. Index =levels of achievement for a, b, c + 3		
Health Index		Level of achievement for a, b, c, d, e, f = observed + expected x 1. Index = levels of achievement for a, b, c, d, e, f + 6		
Education Index		Level of achievement for a, b, c = observed + expected x 1. Index =levels of achievement for a , b, c + 3		
Road Index		Index = summation of levels of achievement for a, b, c + 10		
Others Index		Index = summation of scores for B, P, M, T, E + 17		

Source : Atser[1].

These variables relate to issues of availability, adequacy and accessibility. The initial concern was to determine the availability of infrastructure and level of adequacy while the next consideration was on the level of accessibility in terms of distance measured in kilometres or time spent in accessing existing facilities. The spatial pattern of social infrastructure stock was depicted using data evolved to measure levels of development in five social sectors as shown in Table 1. The levels of development in these social sectors were subsequently summed up to obtain the stock of social infrastructure in each community. The hierarchical cluster analysis was applied on the stock of social infrastructure in order to group the communities on the basis of their social infrastructure profiles using version 13.0 of the statistical package for Social Sciences. One of the simple forms of cluster analysis is the single linkage cluster analysis which offers a simple way of summarising relationship in the form of a dendrogram. This was employed to illustrate the linear combination of the communities on the basis of their stock of social infrastructure.

To assess the optimality of such a grouping procedure and thus bring to light the variables which differentiate or discriminate these groups, a multiple groups linear discriminant analysis was performed on all the four groups earlier obtained from the cluster analysis procedure. Linear discriminant analysis is a multivariate technique which allows for a study of the differences between two or more groups of objects with respect to several variables simultaneously. In employing the technique, our interest is in the way in which groups differ on the basis of some sets of characteristics i.e. how well they discriminate and which characteristics are the most powerful discriminators. Discriminant analysis achieves this by extracting one or more linear combinations of the discriminating variables such that an individual can be assigned to one or more than one group without the least chance of being misclassified. In terms of assumptions, discriminant analysis shares most of the common assumptions of the multiple linear model, yet Lachenbruch[16] and Klecka[17], among others, have noted that linear discriminant analysis is relatively robust as it is unaffected by departures from normality or heterogeneity of variances. The discriminant function is written as :

$$Z = b_1x_1 + b_2x_2 + ... b_nb_n+c$$

Where ,

Z = the score of the discriminant function

b = the standardised weight of the coefficient to be estimated (a reflection of the relative of importance of each discriminating variable)

x and n = the standardised discriminating variables and number of observations or predictor variables used.

C = Constant

Discriminant functions were estimated with SPSS Version 14 using a direct procedure which entered all the explanatory variables into the model.

Results

The initial study by Atser[1] witnessed the use, among others, of cluster analysis technique to group the settlements into four groups based on their performance on the social infrastructure stock of the study area presented in Table 2. In order to determine the spatial patterns of development of social infrastructure in the study area, the results of preliminary analysis of levels of access to social infrastructure were integrated into one as

Table 2 : Levels of Social Infrastructure Stock in the Study Area

S.No.	Social Infrastructure / Communities	W	E	H	R	O	Observed total stock	Observed mean	Expected total stock	Expected mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1.	Ito Ika	-1.67	2.20	-2.00	1.0	0.4	-0.07	-0.01	43.39	2.16
2.	Iqua	-0.67	0.60	-1.10	1.0	0.1	-0.07	-0.01	54	2.70
3.	Ikot Inyang	-1.67	1.50	-0.9	0.60	0.5	0.03	0.00	47.26	2.36
4.	Mbiabong Ikono	-1.67	3.40	-2.50	0.70	0.4	0.33	0.07	45.99	2.29
5.	Nwot Ikono	-0.41	1.30	-1.20	0.70	0.4	0.79	0.16	48.68	2.43
6.	Ikot Umiang	-1.67	1.20	0.50	0.90	0.3	1.23	0.25	56.06	2.80
7.	Urukim	-0.32	0.10	0.50	0.60	0.4	1.28	0.26	62.75	3.13
8.	Ikot Udo Obobo	-1.67	0.60	1.10	1.0	0.4	1.43	0.29	59.59	2.97
9.	Ikot Ekpaw	-0.56	2.10	-1.02	0.60	0.6	1.72	0.34	59.59	2.97
10.	Aka Ekpeme	1.78	1.50	-2.50	1.0	0.6	2.38	0.48	47.04	2.35
11.	Ikot Udo Offong	1.67	3.40	-0.30	0.60	0.4	2.43	0.49	55.56	2.77
12.	Ikot Etefia	-1.67	2.9	0.30	0.60	0.4	2.53	0.51	102.36	5.11
13.	Ikot Odube	1.21	2.40	-2.00	0.70	0.5	2.81	0.56	40.53	2.02
14.	Nsasak	0.64	1.50	-0.00	0.90	0.4	3.44	0.69	59.7	2.98
15.	Ikot Ibok	-1.67	1.70	3.20	0.50	0.2	3.91	0.78	53.18	2.65

(Contd.)

Table 2 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
16.	Eyo Nsek	-0.37	2.80	0.60	0.90	0.4	4.33	0.87	44.18	2.20
17.	Ikot Akpadem	1.41	1.40	-0.00	1.0	0.6	4.41	0.88	60.1	3.00
18.	Utu Nsekhe	2.60	1.40	-0.50	0.70	0.4	4.60	0.92	46.88	2.34
19.	Etibe Afaha	-1.67	1.70	4.20	1.60	0.4	5.23	1.05	114.76	5.73
20.	Ikot Uko	1.64	3.20	-0.50	0.70	0.5	5.54	1.11	41.87	2.09
21.	Ndon Ebom	0.45	3.9	0.10	1.0	0.4	5.85	1.17	104.47	5.22
	Group 1 Total	-7.63	40.80	-4.02	16.30	8.70	54.13	10.83	1247.84	62.27
	Mean	-0.36	1.94	-0.19	0.78	0.41	2.58		59.42	
22.	Ikot Obio Odongo	1.59	1.50	2.70	0.60	0.5	6.89	1.38	57.92	2.89
23.	Mkpok	2.38	2.10	1.40	0.60	0.5	6.98	1.40	63.47	3.17
24.	Ndukpoise	-0.67	3.90	3.20	0.60	0.1	7.13	1.43	70.97	3.54
25.	Ukpom Usung Ubom	1.89	2.70	1.50	0.70	0.7	7.49	1.50	42.44	2.12
26.	Mbiakpa Ibakesi	-0.60	1.20	6.20	0.50	0.4	7.68	1.54	61.19	3.05
27.	Okoro Inyang	1.86	3.30	1.40	0.80	0.6	7.96	1.59	41.13	2.05
28.	Utu Edem Usung	2.30	0.60	4.10	1.0	0.7	8.70	1.74	65.63	3.28
29.	Ikot Akpabim	1.80	1.10	4.50	0.80	0.7	8.90	1.78	52.82	2.64

(Contd.)

Table 2 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
30.	Ikot Ukana	-1.67	1.90	8.10	0.60	0.4	9.33	1.87	46.22	2.31
31.	Ukana	2.40	2.00	3.70	0.70	0.7	9.50	1.90	48.22	2.41
32.	Mbak Ikot Abasi	-0.60	1.40	8.30	0.60	0.4	10.1	2.02	57.1	2.85
33.	Ekparakwa	0.51	2.10	6.50	0.80	0.4	10.31	2.06	66.28	3.31
34.	Mbiaso	1.96	2.90	4.10	1.0	0.4	10.36	2.07	41.75	2.08
35.	Nkari	0.44	2.20	6.80	0.70	0.4	10.54	2.11	69	3.45
	Group 2 Total	13.57	28.90	62.50	10.00	6.9	121.87	24.37	784.14	39.15
	Mean	0.97	2.06	4.46	0.71	0.49	8.71		56.00	
36.	Ikot Ubo	1.47	2.00	6.50	0.90	0.5	11.37	2.27	83.27	4.16
37.	Mbokpu Eyekan	0.47	1.70	8.50	0.70	0.5	11.87	2.37	61.5	3.07
38.	Akpa Utong	1.60	1.90	7.20	0.90	0.4	12.0	2.40	57.35	2.86
39.	Ibiaku Uruan	0.22	3.90	8.00	0.70	0.4	13.22	2.64	76.34	3.81
40.	Ikot Abia	0.49	5.40	6.20	1.0	0.5	13.59	2.72	53.5	2.67
41.	Ekeya	-0.64	4.40	8.40	0.80	0.7	13.66	2.73	95.03	4.75
	Group 3 Total	3.61	19.30	44.80	5.0	3.0	75.71	15.14	426.99	21.32
	Team	0.60	3.22	7.47	0.83	0.5	12.62		71.16	

(Contd.)

Table 2 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
42.	Abak Ikot	1.78	2.60	8.80	1.0	0.6	14.78	2.96	47.22	2.36
43.	Atiamkpat	1.44	4.1	8.30	0.70	0.4	14.94	2.99	68.09	3.40
44.	Ikot Oku Ikono	1.61	2.80	9.10	0.90	0.6	15.01	3.00	55.22	2.76
45.	Okobo Ebughu	1.50	4.80	7.60	1.0	0.5	15.40	3.08	66.94	3.34
46.	Ikot Ibiok	2.27	5.10	6.70	1.0	0.6	15.67	3.13	67.4	3.37
47.	Use Offot	2.70	5.0	6.42	0.70	0.7	15.70	3.14	72.92	3.64
48.	Ituk Mbang	1.18	5.50	8.20	1.0	0.8	16.68	3.34	84.3	4.21
49.	Mbiokporo 1	0.93	1.70	14.00	0.80	0.7	18.13	3.63	52.93	2.64
50.	Nung Udoe Itak	0.43	6.9	9.50	0.90	0.7	18.43	3.69	71.92	3.59
	Group 4 Total	13.84	38.50	78.62	8.20	5.6	144.74	29.23	586.94	29.31
	Mean	1.53	4.27	8.73	0.91	0.6	16.08		65.21	

Source : Atser[1]. Key : W = Water Index, H = Health Index, E = Education Index, R = Road Index, O = Other Infrastructure Index.

shown in Table 2. Specifically, the index values on water supply, education, health care facilities, road network and other facilities are summed up into one index which defines the overall level of development of the communities on the basis of stock of social infrastructure. Thus, the general performance of the study area in terms of stock of social infrastructure, ranges from -0.07 as the least score to 18.43 as the highest score. A total of 17 sampled communities have total performance scores of 10 and above while 33 communities representing 66 per cent score less than 10 points.

Table 2 presents the observed and expected total and mean stock of social infrastructure. On the basis of the magnitude of the observed total stock, the 50 communities are rearranged in descending order with defined cut-off line after each cluster. Further analysis is performed on the stock of social infrastructure using cluster analysis model. This is to aid the classification of communities under study on the basis of their infrastructural profiles. From the result of the cluster analysis, four groups of communities emerged as shown in Table 3.

Table 3: Summary Statistics of Cluster Analysis for Observed Stock

Cluster	Number of cases	Range of stock	Cluster total stock	Mean stock per settlement	Mean stock per facility	Status
1	21	-0.07 – 5.99	54.13	2.58	0.5	Low
2	14	6.00 – 10.99	121.87	8.71	2.5	Fair
3	6	11.00 – 13.99	75.71	12.62	1.7	Moderate
4	9	14.00 -18.99	144.74	16.08	3.2	High
Total	50	-0.07-18.99	396.45	7.93	1.5	

Source : Atser[1] .

Social infrastructure and other basic facilities have minimum population threshold as requirements for their provision. These minimum requirements were used alongside the population of the various communities to establish the expected total and mean stock of social infrastructure for the study area. However, the four clusters that emerged from te study were derived from the observed mean stock. The expected stock per cluster however places all the settlements in the category of low levels of development except a very few communities which have observed mean stock above their expected mean stock values. These communities are Nung Udoe Itak : 3.69 (3.59); Mbiokporo 1:3.63 (2.64); Ikot Oku Ikono : 3.00 (2.76); Abak Ikot : 2.096 (2.36); and Ikot Abia : 2.72 (2.67). Interestingly, these four communities fall in the fourth cluster indicated as developed group of settlements (see Table 2).

From Table 3 the cluster analysis has grouped the communities into four clusters or categories based on their observed levels of performance on stock of infrastructure. This implies that the initial 50 communities could be adequately classified into four groups. In order to further determine the critical need-

gap levels among the four categories of settlements, the social infrastructure profile of each group is analysed. The first group was composed of a total of 21 settlements which performed poorest on the social infrastructure stock computed. This was followed by the second group with 14 settlements. Next was group 3 with 6 settlements while group 4 with 9 settlements performed highest on the social infrastructure stock. The first group consists of 21 communities. The characteristics of this group include a very weak positive performance score on social infrastructure stock as Table 2 shows. With a total cluster stock of 54.13 points and an average of 2.58, the overall performance score for the group is very weak. Water supply sector records the weakest performance as exemplified by its negative mean score of -0.36. This is followed by the health sector with a negative mean score of -0.19. The education infrastructure has the strongest positive score in this group as indicated by its mean score of 1.94. Among the 21 communities, Iqua and Ukana have the weakest mean score (-0.01) while Ndon Ebom records the highest score of 1.17. This group is deficient in almost all the social infrastructure indicators. The negative mean scores observed in the water supply and health sectors, implies the magnitude of the need gap. Thus, this group of communities is the least developed in terms of levels of access to basic social infrastructure and could be termed the most vulnerable communities.

The composition of group two is also summarised in Table 2. This group has fourteen-cluster membership with a combined cluster total stock of 121.87 and a mean of 8.71. The overall performance of this category of communities studied is weak as only 4 out of the total cluster membership recorded positive mean scores that are slightly above 2 points. There are only 6 communities in the third group with a combined cluster stock of 75.71 and a mean score of 12.62. The overall performance of this group of communities is moderate as its mean score of 12.62 is above 7.93 representing the mean score for the entire study area (Table 3). Group four comprises nine-cluster membership. It features prominently as the group with a very strong positive performance scores on stock of social infrastructure. The group has a total of 144.74 cluster stock scores and an average of 16.08 point and thus stands out above all other groups in levels of performance (Table 2). On the whole, the distribution of the performance scores among the communities analysed provides a means of easy identification of spatial variation in levels of access to basic social infrastructure in the study area. While three communities have the least mean performance scores of less than 0.01, seven other ones are outstanding among the 50 communities with average performance scores of above 3 points. Generally, majority of the communities as well as the people in the study area have poor access to social infrastructure development.

Optimality of the Settlements Groupings

The result of multiple linear discriminant analysis carried out on all the four groups of settlements earlier derived from a cluster analysis solution is presented in Table 4. The interpretation of the discriminant function analysis on SPSS is reasonably straightforward. Discriminant function analysis is a way of assessing whether members of different groups can be identified on the basis of their scores on a set of variables. There may be several discriminant functions obtained in an analysis. The number depends on the characteristics of the data especially the number of independent variables. Each discriminant function is uncorrelated with the other, that is, they are independent of each other. This ensures that the discriminant functions have the maximum possible power to differentiate between the groups.

Figure 2 : Spatial Patterns of Social Infrastructure in Akwa Ibom State

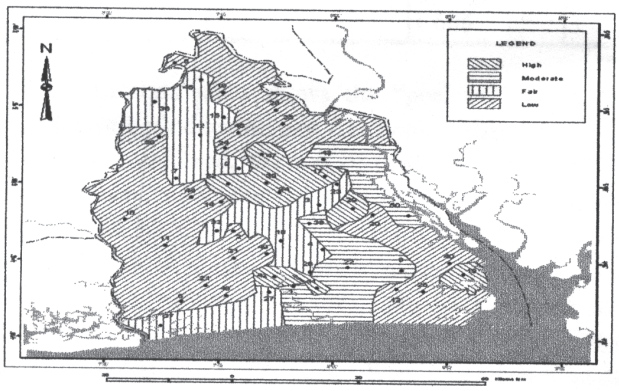


Table 4 : Summary of Canonical Discriminant Functions Eigenvalues

Functions	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1.	2.879[a]	61.2	61.2	.862
2.	1.588[a]	33.7	94.9	.783
3.	.239[a]	5.1	100.0	.439

a. First 3 canonical discriminant functions were used in the analysis.

Three discriminant functions have been identified. One is substantial as it accounts for 61.2 per cent of the reliable variance; the second is quite small in comparison as it explains only 33.7 per cent while the third function is insignificant. In Linear discriminant analysis, function 1 is computed upon which the group means are as different as possible. This is followed by function 2 that is orthogonal to function 1 and so on. The eigenvalues and their associated canonical correlations show the relative ability of each discriminant function to discriminate the groups. Usually, eigenvalues that are less than unity are considered useless. The absolute value of the Standardised Canonical Discriminant Coefficient is a measure of discriminatory ability. Having been standardised, it means that the larger the values, the greater the variables' ability to discriminate. The values may then be used to rank the importance of each variable. Table 4 shows that Function I with the engenvalue of 2.879 accounts for about 61.2 per cent of the variance in the social infrastructural stock in the four groups of settlements (the dependent variable) while

Table 5 : Wilks' Lambda

Test of Function (s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 3	.080	18.906	15	.218
2 through 3	.312	8.738	8	.365
3	.807	1.606	3	.658

Function 2 accounts for 33.7 per cent, the third function accounts for the remaining 5.1 per cent making a total 100 per cent. Canonical correlation indicated that Function 1 is very strongly correlated with the four groups of settlements.

The Wilk's Lambda Table shows the "peel off" significance test of successive discriminant functions. For the combination of both discriminant functions, 1 through 3; all functions tested together, chi-square is 18.906. After the first function is removed, the test of function 2 through 3 shows that chi-square is 8.738. This is still statistically significant at □ = .05 because sig. = .365. Function 3 is equally significant after the removal of the first two functions. This means that the first and second functions are significant as well as the third, if not the third discriminant function would not have been marked as one of the discriminated functions remaining in the analysis. Wilk's Lambda statistic is used to test the Null hypothesis (Ho) that the canonical correlations derived are equal to zero in the population. It is the product of the values of one minus canonical correlation square. It tests which variable contributes significantly to the discriminant function. The closer Wilk's Lambda is to zero, the more the variable contributes to the discriminant function. The chi square statistic is used to test the significance of Wilk's Lambda. If the p-value is less than 0.05, it means that the corresponding function well explains group membership. Wilk's Lambda statistics (Table 5) show that function 1 in the most significant in discriminating the groups. This is followed by function 2 while function 3 is the least significant.

Table 6 : Standardised Canonical Discrminant Function Coefficients

Sector	Function		
	1	2	3
Water	1.425	.739	.006
Education	1.006	-.321	-.199
Health	.928	1.694	.273
Road	.588	.370	.320
Others	.100	.444	.969

Standardised canonical discriminant function coefficient are given for driving discriminant function scores from standardised predictors. The correlation loadings between predictors and discriminant functions are given in structure matrix. These are ordered so that predictor loadings on the first discriminant function are listed first and those loadings on the second discriminant function listed second and so on. Standardised canonical discriminant function coefficients are also known as discriminant refers. As in Principal component analysis and Factor analysis, their loadings are used to name the discriminant functions extracted. The signs indicate whether the coefficient is making a positive or negative contribution to the function extracted. Because they are in standard form, the higher they are the more important they are in explaining the functions extracted. The result shows that water recorded the highest loading (1.425) followed by education (1.006) in function1. Function 1 is therefore, identified as a water/education function. Based on the high loading (1.694) in function 2, this function

is significant, and is therefore, identified as a health function. Function 3 loading high (.969) on others; it is also a significiant function.

Table 7 : Structure Matrix

Sector	Function		
	1	2	3
Water	.468*	-.127	.379
Education	.437*	-.430	-.423
Health	.114	-.301	.909
Road	.057	.120	.631*
Others	-.163	.617	.621*

* Largest absolute correlation between each variable and any discriminant function.

Canonical structure matrix reveals the correlation between each variable in the model and the discriminant functions derived. Differently put, it measures directly, the contribution of the criterion and the predictor variables to pairs of canonical variates extrated. It is simply obtained by carrying out the correlation between the original variables (p and q) and the extracted canonical variates. A discriminant function is a sort of variable based on several measured variables. Therefore, in order to understand what the discriminant function measures, it is necessary to know how each of the score variables that contribute to the discriminant function correlate with that discriminant function.This information is found in the structure matrix function (Table 7).This, taken in combination with the classfication result (Table 9), gives a basic understanding of the output of the discriminant function analysis. Table 7 shows that the water sector contributes more and so can be used to predict discriminant function 1. This is followed by education. For discriminant function 2, it is the health sector that contributes more.The third function is influenced by other sectors, this function is also significant.The structure matrix component shows the correlation of each independent variable with each discriminant function and as in factor analysis; the largest values may be used to name each function. In this case function 1 is clearly a water/ education function while function 2 may be regarded as a health function. Function 3 may be regarded as other sectors' function; although it is a weak function.This means that the presence of water, education and health facilities are the most important variables in differentiating the four groups of settlements in the study area.The meaning of a discriminant function lies in the variables that were used to derive the discriminant function. Some variables will be strongly related to the discriminant function and others will relate to it poorly. So the variables that correlate with (load on) a discriminant function are the ones that identify what the discriminant function is.

Table 8 : Functions at Group Centroids

Groups	Function		
	1	2	3
1,000	-1.982	.059	.214
2,000	.740	-1.425	-.146
3,000	.033	1.327	-.803
4,000	1.634	.937	.444

Unstandardised canonical discriminant functions evaluated at group means.

Functions at group centroids indicate the average discriminant scores (multivariate means) for each group on each function.The means of each of the group on the resulting discriminant function are calculated. Centroids are the canonical group means.They are means for each group's canonical observation score. The larger the difference between the canonical group means, the better the predictive power. Table 8 shows unstandardised canonical discriminant

functions evaluated at group means. The Table shows that the groups are well discriminated as the mean values are far apart from each other. Looking at the signs of the centroids (positive or negative), function 1, which is a water/education function, discriminates Group 1 settlements from the other two (-1.982). Function 2 which is a health function seems to discriminate Group 2 settlements from both Groups 1 and 3 and lastly, function 3 discriminates Group 3 settlements from Groups one and two though it is less significant.

The results indicate that the rows represent actual group membership (original count) and columns represent predicted group memberhship. Within each cell, the number and per cent of cases correctly classified are shown. A Classification Table is also called a prediction matrix or a confusion matrix and it contains the number of correctly classified and misclassified cases. The Table compares the actual group membership with the predicted group membership. It enables us to see how well or how poorly the predicted discriminant

Table 9 : Classification Results

			Predicted Group Membership				
		Groups	1,000	2,000	3,000	4,000	Total
Original	Count	1,000	4	0	0	0	4
		2,000	0	4	0	0	4
		3,000	0	0	1	1	2
		4,000	0	0	0	3	3
		Ungrouped cases	3	2	0	32	37
	%	1,000	100.0	.0	.0	.0	100.0
		2,000	.0	100.0	.0	.0	100.0
		3,000	.0	.0	50.0	50.0	100.0
		4,000	.0	.0	.0	100.0	100.0
		Ungrouped cases	8.1	5.4	.0	86.5	100.0

92.3 per cent of original grouped cases correctly classified.

functions fit actual group membership. In this Table, each row and column corresponds to one of the groups. The numbers on the diagonal represent cases that have been correctly classified. In the Classification Table, the rows are the actual and the columns are the predicted values. All cases will lie on the diagonal axis when prediction is perfectly archived. Table 9 shows how well MLDA has performed the classification. The Table shows that MLDA has correctly classified 92.3 per cent of original cases. The multiple linear discriminant technique correctly classified 100 per cent of Group 1 settlements as Group 1 settlements with no misclassification. The same applied for Group 2, however 50 per cent

of Group 3 settlements were correctly classified as Group settlements were correctly classified as Group 3 but misclassified 50 per cent of Group 3 settlements as Group 4 settlements. It correctly classified 100 per cent of Group 4 settlements with no misclassification.

Conclusion

Four groups of settlements namely Group 1 (Low performance), Group 2 (Fair performance), Group 3 (Moderate performance) and Group 4 (High performance) were derived using cluster analysis procedure. After that, efforts were made to assess the optimality of such a classification as well as identify the variables which discriminate these groupings of settlements using multiple linear discriminant analysis (MLDA). The result shows that the multiple discriminant analysis technique correctly classified about 92.3 per cent of the settlements thus confirming the earlier classification obtained using cluster analysis. The result shows that the presence of water, education and health facilities are the most important indicators which discriminate the four groups of settlements in the study area. This is confirmed by inspecting the entries in Table 2. The overall result of the study has some implications for the sustainability of rural communities in Akwa Ibom State. The four settlements groupings depict the varying degrees of concentration of stock of social infrastructure. The observed unequal concentration of stock of social infrastructure implies that some communities and families are more vulnerable than others. The spatial patterns that emerged from this study, serve as a framework for development intervention by government at all levels and other international development agencies to direct attention to the most vulnerable communities in their welfare development efforts. At the present levels of development, the sustainability of most of the rural communities and human life in the study area is in doubt and may not be achieved within the MDGs target period of 2015, unless drastic measures are directed towards making the rural communities economically buoyant and socially vibrant. There is the need to adopt social planning framework as a purposeful and result-oriented planning style to meet the social needs of rural communities and families.

The spatial pattern of the water, education and healthcare facilities distribution are identified as the most important indicators which discriminated the four settlements groupings in the study area. The observed strong disparity which occurred in the spatial distribution of water, education and healthcare facilities, by extension, resulted in the disparity among settlements in terms of overall development. Disparity in access to basic social facilities among families and communities could generate corresponding spatial disparities in levels of productivity as a result of the existing correlation between basic facilities, welfare of population and productivity. Thus, the criticality of basic social facilities in the overall development of the rural communities calls for proactive role by all the tiers of government and the private sector to intervene aggressively in the development of the most vulnerable communities. In this context, the type of basic social facilities should be used based on population threshold in order to bring equity to bear on facility distribution.

References

1. J Atser, 'Analysis of Spatial Patterns of Social Infrastructure in the Rural Areas of Akwa Ibom State, Nigeria', An Unpublished PhD Thesis, University of Uyo, Nigeria, 2008.
2. A Crump, Dictionary of Environment and Development, People, Places, Ideas and Organisations, London, Earthscan Publishers Limited, 1991.
3. R Johnson, The Dictionary of Human Geography, London, Basil Black Well Ltd, 1989.
4. J Von Braun, 'Rural-Urban Linkages for Growth, Employment and Poverty Reduction', Ethiopian Economic Association Fifth International Conference Paper, UN Conference Centre, Addis-Ababa, 2007.
5. World Bank, Equity and Development, World Development Report 2006, Oxford University Press, New York, 2007.
6. World Bank, Infrastructure for Development, World Development Report, OUP, New York, 1994.
7. N Lusting, 'Economics with a Social Face, *Finance and Development*, A Quarterly Publication of the International Monetary Fund, Vol. 42(4) 2005, pp 4-7.
8. UN, Millennium Development Goals (MDGs), 8th Plenary Meeting, 8 September 2000 http// www:sovereignty.net/p/gov/made.html, 4th August, 2010.
9. National Population Commission (NPC), '2006 National Population Census Result : Legal Notice on the Details of the Breakdown of the National and State Provisional Totals', Printed and Published by the Federal Government Printer, Lagos, Nigeria. FGP71/52007/2500(OL24), 2007.
10. National Population Commission (NPC), '1991 National Population Census of the Federal Republic of Nigeria : Analytical Report at the National Level', Abuja, 1998, pp 6.
11. JO Abiodun, 'Aspects of the Spatial Impact of Development Efforts : A Case Study of Nigeria', TESG, 72(2), 1981, pp 274-279.
12. A Uzoagulu, Practical Guide to Writing Research Project Reports in Tertiary Institutions, Enugu: John Jacob Publishers, 1998.
13. Federal Government of Nigeria (FGN), 'National Water Supply and Sanitation Policy', Federal Ministry of Water Resources, Department of Water Supply and Quality Control, First Edition. Abuja, Nigeria, 2000.
14. UN, 'Combating Poverty', Report of the Secretary General, Commission on Sustainable Development, UN Economic and Social Council Fourth Session, 18 April – 3 May, 1996.
15. AL Mabogunje, Cities and Social Order, Inaugural Lectures 1973-74, University of Ibadan Press,1994, p12.
16. PA Lachenbruch, Discriminant Analysis, New York , Hayner Press, 1975, p62.
17. WR Klecka, Discriminant Analysis : Quantitative Applications in the Social Sciences Series, No. 19, Thousand Oaks, CA : Sage Publications, 1980, p102.

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HUMAN DEVELOPMENT AND ITS MOBILITY : A STUDY IN SOME SELECTED BLOCKS OF WEST BENGAL

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ABSTRACT

In this paper, we have considered human welfare in the global era as captured by a set of socio-economic indicators. For this purpose we have selected all the blocks of five districts (Howrah, North 24 Parganas, Burdwan, Purulia and Malda) of West Bengal on the basis of ranking in West Bengal Human Development Report (2004) during the two Census points (1991 and 2001). For the analysis, we have considered both an aggregate and disaggregate approach. In the aggregate approach we have constructed a composite Modified Human Development Index (MHDI) for all the blocks of the five selected districts following United Nations Development Programme (UNDP) formula, used for the construction of Human Development Index (HDI). This combined MHDI is a combination of three indices–an index of health outcome, an educational attainment index and an income index. The relevant data are gathered from Census Reports. The temporal movement of this MHDI is noted. For disaggregate analysis, we have used mean-proportions of the socio-economic indicators and their transition across the two recent Census points. The constructed mobility matrices reveal positional movement of the rural areas in this decade.

Introduction

Human endeavour has always searched for welfare that transcends well beyond mere accumulation of wealth. An echo of this is found in the Brihadaranyaka Upanishad where Maitreyi raises a very important question about the problem and prospect of human life. When her husband, sage Yâjñavalkya wanted to give away between his two wives, Maitreyi asked if she could attain immortality with all the wealth of the earth. The sage replies in negative. Then she asked "What should I do with that by which I do not become immortal". This ancient question uttered long ago is still very relevant in today's world (Sen 1999). The aspect of human welfare is a very broad question, not to be ascertained merely by the accumulation of wealth. This is particularly true when we consider welfare of an entire nation. Economists generally try to narrow down the concern to the concept of National Product (NP) or more provocatively per capita national product.

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The quest of a measure that can capture multi-dimensional aspects of human welfare is age old. After a long journey, the Human Development Report by United Nations Development Programme (UNDP) in 1990 was published proposing a single index, Human Development Index (HDI). However, this index receives several criticisms. Since its inception, there is a debate as to how far a unified measure can cover the various aspects of human development that is essentially disaggregated[1] in nature. Nevertheless, it achieved world-wide popularity.

The dynamic aspect of HDI has been a neglected area. Though State level (even district level) Human Development Report has been published, these reports are non-comparable. Disaggregate analysis to capture the dynamics are not widely studied. In this paper, we address these issues. We work out Modified Human Development Index (MHDI) following UNDP formula to investigate the well-being condition of the people of selected blocks of West Bengal. For disaggregate analysis, we apply the mobility literature (Sengupta and Ghosh 2010).

In this paper we have tried to discuss both sides of human development. While suggesting a unique measure and its changes, we have also focused on the movement of its components. Without these two aspects any discussion of human development is inadequate.

Methodology

Towards an Aggregative Measure : Human Development Index (MHDI) tries to capture three dimensions by incorporating a life expectancy index that captures health attainment, an educational index and income index. It is standard practice to use expected life expectancy at birth (ELB), adult literacy rate (LR) and per capita income (PCI) as the most common indices for this purpose. They are combined with proper weight to generate a unique scalar measure- HDI.

To study the human welfare at the sub-district level it is necessary to take into account a set of factors similar to that of HDI. However, all the relevant data are not available at the sub-district (block/municipality) level from the major official source. Hence we are contended with a limited variable set than the HDI. Thus we get the concept of Modified HDI (MHDI). Following Sengupta and Ghosh (2008), we use three indicators for three dimensions of MHDI.

The first important dimension of MHDI is health that is captured by life expectancy at birth. However, these data are not available at any administrative level below the district. Similar is the case for under-five mortality rate that is often used to substitute and/or complement life expectancy. In many cases researchers used health facilities indicators (such as health infrastructure and/or basic household amenities such as access to safe drinking water or sanitation facilities) (Ram and Shekhar 2006; West Bengal Government 2004). However, there are difficulties in assessing their efficacy in fostering health outcomes (such as life expectancy, under-five mortality, checking the spread of preventive diseases etc.). As for example, Ram and Shekhar (2006) have included the water from tap; tubewell, wells etc. as sources of safe drinking water. In the Southern West Bengal, arsenic contamination is a major source of problem that adversely affects the quality of water (West Bengal Government 2004). In such cases underground water from wells, tubewells may not be safe at all. Moreover, when water is supplied by some public authorities (such as municipalities or panchayats), improper maintenance of the supply system may lead to leakage in pipes leading to contamination that makes tap water unsafe. Hence it is better to use some outcome indicator of health[2].

