IMPACT OF NATIONAL RURAL EMPLOYMENT GUARANTEE SCHEME (NREGS)

ON THE RURAL ECONOMY: THEORY AND EMPIRICS

THESIS SUBMITTED FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY (ARTS)

OF

JADAVPUR UNIVERSITY

2016

BY

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Certified that the Thesis entitled

IMPACT OF NATIONAL RURAL EMPLOYMENT GUARANTEE SCHEME (NREGS) ON THE RURAL ECONOMY: THEORY AND EMPIRICS submitted by me for the award of the Degree of Doctor of Philosophy in Arts at Jadavpur University is based upon my work carried out under the Supervision of Professor Amit Kundu, Department of Economics, Jadavpur University. And that neither this thesis nor any part of it has been submitted before for any degree or diploma anywhere/elsewhere.

Countersigned by the   **Candidate:**

Supervisor: **Dated:**

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<u>Acknowledgement</u>

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Executive Summery of the Thesis

At the outset, the present thesis aims to investigate about the impact of National Rural Employment Guarantee Scheme (NREGS) on the rural economy. In order to accomplish the aim, the thesis concentrates on different dimensions covering net farm income of farming households, aggregate net pecuniary benefit of the rural poor, average monthly income of the beneficiaries of the scheme and agricultural productivity. In addition, it also deals with an important aspect pertaining to the implementation of the scheme, viz, the female employment generation aspect. First three chapters contain introduction, literature review and objectives of the thesis respectively.

The fourth chapter of the thesis 'Impact of National Rural Employment Guarantee Scheme (NREGS) on the Rural Poor - A Simple Theoretical Discourse' addresses two important linked aspects in respect of implementation of the scheme. Implementation of NREGS in multiple cropping areas can increase the employment opportunities among the landless agricultural labourers and thus inevitably raises their bargaining power particularly during the time of second crop i.e. post rainy season cultivation. Besides this, Government of India has persistently been hiking per man-day NREGS wage. Both these instances undoubtedly increase the reservation wage in agricultural labour market which in turn may have an adverse effect on the farm income in the multicropping areas. In this chapter, maximum possible per man-day NREGS wage is determined at which the corresponding agricultural wage can help the marginal farmers to sustain their net farm income at least at subsistence level. This chapter also establishes the fact that as a result of the hike of NREGS wage, sustenance of subsistence net farm income may lead to price hike in agricultural sector. The chapter also analyzes the results in respect of aggregate net pecuniary benefits of the rural poor in the light of NREGS considering different agricultural frameworks.

Chapter 5, 'The Impact of NREGS on Rural Households: Evidence from a Quasi-Experiment' analyzes the impact of the implementation of NREGS on an important outcome of interest, viz, average monthly income. The study in this chapter observes that the heterogeneity in seeking employment through NREGS is panchayat specific. As a result, the performance of the implementation of NREGS depends both qualitatively and quantitatively to a large extent on the

efficacy of the local panchayat. However the result of the analysis shows that getting employment through NREGS helps the rural households to improve their livelihood.

In the sixth chapter, 'Asset Creation through National Rural Employment Guarantee Scheme (NREGS) and its Impact on West Bengal Agriculture: A District Level Analysis' focuses on whether different kinds of asset creation activities related to agriculture under NREGS have any impact on the cropping intensity of West Bengal over the years. We have taken 18 districts in West Bengal and the time period is considered from 2006-07 to 2013-14. We primarily carried out Random Effect estimation without considering the district specific effects. We adopt Random Effect estimation technique suggested through Hausman test and taking West Bengal as a unit of study because the Hausman test yields the following results:

$\chi^2(5) = 4.03$ which is statistically not significant. The results clearly lead us to accept that Random Effects model is consistent. The result shows that works like 'micro irrigation' and 'rural connectivity' through NREGS have created a positive but small impact on cropping intensity. It is further observed that average rain fall and average harvest price of principal crops in the previous period play a significant role to enhance the cropping intensity of West Bengal. Considering few bottlenecks of random effect estimation, we as supplementary carried out the Fixed effect estimation to judge both cross district disparity in cropping intensity through district specific effects and variation over the time periods via examining time specific effects.

Chapter 7 'Employment Generation among Women in NREGS: a Synthesis on the basis of Micro Level Field Investigation' based on a primary survey made in Birbhum district of West Bengal, attempts to investigate whether expansion of NREGS has been able to help the female job-card holders to get employment through NREGS where we have considered ratio of female man days to total man days of a household as the outcome variable. It is observed that the heterogeneity in the value of the stated outcome variable is significantly caused by nature of works the female job card holders have to carry out under NREGS and family parameters faced by them which somehow emanate from socio-cultural factor(s) in general and binding in particular. Apart from this, although there is inevitability of the influence of total number of NREGS man days received in the entire reference period by the household to which the female member(s) belongs, yet, there seems no one to one correspondence between the outcome variable and the same.

Contents

C H A P T E R – 1: Introduction

Introduction

In the 56th year of the Republic and working of the constitution, the Parliament passed the NREG Bill 2005 towards partial fulfillment of a constitutional obligation under Article 39(a) and 41 of the Directive Principles of State Policy contained in Part IV of the Indian constitution. Article 39(a) reads: 'The State shall, in particular, direct its policy towards securing that- the citizens, men and women equally, have the right to an adequate means to livelihood;' and Article 41 directs that: 'The State shall within the limits of its economic capacity and development, make effective provision for securing the right to work to public assistance in cases of unemployment…and in other cases of undeserving want' (Baxi 2000:89).

After independence of our country, the National Rural Employment Guarantee Act (NREGA) of 2005 is a path-breaking legislation to honour the right to work to each and every able-bodied person living in rural areas. The objects and reasons of the NREGA popularly known as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) very distinctively state the importance of the Act: "to provide for the enhancement of livelihood security of the poor households in rural areas of the country by providing at least one hundred days of guaranteed wage employment in every financial year to every household whose adult members volunteer to do unskilled manual work and for matter connected therewith or incidental thereto". Regarding the background of the NREGA, it will be pertinent here to present the views of the Standing Committee on Rural Development of Fourteenth Lok Sabha expressed in its thirteenth report (2005):

"…In order to provide direct supplementary wage-employment to the rural poor through public works, many schemes were initiated by the Government of India, namely National Rural Employment Scheme(NREP), Rural Landless Employment Guarantee Scheme(RLEGP) and Jawahar Rozgar Yojana(JRY). Currently, Sampoorna Grameen Rozgar Yojana (SGRY) is being implemented all over the country with the objective to provide supplementary wage employment in rural areas, create durable rural infrastructure and to ensure food security...the scale of employment generation under SGRY in 2002-03 and 2003-04 was barely adequate to provide an average 20 days of employment to each below poverty line (BPL) household in the rural areas."

The United Progressive Alliance (UPA) Government at the Union level recognized the inadequacies of the on-going wage employment schemes and felt the urgent need to ensure a

certain minimum days of wage employment for the rural poor. In tune with this feeling, the UPA Government in their National Common Minimum Scheme (NCMP) made a declaration that it would immediately enact a National Employment Guarantee Act for providing "legal guarantee for at least 100 days of employment, to begin with on asset creating public works schemes every year at minimum wages for at least one able-bodied person in rural areas, urban poor and lower middle class households."

This in a nutshell is the background of introducing such a massive scheme for generation of wage employment in the rural areas. At the time of introducing the NREG Bill it was contemplated that "it has to be necessarily implemented in phases so as to eventually cover all the rural areas of the country, subject to the economic capacity of the Central and State Government." The NREGA thus can be described as the first step of the Union Government towards ensuring a safety net by way of guaranteed wage employment to the millions of poor in the rural areas in the country. With this background of introducing the NREGA, let us narrate some of its basic features underlying the fulfillment of right to work to every able-bodied person in the rural areas.

The coverage of the NREGA has been expanded in phased manner to include all the districts except those districts having hundred percent urban populations. In the first phase, 200 districts were brought under the Act with effect from February 2, 2006. Ten districts from West Bengal were selected in the first phase. Then the Act was extended to 130 districts in the year 2007-08 where 113 districts were notified with effect from April 1, 2007 and 17 districts in Uttar Pradesh were notified with effect from May 15, 2007. Seven districts of West Bengal were included in the second phase expansion. Finally, the remaining districts have been notified under the NREGA with effect from April 1, 2008. The Government of India kept its commitment to bring whole country under NREGA.

SALIENT FEATURES OF THE ACT[1]

- Adult members of a rural household, willing to do unskilled manual work, may apply for registration in writing or orally to the local Gram Panchayat.

- The Gram Panchayat after due verification will issue a Job Card. The Job Card will bear the photograph of all adult members of the household willing to work under NREGA and is free of cost.

- The Job Card should be issued within 15 days of application.

- A Job Card holder may submit a written application for employment to the Gram Panchayat, stating the time and duration for which work is sought. The minimum days of employment have to be at least fourteen.

- The Gram Panchayat will issue a dated receipt of the written application for employment, against which the guarantee of providing employment within 15 days operates.

- Employment will be given within 15 days of application for work, if it is not then daily unemployment allowance as per the Act, has to be paid. Liability of payment of unemployment allowance is of the States.

- Work should ordinarily be provided within 5 km radius of the village. In case work is provided beyond 5 km, extra wages of 10% are payable to meet additional transportation and living expenses.

- Wages are to be paid according to the Minimum Wages Act 1948 for agricultural labourers in the State, unless the Centre notifies a wage rate which will not be less than Rs. 60/ per day. Equal wages will be provided to both men and women.

- Wages are to be paid according to piece rate or daily rate. Disbursement of wages has to be done on weekly basis and not beyond a fortnight in any case.

- At least one-third beneficiaries shall be women who have registered and requested work under the scheme.

- Work site facilities such as crèche, drinking water, shade have to be provided.

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1. The NREGA, 2005: Operational Guidelines 2008, 3rd Edition by Ministry of Rural Development, Govt. of India.

- The shelf of projects for a village will be recommended by the *gram sabha* and approved by the *zilla panchayat.*

- At least 50% of works will be allotted to Gram Panchayats for execution.

- Permissible works predominantly include water and soil conservation, afforestation and land development works.

- A 60:40 wage and material ratio has to be maintained. No contractors and machinery is allowed.

- The Central Government bears the 100 percent wage cost of unskilled manual labour and 75 percent of the material cost including the wages of skilled and semi skilled workers.

- Social Audit has to be done by the Gram Sabha.

- Grievance redressal mechanisms have to be put in place for ensuring a responsive implementation process.

- All accounts and records relating to the Scheme should be available for public scrutiny.

Objectives:

The scheme was expected to mitigate the rural distress and agrarian crisis. The NREGA was expected to reverse or at least halt the tendency of growth by-passing poor regions and people since it was a more universal, inclusive and labour-intensive strategy. The objectives of NREGA can thus be categorized in three broad heads as follows.[2]

1. Poverty reduction and livelihood security through

    ✓ Creation of remunerative employment
    ✓ Reduction in distress out-migration
    ✓ Lessening of extra-economic coercion and unfreedom of wage labour
    ✓ Improvement in nutrition and health, school retention and enrolment, etc.
    ✓ Regeneration of common property resources

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2. "A Note on the Performance of the Rights-Based NREGS: Initial Experiences and Possible Causes" by Smita Gupta, Fellow, Indian School of Women's Studies and Development.

2. Broad-based increase in productivity and growth due to

- ✓ Asset creation
- ✓ Soil moisture conservation and irrigation
- ✓ Land improvement and higher land use intensity
- ✓ Multiplier effects of demand creation

3. Democratic and decentralized planning and development by

- ✓ Principle role of PRIs in planning and implementation
- ✓ Greater availability of finances with PRIs
- ✓ Central role of Gram Sabhas in selection, monitoring and audit of works
- ✓ Empowerment of women

PARADIGM SHIFT FROM WAGE EMPLOYMENT SCHEMES[3]:

NREGA marks a paradigm shift from all precedent wage employment schemes. The significant aspects of this paradigm shift are captured below:

- NREGA provides a statutory guarantee of wage employment.
- It provides a rights-based framework for wage employment. Employment is dependent upon the worker exercising the choice to apply for registration, obtain a Job Card, and seek employment for the time and duration that the worker wants.
- There is a 15 day time limit for fulfilling the legal guarantee of providing employment.
- The legal mandate of providing employment in a time bound manner is underpinned by the provision of Unemployment Allowance.

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3. Operational Guidelines 2008, 3rd Edition.

- The Act is designed to offer an incentive structure to the States for providing employment as ninety percent of the cost for employment provided is borne by the Centre. There is a concomitant disincentive for not providing employment as the States then bear the double indemnity of unemployment and the cost of unemployment allowance.
- Unlike the earlier wage employment schemes that were allocation based, NREGA is demand driven. Resource transfer under NREGA is based on the demand for employment and this provides another critical incentive to States to leverage the Act to meet the employment needs of the poor.
- NREGA has extensive inbuilt transparency safeguards.
  a. Documents: Job Cards recording entitlements (in the custody of workers) written application for employment, Muster Rolls, Measurement Books and Asset Registers.
  b. Processes: Acceptance of employment application, issue of dated receipts, time bound work allocation and wage payment, Citizen Information Boards at worksites, Vigilance Monitoring Committees, regular block, district and state level inspections and social audits
- The public delivery system has been made accountable, as it envisages an Annual Report on the outcomes of NREGA to be presented by the Central Government to the Parliament and to the Legislature by the State Government. Specifically personnel responsible for implementing the Act have been made legally responsible for delivering the guarantee under the Act.

NREGA from Media's View[4]:

It should universally be accepted that the media has a pivoting role in respect of any flagship programme from any consideration whatsoever. Naturally, in case of NREGA also, it is imperative on the part of the media that the programme should be covered both extensively as well as intensively and there should be critical examination. The purpose of the review of the

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4. "Status of NREGA Implementation- Grassroots Learning and Ways Forward: 1st Monitoring Report" prepared by Samarthan-Centre for Development Support with support from PACS programme.

media coverage is to consider issues reflected/highlighted in the media on NREGA. This has been divided into three sections.

Media Response at the time of enactment:

The coverage of the NREGA in the media has changed over a period of time. When the bill was being discussed in Parliament several journalists and columnists denounced the bill as

- ❖ An economic hoax because it was not the duty of the state to guarantee employment, it burdened the tax paying public that actually funded such schemes; the nation should maximize production not work, and government actually destroys jobs

- ❖ A corruption guarantee scheme because it was a planned drain of wealth from the productive sector to the underground economy, perpetuates the populist legacy of politicians, would not only be wasteful but entail fresh taxes and erode India's competitiveness, and encourage a network of patronage

- ❖ Bountiful and wasteful because already the Central government spent over Rs. 40,000 crores per annum for poverty alleviation which was wasted; the scheme would be implemented first in districts represented by powerful politicians who would get the chance to utilize tax payer's money for political patronage

- ❖ A means to call mid term elections because it allowed purchasing power worth Rs. 12000 crores to 20 million Indians in the first phase of the programme.

- ❖ A still-born child because it would generate vast rents with small transfer benefits, leakages of government programmes were as high as 98%, reduce growth rate of the economy, but land reform could generate capitalist employment.

- ❖ Create a hole in government finances to the tune of 0.6% of the GDP.

- ❖ A means to siphon off money because the NREGA was to be evaluated on the basis of the number of days of employment generated not outputs like creation of assets and therefore could lead to massive fraud by the bureaucrats to show generation of employment, thus costs of the scheme as well as widespread corruption along with capitalist rhetoric were the main objections. The same sentiments were shared in sections of the international media which wondered as to how the government would sustain the programme.

The Act was defended by a retired bureaucrat who disputed the figures of high costs said to be to the tune of one lakh fifty thousand crore pointing out that Maharashtra had had an employment guarantee scheme for over 30 years. Based on the Maharashtra figures the employment guarantee scheme would cost only Rs 17, 000 crore or even less. Another writer saw it as a momentous initiative that had the potential to boost the rural economy and compared it with employment programmes across the world. A third writer pointed out that the act improved the rural economy's ability to absorb labour leading to better wages. It was based on the principle of self-targeting and would benefit only those in dire need. These were the exceptions.

Media Response on NREGA programme implementation:
Since then the coverage of the NREGA has changed. The media has either started looking at success stories on the positive side or lamented lapses in implementation, which prevented the poorer sections from receiving their due. Benefits from the scheme that have been highlighted include:

➢ Rural unemployed labourers in Panchayats in Delhi gaining productive employment for a longer period of time. This was being facilitated by a smooth flow of information from Delhi to all tiers of the district officials and the Panchayati Raj

➢ Higher participation of women in Dungarpur district of Rajasthan where 90% of the workers under the NREG scheme are women

➢ Corruption being minimized in Rajasthan due to public vigilance leading to more than one and a half lakh people gaining employment in Dungarpur district. There was massive participation of rural folk. Tribal women looked forward to seeing their men back home. A Padyatra of activist groups in Rajasthan revealed little corruption and a pro-active administration.

➢ Reduced rural-urban migration in Gujarat and Rajasthan since it enabled labourers avoid costs of migration.

There are specific case studies, stories, and news items on selective states focusing on problems in implementation:

- Lack of assessment especially in Uttar Pradesh where there is no data available on jobs required to provide livelihood security. In fact Uttar Pradesh is seen as a laggard in this regard.
- Lack of rationalization of work norms which are too demanding so that few are able to earn the wage rate of Rs. 73 per day.
- Corruption and neglect hindering implementation of the programme in Haryana and UP.
- Low ground awareness, low wages and lack of attendance in gram sabhas in Gujarat which also has the distinction of having the first court case on lack of payment of adequate wages
- Difficult work sites, underpayment, violation of social security norms, uninformed people and children in scorching heat characterizing the implementation of NREGA in Madhya Pradesh. Discrimination on the basis of caste, community, disability and proximity to sarpanch, panchayat secretary have been noticed across the country
- Several states failing to implement provisions of the programme. Haryana, Jharkhand, Uttar Pradesh, Uttaranchal and Kerala have not issued state specific operational guidelines. Chattisgarh and Madhya Pradesh have issued their own amendments which violate the provisions of NREGA.

Public vigilance and the emerging success stories have induced many media persons to change their outlook towards the programme. The difference in coverage is now only a matter of degree with some media being more supportive than the other. An interesting issue is that those sections of the media that had championed the Act are playing the role of watchdogs by pointing out lapses in implementation while other sections that had been negative or ambivalent are coming to a grudging acceptance of the merits of the programme.

The present study has been taken up with focus on West Bengal only. In this study both secondary and field level data are used. Efforts are made to capture the field reality through narratives of the local people. As the panchayats are identified as the prime implementing agencies, therefore it is imperative to discuss about the background and existing status of panchayats in West Bengal.