One of the health indicators may be under-five mortality. Economists generally argue that there is an inverse relationship between under-five mortality (and life expectancy in general) and fertility rate (Ray 1998). With lower chance of child survival, families settle for higher fertility and vice-versa. As argued by Ram and Shekhar (2006), "The percentage of population below 6 years is an indirect of the fertility level. In general, its higher proportion leads to a young–age structure i.e., a higher level of young dependency ratio." Thus, we have selected an inverse of this index (1-the index of population below 6 years) to be an indicator of health outcome at the sub-district level.

The second factor–educational attainment–is captured by literacy rate. However, the additional factor for education–enrolment rate–is very unreliable at the block or municipality level (West Bengal Government 2004). Hence, for educational attainment we depend solely on literacy rate[3].

The third factor is an economic one. Ideally one would prefer some measure of sub-district level output or income as in the case of MHDI. Alternatively one suggestion could be the use of the consumer expenditure data, which if explored at the unit level should have given a better result. Unfortunately no such reliable measure is available at the disaggregated level that we are discussing here (West Bengal Government 2004). Thus, it has to be substituted by some measures of employment. We have used the workforce participation data from the Census record that provides distribution of workers and non-workers in different municipalities. These data coincide with other social indicators that have been used by us and hence make it comparable.

A standard argument against the workforce participation rate (WFPR) is that it may include distress living conditions–situations whereby people are forced to work at a lower wage. However, in our case, the argument is weakened because within the State, there remain certain homogeneity in the public policy and/or possibility of migration. Moreover, our analysis is dynamic. Such movement across time rules away most of the ambiguities that might be centred on WFPR.

All the above factors are transformed into one-dimensional index in 0-1 scale using UNDP formula. These are then combined similarly in the case of construction of UNDP - HDI. For all the blocks we thus get three indices : (i) a health index (ii) an educational index and (iii) an income index combined to form the fourth index that may be called Modified Human Development Index (MHDI) because it differs from the UNDP HDI.

UNDP takes pre-specified maximum and minimum values of different dimensions for normalisation. For example, maximum value for adult literacy rate is 100 per cent. It is good if a society can achieve this target. But objective reality may not permit the society to achieve the target. Socio-economic, cultural, political atmosphere or even historical legacy may be barrier to achieve desired level of achievement of any dimension of human development for a society. So, any society will have to fix its own target taking into account its own status. Observed maximum and minimum value of any component is taken for normalisation. Under this normalisation rule, temporal comparison is feasible.

Recently a lot of focus is given to the changes in HDI and its various components over time (Ramirez, Ranis and Stewart 1998; Ranis and Stewart 2000; Ghosh 2006). In order to understand the temporal changes of the MHDI indicators, we have to use some indices that can capture the dynamic changes in human development. It is customary to use growth rate as the relevant index. We consider the growth rate of our suggested MHDI over

this time period. We also consider changes in relative ranking.

The blocks are divided into four ranges: (i) blocks obtaining MHDI value less than 0.3, (ii) blocks obtaining MHDI value 0.3 but less than 0.5, (iii) blocks obtaining value 0.5 but less than 0.8 and (iv) blocks obtaining MHDI value between 0.8 and 1. On the basis of the ranges, blocks are divided into four categories: (i) Very low MHDI, (ii) Low MHDI, (iii) Medium MHDI and (iv) High MHDI, respectively.

Human Development and Disaggregate Analysis : As already noted above, it is necessary to look at a more disaggregated level rather than concentrating merely on a unique number to assess changes in MHDI. In order to study the movements of MHDI and other components of MHDI, mobility analysis has been done. Here mobility tables for Health, Education, Income Index and MHDI are estimated on the basis of relative efficiency scores. However, in order to evaluate changes in human development from the viewpoint of positional objectivity, our first target is to transform these data into a positional objectivity framework. There are several ways in which this can be done. An easy way is to represent individual values as proportion of the group mean (Quah 1993; Ray 1998). These proportions are independent of units and are easily comparable. Secondly, they are pure numbers and hence we can compare across the variables (for example, determine the degree of shortfall according to different parameters). Also shifting them across time-periods it is possible to determine the temporal movement for various units. For this we require the concept of transition probability and mobility matrix.

There are several procedures in constructing transition probability and mobility matrix. We have however used the technique already developed by Sengupta (2000) in his analysis of dynamic efficiency. In any given time period *t*, it is possible to arrange these ratios (e_i^t) into intervals of equal length (d_j^t) starting from the lowest level (lowest value of e_i^t) to the highest ($e_i^t = e_i^{max}$). It is then possible to construct a transition probability matrix or mobility matrix between two time periods *t* and $t+\frac{1}{100}$ with $\frac{1}{100}>0$. The transition probability is defined as:

$$p_{jj'} = Prob\left\{e_i^{t+r} = d_{j'}^{t+r}\, e_i^t = d_j^t\right\} \qquad (1)$$

where $\sum_{j'} p_{jj'} = 1$.

The transition probability ($p_{jj'}$) shows the probability of an observed unit to move from the *jth* class to the *j'*th class during the time span t.

In our case, we first classified the mean proportions into several (not necessarily of equal length)[4] intervals. For example, in the case of income index (Table 5 a & 5 b) we have six intervals (0.5, 0.6, 0.7, 0.8, 0.9 and 1). The transition probabilities are calculated with reference to these intervals. All these transition probabilities together constitute a mobility matrix- *j*th row of it representing the probabilities of an observed unit at interval *j* at time period *t* to move to any other interval (j') at time period $t+\frac{1}{100}$ with first column representing interval 1 at time point $t+\frac{1}{100}$, second representing interval 2 at *t+t* and so on.

Selection of Districts : There are nineteen districts in West Bengal. These districts are well divided into different geographical regions. Some of the districts carry some completely distinct features which are absolutely different from other districts. Even agricultural and industrial sector are not evenly distributed. Some of the districts seriously suffer from water scarcity. On the other hand, there is a district[5] which is called rice bowl of India. There is also wide variation in other aspects of human welfare within the districts. So, this dimension needs to be captured in the study.

To select the study area, we depend on the West Bengal Human Development Report, 2004 published by Development and Planning Department, Government of West Bengal. It is evident from the Report that there is significant difference in the best performing district (in terms of HDI) and the worst performing district. Kolkata[6] ranks first with HDI 0.78 and Malda ranks last with HDI 0.44. This variation confirms our stand that region–specific study of human well-being needs to be conducted.

To study rural perspectives, we selected five districts. We took two best performing districts in terms of ranking excluding Kolkata. These are Howrah and North 24 Parganas, ranked second and third, respectively (Government of West Bengal 2004). Two worst performing districts, Purulia and Malda, ranks 16 and 17 were taken for study. We also took Burdwan, occupying rank 5 for the study. Burdwan is the largest district of West Bengal with the highest number of blocks. Not only that, there are famous agricultural and industrial zones existing in Burdwan[7]. Burdwan is fabulously diverse. It is diverse not only in religion, language and ethnicity. Economy of this district is also diverse. Eastern side of this district is covered by one of the most fertile agricultural tracts in West Bengal (and probably India) whereas western side is one of the oldest industrial areas in India. Thus, Burdwan provides a wide arena for studying human welfare.

These five districts are situated in different parts of the State of West Bengal. All the blocks of these five districts are taken to conduct our proposed rural study. This covers 102 blocks out of 341 blocks of West Bengal.

Analysis

The value of MHDI, Health Index, Education Index and Income Index are provided in the Appendix (Table A.1). The temporal changes of the blocks are given in the Appendix (Table A.2). In Table 1, temporal changes of the blocks in percentage term of MHDI value are presented. It is evident from the Table that all the blocks of all three advanced districts (Howrah, North 24 Parganas and Burdwan) have registered positive change in MHDI value during the decade. There are 86.67 percentage of blocks in Malda having positive change. Equal number of blocks in Malda record 'negative change' and 'no change'. Purulia district shows a poor performance with 60 percentages of its blocks having negative change and 40 percentages of blocks having 'positive change' in MHDI value during the decade.

Table 1: Temporal Changes of Blocks (in Percentage) in MHDI Value, 1991-2001

Category	Howrah	North 24 Parganas	Burdwan	Purulia	Malda*
% of Blocks having positive change	100	100	100	40	86.67
% of Blocks having negative change	0	0	0	60	6.67
% of Blocks having no change	0	0	0	0	6.67

*Note : The fractional figures are used so that the total adds up to 100.

Source : Authors' Calculation.

Table 2 describes the categorisation of all the blocks. It is clear from the Table that Purulia and Malda districts are the worst performer during the time period. 100 per cent blocks in Malda district belong to the Very Low MHDI and Low MHDI category in 1991[8].The situation has slightly improved. in 2001 with a slight improvement, more than 93 per cent blocks belong to these categories. There is not a single block in Howrah, North 24 Parganas and Burdwan are in the Very Low MHDI category in both the time period except in North 24 Parganas where 32 per cent blocks belong to the Very Low MHDI category. One interesting result is that not a single block is in the High MHDI category in both the time periods. Only exception is to the Howrah district where 7 per cent blocks in 2001 are in the High MHDI category.

Table 3 shows the ten consistent leading and laggard blocks during the two time periods[9]. All the three consistent leading blocks are situated adjacent to the Kolkata Metropolitan Area. These blocks have been able to exploit the facilities of urban area. All the six consistent laggard blocks are in Malda district.This is consistent with the West Bengal Human Development Report, 2004.

Table 3 : Categorisation of All the Blocks (In Percentage)

Category	1991					2001				
	Howrah	North 24 Parganas	Burd-wan	Purulia	Malda	Howrah	North 24 Parganas	Burd-wan	Purulia	Malda
Very Low MHDI	0	32	0	15	80	0	0	0	10	46.67
Low MHDI	71	45	45	55	20	14	27	16	85	46.67
Medium MHDI	29	23	55	30	0	79	73	84	5	6.67
High MHDI	0	0	0	0	0	7	0	0	0	0.00

Source : Authors' Calculation.

Table 3 : Ten Consistent Leading and Laggard Blocks over the Two Time Periods

Category	Blocks
Ten Consistent Leading Blocks	Bally – Jagachha (Howrah), Barrackpur-II (North 24 Parganas), Barrackpur-I (North 24 Parganas)
Consistent Laggard 10 blocks	Harischandrapur -II (Malda), Ratua-I (Malda), Harischandrapur –I (Malda), Chanchal-II (Malda), Ratua-II (Malda), Kaliachak-II (Malda)

Note : Number in parentheses indicate the name of the district where concerned block belongs to.

Source : Authors' Calculation.

Disaggregate Analysis of MHDI and its Components for All The Districts from a Common Platform : Until now, we have discussed the partial mobility scenario of each district separately. This is useful to bring in the intra-district mobility. However, now we focus on the movement from a common platform– an envelope of the individual districts. Such an enveloping measure helps us to discern the inter-block comparisons across the districts.

Health Index

The mobility Table for Health Index is provided in 4. The probability for the blocks belonging to the lowest category to remain at the same position is 0.451. For the same category, the probability to move to the higher category, 0.6, 0.7 and 0.8 respectively, are 0.235, 0.216 and 0.098. The probability for 0.6 category to move down to the lowest category is 0.038. For the same category, the probability to move to the higher categories 0.7 and 0.8 are 0.308 and 0.654, respectively. The probability to remain at the same position for 0.7 and 0.8 category are 0.0714 and 0.333. The probabilities for the 0.7 category are 0.7143 and 0.2143, respectively to move to the 0.8 and 0.9 category. However, for the 0.8 category the probability is 0.167 to move to the lower category 0.7. The probability is 0.5 for the same category to move to the immediate higher category. The elitist blocks belonging to the 0.9 and 1 category are able to maintain their position with 100 per cent probability.

Table 4 : Relative Mobility Table of Health Index

			2001			
1991—>	0.5	0.6	0.7	0.8	0.9	1
0.5	0.451	0.235	0.216	0.098	0.000	0.000
0.6	0.038	0.000	0.308	0.654	0.000	0.000
0.7	0.000	0.000	0.0714	0.7143	0.2143	0.000
0.8	0.000	0.000	0.167	0.333	0.500	0.000
0.9	0.000	0.000	0.000	0.000	1.000	0.000
1	0.000	0.000	0.000	0.000	0.000	1.000

Source : Authors' Calculation.

Education Index

Table 5 shows the mobility Table for education index. The probabilities to remain at the same position are 0.90, 0.429, 0.27, 0.64 and 0.60 for the lowest to highest category, respectively. The first category demonstrates almost status- quo situation. There is very little probability of 0.06 and 0.04 for the lowest category to move to the 0.6 and 0.7 categories, respectively. The probability is 0.60 for the blocks belonging to the highest category to maintain their position. Forty per cent blocks of this category move down to the immediate lower category. Hundred per cent blocks of 0.9 category move to the immediate lower category, 0.8. The probability is 0.09 and 0.27 for the 0.8 category to move to the 0.7 and 0.9 category, respectively. The probability for the 0.8 category is 0.09 to move

down to the 0.7 category while the probability is 0.27 to move to the 0.9 category. There is 60 per cent probability for the 0.7 category to move to the 0.8 category and the probability is 0.13 to move to the 0.6 category for the same category. The 0.6 category has the probability of 0.476 to move to the immediate higher category, 0.7 while the probability is 0.095 to move down to the 0.5 category.

Table 5 : Relative Mobility Table of Education Index

			2001			
1991—>	0.5	0.6	0.7	0.8	0.9	1
0.5	0.90	0.06	0.04	0.00	0.00	0.00
0.6	0.095	0.429	0.476	0.00	0.00	0.00
0.7	0.00	0.13	0.27	0.60	0.00	0.00
0.8	0.00	0.00	0.09	0.64	0.27	0.00
0.9	0.00	0.00	0.00	1.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.40	0.60

Source : Authors' Calculation.

Income Index

Table 6 describes the mobility table of Income Index. The picture is very frustrating. The blocks belonging to the elitist category cannot retain their status. The probability to move down to the 0.5 and 0.9 category for the highest category is 0.67 and 0.33, respectively. There is 100 per cent probability for the 0.8 category to move down to the immediate next category. The 0.7 category also demonstrates depressing results. The probability for this category to move to the 0.5 and 0.6 category is 0.60 and 0.20, respectively. There is 50 per cent probability to move down to the first category for the blocks belonging to the 0.6 category. For the same category, the probability is 0.125 each to move to the 0.7 and 0.8 category. There is very little probability of 0.18, 0.04 and 0.01 for the blocks belonging to the first category to move up to the 0.6, 0.7 and 0.01 category, respectively. The probability for the status quo position is 0.76, 0.250 and 0.20 for the consecutive first three categories, respectively.

Table 6 : Relative Mobility Table of Income Index

			2001			
1991—>	0.5	0.6	0.7	0.8	0.9	1
0.5	0.76	0.18	0.04	0.01	0.00	0.01
0.6	0.500	0.250	0.125	0.125	0.00	0.00
0.7	0.60	0.20	0.20	0.00	0.00	0.00
0.8	0.00	0.00	1.00	0.00	0.00	0.00
0.9	0.00	0.00	0.00	0.00	0.00	0.00
1	0.67	0.00	0.00	0.00	0.33	0.00

Source : Authors' Calculation.

Modified Human Development Index

The mobility Table for Modified Human Development Index is shown in Table 7. The probability to remain at the same category is 0.62, 0.36, 0.39, 0.20 and 0.50 for the first to last category. The probability for the blocks belonging to the first category to move to the 0.6 and 0.7 categories are 0.16 and 0.22, respectively. The second category (0.6) has the probability of 0.23 each to move to the 0.7 and 0.8 category. The same category has the probability of 0.18 to move down to the 0.5 category. The probability to move down to the 0.6 category is 0.11 for the blocks belonging to the 0.7 category. The same category has the probability of 0.28 and 0.22 to move up to the 0.8 and 0.9 categories. The blocks belonging to the 0.8 category has the probability of 0.11 and 0.22 to move down to the 0.6 and 0.7 categories. The same category has the probability of 0.17 to move to the 0.9 category. Two higher most categories demonstrate a bleak performance as most of the blocks of these categories cannot retain their position. The probability is 0.80 for the blocks belonging to the 0.9 category to move down to the 0.8 category. There is 50 per cent probability for the blocks belonging to the highest category to move down to the 0.9 category.

Table 7 : Relative Mobility Table of Modified Human Development Index

	2001					
1991—>	0.5	0.6	0.7	0.8	0.9	1
0.5	0.62	0.16	0.22	0.00	0.00	0.00
0.6	0.18	0.36	0.23	0.23	0.00	0.00
0.7	0.00	0.11	0.39	0.28	0.22	0.00
0.8	0.11	0.11	0.22	0.39	0.17	0.00
0.9	0.00	0.00	0.00	0.80	0.20	0.00
1	0.00	0.00	0.00	0.00	0.50	0.50

Source : Authors' Calculation.

Mobility Indices

Comparing the MHDI and its various components, we get a bleak picture. We have provided the Rawlsian and Elitist partial mobility indices[10] in Table 8. The Rawlsian mobility measures the transition probability from the least performed blocks in 1991. Weak negative includes the possibility of staying at the same block in 2001 also. In strict positive sense, an improvement in position is a must. Netting is a difference between the two (Strict Positive-Weak Negative). The Elitist indices give the same value for the highest achieved blocks. In almost all the aspects, except health, Rawlsian Net Mobility is negative. In health index, though it is non-negative, it is very low. Even the elitists do not fare well. Again except health, in other aspects, their performance is below par. For income it is negative and for MHDI it is zero. Thus, the overall picture is as bleak. The time period considered here coincides with the era of globalisation. It is revealed from the analysis that globalisation has stamped down the pace of human development.

Conclusion

In this paper we discussed various aspects of human development at the block level of our selected districts. We see wide variation among them. The inter-district analysis shows that Purulia and Malda are the worst performing districts in terms of MHDI achievement. Malda is the worst performer with 100 per cent of its block low or very low categories. In 2001, 93.33 per cent blocks of Malda are in the low or in the very low categories. Purulia is the second worst. Comparing 1991 and 2001, there is an improvement that a greater percentage of blocks are placed in medium MHDI as compared to 1991. Moreover, none of the blocks are placed in High MHDI, except 7 per cent blocks of Howrah in 2001. The only exception to generally highly acclaimed trend is Purulia where we see a fall in the percentage of medium MHDI from 30 to 5 per cent.

The mobility analysis reveals more concrete picture which is not captured in aggregate analysis. The blocks within same district perform differently. This ascertains our view of partial analysis. The need to carry out study for the below district level is confirmed as well through this approach. Every performance depicted in partial analysis needs to be taken into account at the policy level.

Table 8 : Mobility Indices of the Districts

	Positive and Negative Mobility Indices	
	MHDI	All Selected districts
Rawlsian	Strict positive	0.38
	Weak negative	0.62
	Net	-0.24
Elitist	Weak positive	0.5
	Strong negative	0.5
	Net	0
Health Index		
Rawlsian	Strict positive	0.549
	Weak negative	0.451
	Net	0.098
Elitist	Weak positive	1
	Strong negative	0
	Net	1
Education Index		
Rawlsian	Strict positive	0.1
	Weak negative	0.9
	Net	-0.8
Elitist	Weak positive	0.6
	Strong negative	0.4
	Net	0.2
Income Index		
Rawlsian	Strict positive	0.24
	Weak negative	0.76
	Net	-0.52
Elitist	Weak positive	0
	Strong negative	1
	Net	-1

Source: Authors' Derivation.

Appendix

Table A.1 : MHDI and Other Components of MHDI for all the Blocks

District	Block	Health Index		Education Index		Income Index		MHDI (Value)		MHDI (Rank)	
		1991	2001	1991	2001	1991	2001	1991	2001	1991	2001
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Howrah	Udaynarayanpur	0.739	0.880	0.701	0.763	0.230	0.529	0.557	0.724	13	5
Howrah	Amta-II	0.580	0.783	0.692	0.763	0.085	0.345	0.452	0.630	41	22
Howrah	Amta-I	0.638	0.806	0.683	0.770	0.097	0.525	0.472	0.700	35	9
Howrah	Jagatballavpur	0.560	0.722	0.726	0.706	0.150	0.529	0.478	0.652	34	14
Howrah	Domjur	0.662	0.802	0.743	0.786	0.148	0.533	0.518	0.707	27	8
Howrah	Bally-Jagachha	1.000	1.000	1.000	1.000	0.221	0.563	0.740	0.854	1	1
Howrah	Sankrail	0.762	0.850	0.759	0.802	0.135	0.497	0.552	0.716	16	7
Howrah	Panchla	0.487	0.680	0.603	0.702	0.081	0.514	0.390	0.632	57	21
Howrah	Uluberia-II	0.421	0.668	0.598	0.638	0.028	0.187	0.349	0.497	71	59
Howrah	Uluberia-I	0.378	0.621	0.542	0.638	0.020	0.115	0.313	0.458	78	66
Howrah	Bagnan-I	0.552	0.754	0.784	0.812	0.000	0.191	0.445	0.586	43	37
Howrah	Bagnan-II	0.586	0.785	0.757	0.789	0.035	0.166	0.459	0.580	39	39
Howrah	Shyampur-I	0.577	0.763	0.656	0.731	0.128	0.161	0.453	0.552	40	44

(Contd.)

Appendix

Table A.1 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Howrah	Shyampur-II	0.570	0.732	0.711	0.794	0.104	0.181	0.462	0.569	37	41
North 24 Parganas	Bagda	0.552	0.754	0.422	0.592	0.183	0.523	0.386	0.623	60	26
North 24 Parganas	Bongaon	0.595	0.790	0.501	0.687	0.156	0.488	0.417	0.655	52	13
North 24 Parganas	Gaighata	0.738	0.887	0.690	0.787	0.238	0.558	0.555	0.744	14	4
North 24 Parganas	Swarupnagar	0.385	0.705	0.506	0.650	0.169	0.425	0.353	0.594	69	34
North 24 Parganas	Habra-I	0.640	0.818	0.756	0.850	0.157	0.495	0.518	0.721	26	6
North 24 Parganas	Habra-II	0.404	0.704	0.626	0.764	0.156	0.453	0.396	0.640	56	18
North 24 Parganas	Amdanga	0.274	0.644	0.614	0.702	0.114	0.350	0.334	0.565	74	43
North 24 Parganas	Barrackpur-I	0.983	0.945	0.954	0.900	0.085	0.423	0.674	0.756	2	3
North 24 Parganas	Barrackpur-II	0.966	0.937	0.925	0.900	0.091	0.446	0.660	0.761	3	2
North 24 Parganas	Barasat-I	0.577	0.743	0.725	0.746	0.182	0.445	0.495	0.645	33	16
North 24 Parganas	Barasat-II	0.461	0.505	0.714	0.646	0.126	0.312	0.434	0.488	48	63
North 24 Parganas	Deganga	0.181	0.600	0.508	0.632	0.071	0.379	0.253	0.537	87	48
North 24 Parganas	Baduria	0.359	0.653	0.548	0.684	0.159	0.457	0.355	0.598	68	32
North 24 Parganas	Basirhat-I	0.204	0.537	0.342	0.493	0.158	0.434	0.235	0.488	89	62
North 24 Parganas	Basirhat-II	0.165	0.576	0.530	0.633	0.084	0.372	0.259	0.527	86	52

(Contd.)

Appendix

Table A.1 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
North 24 Parganas	Haroa	0.116	0.510	0.320	0.506	0.036	0.325	0.157	0.447	96	70
North 24 Parganas	Rajarhat	0.716	0.695	0.855	0.770	0.063	0.345	0.545	0.603	19	31
North 24 Parganas	Minakhan	0.109	0.365	0.260	0.410	0.070	0.281	0.146	0.352	100	86
North 24 Parganas	Sandeshkhali-I	0.287	0.479	0.203	0.406	0.209	0.296	0.233	0.394	90	76
North 24 Parganas	Sandeshkhali-II	0.426	0.561	0.276	0.425	0.271	0.159	0.324	0.382	75	77
North 24 Parganas	Hasnabad	0.275	0.515	0.367	0.520	0.186	0.526	0.276	0.521	83	54
North 24 Parganas	Hingalganj	0.586	0.718	0.494	0.672	0.228	0.391	0.436	0.594	46	33
Burdwan	Salanpur	0.805	0.854	0.950	0.858	0.067	0.296	0.607	0.669	5	12
Burdwan	Barabani	0.458	0.724	0.523	0.523	0.181	0.097	0.387	0.448	59	69
Burdwan	Jamuria	0.599	0.748	0.439	0.608	0.096	0.142	0.378	0.499	64	57
Burdwan	Raniganj	0.683	0.798	0.557	0.575	0.060	0.095	0.433	0.490	49	61
Burdwan	Ondal	0.871	0.861	0.681	0.716	0.023	0.191	0.525	0.589	23	36
Burdwan	Pandabeswar	0.687	0.741	0.511	0.527	0.109	0.215	0.435	0.494	47	60
Burdwan	Faridpur-Durgapur	0.564	0.738	0.586	0.609	0.140	0.199	0.430	0.515	50	55
Burdwan	Kanksa	0.567	0.766	0.650	0.625	0.378	0.259	0.531	0.550	22	45
Burdwan	Ausgram - II	0.517	0.681	0.489	0.499	0.538	0.446	0.515	0.542	28	47

(Contd.)

Appendix

Table A.1 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Burdwan	Ausgram - I	0.595	0.751	0.566	0.499	0.535	0.526	0.565	0.592	11	35
Burdwan	Mangolkote	0.559	0.659	0.477	0.427	0.224	0.522	0.420	0.536	51	49
Burdwan	Ketugram - I	0.385	0.538	0.453	0.438	0.125	0.321	0.321	0.432	77	73
Burdwan	Ketugram -II	0.482	0.706	0.561	0.466	0.149	0.464	0.398	0.545	55	46
Burdwan	Katwa - I	0.502	0.633	0.432	0.477	0.162	0.588	0.366	0.566	67	42
Burdwan	Katwa - II	0.532	0.635	0.390	0.426	0.222	0.519	0.381	0.527	61	53
Burdwan	Purbasthali - I	0.458	0.707	0.630	0.659	0.292	0.703	0.460	0.690	38	10
Burdwan	Purbasthali - II	0.380	0.670	0.506	0.544	0.282	0.642	0.389	0.619	58	28
Burdwan	Manteswar	0.499	0.576	0.622	0.577	0.224	0.362	0.449	0.505	42	56
Burdwan	Bhatar	0.648	0.742	0.563	0.536	0.328	0.472	0.513	0.583	30	38
Burdwan	Galsi - I	0.557	0.797	0.576	0.572	0.372	0.360	0.502	0.577	32	40
Burdwan	Galsi - II	0.618	0.762	0.574	0.545	0.467	0.647	0.553	0.651	15	15
Burdwan	Burdwan - I	0.599	0.743	0.619	0.643	0.313	0.480	0.510	0.622	31	27
Burdwan	Burdwan - II	0.652	0.786	0.602	0.627	0.531	0.473	0.595	0.628	6	24
Burdwan	Memari - I	0.601	0.753	0.622	0.588	0.420	0.478	0.548	0.607	18	29
Burdwan	Memari - II	0.600	0.746	0.588	0.667	0.438	0.497	0.542	0.637	20	20

(Contd.)

Appendix

Table A.1 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Burdwan	Kalna - I	0.523	0.723	0.941	0.589	0.418	0.573	0.627	0.628	4	25
Burdwan	Kalna - II	0.617	0.745	0.591	0.606	0.504	0.568	0.571	0.640	10	19
Burdwan	Jamalpur	0.604	0.769	0.539	0.568	0.503	0.711	0.549	0.683	17	11
Burdwan	Raina - I	0.711	0.772	0.821	0.777	0.232	0.375	0.588	0.641	8	17
Burdwan	Khandaghosh	0.577	0.700	0.619	0.734	0.209	0.384	0.468	0.606	36	30
Burdwan	Raina - II	0.764	0.753	0.767	0.788	0.251	0.348	0.594	0.630	7	23
Purulia	Jaipur	0.341	0.372	0.167	0.215	0.405	0.233	0.304	0.273	80	96
Purulia	Purulia-II	0.327	0.467	0.343	0.354	0.362	0.218	0.344	0.346	73	88
Purulia	Para	0.287	0.492	0.416	0.398	0.179	0.049	0.294	0.313	81	92
Purulia	Raghunathpur-II	0.257	0.516	0.340	0.323	0.199	0.020	0.266	0.286	84	94
Purulia	Raghunathpur-I	0.435	0.649	0.452	0.417	0.236	0.000	0.374	0.355	65	85
Purulia	Neturia	0.304	0.635	0.367	0.389	0.122	0.015	0.264	0.346	85	87
Purulia	Santuri	0.454	0.650	0.313	0.361	0.162	0.220	0.310	0.410	79	74
Purulia	Kashipur	0.581	0.690	0.538	0.536	0.479	0.093	0.532	0.440	21	72
Purulia	Hura	0.450	0.612	0.285	0.419	0.596	0.319	0.444	0.450	44	67
Purulia	Purulia-I	0.388	0.477	0.280	0.313	0.390	0.307	0.353	0.366	70	83

(Contd.)

Appendix

Table A.1 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Purulia	Puncha	0.563	0.640	0.301	0.380	0.676	0.321	0.513	0.447	29	71
Purulia	Arsha	0.347	0.445	0.109	0.122	0.680	0.396	0.379	0.321	63	90
Purulia	Jhalda-I	0.539	0.452	0.215	0.299	0.563	0.684	0.439	0.478	45	64
Purulia	Jhalda-II	0.403	0.355	0.098	0.070	0.745	0.671	0.415	0.365	53	84
Purulia	Bagmundi	0.374	0.478	0.155	0.143	0.687	0.516	0.405	0.379	54	79
Purulia	Balarampur	0.335	0.488	0.274	0.208	0.432	0.323	0.347	0.340	72	89
Purulia	Barabazar	0.457	0.546	0.187	0.272	0.930	0.315	0.525	0.377	24	80
Purulia	Manbazar-I	0.616	0.637	0.245	0.329	0.699	0.234	0.520	0.400	25	75
Purulia	Manbazar-II	0.648	0.723	0.148	0.293	0.934	0.480	0.577	0.499	9	58
Purulia	Bundwan	0.566	0.615	0.114	0.159	1.000	0.816	0.560	0.530	12	50
Malda	Harischandrapur-I	0.071	0.177	0.052	0.077	0.327	0.293	0.150	0.182	99	100
Malda	Harischandrapur-II	0.000	0.000	0.039	0.000	0.247	0.286	0.095	0.095	102	102
Malda	Chanchal-I	0.266	0.352	0.243	0.352	0.243	0.397	0.251	0.367	88	82
Malda	Chanchal-II	0.089	0.174	0.082	0.087	0.322	0.336	0.164	0.199	95	98
Malda	Ratua-I	0.153	0.168	0.085	0.098	0.126	0.204	0.121	0.156	101	101
Malda	Ratua-II	0.220	0.192	0.061	0.163	0.177	0.351	0.153	0.235	98	97

(Contd.)

Appendix

Table A.1 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Malda	Gazole	0.366	0.403	0.071	0.236	0.417	0.487	0.285	0.375	82	81
Malda	Bamangola	0.397	0.534	0.199	0.352	0.507	0.489	0.368	0.458	66	65
Malda	Habibpur	0.360	0.507	0.118	0.172	0.661	0.666	0.380	0.448	62	68
Malda	Maldah (Old)	0.330	0.409	0.228	0.161	0.406	0.569	0.322	0.380	76	78
Malda	English Bazar	0.185	0.352	0.166	0.223	0.189	0.385	0.180	0.320	94	91
Malda	Manikchak	0.315	0.245	0.083	0.078	0.279	0.256	0.226	0.193	91	99
Malda	Kaliachak-I	0.118	0.276	0.151	0.311	0.195	1.000	0.155	0.529	97	51
Malda	Kaliachak-II	0.117	0.240	0.088	0.123	0.394	0.560	0.199	0.308	93	93
Malda	Kaliachak-III	0.174	0.168	0.000	0.024	0.459	0.651	0.211	0.281	92	95
Average	0.476	0.620	0.466	0.508	0.283	0.392	0.408	0.507			
Variance	0.042	0.038	0.061	0.055	0.046	0.033	0.019	0.023			
CV (in %)	42.97	31.55	53.01	46.21	75.62	46.45	33.81	29.71			

Source: Authors' Calculation.

Table A.2 : Temporal Changes in MHDI, 1991-2001

District	Block	Per cent change in MHDI (Value)	Change in MHDI (Rank)
(1)	(2)	(3)	(4)
Howrah	Udaynarayanpur	29.97	8
Howrah	Amta-II	39.36	19
Howrah	Amta-I	48.26	26
Howrah	Jagatballavpur	36.35	20
Howrah	Domjur	36.57	19
Howrah	Bally - Jagachha	15.40	0
Howrah	Sankrail	29.77	9
Howrah	Panchla	61.90	36
Howrah	Uluberia-II	42.42	12
Howrah	Uluberia-I	46.19	12
Howrah	Bagnan-I	31.53	6
Howrah	Bagnan-II	26.26	0
Howrah	Shyampur-I	21.67	-4
Howrah	Shyampur-II	23.27	-4
North 24 Parganas	Bagda	61.47	34
North 24 Parganas	Bongaon	56.96	39
North 24 Parganas	Gaighata	33.96	10
North 24 Parganas	Swarupnagar	68.04	35
North 24 Parganas	Habra-I	39.23	20
North 24 Parganas	Habra-II	61.85	38
North 24 Parganas	Amdanga	69.18	31
North 24 Parganas	Barrackpur-I	12.13	-1

(Contd.)

Table A.2 : *(Contd.)*

(1)	(2)	(3)	(4)
North 24 Parganas	Barrackpur-II	15.20	1
North 24 Parganas	Barasat-I	30.35	17
North 24 Parganas	Barasat-II	12.45	-15
North 24 Parganas	Deganga	111.99	39
North 24 Parganas	Baduria	68.36	36
North 24 Parganas	Basirhat-I	108.00	27
North 24 Parganas	Basirhat-II	103.12	34
North 24 Parganas	Haroa	183.91	26
North 24 Parganas	Rajarhat	10.81	-12
North 24 Parganas	Minakhan	140.44	14
North 24 Parganas	Sandeshkhali-I	68.88	14
North 24 Parganas	Sandeshkhali-II	17.64	-2
North 24 Parganas	Hasnabad	88.53	29
North 24 Parganas	Hingalganj	36.05	13
Burdwan	Salanpur	10.25	-7
Burdwan	Barabani	15.58	-10
Burdwan	Jamuria	32.16	7
Burdwan	Raniganj	12.98	-12
Burdwan	Ondal	12.24	-13
Burdwan	Pandabeswar	13.51	-13
Burdwan	Faridpur-Durgapur	19.86	-5
Burdwan	Kanksa	3.53	-23
Burdwan	Ausgram - II	5.22	-19
Burdwan	Ausgram - I	4.72	-24

(Contd.)

Table A.2 : *(Contd.)*

(1)	(2)	(3)	(4)
Burdwan	Mangolkote	27.56	2
Burdwan	Ketugram - I	34.74	4
Burdwan	Ketugram -II	37.17	9
Burdwan	Katwa - I	54.83	25
Burdwan	Katwa - II	38.11	8
Burdwan	Purbasthali - I	49.97	28
Burdwan	Purbasthali - II	59.07	30
Burdwan	Manteswar	12.58	-14
Burdwan	Bhatar	13.76	-8
Burdwan	Galsi - I	14.96	-8
Burdwan	Galsi - II	17.77	0
Burdwan	Burdwan - I	21.87	4
Burdwan	Burdwan - II	5.59	-18
Burdwan	Memari - I	10.75	-11
Burdwan	Memari - II	17.44	0
Burdwan	Kalna - I	0.18	-21
Burdwan	Kalna - II	12.07	-9
Burdwan	Jamalpur	24.44	6
Burdwan	Raina - I	9.09	-9
Burdwan	Khandaghosh	29.44	6
Burdwan	Raina - II	6.00	-16
Purulia	Jaipur	-10.19	-16
Purulia	Purulia-II	0.65	-15
Purulia	Para	6.30	-11

(Contd.)

Table A.2 : *(Contd.)*

(1)	(2)	(3)	(4)
Purulia	Raghunathpur-II	7.82	-10
Purulia	Raghunathpur-I	-5.08	-20
Purulia	Neturia	31.05	-2
Purulia	Santuri	32.42	5
Purulia	Kashipur	-17.37	-51
Purulia	Hura	1.42	-23
Purulia	Purulia-I	3.67	-13
Purulia	Puncha	-12.92	-42
Purulia	Arsha	-15.32	-27
Purulia	Jhalda-I	8.97	-19
Purulia	Jhalda-II	-12.01	-31
Purulia	Bagmundi	-6.43	-25
Purulia	Balarampur	-2.15	-17
Purulia	Barabazar	-28.05	-56
Purulia	Manbazar-I	-23.13	-50
Purulia	Manbazar-II	-13.60	-49
Purulia	Bundwan	-5.30	-38
Malda	Harischandrapur -I	21.52	-1
Malda	Harischandrapur -II	0.00	0
Malda	Chanchal-I	46.44	6
Malda	Chanchal-II	21.11	-3
Malda	Ratua-I	29.16	0
Malda	Ratua-II	54.22	1
Malda	Gazole	31.86	1

(Contd.)

Table A.2 : *(Contd.)*

(1)	(2)	(3)	(4)
Malda	Bamangola	24.68	1
Malda	Habibpur	18.07	-6
Malda	Maldah (Old)	18.06	-2
Malda	English Bazar	77.88	3
Malda	Manikchak	-14.62	-8
Malda	Kaliachak-I	241.90	46
Malda	Kaliachak-II	54.29	0
Malda	Kaliachak-III	33.14	-3
	Average	24.06	

Source : Authors' Calculation.

Notes

1 The so-called Haque-Sen debate is based on this point (Sengupta and Ghosh 2008).

2 In fact, Sengupta and Ghosh (2008) demonstrated the non-existence of any significant relation between the provisionary facilities (in health and education) and their actual outcome.

3 Other educational variables are not available for all the blocks at least in 1991. Further, their reliability is also at a question.

4 The inequality of length is indirectly linked with the relative evaluation of intervals. However, it is still not possible to extract all the information even in partial mobility. Traces of substantial intra-class mobility may remain in trying to homogenize over a broader region. However, the cost is still substantially low compared to a fully aggregative index.

5 Burdwan is famously known as rice bowl of India.

6 Infact Kolkata may be compared with the developed area in terms of HDI.

7 Famous Asansol-Durgapur industrial zone and bowl of rice are situated in the district.

8 The high aggregate HDI of North 24 Parganas is due to the presence of an urban conglomerate around the river Hooghly situated closest to Kolkata Metropolitan Area. However, there are many underdeveloped rural blocks (such as Minakhan, Sandeshkhali-I, Sandeshkhali-II) in the district. For Burdwan the rural blocks are much more endowed and developed.

9 Only those blocks are considered for the categorisation of the ten consistent leading and laggard blocks which maintained rank from 1 to 10 and 93 to 102 respectively, over the two-time periods.

10. For details see Sengupta and Ghosh (2010).

References

1. Census of India, (1991), Office of the Registrar General, Ministry of Home Affairs, Government of India.
2. Census of India, (2001), Office of the Registrar General, Ministry of Home Affairs, Government of India.
3. Ghosh, M. (2006), "Economic Growth and Human Development in Indian States", *Economic and Political Weekly,* 41 (30), 3321-3329.
4. Government of West Bengal (2004), West Bengal Human Development Report, Oxford University Press.
5. Quah, D (1993), "Empirical Cross Section Dynamics in Economic Growth", *European Economic Review,* Vol. 37, p. 426-437.
6. Ram F. and Chander Shekhar (2006), "Ranking and Mapping of Districts Based on Socio-Economic and Demographic Indicators", Institute of Population Studies, Mumbai.
7. Ramirez, A., G. Ranis and F. Stewart (1998), Economic Growth and Human Development, Working Paper 18, Queen Elizabeth House, Oxford.
8. Ranis, G. and F. Stewart (2000), Strategies for Success in Human Development, Working Paper 32, Queen Elizabeth House, Oxford.
9. Ray, D. (1998), Development Economics, Delhi, Oxford University Press.
10. Sen, A.K. (1999), Development as Freedom, Oxford, Oxford University Press.
11. Sengupta, Atanu and Abhijit Ghosh (2008), "Urbanisation and Human Welfare in the Era of Globalisation : A Case Study in Burdwan, West Bengal", *Arthavijnana,* Vol.1 (2), pp.129-150.
12. Sengupta, Atanu and Abhijit Ghosh (2010), "Negative and Positive Partial Mobility : A Study of the Relative Changes in Human Development", *Social Indicators Research,* Vol.99 (2), pp.249-268.
13. Sengupta, J. (2000), Dynamic and Stochastic Efficiency Analysis, World Scientific, Singapore.
14. UNDP (United Nations Development Programme) (1990), Human Development Report 1990, Concept and Measurement of Human Development, New York, Oxford University Press.

Journal of Rural Development, Vol. 32, No. (2) pp. 165 - 184
NIRD, Hyderabad.

EFFECTS OF SOIL EROSION ON AGRICULTURAL PRODUCTIVITY IN SEMI-ARID REGIONS : THE CASE OF LOWER CHAMBAL VALLEY

*Hemant Kumar and Padmini Pani**

ABSTRACT

Soil erosion is a world-wide challenge for sustainability of agriculture especially in the tropical region. The rates of soil erosion that exceed the generation of new topsoil are a dynamic process which leads to decline in the soil productivity, low agricultural yield and income. The balance between soil-forming and depleting processes is of utmost importance for attaining long-term sustainability in any production system. Land degradation in the form of soil erosion is a major problem in the semi-arid region of Lower Chambal Valley. In the present study Landsat satellite images for the years of 1977, 1990 and 2000 have been used to identify the change in degraded land in the region. Evidences suggest that the rate of encroachment of arable land is high and is equal to spreading rate of degraded land. The data obtained by field survey reveal that productivity of crop land is negatively correlated with share of degraded land to gross cropped area. The productivity of agriculture, measured through gross value of output per area, is comparatively high in villages having fewer shares of degraded land and vice-versa. Simple linear regression model explains high variation of productivity by high share of degraded land (above 50 per cent of gross cropped area). This paper provides evidences of the severity of land degradation and its close association with agricultural production of the region.

Introduction

Soil erosion is a world-wide challenge for sustainability of agriculture especially in tropical region. It is the process of detachment and transport of soil particles. Erosion can decrease rooting depth, soil fertility, organic matter in the soil and plant-available water reserves (Lal, 1987). The rates of soil erosion that exceed the generation of new topsoil are a dynamic process which may lead to a decline of soil productivity, and result in lower agricultural yield and income, at least in the long run. The balance between soil-forming and depleting processes is of utmost importance for attaining long-term sustainability in any production system. Soil being a non-renewable resource and the basis for 97 per cent of all food production (Pimentel, 1993), strategies to prevent soil depletion are critical for sustainable development. For developing suitable soil conservation strategies, knowledge of the prevailing and permissible rates of soil erosion is an essential pre-requisite. In order to adequately understand the complex issues

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related to land degradation, it is necessary to identify the underlying causes and gain a comprehensive understanding of the physical, economic, political, institutional and social dimensions.

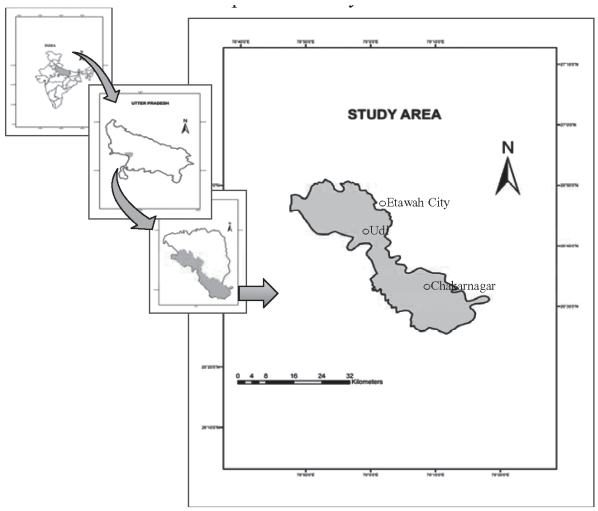
The question of sustainability of agriculture mainly focuses on production over an extended scale of time and space. This essentially would mean that crop production and economic gains would flourish over a long period of time, almost infinitely and globally (Van Loon, et al. 2004; Shah, 2006). It encompasses a range of strategies for addressing many of the problems such as loss of productivity from excessive erosion and associated plant nutrient losses; surface and groundwater pollution from pesticides, fertilisers, and sediment; impending shortage of non-renewable resources; and low farm income from depressed commodity prices and high production cost (Parr et al, 1990). Moreover, agricultural sustainability implies a time dimension and the capacity of a farming system to endure indefinitely (Lockeretz, 1988).

The problem of soil erosion is prevalent over 53 per cent of the total land area of India (Dhruvanarayana and Ram Babu, 1983). India loses about 16.4 t of soil ha^{-1} yr^{-1}, of which 29 per cent is lost permanently into the sea, 10 per cent gets deposited in the reservoirs reducing their capacity by 1–2 per cent every year and the remaining 61 per cent gets displaced from one place to another (Narayana, and Rambabu, 1983; Mandal and Sarda, 2011). The regions of high erosion include the severely eroded gullied land along the banks of the rivers Yamuna, Chambal. In these areas decline in the growth rates of agricultural production and productivity is a serious issue considering the questions of food security, livelihood, and environment.

Study Area

The study area is located in 25° 26' 30'' to 26° 50' 58''N latitude and between 78° 26'46" to 79° 18' 13''E longitude. It covers Badpura and Chakarnagar blocks of district Etawah, Uttar Pradesh. (Fig. 1). River Chambal forms

Figure 1 : Map of the Study Area



the southern boundary of Badpura block and further flow form Chakarnagar block. River Kunwari makes southern limit of this block. The region is characterised by sub-humid climate which experiences extreme temperature and rainfall conditions. The mean daily maximum temperature is about 42 °C and the mean daily minimum is about 26 °C. The summer is intensely hot, and dry. The average annual rainfall is 790 mm[2]. About 85 per cent of the annual normal rainfall is received during June to September. This entire area is known for its great expansion of gully and ravines, the region is inaccessible in character due to its irregular and undulating topography. These undulating and dissected alluvial terrains are known to provide safe hiding places for dacoits over the years.

Soil and Cropping Pattern : The soil of the region is sandy loam to loamy sand. Whole ravine area has poor soil with sticky and plastic in lower reaches. Kanker layer is generally found at the depth of 1 to 2 meters but in some places due to soil erosion it is exposed on surface. Because of long and continuous fluvial erosion a huge share of fertile land has gone out of plough. Moreover, due to this threat of land degradation, the water table has also gone down further retarding the development of irrigation facilities (Sharma, 1988). Within the ravine belt, there are some patches of land with accumulation of good soils that enabled the peasants to grow some crops.

The rabi (Syalu) and kharif (Unalu) are two main cropping seasons in the study area. The rabi season starts from the mid of October. Crop sowing of this season continues till mid-November and harvesting starts in late March and in April. Due to inadequate rainfall and absence of proper irrigation facility, low crop-productivity is a serious problem in the region. The kharif season starts with the onset of south-western monsoon from the end of June. Sowing is generally done in mid-July. In case of continuous rainfall the heavy textured soil that retains more moisture, brings some difficulties in tillage operation. It's harvesting starts in end of October and continues till December. The major portion of the total agricultural area in the surveyed villages is used for food crops. Commercial crops are occupying very little area. The main crops of rabi are wheat, mustard, gram, while the kharif crops are sinhua, bajra, pulses (pegion pea), jowar. As pointed out in Table 1, in Sahso and Rajpur, bajra followed by wheat and mustard are the major crops; in Bedhupur the major crops are mustard, wheat and bajra, respctively.

Objectives

The broad objective of this paper is to identify the impact of soil erosion of the study region. More specifically, the objectives are:

* To delineate the degraded land cover change in the study area
* To estimate the impact of soil erosion on agricultural productivity.

Database and Sampling Methods

Sampling Design : The study is based on both remote sensing as well as the household level primary data collected from three villages in the study area. The villages were selected on the basis of severity of land degradation which has been identified in the beginning through the Landsat data. Initially the Landsat MSS data of 1977 and Landsat ETM data of 2000 were used to prepare land cover maps of respective years by visual interpretation and on-screen digitisation method. The maps were later on superimposed by the village boundary for the selection of final villages according to the severity of the degradation for field survey. Although all these surveyed villages are part of ravine affected Chambal Basin area, the magnitude of degradation differs among these villages. As the first step, a degraded area was identified on the basis of satellite imagery and

Table 1: Percentage Share of Major Crops in Gross Cropped Area

Crops	Sahso		Rajpur		Bedhupur	
	Cultivators	Area	Cultivators	Area	Cultivators	Area
Wheat	38 (47.50)	221 (25.9)	67 (52.34)	301 (25.2)	60 (73.17)	362 (35.2)
Bajra	53 (66.25)	359 (42.3)	118 (92.19)	406 (33.9)	34 (41.46)	189 (18.4)
Mustard	47 (58.75)	195 (22.9)	68 (53.13)	270 (22.6)	51 (62.20)	]422 (41.0)
Peagon-pea	5 (6.25)	47 (5.5)	28 (21.88)	93 (7.7)	2 (2.44)	7 (0.7)
Gram	3 (3.75)	21 (2.4)	23 (17.97)	62 (5.2)	11 (13.41)	32 (3.1)

Note: (i) Area in bigha.; (ii) In share of cultivators, the total is more than 100 as farmers cultivate multiple crops. The share in GCA excludes the share of minor crops.

Source: Field Survey, 2009.

among the villages in the area, three villages were selected on the basis of information gathered from key informants and field observations. These villages represent different levels of land degradation in the study region. Out of the three selected villages, Sahso is considered as severely affected, Rajpur as moderately affected and Bedhupur as less affected village by land degradation.

In order to collect household-level data a questionnaire was prepared and was canvassed in the sample villages. Fieldwork was conducted during May, 2009. In total 295 households of three selected villages of the study area were surveyed. All households of each village were surveyed and information about farm holding size, cropping pattern, agents causing damage to crops and crop production, degraded land etc. were collected from households.

The village Sahso is situated on the right bank of river Yamuna. Population of this village is 677. Deep ravines and gullies affected land with babul trees extended in the east known as Hanumantpura Reserved Forest and Sahso Reserve Forest in west. Chambal river flows in north and Kunwari in south. A narrow Chambal-Kunwari plain is in its south. Chakarnagar-Sindos link is connecting it with rest of the world. Block headquarter is five kilometers far from here. Rajpur is settled on middle of Yamuna Chambal table-land. Both the north and south side of this table-land is moderately affected by land erosion. It is connected with Chakarnagar-Pachnada roadway. Chakarnagar, the block headquarters is on two and half kilometers distance. Bedhupur village is expended in finger shape in southern side of mid-Yamuna-Chambal plain of Badahpura block. Block headquarter is seven kilometers far from here. The southern part of this village is engulfed by gully and ravines of Chambal. The village is linked with Udi-Bah roadway that is the lifeline of this region.

The expansion of degraded land has been delineated with the help of Landsat images (1977, 1990 and 2000) and Survey of India topographic sheets of referenced area. Association of degraded land and productivity has been examined by correlating share of degraded land and productivity of land in rupees (Gross Value of Output per bigha of land). Prices of crops have been calculated according to local market price in 2009. To find out the relationship between crop productivity (dependent variable) and degraded land (independent variable), regression analysis has been attempted here. The form of any linear relationship between a dependent variable Y and an independent variable X is given as:

$$Y = \alpha+\beta x+U$$

Where the constants α and β are the intercept and slope of the straight line, respectively and u is the error term. Y is the variable whose values are being predicted from the independent variable x.

Results and Discussion

Agrarian Structure and Production Conditions : The agrarian structure is an important dimension of the agricultural economy of a region. Before proceeding to an analysis of land degradation and its impact on agriculture we have presented an overview of the agrarian structure of the villages through size-class wise distribution of operational holdings and area (Table 2). The agrarian structure in the study area is dominated by small and marginal holdings, accounting for about 97 per cent of holdings and 84 per cent of area. The share of marginal holdings is highest in Rajpur, but by and large, the same pattern is observed in all study villages.

Encroachments of Arable Land : Most part of this land is affected by erosion in the studied region. There are two large patches of plain. One of them is between Yamuna and Chambal,

Table 2 : Size-Class wise Distribution of Operational Holdings and Area

Villages	Marginal(<1.0 ha)		Small 1-2 ha)		Medium (2-5 ha)		Large (>5 ha)		Total	
	Area	Holdings	Area	Holdings	Area	Holdings	Area	Holdings	Area	Holdings
Sahso	17.36 (30)	54 (67.5)	34.71 (60)	25 (31.25)	5.79 (10)	1 (1.25)	0 (0)	0 (0)	57.86 (100)	80 (100)
Rajpur	37.49 (30)	92 (71.87)	53.73 (43)	32 (25)	17.49 (14)	3 (2.34)	16.24 (13)	1 (0.78)	124.95 (100)	128 (100)
Bedhupur	21.69 (29)	55 (67.07)	44.13 (59)	25 (30.49)	8.98 (12)	2 (2.44)	0 (0)	0 (0)	74.79 (100)	82 (100)
All	76.53 (29.7)	201 (69.31)	132.57 (54)	82 (28.28)	32.25 (12)	6 (2.07)	16.24 (4.3)	1 (0.34)	257.60 (100)	290 (100)

Note : Area in hectare. Figures in brackets refer to row totals.

Source : Field survey, 2009.

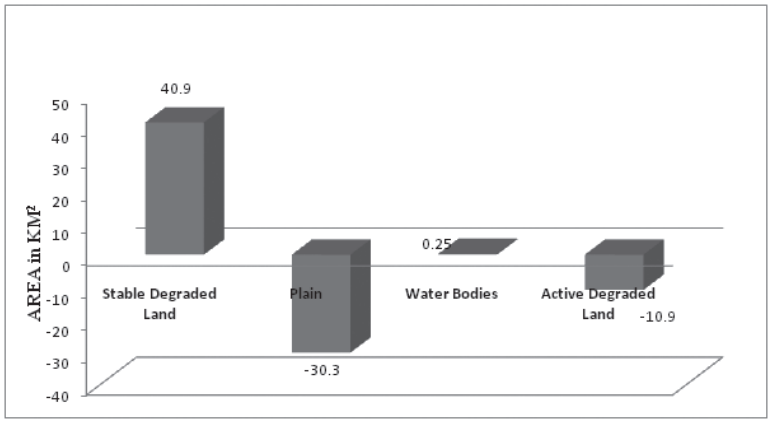
whose continuation is broken by headward erosion in the middle of the study area. The western Yamuna-Chambal table-land has its length around 23 kilometers that narrows at both ends. The eastern part of this plain that is separated from it have maximum length 13 kilometers with five kilometers maximum width also narrowing at both ends. Another big plain is in north of Yamuna and The plain between Chambal and Kunwari that is broken in many patches by headward erosion of ravines and gullies of both streams. Due to ravine expansion this land has been decreased by 44.6 to 40.7 per cent in period of 1977 to 2000. The distribution of land area among the various land cover classes, based on the land cover maps prepared from the Landsat images, has been given in Table 3[1].

It has been found that around half of the area of this region is under ravine activities. These are expanded along all four major streams. As a result of that a narrow belt of loamy plain left between Yamuna-Chambal and Chambal-Kunwari rivers. Almost all the plain between Chambal–Kunwari is eroded by streams. In middle of the region at many places the headward erosion in gullies and ravine of Chambal are combined themselves with degraded sites of Yamuna. Few plain areas are left in the form of patches there.

The village-wise share of degraded land in Net Cropped Area (NCA) has been presented in Table 4. It is found that among the study villages the highest incidence of land degradation in absolute amount is in Rajpur, but as a share of NCA is highest in Sasho, followed by Rajpur and Bedhupur.

Rate of Encroachment : As per our estimate of degraded area from satellite images, 46.6 per cent area of total region has been identified as degraded land in 1977 and it has increased to 50.4 per cent in 2000. The share of degraded land in total land has increased by 3.83 per cent; the area of stable degraded land has increased by 40.9 km^2 and active degraded land is decreased by 10.9 km^2 in referenced period (Figure 2). Hence total increase in degraded land is 30 km^2. On other hand, area under plain land is decreased by 30km^2 in the same time period. Thus, the expansion rate of degraded land is approximately same with the reduction rate of plain land. Therefore, it can be concluded that all the reduced plain land is converted into degraded land.

Figure 2 : Changes in Land Cover in the Study Area: 1977-2000



Source : Computed from Landsat images of 1977, 1990 and 2000.

Table 3: Distribution of Land Cover Classes

Land Cover Classes	1977		1990		2000	
	Km^2	%	Km^2	%	Km^2	%
Stable Degraded Land (Vegetation Cover)	49.9	6.4	46.9	6.0	90.8	11.6
Plain	349.8	44.6	333.1	42.5	319.5	40.7
Water bodies	69.1	8.8	69.5	8.9	69.3	8.8
Active Degraded Land	315.8	40.2	335.1	42.7	304.9	38.9
Total	784.5	100	784.5	100	784.5	100

Source : Computed from LANDSAT images of 1977, 1990 and 2000.

Impact of Soil Erosion on Productivity

The impact of degradation on socio-economic condition of a society comes through many ways. The direct impact of degradation can be identified in the variations of agricultural output. The magnitude of degradation decides its degree of impact, however, this impact is affected by a number of socio-economic and agro-ecological variables. Soil's physical degradation affects crop growth and yield by decreasing root depth, water availability and nutrient reserves. Thus, it leads to yield loss by affecting soil organic carbon, nitrogen, phosphorus, and potassium contents and soil pH. For example, as Scherr (1999: 8) points out, 'the effects of soil degradation vary with the types of soil, crops, extent of degradation and initial soil conditions and may not be linear. Lower

Table 4 : Share of Degraded Land and Cropping Intensity

Villages	Reported Net Cropped Area	Gross Cropped Land	Total Degraded Land to NCA	% of Degraded Intensity	Cropping
SAHSO	686.4	849	360	52.44	123.69
RAJPUR	1132.2	1194.32	478.72	42.28	105.49
BEDHUPUR	887.24	1028.5	188.6	21.26	115.92
ALL	2705.84	3071.82	1027.32	37.96	100.52

Note : Area in bigha.

Source : Field survey, 2009.

potential production due to degradation may not show up in intensive, high input system until yields are approaching their ceiling. Reduced efficiency of inputs (fertilisers, water, and biocides, labour) could show up in higher production costs rather than lower yields'.

Crop Productivity : In surveyed villages the lowest land productivity, as measured by Gross Value of output per bigha, is in Sahso, that is severally affected by land erosion. It is highest in Bedhupur. The area under degraded land has been presented in Table 4. About half of the households in Sahso village have reported to have degraded land with an average of 4.5 bigha per household. Thirty nine per cent of households in Rajpur and Bedhupur have been reported to have degraded land with an average of 3.74 and 2.30 bigha / household, respectively. On an average, degraded land per household is 2.4, 1.5 and 0.9 bigha in Sahso, Rajpur and Bedhupur, respectively. The estimates of village-wise cropped area, gross value of output and yield in agriculture are given in Table 5.

Regional variation in agricultural productivity is the result of various factors like the agro- ecological conditions of land, the variations of labour force employed in the agricultural practices and the other socio-economic factors related to land tenancy, size and parcels of land and so on. The population of Sahso village is high with large household size than in Rajpur and Bedhupur, respectively. However, only 20 per cent workforce of Sahso

Table 5 : Cropped Area, Gross Value of Output and Yield in Agriculture

Name of the Village	Gross Value of Output (GVO) (in Rupees)	Gross Cropped Area (in bigha)	Yield (GVO) / Area (in Rs per ha)
SAHSO	1273.68	1273.68	1273.68
RAJPUR	1491.08	1491.08	1491.08
BEDHUPUR	1630.90	1630.90	1630.90

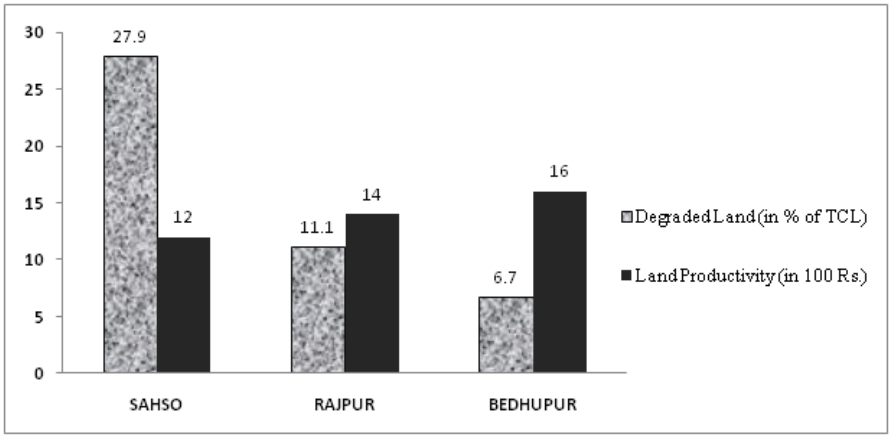
Note : GVO is sum of all crop produced by households valued at nearest market prices.

Source : Field Survey; 2009.

village has reported cultivation as their only occupation. The highest shares of these cultivators are reported in Rajpur (32 per cent of its total workforce). This result indicates that as agriculture comes under increasing environmental stress[2], mainly in the form of water shortage and land degradation, people tend to move out of agriculture. Although we have not quantified the linkage between land degradation and livelihoods diversification here, discussions with key informants and villagers suggest a strong linkage between declining agricultural productivity and shift of labour to non-agricultural occupations[3]. Normally shift to such occupations outside agriculture should increase the income of labour. But evidences from Chambal valley and other semi-arid regions suggest that at times labour shifting out of agriculture under environmental stress move to multiple, seasonal and low-earning occupations and activities (Pani et al, 2011; Chopra et al., 2001).

Association of Degraded Land and Total Crop Productivity : There is negative association between share of degradation and crop

Figure 3 : Share of Degraded Land and Agricultural Productivity



Source : Field Survey, 2009.

productivity. As the share of degraded land is increasing, the level of productivity decreases in the study area. Shaso village has the highest share of degraded land (52 per cent) to total cultivated land. The slope inclination is also sharp for this village. Analysis of primary data suggests that there is a strong negative correlation (-0.509) between share of

Figure 4 : Agricultural Productivity and Land Degradation : Sahso

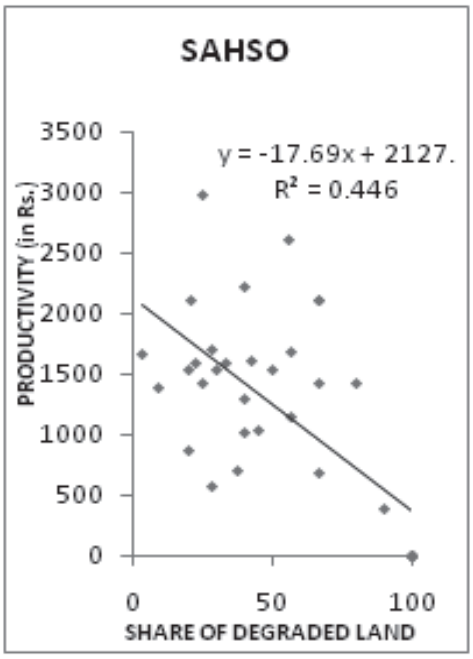


Figure 5 : Agricultural Productivity and Land Degradation : Rajpur

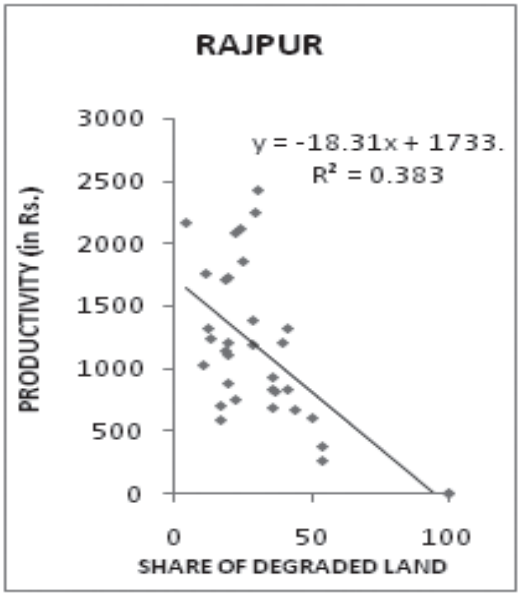
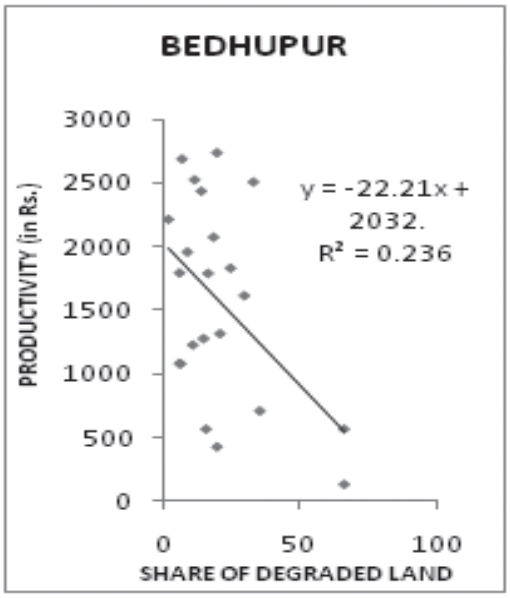


Figure 6 : Agricultural Productivity and Land Degradation : Bedhupur



Source : Computed from field survey data.

degraded land to total cultivated land and productivity of land per bigha. Figures 4 to 6 are showing regression results of land productivity and share of degraded land in surveyed villages.