After the establishment of the Government in West Bengal in 1977, Panchayat as a participatory unit at the grass root level has been institutionalized through a series of legal, political, and

administrative measures. Through the elections of the Panchayat bodies, a new kind of leadership has emerged in the Panchayat system that represents all the sections of the society. The scope of people's participation in the Panchayats has been ensured over the years through the creation of different participatory institutions such as Gram Sabha and Gram Sansad, Gram Unnayan Samiti.

West Bengal was a late starter in the first phase of democratic decentralization in India in 1950s. It also did not follow the national model of three-tiered Panchayati Raj structure due to historical reasons. Unlike other states, the first generation of democratic decentralisation in rural West Bengal failed to strike of the roots. The pre-eminence of the well-established local leaders in the Union and the District Boards realized the impact of Panchayati Raj as a force of political change, and the leadership structure underwent no appreciable change as a result of democratization of local administration. A comprehensive legislative exercise was undertaken in 1973, but out of that nothing came worth mentioning primarily due to the lack of political will.

The second generation democratic decentralisation experiment started in India in 1978 following the recommendations of the Asok Mehta Committee. It was a time when the Left Front rule in West Bengal had just begun. The result of assembly election indicated that the Left Front had weaker base in rural areas. It became imperative therefore for them to strengthen rural base. Added to it was the need for institutional arrangement in the countryside for the purpose of implementation of the rural development programme the Government stood for.

Against this backdrop the Government had three tasks on the rural front: a) to regenerate rural economy- agricultural growth was 11.9% while the national average was 32.3%; b) To democratize the rural governing process. The last general elections were held only in 1957; c) to undermine rock departmentalism.

The Government formulates their policy on rural development through the Panchayati Raj Institutions. Their policy of rural development is guided by the philosophy of what may be called redistribution before growth to ensure growth with social justice. The policy on rural development of the Government has three broad objectives. In the first place, it aims at involving the people not only in the process of implementation of development programmes but also in the process of preparation, implementation and monitoring of development plans by building up decentralised structures at the grassroots' level. Secondly, it seeks to bring about a change in the

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co-relation of class forces in favour of the poor and working people by involving them in an organised manner in the processes of development. Thirdly, it attempts to raise class consciousness of the people through radicalization of political processes and politicization of development.

The process of rural development in West Bengal is characterized by two features-curbing the power of the bureaucracy as far as possible within the framework of the Indian constitution and horizontal mobilization of the masses.

Status of implementation of NREGA in India:

The NREGA has always been a subject of lively debate. Fortunately, the scope for informed analysis is rapidly growing, as reports have been pouring in from various parts of the country.

NREGA essentially guarantees employment for the unemployed in rural areas for 100 days in a year through works such as building roads, improving water supply and works that are necessary to improve the village infrastructure. 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.

During the first year of implementation (FY 2006-07) in 200 districts, more than 2.10 crore households were employed and 90.5 crore man days were generated. In 2007-08, 3.39 crore were provided employment and 143.59 crore man days were generated in 330 districts. In 2008-09, 4.5 crore households have been provided employment and 215.63 crore man days have been generated across the country and in this way the figures went on getting larger in the succeeding years.[5]

NREGS has been the most successful in Rajasthan. The state created on an average 77 person-days of work per household, with women doing 68% of the work. The Act has also been a success in the states of Assam and Madhya Pradesh. The ostensible objectives of the NREGA were to create rural employment, build rural infrastructure and check migration to urban areas from drought affected districts.[6]

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[5] "Driver of Rural Economy" by D. Muthamizh Vendon Murugavel in Kurukshetra December 2009

[6] Ibid.

Performance on various aspects of the programme:

The NREGS has several key dimensions/aspects which are interdependent and have implications on the overall performance. Let us describe how NREGS has performed on those fronts.

Awareness of the programme

A rally on NREGS in Uttar Pradesh and Madhya Pradesh by civil society groups found extremely low level of knowledge on the scheme among the community members. However, elected representatives specially the Panchayat head and Secretaries of the Panchayat were reasonably aware. Similarly, a survey of 15 groups covering about 40 individuals from different wards of the Panchayat Heera Nagar in the Tikamgarh district of the Madhya Pradesh revealed that only 10% of the individuals were aware of the scheme. Many of the individuals who had even got the employment under the NREGS thought that it was some sort of employment provided by the Panchayat from prevailing schemes like SGRY etc. It was also observed that the people who formed the upper strata of the society were better informed than the workers. Many of these upper class families were not seeking employment in the NREGS.

Most of the road side Panchayats had walls painted with the main features of the scheme. But the impact of these wall writings cannot be said for sure in predominantly illiterate populations that reside in these villages. In some districts of Madhya Pradesh, it was observed that there was little or no information available at the Panchayat level about the type of work available or its timeframe. Also the lack of understanding on wage payment rate was creating confusion among the villagers. Often people felt that they were being underpaid for the entire day's work. The disabled were refused work, and in some cases people from outside the village were given work in the village.[7]

In Uttar Pradesh, it was found in some districts that the panchayat secretaries were not aware that the responsibility of registering applications was with them. There was also some misinformation about the fact that only households listed as BPL were entitled for getting job cards. In Chattisgarh, the level of awareness was abysmally low in many cases. People were not aware of the purpose of the job cards. Inquiries in the field showed that the distribution of job cards was well under way in villages in the districts of Ranchi, Gumla, Lohardagga, Simdega and West

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7   "Status of NREGA Implementation- Grassroots Learning and Ways Forward: 1st Monitoring Report" prepared by Samarthan-Centre for Development Support with support from PACS programme.

Singhbhum of Jharkhand, but the process of applying had not begun because the people did not know that they had to apply for work.[8] Also in some villages, it has been found that work had not started anywhere in the village, and the gram sabha itself did not know about the NREGS. A similar situation prevailed in the other states as well. It was observed at the outset, that, there is very low level of awareness among people.

During our survey, we observed that one problem rampant across all the villages was the lack of adequate communication which led to lack of awareness among various stakeholders. There was a lack of communication from the District level to the Panchayat level and from the Panchayat to the villagers. Panchayat workers, who are the implementer of this scheme, were not aware of the scheme in its true spirit. They might be thorough with the wording of the Act per say but the interpretation, which was in most cases erroneous, was different in different villages. Hence there were very few Panchayats which understood the fact that the objective was not merely to create man-hours or temporary employment generation, but to create certain essential and most importantly sustainable assets which in turn will be giving them livelihood security in the future.

The villagers were far behind them in their knowledge of NREGS. There is no denying the fact that every single person had heard of *"Eksho Diner Kaaj"* (100 days work) as they call it locally. However when it comes to the procedures to ask for that 100 days work and their rights under the scheme, they seemed to be utterly ignorant in some cases. The level of knowledge was so poor that in some villages, villagers didn't even know that they should apply for the work by filling up an application form. Even those who had worked under the NREGS in the past were unaware of the procedures.[9] In 'Sukna' village of 'Bhutura' gram panchayat under Mahammad Bazar block, we found during our field study that people are completely ignorant about the fundamental difference in provision of this programme with other flagship programmes. Pradip Marandi and Shanti Lohar, residents of Sukna village do not know that after registration, they were entitled to get receipt and naturally they were not given any receipt.

With most of the job card holders, unemployment allowance is something unheard of. Even if some have heard about it from some sources, they find it very hard to believe in. Most scorned

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8. Ibid

9. Lessons from NREGS, West Bengal – A study of Sustainable Livelihood Models by MICA. In this regard our observation is also identical.

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even at the mention of such a concept. They said that they were content even if they received their daily wages under NREGS in time. This fact can be generalised in case of all villages in all GPs.

An interesting point to note here that while the daily wages comes from the central government, the unemployment allowance falls in the State government's kitty. Naturally the State government is reluctant to release fund to pay job card holders who have not been allotted work, which is due to inefficiency on the part of the Panchayats or the District level authorities. The Panchayats hence, keep this chapter closed lest it may arouse more clashes between the governments. The panchayat officials confessed while being interviewed that they deliberately avoid to despatch receipts against registration in order not to give any unemployment allowance. Moreover they are also of the view that, it is absolutely non-viable and uneconomical for an applicant to go for collecting unemployment allowance as regards the pain that he or she has to bear in this regard.

Capacity Building at different Stages of Implementation

Panchayats have very rightly been made the principal authority in planning and implementation of NREGS. But have they been provided with enough staff to perform this additional responsibility? Panchayats have a huge workload. Out of 214 centrally sponsored schemes targeted at rural communities, Panchayats implement 151 and have partial role in 23 others. They have to maintain accounts for as many as 76 schemes on an average.

Findings suggest that Gram Panchayat is implementing well above 50% of total sanctioned works. This coupled with workload of existing other schemes have brought Gram Panchayats under tremendous pressure.

To implement NREGS, Central Operational Guidelines provides for one Employment Guarantee Assistant (Rojgar Sahayak) for each Gram Panchayat. But all Gram Panchayats have been provided this very necessary administrative staff.[10]

10.National Study: Phase III Role of Panchayati Raj Institutions in Implementation of NREGA, August 2008 by PRIA

Findings also suggest that not all Gram Panchayats have Panchayat Secretaries with exclusive responsibility of that Gram Panchayat only. It was found that sometimes one Panchayat Secretary has responsibility of two or more Gram Panchayats and hence is not available in the Gram Panchayat office on regular basis.

Non availability of Panchayat Secretaries and Employment Guarantee Assistants has made it difficult for those Gram Panchayats to allocate jobs and make payments to workers on time. In states such as Himachal Pradesh, where one Secretary has 3 Gram Panchayats to look after, Gram Panchayats have fixed dates (eg. 5th and 21st of every month in HP) to invite application and allocate job.

It was found during several studies that except in only a few districts (eg. Madhubani, Rajnandgaon, Wayanad, Karauli and Birbhum) Programme Officers have not been deployed with exclusive responsibility to implement NREGS. Similar are the cases in respect of having Assistant Engineers in all blocks and Junior Engineer for every 10 GPs. In only a handful of districts all of these three key officials have been deployed in all blocks as suggested by the guidelines. Non-availability of administrative and technical staff at intermediate Panchayat level affects badly the implementation of NREGS in those districts. Surely, inadequate number of technical staff has caused delay in technical sanction and measurement. As a result, allocation of jobs as well as payment of wages is delayed.

PRIA also studied the status of training of elected representatives on NREGS. When the estimated percentage of GPs where elected representatives of GPs have been trained and oriented on NREGS is considered, then it is observed that a higher percentage of GPs have trained and oriented elected representatives. As regards capacity building in Madhya Pradesh, Samarthan imparted training on record keeping and accounts management to GP level functionaries in selected GPs. Likewise, in many other states, GP officials in selected GPs have been given the training and orientation with efforts of governmental and non-governmental organizations.

During our field study interactions with the Panchayat officials reveal the fact that most of the Panchayats lack personnel both quantitatively as well as qualitatively. It most of the cases, the main reason for the huge delays in implementation of the scheme (including planning, measurement delivering wages etc.) is the inadequate member of trained personnel at the

Panchayat level. Also lack of required staffs cause delay in many activities like training of the villagers, taking care of the assets developed under NREGS etc.

Registration, issue of Job Cards and demand for employment

Section 2 of Schedule II of NREGA has made the Gram Panchayat responsible for registering and issuing job cards to eligible households and to receive application demanding employment under NREGS. It was found that initial hiccups in registration and issuance of job cards have largely been removed. Registration rate and rate of issuance of job cards have increased immensely. Almost all registered households have been issued job cards.

But there are districts where not even 50% of rural households are registered under NREGS. Since all these districts are from 200 Phase I districts considered to be backward, reasons could be procedural difficulties and low awareness among rural population.

The new employment scheme has evoked tremendous response among the rural people of the Andaman and Nicobar Islands. Within a very short period, more than 50 thousand households have registered their names in the scheme, but only 60% individuals have received the job cards. In Middle and North Andaman districts only 40% of the applicants have received job cards. However in Nicobar 90% people have received job cards. On the other hand, only 30% card holders on an average have got engaged in the scheme. In South Andaman only 10% households, in Nicobar only 15% households have been provided jobs. But in Middle and North Andaman 80% card holders have received jobs.[11]

There are some examples of commendable efforts on the part of state governments of making people and implementing agencies more aware about NREGS. For example, the Government of Bihar prepared a 56-page booklet on NREG act including important government orders and notifications. The same book was then printed on the flexes (banners) and one set each was disseminated to every Block headquarter in Bihar. The whole book is now available for display in every block.

Although almost all registered households have been issued job cards, findings suggest that these cards are not handed over to households within the stipulated 15 days. Data suggests that a high percentage of households have responded that they received their job cards after 15 days. Job Card is a very important document and procedural delay in its issuance restricts households from

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11.”NREGA: A study in Andaman and Nicobar Islands” by Hema Bannerjee in Kurukshetra, Dec. 2009

realizing their entitlements. Apart from this delay, it was also reported that Gram Panchayat officials keep these Job Cards with themselves. This is gross violation of the Act and Operational Guidelines.

As far as demand for job under NREGS is concerned, barring few districts, in most of the districts covered under the national study, only a small percentage of registered households are applying for jobs. And in the majority of districts, those who are applying are not getting receipts against such application. This does not mean there is less demand for job. Actually demand is not being documented and receipts are not handed over. All this is done to avoid claim for unemployment allowance in case job is not provided within the stipulated 15 days. Unemployment allowance has to be paid from the state's own fund and requires explanation from authorities about circumstances making them unable to provide jobs within 15 days. To avoid all these repercussions, state and district administrations have directed (of course not in writing) to block and GP officials not to pay unemployment allowance. Once the job is allocated to a household, application is taken and receipts are given in back dates. This trend has negated the very rights based approach of this Act.[12]

Wage Payment

Timely and adequate wage payment is necessary not only to make NREGS attractive but also to mitigate rural distress. Findings of the national study suggest that a large percentage of households responded that they received their wages after a maximum period of 15 days. In some districts there is improvement while in other districts the situation has deteriorated especially when we compare the response of households in the first phase and the third phase of study conducted in 2006 and 2007 respectively. Delay in wage payment can be attributed to inadequacy of administrative and technical staff and lack of accountability. No case has been reported where worker has been paid compensation for delayed payment of wages as per the provisions of the Payment of Wages Act, 1936.

The Union Ministry of Rural Development has signed an MOU with the Department of Post to open accounts of workers. Circulars have been issued to all state governments to make arrangements for payment of wages through accounts in Post Offices and Banks only.

12.National Study: Phase III, August 2008

This will not only ensure timely payments but also check malpractices. Similarly, data suggests that more than one third of households in 7 of surveyed districts in the national study responded that wages they received were less than the minimum wage. This is mainly because workers were unable to achieve the given tasks as wages were not revised. In some cases, faulty measurement and misappropriation of money were also the reason why workers could not get full minimum wages. Of late minimum wages in many states have been revised. This coupled with revision in schedule of rates has had positive impact on the average wages being earned by workers under NREGS. Bihar has relaxed task norms for women. After conducting time and motion study, the Government of Bihar came up with separate measurements of works for men and women. Under normal soil conditions, progress for a male for one day of work was notified as 80 cft. For female, the measurement for it was notified as 15% less to that of men. Hence the figures for women were notified as 68 cft.

For Andaman and Nicobar group of Islands, Rs 156/- per day wage was fixed. But in case of Nicobar Islands, the wage was fixed at Rs 167/- which is the highest in all Indian average. Moreover, on an average 40% jobs have been given to women workers.

Payment of Wages of NREGS through biometric smart cards in Andhra Pradesh is a remarkable initiative undertaken by the state government. After a successful pilot programme in eight mandals of Warangal and Karimnagar districts, wages under National Rural Employment Guarantee Scheme are now being paid through smart cards.

The main advantage of the method is lack of corruption due to complete transparency. The transactions using smart cards are recorded in the stand alone computers at every Point of Transaction (PoT) connected to the server at the regional point, which are networked to the central server. So even in remote areas, details of transactions at PoT can be fed into the main server. They are also working on an option of using mobile phones for updating the server.[13]

Planning of Works

According to Section 16 (1) of the NREGA, the Gram Panchayat shall be responsible for identification of projects in the Gram Panchayat area to be taken up under a Scheme as per the recommendations of the Gram Sabha and the Ward Sabhas. Intermediate level Panchayats and

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13.Ibid

district level Panchayats will consolidate and examine plans of GPs and intermediate Panchayats respectively.

Most of the Gram Panchayats in surveyed districts of the national study have prepared their annual plans as per official records. Participation of registered households in Gram Sabha for planning in those Gram Panchayats is also good ranging from 10% to 94%. This is an encouraging trend. But data is only of attendance and does not cover the quality of participation. Various study experiences suggest that members from marginalized sections and women do not raise their voices and concerns in these Gram Sabhas. In some cases district and block administration are still the controlling and planning authorities without any knowledge whatsoever about the socio-economic status of the beneficiaries. Moreover, in many cases works remain incomplete due to bad planning.

The Union Ministry of Rural Development is contemplating removal of rural connectivity from the list of 8 recommended types of works as there is a separate scheme of Pradhan Mantri Gram Sadak Yojana.

The Government of Bihar has published a booklet on the works on NREGA for the benefit of Gram Panchayats and other implementing agencies. The booklet focused on the suggestive types of work that could be taken up under NREGA in the context of Bihar. The book explained, in detail, different aspects of works like planning, budgeting, and technical engineering aspects.

There is a real need of resource mapping and knowledge mapping to decide which part of the village needs what resources and to make sure the project's benefits reach the neediest people. Even though most villagers under Nogori Panchayat are satisfied, they also raised questions regarding the quality of the work done and this has been attributed to lack of proper planning. Moreover, in most cases, no need based assets are created and the beneficiaries or broadly the stakeholders are not properly consulted with.

Need for seasonal work

Almost at all places, villagers mentioned that they want work only in selective months. As per Hindi Calendar they need work in the months of *Bhadro/Asin* (15th Aug-15th Oct) and *Magh/Falgun* (15th Jan-15th March). Rest of the time they have some other work, however in these months they are free and do not have anything else to do. This aspect is not factored in

while drawing up plans for the projects. Some Panchayat officials have quite openly disclose the matter while interacting with the researcher. They said there is lack of need based projects.

Monitoring of works

According to Section 13 of NREGA, Panchayats at intermediate level are responsible for the supervision and monitoring of the project taken up at Gram Panchayat and Block level whereas Panchayats at district level will supervise. Section 7.1 of Central Operational Guidelines suggests that for each sanctioned work there will be Vigilance and Monitoring Committee (VMC) composed of members of the locality or village where the work is undertaken. Findings of the national study suggest that in most of the Gram Panchayats of surveyed districts, Vigilance Committees have been formed, but in all the districts it was found that only one VMC for one Gram Panchayat has been formed. Members have not been selected by Gram Sabha but handpicked by Chairperson and Secretary of Gram Panchayats and most of the members are unaware of their roles and responsibilities. Findings also suggest that elected representatives (ERs) of Panchayats at district and intermediate level do visit worksites of Gram Panchayats, albeit percentage of such GPs are not very high. When we compare percentages of GPs visited by ERs of district Panchayats with ERs of intermediate Panchayats, higher percentage of GPs have worksites visited by intermediate level of Panchayats. This can be attributed to physical proximity of ERs of intermediate Panchayats to worksites in GPs. Involvement of ERs of intermediate and district level in supervision and monitoring works undertaken at GP level is a good sign and will help develop and strengthen organic linkages among the three tiers of Panchayats.