Simple linear Regression has been run for measuring the impact of land degradation on total crop productivity. Here percentage of degraded land to total cultivated land is treated as independent variable and crops output (in rupees) per bigha as dependent variable. The market price of particular crop has been used for estimating the total output in rupees. This total output has been calculated per bigha of cultivable land.

It has been found that for village Sahso 44.6 per cent variation in productivity is explained by share of degraded land to total cultivated land. On other hand, Bedhupur is showing the least explanation (R^2 =0.236). Since Sahso has high share of degraded land (52 per cent), it explains the high share of variation of productivity. Bedhupur that has comparatively low share of degraded land (21 per cent) has no strong relationship between productivity of land and share of degraded land[4]. Therefore, it can be said that the dependency of productivity is high only in condition of big share of degraded land. Figures 7 to 9 are showing the association of land productivity and degradation levels in surveyed villages.

In a combined analysis of all three villages, it has been found that the dependency of crop productivity is explainable at a high level with high share of degraded land (more than 50 per cent of Gross Cropped Area). The impact of degraded land is very less (R^2=0.115) where the proportion of degraded

Figure 7 : Association of Productivity with Low Degradation

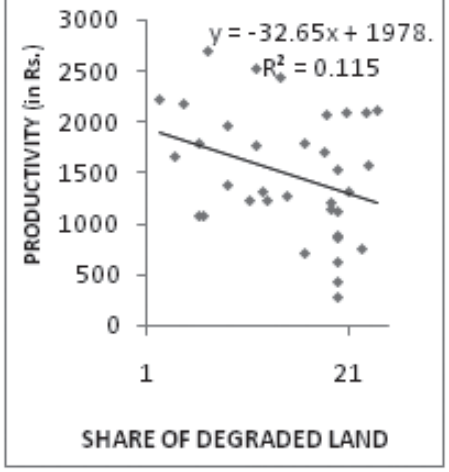


Figure 8 : Association of Productivity with Moderate Degradation

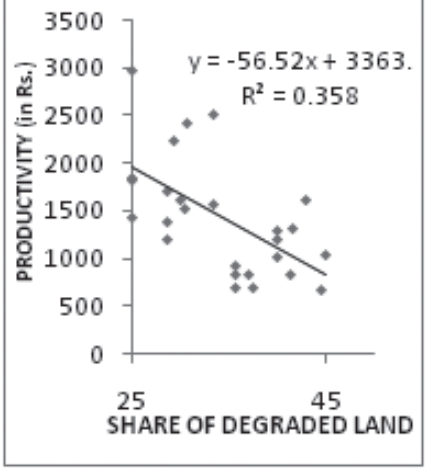
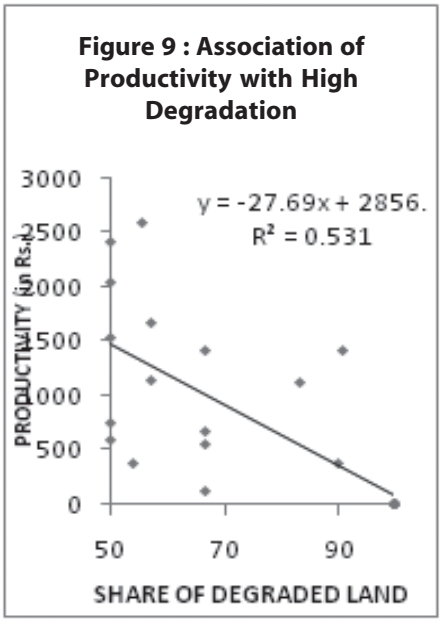


Figure 9 : Association of Productivity with High Degradation



Source : computed from field survey data.

land is less than 25[5] per cent. Thus, the evidence suggests that the impact of degradation on productivity increases with increase in its share. Beyond a threshold it becomes significant. Hence, expansion of area under degraded land is a major hindrance for sustainable agriculture in the region.

Conclusion

On the basis of the evidence presented here, it can be concluded that the region is severely affected by ravine and gully erosion and degraded land is expanding at an alarming rate. In the Chambal region, land degradation through ravine formation has been a major problem (Pani et al, 2009). The key impact of land degradation is through its impact on agricultural system (Pani et al, 2011). The encroachment of arable land by land degradation has adversely affected crop productivity of the region. Because of long and continuous fluvial erosion a huge share of fertile land has gone out of plough. As a result, crop productivity has declined in villages that are severely affected by land degradation. Moreover, due to this menace, the water table has also gone down further retarding the development of irrigation facilities.

The study brings out a clear relationship between land degradation and agricultural productivity, Gross Value of Output per land area has been found to be lower in villages severely affected by land degradation. The household data confirm this relationship. The strength of the impact of land degradation on agricultural productivity increases with severity of land degradation. This clearly points out that there may be a threshold level beyond which land degradation starts affecting agricultural productivity. Given the dependence of people on agriculture in this semi-arid region there is a need for proper agricultural strategy to halt the degradation of land. There is a need for micro-ecological management to stop the degradation before its impacts become catastrophic. Such effects need active coordination across multiple levels and among diverse players - such as government officials, village community, individual farmers and the wider scientific community.

Notes

1 In this study, open source satellite data have been used for the land use/ land cover analysis. The data for the year 2000 are post-monsoon data, where most of the shallow degraded area is covered by thorny bushes, and which was interpreted as a forest cover. This could be the reason behind the possibly inconsistent result of increase in the forest cover during 1990-2000.

2 In this area environmental stress includes declining forest cover, water shortage, soil erosion, declining land-man ratio and loss of agricultural and grazing land due to land degradation. However, a comprehensive analysis of these multiple linkages between land degradation and labour out-migration is beyond the scope of our paper.

3 In response to our queries on reasons for migration, most of the migrants or their family members cited declining or inadequate income from agriculture as the main reason for migration.

4 The F-values for these three regressions are 27.399859, 19.92783 and 6.196228, respectively.

5 The F-values for these three regressions are 4.28877, 13.4013, and 28.33763, respectively.

References

1. Baboule Zachee Boli, Benjamin Bep Aziem and Eric Rose (1994), Erosion Impact on Crop Productivity on Sandy Soils Northern Cameroon, In : Bhushan L.S. , Abrol I.P., Rama Mohan Rao M.S. (eds.) Soil and Water Conservation : Challenges and Opportunities. Dehra Dun : Indian Association of Soil and Water Conservationists, pp. 80-89.

2. Brodd, P, Osanius M. (2002), Erosion and Land Use at Plot and Catchment Levels – A Case Study in Northern Vietnam, Minor Field Studies –International Office, Swedish University of Agricultural Sciences, No 192.

3. Chopra, K, S.C. Gulati (2001), Migration, Common Property Resources and Environmental Degradation: Interlinkages in India's Arid and Semi-arid Regions, Sage, New Delhi.

4. Desmet, P.J.J. and Govers, G., (1996), Comparison of Routing Algorithms for Digital Elevation Models and Their Implications for Predicting Ephemeral Gullies, *International Journal of Geographical Information Systems,* Vol.10, pp.311-331.

5. Dhruvanarayana, V.V. and Ram Babu, (1983), Estimation of Soil Erosion in India, J. Irrigation and Drainage Engg., Vol.109, pp.419–34.

6. H. Drost, W. C. Mahaney, M. Bezada, V. Kalm (1999), Measuring the Impact of Land Degradation on Agricultural Production : A Multi-Disciplinary Approach, Mountain Research and Development, Vol.19, No.1, pp. 68-70.

7. Haigh, M. J. (1984), Ravine Erosion and Reclamation in India, *Geoform,* Vol.15, No.4, pp.543-561.

8. International Food Policy Research Institute (IFPRI) (2005), Poverty and Land Degradation in Ethiopia: How to Reverse the Spiral? International Food Policy Research Institute (IFPRI), Wageningen University and Research Center (WUR) and Environmental Economics Policy Forum of Ethiopia (EEPFE) available at http://www.efdinitiative.org/research/projects/project-repository/economic-sector-work-on-poverty-and-land-degradation-in-ethiopia assessed on 8.4.2012.

9. International Food Policy Research Institute (IFPRI) (2008), Linkages Between Land Management, Land Degradation, And Poverty In Sub-Saharan Africa; The Case Of Uganda, Research Report 158, IFPRI Washington D.C., USA.

10. Kefi, M., Yoshino K. (2010), Evaluation of The Economic Effects Of Soil Erosion Risk On Agricultural Productivity Using Remote Sensing : Case Of Watershed In Tunisia,International Archives of the Photogrammetry, Remote Sensing and Spatial Information Science, Volume XXXVIII, Part 8, Kyoto, Japan.

11. Künkel, Nana (2004), Agricultural Development Patterns and Soil Degradation in Asia - A Regional Analysis Based on Multivariate Data Analysis and GIS, published in Conference on International Agricultural Research for Development, Berlin, October 5-7, 2004.

12. Kumar, Hemant, (2011), Land Degradation and Socio-Economic Scenario in a Part of Etawah District, Lower Chambal Valley, (Unpublished M.Phil Dissertation, Jawaharlal Nehru University).

13. Lal, R, C. William, and Moldenhaver (1987), Effect of Soil Erosion on Crop Productivity, *Critical Review in Plant Sciences,* Vol. 5, No. 4, pp.303-367.

14. Lal, R. (1987), Managing the Soils of Sub-Sahara Africa, *Science,* Vol.236, pp. 1069-1086.

15. Lal, R. (1995), Erosion – Crop Productivity Relationships for Soils of Africa, *Soil Science Society of America Journal,* Vol: 59, No.3, pp. 661-667.

16. Lockeretz, W. (1988), Open Questions in Sustainable Agriculture, *American Journal of Alternative Agriculture,* Vol.3, pp 4174-181.

17. Pani ,P., S. N. Mohapatra, (2001), Delineation and Monitoring of Gullied and Ravenous Lands In A Part Of Lower Chambal Valley, India, Using Remote Sensing and GIS - Proc. ACRS 2001 - 22nd Asian Conference on Remote Sensing, 5-9 November 2001, Singapore. Vol. 1,pp 671- 675. available at www.crisp.nus.edu.sg/~acrs2001/pdf/021PANI.pdf assessed on 29.03.2012.

18. Pani, P., Deepak K. Mishra and S.N.Mahapatra, (2011), Land Degradation and Livelihood in Semiarid India : A Study of Farmers' Perception in Chambal Valley, *Asian Profile,* Vol.39, No.3., pp.505-519.

19. Pani, P., S. N. Mohapatra, (2009), Ravine Erosion in India : A Geospatial Study of Lower Chambal Valley, *Geography and You,* Vol. 9, pp. 20-25.

20. Pimentel, D. (1993), Habitat Factors in New Pest Invasions, In : Kim, K.C., McPheron, B.A. (Eds.), Evolution of Insect Pests— Patterns of Variation, Wiley, New York, pp.165–181.

21. Renard, K.G.e. (1997), Predicting Soil Erosion by Water : A Guide to Conservation Planning With the Revised Universal Soil Loss Equation RUSLE, USDA Handbook; 703, United States Department of Agriculture (USDA), Washington, D.C.

22. Shah, Amita, (2006), Environmental Implications of Agriculture and Policy Initiatives in India and the EU : Review of Evidence and Issues, Working Paper No. 277., Institute of Economic Growth, Delhi.

23. Sharma, H.S. (1979), The Physiography of the Lower Chambal Valley and its Agricultural Development : A Study in Applied Geomorphology, Concept Publishing Company, New Delhi.

24. Shrestha, D.P. (2007), Lecture Notes on Soil Degradation Assessment and Modeling, Department of Earth System Analysis, ITC, Enschede available at: http://www.itc.nl/~rossiter/teach/lecnotes.html#20, assessed on 15.3.2012.

25. Singh, Gurmal, Babu R.Narain Pratap, Bhusan L.S., Abrol I.P. (1992), Soil Erosion Rates in India, *Journal of Soil and Water Conservation,* Vol 47, No.1, pp. 97-99.

26. Singh, S. and S. P. Agnihotri (1987), Rill and Gully Erosion in the Sub Humid Tropical Riverine Environment of Teonther Tahsil, Madhya Pradesh, India, *Geografiska Annaler. Series A, Physical Geography,* Vol. 69, No.1, pp. 227-236.

27. Suriyaprsit, M. (2008), Digital Terrain Analysis And Image Processing For Assessing Erosion Prone Areas : A Case Study Of Nam Chun Watershed, Phetchabun, Thailand, Unpublished M.Sc Thesis, ITC : Enschede.

28. Timsina, J and Connor D J. (2001), Productivity and Management of Rice-Wheat Cropping Systems : Issues And Challenges, *Field Crops Research,* Vol.69, 93-132.

29. Tunji, Titilola S., L.K. Jeje (2008), Environmental Degradation and Its Implications for Agricultural and Rural Development : The Issue of Land Erosion, *Journal of Sustainable Development in Africa,* Vol.10, No.2.

30. Wischmeier, W.H. and Smith, D.D. (1978), Predicting Rainfall Erosion Losses: A Guide to Conservation Planning, Supersedes Agriculture Handbook No. 282, Science and Education Administration, United States Department of Agriculture (USDA).

Journal of Rural Development, Vol. 32, No. (2) pp. 181 - 189
NIRD, Hyderabad.

FUNCTIONING PROFILE OF SELF-HELP GROUPS - EVIDENCES AND INSIGHTS

*Neeta Tapan**

ABSTRACT

Micro-credit delivery through the thrift and credit group approach was evolved as a blend of financial and social intermediation where social cohesion and group lending are ensured through joint liability to bridge the gaps created by poverty, illiteracy, gender and remoteness. A Self-Help Group is a voluntary organisation and the functional efficiency of the groups can head start the growth of the SHGs whereas inefficiency on this level can lead to passiveness or disintegration of the groups. The SHGs have no written bylaws for their formation or functioning but some basic norms, ensured through regular interventions of the facilitator, can help the SHGs become vibrant entities as functional efficiency is the foundation stone of the successful edifice of bank linkage and income generation.

This paper, therefore attempts to study the functioning of SHGs in the context of certain parameters and evaluate the functional efficiency to reflect and evolve prescriptions.

Introduction

Until recently, depending upon the constructs available in a particular culture, debt was always seen as bad for the society, individual, religion and the family. But now a new era of credit culture has dawned upon the whole world. It has been realised that lack of access to and control over resources is a critical component of poverty and more so, of vulnerability. In this context, credit means an opportunity for betterment, an access to new resources, and freedom from non-institutional credit channels. The fact that credit plays a crucial role in the modernisation of agriculture had been established long ago, but its role in the fight against rural poverty has been recognised lately. Credit for empowerment is about meeting daily consumption needs of the poorest. It entails trying to build capacities of a large number of individuals, usually collectives, to increase credit absorption and undertake sustainable livelihoods.

In India, rural credit packages were male-dominated until the late 1980s. These are age-old facts that women are many a time sole breadearners, are concentrated in unorganised sector, more hesitant of formal credit channels, face small and emergent household needs frequently, have micro-credit needs for their micro-enterprises and more certainly contribute their income to household needs. However, it was only after women-oriented

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studies highlighted the deprivation and struggle for survival that the concept of designing credit schemes for women emerged. The Development of Women and Children (DWCRA) programme was an important adjunct to the Integrated Rural Development Programme (IRDP) in 1980. The IRDP was a unique programme in view of its vast coverage, but it did not target women specifically. Consequently, the government's poverty alleviation programmes and tools such as Swaranajayanti Gram Swarozgar Yojana (SGSY) and the Rashtriya Mahila Kosh implement their programmes through micro-finance interventions of NABARD's Self-Help Group-Bank linkage programme. In this programme, a novel solution for financial intermediation was sought through group lending with joint liability. It has been well accepted that simple financial intermediation is not sufficient for eliminating poverty and to foster rural development. Government therefore, needed to create mechanisms to bridge the gaps created by poverty, illiteracy, gender and remoteness. Hence, the thrift and credit group approach under SGSY was evolved as a blend of financial and social intermediation. Women have always practised thrift and saving secretly at home or publicly in informal credit structures such as "chit funds", "Bisis" etc. The Self-Help Group approach follows the same approach in saving and lending pattern in a more organised way.

Savings and credit groups provide a base for poor, especially women to organise themselves, expand options for livelihoods and to participate actively in development. More apparently, the capacity of women is built up in spheres that were previously not their domain, such as, opening and operating bank accounts, visiting local offices, accessing loans, etc. This often pre-supposes a number of skills that women must acquire to be able to operate effectively in the SHG. The SHG thus often provides a platform for women to become functionally literate, sharpen communication and conflict resolution skills, and acquire skills in democratic functioning and institution building. Group formation is, thus, seen as crucial to the empowerment process as women draw strength from numbers. They are able to acquire confidence to renegotiate gender relations, to a very modest degree, both within the household as well as in the larger community.

The self-help group (SHG) is, thus, conceived as a sustainable people's institution, which provides the poor with the space and support necessary for them to take effective steps towards achieving greater control of their lives in society. The focus is on mobilising the poor to pool their own funds, build their capacities and empower them to leverage external credit. Self-Help Groups, being dynamic, evolve and develop over time. The studies that have been conducted to study the groups, suggest that they move through stages, but these stages are not constant across different groups. In addition, these stages are not watertight compartments. Some of the characteristics and requirements of one stage may overlap and spill over to the next. It is possible to delineate the process of group formation broadly into four stages: the first stage, which involves pre-group formation and group formation exercises, is likely to take about six months. This is followed by the stage of group stabilisation (7-12 months), third stage of self-reliance (13-18 months) and the last stage of group institutionalisation (19-24 months). The last stage continues till the group is able to transform and institutionalise itself as a sustainable village institution.

The working stages of SHGs involve saving and lending, bank linkage and income generation. The group members save and engage in internal lending. They voluntarily decide by consensus their own lending and repayment rules. The sustainable groups are

then linked with banks after a minimum period of six months. These groups then become eligible for leveraging external credit or obtaining revolving fund from banks. This may lead to involvement in income generation either on group level or on individual level as *swarozgaris*. SHGs are identified for bank linkage and income generation through grading or monitoring.

SHG-Banking is a programme that helps to promote financial transactions between the formal rural banking system in India comprising public and private sector commercial banks, regional rural banks and cooperative banks with the informal SHGs as clients. SHG-Banking through Self-Help Groups and the existing decentralised formal banking network including several organisations in the formal and non-formal sectors as banking partners allow for large-scale outreach of micro-finance services to the poor in India. These banking services (depositing savings, taking loans) are made available at low cost, are easily accessible and flexible enough to meet poor people's needs. Linking SHGs directly to banks is the basic model in which an SHG, promoted by an NGO or District Rural Development Agency (DRDA), can access a multiple of savings in the form of loan funds or cash credit limit from the local rural bank. The SHG lends the funds it accesses from banks to its members.

A point to be noted here is that an SHG is a voluntary organisation, which decides its own functioning norms and bylaws. Moreover, basically the functioning profile and efficiency of an SHG decide its status of economic activity, bank linkage and involvement in income generation and empowerment profiles. Thus, functional efficiency of the groups can head start the growth of the SHGs and inefficiency on this level can lead to passiveness or disintegration of the groups. This paper, therefore attempts to study the functioning of SHGs in the context of certain parameters and evaluate the functional efficiency to reflect and evolve prescriptions.

Methodology

The present study is based on a sample of 150 women SHGs drawn from Ujjain district of Madhya Pradesh. These SHGs are being run block-wise in the district under the Swarnajayanti Gram Swarozgar Yojana (SGSY). The saving and lending groups were selected through stratified random sampling from the lists provided by the district agencies and then mapped across the villages in different blocks. Two women were selected from each SHG. Of these two women, one was purposively selected from the office-bearers and the other one was randomly selected from the remaining members. Thus, in all 300 women were selected to get their responses. A structured schedule was administered on the respondents. Besides, a range of methods like observation, interviews, group discussion, and maintenance of field diary were used to collect primary data.

Functioning Profile of SHGs

The basic functioning profile of the SHGs includes the holding of meeting, deposit of saving amount, issuing of receipt or personal passbook of the deposit, safety of deposit, maintenance of records, grading, linkage with banks, issuing of revolving fund, capacity building and training programmes. All these variables are meant for social cohesion, transparency, assessment and monitoring, and capacity building exercises to ensure quality working and sustainability of SHGs. The functioning profile of the SHGs studied is given below in Table 1 and the variables have been discussed further in detail with reference to this Table.

Meetings

Regularity of meetings of a group is the key factor of self-help. The facilitator is

Table 1 : Functioning Profile of SHGs

S.No.	Functioning Profile of SHGs	No. of Groups	Per cent
1	Meeting Held	116	77.33
2	Saving Amount Deposited in Meeting	50	33.33
3	Receipt of Every Deposit Issued	11	7.33
4	Personal Passbook Issued	106	70.67
5	Saving Amount Kept in Bank	147	98
6	Records Maintained	132	88
7	First Grading Complete	38	25.33
8	Training Received	60	40

Source : Primary Data.

expected to explain the concept of and need for Self-Help Group, for which, a meeting with the members is essential. Further, the group members have to frame the rules and regulations of the group and get acquainted with each other. The meetings are very important and should be compulsory in this initial phase. But an SHG has to continue this trend for its successful survival. Collection of saving, acceptance of loan applications, consideration and disbursal of loan, repayments of loans, decisions about external lending, bank transactions, and issues regarding income-generating activity should be necessarily discussed in the group meetings to maintain transparency, accountability, and trust in the group. Besides discussing these economic issues, meeting is also a powerful platform for women to organise themselves to share personal problems and talk about the community and social problems on a later stage.This social exchange is thus an important tool of group cohesion and solidarity, which can help in individual and community development.

The SHGs have a regular meeting in most of the cases in this study.The data reveal that 77.33 per cent of the SHGs have monthly meetings (Table 1). About 18 per cent of the SHGs have no meetings and 5 per cent SHGs have annual meetings. The SHGs without a culture of meeting have no scope for evolution as empowerment tools and change agents. Of those respondents who reported conducting of meetings in their SHGs, about 24 per cent reported about compulsory attendance in meetings, while about 76 per cent had no such compulsion in their SHGs. About their individual attendance in meetings, 88 per cent of the SHG members responded positively while 12 per cent of the respondents did not attend the meetings regularly. Of these respondents who were not regular in the meetings gave different reasons for their absence. Among these, family responsibilities were reported by 31 per cent of the respondents and about 21 per cent of the respondents complained that they did not get any information about the meeting; while, 17 per cent of the respondents reported

absence of most of the members which in turn dissuaded even them from attending the meetings; and 14 per cent of the respondents blamed the irregular schedule of meetings for their disinterest. On the other hand, engagement in labour was reported by about 10 per cent of the respondents as the reason behind their absence in meetings.

With regard to the safety of the amount of saving, it was a positive thing to note that 98.7 per cent of the SHGs have opened an account in the bank and 98 per cent of the SHGs keep their savings in the bank. The few exceptions keep their savings with the office-bearers. The saving records are maintained in the group-register by 83 per cent of the SHGs. The amount of saving is taken in meeting by 33.33 per cent of the SHGs, while 67 per cent of the SHGs do not take the saving amount in the meeting. Such SHGs either send representatives door to door to collect the contribution or the members send the contribution to the office-bearers. Both these methods should be avoided as saving is only a means and not an end in this approach. This tendency undermines the importance of the meeting and social interaction.

Passbook is issued as a personal record of all individual money transactions in 70.67 per cent of the cases while, 25.3 per cent of the SHGs do not issue any such passbook. On the other hand, 92 per cent of the SHGs do not give any receipt of the deposit. There is no scope for penalty in 77.3 per cent of the SHGs for those who are unable to deposit saving amount whereas, 22.7 per cent of the SHGs have a provision of penalising such members.

Assessment

To ensure the viability of the groups, it is essential that the groups be monitored for their quality from time to time. Regular quality assessments of the group can help in their current status appraisal and in preparation of strategies for their future development. The groups are assessed on the basis of their size, bylaws, meetings and attendance therein, status of financial transactions like saving, lending, recovery, revolving fund, income generation, maintenance of records, linkages with related institutions, overall participation level of the members and conflict management in the group etc. Various agencies or the concerned Self-Help Promoting Institution (SHPI) conduct the work of grading.

The responses of the groups regarding this issue revealed that only 25.33 per cent of the groups had been graded (Table 1). Of the groups that have undergone the process of grading, 36 per cent of the respondents did not recognise the grading institute, 20 per cent reported that their groups had been graded by Women and Child Development Department, 23 per cent had been graded by *Zilla/Janpad Panchayat,* and the remaining were graded by others like *gram sewak, Jan Shiksha Kendra,* and Regional Rural Bank. On the other hand, 26 per cent of the groups reported absence of any such grading exercise while respondents of 49 per cent of the groups showed ignorance in this matter.

Record Keeping

It is important that all transactions of the group should be recorded. This would ensure transparency, participation, and continuity of the group. There are several kinds of records like those pertaining to membership, proceedings of the meetings, financial transactions, stocks, etc. The number and format of records varies in different SHPIs. A few indicative records to be maintained by the groups are minutes book, membership records, attendance register, savings records, lending records, individual saving and lending ledger, general ledger, and cashbook. It is important to keep the records simple and easy to maintain. The need to maintain records and

accounts has to be emphasised with the group members. One advantage of the requirement of record keeping is that it creates demand for literacy among the members. The records, help in grading and auditing, if done. In addition, banks inspect the records and books of accounts for the purpose of linkages. In the initial period, the facilitator may maintain the records, but ultimately the responsibility has to be taken over by the group. One of the indicators of the maturity of the group is its ability to maintain systematic records.

The groups in the sample show a good sign in this respect as 88 per cent of the respondents reported that records were maintained systematically in their groups (Table1).

Management Training

Although Self-Help Group is a voluntary and informal group, the goals, objectives, and activities of the group need to be explained to the members. After this conceptual explanation, the next step of training includes the functional and management modules, which acquaint the group leaders and/or the members with the operational skills of the group from organisation and conducting of meetings to record keeping, team management, fund management. On-site and off-site training programmes may be conducted for all these objectives by the facilitator, SHPI and/or by the specialised persons/institutions.

With regard to the training for management of group activities at the operational level, 40 per cent of the respondents stated that their groups had been given such training (Table 1). Out of these, about 57 per cent of the groups had received this training by Mahila Baal Vikaas Vibhaag and Janpad/Zilla Panchayat had imparted training to the rest of such groups. On the other hand, about 58 per cent of the total respondents reported that they did not receive any such training from any person/institute.

Functional Efficiency Index

The functional profile of the SHGs involves several parameters. Moreover, there are no fixed operational rules laid down for the management or functioning of SHGs. Thus, to get an overall picture of the functional efficiency of the SHGs, it was essential to construct an index. The size of SHG, BPL membership, method of appointment of office-bearers, frequency of meeting, issuing of personal passbook, basis of bank linkage, grading, record-keeping, training for management, and participation in community development are the parameters selected to construct the Functional Efficiency Index (FEI). A dummy variable 1 was assigned for (1) a size of more than 9 members in SHG, (2) more than 50 per cent of BPL membership, (3) adoption of democratic measures for appointment of office-bearers, (4) holding of meeting within a month, (5) issuing of personal passbooks, (6) bank linked after attaining sound status of saving and lending, (7) groups which have undergone grading exercise, (8) keeping records (9) received training for management (10) which participate in community development. To get a clearer picture of the position of the SHGs on the 10–point-scale these SHGs were classified into functioning levels of low, moderate and high efficiency. The Functional Efficiency Level of the groups is as shown in Table 2.

Table 2 shows that 28 per cent of the total groups have a low level of functional efficiency, while 42 per cent of the groups have attained moderate level of functional efficiency and 30 per cent of the groups have managed to reach a high level of functional efficiency.

Table 2 : Functional Efficiency Level

S.No.	Functional EfficiencyLevel	No. of Groups	Per cent
1	Low	42	28
2	Moderate	63	42
3	High	45	30
	Total	150	100

Source : Primary Data.

Reflections

The study reveals that about three-fourths of the total groups hold meeting but this is not enough as it is one aspect, which no single group can afford to ignore. Very few members reported compulsory attendance in meetings, which is not a positive sign for the group norms. Nevertheless, individual profile of attendance is quite good. On the other hand, only one-fourth of the total groups have a record of collection of saving amount in the meeting. This again is not a very encouraging sign as it implies disinterest of the members and lack of transparency. These can soon lead to disintegration of the groups. Training has also been received by just forty per cent of the groups and this factor also needs to be taken care of. Performance of the groups on the remaining indicators of the functioning profile is satisfactory. The following recommendations emerge from the above analysis :

The formation of a group is a tedious process and involves caution from the stage of selection of real poor from similar demographic background. The purpose of group formation should be crystal clear to the SHPI and should be spelt out as clearly and honestly to the associating members. Moreover, training for management and record keeping should be imparted to more and more members so that leadership can rotate to ensure that power does not get centralised in few hands.

The culture of meeting has to be inculcated among the SHG members by the facilitator, who should conduct a simple participatory analysis of poverty, structural analysis of society and the importance of the collective action. In this process husbands or the female members from the households of the aspiring SHG members, along with the whole community, should be taken into confidence by the facilitator. This can help to sensitise the women members to their social and economic condition and the constraints they face in society. In these introductory meetings, the facilitator should simultaneously attempt an analysis of the indebtedness and local credit delivery system to make the women appreciate the importance of savings and credit activities through mutual action. After the formation of the group, the facilitator should arrange meetings for the group and initiate discussions on various issues. Otherwise, the meeting will be a ten-minute affair with all savings collected and loans disbursed. Soon these formal gatherings will also culminate into door-to-door collection or proxy collection. Therefore, the facilitator needs to discuss with women, matters concerning their lives, starting from issues like nutrition, health, care of children, literacy and moving on to gender awareness. Only such inputs can help the group evolve into "credit

plus" groups. A conceptual clarity about the revolving fund and bank linkage can be created in these meetings and the members can be pulled out of their old subsidy hangover. Moreover, meeting is the platform, which can build peer group monitoring and pressure for the proper use and repayment of loans.

The facilitator should see to it that in the process of helping the group to take off, she/he does not cripple the group and develop a perpetual dependence among the group members on her/him for meetings, record maintenance, conflict resolution and other activities. The entry and exit points of the facilitator should be decided very thoughtfully.

Grading or monitoring is the formula for success of the SHGs. The earlier government programmes suffered from lack of any self-monitoring or follow-up techniques. But grading exercise is an in-built feature of SHG mechanism of SGSY and the Self-Help Promoting Institute is supposed to monitor and fill the grading schedules, which then decide the status of the SHGs for required interventions. Therefore, regular grading will not just prevent disintegration of the SHGs but it can actually keep the SHGs on the right track and vibrant. The Functional Efficiency Index revealed that the highest number of SHGs was found concentrated in the moderate level of functional efficiency level, followed by those found in the high level and low levels, respectively.

Finally, since the sample included women SHGs, therefore the variables studied can show weaker results owing to factors like the immobility of women, illiteracy, social and family constraints, over-burdened status of women, disinterest and hesitation on the part of the members etc. However, a gendered context increases the significance of the role of SHPI or facilitator all the more, because more rigorous, systematic and well-planned efforts are essential for helping these SHGs to improve their functioning profile.

Thus, it is evident that the SHGs have no written bylaws for their formation or functioning but some basic norms, ensured through regular interventions of the facilitator, can help the SHGs become vibrant entities as functional efficiency is the foundation stone of the successful edifice of bank linkage and income generation.

References

1. Gupta, Anju et al. (2003), 'Self Help Group - A Friend of Poor', *Political Economy Journal of India,* Vol. 12, No. 1, January-June, Chandigarh.

2. Karmakar K.G. (1999), Rural Credit and Self-Help Groups (Micro Finance Needs and Concepts in India), Sage Publications, New Delhi.

3. Krishnaiah P. (2004), Poverty Reduction : Self Help Group Strategy, B.R. World of Books, New Delhi.

4. Lalitha, N. and B.S. Nagarajan (2002), Self-help Groups in Rural Development, New Delhi, Dominant Publishers and Distributors.