Social Audit

According to section 17(2) of NREGA, the Gram Sabha shall conduct regular social audit of all the projects under the Scheme taken up in the Gram Panchayat. Central Operational Guidelines suggest the organization of two special Gram Sabhas in a financial year for social audit of NREGS.

Different agents with different approaches have facilitated social audits. With proactive approach, administration and Gram Panchayats themselves disclose information for examination of people; in collaborative approach Civil Society Organisations, administration and Gram Panchayats have come together to jointly facilitate social audit; and in confrontational approach,

CSOs and activists have conducted 'Jan Sunvais' after getting information with the help of the Right to Information (RTI) Act, 2005.

Findings of the national study suggest that a negligible percentage of registered households in 10 out of 20 surveyed districts responded that Gram Sabha for social audit has been held. On the whole, social audit is just a formality in all these districts. Under pressure from the Union Government, a format with certain indicators is filled up and then consolidated at block and district level. Gram Sabha is largely ignored in this process and there is no ownership of Gram Panchayats. Hence, neither is this process empowering people nor is it institutionalizing downward accountability at Gram Panchayat level. Draft Transparancy and Accountability Rules of the Ministry of Rural Development, Government of India tries to address some of these gaps and fixes up responsibility.

Table 1.1: Gram Sabha for Social Audit

State	% of registered households responding that Gram Sabha held for social audit
Bihar	5.6
Chhattisgarh	6.9
Gujrat	1.1
Haryana	0.0
Himachal Pradesh	0.0
Jharkhand	23.0
Kerala	1.9
Madhya Pradesh	53.2
Orissa	13.75
Rajasthan	73.7

Uttar Pradesh	6.03
Uttarakhand	12.7
West Bengal	48.3
Combined Estimate for all 13 states surveyed	**18.94**

Source: Compiled from National Study: Phase III, August 2008

There are also some good examples of CSOs facilitating social audit of NREGS. PRIA's partner Unnati facilitated Social Audit in five Gram Panchayats of Khedbrahma Taluka in Sabarkantha district of Gujarat.

The concept of social audit was introduced in the meetings of Taluka Nirikshan Samiti. Unnati adopted the following guiding principles for social audit in these Gram Panchayats: First, Gram Panchayats should own the process and organise Gram Sabha; Second, process should be simple and replicable; Third, social audit should be non-threatening but empower people; Fourth, strong linkages should be made with administration to facilitate institutionalization of process. Commissioner and Secretary, Rural Development and State Project Coordinator for NREGS were contacted and they instructed the District Programme Coordinator (DPC) to support the initiative as an educational process and also attend all Gram Sabhas. There were numerous informal consultations with the Gram Panchayats and they were provided hand-holding support in bringing out notice for the Gram Sabha, informing people and also making all records open to the public for inspection. Village level collectives of citizen leaders, 'Panchayat Vikas Samitis', played important role in facilitating social audit. A 15 minute film on social audit was used to generate awareness, clarify doubts and bring out issues of people before the scheduled Gram Sabha for social audit.[14]

So far as our field experience goes the ground reality gives a different picture altogether. There is no proper execution of social audit in most places. This leads to a situation where the villagers and the Panchayat *Karmis* know all the problems involved but they cannot do anything about it. Wherever social auditing takes place, it is done in a very haphazard manner. Moreover, most of

14. National Study: Phase III, August 2008

the villagers did not even know about social audit. The researcher found it to be difficult to make them understand about the very concept of social audit not to mention about the apprehension of the same by the villagers.

Political Dimension

At many Panchayats, it was observed that NREGS has continuously been used for scoring political points. It was stated by many Panchayat Karmis that opposition instigates villagers to go for making a job-card even if they don't need one, so that it increases the pressure on the village Panchayat. Since these people are not in need of this scheme and there fore do not apply for work, this gives the opposition a way to show the inefficiency of the Panchayat using these numbers.

There are also some rare cases where the opposition party at the state or district level heads the Panchayat and so doesn't receive proper fund. So on the one hand, Panchayat Karmis and the allied political parties try to highlight only the positive gains they have made and on the other hand, opposition party men do not see any of the gains and always attempt for focusing the loopholes. At the outset a prominent impression was that there was clear politicization of the NREGS. The following observations do nothing but strengthen the impression.

- ✓ Job cards are not owned by the respective beneficiaries but by the local influential party leader.
- ✓ Bank or post office accounts are operated by a specific person who is empowered by the powerful lobby.
- ✓ Not all poor eligible people get the job cards but only those who are close to Panchayats get it.
- ✓ No proper and timely monitoring of works is carried out by the block and/or district administration.

While these political obstacles can not be generalized to all villages, they do show the politicization of NREGS.

Corruption at many levels

A seemingly fascinating observation in different villages of Nogori GP is that, no major corruption has been reported yet since 2008. By this, the villagers want to say that the existing ruling party is more or less maintaining transparency since it came to power in 2008. Interaction

and relatively open discussion with residents of Sukna, Banagram, Bagdola and Udaydihi villages give a different impression all together. According to them, the progress of NREGS has not been satisfactory solely because of huge corruption involved at the implementation stages. As a result, they have become frustrated and hopeless which in turn has jeopardized the very essence of the Act, the bottom-up or participatory approach.

It is mandatory for each Panchayat to increase forest area and invest NREGS money in social forestry project, however it was observed that only two species acacia and eucalyptus, which are neither Indian nor meant for Indian soil are grown wherever NREGS work is done. The land where these plants are grown becomes totally infertile and uncultivable with in a few years. What is alarming is that the villagers well know the hazards of planting these trees but continue planting them in spite of Panchayat's request not to do so only because of the financial returns. Another reason to plant only these two types of trees is that the forest department prefers to supply only these two types of trees

due to the quick returns it gives and the rewards can be reaped with in the official's tenure in that area.

To make matters worse, a few villagers indirectly admitted that they manipulate the number of days they worked for financial gains. They used to mention more number of days than they have worked for. Also a few college students have been reported as being the NREGA workers who are found only on the date of payment of wages.

Low Participation of the Beneficiaries

This factor is also an effect of lack of resources. In *Gram Unnayan Samiti* meetings, there is representation of different stakeholders. However all the representatives do not come to attend these meetings for a simple reason that they don't find any incentive to come to the meeting. In most of the cases these people survive on daily wages and for them going out to earn their livelihood are more important than attending *Gram Unnayan Samiti* meetings. Each person is paid only 250/- per year for being the member of *Gram Unnayan Samiti* which is not much of an incentive for these people to turn up in these meetings and concentrating on the planning of the projects needed for their respective communities.

Another place where projects are decided and proposals are discussed, are the Gram Sansad meetings which generally happen in the months of May and November. Once again, the

attendance is very low and the decisions which are to be taken unanimously are taken by a handful of people. There was no clear idea about the Gram Sabha among most of the villagers. Some said it takes place monthly, whereas some others said it never takes place or it may but they do not know any thing about it. Even some people came out with same that the meeting takes place at midnight so that only the vested people can attend and not the general public.

Irregular attendance of workers

One problem that stems from the attitude of the villagers is that there is no sense of responsibility towards government projects. Many times it happens that villagers register themselves for the work but do not turn up on the site regularly. There are not enough people as well who can monitor the projects on a daily basis. Finally it leads to deviation from the planning and creates problem in execution. On the other hand, members in a *Dal* formed by DRCSC feel more attached with the assets developed under DRCSC projects rather that NREGS. The reason they have stated that when they work for a government project, objective is to get the wages of that particular day and leave the site, while in a DRCSC project they are involved from the very conception of the project. Apart from that, the profit generated though the projects is shared with them developing a sense of belonging in them. They feel it becomes their responsibility to take care of the asset and it leads to a sustainable employment generation source.

Lack of knowledge

There is a lack of awareness in the villagers about the concept of 'Sustainable Asset'. The focus instead is on the short term gains. As mentioned earlier in this report in the case of acacia and eucalyptus plantations, despite of the *Panchayat's* efforts, as their objective is to get financial returns as soon as possible even though it might mean grave problems in the long term. Panchayat, while aware of this, are helpless because neither there is cooperation from the villagers nor they have enough resources to maintain these assets. In fact Panchayat tried to plant different type of plants in the starting in the Social Forestry projects, but they could not survive since they were not taken care of by the villagers. The villagers finally opted for Acacia and Eucalyptus plants for a reason that they do not need any maintenance or care.

Government of India has initiated the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) in 2006 where the basic objective is to provide 100 full man-days of employment to each willing rural household. The underlying aim was to provide safety net for

the rural poor and to stabilize agricultural production through creating productive assets via employing labourers. Carrying the flavor of the broad theme of the thesis, i.e the "impact of NREGS on the rural economy: theory and empirics", we made an effort to study the impact of NREGS on four distinct dimensions concerning rural economy and rural poor through involving theoretical and empirical discourses.

Chapter 2 solely comprises of survey of numerous studies carried out covering several aspects pertaining to NREGS.

On the basis of the literature survey, several areas concerning NREGS are identified as either unexplored or partially explored (if any). Now keeping in view the title of the thesis and its meaning, chapter 3 orients itself towards raising some inevitable research questions which are imperative to be looked into in order to effectively evaluate the impact of NREGS on the rural economy.

At first, in chapter 4, we have identified that two important linked aspects are worth noting in respect of implementation of the programme. Implementation of NREGS in multiple cropping areas can increase the employment opportunities among the landless agricultural labourers and thus inevitably raises their bargaining power particularly during the time of second crop i.e. post rainy season cultivation. Besides this, Government of India has persistently been hiking per man-day NREGS wage. Both these instances undoubtedly increase the reservation wage in agricultural labour market which in turn may have an adverse effect on the farm income in the multicropping areas. In this chapter involving theoretical model, maximum possible per man-day NREGS wage is determined at which the corresponding agricultural wage can help the marginal farmers to sustain their net farm income at least at subsistence level. This paper also establishes the fact that as a result of the hike of NREGS wage, sustenance of subsistence net farm income may lead to price hike in agricultural sector. The study also attempts to analyze the results in respect of aggregate net pecuniary benefits of the rural poor in the light of NREGS considering different agricultural frameworks.

Secondly, chapter 5 indicating an empirical exercise applies a quasi experimental investigation to get an impression of the impact of the implementation of NREGS on an important outcome of interest, viz, average monthly income. The study is based on primary data collected from four

gram panchayats of two randomly selected blocks of Birbhum district of West Bengal considering 2012-13 as the reference period.

The expectation behind formulating NREGS is also to raise agricultural productivity through creating different productive assets related to agriculture especially keeping in view the fact that, it will ultimately reduce the dependence on the scheme. The NREG Act includes works like constructing irrigation canals including micro and minor irrigation works, provision of irrigation facility, rural connectivity etc. Provision of water through creation of irrigation facilities and micro irrigation works are vital for enhancement of agricultural activities in rural India including West Bengal. Chapter 6 investigates whether different kinds of asset creation activities related to agriculture under NREGS have any impact on the cropping intensity of West Bengal over the years. We have taken 18 districts in West Bengal and the time period is considered up to 2013-14.

Like traditional public works programmes this also offers a unique opportunity for women to earn cash incomes in a context where, too often, the ability of women to work outside the home is severely constrained by social norms. The adjoining act (NREG Act of 2005) that guarantees employment of every rural household for 100 days has different provisions to incentivize participation of women in the programme. The scheme indeed has both direct and indirect aspects towards favoring the participation of women in order to fulfill a larger objective of women empowerment. Perhaps, that is the reason why there has been provision of 33% reservation of women in the act. Thus it becomes imperative to focus on the extent to which the programme is inclusive of women. Official data suggest that 47% of all NREGS workers are women. However, in this regard, there is substantial variation not only across states but also across different regions within a state. Chapter 7 based on a primary survey made in Birbhum district of West Bengal, attempts to investigate whether expansion of NREGS has been able to help the female job-card holders to get employment through NREGS where we have considered ratio of female man days to total man days of a household as the outcome variable.

Chapter 8 comprises of concluding section whereas different policy implications derived from the results of the preceding chapters are contained in chapter 9. Chapter 10 displays the list of references.

CHAPTER – 2: Survey of Literature

Survey of Literature

The history of Public Works Scheme or Welfare through Workfare has been old for centuries in India. Jean Dreze and Amartya Sen in "Hunger and Public Action" (1991) had talked about 'Arthashastra' which was written by Chanakya in the 4th Century B.C. mentioning about welfare measures in the form of public works during calamitous period. Later, colonial India also witnessed such workfare schemes especially designed as famine relief measures. But the most gigantic scheme[15] in the history of India's state sponsored workfare initiatives is the National Rural Employment Guarantee Scheme (NREGS) which is named after Mahatma Gandhi as MGNREGS.

In this context, the NREGS can be thought of as a policy to boost rural income and stabilize agricultural production. It is expected that NREGS can generate income support for the poor and can raise agricultural productivity as well as profitability in the long run through creating different productive assets related to agriculture. As for example, the Employment Guarantee Programme (EGP) in Maharastra was able to avert famine during draught of 1970-73 and reduced poverty while Rural Public Works Scheme in Bangladesh has been commented to its contribution to rural development and increased agricultural productivity through the creation and maintenance of rural infrastructure (Dreze and Sen, 1991). This scheme will generate productive assets which can directly influence agricultural productivity as well as profitability in the long run. The 'productive assets' include water harvesting, construction of irrigation canals, land development, flood control to reduce vulnerability of rural people and improvement of rural connectivity (Dev 1995).

Employment generation through NREGS emphasized its role in income insurance in the presence of seasonality in agricultural labour market (Basu, 2011). Dev (1995) reported that Maharashtra EGP and agricultural employment were complementary in the sense that EGP employment was high in lean season (April-July) and low in peak season (October – January). He had shown that in two villages within Maharashtra, negative correlation was observed

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[15] The annual outlay of NREGS was 0.31% of GDP covering 21 million households in 2006-07 and it immensely increased to 1.29% of GDP covering 54.95 million households in 2011-12. In the FY 2015-16 the corresponding figures are 0.323% of GDP and 48.206 million respectively (www.nrega.nic.in).

between the EGP employment and agricultural employment where the values were -0.68 and -0.33 respectively. On the basis of this he concluded that NREGS should not compete with agricultural labour hiring decision.

Initially the contemplation was that the employment be provided mainly in the agricultural slack season when the rural poor especially the landless labourers are absolutely jobless. But to reach the target and for proper utilization of funds, the local panchayats sometimes offer job under NREGS even in the agriculturally busy season in the multiple cropping framework mainly during the time of cultivation after rainy season. Then, the agricultural labour households have two choices: either the labourer can work as an agricultural labourer or he can work under NREGS. The small as well as marginal farmers also have two choices. He can start agricultural production for second crop with the help of hired and family labourers or he can engage himself and his family members to work under NREGS on the basis of assumption that all the working members of the marginal farm households are job card holders. This actually increases the bargaining power of the local labourers and the land holders of farmer households need to raise wage of the workers during the time of hiring in order to get ready availability of labour. Basu *et.al*. (2009) developed a theoretical model to analyze different implications of such public policy in the context of labour market. According to them such scheme introduces 'contestability' in the agricultural labour market where government and the land-lord class are two different employers. They had shown that the outcome with respect to wages and overall level of employment in the labour market depends on the degree of distributional concern of the planners. In effect, implementation of NREGS raises the reservation wage of the agricultural labourers in an imperfectly competitive rural labour market which may reduce private employment in standard framework.

The government can influence the NREGS piece rate in two ways (i) it can enhance the wage rate keeping the task unchanged or (ii) can reduce the task at unchanged wage rate. According to the recommendation of the expert committee set up by the Union Rural Development Ministry, piece rate of NREGS should be the minimum wage fixed by the respective state. The panel also recommended linking of the per man-day piece rate to the consumer price index of rural labourers for protecting NREGS piece rate against inflation. But hike of farm wage is observed after the hike of NREGS piece rate. Report of the Commission on Agricultural Costs and Prices

(2012), Government of India has argued that NREGS has been one of the factors that has contributed to increase in agricultural wages. The report mentioned that the trend in real wage of the farm labourers irrespective of gender increased at a slower pace between 2000-2004, but thereafter the real farm wage has increased significantly which coincides with the phase of NREGS implementation. Haque (2013) comments that the NREGS has resulted in substantial increase in the market wage rates of agricultural and non agricultural labourers and also makes a note that the fact is confirmed by the NSSO 66th Round. Reddy (2013) reports that the introduction of NREGS with minimum and equal wages for male and female workers, did bring about not only an increase in the overall agricultural wages but also reduction in the male-female wage differentials. According to him, wage increases were reported in a number of states like Punjab, Haryana, Gujarat and West Bengal etc. and higher wages in NREGS has diverted workers from agriculture and has created labour shortages in agriculture.

Doug Johnson (2009) found that NREGS allowed households to mitigate the effects of weather induced income shocks. Although he was unable to precisely identify the relationship between changes in income and participation in NREGS, he showed that the relationship is strong enough to be practically significant. Jha *et al.(*2008) using pooled household level data for the Indian states of Rajasthan and Andhra Pradesh found that the size of landholdings is a negative predictor of participation in this employment scheme. In state level analysis, this pattern survives in Rajasthan but reverses in Andhra Pradesh where there is a positive relationship. They also found evidence of complementarities between NREGS and the Public Distribution System (PDS). Dasgupta (2013) examines the role of this public policy in buffering the negative effects of early childhood exposure to rainfall shocks on long-term health outcomes. The study finds that while the policy does not help correct for long term past health deficiencies, it is useful in buffering recent drought shocks, which varies by policy relevant sub-groups.

On the contrary Anna McCord and John Farrington (2008) are of the opinion that the types of impact achieved by both long and short term public works programme (PWP) such as NREGS are often limited to smoothing income or consumption during the period of employment, and given the additional costs associated with PWP implementation, PWP may not be as cost-effective as other measures seeking these types of limited impact. Dutta et al (2012) found that although the scheme is reaching the rural poor and backward classes and is attracting poor

women into the workforce, yet there is considerable unmet demand for work on the scheme in all states, and more so in the poorest ones, where the scheme is needed most. Yanyan Liu, Christopher B Barrett (2013) using 2009-10 National Sample Survey data, describes patterns of job-seeking, rationing, and participation in NREGS. At the national level, it finds that the self-targeting design of it leads to greater rates of self-selection into the scheme by poorer and scheduled tribe or scheduled caste households. However, the administrative rationing of NREGS jobs is not pro-poor but exhibits a sort of middle-class bias.

The NREGS is aimed to enhance agricultural productivity along with increase in demand for labour. Although the effects of additional employment generation are indirect, the effects pertaining to asset creation are direct.

Land development, water conservation, water harvesting, drought proofing, flood control etc. would help improving crop yields per unit of land in a sustainable manner. It is expected that improvement in irrigation capacity, apart from bringing new area under cultivation, can also improve crop yields due to availability of more water, and will result in multi-cropping as well (Haque, 2013).

Field observation and interactions with the villagers suggest that in most of the villages irrigation works have been undertaken, people have reported recharging of ground water. Renovation of ponds or canals using NREGS resources helped improve irrigated area and cropping pattern positively. There are reports on the revival of water bodies and canals under the NREGS. In many parts of the country, a large number of farmers could raise crops after works undertaken in NREGS like renovation of long canal where there was hardly any crop (Reddy, 2013). In the barren district of *Barmer* in Rajasthan, the NREGS has brought about substantial improvement in water resources. As many as 47,779 tankas[16] have been constructed under the National Rural Employment Guarantee Act (NREGA). The district administration has refurbished a *poshalnari* (man-made pond) built about 40 years ago. This 33- hectare-vast and 10.06-metre-deep pond built in the middle of sand dunes in Nagarda village was drying up. Under NREGS, its base has been thickened with more layers of black soil. This prevents seepage. Revived at a cost of Rs 8 lakhs, it serves around 10,000 people and their livestock in 14 villages. The area around the pond

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[16]*Tankas* are small well-like structures made of concrete, cement and sand. During months when it does not rain, government water tankers fill them up.

now has good vegetation and invites migratory birds. The Barmer collector has, therefore, proposed turning the area into a tourist spot (Paliwal, 2011).The study of Mishra, 2011 in the three districts of Madhya Pradesh indicates that there is a significant impact of assets created through NREGA on rural households. However, the productive value of assets created by NREGA works could be enhanced further with proper monitoring activities.[17]In a study across 10 semi-arid villages spread in three states of Gujarat, Madhya Pradesh and Maharashtra, Mishra, Viswanathan and Bhattarai (2014) found that the implementation of the NREGS has varied experiences. But as regards asset creation in the Scheme, the beneficiaries appreciated the community wide benefits of rural assets and infrastructure created. Even though it may not have any direct benefit to the labor households, it certainly has a community level benefit. The study also suggests for proper monitoring of the work activities at the local level with good governance and participatory decision making in the selection of work activities. In a working paper, Sudha Narayanan, Krushna Ranaware Upasak Das and Ashwini Kulkarni(2014) based on a study on over 4100 works created under the National Rural Employment Guarantee Act (NREGA) and over 4800 randomly selected users across 100 villages in 20 districts in Maharashtra found that an overwhelming 90% of respondents considered the works very useful or somewhat useful; only 8% felt the works were useless. There is some evidence where people feel that they have played a part in deciding the type of work, these are more likely to be ranked as useful and well-maintained. Likewise, works on private lands tend to score better in terms of perceived usefulness and in terms of present condition. Overall it appears that the works are supportive of agriculture and of small and marginal farmers. There is however scope to improve the design of assets and to have a more inclusive process of work selection.

A study conducted by the Institute of Rural Management Anand (2010) reveals that there is overall positive impacts of assets created under NREGA in the state of Sikkim and it also foresees a positive second round multiplier effect of the Scheme. However, it added that the mechanism to ensure durability and sustainability of the assets created under the Scheme needs to be strengthened and clearly suggests some strategies in this regard. According to MGNREGA Sameeksha, 146 lakh works have been taken up since the beginning of the Scheme, of which about 60 per cent have been completed. Of these works,

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[17] Mishra, 2011

• 19 per cent relate to rural connectivity (e.g. village roads)

• 25 per cent relate to water conservation and water harvesting

• 14 per cent relate to irrigation canals and renovation of traditional water bodies

• 13 per cent relate to flood protection and drought proofing

• 13 per cent relate to land development

• 14 per cent relate to work done on private lands (lands belonging to small and marginal farmers/SCs/STs/Below Poverty Line (BPL) households/Indira AwasYojana (IAY) and land reform beneficiaries)

Like traditional public works schemes NREGS also offers a unique opportunity for women to earn cash incomes in a context where, too often, the ability of women to work outside the home is severely constrained by social norms. Actually the NREGS has different progressive provisions to incentivize participation of women in the scheme. This act had an objective to ensure that women have equitable and easy access to work, decent working conditions and equal payment of wages to keep gender equity in informal sector which certainly is expected to have spillover effects on other sectors. The basic objective of this employment scheme is to arrange 100 person-days of guaranteed employment for each willing household. But in a male dominated society, it is sometimes difficult to believe that within a household, women's decision to avail of employment under the NREGS would get precedence over the decision of the male members. Khera and Nayak (2009) commented that the NREGS is unique in the context of two key features. First, the Act prescribes that at least a third of all workers be women. Second, since the entitlement to at least 100 days of work is at the household level, the allocation of the work is left to the household members allowing space for the participation of women. MGNREGA Sameeksha, Government of India (2012) views that in addition to the above features, there are provisions for facilities such as childcare at the worksites that aim to reduce the barriers to women's participation. Further, several other aspects of the Act are indicative of creating an ambience favourable to women at least in principle, for example, the stipulation that the work is within five kilometers of an applicant's residence. Holmes *et al* (2011) discusses about the measures incorporated by the operational guidelines which are sensitive to gender related issues. The recommendation regarding opening bank accounts for wage payments is that the local government should consider joint accounts to avoid crediting earnings solely to the male member

of the household. The operational guidelines also recommend that women be given preference on worksites closest to their dwelling. As far as social audit forums are concerned, the guideline recommends that it must be conveniently scheduled for the workers so that women and marginalized communities can participate without constraints.

In the eight years since its implementation, administrative data of the NREGS suggests that a large number of women have been involved in the scheme. Pankaj and Tankha (2009) based on field survey support the idea that the NREGS has been inclusive and empowering of women. In another survey based study (Pankaj and Tankha, 2010), they also examined the empowerment effects of NREGS on rural women in Bihar, Jharkhand, Rajasthan and Himachal Pradesh and argued that women workers have gained from the scheme primarily because of the paid employment opportunity, and benefits have been realized through income-consumption effects, intra-household effects and the enhancement of choice and capability. As already mentioned, Reddy(2013) comments that the introduction of the NREGS, with minimum and equal wages for male and female workers, did bring about not only an increase in the overall agricultural wages but also reduction in the male-female wage differential.

At the same time, Dreze and Oldiges (2007) and Dutta *et al*.(2012) find that there are large interstate variations in the extent of women's participation which indicate that the NREGS has not been uniformly inclusive of women. It can be reiterated that Dutta et al (2012) also found that although the scheme is reaching the rural poor and backward classes and is attracting poor women into the workforce, yet there is considerable unmet demand for work on the scheme in all states, and more so in the poorest ones, where the scheme is needed most. Liu and Barrett(2013) using NSSO data examined differences across men and women along a number of aspects; possessing a job card, seeking work under the NREGS and participation and rationing rate, defined as the proportion of job seekers who were not allocated work. Narayanan and Das (2014) studied the extent to which the scheme is inclusive of women, with a particular focus on sub-populations of women such as widows and mothers of young children who typically face serious constraints in the context of labour market participation. They found that while the scheme has indeed been inclusive of women, the substantial variations both across states and the exclusion of vulnerable groups of women need attention. In fact provision of child care facilities is one of the entitlements provided under the NREG Act to encourage women to work. But surveys and

anecdotal evidence suggest that this provision is not always available (Dasgupta and Sudarshan, 2011). According to MGNREGA Sameeksha (2012), in the financial year 2011-12 female participation in NREGS was 47% on an average at the national level and in certain number of states we observe such participation lies below national level. West Bengal is one of the states having lower than average performance, where, women participation percentage in the financial year 2011-12 was only 32. Thus inter alia it is evident that the objective of inclusiveness of women in NREGS is vitiated so far as its uniformity is concerned.

CHAPTER – 3: Research Questions

Research Questions

At the time of initiation of NREGS the contemplation was that the employment be provided mainly in the agricultural slack season when the rural poor especially the landless labourers are absolutely jobless. But to reach the target and for proper utilization of funds, the local panchayats sometimes offer job under NREGS even in the agriculturally busy season in the multiple cropping framework mainly during the time of cultivation after rainy season. Then, the agricultural labour households have two choices: either the labourer can work as an agricultural labourer or he can work under NREGS. The small as well as marginal farmers also have two choices. He can start agricultural production for post rainy season crop with the help of hired and family labourers or he can engage himself and his family members to work under NREGS. This is conceived on the premise that all the working members of the marginal farm households are job card holders. Under the circumstances, the bargaining power of the local labourers increases and the land holders of farmer households need to raise wage of the workers during the time of hiring in order to get ready availability of labour.

The government can influence the NREGS piece rate in two ways (i) it can enhance the wage rate keeping the task unchanged or (ii) can reduce the task at unchanged wage rate. Now enhancement of NREGS wage in any way puts an upward pressure on the agricultural wage rate, thus, having a dampening impact on the farm income.

In this situation, constructing a theoretical model we try to find the maximum permissible hike of NREGS wage which can sustain the minimum net farm income of the small and marginal farmers from secondary agricultural production activities. Thus the basic objective of chapter 3 is to investigate the impact of the hike of NREGS wage on net farm income and employment generation in agricultural labour market. The chapter also investigates the status of aggregate net benefit as envisaged in different agricultural contexts along with focusing on the responsiveness of aggregate net benefit with respect to relevant policy parameters.

Apart from the theoretical understanding of the impact of one aspect pertaining to NREGS viz, hike of NREGS wage, on net farm income of the rural poor, empirical exercises have also been carried out covering distinct areas contemplated to be influenced by the introduction and persistence of NREGS.

Since the inception, NREGS has always been at the helm of controversy. Time and again different facets of the society have raised question about the efficacy of NREGS particularly pertaining to the aspects of targeting and productive asset creation under the scheme. a time came when even the government fell doubtful whether the implementation of NREGS has been at its best especially in respect of the aims and objectives with which the corresponding act was devised.

Against this backdrop we were tempted to investigate the effectiveness of NREGS in the agriculturally backward areas to improve the livelihood of rural people. To do that, we carried out a quasi experimental study which was conducted in four gram panchayats of two separate blocks in Birbhum district of West Bengal. This is done in chapter 5.

Sustenance of the same spirit i.e, effectiveness of NREGS to impact the rural economy, prompted us next to concentrate upon the asset creation aspect. Provision of water through creation of irrigation facilities and micro irrigation works are vital for agriculture and ensuring food and water security in rural India including West Bengal. Research suggests that water-related assets created under NREGS have increased the number of days of availability of water and also the quantity of water available for irrigation. The increased availability of water has also led to changes in crop patterns and increased area under cultivation according to some studies. For example, a study conducted by Indian Institute of Science, Bangalore during 2012-13 has indicated that such works taken up under NREGS have contributed to improved ground water levels, increased water availability for irrigation, increased area irrigated by ground and surface water sources and improved drinking water availability for humans and livestock.

In the light of the above proceedings, the present study has tried to investigate in chapter 6 whether introduction and persistence of different kinds of works and the resulting asset creation related to agriculture under NREGS have any impact on the cropping intensity of West Bengal over the years. We know that in West Bengal economy, agriculture is placed at an important position. Hence, at the backdrop of the significant role of agriculture in West Bengal economy and taking into account the emphasis given in the NREG Act to create long term assets with a view to enhance agricultural productivity, we undertook the study focusing on West Bengal and taking each district as the unit of study.

Another important aspect taken into account in the thesis is the female employment generation in NREGS. The adjoining act (NREG Act of 2005) that guarantees employment of every rural household for 100 days has different provisions to incentivize participation of women in the scheme. The scheme indeed has both direct and indirect aspects towards favoring the participation of women in order to fulfill a larger objective of women empowerment. Perhaps, that is the reason why there has been provision of 33% reservation of women in the act. Thus it becomes imperative to focus on the extent to which the programme is inclusive of women. According to MGNREGA Sameeksha (2012), in the financial year 2011-12 female participation in NREGS was 47% on an average at the national level and in certain number of states we observe such participation lies below national level. West Bengal is one of the states having lower than average performance, where, women participation percentage in the financial year 2011-12 was only 32. In this regard, there is substantial variation not only across states but also across different regions within a state.

As a matter of fact, several factors may be active either jointly or single handedly across different regions and communities behind generation of female employment among rural households through NREGS especially for married female members and these are (i) inter-household factor(s) (ii) woman specific factor(s) and (iii) intra-household factor(s). Considering all the factors simultaneously still no investigation has been done to identify the specific factor(s) which is (are) much more responsible to influence employment generation among rural women (mainly married) through NREGS. Against this backdrop we wanted to investigate the effectiveness of NREGS in the agriculturally backward areas to generate female employment in the scheme and to this end, it makes an empirical exercise in chapter 7 with intent of objectivity. Thus the thesis aims to address the following research questions expressed in summarized form.

1. In a theoretical model we try to find the maximum permissible hike of NREGS wage which can sustain the minimum net farm income of the small and marginal farmers from secondary agricultural production activities. In other words, the basic objective is to investigate the impact of the hike of NREGS wage on net farm income and employment generation in agricultural labour market.

2. The theoretical study also investigates the status of aggregate net benefit as envisaged in different agricultural contexts along with focusing on the responsiveness of aggregate net benefit with respect to relevant policy parameters.

3. To investigate empirically the effectiveness of NREGS in the agriculturally backward areas to improve the livelihood of rural people.

4. To investigate through a district level empirical exercise whether introduction and persistence of different kinds of works and the resulting asset creation related to agriculture under NREGS has any impact on the cropping intensity of West Bengal over the years.

5. To investigate the effectiveness of NREGS in the agriculturally backward areas to generate female employment in the scheme and to this end, it makes an empirical exercise with intent of objectivity.

C H A P T E R – 4:

IMPACT OF MAHATMA GANDHI NATIONAL RURAL EMPLOYMENT GUARANTEE SCHEME (NREGS) ON THE RURAL POOR- A SIMPLE THEORETICAL DISCOURSE

IMPACT OF MAHATMA GANDHI NATIONAL RURAL EMPLOYMENT GUARANTEE SCHEME (NREGS) ON THE RURAL POOR- A SIMPLE THEORETICAL DISCOURSE

4.1 Introduction:

Government of India has initiated National Rural Employment Guarantee Scheme which is presently known as Mahatma Gandhi National Rural Employment Guarantee Scheme (NREGS) where the basic objective is to provide 100 full man-days of employment to each willing rural household. It is expected that NREGS can generate income support for the poor and can raise agricultural productivity as well as profitability in the long run through creating different productive assets related to agriculture. As for example, the Employment Guarantee Scheme (EGS) in Maharastra was able to avert famine during draught of 1970-73 and reduced poverty while Rural Public Works Scheme in Bangladesh has been commented to its contribution to rural development and increased agricultural productivity through the creation and maintenance of rural infrastructure. Employment generation through NREGS emphasized its role in income insurance in the presence of seasonality in agricultural labour market. Maharashtra EGS and agricultural employment were complementary in the sense that EGS employment was high in lean season (April-July) and low in peak season (October – January). In two villages within Maharashtra, negative correlation was observed between the EGP employment and agricultural employment where the values were -0.68 and -0.33 respectively. On the basis of this we can reach the premise that NREGS should not compete with agricultural labour hiring decision. Besides that this scheme will generate productive assets which can directly influence agricultural productivity as well as profitability in the long run. The 'productive assets' include water harvesting, construction of irrigation canals, land development, flood control to reduce vulnerability of rural people and improvement of rural connectivity.

Initially the contemplation was that the employment be provided mainly in the agricultural slack season when the rural poor especially the landless labourers are absolutely jobless. But to reach the target and for proper utilization of funds, the local panchayats sometimes offer job under NREGS even in the agriculturally busy season in the multiple cropping framework mainly

during the time of cultivation after rainy season. Then, the agricultural labour households have two choices: either the labourer can work as an agricultural labourer or he can work under NREGS. The small as well as marginal farmers[18] also have two choices. He can start agricultural production for second crop with the help of hired and family labourers or he can engage himself and his family members to work under NREGS on the basis of assumption that all the working members of the marginal farm households are job card holders. This actually increases the bargaining power of the local labourers and the land holders of farmer households need to raise wage of the workers during the time of hiring in order to get ready availability of labour. In effect, implementation of NREGS raises the reservation wage of the agricultural labourers in an imperfectly competitive rural labour market which may reduce private employment in standard framework.

The government can influence the NREGS piece rate in two ways (i) it can enhance the wage rate keeping the task unchanged or (ii) can reduce the task at unchanged wage rate. In this theoretical framework both the possibilities will be considered.

According to the recommendation of the expert committee set up by the Union Rural Development Ministry, piece rate of NREGS should be the minimum wage fixed by the respective state. The panel also recommended linking of the per man-day piece rate to the consumer price index of rural labourers for protecting NREGS piece rate against inflation. But hike of farm wage is observed after the hike of NREGS piece rate. Report of the Commission on Agricultural Costs and Prices (2012), Government of India has argued that NREGS has been one of the factors that has contributed to increase in agricultural wages. The report mentioned that the trend in real wage of the farm labourers irrespective of gender increased at a slower pace between 2000-2004, but thereafter the real farm wage has increased significantly which coincides the phase of NREGS implementation. Several studies have reported that the NREGS has resulted in substantial increase in the market wage rates of agricultural and non agricultural labourers and the fact is confirmed by the NSSO 66th Round. Again the introduction of NREGS with minimum and equal wages for male and female workers, did bring about not only an increase in the overall agricultural wages but also reduction in the male-female wage

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[18] Farmers who own up to 1 hector of land are called marginal farmers and farmers who own up to 1-2 hector land are called small farmers.

differentials. Wage increases were reported in a number of states like Punjab, Haryana, Gujarat and West Bengal etc. and higher wages in NREGS has diverted workers from agriculture and has created labour shortages in agriculture.

In this situation, incorporating the stylized facts in a theoretical model we try to find the maximum permissible hike of NREGS wage which can sustain the minimum net farm income of the small and marginal farmers from secondary agricultural production activities. The basic objective of this paper is to investigate the impact of the hike of NREGS wage on net farm income and employment generation in agricultural labour market. This is dealt with in section 2 where as section 3 investigates the status of aggregate net benefit as envisaged in different agricultural contexts. This section also focuses on the responsiveness of aggregate net benefit with respect to relevant policy parameters. Section 4 highlights on some observations. Section 5 comments on the contribution of the study along with its limitations and future scope. Appendices are worked out in section 6.