5. Narsimhan Shakuntala (1999), Empowering Women (An Alternative Strategy for Rural India), Sage Publications, New Delhi.

6. Poogary, Vanitha (2004), 'Helping Them Help Themselves', *Grassroots,* Vol. 5, No. 8, August 2004.

7. Rajagopalan, Shashi (2005), 'Self-Help Groups: A Critique', *Mainstream,* Vol. XLIII, No. 16, April 9.

8. Sunder Raj, D. (2004), 'SHGs and Women Empowerment', *Social Welfare,* Vol. 50, No. 10, January, New Delhi.

9. *Swa Sahayata Samooh Gathan - Prakriya evam Margdarshan* (2000), SEDMAP, Bhopal.

10. *Swarnjayanti Gram Swarozgar Yojana : Margdarshika Swa Sahayata Samooh* (2000), District Panchayat Office, Ujjain.

11. Verma Sawali Bihari (2004), Role of Self Help Groups, NGOs and Panchayati Raj Institutions in Promoting Rural India, B.R. World of Books, New Delhi.

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NIRD, Hyderabad.

A DOZEN YEARS OF SGSY - AN ASSORTMENT OF FIELD-WORK-BASED STUDIES

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ABSTRACT

The Swarna Jayanti Gram Sworozgar Yojana (SGSY), the flagship poverty alleviation programme, has been a holistic Scheme with uniquely perfect and detailed Guidelines covering all aspects of self-employment, operative from 1 April 1999 in rural areas of the country. After a decade of relatively successful performance, the SGSY is being restructured into National Rural Livelihood Mission (NRLM) for its effective implementation in a mission mode. An analysis of various studies on SGSY, mostly from direct experiences at different corners of India, is covered in this paper. It is an assortment of field work reports which throw light to the setbacks in the implementation of SGSY, as observed from the wide range of study areas located in different States.

Introduction

In spite of fast development in various fields, India remains to be slow in the development of its rural areas. Rural unemployment and resulting rural poverty are among the core problems of Indian economy, as a majority of the Indian population live in villages. In all the Five Year Plans, upliftment of poor, rural development and employment creation are given due importance. Government, from time to time, launches various development programmes in which banks have a major role to play, by way of schematic lending. The Swarna Jayanti Gram Sworozgar Yojana (SGSY) marked a distinct novelty from the earlier micro-finance programmes and poverty alleviation schemes. Launched in 1999 as a holistic scheme subsuming various erstwhile rural development programmes namely IRDP, TRYSEM, DWCRA, SITRA, GKY and MWS, it covered all aspects of self-employment such as organising the poor into self-help groups, training, credit, technology, infrastructure and marketing. It is concurrently evaluated by the Department of Rural Development, as a kind of achievement audit. Based on the recommendations made by various evaluation studies and the feedback provided, the SGSY is restructured and National Rural Livelihood Mission was launched during 2009-10 for its effective implementation in a mission mode. NRLM aims at rural poverty reduction through promotion of diversified and gainful self-employment and wage employment opportunities. Apart from the governmental appraisal, SGSY has been studied from different

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angles in various villages of India, giving thrust to each of its diverse features like poverty alleviation, employment creation, capacity building, women empowerment, NGO involvement, bank participation, quality of groups etc. Several field work experiences have been emerged either reminiscent of or contrasting to the official studies, whose compilation may be beneficial in facilitating better implementation of the scheme.

Methodology

With exclusively ideal and detailed Guidelines, SGSY created around 17 lakh self-help groups in rural India, relatively successful in supporting the BPL households. This paper is an assortment that attempts to organise several field-work-based articles whose comparison is done with the official guidelines or reports. As NRLM is gaining momentum by stepping into the shoes of SGSY in a few States, and yet on the way of being introduced in some other States, an analysis of various articles on the subject will throw light to avoid past shortfalls and for the creation of sustainable livelihoods. This paper is based on the review of a few research articles from various corners of India, over the past dozen years, majority being non-governmental in nature, not conducted by the planning and implementing agencie of the scheme. The SGSY guidelines, NRLM background note and the report of the second round of the concurrent evaluation also provided the data for the paper.

Uniquely Finest Guidelines

The Guidelines for SGSY issued by the Ministry of Rural Development, Government of India, have been uniquely superior declaring the processes of confidence-building and community empowerment as important aspects of the SGSY through self-help groups (SHG). It lays down instructions concerning selection of key activities, programme infrastructure, formation, stages of evolution and grading of SHGs, role of NGOs, Bank-linkage, asset creation, multiple doses of credit, back-end subsidy, repayment, recovery, refinance, group life insurance scheme, skill upgradation, marketing support, monitoring and special projects. However, experiences from various vicinities show that guidelines were not always adhered to. Although SGSY has several in-built measures to overcome limitations and to promote viable and sustainable enterprises, the implementation does not appear to be effective. At the initial stages of implementation, the tangibles of SGSY- employment generation, income addition and easy access to institutional credit- were observed (Reddy, 2002). But the later studies give an exploring view of the areas of unused potential of SGSY.

Social Mobilisation Through SHGs

As per the guideline, the sole goal of the policy is not achievement of tangible end results such as a large number of self-employed rural poor, but it reflects the move in policy studies towards 'process-oriented approaches to development' giving importance to social mobilisation and community organisation. It was anticipated that the group formation should not be driven by any targets but members of the SHGs should fully internalise the concept of self-help. It states that "the SHG approach helps the poor to build their self-confidence through community action. Interactions in group meetings and collective decision-making enable them in identification and prioritisation of their needs and resources. This process would ultimately lead to the strengthening and socio-economic empowerment of the rural poor as well as improve their collective bargaining power" (Para 1.1). It adds that the block-level/taluk SGSY committee should ensure that a participative process should be involved in identifying the key activities that are to be taken up to generate local self-employment, (Para 1.4) conferring the idea is

that policy participants are to be involved in decision-making. Ideas and solutions are not to be handed down to the beneficiaries by a charitable, all-knowing State.

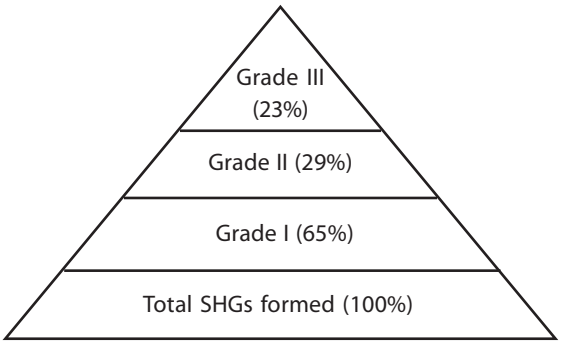
However, such an anticipation of 'process approach' was not satisfied in all cases. An observation of the implementation of the SGSY, to look into the 'process-oriented policies confined to paper' investigated the issue through a textual and field-level exploration in Gandhinagar district, Gujarat. The textual analysis of the SGSY on paper (SGSY guidelines prescribed by the GoI) indicates that the formulators of the policy have made an attempt to make the policy process-oriented and participatory. At the field area of study, the SGSY seems to be process-oriented only on paper. Under political pressure to form as many SHGs in as short a time as possible, policy functionaries at village level and their administrative counterparts at block and district level fail to bring process orientation into their policy practice. In the race to form a large number of SHGs, SGSY participants in villages are treated as mere targets, the policy continues to be monitored using target-oriented criteria like physical and financial progress and the opinion of beneficiaries were not at all considered (Nikita, 2003). A study in Odisha too uncovers the same situation; the activities were not selected by a participatory process involving prospective members of SHG (Tripathy, 2007).

Para 3.4 to 3.7 in the Guideline gives instructions regarding the formation of Self-Help Groups. In practice there are many stumbling blocks in forming and sustaining an SHG, an important one being lack of trust among households. The prime necessity for SHG is 'common interest', and hence the SGSY groups cannot sustain if the only common factor amongst the group members is that they belonged to the official list of BPL. An analysis of the SGSY loans in Lakhipur village in Fatehpur district in UP, noticed that the common sustainable interest in the 'group' is not there; the synergy expected from an SHG is not generated and hence no effective entrepreneurial progress. Many SHGs have come together on an adhoc basis, only because they want a loan. Inadequate attention to group quality could threaten the credibility and viability of the entire programme (Pradeep 2005).

Group Stability

One of the shortfalls of SGSY-SHGs is a very high attrition rate. Out of the total SHGs formed, only 65 per cent are passing to Grade I, only 29 per cent to Grade II and only 23 per cent of total SHGs are finally entering the micro-enterprise level.

Figure 1: Proportion of SHGs Passing Various Grades



(Figure formulated using data from NRLM background note).

The most important thing for the success of SHG is making the poor aware of the concept and advantage of self-help. A study in Nalbari, Assam, uncovered that a large segment of SHGs have closed down, most of them being formed with the motive to have subsidised credit (Baruah, 2012). Various empirical evidences showed that the accessibility of institutional credit corresponds with the maturity level of SHGs. The study at highly poor areas shows a very high correlation (r=.69) between these two aspects, the level of group maturity and quantum of loan availed of (Purushotham, 2009), because the stability of group is the only thing upon which the banker can place his expectation regarding repayment. There had been occasions where around 37 per cent of sample SHGs were neither graded nor linked with micro-credit, even though these had existed for more than two years (Tripathy, 2007). Irregular meetings, absenteeism, low frequency of thrift and credit activities are some of the causes of low quality of SHGs. Group stability of SGSY-SHGs is determined by factors like group cohesion, team spirit, leadership, participatory decision making and regularity in maintenance of records (Lina, 2008), according to a study among agro-processing SGSY units in Kerala.

Role of Facilitators

There can be various reasons for failure of SGSY groups, ranging from lower credit availability to low level of skill. However, "The quality of the groups can be influenced by the capacity of the facilitator" (Para 3.8); the guideline pronounces. The lack of committed and motivated volunteers/fieldworkers to work for the rural poor is an important constraint on replicating the success of the SHG. The functioning of four SHGs operating in a village was observed over a period of more than one year, where SHGs had been formed earlier, under the World Bank-funded Swa-Shakti Programme. When SGSY came into picture, the bank officials cooperated with the SGSY groups as directions came from the top and they were given targets to fulfill under these priority areas. It was observed that the village official tried to sustain the groups by telling the SHG members that keeping proper records and passing the NABARD appraisal, would entitle them for the subsidy (Ameeta, 2005), which is against the objective of the scheme.

In a few high poverty areas in Uttar Pradesh, where facilitators *(spoorthidatas)* were heavily relied upon for formation of SHGs of poor by imparting them the concept of self-help, savings, book keeping and training, it had been observed that as soon as the SHGs are qualified for bank linkage, the facilitators retreat. In the absence of continuing stanchion, the immature groups fail to hold together (Purushotham, 2009). The facilitators should indulge themselves with a committed heart in sensitising and motivating the poor, thus graduating the SHGs from mere groups to micro-enterprises.

Primacy for the Poor

SGSY is above all a poverty alleviation programme, whose objective is to bring the assisted poor families above the poverty line. Pradeep Sreevaastava (2005), after making an indepth study in a village of severe poverty, points out that most of the micro-finance via SGSY are not reaching the poorest of the poor, but only those near the poverty line. SGSY too, like most of the rural credit innovations, though at inception planned brave new courses, inescapably struggle against the 'institutional corruption' and rural 'power inequities'. The report of the Central government committee set up under the chairmanship of R Radhakrishna (2008) to look into credit-related issues under SGSY observed that allocation of Central funds was more in the southern region than in the eastern when compared on the basis of the poor in either area. A National Institute of Bank

Management-National Institute of Public Finance and Policy (NIBM-NIPFP, 2007) study, showed the same scenario. An earlier study in 2005 also stated it as a 'problem' that micro-finance remains concentrated in the southern States, which account for 65 per cent of the SHGs linked and over 75 per cent of the amount disbursed at that time. In contrast, the north-eastern region accounts for 0.6 per cent of the SHGs and 0.3 per cent of the amount. Even the densely populated and highly poor eastern region accounts for 12.6 per cent of the SHGs linked and 5.9 per cent of the amount (Pradeep, 2005). In the southern States there is only 11 per cent of rural BPL population of the country but more than 33 per cent of total SHGs have been formed in these States (draft background material on NRLM, 2010).

Bank Involvement

SGSY is a credit cum subsidy programme where a greater involvement of banks is envisaged. Banks will be closely involved in the planning as well as capacity building and choice of activity of the self-help groups, selection of individual sworozgaris, pre-credit activities and post-credit monitoring including loan recovery. "While sanctioning projects, the bank managers should ensure that the unit costs, terms of loan and repayment schedule are as indicated in the project profiles for the concerned activity. Part financing and under-financing should not be resorted to at any circumstances" (Para 4.5, Guidelines). Banks may also engage in training, skill development and capacity building of the intended beneficiaries. But empirical evidences from a few places show that, even though the place has a bad reputation and high default risks, there are the pressures from top, like minimum lending norms, incremental annual targets which paved the way for loans. The stimulus for formal credit in Lakhipur (Pradeep, 2005) is thus essentially supply-driven credit expansion based on nominal service area programmes. Much of the formal finance in the village comprised loans under government schemes, particularly the SGSY. A study on SGSY in areas of high poverty (Purushotham, 2009) shows that several banks there have just met their targets and resorted to under-financing. Due to limited access to credit, the SHGs were either forced to choose low-investment, low-productive projects or to borrow at lofty rates from external sources. Such risky and unplanned endeavours neither increased income nor gave an expected positive occupational shift. A significant proportion (51 per cent) of respondents could not take up micro-enterprises even after obtaining training, because of inadequate institutional credit. Further, the bank managers could not put forth an effective contribution in SHG capacity building, grading and credit appraisal.

Micro-finance

Micro-finance, which was earlier viewed as 'a silver bullet' that could pull poorer households out of poverty, now takes a cautious approach emphasising the 'protectional' aspects as opposed to the 'promotional' dimensions. The rigid design of micro-credit programmes and the limited range of financial services offered have made the arena of the micro-credit project a difficult terrain to negotiate for the poorer sections. The research on the income enhancement effects of micro-credit programmes gave insight on the heterogeneity of the poor, and so, while addressing the poverty concerns, the questions should be reformulated as one of looking at those beneficiaries whom are to be reached and served (Kalpana 2005).

R. Radhakrishna Committee has made very pertinent observations. Even in Kerala and Andhra Pradesh, where SGSY was functioning fairly well, only about one-fourth of the SHGs could engage themselves in self-employment activities, implying a flaw in the notion of

creating credit-led, self-employment programmes.The rate of attrition among Grade I and II SHGs indicates that a large number of groups fizzle out mid-way after availing themselves of the revolving fund, thus implying that the foundation of the SHG programme is very weak. SHGs that have cleared the Grade II stage have to wait for long periods before availing themselves of the loan and subsidy. The NIBM-NIPFP study observed that though the SGSY supposed a micro-finance approach, bank branches were following the traditional method, whereas what the rural poor require is access to hassle-free, collateral-less and demand-based credit at appropriate times.

The amount of loan provided was sometimes very small to invest in a profitable venture, so as to cross the poverty line.There are reports from several parts of the country that loans are used for consumption purposes, emergency requirements in the family, followed by expenditure on current productive activities, whereas it was actually intended to start a new project (Tripathy, 2007) (Umdor, 2009) (Baruah, 2012).

A better approach to eliminate poverty, would be to make the environment conducive to increased flow of credit to the poor rather than directing it, leaving micro-level credit management to financial institutions. The involvement of the government must be confined to only macro-affairs such as policy formulation and framing incentive mechanisms for both banks and the bureaucracy (Rajaram, 2009).

Subsidy

SGSY aims to work through a mix of bank credit and government subsidy. Satish (2005) illustrates that the SHG-bank linkage model of micro-finance with the group acting as a collateral substitute, overcomes the obstinate problem of lack of collateral security by the poor. He rationalises that the Government has, with this purpose, started the Swarnajayanti Gram Sworozgar Yojana, which operates through the rural development agencies of the State government at the district level.The field level feedback indicates that there were many instances that the groups formed under SGSY disintegrated after accessing credit and subsidy.This appears as a negative example of bank-linkage programme.

There had been experiences where the 'gramasevika' tried to protract the groups by telling the SHG members that if they kept their records and pass the appraisal, they would be entitled for the subsidy, clarifying their impression that the subsidy, not the employment generation, is the centre of attraction (Ameeta, 2005). This asserts the comment of Tara Nair (*EPW*, April 23, 2005) that the efforts at upscaling the provision of micro-finance "need to be viewed with caution as it could actually lead to increased failures and credit indiscipline". But, Ashutosh Jindal (2005), disagrees with the observation while sharing some of his experiences of working with SHGs in a district in Tripura. The element of flexibility of the SGSY scheme, to accommodate the dynamics of micro-finance and SHGs into a government framework is appreciated.

Delving into the impact of subsidy on the sustainability of groups, focusing Meghalaya, (Pati, 2009) it was found that the subsidy component of the SGSY made the scheme more acceptable and many groups are formed, have availed of the loan and seems going on. However, the poor recovery rate of the loans and the low indicators of self-sufficiency bring to light the negative impact of subsidy. It is worth noticing that a study in Maharashtra on impact of SGSY on SHGs and bank linkages (Thekkekkara, 2008) also shows the inhibiting role of subsidy in the progress of SGSY. A field study undertaken in Odisha

too declares that "the groups were not sensitised about the participation and self-help approach and were aware only of the subsidy component of the programme" (Tripathy, 2007). The subsidy fund could be utilised for training and infrastructure purposes, instead of making it related to credit. In fact, the 'principle of subsidy' does not match with the 'principles of self-help group'.

Reservations

Social composition of the assisted sworozgaris was in favour of the most vulnerable groups, like scheduled castes and scheduled tribes. Women accounted for 65 per cent, disabled 2 per cent and minorities 15 per cent. As per the second round of concurrent evaluation of SGSY, the proportion of male and female sworozgaris is as shown in Table 1.

Table 1 : Gender Percentage of Swarozgaris

	Individual	SHG
Male	66.39	22.38
Female	33.61	77.62
Total	100	100

Source : Concurrent evaluation report, 2010.

Indepth studies show that as women have a reservation of 50 per cent, by mandating that bank officials to ensure allocation of their annual quota of SGSY-related loan finance through SHGs, bank staff could be forcing larger amounts of loans tied to the end use of enterprise promotion upon beneficiaries who are neither willing, nor able, to engage in loan-financed income generation. This consecutively imply the establishment of unviable enterprises by women members of SHGs forced to invest in income earning activities, or insurrection of the programme's objectives by sworozgaris, camouflaging their consumption needs as enterprise needs (Kalpana, 2005). However, a study conducted in SGSY-women-SHGs of Puthukottai district in Tamil Nadu, found that the SHG linkage programme has increased the income and consumption level, and hence the standard of living of the beneficiary households (Amudha, et. al, 2006). Evidence from Meghalaya supports that women-SHGs contribute to ability to interact and discuss issues in the public, a great sense of confidence and recognition in the family.

Governmental and Institutional Support

An inter-state performance analysis of the SGSY scheme, found that subsidy is not the influencing factor. This is contrary to the study of Motwani. As SGSY promotes micro ventures through credit-cum-subsidy, effectiveness of lending institutions is crucial for its performance. It could be further articulated that, as the scheme requires a contribution from State, the State's fiscal position and the priority they affix to such developmental schemes are also factors that can affect the performance of SGSY (Rajeev et.al, 2009). SGSY is the resultant paradigm shift, due to the realisation that a more participatory approach to development should be evolved in contrast to ready-made credit delivery mechanisms. For sustainable results from micro-finance, the financial intermediation should be accompanied by social intermediation, micro-enterprise development services and social services (Neeta, 2006). An impact evaluation of SGSY, based on primary data on various economic indicators of tribal households in Koraput district of Odisha, observes that the intended purpose of the programme is not adequately met. On the whole, it found that the sample beneficiaries have marginally gained in terms of better employment opportunities, whereas benefits in terms of real income and expenditure were very modest. These findings underscore the need for redesigning and enlarging the scope of the development

programmes sponsored by the government (Sanjay et.al, 2010). Another study (Purushotham, 2009) had two-thirds of bank branches complaining about lack of cooperation from the rural development officials in loan recovery.

Book Keeping, Training and Monitoring

A review of SGSY in Murshidabad, West Bengal indicated that only a low percentage (21) of sworozgaris were maintaining book-keeping (Amit et.al, 2011). Majority of SHGs, especially in the poorer rural areas, lacked proper knowledge to keep their books of accounts. A survey found that 60 per cent of SHGs' books of accounts were incomplete (Purushotham, 2009).

One of the major thrust areas under SGSY implementation is training and capacity building. A study on SGSY-SHGs financed by Regional Rural Banks in Bihar and Karnataka, unearthed the fact that majority of them opted for traditional income generating activities, which resulted in low skill upgradation, low shift in occupation and confining to the low productivity cycle (Das, 2010). An activity-wise analysis in the district of Murshidabad, West Bengal indicated that most of the sworozgaris were not given any skill development training except in case of a few activities (Amit et.al, 2011). It is to be noted that as per the second round of concurrent evaluation, the proportion of fund utilisation under this component was maximum in West Bengal. SGSY seemed ill-equipped to meet the challenge of gauging the suitability of 'sworozgaris' for various self-employment programmes depending on their initial asset position or possession of prior entrepreneurial experience, training and skills (Kalpana, 2005). Continuous and periodic monitoring of the progress of project and quality of groups is to be done. Where the banks clubbed SGSY loans with other loans, the mechanism to monitor the scheme wanes. Lack of capacity building and training is due to inadequate institutional infrastructure, lack of trainers or inaccessibility of rural poor to the existing institutions. In some areas, because of inadequate manpower in the DRDAs, lack of professional guidance, staff overburdened with a number of schemes, and increasing number of SHGs hindered follow-up and monitoring the SGSY projects, thus weakening the implementation structure.

Conclusion

The SGSY scheme was perfectly designed to obliterate poverty through investment in human capital and one of the underlying reasons behind the under-performance of SGSY is the failure in implementation of the recommendations given in the Guidelines. A major revamping of existing policies is needed to bring out desired benefits of participation. Although the guidelines propose an elaborate process of planning, a comprehensive, holistic planning has remained an illusion. Since the SGSY is being restructured into NRLM to provide greater focus and impetus for poverty reduction to achieve the Millennium Development Goal by 2015, it is to be remembered that SGSY itself had an exceptionally preeminent policy framework and guideline and flaw was in execution of strategy, because of a range of causes including the heterogeneity of the poor. Hence, additional efforts are needed to uplift the NRLM Mission objective to reduce poverty through diversified and gainful opportunities to provide sustainable income generation, in a customised manner.

References

1. Ahuja,Rajeev and Indranil De. (2009),"Poverty Reduction Through Self-Employment Programme in India : Interstate Performance", *The IUP Journal of Governance and Public Policy*, IUP Publications, Vol.(3-4), pp.62-76.

2. Amudha Rani, R and N. Manimekalai (2006), "Rural Women Owned Micro Enterprises : A Stepping Stone for Promoting Enterprises", Bharatidasan University, Tiruchirappilly. http : // www.ediindia.org/creed/data/R%20Amudha%20Rani.htm

3. Baruah, Prasenjit Bujar, (2012), "Impact of Microfinance on Poverty : A Study of Twenty Self-help Groups in Nalbari District, Assam", *Journal of Rural Development,* Vol 31 (2), pp. 223-234.

4. Centre for Management Development, (2010), Concurrent Evaluation of Swarnajayanti Gram Sworozgar Yojana, Trivandrum, CMD.

5. Das, B.C., (2010), "Impact of Credit on Income of SGSY-SHG Members Financed by RRBS in the States of Bihar and Karnataka", NIRD's Research Highlights – '09-'10, Hyderabad, NIRD.

6. Dasgupta, Rajaram. (2009), "SGSY: Need for a Paradigm Shift", *Economic & Political Weekly*, Vol. XLIV (43), pp.21-23.

7. Jindal, Ashutosh. (2005), "Microfinance and SHGs : Role of Government Institutions", *Economic and Political Weekly*, Vol.40 (38), pp. 4178-4179.

8. Joy, Lina, A. Prema and S.Krishnan, (2008), "Determinants of Group Performance of Women Led Agro-processing Self-Help-Groups in Kerala", *Agricultural Economics Research Review*, Vol.21, pp.355-362.

9. Kalpana, K. (2005), "Shifting Trajectories in Microfinance Discourse", *Economic and Political Weekly,* Vol.40 (51), pp.5400-5409.

10. Kundu, Amit and Arghya Kusum Mukharjee. (2011), "Impact of Swarnajayanti Gram Swarojgar Yojana on Health, Education and Women Empowerment", *Microfinance Review*, Vol.3, pp.36-52.

11. Lenka, Sanjay Kumar and Amaresh Samantaraya. (2010), "Government Sponsored Development Programmes for Rural India – A Case Study of SGSY in Orissa", *The IUP Journal of Public Finance*, Vol.VIII (4), pp.21-30.

12. Mahajan, Sanjeev.K and Vinod Kumar, (2007), "Performance Evaluation of Poverty Alleviation Programmes in Himachal Pradesh : A Case Study of SGSY Programme", *Political Economy Journal of India*, Vol. 16(1) pp.39-51.

13. Ministry of Rural Development, Government of India. (2003), Swarnajayanti Gram Sworozgar Yojana – Guidelines, New Delhi, Ministry of Information and Broadcasting.

14. Ministry of Rural Development, Government of India. (2010), Draft Background Material on National Rural Livelihood Mission, New Delhi, Government of India.

15. Motwani, Ameeta. (2005), "Microfinance : Field Observations", *Economic and Political Weekly*, Vol.40(30), pp.3351.

16. Nair, Tara S. (2005), "The Transforming World of Indian Microfinance" ", *Economic and Political Weekly*, Vol.XL (17) pp.1695-1698.

17. Pati, A.P., (2009), "Subsidy Impact on Sustainability of SHGs : An Empirical Analysis of Micro Lending Through SGSY Scheme", *Indian Journal of Agricultural Economics*, Vol.64 (2), pp.276-288.

18. Purushotham, P., (2009), Institutional Credit for Rural Livelihoods - A Study of SGSY in the Regions of High Poverty, Hyderabad, NIRD.

19. Reddy, Gangi Y, (2002), "Planning and Implementation of Swarnajayanti Gram Sworozgar Yojana : Need for Improvement", *IASSI Quarterly*, Vol. 21(1), pp.27-49.

20. Satish.P (2005),"Mainstreaming of Indian Microfinance", *Economic and Political Weekly*, Vol.XL(17), pp 1707-1713.

21. Sreevaastava, Pradeep. (2005), "Microfinance in India : Odysseus or Interloper?", *Economic and Political Weekly*, Vol. 40(33), pp.3626-3628.

22. Sud, Nikita. (2003), "Experiences of SGSY in Gujarat - From Process-oriented Theory to Deterministic Practice", *Economic and Political Weekly*, Vol. 38 (39), pp. 4085-4087.

23. Sudan, Falendra.K, (2006), "Promotion of Micro Enterprises under SGSY – Experiences of J & K", (Ed.R.Venkata Ravi, P.Siva Ram, D.Sunder Raj) *Empowering Rural India, Experiments and Experiences*, (256-285), Kanishka Publishers, New Delhi.

24. Thekkekkara, Thanksy Francis, (2008), "Impact of SGSY on SHG : Bank Linkage", Microfinance in India, Karmakar K.G. (ed), Sage Publications, New Delhi.

25. Tripathy K.K. and I.G.Tripathy, (2007), "Microfinance and Self Employment Initiatives under SGSY : A Review of Intentions and Realities", *Productivity*, Vol. 47(4), pp.387-393.

26. Umdor, S and B. Panda, (2009), "An Assessment of SHGs under SGSY Programme : Evidence from Meghalaya", *Asian Economic Review*, Vol.51(2), pp.311-325.

References

1. Ahuja,Rajeev and Indranil De. (2009),"Poverty Reduction Through Self-Employment Programme in India : Interstate Performance", *The IUP Journal of Governance and Public Policy*, IUP Publications, Vol.(3-4), pp.62-76.

2. Amudha Rani, R and N. Manimekalai (2006), "Rural Women Owned Micro Enterprises : A Stepping Stone for Promoting Enterprises", Bharatidasan University, Tiruchirappilly. http : // www.ediindia.org/creed/data/R%20Amudha%20Rani.htm

3. Baruah, Prasenjit Bujar, (2012), "Impact of Microfinance on Poverty : A Study of Twenty Self-help Groups in Nalbari District, Assam", *Journal of Rural Development,* Vol 31 (2), pp. 223-234.

4. Centre for Management Development, (2010), Concurrent Evaluation of Swarnajayanti Gram Sworozgar Yojana, Trivandrum, CMD.

5. Das, B.C., (2010), "Impact of Credit on Income of SGSY-SHG Members Financed by RRBS in the States of Bihar and Karnataka", NIRD's Research Highlights – '09-'10, Hyderabad, NIRD.

6. Dasgupta, Rajaram. (2009), "SGSY: Need for a Paradigm Shift", *Economic & Political Weekly*, Vol. XLIV (43), pp.21-23.

7. Jindal, Ashutosh. (2005), "Microfinance and SHGs : Role of Government Institutions", *Economic and Political Weekly*, Vol.40 (38), pp. 4178-4179.

8. Joy, Lina, A. Prema and S.Krishnan, (2008), "Determinants of Group Performance of Women Led Agro-processing Self-Help-Groups in Kerala", *Agricultural Economics Research Review*, Vol.21, pp.355-362.

9. Kalpana, K. (2005), "Shifting Trajectories in Microfinance Discourse", *Economic and Political Weekly,* Vol.40 (51), pp.5400-5409.

10. Kundu, Amit and Arghya Kusum Mukharjee. (2011), "Impact of Swarnajayanti Gram Swarojgar Yojana on Health, Education and Women Empowerment", *Microfinance Review*, Vol.3, pp.36-52.

11. Lenka, Sanjay Kumar and Amaresh Samantaraya. (2010), "Government Sponsored Development Programmes for Rural India – A Case Study of SGSY in Orissa", *The IUP Journal of Public Finance*, Vol.VIII (4), pp.21-30.

12. Mahajan, Sanjeev.K and Vinod Kumar, (2007), "Performance Evaluation of Poverty Alleviation Programmes in Himachal Pradesh : A Case Study of SGSY Programme", *Political Economy Journal of India*, Vol. 16(1) pp.39-51.

13. Ministry of Rural Development, Government of India. (2003), Swarnajayanti Gram Sworozgar Yojana – Guidelines, New Delhi, Ministry of Information and Broadcasting.

14. Ministry of Rural Development, Government of India. (2010), Draft Background Material on National Rural Livelihood Mission, New Delhi, Government of India.

15. Motwani, Ameeta. (2005), "Microfinance : Field Observations", *Economic and Political Weekly*, Vol.40(30), pp.3351.

16. Nair, Tara S. (2005), "The Transforming World of Indian Microfinance" ", *Economic and Political Weekly*, Vol.XL (17) pp.1695-1698.

17. Pati, A.P., (2009), "Subsidy Impact on Sustainability of SHGs : An Empirical Analysis of Micro Lending Through SGSY Scheme", *Indian Journal of Agricultural Economics*, Vol.64 (2), pp.276-288.

18. Purushotham, P., (2009), Institutional Credit for Rural Livelihoods - A Study of SGSY in the Regions of High Poverty, Hyderabad, NIRD.

19. Reddy, Gangi Y, (2002), "Planning and Implementation of Swarnajayanti Gram Sworozgar Yojana : Need for Improvement", *IASSI Quarterly*, Vol. 21(1), pp.27-49.

20. Satish.P (2005),"Mainstreaming of Indian Microfinance", *Economic and Political Weekly*, Vol.XL(17), pp 1707-1713.

21. Sreevaastava, Pradeep. (2005), "Microfinance in India : Odysseus or Interloper?", *Economic and Political Weekly*, Vol. 40(33), pp.3626-3628.

22. Sud, Nikita. (2003), "Experiences of SGSY in Gujarat - From Process-oriented Theory to Deterministic Practice", *Economic and Political Weekly*, Vol. 38 (39), pp. 4085-4087.

23. Sudan, Falendra.K, (2006), "Promotion of Micro Enterprises under SGSY – Experiences of J & K", (Ed.R.Venkata Ravi, P.Siva Ram, D.Sunder Raj) *Empowering Rural India, Experiments and Experiences*, (256-285), Kanishka Publishers, New Delhi.

24. Thekkekkara, Thanksy Francis, (2008), "Impact of SGSY on SHG : Bank Linkage", Microfinance in India, Karmakar K.G. (ed), Sage Publications, New Delhi.

25. Tripathy K.K. and I.G.Tripathy, (2007), "Microfinance and Self Employment Initiatives under SGSY : A Review of Intentions and Realities", *Productivity*, Vol. 47(4), pp.387-393.