4.2 The General Framework of the Model:

There is no uncertainty in this model and it is assumed that all the farm households are marginal farmer households. We here consider two types of economic agent in the village economy: (i) the marginal farmers who cultivate their own land with the help of family labour force and hired labourers and (ii) the landless agricultural labourers. We also assume that all the adult members of representative marginal farmer households are job card holders and only the agricultural labourer holds the job card.

Consider a marginal farmer household[19] who cultivates his own land with the help of family labour force denoted as L_F and hired agricultural labourers denoted as L_H.

It is assumed that two kinds of labourers are replaceable by one another as regards the nature of job to be done[20]

The normal working hour of each labourer is 1 and each family labourer has to work more than the normal working hour and the extra hour is denoted as 'H'. Here $H \in (0, \overline{H})$ where $\overline{H}$ indicates maximum hours a family labourer can work more than the normal working hour. So total labour hour used in the production process of a single household will be $\{L_F(1+H) + L_H\}$. Now if 'E' be the effort level[21] devoted by each labourer in each hour then the agricultural production function for each farmer will be[22]

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[19] In terms of numbers, India at present has about 82 million landless labourer and 80 million small and marginal farmers who also have to work as an agricultural labourer (Ministry of Agriculture 2000-01). In this model, we shall concentrate on the impact on net farm income only of marginal farmer households after gradual hike of NREGS wage.

[20] In the model the rural poor consists of two sections- marginal farmers and landless labourers. Again in the absence of joint family system it has become hard to carry out agricultural activities only with the help of family labourers. Thus both kinds of labourers (family and hired) are needed. But they are identical in terms of the task they perform.

[21] Here effort level (E) implies the effective physical and mental involvement a standard nourished worker devotes in each hour and is considered exogenous in the model. Thus with respect to a specific kind of work, such as agricultural work, E can be thought of as an impersonal attribute which remains invariant from person to person.

[22] Like Neo classical type production function, labour measured in terms of hour is the only factor which influences the agricultural output. For the simplicity of this model, we assume that total man-day used in the production function is '1'.

$$Y = A\{L_F(1+H) + L_H\}^\alpha E^\alpha \ \ldots\ldots\ldots\ldots\ldots\ldots..(4.1) \ \text{where } \alpha \in (0,1).$$

Here we hypothesize that the representative marginal farmer household sells her entire crop and 'P' is the price per unit of the produced crop. Again 'A' is a parameter standing for inputs other than labour and irrigation, such as capital goods required during the time of agricultural production, viz- hand tractor, fertilizers etc. Since we consider only marginal farmers and moreover they are considered as homogeneous, so the size of land and capital used can be considered same across different farming households. This implies that the cost of capital can be cross-sectionally taken as given. In this model we consider a developed agricultural framework with no suspension of work under NREGS except the rainy busiest season because during that time it is strictly guided that no NREGS project can be undertaken. So a labourer has to choose between doing job under NREGS or doing job as an agricultural labourer except that time period. For the simplicity of the model we rule out the possibility of the availability of non-farm employment among the rural casual labourers in that locality.

The entire theory is concerned with the agricultural production during the time of cultivation of the second crop which happens only after the completion of principle crop production conducted in the rainy season when no NREGS project can be undertaken. Thus our model presumes that choice between two options will arise during the time of second crop production in agriculturally developed region. Therefore the so called contestability arises only after the completion of rainy season.

We have already mentioned that Government of India in last eight years has been gradually increasing the NREGS piece rate of each labourer for each man-day work. This NREGS piece rate most of the times seems attractive relative to non NREGS market wage and therefore brings the risk of upward wage pressure. So in the presence of NREGS, the landlord cum employers who have to depend on hired labourers for cultivation need to raise wage of the workers they hire in order to ensure the necessary supply of labour. If W_M is per man-day wage a labourer can earn through NREGS, then to get them employed the farmer offers βW_M to each hired labourer where it is implied that $\beta \geq 1$ which means each hired labourer is offered at least the NREGS wage

otherwise it is not possible for him to avail their labour supply[23]. Now we want to locate the maximum possible wage rate Government should offer under NREGS for one-man day work which leads the marginal farmers to continue their agricultural production rather than to stop it and entirely switch over to NREGS.

Due to working in own family farm each family labourer sacrifices his (her) job under NREGS from which he can earn W_M. Apart from that they also devote extra hour over and above the normal working hour in the production process. In effect, their net farm income in agricultural production for second crop hinges on two factors. On the one hand, it depends upon the number of hired labourers and on the other hand, it depends upon the extra hour that the farmer has to devote to keep the agricultural production going. Thus if L_H is varied, then it will result in variation of H. Hence the net farm income function of the marginal farmer in second crop production can be expressed as

$$\pi(H, L_H) = PA\{L_F(1+H) + L_H\}^\alpha E^\alpha - C_w - W_M L_F - \beta W_M L_H - L_F^2(1+H)^2 E^2 \ \ldots\ldots(4.2)$$

The last term on the R.H.S of equation (2) stands for the cost of effort[24] incurred by the family labourers to do agricultural work. Cost of effort is expressed in monetary terms and depends on the substitutable choice variables H and L_H in case of agricultural production activities. The particular expression in equation (2) belies on the fact that it is convex in nature. C_w is the cost of water for cultivation in post rainy season which has some potentiality to be explored in our future discussion. As the production is done simultaneously by family labourer and hired labourer, there is little possibility of the emergence of moral hazard problem among the hired agricultural labourers. So we can anticipate the presence of complete information in our model and hence the effort level devoted by each hired labourer in each hour in the production process is observable and same as that in case of family labourers and there is little possibility of shirking among the hired labourers.

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[23] It is told that expansion of NREGS has boosted wage rate of agriculture by 5.3% on an average between 2010 and 2011. A study by T. Haque (2013) also reveals that in the district Dindigul of Tamil Nadu an increase in the agricultural wage rate by about 200 percent on an average was observed.

[24] Cost of effort in general in the model signifies the flavor of opportunity cost of giving effort to do the task either in agriculture or in NREGS. In other words, it may be synonymous with the concept of disutility of work.

The other alternative of each farm household is to work under NREGS when the feasibility of agricultural production comes at stake. Now if the farm household does not carry out agricultural production and want to work under NREGS then the net earnings of that household will be

$$\overline{\pi} = L_F e^{-\rho} W_M - L_F^2 a^2 E^2 - R \quad \text{.................................. (4.3)}$$

Here 'R' is the implicit cost incurred by the farm household for not using the available land for agricultural purposes. The framework of the model conceives that the rural poor comprises of marginal farmers and landless agricultural labourers. Again there is homogeneity among the farming households in respect of land holding. Hence the possibility of leasing out the land is negated as there is no farmer who can take the lease for cultivation. So a farmer either cultivates his land with the help of family labourers and hired labourers or leaves the land uncultivated. $L_F^2 a^2 E^2 (0 < a < 1)$ is the cost of effort incurred by the family labourers to do work under NREGS[25]. Since the Government can time to time change this work effort to be devoted to NREGS, therefore $'a'$ can be conceived of as a policy parameter in our analysis. Besides that a labourer after doing job through NREGS does not get wage instantly, rather it takes some time. So the labouer has to bear a few 'patience cost'[26] to get wage through NREGS from his/her bank account and that is why we have taken a discounted wage income with ρ as the discounting factor. It must be noted that with increase in delay of payment, ρ increases.

Now a farm household will concentrate on agricultural production rather than sending their entire family labour force to do job under NREGS only if $\pi \geq \overline{\pi}$.

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[25] During our village level survey in three gram panchayats of South 24 Parganas district and seven gram panchayats of Birbhum district of West Bengal, it is observed that to do one may day work under NREGS, each labourer has to dig only 50 cubic feet soil which a standard nourished worker can do within 4 hours and according to them the effort they have to devote to complete this job is almost half of effort they have to devote to do work as an agricultural casual labourer in one day where the working hour is not less than 8 hours.

[26] According to the NREGS guideline, payment for worker should be made within 14 days of the completion of the work. However delay in payment and incorrect payments are common problems here. The delay can be for several weeks or sometimes months. Often workers have to make several visits to the bank/post office to find that their wages have not been credited to their accounts. Sometimes delay is also caused because works under NREGS are carried out without proper approval.

There is a possibility that NREGS crowds out agricultural employment. This may lead to lower participation of the poor in the agricultural labour market. On the other hand, higher wages in agriculture will reduce the demand for labour.

Suppose there are 'N' numbers of agricultural labour households and each labour household has only one member who supplies labourer in the labour market. The labourer has two options: (i) working under the farm household as an agricultural labourer where the wage rate is more than the wage rate offered under NREGS and the payment is instantaneous, but have to work extensively or (ii) work under NREGS where the wage rate is less if we compare that with agricultural wage rate, the payment is delayed but the effort devoted to do one man-day of work is far less than what is required as an agricultural labourer. We have already mentioned that the cost of effort incurred by each labourer doing job under NREGS is expressed as $a^2 E^2$. So the net earnings of a labourer after doing one man-day job under NREGS will be

$$E_{NREGA} = e^{-\rho} W_M - a^2 E^2 \ldots\ldots\ldots\ldots..(4.4)$$

Now from equation (4) we have

$$\frac{\partial E_{NREGA}}{\partial \rho} = -W_M e^{-\rho} < 0 \, and \, \frac{\partial^2 E_{NREGA}}{\partial \rho^2} = W_M e^{-\rho} > 0$$

So E$_{NREGA}$ curve is downward sloping and convex in nature with respect to ρ. At $\rho = 0$, i.e. when payment is instantaneous

$$E_{NREGA} = W_M - a^2 E^2 \ldots\ldots\ldots\ldots(4.4A)$$

Again the net earnings of a labourer after finishing one man-day work as 'hired' agricultural labourer will be

$$E_{AG} = \beta W_M - E^2 \ldots\ldots..(4.5)$$

It is clear that E_{AG} is independent of ρ.

Proposition-1: Instant payment in NREGS work with given relaxation of assigned job under NREGS will reduce the availability of labourers during agricultural production under certain condition, i.e $E^2(1-a^2) > (\beta - 1)W_M$ even if they are paid more than NREGS wage.

Proof. At $\rho = 0$, E$_{NREGA}$ > E$_{AG}$ provided $E^2(1-a^2) > (\beta - 1)W_M$ i.e. the extra sacrifice a labourer has to do in terms of effort to work as an agricultural labourer is more than the net gain he can enjoy as an agricultural labourer in terms of wage.

Now a labourer will prefer to work as an agricultural labourer rather than working under NREGS if and only if $E_{AG} \geq E_{NREGA}$ and that can happen after a certain value of ρ say $\hat{\rho}$ (>0) which can be called as the critical value of ρ at which the net earnings of a labourer under NREGS is just equal to E_{AG} (See appendix I) i.e. when $\rho > \hat{\rho}, E_{AG} > E_{NREGA}$

So in Fig-1 at $\rho = \hat{\rho}, E_{AG} = E_{NREGA}$.
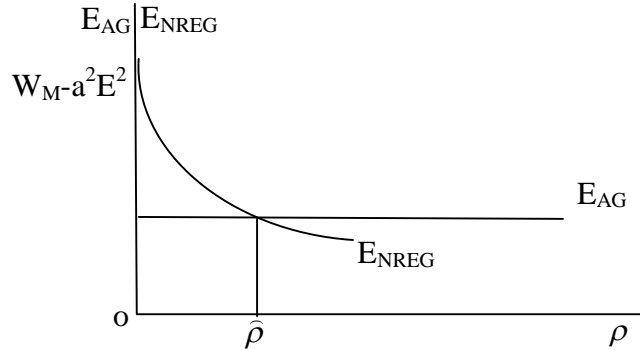
Fig – 1

Determining critical value of ρ beyond which work through NREGS will not be demanded

Fig-1 is drawn based on the premise that the required condition in proposition 1 holds true. From Fig-1 it is obvious that when ρ is less than $\hat{\rho}$ then it will be difficult for a farm household to hire agricultural labourer during the time of production even after offering wage more than W_M because at that situation the rational labourer will always prefer to work under NREGS where he has to devote less effort and get payment within short duration after completing one may-day work. So if government initiates payment system within short duration under NREGS then demand for work under NREGS will increase and it will be difficult to have labour supply in the agricultural production even at much higher wage in post rainy season cultivation.

[60]

NREGS work with maximum relaxation of assigned job leading to no cost of effort in the same will derive to a labourer more earnings from NREGS than that from agricultural production under the condition $E^2 > (\beta - e^{-\rho})w_M$ even if they are enjoying higher wage in agriculture than NREGS. The relevant illustration is given in appendix II.

At A (see figure in app II), the above condition is satisfied which implies that the cost of effort that a labourer has to bear in order to perform agricultural work must outweigh the difference between realized agricultural wage and realized NREGS wage.

At B, $E_{AG} = E_{NREGA}$, which evolves a critical value of a, i.e, $\hat{a} = 1 - \dfrac{\sqrt{(\beta - e^{-\rho})W_M}}{E}$

It is clear that $\hat{a} < 1$ and at this critical value, a labourer will be indifferent between the two jobs. It is to be noted that the cost of effort in NREGS is still less than that in agriculture, but corresponding to the prevailing wage, the job is not unquestionably accepted.

It is clear from the expression of E_{NREGA} that if W_M increases, there will be an upward revision in a i.e, $\hat{a}$ will increase.

Again without delving into intricate mathematical techniques, it can easily be apprehended that ρ and a will move in opposite direction in order to keep earnings from NREGA intact.

For the mobility of our model, we stick to $\rho > \hat{\rho}$ and hence $\pi > \overline{\pi}$ and $H < \overline{H}$.

Securing job through NREGS entirely depends on the willingness of the job seekers. If a labourer seeks job through NREGS, then local panchayat is bound to provide employment for them. But if $\rho > \hat{\rho}$, then employment will be generated in agriculture and the labourers who fail to get job as farm labourers will work through NREGS. So in our model, agricultural production can be done if and only if $\rho > \hat{\rho}$ because then $\pi > \overline{\pi}$.

Now considering $\rho > \hat{\rho}$ and $\pi > \overline{\pi}$ we ultimately have the following optimization problem of the farm household

$Max \pi(H, L_H) = PA\{L_F(1+H) + L_H\}^\alpha E^\alpha - C_w - W_M L_F - \beta W_M L_H - L_F^2(1+H)^2 E^2 \ldots(4.6)$

From Eq.(4.6), we have

$\dfrac{\partial \pi}{\partial H} = 0 \Rightarrow PA\alpha\{L_F(1+H) + L_H\}^{(\alpha-1)} E^\alpha = 2L_F^2(1+H)E^2 \ldots\ldots\ldots(4.7)$

$$\frac{\partial \pi}{\partial L_H} = 0 \Rightarrow PA\alpha\{L_F(1+H) + L_H\}^{(\alpha-1)} E^\alpha = \beta W_M \ \ldots\ldots\ldots\ldots\ldots(4.8)$$

Eq.(4.7) and Eq.(4.8) give the optimum values of 'H' and 'L_H' say H^* and L_H^*. The Second order condition is checked in the appendix- II

From Eq.(4.7) and (4.8) we can say

$$2L_F^2(1+H^*)E^2 = \beta W_M \ \ldots\ldots\ldots\ldots\ldots(4.9)$$

Therefore, $$H^* = \frac{\beta W_M}{2L_F^2 E^2} - 1$$

On the other hand, $L_H^* = \{\frac{\beta W_M}{PA\alpha E^\alpha}\}^{\frac{1}{\alpha-1}} - \frac{\beta W_M}{2L_F E^2}$ (See appendix-III)

Now we shall investigate about the consequence in agricultural employment generation and production in agricultural sector after hike of NREGS wage.

Proposition-2: Higher wage in NREGS tempts the marginal farmer households to reduce the employment of hired labourers.

Proof: From above, we have

$$\frac{\partial L_H^*}{\partial W_M} = \frac{\beta}{\alpha-1}\{\frac{\beta W_M}{PA\alpha E^\alpha}\}^{\frac{1}{\alpha-1}-1} - \frac{\beta}{2L_F E^2} < 0 \ \ldots\ldots\ldots(4.10)$$

Proposition 3: Higher wage in NREGS tempts the family labourers to devote more hours for agricultural production.

Proof: From Eq.(4.9), we have

$$\frac{\partial H^*}{\partial W_M} = \frac{\beta}{2L_F^2 e^2} > 0 \ \ldots\ldots\ldots(4.11)$$

So if government wants to increase W_M then $H \to \overline{H}$ which implies the marginal farmer households will reduce the recruitment of hired labourers and its own family labour force will have to work more than the normal working hour. This establishes the fact that $H^* = H(W_M)$ and $L_H^* = L_H(W_M)$..

Hence, the optimum net farm income function of the marginal farmer will be

$$\pi^* = PA[L_F\{1 + H^*(W_M)\} + L_H^*(W_M)]^\alpha E^\alpha - C_W - W_M L_F - \beta W_M L_H^*(W_M) - L_F^2\{1 + H^*(W_M)\}^2 E^2$$

$$\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(4.12)$$

[62]

Applying Envelope theorem we have

$$\frac{d\pi^*}{dW_M} = -L_F - \beta L_H^* \quad < 0 \quad \ldots\ldots\ldots(4.13)$$

$$\frac{d^2\pi^*}{dW_M^2} = -\beta \frac{\partial L_H^*}{\partial W_M} \quad > 0 \quad \ldots\ldots\ldots(4.14)$$

So the maximum net farm income curve of the marginal farmer is negatively sloped and convex in nature which establishes the fact that with the increase of W_M the maximum net farm income of the marginal farmer household will decrease. So we have to find the critical value of W_M beyond which the farm household will stop agricultural production for the second crop.

Here $Min(W_M) = \vec{W}_M$ (see fig-2) i.e. the NREGS wage will never become zero but its possible subsistence level is denoted as $\vec{W}_M$. We have also mentioned that a marginal farmer household will continue his production as long as it earns at least more than $\overline{\pi}$. From equation (3) it is clear that $\overline{\pi}$ curve is positively slopped and a straight line with respect to W_M. Now at $\vec{W}_M$, $\pi^* > \overline{\pi}$. In figure-2 'k$_1$' is the intersection point where π^* curve intersects $\overline{\pi}$ from above and the corresponding level of W_M will be $\hat{W}_M$ (say) where the farm household will be indifferent between his two options in terms of earnings. At $\hat{W}_M$, $\pi^* = \overline{\pi}$ holds.(See Appendix IV)

Now when W_M increases to $\hat{W}_M$, there will be change in the critical value of ρ. When $W_M \rightarrow \hat{W}_M$ then $\hat{\rho} \rightarrow \overline{\rho}$ (say), i.e, the prospective NREGS workers will be willing to keep more patience than the previous situation if the government hikes the NREGS wage per man day towards a limiting value. So at $\hat{W}_M$, the labour will be available for agricultural production when $\rho > \overline{\rho}$. Hence when $W_M > \hat{W}_M$ and $\rho < \overline{\rho}$, no farmer will be willing to start agricultural production at unchanged P and A, because, then $\pi^* < \overline{\pi}$.