26. Umdor, S and B. Panda, (2009), "An Assessment of SHGs under SGSY Programme : Evidence from Meghalaya", *Asian Economic Review*, Vol.51(2), pp.311-325.

Journal of Rural Development, Vol. 32, No. (2) pp. 201 - 212
NIRD, Hyderabad.

IMPACT OF CONTRACT FARMING ON ECONOMIC STATUS OF FARMERS IN KARNATAKA

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ABSTRACT

In India contract farming has considerable potential where small and marginal farmers can no longer be competitive without access to modern technologies and support of different agencies involved in farming. Hassan, Tumkur, Kolar and Koppal districts of Karnataka were selected for the study. The results indicated that there was maximum per cent of increase in economic status of farmers from Hassan (12.12 per cent), Tumkur (14.85 per cent), Kolar (29.13 per cent) and Koppal (18.34 per cent) districts after adopting contract farming in their fields, respectively. B:C ratio of the four districts viz., Hassan (3.05), Tumkur (2.37), Kolar (2.76) and Koppal (6.18) gave positive signs towards improvement of farmers' economic status. Further, results showed that majority of the farmers faced financial and situational constraints rather than technological and extension constraints.

Introduction

The vast agro-climatic diversity, production potential, farm labour availability and domestic and overseas market potential of India provides greater scope for private sector's participation. Interestingly, in the recent past, private agri-business firms and multi-national companies have also received offers from different State governments including Karnataka State for contract farming. National agricultural policies of India also favoured private sector participation through contract farming arrangements.

Gurdev Singh (2005) provides a more universal definition of contract farming. "Contract farming is a form of vertical coordination between the producers (farmers) and the contractor (processor or marketing firm or a third party such as input manufacturer or service provider) where the latter directly influences the production decisions and exercises some control at the production point under the obligation of purchasing certain quantity of produce at specific price from the producer. The quantity and price relate to delivery of specific quality produce at designated location and for a period of time."

Contract farming is a system of production and supply of agricultural/ horticultural produce under forward contracts between producers/suppliers and buyers. The essence of such an arrangement is the commitment of the producers/sellers to

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provide an agricultural commodity of certain type, at a time and a price, and in the quantity required by the known and committed buyer. Contract farming is generally defined as farming under an agreement between farmers and a sponsor (processing and/or marketing firm) for the production and supply of agricultural products under forward agreements, frequently at predetermined prices (Paty B.K., 2005). According to the contract, the farmer is required to grow the contractor's crop on his land, and to harvest and deliver to the contractor a quantum of produce, based upon anticipated yield and contracted acreage. Towards these ends, the contractor supplies the farmer with selected inputs, including the required technical knowhow and advice, on the other hand, farmer supplies land and labour. However, the terms and nature of the contract differ according to variations in the nature of crops to be grown, agencies, farmers and technologies and the context in which they are practised.

Crops Covered Under Contract Farming

Professor Mathur (2004) found that in five sample States, crops covered under contract farming varied from fruits and vegetables, medicinal and aromatic plants to cereals. Different companies initiated contract farming in various States. Mathur's findings are summarised below :

Table 1 : Example of Contract Farming States and Crops

Karnataka	Maharashtra	Madhya Pradesh	Punjab	Tamil Nadu
Ashwagandha	Soyabean	Wheat, maize	Tomato, chilly	Cotton
Dhavana	Several fruits	Soyabean	Barley	Maize
Marigold	Vegetables, cereals	Several fruits	Basmati rice	Paddy
Capsica Chilly	Spices and pulses	Vegetables, cereals	Maize	
Coleus		Spices and pulses	Groundnut	
Gherkins			Potato	

Contract farming has been tried in various States and covered a variety of crops. Different agro-climate zones produce different specialised crops. For example, tea in North Bengal, and Nilgiri in South, coffee in South, apples in Kashmir and Himachal Pradesh, grapes in Nasik and around Hyderabad. Some notable instances are:

* Seed multiplication in Marathawada and Andhra Pradesh.
* Tea and coffee in Karnataka, Kerala and Tamil Nadu.
* Rubber and pepper in Kerala.
* Poplars in Uttar Pradesh, Haryana and Punjab.
* Medicinal plants in Uttar Pradesh.
* Castor, Isabgol, cumin and aniseed in North Gujarat.
* Jute in West Bengal.
* Tomato and chillies in Punjab, Andhra Pradesh and Karnataka.

* Mangoes in Andhra Pradesh, Tamil Nadu and Maharashtra.

Elements of Contract Farming: There are 17 elements of contract farming:

1. Purpose / Reason: which includes quantity of material needed by the company not available in open market and required quality not available in open market, need for bulk and cost-effective procurement, easy market access to farmers.
2. Time of Contract: it includes pre-harvest and post-harvest.
3. Minimum Size of Contractual Acreage: may vary from commodity to commodity. The unit of measurement may vary from area/acreage for crops to quantity say number of animals in case of dairy.
4. Registration Process : the registration process includes the registration fees and signing a simple document
5. Partners in the Consortium : the contract farming includes State government / board (in case of plantation crops such as spices board, tea board etc, financial Institutes-NABARD, Banks, input providers, service providers and insurance providers.
6. Insurance supplied : the insurance supplied in contract farming includes life insurance and crop insurance.
7. Inputs Provided : during the contract the company under the contract supplies fertilisers, seeds, and pesticides.
8. Services Provided in contract farming are extension services and monitoring quality.
9. Quantity Specifications : it includes main products and the byproducts.
10. Harvesting Time : the harvesting time will be decided by corporate and also by producer.
11. Price Fixation Criteria : the price fixation criteria followed in contract farming includes pre-fixed (including or excluding cost of handling, packaging, transport, taxes and octroi), market base and pre-fixed with market link component.
12. Procurement Strategy : the procurement strategy followed in contract farming includes (a) Delivery taken at farm gate (b) Delivery taken at factory/godown gate. (c) Delivery at designated Mandis.
13. Packaging : (a) Provided by the buyer at his cost (b) Provided by the producer at his cost Contract Farming.
14. Handling : (a) Cost borne by the producer. (b) Cost borne by the buyer
15. Transport : (a) Arranged and paid by the producer up to delivery point. (b) Arranged and paid by the buyer up to delivery point. (c) Arranged by producer but paid by the buyer at delivery point. (d) Transport subsidy paid by company / government / board.
16. Mode of Payment : Cash. (b) Cheque.
17. Time of Payment : (a) Part or full payment immediately. (b) Remaining part or full payment in a given time period (week, fortnight, month). (c) As per specified payment schedule. Karnataka has opened the doors for contract farming and entry of major players into trade in agricultural commodities.

The State Assembly of Karnataka amended the Karnataka Agricultural Produce

Marketing act to allow private players to enter the agricultural sector in a big way. The amended act reveals that contract farming will help farmers get pre-fixed rates for their produce. Presumably the agricultural trade in the State is dominated by the Agricultural Produce Marketing Committees (APMCs) and small and medium players. The amendment will help in the entry of big players like Metro Cash & Carry, Reliance etc. to the agriculture produce trade. PepsiCo India Holdings is looking at the State for large-scale contract farming in maize, chillies and tomatoes, for which it has commenced trials in Haveri district. Although these trials are on a small scale, the company is said to be looking at nearly 20,000 hectares of contract farming in maize to fall in place by next year in Haveri and neighbouring districts (Keshavamurthy, 2005).

Though farmers are gradually entering into this farming, studies are limited to assess the impact. Hence, the study was conceptualised with the following specific objectives viz. (1) To analyse the impact of contract farming on economic status of farmers and (2) to elicit the constraints faced by the farmers practising contract farming and suggestions for the success of contract farming.

Methodology

The present study was carried out in four districts of Karnataka which includes Hassan, Tumkur, Kolar and Koppal. Thirty farmers from each district were selected as sample to make it total of 120. Ex-post Facto Research Design was considered as appropriate for the study. The economic index of farmers before and after contract farming was computed by converting the individual raw scores of landholding, family income and assets possession, obtained into standard scores to avoid the difference of units of the variables. Benefit-cost ratio of farmers practising contract farming before and after adopting the contract farming was also calculated.

The economic index of farmers before and after contract farming was computed by converting the individual raw scores of landholding, family income and assets possession (number and type of house, farm power, agricultural implements, and materials possession) obtained into standard scores. The raw scores were converted into standard scores by using formula :

Standard scores = x-X /? (10) + 50

Where x= individual raw score

X= mean of raw score

?= Standard deviation of raw score

Thus, the average economic index (AEI) was worked out by using the formula:

$$AEI = \frac{f(\text{landholding} + \text{income} + \text{number and type of house} + \text{Farm power} + \text{agricultural implements} + \text{materials possession})}{6}$$

Paired't' test was used for testing the significant differences of mean scores of the economic status of farmers before and after contract farming.

Results and Discussion

The results reveal the economic status of the farmers practising contract farming before and after adopting the contract farming.

Table 2 reveals that benefit-cost ratio is higher after contract farming. Accordingly, B:C ratio of Hassan, Tumkur, Kolar and Koppal districts was 13.15, 12.89, 9.24 and 7.00, respectively before contract farming was less

compared to after contract farming (16.20, 15.26, 12 and 13.18 respectively). It is clear that the total cost of cultivation increased after adopting contract farming in all the four districts but it was relatively high in Koppal district. The major reason for the result obtained was the type of crop under contract farming. In Koppal district crop under contract farming was the chilli seed production where the cost of production was also high because of high input requirements including the shade net used and the returns from the seed production were also considerably high. Kolar and Tumkur had gherkin crop under contract farming and had less increase in the B: C ratio compared to the other two districts. The gherkin is a new crop to the farmers and also strict enforcement of time of harvesting of crop might have resulted in decreased B:C ratio. The result is in confirmation with the findings of Keshavamurthy (2005).

Table 2 : Cost and Returns Under Contract Farming in the Selected Districts

Districts		Gross returns	Total cost	% increase in cost	Net returns	B:C ratio	Difference in B:C ratio
Hassan (N=30)	Before contract farming	80,733	6,139	47.10	73,133	13.15	3.05
	After contract farming	146,383	9,031		154,990	16.20	
Tumkur (N=30)	Before contract farming	57,700	4,474	59.11	48,087	12.89	2.37
	After contract farming	108,667	7,119		91,535	15.26	
Kolar (N=30)	Before contract farming	77800	8419.83	15.29	69380.17	9.24	2.76
	After contract farming	112066.7	9,706		100444	12.00	
Koppal (N=30)	Before contract farming	110,733	15,340	31.55	103,770	7.00	6.18
	After contract farming	266,000	20,180		245,783	13.18	
Pooled (N=30)	Before contract farming	81,741.5	8593.20	33.93	73592.50	10.57	3.59
	After contract farming	1,58,279.7	11509		1,48,188	14.16	

Economic status of farmers practising contract farming was represented in Table 3, it is evident that standard mean scores of economic status before contract farming was highest in Hassan (262.68) followed by Koppal 9253.65), Tumkur (252.79) and Kolar (232.19). It is also clear that standard mean scores of economic status after contract farming was highest in Koppal (300.16) followed by Kolar (299.85), Hassan (294.52) and Tumkur (290.32) districts. The percentage increase of the economic status is highest in Kolar (18.33) followed by Koppal (18.33), Tumkur (14.85 per cent) and Lowest in Hassan (12.12). It is very interesting to know that there is maximum per cent of increase in economic status of farmers from Kolar district after adopting the contract farming in their fields. This may be due to the reason that farmers of Kolar district were involved in vegetable production since many years and they were facing the problem of market fluctuation. Further, the gherkin crop for which they have entered into an agreement is a new crop and it does not require much input and pesticides compared to the earlier crops. The reduced cost of cultivation coupled with increased income resulted in B:C ratio.

Table 3 : Economic Status of Farmers Practising Contract Farming in Selected Districts of Karnataka

(N=30)

Districts	Standard mean scores		Per cent increase due to contract farming	Paired t-value
	Before contract farming	After contract farming		
Hassan	262.66	294.52	12.12	6.72*(4.73)
Tumkur	252.79	290.32	14.85	8.97*(4.18)
Kolar	232.19	299.85	29.13	14.39*(4.70)
Koppal	253.65	300.16	18.34	9.92*(4.69)
Total	250.25	296.25	18.38	17.90*(2.57)

*- Significant at 5 per cent (Note: Figures in bracket refers to Std. Error Mean of Paired differences).

Koppal district also had similar changes but less, compared to Kolar district. The seed production was practised by Koppal farmers under open field cultivation since many years. But after the contract farming the farmers were made to adopt the shade nets for cultivation of chilli seed production. This has resulted in increased cost of cultivation with slight increase in income. This might have resulted in higher B:C ratio. The findings were supported by the studies of Ramasundharam *et al.* (2005), Pramod (2006) and Roopa, (2006).

It was observed from the results that there were more financial and situational constraints than technological and extension constraints. Reason for the obtained result is

Table 4 : Problems Faced by Farmers in Practising Contract Farming

Problems	Tumkur (N=30)		Hassan (N=30)		Kolar (N=30)		Koppal (N=30)		Combined (N=30)	
	No.	%	No.	%	No.	%	No.	%	No.	%
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
I. Technological Constraints										
1. The popularity of crop itself is low	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
2. Varieties used are susceptible to pests and diseases	2	6.67	1	3.33	3	10.00	4	13.33	10	8.33
3. The yield levels of the crop are low	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
4. No constraints	28	93.33	29	96.67	27	90.00	26	86.67	110	91.67
II. Financial Constraints										
1. Non-availability of loans in required time	29	96.67	27	90.00	26	86.67	25	83.33	107	89.17
2. Non-availability of loans in required amount	30	100.00	28	93.33	28	93.33	27	90.00	113	94.17
3. Initial investment is high	21	70.00	17	56.67	20	66.67	19	63.33	77	64.17

(Contd.)

Table 4 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
4. Payment after delivery is delayed	11	36.67	8	26.67	14	46.67	10	33.33	43	35.83
5. High interest rate for loan	22	73.33	17	56.67	20	66.67	19	63.33	78	65.00
6. High cost of inputs	30	120	30	100	30	100	30	100	120	100
7. No constraints	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
III. Extension Constraints										
1. Poor technical assistance by the agency	3	10.00	6	20.00	6	20.00	5	16.67	20	16.67
2. Non-availability of technical assistance in required time	3	10.00	6	20.00	6	20.00	5	16.67	20	16.67
3. Lack of technical competency by extension workers	1	3.33	2	6.67	4	13.33	4	13.33	11	9.17
4. No fixed schedules of visit by extension workers	4	13.33	6	20.00	6	20.00	5	16.67	21	17.5
5. Lack of training on time and methods of harvesting	2	6.67	5	16.67	3	10.00	2	6.67	12	10.00
6. Lack of knowledge on grading and packaging	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
7. No constraints	27	90.00	24	80.00	23	76.67	25	83.33	80	66.67

(Contd.)

Table 4 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
IV. Situational Constraints										
1. Non-availability of inputs in required quantity	19	63.33	25	83.33	27	90.00	27	90.00	98	81.67
2. Non-availability of inputs in required time	19	63.33	24	80.00	27	90.00	26	86.67	96	80.00
3. Lack of storage facilities	0	0.00	2	6.67	2	6.67	3	10.00	7	5.83
4. Lack of transportation facilities	1	3.33	2	6.67	2	6.67	3	10.00	8	6.67
5. Lack of information on marketing channels	1	3.33	5	16.67	6	20.00	8	26.67	20	16.67
6. Non-availability of labours	30	100	30	100	30	100	30	100	120	100
7. Non-availability of custom hiring services	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
8. Labour requirement for operations is very high	30	100	30	100	30	100	30	100	120	100
a) No constraints	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
b) No constraints	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

Note : Multiple responses possible.

that the contract firms are efficiently providing the technical guidance and extension services time to time to all the farmers involved in contract farming to ensure maximum output with good quality. Further, it is mandatory on the part of the firms to provide the technical guidance as part of the agreement made in the contract or otherwise the company will also be at loss.

The contract firms will not compromise on the quality and recommended quantity of inputs to be used by the farmers, as a result the cost of such inputs will be more. Any compromise by the company in supplying the inputs will reduce the yield and quality of produce.This might have prompted the farmers to indicate that the cost of inputs supplied was more.

Farmers had a major problem of non-availability of labours in time and required number for timely operation.This may be due to the maintenance of quality of the produce which naturally demands more labours than usual. Further, the small family size restricts the availability of family labours and the migration of labours from rural areas to urban in search of employment might aggravate the problem of labour. Findings of Sukhpal Singh (2002**)** and Keshavamurthy (2005) were in confirmation with the results of the present study.

Suggestions given by the farmers practising contract farming presented in Table 5 reveal that majority of the farmers opted for settling of payments in time. They also suggested that cost of inputs should be reduced by the contract firms and increase the price for the produce. Further, half of the respondents suggested that there should be Government intervention for making strict laws to legalise the contracts. Few of the farmers suggested that more MNC's should be allowed to do such type of agri-business.

It was very interesting to know that farmers gave suggestions very critically to improve the contract farming in the country and to raise the economic status of the farmers. Cost of the inputs provided by the contract firms should be reduced as suggested by majority of the farmers. It was also suggested that the payments should be made in time since they were facing problems due to delayed payments. Government intervention for making strict laws to legalise the contracts was the important legal suggestion given by the farmers to improve the present status of the contract farming in the research areas.

It was very much interesting to know that farmers wanted more of the contract firms to be allowed to do contract farming since they had improved their economic conditions due to these contracts and wanted to gain more profits and avoid monopoly.The results were supported by the findings of Chawla (2002) and Keshavamurthy (2005).

Conclusion

Contract farming is found to be more ideal to enhance the income level of farmers. The results showed that there were no marketing and transportation risks on the part of the farmers. The B:C ratio worked out for both before and after adoption of contract farming indicated that contract farming is most profitable in improving the economic status of the farmers. Hence, extension workers need to educate interested farmers regarding contract farming for adoption. It was observed from the results that there were more financial and situational constraints than technological and extension constraints. This may be because the contract firms were efficiently providing the technical guidance and extension services from time to time to all the farmers involved in contract farming to ensure maximum output with good quality and it is

Table 5 : Suggestions of Farmers Practising Contract Farming

S.No.	Suggestions	Hassan (N=30)		Tumkur (N=30)		Kolar (N=30)		Koppal (N=30)		Combined (N=120)	
		No.	%	No.	%	No.	%	No.	%	No.	%
1.	Cost of inputs should be reduced by the contract firms	26	86.67	24	80.00	22	73.33	30	100	102	85.00
2.	Settling of payments should be in time	22	73.33	30	100	26	86.67	30	100	108	90.00
3.	Increased price for the produce	28	93.33	30	100	27	90.00	9	30.00	94	78.33
4.	Government intervention for making strict laws to legalise the contracts	16	53.33	19	63.33	20	66.67	14	46.67	69	57.5
5.	More MNC's should be allowed to do agri-business	25	83.33	0	0.00	0	0.00	0	0.00	25	20.83

Note : Multiple responses possible.

mandatory on the part of the firms to provide the technical guidance as part of the agreement made in the contract or otherwise the company will also be at loss. Further, it was very much interesting to know that farmers wanted more of the contract firms to be allowed to do contract farming since they had improved their economic conditions due to these contracts and wanted to gain more profits and avoid monopoly. Hence it may be concluded that contract farming is a boom in agriculture. Also, Government interventions are necessary for making strict laws to legalise the contracts and there is scope for multi-national companies to enlarge their area of coverage in any such similar locations.

References

1. Chawla, S., (2002), Contract Farming "Partners in Progress", *Agriculture Today,* Feb: 18-23.

2. Gurdev Singh and S.R.Asokan, Contract Farming in India : Text and Cases, CMA Monograph No. 213, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, (2005), pp. 57-59, 97, 140-43.

3. Keshava Murthy, N.N., (2005), A Study on Contract Farming in Gherkin Production, M.Sc (Agri) Thesis, University of Agricultural Sciences, Dharwad.

4. Mathur Kamal, Contract Farming Operations in India and Impact on Agricultural Marketing, National Institute of Agricultural Marketing (NIAM), Jaipur, (2004), (mimeographed).

5. Paty, B.K., (2005), Contract Farming in India-Progress and Potential, Agricultural Marketing, Directorate of Marketing and Inspection, Ministry of Agriculture, GoI. p: 13-19.

6. Pramod, M., (2006), Economics of Contract Farming of Green Chilli Production in Karnataka, M.Sc (Agri) Thesis, University of Agricultural Sciences, Bangalore.

7. Ramasundharam, P., Ingle Rajendra, Dhote, Sonali and Singh, M., (2005), Contract Farming in Cotton, Financing Agriculture, 49-53.

8. ROOPA, H.S., (2006), Economics of Contract Farming of Baby Corn Production in Karnataka, M.Sc (Agri) Thesis, University of Agricultural Sciences, Bangalore.

9. Singh Sukhpal, (2000), Theory and Practice of Contract Farming : A Review, *J. of Soc.Econ. Develp.,* 2(1):228-246.

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NIRD, Hyderabad.

SGSY : HOW MUCH BENEFICIAL ACROSS SOCIO-RELIGIOUS COMMUNITIES?

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ABSTRACT

The paper analysed the impact of 'Swarnajayanti Gram Swarojgar Yojana (SGSY)', a government sponsored micro-finance programme, on 'food expenditure', 'expenditure on temptation good', 'expenditure on children's education and health', 'business expenditure' and 'profit' across different castes, creeds and religious beliefs. Murshidabad district of West Bengal, India, was chosen as the field of investigation. During the survey stratification was done in terms of social hierarchy and religious beliefs. These are Upper Caste Hindus (UC); Other Backward Castes (OBC); Scheduled Castes (SC) and Muslims. Taking together they are called socio- religious communities (SRCs). To remove selection bias we used 'treatment effect model'. The paper reveals that participation in SGSY programme decreased 'food expenditure' across all SRCs significantly except Muslims. Borrowing from the SGSY programme has significant negative impact on 'expenditure on temptation good' for the households of UC and OBC communities. The influence is negative but insignificant for Muslim-programme participating households. However, participation in the SGSY programme increased expenditure on temptation good for SCs, though insignificantly. Borrowing from SGSY-run self-help group (SHG) enhanced spending on children's education and health across all SRCs, but significantly for UC and OBC. 'Business expenditure' and 'profit' increased significantly due to programme participation across all SRCs except Muslims. Programme participant Muslim –households get minimal benefits of this development programme among SRCs.

Introduction

The impact of any development programme differs widely among different castes, creeds and religions of a society. India is a multi-religious, multi-lingual and multi-cultural country. Variations in terms of human development, poverty and deprivation among socio-religious communities (SRCs) are wide, and evaluation of impact might yield a better picture if the process incorporates heterogeneity existing among social communities. This paper explores the impact of participation in government-sponsored micro-finance programme — the Swarnajayanti Gram Swarojgar Yojana (SGSY) - on 'expenditure on food', 'expenditure on temptation good','expenditure on education

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and health of children', 'expenditure on business' and 'profit' across communities of different faith and socio-economic status in West Bengal, India.

The existing economic research on micro- finance can be divided into two broad areas: (i) the theoretical analysis of the distinctive features of 'credit contracts'(like joint liability and dynamic incentives) with an emphasis on their implication for solving the adverse selection and moral hazard problems (See, for example, Stiglitz,1990, Besley and Coate,1995, Ghatak, 2000, Jain and Mansuri,2003, Aghion and Morduch, 2000, Laffont and Rey, 2003, and Rai and Sjostron,2004), and (ii) the empirical analysis that focuses on the evolution of the effects of such programmes on the welfare of the borrowers, especially the women (See, for example, Pitt and Khandker,1998, Morduch, 1998, Smith, 2002). However, there is no consensus among academicians on the impact of micro-credit. It is well recognised that the estimate of a causal effect obtained by comparing a treatment group with a non-experimental comparison group could be biased because of problems such as self-selection or some systematic judgment by the researcher in selecting units to be assigned to the treatment. It warrants for application of an appropriate technique like 'Treatment Effect'.

SGSY and Background Literature

SGSY scheme is an amalgamated version of six self-employment schemes. This scheme is based on ' joint liability'[1], 'progressive lending'[2] and 'back-ended subsidy'[3] principles. Initially each member has to contribute some amount to her group corpus regularly. At least after six months of the formation of the group, each SHG has to appear in graduation test. The performance of a group depends on the average number of meetings arranged by the group in a particular month, regularity of the monthly contribution, regularity of the repayment of loans etc. Consequently the group has to go through the II - gradation test, and ultimately become eligible to get subsidy. As groups pass different gradation tests, they become eligible to get higher amount of credit.

Though the programme is in vogue for more than one decade, there are meagre studies to provide a comprehensive picture as well as the impact generated by the programme. 'The Comptroller and Auditor General' (CAG Report on SGSY, 2003) observed that all over the country the programme could not be implemented in the desired manner. It was felt that the implementing agencies did not prepare the 'swarojgaris'[4] for taking up self-employment activities. In fact although the programme was conceived as process-oriented one, the activities, such as proper identification of 'swarojgaris', selection of key activities, market survey, networking the 'swarojgaris' were not carried out properly in many districts. The Report even went to the extent of saying that SGSY has not emerged as an improvement over the earlier Integrated Rural Development Programme (IRDP).

Another important study was taken up by the Centre for Management Development, Thiruvanantapuram in 2004 on impact assessment of the programme and found marginal improvement in income. The average annual incremental income earned by the individuals due to the assistance under the programme was ₹ 8800 whereas in case of group 'swarojgaris' it was substantial, ₹ 34,920. The study also found that in 89 per cent district line department participated actively. It was also observed that nearly 72 per cent of the respondents did not undergo any training for skill development. The average cost of various individual projects taken up under the programme in different States varied from ₹ 16,000 to 40,000. Nearly half of the respondents did not obtain second or multiple

doses of credit. This apart, the Ministry of Rural Development, Government of India also commissioned district-wise studies across the country to know the impact of rural development programmes, including SGSY.

National Institute of Rural Development, Hyderabad conducted a national level study on SGSY during 2006. The average post-project income of the SGSY group 'swarojgaris' was ₹ 1356, at least 46 per cent less than the level of income desired in the project objectives. Kundu (2008) observed in 'Bankura' district that SGSY helped the rural poor to reduce their poverty but failed to reduce their vulnerability. Thekkekara (2008) found in Amaravati district, Maharashtra that the 'swarojgaris' formed SHGs solely with the objective of availing of subsidy of the programme. She further found that the assumption on investment levels necessary for poverty alleviation under SGSY was unrealistic.

Lyngdoh and Pati (2011) conducted a study in 'Meghalaya'. The study revealed that micro-finance has resulted in a positive socio-economic change for the borrowers. It has led to an appreciation of income, expenditure, savings, increased access to productive assets and household property etc. Kalpana (2011) in her study in 'Tamil Nadu' found that out of 97 sample respondents, 33 directly invested some part of their SHG loans to finance a total of 37 income-generation activities. Only 17 of the 37 activities (46 per cent) were initiated by respondents after joining SHGs, with the remaining having existed prior to joining SHGs. SHG-member households, which did not own capital assets (that could serve as a financial cushion in case of a business downturn) nor had prior entrepreneurial experience, were unwilling to make investments in new business activity.

Sawtelle, (1993) estimated two linear Engel functions for household total expenditure using US cross section data. Using data from the United States, Lee and Brown, (1986) examined food expenditure of household. However, studies on consumption in the context of developing countries are not overwhelming. In this regard it is worth mentioning the study conducted by Weiskoff (1971), who studied demand elasticity for the developing economy. Ray and Meenakshi (2002), combined the expenditure and demographic information contained in the unit records of nearly 70,000 households to analyse rural poverty in India. Research suggests that access to credit has the potential to reduce poverty significantly (Khandker, 1998, Wahid, 1993; Khandker, 2003). Based on the success stories (Hossain, 1988; Hulme et al. 1996; Yaron, 1992; Montgomery et al. 1996) it is assumed that micro-credit is improving the standard of living and well-being of the borrowers by improving their level of consumption. Rahaman et al. (2012) investigated the consumption behaviour of the borrowers from two major micro-credit institutions in Bangladesh and compared that with the non-borrowers of the same category. The study suggests that borrowers of micro-credit programmes are better-off in terms of consumption of most of the food and non-food items compared to non-borrowers.

Micro-finance interventions have been shown to have a positive impact on the education of clients' children. Littlefield, Morduch and Hashemi (2003) state that one of the first things that poor people do with new income from micro-enterprise activities are to invest in their children's education. Studies show that children of micro-finance clients are more likely to go to school and stay longer in school than that of the non-clients. Similar findings were seen for projects in Zimbabwe, India, Honduras and Bangladesh.

The literature on enterprise dynamics (entry, growth, exit) in developing countries shows that firm characteristics such as age, size, location and sector in which the enterprise operates are important. In addition, personal

characteristics of the owner matter, such as education, age and gender. Less is known, however, about the determinants of enterprises' success in terms of profits. In an early study, Vijverberg (1991) found no significant determinants of profits among self-employed persons in the food commerce sector in Cote d'Ivoir. More recent research by Masakure et al. (2008), on non-farm micro-enterprises in Ghana, confirmed the results found in the literature on enterprise dynamics. The study showed that size, sector and the number of months the firm was in operation during the past year determined MSEs' financial performance. Some of these studies also suggested a role of risk in determining firm profitability (Fajnzylber et al., 2006). The psychology literature describes the importance of risk attitude of the entrepreneur and how this relates to firm performance (e.g. Rauch & Frese, 2000; Kraus et al., 2005).

Methodology

Field Selection : The district of Murshidabad, West Bengal was chosen as the field of study. The district is one of the most backward districts in the country in terms of human development index (Sachar, 2006). As per Census-2001, the district is most densely Muslim populated district in the country. Therefore, it is interesting to observe how programme participants of a backward district get benefited from the programme. 'Sachar Committee Report (2006)' portrayed heart-rending socio-economic conditions for the Muslims. Therefore, the district becomes a pertinent field to measure the impact of the programme across socio-religious communities. At the first stage of sampling of SHGs under SGSY scheme, however, an intervening stratification by categories of communities was introduced. SHGs were classified among four strata by caste and community affiliation : Upper Caste Hindus (UCs), Scheduled Caste Hindus (SCs), Other Backward Castes (OBCs) and Muslims. A survey was conducted in both programme-villages[5] and non-programme-villages[6]. These data are a part of two-year panel data. A survey was conducted both in 2006 and 2008. Overview of sampling across socio-religious communities (SRCs) in 2008 is given in Table 1.

Table 1 : Overview of Sample Size Across Socio-Religious Communities

District : Murshidabad Socio-Religious Communities	No. of SHG member-households under SGSY groups covered in programme villages	Non-SHG member-households covered in programme villages	Non-SHG member-households covered in non-programme villages
UC	109	50	30
OBC	58	27	10
SC	55	28	10
Muslim	55	27	10
Total	277	132	60

Method of Impact Analysis : Simply using non-participating households as a control group will not be a solution to address selection biases. In order to identify such a control group, the best strategy is to find out exogenous eligibility conditions used by the lenders in selecting a borrower (Nagyuen, 2007). These exogenous requirements will help to define who among non-participating households are compared with participants. Pitt and Khandker (1998),Morduch (1998) and Khandker (2003) used the 'Grameen Bank's' eligibility requirement of maximum landholding of 0.5 acre to define control group. However, we do not find that sort of exogenous eligibility in our data.

The basic problem of impact analysis is to find the missing counterfactual. 'Counterfactual framework' is proposed by Rubin (1973) and subsequently used by both statisticians and econometricians (Rosenbaum and Rubin (1983), Heckman, Imbene and Angrist (1994), Heckman, Ichimura and Todd (1997), Jalan and Ravallion (2003) among others) to estimate the average treatment effects. Let Y_1 denotes the outcome with treatment and Y_0 denotes outcome without treatment.

Recognise that a unit cannot simultaneously be in both states. So, we cannot observe both Y_1 and Y_0 at the same time for the same unit. This is known as "missing data" problem. Let t be a binary indicator, where t=1 indicates participation in the programme and t=0 otherwise. (Y_1, Y_0, t) represents a random vector from the population of interest. For a random draw i from the population, the relevant vector is (Y_{1i}, Y_{0i}, ti). The implicit assumption that we make is that treatment of the unit i affects only the outcome of the unit i and does not affect any other unit's outcome. Moreover, (Y_1, Y_0) could be correlated with t.