Hence under the above circumstances, for sustainability of agricultural production in post rainy season, government should not hike one man-day wage under NREGS beyond $\hat{W}_M$. The following fig-2 also establishes the fact that if due to political pressure or any populist policy, government plans to hike NREGS wage beyond $\hat{W}_M$ then for survival purposes the farmer will have no other option but to hike the price of the agricultural commodity which ultimately may

create agricultural price inflation in the economy. It is observed from figure-2 that when $W_M \in (\hat{W}_M, \overline{W_M})$ the farmer has no other alternative but to increase the price of the product to make production at least sustainable. In Fig-2, the new net farm income curve is denoted as $\pi **$ when the crop price is increased from P_0 to P_1. Other wise beyond $\hat{W}_M$ with $\rho < \overline{\rho}$, $\overline{\pi} >$ $\pi *$ which establishes the fact that the farm household has to stop his agricultural production and engage totally in NREGS[27].
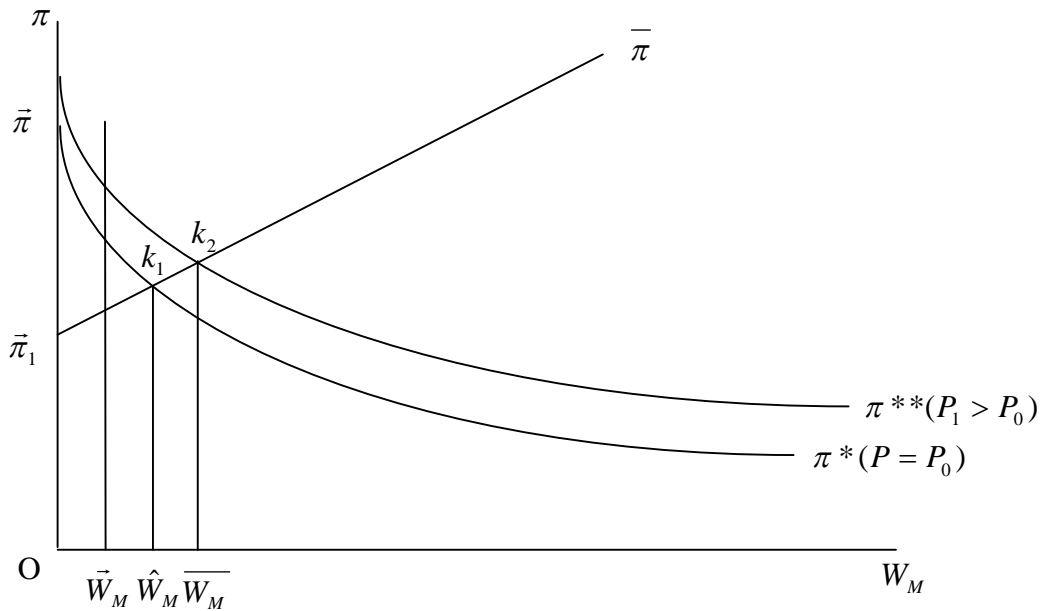

Fig – 2

Determining the critical value of W_M and citing the possibility of price hike

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[27] Here it should be mentioned that like Neo-classical type labour market, hike of W_M will not reduce employment generation through NREGS because this public policy is entirely funded by government whose main objective is to generate employment as much as possible.

4.3 Perspective on Aggregate Net Pecuniary Benefit of the rural poor in presence of NREGS:

There is a growing concern that NREGS crowds out private employment (here employment in agriculture) because it is expected that expansion of NREGS may lead to lower participation of the poor in the private agricultural labour market. On the other hand, persistent hike in wages in private agricultural employment keeping in pace with the NREGS wages will also reduce the demand for labour in private labour market and hence labour may switch over from private to public employment. In this background, we try to investigate the extent of aggregate net pecuniary benefit of the rural poor (viz. marginal farmers and agricultural labourers) in different contexts such as double cropping and mono cropping regions.

In India, bi-cropping areas cultivate 'aman' and 'boro' crops so far as paddy cultivation is concerned. The former is cultivated in rainy season when no (minimum) irrigation facilities are required. On the other hand, 'boro' crops are cultivated in the winter season when proper irrigation facility is necessary. Moreover, in this season, fertilizers and other inputs are also compulsorily used up. In the present set up we incorporate these features of agriculture and also presume the nature of employment of labour similar to that in agriculturally developed set up considered in our earlier discussion.

 We consider a rural economy where there are *n* number of homogeneous marginal farmers and *N* number of equally efficient agricultural labourers. Here we subscribe the idea that $\bar{\pi}$ is the total earnings of a farmer household if it does not get involved in agricultural activity in the winter or second crop production season. On the other hand, π is again the profit of a farmer household from agricultural activity for second crop production in the winter season.[28] Moreover, we consider the parameter '*A*' as before denoting the capital goods used up in agriculture not linked with NREGS works. We further hold that $P = 1$. Now we consider static one period (say one year) aggregate net benefit function of the rural poor in a village economy in different situations on the basis of the following assumptions.

It is assumed that Aggregate net benefit functions of different agents have one to one correspondence and monotonic relationship with their respective influencing factors, viz, net

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[28] See earlier exposition where π and $\bar{\pi}$ are carrying the same meaning.

farm income for farmers and wage income for landless labourers etc. The analysis is also based on the belief that all adjustments and readjustments pertaining to wage and employment of labourers have already taken place. Now two possible contexts will be narrated.

Context-1: Suppose $\pi \geq \bar{\pi}$ implying that the agricultural production activity is profitable even in a bi-cropping set up for both seasons and the required number of agricultural labourers working in agriculture is nL_H which remains same in all seasons. In this set up, both cropping seasons are more or less peak seasons which are defined as the busiest times with numerous jobs on the field. The remaining $(N - nL_H)$ workers will work under NREGS. It is confirmed that $\rho > \bar{\rho}$ and/ or $W_M < \hat{W}_M$ which ensures relative unattractiveness towards NREGS works[29]. Here λ_M is the marginal product or average product in NREGS work apart from renovation of water bodies which facilitates irrigation.

It is also assumed that λ_M is directly proportional to the material cost involved in the NREGS project say, Z, such as $\lambda_M = \theta Z$ (where θ is constant of proportionality and $\theta > 0$).

Now the aggregate net benefit function in context 1, i.e, B_1 comprises of four parts.

(i). The first part is the net real value of output of *n* farmers in agricultural work in the two seasons (viz, aman and boro),

$$[nA\{L_F(1+H)+L_H\}^\alpha E^\alpha + nA\{L_F(1+H)+L_H\}^\alpha E^\alpha - C_w - 2nW_M L_F - 2n\beta W_M L_H - 2nL_F^2(1+H)^2 E^2]$$

Here C_w is the extra cost of provisioning for agricultural work (say, cost of water) during second crop production season (viz, boro season) which is not environmentally congenial. C_w is considered to be a decreasing function of material cost (Z) say, $C_w = \dfrac{\gamma}{2 \, Z^2}$. Here enhancement of Z will reduce the cost of irrigation, because the major works done under NREGS is digging of soil for construction of canals in public land to facilitate irrigation.[30] Moreover Z in no case here influences *A*, it will reduce the cost of cultivation mainly in winter season.

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[29] See the earlier section. Here we add the assumption that only those labourers who do not find any agricultural work join NREGS. Hence non existence of rural unemployment is here considered.

[30] According to MGNREGA SAMEEKSHA (2012) published by Ministry of Rural Development, Government of India, with renovation of water bodies, water is available in the canals for up to eight months in a year and this has allowed the farmers to provide 3–6 additional watering to their paddy crops, the renovation increased the crop

(ii). The second part is the value of output generated under NREGS, $\lambda_M (N - nL_H)$.

(iii). The third component of B_1 is net wage incomes of hired labourers in agricultural work,

$[2\beta n W_M L_H - 2nL_H^2 E^2]$

(iv). The last part includes net wage income earned through NREGS work

$[e^{-\rho} W_M (N - nL_H) - (N - nL_H)^2 a^2 E^2]$.

$$B_1 = nA\{L_F(1+H) + L_H\}^\alpha E^\alpha + nA\{L_F(1+H) + L_H\}^\alpha E^\alpha - \frac{\gamma}{2Z^2} - 2nW_M L_F - 2n\beta W_M L_H$$
$$- 2nL_F^2(1+H)^2 E^2 + \theta Z(N - nL_H) + 2\beta n W_M L_H - 2nL_H^2 E^2 + e^{-\rho} W_M (N - nL_H)$$
$$- (N - nL_H)^2 a^2 E^2$$

....(4.15)

Context-2: In monocropping region, when $\pi < \bar{\pi}$ for the second crop production, then the agricultural production activity becomes non-profitable in case of second crop production because all the agricultural labourers join NREGS. Moreover, the farmer household also joins NREGS after incurring the opportunity cost of not using the land. $\rho < \bar{\rho}$ and/or $W_M > \hat{W}_M$ hold true which makes NREGS work attractive. Thus the region remains monocropping where no contestability remains from the point of view of either farmers or landless labourers. Rather, in this case NREGS supplements agriculture.

In this case, the specification of the aggregate net benefit function is same as that in context 1 albeit difference in expressions.

(i). The first part is the net real value of output of n farmers in agricultural work as far as first crop production (viz, aman production) is concerned,

$[nA\{L_F(1+H) + L_H\}^\alpha E^\alpha - nW_M L_F - n\beta W_M L_H - nL_F^2(1+H)^2 E^2 - R]$.

(ii). The second part is the value of output generated under NREGS, $\lambda_M (N + nL_F)$.

(iii) The third part covers the net wage incomes of hired labourers in agricultural work,

$\{n\beta W_M L_H - nL_H^2 E^2\}$

[67]

(iv). The last part is composed of the net wage income earned through NREGS work, $\{e^{-\rho}W_M(nL_F + N) - (nL_F + N)^2 a^2 E^2\}$.

Hence, the aggregate net benefit B_2 can be expressed as:

$$B_2 = nA\{L_F(1+H) + L_H\}^\alpha E^\alpha - nW_M L_F - \beta nW_M L_H - nL_F^2(1+H)^2 E^2 - R$$
$$+ \theta Z(N + nL_F) + \beta nW_M L_H - nL_H^2 E^2 + e^{-\rho}W_M(nL_F + N) - (nL_F + N)^2 a^2 E^2 \ldots\ldots\ldots\ldots(4.16)$$

As in the above instance there is distinct compartmentalization of the two activities (agriculture and NREGS), hence there is complementarities between them as far as yearly allocation of time is concerned yielding no trade off or contestability framework.

The basic objective of NREGS is not only to generate employment among rural labourers in post rainy season, but also to create some assets so that the region can be converted in to at least double cropping regions. So $B_1 \geq B_2$ is here considered.

Again $B_1 \geq B_2$ if

$$nA\{L_F(1+H) + L_H\}^\alpha E^\alpha + \{(N + nL_F)^2 - (N - nL_H)^2\}a^2 E^2 + R$$

$$\geq nW_M L_F + \{nL_F^2(1+H)^2 + nL_H^2\}E^2 + \theta Z(nL_H + nL_F) + e^{-\rho}W_M(nL_H + nL_F) + \frac{\gamma}{2Z^2}$$

Which implies that the resultant benefit from bi-cropping nature of cultivation and potential implicit cost of expansion of NREGS is more than the potential explicit as well as the implicit costs of agriculture in general and of bi-cropping context in particular and potential benefits from NREGS. The following course of analysis will proceed on the basis of the above condition.

The character of the present theory implies that the aggregate net benefit of the rural poor consists of the interests of two sections, viz, marginal farmer households and agricultural labourers. Hence, the aggregate net benefit of the rural poor can be influenced by altering two crucial endogenous decision variables, viz, H and L_H. Now our aim is to maximize B_1 with respect to H and L_H and analyze the nature of responsiveness of optimum B_1 with respect to W_M, Z, ρ and a which can be regarded as the policy parameters here. Thus we have the optimization problem as discussed below where the underlying constraints are $\rho > \bar{\rho}$ and/or $W_M < \hat{W}_M$

Max $B_1(H, L_H) = 2nA\{L_F(1+H) + L_H\}^\alpha E^\alpha - \dfrac{\gamma}{2Z^2} - 2nW_M L_F - 2nL_F^2(1+H)^2 E^2 + \theta Z$

$(N - nL_H) - 2nL_H^2 E^2 + e^{-\rho} W_M(N - nL_H) - (N - nL_H)^2 a^2 E^2$

Now we have:

$\dfrac{\partial B_1}{\partial H} = 0 \Rightarrow 2nA\alpha\{L_F(1+H) + L_H\}^{(\alpha-1)} E^\alpha = 4nL_F^2(1+H)E^2 \ldots\ldots\ldots(4.17)$

And $\dfrac{\partial B_1}{\partial L_H} = 0$

$\Rightarrow 2nA\alpha\{L_F(1+H) + L_H\}^{(\alpha-1)} E^\alpha + 2na^2 E^2(N - nL_H) = 4nL_H E^2 + n\theta Z + ne^{-\rho}W_M \ldots\ldots(4.18)$

From equations (4.17) and (4.18) it appears that both H and L_H can be solved in terms of W_M, ρ, Z and a. Suppose that the optimum values of H and L_H are H^* and L_H^* respectively.

Proposition 4: Higher wage in NREGS reduces the employment of hired labourers in agriculture and in turn increases the extra hours put in agriculture by the family labourers

From (4.17) and (4.18), we can write[31]

$4nL_F^2(1+H^*)E^2 = n\theta Z + 4nL_H^* E^2 + ne^{-\rho}W_M - 2na^2 E^2(N - nL_H^*) \ldots\ldots\ldots(4.19)$

From (4.19) we have,

$\dfrac{\partial H^*}{\partial W_M} = \dfrac{ne^{-\rho}}{4nL_F^2 E^2} > 0 \ldots\ldots(4.20)$

And

$\dfrac{\partial L_H^*}{\partial W_M} = \dfrac{ne^{-\rho}}{-2nE^2(2 + na^2)} < 0 \ldots\ldots(4.21)$

Hence the responsiveness of H^* and L_H^* with respect to W_M are respectively positive and negative. Therefore, the optimum values of H and L_H respond in the same manner both in individual net farm income and aggregate net benefit contexts.

Proposition 5: Due to more delay in payment of wages more rural landless labourers will be optimally willing to work as agricultural labourers ignoring the opportunity to work in NREGS,

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[31] It is quite clear that finding out the exact expression of H^* and L_H^* needs further mathematical techniques. Hence we use equations (4.17) and (4.18) again to get the flavor of comparative static results.

leading in turn to the fall in the extra hours that the family labour force of the farmer household has to devote in the agricultural work.

From (4.19) we have,

$$\frac{\partial H^*}{\partial \rho} = -\frac{n\rho W_M e^{-\rho}}{4nL_F^2 E^2} < 0 . \text{ .... (4.22)}$$

And $\dfrac{\partial L_H^*}{\partial \rho} = \dfrac{n\rho W_M e^{-\rho}}{2nE^2(2+na^2)} > 0$ …..(4.23)

The result shows that as the wage payment in NREGS is delayed, the incentive towards joining in NREGS work falls. As a result, supply of agricultural labourers to the farming households increases resulting in the fall in the extra hours over and above the normal hours that a farmer household has to devote in the agricultural work.

Proposition 6: In the short run increase in the material cost enhances the extra effort measured in terms of hours devoted by farming households in agriculture and on the other hand reduces the optimum demand for agricultural labourers in the agricultural activity.

Again from equation (4.19), we have,

$$\frac{\partial H^*}{\partial Z} = \frac{n\theta}{4nL_F^2 E^2} > 0 \text{ ……(4.24)}$$

And $\dfrac{\partial L_H^*}{\partial Z} = -\dfrac{n\theta}{2nE^2(2+na^2)} < 0$ ….(4.25)

The intuition is that an increase in the allocation of material cost increases the productivity of agricultural land. As a result, agricultural output increases at unchanged level of employment. This induces farming households at least in the short run to put extra effort in terms of hours in agriculture followed by reduction in demand for hired labourers.

Proposition 7: If there is increase in the effort level to be put in NREGS work, then the optimum agricultural employment of hired labourers will rise with a corresponding fall in the extra effort in terms of hours devoted by farming households.

Again from equation (4.19), we have,

$$\frac{\partial H^*}{\partial a} = -\frac{a(N - nL_H)}{L_F^2} < 0 \text{…………..(4.26)}$$

And $\dfrac{\partial L_H^*}{\partial a} = a(N - nL_H) > 0 \dots\dots(4.27)$

One of the lucrative facts towards joining NREGS is the lower effort level vis a vis the agricultural work considering the corresponding wage payment. So if that effort requirement to complete on man-day NREGS work becomes high, then the casual labourers have no reasons to stick to NREGS with a lower wage as compared with agricultural work with a higher wage and high level of effort.

The ongoing analysis has established the fact that $H^* = H(W_M, \rho, Z, a)$ and $L_H^* = L_H(W_M, \rho, Z, a)$. Hence the optimum aggregate net benefit function of the rural poor will be

$$B_1^*(W_M, \rho, Z, a) = 2nA[L_F\{1 + H^*(W_M, \rho, Z, a)\} + L_H^*(W_M, \rho, Z, a)]^\alpha E^\alpha - \dfrac{\gamma}{2Z^2} - 2nW_M L_F -$$

$$2nL_F^2\{1 + H^*(W_M, \rho, Z, a)\}^2 E^2 + \theta Z\{N - nL_H^*(W_M, \rho, Z, a)\} - 2n\{L_H^*(W_M, \rho, Z, a)\}^2 E^2$$

$$+ e^{-\rho}W_M\{N - nL_H^*(W_M, \rho, Z, a)\} - \{N - nL_H^*(W_M, \rho, Z, a)\}^2 a^2 E^2$$

Proposition 8: Enhancement of NREGS wage increases the optimum aggregate net benefit of the rural poor if the relative size of the agriculturally unemployed labourers is sufficiently large.

With the help of Envelope theorem we have,

$$\dfrac{dB_1^*}{dW_M} = e^{-\rho}\{N - nL_H^*(W_M)\} - 2nL_F \dots\dots.(4.28)$$

The responsiveness of maximum aggregate net benefit of the rural poor with respect to NREGS wage is conditional upon the size of agriculturally unemployed labour force vis-à-vis the size of family labour force in a particular village economy. If $e^{-\rho}\{N - nL_H^*(W_M)\} > 2nL_F, then\ \dfrac{dB_1^*}{dW_M} > 0$ and vice versa. Hence the model prescribes for clear mapping of employment status in area specific manner.