To measure the impact of the programme, we are interested in the difference in outcomes with and without treatment. Several estimators are possible. We use the standard estimator of the average treatment on the treated (ATE) defined as :

$$ATE = E(Y_1 - Y_0|t=1) \ldots\ldots\ldots\ldots (1)$$

i.e. the mean effect of the programme on the participants. Furthermore, if X is a vector of observed covariates, ATE can be redefined as :

$$ATE = E(Y_1 - Y_0| t=1, X) \ldots\ldots\ldots\ldots\ldots (2)$$

Right at the beginning of the discussion we had posed the econometric problem underlying the estimation of programme impacts as that of "missing data". That is, for each treated (non-treated), at any point in time, we observe only Y_1 (Y_0). The observed outcome is:

$$Y = Y_0 + t(Y_1 - Y_0) \ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

The question, therefore, remains as to what do we do about the 'missing data' problem?

Imagine we have access to data on a large number of treated and non-treated in one region.

One approach is to take the average of both groups and examine the difference between average t scores on outcomes. In a large sample, this will converge to

$$D = E(Y_1 |t=1) - E(Y_0|t=0) \ldots\ldots\ldots\ldots (4)$$

Subtracting and adding $E(Y_0|t=1)$. i.e., the expected outcome for a subject in the treatment group had she not been treated (a quantity that cannot be observed but is logically well defined)

We obtain,

$$D = E(Y_1 |t=1) - E(Y_0|t=1) + E(Y_0 |t=1) - E(Y_0|t=0) \ldots\ldots\ldots (5)$$

$$= E(Y_1 - Y_0 | t=1, X) + E(Y_0 | t=1) - E(Y_0 | t=0) \quad \ldots\ldots\ldots\ldots (6)$$

The first term, $E(Y_1 - Y_0 | t=1, X)$ is the treatment effect that we are trying to isolate (i.e., the effect of treatment on the treated) whereas $E(Y_0 | t=1) - E(Y_0 | t=0)$ is selection bias. In reality it is impossible to observe the counterfactual $E(Y_0 | t=1)$. Therefore, ATE can be identified only when $E(Y_0 | t=1) = E(Y_0 | t=0)$. This is possible in case of randomisation. In non-experimental studies one has to invoke some identifying assumptions to solve the selection problem. One possible identification strategy is to assume, that given a set of observable covariates *X* which are not affected by treatment, potential outcomes are independent of treatment assignment : Y_0, Y_1 II t | X for all X. This condition is known as 'Conditional Independence Assumption'. Then no need to worry about unobservable heterogeneity. The situation is as if people were selected in the programme only on the basis of observable characteristics. If there is a selection on observable, then the counterfactual outcome for participant i is equal to the outcome of non-participant j with the same observable attributes. Matching provides a way of controlling for observable heterogeneity by finding in the comparison group look-alikes for participants, based on some tolerance criterion. This is an attempt to replicate the 'all other things being equal or held constant' solution subject to conditional independence.

In practice matching directly on observable characteristics becomes more and more difficult, the larger the set of attributes. The dimensionality of the problem can be significantly reduced by matching on the propensity score i.e. the probability of participation, p(X) (Rosenbaum and Rubin, 1983). Thus, instead of conditioning on n-dimensional variable; units are matched with the basis of a scalar variable. 'Propensity score' analysis requires a large set of data. As we want to make a comparative analysis across the SRCs, and size of the data is not sufficiently large , we are not in a position to apply 'propensity score analysis'. 'Treatment Effect' model in this regard might be an efficient way to measure the impact of SGSY programme across SRCs. In treatment effect model a dummy variable D_i indicates the treatment condition where $D_i = 1$ for the programme participants and $D_i = 0$ otherwise. This Di directly enters into the regression equation. Outcome variable D_i of the regression equation is observed for both the programme participants as well as non-programme participants. Here 'Treatment Effect' model differs from Heckman's 'Sample Selection Model'. In Heckman's model outcome variable Y_i of the regression equation is observed for the treated i.e. the programme participants only. The 'Treatment Effect' model is expressed in terms of following two equations:

Regression equation

$$Y_i = X_i \beta + D_i \delta + \varepsilon_i \quad \ldots\ldots\ldots\ldots (7)$$

Selection equation :

$$D_i^* = Z_i \lambda + \mu_i \text{ , } D_i = 1 \text{ if } D_i^* > 0 \text{ and } D_i = 0 \text{ otherwise} \quad \ldots\ldots (8)$$

$$\text{Prob}(D_i = 1 | Z_i) = \varphi(Z_i \gamma)$$

and $\text{Prob}(D_i = 0 | Z_i) = 1 - \varphi(Z_i \gamma)$,where ε and μ are bivariate normal with mean zero and covariate matrix

$$\begin{bmatrix} \delta & \rho \\ \rho & 1 \end{bmatrix}$$

Given incidental truncation or sample selection and that D is an endogenous dummy variable, the evaluation task is to use the

observed variables to estimate the regression coefficients β, while controlling for selection bias induced by non-ignorable treatment assignment (Guo and Fraser, 2010). Model consisting equation (7) and (8) is a switching regression model where for the treated or programme participants the outcome model is :

$Y_i = X_i \beta + (Z_i \gamma + \mu_i) \delta + \varepsilon_i$, and for the non-treated the outcome model is

$Y_i = X_i \beta + \varepsilon_i$.

This model can be estimated in a two-step procedure. The log likelihood function following Madala (1983) for participant i are as follows : for D_i =1,

$$= \ln \phi\{\frac{-Z_i\gamma + (Y_i - X_i\beta - \delta)\rho/\sigma}{\sqrt{1-\rho^2}}\} - \frac{1}{2}\left(\frac{Y_i - X_i - \delta}{\sigma}\right) - \ln\left(\sqrt{2\pi\sigma}\right) \qquad \ldots\ldots(9)$$

For D_i =0 .....(10)

$$= \ln \phi\{\frac{-Z_i\gamma(Y_i - X_i\beta)\rho/\sigma}{\sqrt{1-\rho^2}}\} - \frac{1}{2}\left(\frac{Y_i - X_i - \delta}{\sigma}\right) - \ln\left(\sqrt{2\pi\sigma}\right) \qquad \ldots\ldots(10)$$

Factors Determining SGSY Participation : The participation in SGSY programme is determined, as specified in equation (8), by a host of factors at the household and group level, including physical endowments (such as land) and human capital (such as education), given the availability of the programme in a village. Equation (8) has to be estimated jointly with equation (7). Di is a binary variable and Z_i consists of following variables: 'number of years living in the same locality', 'index of women's access to public offices and processes of political activities[7]' 'index of household's social capital[8]', 'education level', 'education level[2]', 'wealth of the household, 'wealth of the household[2]', 'gender of the household head', and 'occupation of the household head'.

Our a priori expectation is that likelihood of participating in the SGSY programme is positively related with 'number of years of living in the same locality','index of women's access to public offices and processes of political activities' 'index of household's social capital', 'education level', and 'wealth of the household'. Each of the variables can positively influence the likelihood of participation in the SGSY programme. The square value of education and wealth has been taken to see whether there exists any non-linear relationship between these variables and likelihood of participation. It is expected that women-headed households have a high probability of participating in the SGSY programme. Gender of the household is a binary variable, and male gender of the household is the reference category. We further postulate that if the occupation of the household head is non-agriculture like petty trading, then there is greater likelihood to participate in the SGSY programme. 'Occupation of the household head' is also a binary variable, and occupation-agriculture is the reference category.

IMPACT ANALYSIS, RESULTS AND DISCUSSION

Impact of SGSY on Food Expenditure

Here we calculate expenditure of household on food items. The food items are;

(a) cereals and cereal substitutes; (b) pulses and their products (including gram); (c) milk and milk products; (d) edible oil; (e) egg, fish and meat; (f) vegetables and fruits and (g) sugar, salt, spices and processed food. The value of consumption of food for a period of 30 days is obtained for a surveyed household.

In equation (7) Y is the outcome variable 'monthly per capita expenditure on food' and X is the vector of following explanatory variables:

i. Household Size : If household size is large, then there may be lower consumption expenditure. Following the conversion to adult equivalents used by Townsend (1994) for rural Andhra Pradesh and Maharashtra, the weights are: for adult males, 1.0; for adult females, 0.9. For males and females aged 13-18, 0.94, and 0.83, respectively; for children aged 7-12, 0.67 regardless of gender; for children 4-6, 0.52; for toddlers 1-3, 0.32; and for infants 0.05.

ii. Gender of the Household Head : This variable is binary in nature. It takes value 1 if the household head is female, and zero otherwise. Most of the women-headed households are resource-poor in nature. So a woman-headed household will spend less compared to the reference category.

iii. Age of the Household Head : As per the report of 'Euro Stat' (2008) the mean consumption expenditure of a household whose head is aged between 30 to 59 years old tends to be much higher than the equivalent expenditure of household whose head is either aged under 30 or over 60. We take age as an explanatory variable.

iv. Occupation of the Household Head : We assume that if the occupation of the household head is non-agriculture, then the expenditure will be lower. This variable is a dummy variable.

v. Number of Working Adults in the Households : As may be expected, there is a strong link between household income and expenditure. There is supposed to be a strong correlation between average household consumption expenditure, the size of households and the number of active persons in the household. Household consumption expenditure was higher in households with three or more adults with dependent children and lowest within single person households; households with three or more active people spent more than households with no active people. Nevertheless, in both cases the relationship was not linear: economies of scale (for example, sharing a flat or a car, heating a room, etc.) may, at least to some degree, explain why the expenditure of a single person is generally considerably more than half the expenditure of a couple.

vi. Social Security Measures : Whether household members have the opportunity of protectional or promotional social security measures. Availability of social security measures increases household expenditure. We consider here whether household members get the benefits of 'National Rural Employment Guarantee Programme (NREGP)', 'National Old Age Pension Schemes (NOAPs)', 'National Family Benefit Schemes (NBFS)', 'Scheme for Handloom Weavers and Artisans', 'Janshree Bima Yojana' and 'Krishi Shramik Samajik Suraksh Yojana'. All these schemes have been introduced by the Government of India.

We estimate both equations (7) and (8) for each of the four socio-religious communities UC, OBC, SC and Muslims using 'Treatment Effect Model'. In each case non-programme participant households become the reference category. Regression results are as follows :

From the above Table we can observe that 'lambda' is significant for all the SRCs, i.e.,

Table 2 : Impact of Borrowing from SGSY on 'Expenditure on Food' Across SRCs

SRCs Variables	UC	OBC	SC	Muslims
Constant	14.63**(6.13)	18.461* (3.28)	23.45* (5.017)	20.703*(2.185)
Household Size	3.51** (1.405)	2.85 (1.9)	1.557 (1.47)	2.58** (.124)
Gender of Household Head (Ref: Male)	-.313 (1.32)	-.11 (.28)	-.903*** (.524)	.077 (.187)
Age of the HH	.198 (.438)	.256 (.291)	.236 (.253)	.138 (.163)
Occupation of the HH (Ref: Agriculture)	2.62 (1.59)	.699*** (.403)	1.27* (.434)	.169 (.248)
No. of Working Adults	5.54* (1.75)	1.4* (.43)	5.837* (1.7)	.82 (.715)
Social Security Measures (Ref: No social security)	2.175**(1.064)	.075 (.247)	1.232** (.532)	.042 (.29)
Participation in SGSY Programme (Ref : Non-participation)	-7.37** (3.21)	-1.835*** (.995)	-1.496* (.412)	-1.358 (2.29)
Participation in SGSY Programme				
Constant	-.64 (3.13)	4.139 (4.53)	2.35 (1.75)	-6.60 (5.42)
No. of Years Living in the Same Locality	.054 (.124)	.153 (.156)	.053 (.11)	.045 (.185)
Index of Women's Access to Public Office	.327 (.22)	.08 (.281)	.2053 (.134)	.376 (.284)
Household's Social Capital	.027 (.116)	.0226 (.179)	.0789 (.073)	.060 (.114)
Education Level	.112*** (.057)	.126*** (.067)	.0111 (.012)	-.030 (.03)
Education Level^2	-.076*** (.043)	-.053 (.047)	-.0158 (.024)	.012 (.044)
Wealth	.063 (.06)	.068 (.094)	.0013 (.041)	.097 (.106)
Wealth^2	-.027 (.046)	.188 (.196)	-.0129 (.037)	.269 (.261)
Gender of Household Head	.73** (.37)	.367 (.439)	.561*** (.241)	.213 (.501)
Wald Chi^2	33.1	68.79	151.18	49.70
Prob> Chi^2	.0003	0.000	0.000	0.000
Λ (Lambda)	-4.921**(2.063)	1.14***(.59)	-.535** (.209)	-.954* (.244)

*, ** and *** imply significance at 1, 5 and 10 % level of significance.

correlation between error terms of equations (7) and (8) are non-zero. It creates selection bias in estimation. Therefore, 'treatment effect' model is appropriate in this context. All Wald statistics are significant. It implies that all covariates used in the regression model may be appropriate, and at least one of the covariates has an effect that is not equal to zero. From the lower panel of the above Table we can see that 'household size', 'number of working adults 'and 'social security measures' have significant positive impact on the decision of SGSY programme participation. Households having more members, more working adults and social security measures are more likely to join the SGSY programme. These variables create 'selection biases' in the estimation of food expenditure for UCs. Treatment effect is an indicator of programme impact net of observed selection bias. This statistic is shown by the coefficients of the variable 'participation in the SGSY programme' in the upper panel of the Table.

From the above Table it is evident that 'expenditure on food' has been decreased 7.37, 1.835, 1.496 and 1.358 times for UC, OBC, SC and Muslim programme-participating households compared to non-programme participating households. This result does not corroborate the available evidence that participation in micro-finance programme enhances food expenditure. This decline in food expenditure could be to meet increased business expenditure.

Impact of SGSY on 'Temptation Good'

Experimental studies have defined addiction in terms of reinforcement, acquired tolerance and withdrawal. Reinforcement implies a learned response to past consumption; that is, greater past consumption raises the marginal utility of current consumption. Acquired tolerance: a given level of current consumption is less satisfying when past consumption is higher. Withdrawal: a negative physical reaction and other reductions in satisfaction as current consumptions are terminated.

'Temptation good' comprises the following items : (a) betel leaves including supari, lime and katha; (b) tobacco and its product; (c) liquor; (iv) intoxicants like 'mahua' and 'ganza'; (d) meals or snacks consumed outside the home; and (e) lottery tickets and gambling. In surveyed household respondents were asked expenditure on these items for the last thirty days. We want to estimate the impact of SGSY participation on the monthly per capita expenditure on 'temptation good'. In equation (7) X contains following explanatory variables:

i. Mean Education of the Household : A better-educated household will realise the danger of negative relationship between education and 'expenditure on temptation good'.

ii. Gender of the Household Head : There are several findings that if money is channeled through women, then there is less likelihood of spending money in 'temptation good'. Therefore, we expect a positive relationship between these variables.

iii. The Highest Level of Female Education in the Household : We measure female education in terms of years of formal education. A better-educated woman should have greater say in the financial matters, and acquaint with the hazard of 'temptation good'.

iv. Occupation of the Household Head: We assume that if the occupation of the household head is non-agriculture, then expenditure on 'temptation good' will be lower. This is a binary variable and reference category is agriculture.

v. Working Adults : Large number of working adults in the household mean the household is economically better-off.

However, we do not assume any positive or negative relationship between working adults and expenditure on 'temptation good'.

vi. Participation in SGSY Programme: Participation in SGSY programme or micro-finance programme releases a series of positive effects. It has the potential to empower women, and make aware people about the evils of addiction or gambling. Therefore, we anticipate a negative relationship between participation in micro-finance programme and expenditure on temptation good.

We estimate equation (7) and (8) jointly for each of the four SRCs i.e. UCs, OBCs, SCs and Muslims. In all these cases non-programme participant households are reference categories.

Regression result shows that borrowing from SGSY programme has significantly reduced spending on temptation good for UCs and OBCs, but enhanced spending on temptation good for SCs. Education has a strong negative influence on the expenditure on temptation good. We do not get any significant impact of the gender of the household head on this expenditure. 'Number of working adults', a proxy of household financial status has some positive impact on spending on temptation good, though insignificant. Female education is one of the variables that curtail spending on temptation good.

Values of 'Wald-chi-square' are significant across all the SRCs. It implies, covariates used in the regression models are appropriate. Statistically significant values of lambda justify use of 'treatment effect model' for estimation.

Impact of SGSY on the Expenditure on Education and Health of Children

'Expenditure on education and health of children' consists of following items (a) expenditure on books, paper, pen and pencil; (b) fees to educational institute; (c) fees to private tutor; (d) expenditure incurred on account of journey to educational institute; (e) expenditure on medicine; (f) payments to doctor, nurse, hospital and nursing home; and (g) expenditure on clinical test. During the survey respondent was asked about the expenditure on the above-mentioned heads of children for the last 365 days. Total expenditure on this account is divided by 12 to get monthly 'expenditure on health and education of children'.

Following factors influence spending on education and health of children:

i. Mean Education of the Household : In an educated household, it is expected that they will realise the benefit of good health and education for the better future of their child. Therefore, in an educated household it is expected that 'expenditure on education and health of children will be higher'.

ii. Gender of the Household Head : There are ample evidences that if credit is channeled through women, then a significant portion of that credit goes to the betterment of children. In a woman-headed household it is expected that spending on children's health and education will be higher compared to male-headed household.

iii. The Highest Level of Female Education : Higher female education in the household will put more emphasis in the spending on children's education and health. Higher female education should have some positive impact on this spending.

iv. Occupation of the Household Head : We postulate that if the occupation of the household is non-agriculture, then spending will be higher in children's education and health. The variable is a dummy variable, and agriculture is the reference category.

Table 3 : Impact of Borrowing from SGSY Programme on the 'Expenditure on Temptation Good' Across SRCs

SRCs Variables	UC	OBC	SC	Muslims
Constant	-1.964 (1.537)	6.238* (1.48)	6.70* (1.26)	4.15* (.515)
Mean Education of the Household	-.338** (.152)	-.066* (.018)	-.052 (.074)	-.104 (.135)
Gender of Household Head (Ref : Male)	.109 (.123)	.132 (.114)	.1607 (.99)	.06 (.081)
Highest Level of Female Education in the Household	–1.201* (.044)	-.089** (.043)	-.103 (.068)	.029 (.187)
Occupation of the HH	-.214 (.178)	-.381** (.184)	-.1513 (.162)	.263 (.191)
No. of Working Adults (Ref : Agriculture)	.279 (.189)	.32 (.256)	.237 (.136)	.162 (.109)
Participation inSGSY Programme (Ref : Non-participation)	-.625* (.221)	-.867* (.322)	-.105(.307)	.355(1.48)
Participation in SGSY Programme				
Constant	-.64 (3.137)	-13.57 (10.25)	-6.60 (5.42)	-.475 (2.86)
No. of Years Living in the Same Locality	.054 (.124)	.493 (.302)	.045 (.185)	.535** (.245)
Index of Women's Access to Public Office	-.327 (.22)	.662 (.478)	.376 (.284)	.099 (.273)
Household's Social Capital	.027 (.116)	.483 (.371)	.0607 (.114)	.025 (.075)
Education Level	.112** (.057)	.546* (.195)	-.03 (.031)	.169 (.186)
Education Level^2	-.076** (.043)	-.01 (.08)	-.012 (.043)	-.012 (.012)
Wealth	.063 (.06)	.706** (.342)	.097 (.106)	.013 (.037)
Wealth^2	-.249 (.324)	-.041 (.178)	-.2694 (.261)	-.074 (.081)
Gender of Household Head	.73** (.37)	.744 (.656)	.871** (.34)	.145 (.141)
Wald Chi^2	36.37	24.28	54.27	35.07
Prob> Chi^2	0.000	.0039	0.000	0.000
Λ (Lambda)	-.584* (.194)	-.383** (.149)	.309** (.141)	-.405** (.18)

*, ** and *** imply significance at 1, 5 and 10 % level of significance.

v. Number of Working Adults : Number of working adults has been taken as proxy of economic status. An affluent family will put more emphasis on the education and health of children.

vi. Number of Children : There should be a positive correlation between number of children and spending on education and health.

vii. Participation in SGSY Programme : Through participation in SGSY-run SHGs, participants, particularly women become familiar with the outer world. They become aware about the better health and education of the children. Therefore, programme participating households could have higher spending on children's education and health.

Participation in SGSY programme increased 'expenditure on children's health and education' across all SRCs; however, we get a significant impact on the participants of UC and OBC communities. It further corroborates that even after removing selection bias, the impact of SGSY programme participation has varied impact across different castes and creeds. Enhanced income and greater awareness regarding children's health and education through participation in SGSY programme may encourage parents to spend more on children. Among other explanatory variables, education of the household head has a positive and significant impact on this spending. If the occupation of the household head is non-agriculture, then household's spending for children's schooling and health will also rise. Number of working adults, a proxy of economic status, has significant positive impact on the spending for OBCs and SCs, not for UCs or OBCs. 'Number of children' has a positive and significant influence on the spending for the members of UC community only. Among the explanatory variables of SGSY programme participation, all variables except square values of education and wealth have positive impacts on the likelihood of participating SGSY programme. In the woman-headed household the likelihood of participating in the SGSY programme is significantly higher compared to the reference category. Wald statistics show, goodness of fit of the model is high across the regression equations of all SRCs. Significant values of lambda show the existence of selection bias if equation (7) is estimated without considering equation (8).

Impact on Business Expenditure

Business Expenditure : Following Banerjee et al (2009), business has been defined as an activity conducted to earn money where one is not someone's employee. Business expenditure means expenditure to start a new business or expand existing business. It includes: (a) working capital; (b) expenditure on the asset; (c) inputs and (d) wage bill (number of employees multiplied by existing market wage). Employees are individuals who earn a wage for working for someone else. Household members are not considered as employees. Following are the determinants of business expenditure.

i. Mean Education of the Household : Education will increase one's confidence, and she will be willing to take bigger project. Therefore, education will increase business expenditure.

ii. Age of the Household Head : Higher age will dampen the spirit of taking bigger investment; therefore, there should be a negative relationship between age of the household head and business expenditure.

iii. Occupation of the Household Head : If the occupation of the household head is non-agriculture, then we expect a positive relationship between occupation and business expenditure.

Table 4 : Impact of SGSY Participation on 'Expenditure on Children's Education and Health'

SRCs Variables	UC	OBC	SC	Muslims
Constant	30.45*(5.52)	36.22** (11.06)	20.19** (9.66)	25.46* (4.75)
Mean Male Education of the Household	1.51* (.42)	2.708** (1.136)	1.6 (1.523)	1.097 (1.270)
Gender of the Household Head (Ref : Male)	.66 (.5)	.696 (1.21)	.88 (.713)	.638 (.407)
Mean Female Education	.187 (.16)	.22 (.331)	.23 (.218)	.199 (.203)
Occupation of the Household Head (Ref : Agriculture)	.205* (.069)	.156 (1.27)	.54 (1.13)	.474 (.540)
Number of Working Adults	.28 (.39)	1.94* (.759)	2.54* (.65)	.452 (.338)
Number of Children	.502** (.21)	.182 (.392)	.28 (.32)	.2 (.1606)
Participation in SGSY Programme (Ref : Non-participation)	4.5* (2.17)	8.902* (2.92)	1.36 (1.60)	1.416 (.898)
Participation in SGSY Programme				
Constant	-2.35 (1.76)	-1.64 (1.13)	2.045 (1.85)	-6.608 (5.426)
No. of Years Living in the Same Locality	.053 (.071)	.054 (.124)	.037 (.028)	.045 (.185)
Index of Women's Access to Public Office	.205 (.134)	.327 (.22)	.260 (.214)	.376 (.284)
Household's Social Capital	.078 (.073)	.027 (.116)	.030 (.031)	.06 (.114)
Education Level	.111 (.012)	.112 (.57)	.12 (.43)	.309 (.31)
Education Level^2	-.158 (.24)	-.76(.53)	-.57 (.46)	.122 (.439)
Wealth	.013 (.0414)	.063 (.060)	.069 (.261)	.097 (.106)
Wealth^2	-.013 (.037)	-.028 (.046)	-.051 (.040)	.069 (.061)
Gender of Household Head	.562** (.241)	.73** (.37)	.608 (.426)	.871* (.330)
Wald Chi^2	44.17	36.59	52.81	28.73
Prob> Chi^2	0.000	0.0001	0.00	.0014
Λ (Lambda)	.214** (.123)	.564* (.184)	.201** (.098)	-.202* (.053)

*, ** and *** imply significance at 1, 5 and 10 % level of significance.

iv. Any Prior Business Experience : Some prior knowledge of business will encourage the investor to invest in a relatively large project. Therefore, any prior business knowledge will increase business expenditure.

v. Number of Dependents on the Family : More dependent members in the family reduce surplus for investment in business. Therefore, we can get a negative relationship between business expenditure and number of dependents in the family.

vi. Number of Working Adults in the Family : As we take the number of working adults as a proxy of the economic status of the family, an economically better-off family will be more akin to take a larger project.

vi. Participation in SGSY Programme : SGSY programme participants get easy access to credit and subsidy. It helps them to invest more. So, we anticipate a positive relationship between 'business expenditure and participation in SGSY.'

Participation in SGSY programme has significantly increased business expenditure for all the programme participants across SRCs except Muslims. Business expenditure increased 1.16, 1.72 and 1.627 times for UC, OBC and SC programme participating households compared to non-programme participants. This impact is net of observed selection bias. Values of lambda show presence of selection bias in the model. All SHGs of our sample are four years old. Amount of credit or subsidy that an SHG gets depends on whether it has passed grade-I or grade-II. The success in gradation test depends on regularity of repayment, internal lending and subscription to group corpus. Most of the Muslim-SHGs were unable to perform better on these criteria. As a consequence they got smaller amount of credit or subsidy, and failed to invest more in their business. 'Age of the household head' has a strong negative effect on the business expenditure across all SRCs. Higher age restricts individual to invest in a comparatively expensive project. If the occupation of the household head is non-agriculture, then the expenditure on business will be higher.We got a positive and significant impact on UCs and OBCs. More working adults in the household bring more money in the home, and a portion of that money is invested in the business. We got a positive impact of the number of working adults for the programme participants of all SRCs, however, significant for SCs and UCs. More dependents in the household reduced business expenditure across all the programme participants, but significantly more compared to the control group across the households of UCs and SCs. Education and business skills have some insignificant positive impact on business expenditure.

Business Profit

Business profit has been defined as monthly business revenue less monthly input cost. Regarding business revenues respondents were asked : 'how much of the item did you sell in the last month, and how much did you get for them'.

Following are the determinants of profitability :

i. Mean Education of the Household : In an educated household it is expected that the business will be run in a more efficient way. We postulate a positive relationship between education of the household and profit.

ii. Any Prior Business Experience : Any prior business experience will help the entrepreneur to invest her money in most profitable venture given the existing forward and backward linkages. Therefore, prior

Table 5: Impact of SGSY Participation on Business Expenditure

SRCs Variables	UC	OBC	SC	Muslims
Constant	32.63*(3.86)	17.98*(3.73)	17.86*(3.36)	29.15*(3.13)
Mean Male Education of the Household	.284(.16)	.261(.361)	.205(.186)	.391(.314)
Any Prior Business Experience (Ref : No Business Experience)	.1(.179)	.257(.325)	.363(.273)	.352(.258)
Age of the Household Head	-.465*(.146)	-.184(.234)	-.837*(.239)	-.419**(.199)
Occupation of the Household Head (Ref : Agriculture)	2.56*(.214)	2.204*(.288)	.569(.383)	.679(.411)
Number of Working Adults	.8*(.238)	.525 (.452)	1.016**(.38)	.231(.335)
Number of Dependents in the Family	-.143(.182)	-.134(.129)	-.204***(.112)	-.094(.115)
Participation in SGSY Programme (Ref : Non-participation)	1.16**(.601)	1.72**(.822)	1.627*(.608)	.672(.783)
Participation in SGSY Programme				
Constant	2.35(1.75)	-2.329(4.09)	-6.608(5.42)	-2.64(3.13)
No. of Years Living in the Same Locality	.005(.071)	.044(.125)	.045(.185)	.054(.124)
Index of Women's Access to Public Office	.205(.134)	.287(.227)	.376(.284)	.327(.22)
Household's Social Capital	.011(.073)	.037(.118)	.06(.114)	.027(.116)
Education Level	.078(.073)	.109**(.053)	.0309(.031)	.112(.057)
Education Level^2	-.015(.025)	-.077***(.043)	.012(.044)	-.076***(.043)
Wealth	.001 (.041)	.067 (.06)	.097(.106)	.063(.060)
Wealth^2	-.0129 (.037)	-.031 (.047)	.269(.261)	-.027(.046)
Gender of Household Head	.73**(.37)	.72** (.31)	.871*(.320)	.561(.241)
Wald Chi^2	63.89	22.59	42.49	99.04
Prob> Chi^2	0.000	0.02	0.000	0.000
Λ (Lambda)	-1.366***(.682)	-1.004**(.503)	-1.14*(.364)	1.286*(.358)

*, ** and *** imply significance at 1, 5 and 10 % level of significance.

business experience should have some positive impact on profitability. This variable is a dummy variable, and reference category is 'no prior business experience'.

iii. Risk Perception[9]*:* If the risk perception of the entrepreneur is very high, then she will invest her money in that project which is less risky. Return from the investment in traditional activities like livestock rearing or land leasing is very low. Therefore, risk perception could have a negative impact on profitability.

iv. Nature of Business : If the nature of business is agriculture or allied activities like livestock rearing, then there is less likelihood of earning more profit. On the contrary, petty trade or services bring more profit for the investor. This variable is a dummy variable where 'agriculture or allied activities' is the reference category.

v. The Unemployment Rate in the Family : Here unemployment has been defined as percentage of a household's labour force without a job and currently seeking employment. More unemployed persons in the household will reduce the cost of labour, and profit from the investment will be higher.

vi. Women's Control Over the Asset : Women's control over asset might or might not increase profit from the investment. Women's control over asset may channel credit in productive investment instead of temptation good. It could also force male counterpart to invest money in those projects, which yield a low but certain flow of income.

vii. Participation in the SGSY Programme : SGSY programme participants get subsidised credit, subsidy and vocational training. Programme participants are organised in SHGs. SHGs inculcate a sense of self-confidence among the programme participants. Therefore, it is expected that programme participation will enhance profitability.

Participation in SGSY programme has a significant impact on 'business profit' across all SRCs except Muslims. Participants in SGSY programme get not only subsidised credit and subsidy, but also marketing support, technical expertise and other support services that make a micro-enterprise profitable. Education has a positive influence on the profitability. Risk perception has detrimental effects on 'business profit' , and it is significant for UCs only. If the nature of business is non-agriculture, then the likelihood of making higher profit rises. Higher unemployment rate means there is some surplus labour in the household. Most of the micro-enterprises are home based. They absorb this additional surplus labour. However, households do not have to pay any additional wage for this surplus labour. From the above regression we see a positive impact of higher unemployment in the household on profitability. Woman's control over asset has some mixed impact on the business profit. It has strong significant and positive impact across UCs and OBCs. On the contrary we get a negative impact, though insignificant, of women's control over asset on business profit across SCs and Muslims. Among explanatory variables for the participation in SGSY we get a significant impact of education for UCs and OBCs. However, there is the non-linear negative effect of education on the participation in SGSY programme. It corroborates a higher opportunity cost of highly educated people. Wealth has a positive impact on the likelihood of joining the programme. Gender of the household head also has some significant impact on the likelihood of participation. Goodness of fit of the model is quite high for all the regression equations, and values of lambda show necessity of treatment effect model.

Table 6 : Impact of SGSY Participation on 'Business Profit Across SRCs'

SRCs Variables	UC	OBC	SC	Muslims
Constant	20.67*(8.68)	36.228*(11.063)	25.46* (4.75)	18.21 (19.85)
Mean Education of the Household	1.27**(0.58)	2.70**(1.13)	.452(.338)	2.1(1.43)
Prior Business Experience (Ref : No Business Experience)	.13**(.071)	.696(1.21)	.638(.407)	.129(.164)
Index of Risk Perception	-.047**(.025)	-.044(.35)	-.009(.1050)	-.008(.055)
Nature of Business (Ref : Agriculture)	.236**(.104)	.156(1.275)	-.473(.54)	-.26(.243)
Unemployment Rate in the Family	.343*(.093)	3.3**(1.4)	.519(.467)	.477**(.256)
Women's Control Over Asset (Ref : No control)	1.18***(.07)	2.244**(.865)	-.453(.322)	-1.79(.158)
Participation in SGSY Programme	4.15*(1.311)	8.902*(2.925)	3.416*(.896)	2.402(2.76)
Participation in SGSY Programme				
Constant	2.35(1.76)	-.64(3.137)	-6.608(5.426)	.821(1.985)
No. of Years Living in the Same Locality	.05(.71)	.54(.124)	.045(.185)	.153(.156)
Index of Women's Access to Public Office	.205(1.34)	.327(.22)	.376(.284)	.0805(.280)
Household's Social Capital	.078(.073)	.027(.116)	.0607(.114)	.022(.179)
Education Level	.126**(.067)	.112*(.057)	.030(.031)	.0111(.012)
Education Level^2	-.076**(.043)	-.0158(.025)	.0122(.0439)	-.0536(.047)
Wealth	.013(.37)	.063(.06)	.8711**(.3408)	.068(.094)
Wealth^2	- .0134(.041)	-.027(.046)	.269(.261)	-.1886(.196)
Gender of Household Head	.561*(.241)	.73**(.37)	.213(.501)	.367(.439)
Wald Chi^2	45.73	36.59	28.73	24.87
Prob> Chi^2	0.000	0.0001	.0014	.0031
Λ (Lambda)	-6.92* (1.89)	-5.64*(1.84)	-3.024*(1.030)	-6.44*(3.44)

*, ** and *** imply significance at 1, 5 and 10 % level of significance.

Conclusion

The Hindu caste system has been developed as an extremely hierarchical social system. SC women face fewer social restrictions and, by virtue of being independent earners, enjoy greater financial autonomy and increased control over household financial decisions relative to UC women (Mencher, 1988). Notably, these restrictions on female autonomy among UCs are not limited to the wealthy (Eswaran, 2009). Relative to Hindus, Muslims in India place more restrictions on women. In general, the returns to SHG participation should be higher for those least fettered by conservative social norms. However, this need not be the case for an intervention that primarily influences women's knowledge and aspirations. If traditional norms about gender roles can be challenged, or if intervention mainly works to expand women's exposure, knowledge and opportunities, then returns from SHG participation may be higher for women from more restrictive social groups (Field, 2010). In our sample all SHG members and non-members are women. The result of this paper corroborates above ideas. UCs got maximum benefits, whereas Muslims got least benefits from participating in SGSY programme. In estimating the impact of SGSY participation across socio-religious communities, we have used 'Treatment Effect Model'. The model removes selection bias arising from observed heterogeneity. Therefore, given the identical socio-economic conditions, difference across groups in their response to micro-finance programme participation is stark. One possible explanation of this differential treatment effect is that samples are not balanced across socio-religious communities in terms of unobservable characteristics. 'Treatment Effect Model' cannot remove bias arising from unobserved heterogeneity.

All the SHG members of our sample were women. As Muslim women face more social restrictions compared to the members of other SRCs, it might reduce the benefit of SGSY programme participation. A high level committee chaired by Justice Rajendra Sachar[11] depicted a precarious socio-economic condition of Muslim community including Muslim women. 'The Committee' prescribed some policies to uplift the community from its existing conditions. However, political parties are more eager to reservation in jobs and educational institutions than providing primary education, basic health facilities, technical knowledge, higher amount of credit, and creating backward and forward linkages. Betterment of this downtrodden section requires a holistic approach rather than treating as a vote bank.

Notes

1. If any member of the group fails to repay the loan, the entire group will be responsible for the repayment of a loan.
2. Repayment of existing loan ensures higher amount of future loan.
3. A portion of the subsidy is retained by bank officials, and paid after the repayment of the entire loan.
4. Those who are participating in the SGSY programme.
5. A survey was conducted both in programme and non-programme villages. Programme village means where some of the villagers have already become members of SGSY-run SHGs. The programme villages in the Kandi sub-division were Salar, Raigram, Agardanga, Alugram and

Masla, and in the Berhampore Sub-division were Bazarsau, Kamnagar, Saktipur, Mirzapur and Simuldanga.

6. Non-programme village means not a single villager has become a member of the SGSY-run SHG. The non-programme villages in Kandi sub-division and Berhampore sub-division were Berbari, Bhabanipur, Ibrahimpur and Sonar Gram.

7. Women's access to public offices and processes of political activities imply casting vote at own will; attending 'Village Council' meeting; whether known about the legal rights of the women and different government programmes and schemes going on in their locality; and participating in political campaigns.

8. Household's social capital is computed as involvement of the household members in different organisations like 'Village Education Committee (VEC)', 'Water Users Associations', 'Festival Committee', 'Local Clubs' and political parties.

9. This index has been constructed on the basis of respondents' answer in aspects like: (a) incidence of idiosyncratic shocks, health hazards, death of the family members etc.; (b) covariate shocks, drought, cyclone flood etc., in last two years; (c) number of repayment failure to moneylenders and banks, and (d) number of dependent family members in the households.

10. At least after six months of the formation of the group, each group may appear in 'grade-I' test. If they qualify 'grade-I' then they become eligible to get 'revolving fund'. Revolving fund comprises credit from both DRDA and commercial banks. SHGs do not have to pay any interest for the loan from the DRDA, however, they have to pay interest for the credit from a commercial bank. The size of the 'revolving fund depends on the size of the group corpus'.

11. A high-level committee was formed under the chairmanship of Justice Rajinder Sachar, ex-judge, the Supreme Court of India, to review the socio-economic conditions of the Muslim community. The committee submitted its report in 2005.

References

1. Aghion, B and J. Morduch (2000), "Micro Finance Beyond Group Lending", The Economics of Transition, 8 (2): 401-420.

2. Aghion,B. and J.Morduch (2005), The Economics of Microfinance, The MIT Press, MA, US.

3. Banerjee, Abhijeet, E. Duflo, R. Glennerster, C. Kinnan (2009), "The Miracle of Microfinance? Evidence from a Randomized Evaluation", retrieved from www.mit.edu on 24.02.12.

4. Besley, T and S. Coate (1995), "Group Lending, Repayment Incentives, and Social Collateral", *Journal of Development Economics,* 46 (1): 1-18.

5. CAG (2003), Report on SGSY, New Delhi, Comptroller and Auditor General of India.

6. Centre for Management Development, Thiruvanantapuram(2004), Impact Asessment of SGSY Program, Retrieved from www.cmdkerala.net/finished.html on11/05/05.

7. Eswaran, Mukesh, Bharat Ramaswami, and Wilima Wadhwa, (2009),"Status, Caste, and the Time Allocation of Women in Rural India,"mimeo, University of British Columbia.

8. *Euro stat (2008) retrieved from www.etlc-network.eu/.../eurostat/eurostat_yearbook_2008_published on 10.08.11*

9. Field, Erica, Seema Jayachandran & Rohini Pande, (2010), Do Traditional Institutions Constrain Female Entrepreneurship? A Field Experiment on Business Training in India, Working Paper Series No. 36, IFMR Research, Centre for Micro Finance.

10. Fajnzylber, P., Maloney, W. and Rojas, G. M. (2006), "Microenterprise Dynamics in Developing Countries: How Similar are They to Those in the Industrialized World? Evidence from Mexico", *The World Bank Economic Review,* 20 (3): 389-419.

11. Ghatak, M (2000), "Screening by the Company You Keep : Joint Liability Lending and the Peer Selection ", *Economic Journal,* 110(465) : 601-631.

12. Guo, S. and Fraser, M. W., (2010), Propensity Score Analysis Statistical Methods and Applications, Thousand Oaks, Sage Publication.

13. Heckman, J., Ichimura, H., Todd, P (1997), "Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Program", *Review of Economic Studies,* 64 (1): 605–654.

14. Heckman, J., Imbens, G. and J. Angrist (1994), "Identification and Estimation of Local Average Treatment Effects", *Econometrica,* 62 (1): 467-476.

15. Hossain, M. (1988),"Credit for Alleviation of Rural Poverty : The Grameen Bank in Bangladesh", International Food Policy Research Institute, Washington, D.C.

16. Hulme, D. and Mosley P.(1996), Finance Against Poverty, London, Routledge Int. Publishing Company.

17. Jain, S. and Mansuri, G. (2003), "A Little at a Time : The Use of Regularly Scheduled Repayments in Micro Finance Programs", *Journal of Development Economics,* 72 (1): 253-79.

18. Jalan, J. and M. Ravallion (2003), "Estimating the Benefit Incidence of an Antipoverty Program by Propensity Score Matching", *Journal of Business and Economic Statistics,* 21 (1): 19-30.

19. Kalpana, K. (2011). "Subverting Policy, Surviving Poverty : Women and the SGSY in Rural Tamil Nadu', *Economic and Political Weekly",* 46 (43): 50-57.

20. Khandker, S. R. (1998), "Micro-credit Program Evaluation : A Critical Review", *IDS Bulletin* 29 (4): 11-20.

21. Khandekar S. R. (2003), "Microfinance and Poverty : Evidence Using Panel Data from Bangla Desh", Working Paper Number 5497, World Bank.

22. Krauss, S. I., Frese, M., Friedrich, C. and Unger, J. M. (2005), "Entrepreneurial Orientation : a Psychological Model of Success Among Southern African Small Business Owners", *Journal of Applied Psychology,* 90(28) : 1206-40.

23. Kundu, A (2008),"Impact of SGSY Scheme on Self Help Group Members in West Bengal" Available at: http: //ssrn.com/abstract=1164362

24. Laffont, J and P. Rey (2003), "Collusion and Group Lending With Moral Hazard", Working Paper, mimeoIDEI.

25. Lee, J. Y. and M. Brown, (1986), Food Expenditures at Home and Away Home in the United States - A Switching Regression Analysis, *The Review of Economics and Statistics,* 68:142-47.

26. Littlefield,E. S Hashemi, J. Morduch (2003), "Is Microfinance an Effective Strategy to Reach the Millennium Development Goals?", retrieved from www.microfinancegateway.org/ on 26/07/2011.

27. Lyngdoh, B. F. and A. P. Pati. (2011). Microfinance and Socio-economic Change : An Assessment of Women Clients of Meghalaya, *The Microfinance Review,* 3(1):110-21.

28. Masakure, O., Cranfield, J. and Henson, S. (2008), "The Financial Performance of Nonfarm Microenterprises in Ghana", *World Development,* 36(12): 2733-2762.

29. Maddala, G. S. (1983), Limited-Dependent and Qualitative Variables in Economics, New York: Cambridge University Press, pp. 257-91.

30. Mencher, Joan P. (1988), "Women's Work and Poverty: Women's Contribution to Household Maintenance in South India" In A Home Divided., ed. Daisy Dwyer and Judith Bruce, Stanford, CA:Stanford University Press.

31. Montgomery, R., D. Bhattacharya., and D. Hulme. (1996), Credit For The Poor In Bangladesh : The BRAC Rural Development Program and the Government Thana Resource Development and Employment Program' in Hulme, D. and Mosley, P. *Finance Against Poverty,* 1 and 2, London: Routledge.

32. Morduch, J (1998), "Does Micro Finance Really Help the Poor? New Evidence from Flagship Programs in Bangladesh", McArthur Network Working Paper.

33. Mukherjee, A K and A Kundu (2012), "Microcredit and Women's Agency : A Comparative Perspective Across Socio Religious Communities", *Gender, Technology and Development,* Vol. 16(1): 71-94.

34. Nguyen, Cuong H. (2007), "Determinants of Credit Participation and Its Impact on Household Consumption : Evidence from Rural Vietnam", Discussion Paper 2007/03, Heriot-Watt University, Edinburgh.

35. NIRD (2006), National Study on SGSY : A Process Study, Hyderabad, National Institute of Rural Development, Retrieved from www.nird.org.in on 07/05/07

36. Pitt, M and S. Khandker (1998), The Impact of Group Based Credit Programs on Poor Households in Bangladesh: Does the Gender of the Participants Matter?", *Journal of Political Economy,* 106 (5).

37. Rahaman, S., G. Mallik and P. N. Junankar (2012), "Microcredit Programs and Consumption Behaviour: Are the Borrowers Better Off? Evidence from Bangladesh", Retrieved from https://editorialexpress.com/cgi-bin/conference/download on 23/03/12.

38. Rai, A and T. Sjstrom (2004), "Is Grameen Lending Efficient? Repayment Incentives and Insurance in Village Economies", *Review of Economic Studies,* 71 (1).

39. Ray, R., and J. V. Meenakshi, (2002), Impact of Household Size and Family Composition on Poverty in Rural India, *Journal of Policy Modelling,* 24(1):539-559.

40. Rosenbaum, P., Rubin, D., (1983), The Central Role of the Propensity Score in Observational Studies for Causal Effects, Biometrika 70(1) : 41–55.

41. Rubin, D., (1973), Matching to Remove Bias in Observational Studies, *Biometrics* 29(1) : 159–183.

42. Sawtelle, B. A. (1993), Income Elasticities of Household Expenditure : A US Cross-Section Perspective, *Applied Economics,* 25(1):635-44.

43. Sachar Rajindra (2006), Sachar Committee Report, Retrieved from www.prsindia.org/ on 16/09/11.

44. Smith, S (2002), "Village Banking and Maternal and Child Health", *World Development,*30 (4).

45. Stiglitz, J. E.(1990),"Peer Monitoring and Credit Markets" *World Bank Economic Review* 4(3); 351-366.

46. Tedeschi, GA (2006), ' Here Today Gone Tomorrow: Can Dynamic Incentives Make Microfinance More Flexible?, *Journal of Development Economics,* 80(1): 84-105.

47. Thekkekara. T. F. (2008), "Impact of SGSY on SHG : Bank Linkage' in Karmakar (ed.), Micro Finance, New Delhi, Sage Publications.

48. Townsend, R. (1994), "Risk and Insurance in Village India", *Econometrica,* 62(1) : 539-591.

49. Vijverberg, W. P. M. (1991), "Profits From Self-Employment: The Case of Cote d'Ivoire", *World Development,*19(6):683-696.

50. Wahid, N.W. (1993), The Grameen Bank Poverty Relief in Bangladesh, West View Press.

51. Weiskoff, R.(1971), Demand Elasticities for a Developing Economy, Cambridge: Harvard University Press.

52. Yaron, J. (1994), "What Makes Rural Finance Institute Successful?", *The World Bank Research Observer,* Vol. 9(1):49-70.

Journal of Rural Development, Vol. 32, No. (2) pp. 237 - 244
NIRD, Hyderabad.

BOOK REVIEWS

'Not By Others Hands' : An Anthology of a Century of Credit Cooperatives in India by Mohan Kanda, Global Research Publications, New Delhi, Pages : 361, Price : ₹ 1295.

'Not By Others Hands' is an overview of more than 100 years of credit cooperatives in India, particularly the rural credit structure and it thoroughly reviews the genesis of the cooperative credit structure as well as the progress of this sector in both pre and post-Independence period. Similarly, it discusses the evolution of cooperative legislation in the context of financial sector liberalisation and the subsequent national policy re-engineered for new generation cooperatives to meet the requirements of rural farmers, artisans, marginal labourers, policy makers and all others concerned with cooperatives' growth and development.

It appears that this book is one of the reference books on critical assessment of the functioning of cooperatives sector in India and contains major events of cooperatives with analysis of success and failures attained so far. Needless to add, this book is a must for those who want to delve into the cooperative credit movement in our country as it provides insider's view in a most comprehensive manner. The richness of the book lies in its diversity of perspectives, sectorial contents and breadth of issues covered with in-depth analyses. It is a rare blending of qualitative analysis with policy and action relevance inputs for the cooperative sector in its totality.

The book contains four chapters, each chapter redefining an important aspect of the journey on credit cooperatives through detailed inputs. As it is not possible to present all the relevant points from all the chapters, some notable points from few chapters are illustrated below reflecting the richness of the book.

For example, in the first chapter entitled 'The Vision Unfolds', the author has clearly highlighted that the All India Rural Credit Survey truly marks a great watershed in the history of rural credit in India not only because it made far reaching recommendations but because most of them were accepted with alacrity and implemented with determination in the years followed. Similarly, the author also highlighted the prudential norms recommended by the Basle Committee on Bank Supervision as a measure of assessment of the financial soundness which were extended to state level and district level cooperative banks with a view to making them realise that they should function on sound lines in an increasingly competitive environment. Indeed in this chapter, the author has radically stressed that it is ideal to allow the cooperatives to think for themselves what is best for them without depending much on various committees' reports which more often are repetitive and unidirectional in their approach.

In Chapter II on 'Threshold of Real Change Cooperatives Reinvented' the author has suggested that through induction of women on the board of a cooperative by reservation of seats for them will impart 'thrift' culture in the total structure. Similarly, young people need to be inducted into the credit cooperative movement to rejuvenate the whole process once again in the country. The author strongly feels that with appropriate and faster regulatory changes, the cooperative credit movement will be reinvented for the benefit of the masses that are left behind in the liberalisation process.

In Chapter III on 'Positioning of Cooperatives in the Liberalisation, Privatisation and Globalisation Era', the author has highlighted that instead of following an oppressive capitalism economy, it is better to follow the middle path of cooperative ideology which can guarantee us a brighter future for those who have not benefited in the economic prosperity of the country.

In Chapter IV on "The Road Ahead" the author has suggested various provisions and expects that these provisions will ensure not only autonomous and democratic functioning of the cooperatives but also ensure accountability of management of the members and other stakeholders. In the end, the author has quoted Gandhiji's apt remarks on cooperatives that 'the secret of successful cooperative effort is that the members must be honest and know the great merit of cooperation and it must have a definite progressive goal'.

Finally, it can be rightly stated that this book is a reference for those who are engaged in cooperative credit movement as well as those who are interested to know the status of various decisions taken by the government through various committees in facilitating the growth and achievement of cooperatives in the rural pockets of India. The authors should be highly appreciated as the book contains list of relevant annexures which simplifies the most difficult and contentious issues in a most comprehensive manner.

– Dr. B.K.Swain

Crisis of Governance, by G. Ramachandra Reddy, Serials Publications, New Delhi, ₹1195, Total Pages 298.

It is my understanding after thorough reading of this book, having highlighted the facts about the Constitution and intention of the Article 75 (3), that the entire Cabinet should fall as a result of 'abuse of public office' by a minister or ministers in pursuance of policy decisions of the cabinet unless the said article gets suitably amended. Nor, does it mean that the entire cabinet needs to face criminal investigations for such policy decision which resulted in criminal offences.

The book consists of seven chapters including introduction and conclusion. The first chapter dealt with the Fundamentals of Governance. The aspects of Legacy of British Rule, Need for Human Rights and Civil Liberties, Right to Life and Property, Preventive Arrests by Police, Discretionary powers of executive under various laws, etc., were discussed in detail including the law of the jurists.

The second chapter deals with Anti-Corruption Law. The movement on Lokpal led by the Social Activist Anna Hazare and its need was discussed against corruption. The basic principle involved in Lokpal or the entire anti-corruption movement is Accountability for Corruption. According to the author, the political class confuse right understanding of accountability, it is accountable to people in periodic elections where a person gains or loses political power. This is 'Political Accountability' and it does not include 'legal accountability' for specific offence of corruption. Underlining the importance of 'right to recall' the author reiterated even before the expiry of 5 years of period, the multiple layers of accountability make democracy real. To combat the corruption five steps were suggested by the author. The first step is a good law, second an independent investigation agency, third one is effective enforcement of law, fourth being effective administrative action and the last being the effective pursuance of criminal investigation.

Third chapter was totally dedicated to the Social Activist Anna Hazare and his

contribution to the nation.The team members of Anna were charged with allegations against the senior IPS officer and the young IRS officer. Despite allegations on his core members, the contribution of Anna towards anti-corruption was appreciated by the author.

Fourth chapter deals with Accountability and Transparency. A law on accountability particularly on 'Political Accountability' is an urgent requirement in order to make Democracy purposeful and Governance meaningful. Accountability is the oxygen of good governance. Thus, citizen's accountability is all that our Democracy ensures through its laws and rules, as stated by the author. Transparency, the RTI Act, 2005 is touted as a panacea for all our problems in Democracy. This is not so. In practice, the exercise is limited to seeking information and obtaining the same from public authorities. The information is not in the 'public domain'.

Fifth chapter deals with Current Affairs. In this chapter however, commenting on the democracy the author stated 'Democracy is a game of numbers'. Therefore, everyone including our intellectuals have great belief in numbers to deliver goods. This is not a correct approach. Under this chapter author discussed threadbare current issues like population-police-judge ratio, police and people, misuse of police manpower, age determination of general VK Singh, etc.

In the sixth chapter the author discussed matters relating to secularism VS religion. Religion has nothing to do with morality and vice versa. Mahatma Gandhi said that 'those who say that Religion has nothing to do with politics do not know what Religion is'. Secularism is not atheistic or anti-religious. Secularism implies tolerance of not only religious belief of others but also political and other beliefs. In the name of secularism there is a tendency to banish religion into private domain. This is not right. After all, wherefrom public values such as the following emanate?

* Action
* Fair action
* Efficiency
* Honest Impartiality

In the seventh chapter the author put forth his ideas on various issues like inaction, serious type to be criminalised, Right to Information, Law on Accountability, Right against injustice—new idea, government and judicial power is a public asset though intangible / invisible unlike land or factory, lawlessness of state, political party sponsored violence, etc.

The book is useful to researchers, policymakers and others interested about the democracy and collective responsibility of cabinet ministers and the role of legislature, executive and judiciary.

– Dr. Y. Bhaskar Rao

Social Audit of Public Service Delivery in Karnataka, by M.Vivekananda, S Sreedharan and Malavika, Belavangalay (Eds), 2012.

The book is based on the social audit carried out by Public Affairs Centre, Bangalore, on Public Service Delivery in Karnataka, based on the Citizen Report Card methodology developed by it. Interestingly based on the suggestion from the Department of Planning, Programme Monitoring and Statistics, Government of Karnataka : Public Bus Transport, Food and Civil Supplies through Public Distribution System, the following services were covered under the study : Veterinary Health Care; Pension Schemes; Services of PHCs and District Hospitals; Government High Schools; and Nemmadi Kendras (documentation and issue of certificates).This social audit was based on user

feedback generated through a scientific random survey of users and households in rural areas. The field survey was carried by Social and Rural Research Institute, a specialised unit of International Marketing Research Bureau, a leading social and market research organisation. Responses from large number of 2,688 individuals across the State were collected on the above services in pre-designed questionnaires.The basic assumption of this social audit process was to provide a good diagnosis of the critical problems with the selected public services. Citizens have rated the services in terms of access, reliability, transparency and responsiveness.The pointers and insights from this social audit clearly set an agenda for a process of review, process re-engineering and reforms by the government.

The following processes were involved in the social audit : Identifying issues through discussion with the service providers; Designing the survey instruments; Identifying the scientific sample for the survey; Orienting and training workshops for the survey team; Conducting the survey by a professional survey agency, viz., Social Research Institute of IMRB; Collecting qualitative data for case studies; Coding, analysing and interpreting the findings; and Preparing reports. Further, suitable indicators for each of the dimensions of the services were developed after discussing with concerned officials of the seven service providing departments of the Government of Karnataka. Discussions with the department officials brought out the areas of concern and the standards laid down for delivery of services.Thus, the following dimensions of the services were investigated in the social audit : Access to the services;Usage of the services; Quality/Reliability; Compliance with the standards of service; Grievance-redressal; Cost of availing of the services; and Satisfaction with the services.

As a supplement to the study, 21 interesting case studies (three for each service) were recorded. Two types of case studies were incorporated in the social audit study: one where respondents expressed complete satisfaction with the performance of the service and the other where respondents expressed complete dissatisfaction with the delivery of the service. The study has 328 pages, 296 annexures, 23 figures and 57 Tables.

Major findings of the study are as follows: While access per-se is not a serious barrier in the seven public services, there is substantial evidence of excessive delays in the process of availing of their benefits. Such delays are notable especially in the delivery of ration cards, veterinary services at home, and pensions.

Delivery with acceptable quality and reliability is provided by Nemmadi Kendras unlike other services. Multiple visits to agencies to obtain services, irregular pension payments, non-issue of receipts for payments, non-responsiveness of staff, etc. are examples of unreliable service quality.

The study concludes that corruption is prevalent in all services except in Nemmadi Kendras.The highest proportion of bribes paid is in the pension scheme that deals with the most vulnerable people.The study tries to link the performance of various services with low awareness of people to their entitlements and conditions of service are probably the reason for less pressure on the services.

Complete satisfaction with services by the respondents ranges between 59 and 91 per cent. The highest score was for Nemmadi Kendras while the lowest was for Pensions.A major factor that explains this outcome is the extremely low awareness of the citizens about their entitlements and conditions and norms of service delivery. However, majority of respondents felt that there have been some improvements in most of the services over the

past two years except in the case of PDS.

The study finds that as there are wide variations between the services on many parameters, there are significant variations in service quality and satisfaction with specific services between the four divisions too. Belgaum and Mysore are the two divisions that have received lower ratings for several service dimensions and overall satisfaction.

Thus the study calls for urgent attention at policy level on the following major issues: the access barriers in some service, quality dimensions, the gap between the declared norms of service and the reality on the ground,the low public awareness of their rights and entitlements, the prevalence of corruption in several services, and the wide variations in service dimensions between the four divisions.

A study of this nature is very important in good governance characterised by transparency and accountability of state to its citizens in a democracy. It has developed very precise parameters of judging the performance of public services and might be very useful for other studies of this nature. These parameters suggest precise actions which can be taken by service departments. However, case studies provide in-depth understanding of the process of service delivery including the role of citizens in improving different services.

– Dr. V. Annamalai

Socio-economic and Cultural Dimensions of Entrepreneurship in North East India by M. Kennedy Singh, Concept Publishing Company Pvt. Ltd., Pages 226, Price ₹ 750.

The book spread over seven chapters strived to discuss divergent issues related to entrepreneurs *vis-a-vis* socio-economic and cultural dimensions related to entrepreneurship development focusing on Manipur in general and *Kakching of Thoubal* district in particular. *Kakching* was in the news during Second World War and it was the site where many battles took place between Kings of Manipur and Burma in 18th and 19th centuries.

The North-east of India comprising eight States with different cultures, languages, religions portrays a mini-India. With proper development of entrepreneurs, issue of unemployment can be addressed to a great extent in the region as unemployment is the root cause of terrorism in the region. The volume based on field study carried out in Manipur particularly *Thoubal* district of *Kakching* block analysed traditional and modern entrepreneurs and issues related to their development. The first chapter as introductory one covered many issues like meaning of entrepreneur, needs for entrepreneurship development, etc., in Manipur vis-a-vis with review of literature. Many studies based on historical, economic, social and cultural aspects have been referred in the chapter. Second chapter is fully devoted to cultural and historical perspectives related to development of enterprises in Manipur. With local term and by referring names of local God, the author related to entrepreneurship development. While discussing stages of entrepreneurship development in Manipur, the author has touched upon three points – pre-British period, British period and the present phase.Third chapter is the crux of the book as based on the field study carried out among 137 entrepreneurs of *Kakching*, the author has brought out various issues related to entrepreneurs' development. The analysis has been made with different age groups (starting from 16 years to 61 years and above), occupation, income, type of enterprises etc. This chapter has been enriched with few case studies depicting cases of individual entrepreneurs. It is pertinent to mention that the people of *Kakching* have social

entrepreneurial group which controls the irrigation system in the area from long ago."It has been handed over generation after generation among the *Kakching* people", the author observes. Social relationship and organisational behaviour is the focus of chapter –IV which apart from theoretical analysis included some case studies which have made the chapter sublime. In chapter-V, while discussing entrepreneurship development programmes, which are sine qua non in a State like Manipur because of unemployment many youths have been moving towards insurgency, the author has mentioned different courses extended by different organisations for the potential entrepreneurs in *Thoubal* district. Such information is undoubtedly beneficial to local unemployed youth as at glance they can get an idea which trade may be suitable for them. Chapter –VI has dealt with socio-cultural changes in entrepreneurship development. In *Kakching,* entrepreneurship development has brought some changes in rural areas. According to the author, socio-cultural and technological change in rural and tribal areas of Manipur "is very slow unlike the changes which are taking place in the complex urban areas", but even then change have been taking place. While summing up and concluding in Chapter-VII, the author observed that a number of unemployed youth have come up with various activities for developing their own enterprises. Although such development has been taking place at slow pace, the same has been penetrating in rural Manipur. The author feels that development of entrepreneurship is the need of the hour in Manipur in general and *Thoubal* in particular and for this regular supply of power, continuous supply of raw materials, upgradation of skills etc., are sine qua non.

The volume albeit, titled as 'North East' is purely based on micro study carried out at *Thoubal* district of Manipur. However, it is an important publication for researchers, academicians, and policymakers as it is based on field study and portrays plight of entrepreneurs in *Thoubal* district of Manipur.

– Dr. Shankar Chatterjee

Transforming Indian Agriculture – India 2040 – Productivity, Markets and Institutions, By Marco Ferroni, 2013, Published by SAGE Publications India Pvt. Ltd, B1/I-1, Mohan Cooperative Industrial Area, Mathura Road, Post Bag 7, New Delhi -110 044 (India), pp. 357, ₹ 995 (Hardback).

This book originates from a study proposed, financed and technically supported by the Syngenta Foundation for Sustainable Agriculture. This book consists of series of thought provoking background papers commissioned by Centennial Group, Washington, DC. The study was managed by Harinder S. Kohli, Praful Patel and Anil Sood of the Centennial Group and brought out a publication entitled "India 2039: An Affluent Society in one generation" during 2010. The study was closely coordinated with the Planning Commission of India, and with the Ministry of Agriculture, Shenggen Fan of the International Food Policy Research Institute; Ch. Hanumantha Rao of the Centre for Economic and Social Studies, Hyderabad and M.S. Swaminathan of the Economic Advisory Council of the Prime Minister all served as members of the Advisory Committee of this study.

Book comprises two parts viz., Part – I (consisting of five overview sections based on the summary report of a project led by Hans P. Binswanger – Mkhize and Kirit Parikh and background papers written by several renowned authors) and Part – II (with six chapters based on background papers prepared by a group of experts on Indian agriculture).

This book explores the future and presents the audacious question: what could be the agriculture sector in India look like in 2040 and how should it look if it is to successfully meet the needs of the country's affluent society? The author has predicted that such a scenario can be achieved only with bold institutional, policy and programme changes encapsulated by four necessary, interlinked and simultaneous sub-transformations: i) from traditional grains to high value crops and livestock products; ii) from production based on low labour costs, widespread subsidies, and price support to efficiency and productivity – driven growth; iii) from wasteful to efficient water use; and iv) from public support and protection to ever greater involvement of the private sector throughout the value chain.

In part I Harinder S. Kholi and Anil Sood contributed four overview chapters viz., 1. Productivity, Markets and Institutions, 2. A Vision of Indian Agriculture in 2040, 3. Legacies of the Past and Key Challenges and 4. Framework to Achieve India's Agricultural Transformation. The authors have put forth a set of building blocks and recommendations that should be implemented on a priority basis such as a) Make public programmes much more focused and effective, b) Recognise water as a critical, long-term constraint to Indian agricultural growth and give top priority to significantly improving the efficiency of water use, c) Promote new high-yield seeds and related technologies, including mechanisation, to improve yields and productivity, d) Improve the effectiveness of agricultural research and extension, e) Support further improvements of the farm-to-market value chain and reduce spoilage, and f) Improve markets and incentives related to agriculture through reforms of prices, trade and subsidies.

The authors concluded that under the model's assumptions, future growth rates of 8 – 10 per cent of the Indian economy would be commensurate with, and require, agricultural growth rates in excess of 4 – 5 per cent. The model scenarios suggest that small gains in agricultural growth and somewhat larger gains in economic growth are feasible with expanded constraints on foodgrain imports by 2039.

In Part – II, Hans P. Binswanger – Mkhize discussed on India 1960 – 2010 : Structural Change, the Rural Non-farm Sector, and the Prospects for Agriculture. The author has discussed regarding agriculture growth and productivity growth, Employment, unemployment and wage trends. The author states that a decline in the share of agriculture and allied industries in Indian economy; a sharp increase in construction; and a large share of the labour force in urban areas in trade, hotels and restaurants and in both areas they have stayed fairly constant. As a consequence, rural non-farm sector employment has grown especially fast.

Pratap S. Birthal, et.al., discussed a chapter on Agriculture Diversification in India: Trends, Contribution to Growth, and Small Farmers' Participation. The authors concluded the chapter stating that the governments should ensure appropriate policies and a favourable investment climate to accelerate agricultural diversification and greater participation of the private sector in the supply/value chain of high-value commodities.

Chapters III and IV covered the topics on 'Improving Water Use Efficiency : New Directions for Water Management in India' by Richard Ackermann and Review of Agricultural Extension in India by Marco Ferribu and Yuan Zhou.

Partha R. Das Gupta and Marco Ferroni presented the Chapter – V on Agricultural Research for Sustainable Productivity Growth in India. The authors have concluded that to attain and maintain the targeted agricultural growth rate of 4 per cent per year, India needs

an effective public and private apparatus of agricultural research.

Last Chapter by Thomas Reardon and Bart Minten discussed on the Quiet Revolution in India's Food Supply Chains. It focused on issues of transformation in the supply stream – 'downstream' (in retail), and 'midstream' (in food processing and wholesale) – as the changing market context that will condition and influence the path of agriculture and food security in the coming decades.

This book will provoke a discussion of longer term policy options in agriculture over the next three decades. This is recommended for students, field demonstrators, extension officials and researchers.

– *Dr. V. Suresh Babu*

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