Proposition 9: The responsiveness of maximum aggregate net benefit function with respect to the delay in payment of wages is unconditionally negative.

Although ρ is subjective and depends on individual's perception, yet ρ can be influenced by the government deliberately as a policy parameter without altering W_M. From the optimum aggregate net benefit function of the rural poor, we have,

[71]

$$\frac{dB_1^*}{d\rho} = -e^{-\rho}W_M\{N - nL_H^*(\rho)\} < 0 \ldots.(4.29)$$

Presently wage payment through NREGS is done through bank account. This is undoubtedly a positive 'financial inclusion' drive among the rural poor. This also has reduced the intensity of corruption at panchayat level during the time of wage payment. But the poor rural participants always want to get the payment instantly or within very short time period after completion of job. Sometimes due to administrative inefficiency the payment is delayed and if that happens then that adversely impacts the maximum aggregate net benefit of the rural community in double- cropping areas.

Proposition 10: Maximum aggregate net benefit function varies directly with the change in material cost. i.e, it is an increasing function of material cost.

$$\frac{dB_1^*}{dZ} = \frac{\gamma}{Z^3} + \theta\{N - nL_H^*(Z)\} > 0 \ldots\ldots\ldots(4.30)$$

Thus as allotment towards material cost in NREGS increases, aggregate net benefit of the rural poor unambiguously rises. So implementation of NREGS in a particular rural area can improve aggregate net benefit through enhancing the feasibility of multiple cropping system which can be regarded as a positive fall out of NREGS.

Proposition 11: Reduction of effort level required to complete one man-day work through NREGS enhances the aggregate net benefit of the rural poor.

Suppose, to complete one man-day work through NREGS a labourer has to dig 80 cubic foot soil. But the government decides that a labourer can complete that after digging only 50 cubic foot soil. Then a labourer of NREGS has to devote less effort to complete one man-day work. From the optimum aggregate net benefit function we get

$$\frac{dB_1^*}{da} = -2aE^2\{N - nL_H^*(a)\} < 0 \ldots\ldots..(4.31)$$

Given other parameters, if the government reduces the effort level required to complete one man -day work through NREGS then it unambiguously enhances the aggregate net benefit of the rural poor in the village economy.

4.4 Observations:

The constructive impact of NREGS has been undeniable. A rise in NREGS wage may create a positive economic impact in the sense that it can improve the livelihood of the rural poor. But it has also contributed to rise in farm input costs and withdrawal of labour from farm sector therefore adversely affecting agricultural operation and crop prices viz, food prices. The motivation behind the present theory emerges from this adverse impact of NREGS on the agricultural ambience. Section 2 ends up with a culmination point where ceteris paribus, enhancement of NREGS wage above a critical level will stop agricultural activity in post rainy season. Again, keeping an eye on the broad objective of the study (viz, impact of NREGS on the rural poor), we evaluate the same in section 3 by looking at the impact of introducing NREGS on aggregate net benefit of the rural poor under the auspices of two different agricultural circumstances. In this regard, a prominent observation is that there arises no conflict between agriculture and NREGS from the point of view of the rural poor in mono cropping contexts, rather NREGS supplements agricultural employment and income there. Thus it is found that examining the impact of changes in the relevant policy parameters on aggregate net benefit in such contexts becomes redundant. But under certain conditions the double cropping systems will give more benefit for the rural poor than single cropping system. It is observed that hike of NREGS wage may not benefit the overall rural community. In other situations the effect is unambiguous.

4.5 Contribution, limitation and future scope of the study:

The wage rates of agricultural labourers have substantially increased in recent years after the expansion of NREGS. Also there has been the phenomenon of workers getting diverted from agriculture and creating shortages of labour in agriculture due to higher wages in NREGS. This model has abstracted the interplay through considering a village economy which consists of two types of vulnerable rural population sections, viz, marginal farmers and landless agricultural labourers. This paper explores the implications of NREGS in the village economy and subsequent parametric shifts under the same on agricultural employment and income scenario. Moreover, farmers have improved their irrigated areas and changed the cropping patterns for realizing higher productivity and income in areas treated through NREGS works making it imperative to reorient wage cost and material cost composition under the scheme. The model has asserted this fact by depicting a favourable impact of material cost on aggregate net benefit of the rural poor.

Bearing the protocol of a theoretical model, the present model is undoubtedly an abstraction from real life disruptions, thus, involving restrictions (eg, non stochasticity and static nature etc). Hence there can be considerable advancements made in the study in future by ameliorating with these restrictions.

Thus in the context of substantial underemployment prevailing in rural areas, the extent to which the theory works is an empirical question. The model is based on total absence of private non-farm employment and migration from/to other places. If those factors are incorporated then the rural labourers in post rainy season will have different types of employment opportunities. That situation may create different impact on local labour market. The impact of NREGS on private farm wages in such cases may not be much. The analysis is based on the condition that double cropping can generate much more benefit in the village economy than single cropping. It is required to empirically validate the propositions of the model which again leaves the scope for future research.

However, in our present research work, the three succeeding chapters involving empirical discourses help us to evaluate the impact of NREGS on three distinct aspects significantly enshrined in the NREG Act. The first among them in the next chapter deals with the impact on rural livelihood.

4.6 APPENDIX

Appendix- I

When $E_{NREGA} = E_{AG}$,

$$e^{-\rho}W_M - a^2E^2 = \beta W_M - E^2$$

$$e^{-\rho} = \beta - \frac{E^2(1-a^2)}{W_M}$$

$$\hat{\rho} = \log \frac{1}{\beta - \dfrac{E^2(1-a^2)}{W_M}}$$

Appendix- II

Illustration:

$$E_{NREGA} = e^{-\rho}w_M - a^2E^2$$

$$\frac{\partial E_{NREGA}}{\partial a} = -2aE^2 < 0$$

$$\frac{\partial^2 E_{NREGA}}{\partial a^2} = -2E^2 < 0$$

Hence E_{NREGA} curve is negatively sloped and concave to the origin with respect to a.

On the other hand $E_{AG} = \beta W_M - E^2$ is independent of a and thus the corresponding curve will be a straight line parallel to a axis

At $a = 0$,

$$E_{NREGA} > E_{AG} \ iff$$
$$e^{-\rho}W_M > \beta W_M - E^2 \ iff$$
$$E^2 > (\beta - e^{-\rho})W_M$$

E_{AG} , E_{NREGA}
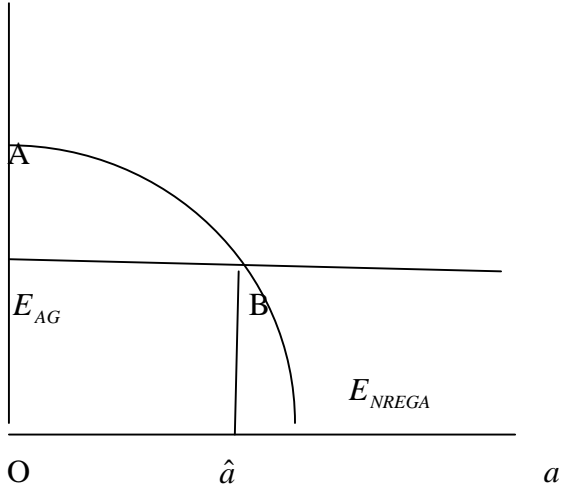
Determination of critical value of a

Appendix – III

From equation (7) and equation (8) we have

$$\frac{\partial^2 \pi^*}{\partial H^2} = PA\alpha(\alpha-1)\{L_F(1+H)+L_H\}^{(\alpha-2)} E^\alpha - 2L_F^2 E^2 < 0$$

$$\frac{\partial^2 \pi^*}{\partial L_H^2} = PA\alpha(\alpha-1)\{L_F(1+H)+L_H\}^{(\alpha-2)} E^\alpha < 0$$

$$\frac{\partial^2 \pi^*}{\partial L_H \partial H} = PA\alpha(\alpha-1)\{L_F(1+H)+L_H\}^{(\alpha-2)} E^\alpha < 0$$

Now according to second order condition it is observed that $\begin{vmatrix} \dfrac{\partial^2 \pi^*}{\partial H^2} & \dfrac{\partial^2 \pi^*}{\partial L_H \partial H} \\ \dfrac{\partial^2 \pi^*}{\partial L_H \partial H} & \dfrac{\partial^2 \pi^*}{\partial L_H^2} \end{vmatrix} > 0$

Appendix- IV

From equation (8), we get

$$PA\alpha\{L_F(1+H^*)+L_H\}^{\alpha-1}E^\alpha = \beta W_M$$

Replacing H^* from equation (9)

$$PA\alpha\{\frac{\beta W_M}{2L_F E^2}+L_H\}^{\alpha-1}E^\alpha = \beta W_M$$

$$\{\frac{\beta W_M}{2L_F E^2}+L_H\}^{\alpha-1} = \frac{\beta W_M}{PA\alpha E^\alpha} \quad or \quad \frac{\beta W_M}{2L_F E^2}+L_H = \{\frac{\beta W_M}{PA\alpha E^\alpha}\}^{\frac{1}{\alpha-1}}$$

Appendix-V

The exact expression of $\widehat{W}_M$ seems to be complicated here. But we come across below the final

form of the equation solving which the exact value of $\widehat{W}_M$ can be obtained.

$$(W_M)^{\frac{\alpha}{\alpha-1}}[\frac{\beta^{\frac{\alpha}{\alpha-1}}}{\alpha PAE} - \frac{\beta^{\frac{\alpha}{\alpha-1}}}{\alpha^{\frac{\alpha}{\alpha-1}}(PA)^{\frac{1}{\alpha-1}}E^{\frac{\alpha}{\alpha-1}}}] - W_M[L_F + e^{-\rho}L_F] + W_M^2[\frac{\beta^2}{2L_F E^2} - \frac{\beta^2}{2L_F^2}] = C_W - L_F^2 a^2 E^2 - R$$

CHAPTER – 5:

The Impact of NREGS on Rural Households:

Evidence from a Quasi-Experiment

The Impact of NREGS on Rural Households: Evidence from a Quasi-Experiment

5.1 Introduction:

The basic objective of the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS or simply NREGS) is to provide safety net for the rural poor and stabilize agricultural production through creating productive assets via employing labourers under this Programme. In broader perspective, NREGS aims to reduce rural poverty by improving the rural livelihood channels. Employment generation through NREGS emphasized its role as income insurance in the presence of seasonality in agricultural labour market. In this context, the NREGS can be thought of as a policy to boost rural income and stabilize agricultural production.

After the lapse of eight years from the initiation of the scheme, the present central government after being elected raised question about the efficacy of NREGS particularly pertaining to the aspects of targeting and productive asset creation under the scheme. The government is doubtful whether the implementation of NREGS has been at its best especially in respect of the aims and objectives with which the corresponding act was devised. Hence, the government is contemplating to revamp the scheme.

Against this backdrop we want to investigate the effectiveness of NREGS in the agriculturally backward areas to improve the livelihood of rural people. To do that, we carried out a quasi experimental study which was conducted in four gram panchayats of two separate blocks in Birbhum district of West Bengal.

5.2 Sample design and methodology:

In West Bengal, out of 19 districts, we have chosen Birbhum district as sample district for our impact evaluation. While the choice of the district was primarily driven by pragmatic concerns, yet the selection can be justified on several grounds. In 2006, the Ministry of Panchayati Raj named Birbhum as one of the country's 250 most backward districts. It is also one of the first phase districts in West Bengal as regards implementation of NREGS and it is one of the three most backward and vulnerable districts in West Bengal also. The soil type is older alluvial in the east and laterite in the west. The district is climatically varied and is prone to both drought and flood situation. It is primarily an agricultural district with around 75% of the population being dependent on agriculture.

According to the District Human Development Report (2007) of Birbhum district, the share of workers in total population is 37.4 per cent in Birbhum, which is marginally higher than the state average of 36.8 per cent. Between the two census years (viz.1991 and 2001) the district has experienced only 4 percentage point increase in work participation rate (from 33.2 per cent to 37.4 per cent). Like in other districts, in Birbhum also the work participation rate is very high for males compared to females. While the share of male workers in total male population is 54 per cent, that of female workers is only 20 per cent (2001 Census). However, the female work participation rate has increased from 13 per cent in 1991 to 20 per cent in 2001. It is important to note that in Birbhum, increasing work participation is associated with increasing share of marginal workers in total work force.[32] The share of marginal workers in total workers in the district increased from 8 per cent in 1991 to 26 per cent in 2001. The number of workers engaged in agriculture as a percentage of total workers has decreased from 72 per cent in 1991 to 60 per cent in 2001. This corresponds to the overall common perception that more people are now engaged in non-agricultural activities, such as fishing, retail sales, vegetable vending, selling milk, and so on. As all these activities are at the lower end of the spectrum of marketable skills, it remains doubtful if these activities generate enough return for their family's sustenance.[33] The

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[32] By census definition marginal workers are those who do not work for major part of the year which could either be due to lack of opportunity or other reasons.

[33] Data of Census 2011 pertaining to Birbhum district could not be retrieved. The researcher admits his limitation in this regard.

share of agricultural labour in total workers engaged in agriculture (the latter includes both cultivators and agricultural workers – two Census categories) increased over the Census decade (53 per cent in 1991 to 62 per cent in 2001). As a matter fact, between 1991 and 2001, the absolute number of cultivators in Birbhum came down from 289155 to 260955 indicating a 10 per cent decennial fall, while during the same period, the number of agricultural labourers increased from 324701 to 416949 indicating a decennial growth rate of 28 per cent.

We now look at the incidence of rural poverty and its connection with the composition of employment across blocks. The BPL household survey carried out in 2006 provides information on total number of families and families below the poverty line at a highly disaggregated level (viz. the *Sansad* level). Despite the controversies surrounding the BPL survey and reliability of the data, the figures can highlight certain important aspects of the spatial distribution of the poor people if we assume that the alleged upward bias is more-or-less evenly distributed across blocks. The percentage of BPL families across blocks shows that there are only three blocks where the percentage of BPL households is less than 30 per cent where as there are five blocks where percentage of BPL households is even more than 50 percent.

Birbhum district is historically rich, economically poor, climatically both dry and wet depending on different locations and politically challenging. Since NREGS is primarily aimed at poverty alleviation, hence Birbhum can be regarded as a good platform for citing the impact of NREGS.

Birbhum district has 19 blocks out of which we have randomly chosen two blocks, Rajnagar and Suri-1. Again from Rajnagar, we have randomly chosen Tantipara and Gangmuri-Joypur gram panchayats whereas from Suri-1 we have randomly chosen Mallickpur and Nogori gram panchayats. As the prime objective of NREGS is to improve the livelihood of the rural people, for proper effectiveness of this public policy we have to consider household as a unit.

In any impact evaluation study, we have to investigate how have outcomes changed with the intervention relative to what would have occurred without intervention. But it is difficult to judge the outcome of the same individual with and without intervention because people can only be in one circumstance at a time. Often treatments that influence outcomes do not just happen naturally; they are implemented precisely to influence outcomes. Different public policies implemented by the government is an example of it. Sometimes treatments are made on the basis of some non-economic factors like political considerations. In this situation an investigator

cannot randomly assign people or two separate units like treatment group and control group. So to do proper impact evaluation; instead of 'control group' we can consider a 'comparison group' and the experiment becomes not natural experiment but quasi-experiment. In any quasi-experimental study, two sets of households are required. We have a 'treatment group', a set of households who are affected by policy change and a 'comparison group', a set of households who are not or partially affected by policy change. Actually finding a proper counterfactual to treatment is always a challenge. After eight years of the implementation of the scheme, it is hardly possible to find out non-participant of this scheme at least in our study area among the poor households. So participant-non-participant approach will not be applicable; instead, two kinds of households are selected in our experiment according to the number of days they got employment in NREGS in the reference period 2012-13.

Initially from the official website of NREGS we have identified the beneficiary households of the sample gram panchayats who got 60 man-days or more through NREGS in the entire reference period and the households who received 15 or less man-days job in those same sample gram panchayats in the entire reference period. All such households were surveyed on the basis of our well designed questionnaire. The agro-climatic and farming conditions were almost identical in the sample villages, where predominance of mono-cropping was observed. The sample villages were not particularly prosperous, and the residents in the survey area had limited opportunities for alternative employment.

The survey work was done between June and August 2013. So this quasi experiment is based on cross-sectional primary data. Different socio-economic information was collected from the sample households. The Focus Group Discussions (FGDs) were also conducted in all the selected villages with the village community including workers to substantiate the data collected from the individual worker.

Here we have used average monthly income (*AVMI*) of a household as an indicator of its livelihood. The investigation tries to locate whether households getting more than 60 days of work under the scheme are living better in terms of their income as compared with the households getting less than 15 days of work under the same. As there is clear demarcation of the number of days of work, the households getting 15-60 days of work under NREGS have not been considered in our investigation. In this impact evaluation, households got more than 60

person-days of work through NREGS is considered as 'treatment group' and households worked less than 15 man-days through NREGS is considered as 'comparison group'.

Total number of sample households is 286, out of which 180 households belong to treatment group and 106 households belong to comparison group. We took special care to ensure that the comparison group closely matched the treatment group by economic, physical, and social attributes.

5.3 Description of the household level data collected from the field survey:

NREGS is designed to supplement agricultural employment which implies that it is primarily meant for the monocropping areas. Birbhum is a district dominated by monocropping areas and moreover our sample solely comprises of monocropping villages. Thus the selection of the district and the sample is expected to fulfill the requirement of the study.

Our sample households are composed of general as well as scheduled caste (SC) and scheduled tribe (ST) categories. Within the treatment group more than 80% belong to either SC or ST communities. On the contrary just above 30% households are from reserved categories among the sample households belong to comparison group. This brings out an important feature that participation in NREGS is much more rigorous among SC/ST communities vis a vis the general ones. Beside this, we observed that less than 25% households in the treatment group possess BPL cards and little over 10% households in the comparison group belong to BPL category.

So far as the distribution of number of man days in NREGS is concerned, we observed that within the reference period mentioned above, nearly 43% of the treatment group households received employment between 60 and 80 days. Moreover, within the whole treatment group 49 households got 100 days of employment. On the other hand, more than 26% households belonging to comparison group received less than 10 days of employment. The rest 74% households of the comparison group received employment between 10 and 15 days in the same reference period.

Low level of awareness regarding the provisions of the NREGS Act is rampant amongst the beneficiaries. We observed that in our sample households there is lack of awareness about 33% reservation of job for female workers. Only 2.8% of the male respondents within treatment group and 1.9% of male respondents within comparison group were aware about the provision. But there was absolutely zero awareness amongst the female respondents of both the groups. However as participation of female workers is an important component of the scheme, we tried to look at the man days generated among the female members of both treatment and comparison group households.

Table 5.1:

Distribution of female participating households in NREGS terms of man-days

Man days	Treatment group	Comparison group
Nil	21(11.67%)	100 (94.34%)
01-15	01 (.005%)	06 (5.66%)
15-60	151(83.89%)	_
Above 60	07 (4.43%)	_
Total	180 (100%)	106 (100%)

Source: Field survey conducted by the researcher

Table 5.1 shows that within the comparison group female participation is very poor and all households except only 6 replied that their female members did not or could not participate in the program. On the contrary, only 11.67% households in the treatment group have nonparticipant female members. Moreover above 83.89% households within the same group have female members who worked for sizable number of days in the reference period. This invokes us to hypothesize that female participation can be regarded as a vital force driving a household to seek for greater number of man days in NREGS as a whole in our study region. A very notable feature observed in the study area was that the female participation in the program is guided by cultural factors nourished either consciously or subconsciously by different village communities. Moreover, it should be mentioned that the female participation is higher in tribal communities. Among our sample households nearly 33% households within treatment group were land owners (either owned and/or leased) and nearly 37% households are so within the comparison group. Again the compatibility among the sample households is further strengthened by the fact that all the surveyed households owning land are marginal farmers.[34] Within the treatment group nearly

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[34] As mentioned earlier, farmers who own up to 1 hector of land are called marginal farmers.

18% households hold less than 2 bighas of land each, 14% hold 2-5 bighas of land each and only 1% holds 5-7 bighas of land. Alongside, within the comparison group, nearly 9% own less than 2 bighas of land each, 22% hold 2-5 bighas each and approximately 6% of households are there each owning 5-7 bighas of land. Besides that it should be mentioned that most of the marginal farmer households both in the treatment and comparison groups have monocropping land. But as will be discussed soon, it was observed that NREGS has benefitted a few households to go for second crop cultivation in the form of horticulture although in small scale after their main crop cultivation and farming is done entirely on the basis of family labour force.

We have calculated net total farm income of the marginal farmer households by first computing their value of total output sold (total output sold x market price). Then we add total value of output kept for self consumption (amount x market price) and thus get the value of total output produced (Total Revenue). After that we calculate the total cost of cultivation under different heads (Total Cost).[35] Finally after subtracting total cost from total revenue, we can get net total farm income in monetary terms.

Table 5.2: Distribution of households in terms of aggregate net farm income

Range of Income (Rs)	Treatment group	Comparison group
Nil	116 (64.44%)	67 (63.2%)
1000-5000	34 (18.89%)	26 (24.5%)
6001-12000	14 (7.77%)	13 (12.3%)
12001-20000	16 (8.9%)	_
Total	180 (100%)	106 (100%)

Source: Field survey conducted by the researcher

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[35] Here total cost includes cost of seeds, hand tractors/bullocks, different fertilizers at purchase price, pesticides at purchase price, water, hired labour in terms of total wage bill and other costs if any.

Table 5.2 shows that in case of both treatment group and comparison group majority of the households among the marginal farmers earn less than Rs 5000 per year from their output. This implies that they earn marginally above Rs 400 per month from farming which means they need to supplement their agricultural income for sustenance of livelihood. Within the treatment group, 16 households responded that their net farm income was enhanced as a positive fall out of NREGS. NREGS has improved their irrigation facilities which in turn induced them to carry out cultivation of vegetables after the prime crop cultivation. Moreover, in this case they exclusively depend upon family labourers viz, female labourers and not hired labourers. Hence the apprehension is that the farmers although a few in numbers in our study area have witnessed the opportunity of asset creation in NREGS.

As regards employment in private nonfarm activities within the village, nearly 54% households from treatment group are not engaged in the same and another 27% households are engaged for less than 50 days in the entire year corresponding to the reference period. Again around 54% of the sample households belonging to comparison group do not have access to private nonfarm activities and another 27% have less than 50 man-days of work throughout the year. Moreover in almost all sorts of nonfarm engagement, the wage rate per man- day is Rs 100. It is observed that more than 80% of the sample households each from the treatment group and comparison group remain jobless for a significant time period. Thus it is imperative that their tenure of joblessness can be reduced in our study area by formulating a comprehensive policy for employment.

Table 5.3: Distribution of private nonfarm activities among the sample households in terms of man-days

Number of man-days in private nonfarm activities	Treatment group	Comparison group
Nil	97(53.89%)	57(53.77%)
01-50	49(27.22%)	29(27.36%)
51-100	26(14.44%)	13(12.26%)
Above 100	08(4.44%)	07(6.6%)
Total	180(100%)	106(100%)

Source: Field survey conducted by the researcher

Table 5.3 shows that in the study area, there are little opportunities for alternative supplementary employment beyond agriculture which urgently necessitates for a comprehensive public works program.

A significant characteristic of the region we studied is that there is almost no incidence of distress migration. More than 90% households within the treatment group do not migrate in the lean period and above 95% households belonging to comparison group are non migrants. Although the reason behind non migration is not explicitly cited by the sample households, yet we apprehend that for these people, the cost of migration might be very high.

Table 5.4: Incidence of daily distress migration among sample household

Number of days of daily distress migration	Treatment group	Comparison group
Nil	163(90.56%)	101(95.28%)
01-50	09(5%)	04(3.77%)
Above 50	08(4.44%)	01(0.9%)
Total	180(100%)	106(100%)

Source: Field survey conducted by the researcher

Table 5.4 depicts the incidence of migration outside the village among the sample households. Besides the fact that a large section within the treatment and comparison group do not migrate, we also observe that 5% households from the treatment group and a little over 3% households from the comparison group migrate for less than 50 days throughout the whole year.

As mentioned earlier that the chosen study area in Birbhum district is predominantly mono-cropping in nature. Further, the sample farming households both in the treatment group and comparison group are mostly marginal farming households. Apart from this, a gigantic portion of the sample households within both groups belongs to agricultural labour class. Moreover, illustration of table 5.3 and table 5.4 brings out that a remarkable size of sample households have little or no access to either private nonfarm activities within the village or migrated job available outside their villages, implying very meager sources of alternative employment opportunities. Thus the sample households in the study area are not only poor; their poverty is also accompanied by limited or no employment opportunities in the agriculturally lean period, making them absolutely vulnerable.

5.4 The Model and its results:

As outcome variable is observed both for the treatment group and comparison group we here will apply two step treatment effect model developed by Heckman (1976) to determine the impact of the NREGS on rural households. We carry out the analysis by using a cross section data of 286 households collected for the financial year 2012-13.

The original equation is

$$AVMI_i = \alpha_0 + \alpha_1 TREATDUMMY_i + \alpha_2 AEM_i + \mu_i \ldots\ldots..(5.1)$$

The Selection equation is:

$$TREATDUMMY_i$$
$$= \beta_0 + \beta_1 PSPDUMMY_i + \beta_2 FEMP_i + \beta_3 TNONFARM_i + \beta_4 MIGR_i + \beta_5 NERLAND_i + \varepsilon_i \ldots\ldots\ldots$$

$$\ldots\ldots..(5.2)$$

It is expected that there may be few economic and non economic factor(s) due to which in the same geographical area some households had sought employment more than 60 man-days and some households had sought employment less than 15 man-days in the entire reference period. We can have the possible causes behind it from our selection equation.

This treatment effect method estimates two regressions simultaneously. The Eq.(5.1) is the original equation and in Eq.(5.2) i.e. in the selection equation, where explained variable is dummy in nature. Initially we have to estimate Eq.(5.2) through Probit model which predicts the probability of being in the Treatment group from a set of strictly exogenous variables. We can now rewrite Eq.(5.1) where in new equation, we have the original explanatory variables of Eq.(5.1) plus an additional explanatory variable, the Inverse Mill's ratio or hazard rate i.e. $\hat{\lambda}_i$ constructed from the estimated coefficients of the selection equation (5.2): The reformed equation of Eq.(5.1) will be :

$$AVMI_i = \alpha_0 + \alpha_1 TREATDUMMY_i + \alpha_2 AEM_i + \alpha_3 \hat{\lambda}_i + \mu_i \ldots\ldots\ldots\ldots\ldots.(5.1A)$$

Both μ_i and ε_i are bivariate normal distributions with mean zero and the value of the covariance matrix is expressed as $[\sigma_\mu - \rho^2]$. Here ρ indicates the correlation between the two error terms mentioned in Eq.(5.1A) and Eq.(5.2). Now $\hat{\alpha}_3 = \rho\sigma_\mu$. As $\sigma_\mu > 0, \hat{\alpha}_3 > 0$ *iff* $\rho > 0$.

If it is proved that $\hat{\alpha}_3 \neq 0$ then we can establish that Two step treatment effect model is appropriate for this quasi-experimental study because at least there exists one factor due to which '*TREATDUMMY*' in Eq.(5.1A) is endogenous in nature.

Description of the variables in Eq.(5.1) and Eq.(5.2):

AVMI$_i$ implies 'Average monthly income' of the ith household. Total annual income of the ith household in the entire reference period is the sum total of different non-farm income in the entire reference period including wage income through NREGS, earnings as agricultural labourer and for the marginal farmer households, the net farm income. Dividing that by 12, we get *AVMI*.

TREATDUMMY is a dummy variable which is endogenous in Eq.(5.1). It takes the value 1 if the household belongs to treatment group; otherwise '0' for the household belong to 'comparison group'.

PSPDUMMY indicates 'Panchayat specific' dummy. Field survey has profoundly shown that getting jobs (and even number of days of jobs) under NREGS depends to a large extent on the efficacy of the local panchayat. Along with this, political clientism and affiliation to the household by the ruling party play a vital role as well. As most of the households are not explicit about their political stand, here we took the *PSPDUMMY* indicating whether they are satisfied with the work of the panchayat or not (1 if yes, 0 if no) to capture the flavor of all the above facts.

FEMP indicates 'Female participation' dummy in NREGS work. The number of days of work received under NREGS must undoubtedly go up if there is female participation. Hence we take female participation in NREGS as a dummy (1 if yes, 0 if no).

TNONFARM implies total number of man-days the ith household got employment in different private non-farm sector in the entire reference period. The study area in the present analysis is mono-cropping in character reflecting that there will be no contestability between agricultural employment and NREGS. Thus number of days getting farm employment is not influential in determining the number of days getting NREGS job. Instead the number of days of nonfarm employment within the village can be a determining factor.

MIGR implies 'Migration' dummy. Migration dummy reveals whether the household is engaged in jobs outside the village (1 if yes, 0 if no). If the household works outside the village, then that

may affect its involvement in NREGS as well as the number of man-days securing job under the scheme.

$NERLAND_i$ implies Net farm income from owned land of the ith sample household in the entire reference year. In our investigation 64 out of 180 sample households belonging to treatment group and 39 out of 106 sample households belonging to comparison group were land owners. It has already been mentioned that the survey area is mainly mono-cropping area. Still there is a possibility that members of these landholding farm households will seek less employment through NREGS for these farm activities. So this variable in accommodated in the selection equation.

AEM implies total earning members of the sample household.

The results of Eq.(5.1A) and Eq.(5.2) are given in Table 5.5:

Table 5.5: Results of regression

Dependent variable : *AVMI*(Eq5.1(A))			Dependent variable : *TREATDUMMY*(Eq5.2)		
Variable	Co-efficient	SE	Variable	Co-efficient	SE
TREATDUMMY	1178.688*	71.9407	*PSPDUMMY*	3.55*	.642
AEM	226.21*	44.2004	*FEMP*	1.707*	.351
			TNONFARM	-0.018**	.0084
$\hat{\lambda}_i$	-288.0513*	89.42	*MIGR*	-0.0164	.011
constant	657.673*	111.344	*NERLAND*	-0.00009	.00005
			constant	-.9856	.251

*=> significant at 1% and **=> significant at 5%

5.5 Discussion:

The parameter estimate of $\hat{\lambda}_i$ is statistically significant and the value of its coefficient is significantly different from zero which establishes the fact that Two step treatment effect model is here appropriate for our Quasi-experiment.

The results from equation 5.2 show that the coefficients of both *PSPDUMMY* and *FEMP* are positive and their estimates are statistically significant which implies that both panchayat specific factor and female participation are significant in influencing the number of man-days of seeking job under NREGS which corroborates with our field level experience. Further the field level experience tells us that role of panchayat is crucial in overall performance of NREGS in village level. Though employment generation under NREGS is done on the basis of 'self-selection' mechanism still it is observed that due to interference of local panchayat a willing households may be deprived to seek desirable man-days of employment through this progarmme.

Secondly, the estimated coefficients of *TNONFARM* and *MIGR* are negative as should be anticipated. But their values are comparatively low signifying that the effect of these two regressors on the treatment dummy is somewhat dampened. Although total number of days of nonfarm employment may seem to be significant in general perspective, yet so far as the migration factor is concerned, our data and results suggest that at least in our study area, migration has not been significant impact in determining the number of man-days of seeking NREGS job. The regressors influencing the treatment dummy in equation 5.2 are in turn comparison led by both economic as well as noneconomic factors. Except *TNONFARM* which depends on the character of local economy, all others are influenced otherwise. For example, *PSPDUMMY* as discussed earlier is affected by the attributes like political clientiesm and/or affiliation to the households by the party ruling panchayat etc. Similarly, both *FEMP* and *MIGR* are governed by the attributes having some socio cultural dimensions pertaining to the particular village in question.

All the estimated coefficients in equation (1) are positive and statistically significant at 1% level. This implies that all of them have a positive and convincing influence on the outcome variable, i.e, *AVMI*. It is prominent that the value of the coefficient of the treatment dummy is very high if we compare with the parameter estimates of other regressors. Thus we observe that the

livelihood symbolized by *AVMI* in our model is better for the rural poor having more number of man-days of work through NREGS in our study area.

5.6 Observations:

This quasi experimental study aimed to investigate the impact of NREGS on the livelihood of rural poor. During this course, livelihood of the rural poor has been epitomized by Average monthly income. The study reveals that the rural poor are benefitted from NREGS in terms of their income. However, the study observes that the heterogeneity in seeking employment through NREGS is panchayat specific. As a result, the performance of the implementation of NREGS depends both qualitatively and quantitatively to a large extent on the efficacy of the panchayat. Further, for a few farming households, NREGS help them to enhance their net farm income which indicates exploration of asset creating potentiality of this scheme. In the chapter that follows next, we try to explore this asset creating potentiality of NREGS. Towards the accomplishment of this objective, the next chapter deals with the impact of asset creation on the cropping intensity in West Bengal.

Nevertheless, standing at the present juncture and assuming status quo it is prudent to continue NREGS effectively to improve the livelihood of the targeted rural people.

CHAPTER- 6:

Asset Creation through National Rural Employment Guarantee Scheme (NREGS) and its Impact on West Bengal Agriculture: A District Level Analysis

Asset Creation through National Rural Employment Guarantee Scheme (NREGS) and its Impact on West Bengal Agriculture: A District Level Analysis

6.1 Introduction:

In the preceding chapter we explored the beneficial role of NREGS in terms of enhancement of rural livelihood. As a downstream observation we found that in our study area, a number of households have also reaped the benefit of NREGS in terms of productive asset creation. Hence we prescribed for persistence of the scheme in full fledged manner. Indeed the scheme continues to be one of the most ambitious centrally sponsored schemes of the independent India. Until August 2014, the scheme has generated 1760.78 crores of man days of work in rural areas with an expenditure of Rs. 2, 65,727 crores.[36] It is expected that NREGS can generate income support for the poor and can raise agricultural productivity as well as profitability in the long run through creating different productive assets related to agriculture.

The NREG Act indicates the kinds of works that may be taken up for this purpose. As per Schedule I of the Act, the focus of the National Rural Employment Guarantee Scheme (NREGS) shall be on the following works.[37]

- Water conservation and water harvesting;

- Drought proofing, including afforestation and tree plantation;

- Irrigation canals, including micro and minor irrigation works;

- Provision of irrigation facility, plantation, horticulture, land development to landowned by households belonging to the SC/ST, or to land of the beneficiaries of landreforms, or to land of the beneficiaries under the Indira AwasYojana/BPL families

- Renovation of traditional water bodies, including de-silting of tanks;

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[36]Mishra, Viswanathan, Bhattarai, 2014

[37]NREGA 2005, Operational Guidelines 2008, 3rd edition

- Land development

- Flood-control and protection works, including drainage in waterlogged areas;

- Rural connectivity to provide all-weather access. The construction of roads may include culverts where necessary, and within the village area may be taken up along with drains. Care should be taken not to take up roads included in the PMGSY network under NREGA. No cement concrete roads should be taken up under NREGA. Priority should be given to roads that give access to SC/ST habitations;

- Any other work that may be notified by the Central Government in consultation with the State Government.

The assets created under the NREGS (see details in Table 6.1) can be broadly classified into two categories: (i) assets created in individuals' land and (ii) assets created in community land.

Table 6.1: Nature of work required for asset creation under NREGS

Type of work	Nature of work
Water conservation and harvesting	Digging of new ponds/tanks etc
Draught proofing and plantation	Afforestation and tree plantation etc
Flood control and protection	Drainage in water logged areas, construction and repair of embankments etc
Land development	Plantation, land leveling etc.
Micro irrigation works	Minor irrigation canals etc.
Renovation of traditional water bodies	Desalting of tanks/ponds, desalting of traditional open wells etc.

Provision of irrigation facilities	In the land of SC and ST, beneficiaries of land reforms, IAY etc. This is actually asset creation work through NREGA in private land
Rural connectivity	Construction of village roads etc.
Any other work approved by the ministry of Rural Development	Other works etc.

Source: Compiled from Mishra, 2011

Land development, water conservation, water harvesting, drought proofing, flood control etc. would help improving crop yields per unit of land in a sustainable manner. It is expected that improvement in irrigation capacity, apart from bringing new area under cultivation, can also improve crop yields due to availability of more water, and can result in multi-cropping as well. The present paper attempts to explore whether irrigation works under NREGS, have been able to convert the mono cropping areas into multi-cropping ones or not.

Enhancement of irrigation facility is one of the most important aspects of asset creating works through NREGS. In most of the villages irrigation works have been undertaken, people have reported recharging of ground water. Renovation of ponds or canals using NREGS resources helped improve irrigated area and cropping pattern positively. There are reports on the revival of water bodies and canals under the NREGS. In many parts of the country, a large number of farmers could raise crops after works undertaken in NREGS like renovation of long canal where there was hardly any crop. The implementation of the NREGS has varied experiences. But as regards asset creation in the Scheme, the beneficiaries appreciated the community wide benefits of rural assets and infrastructure created. Even though it may not have any direct benefit to the labor households, it certainly has a community level benefit. Overall it appears that the works are supportive of agriculture and of small and marginal farmers.

A study conducted by the Institute of Rural Management Anand (2010) reveals that there is overall positive impact of assets created under NREGA in the state of Sikkim and it also foresees a positive second round multiplier effect of the Scheme. However, it added that the mechanism to ensure durability and sustainability of the assets created under the Scheme needs to be

strengthened and clearly suggests some strategies in this regard. According to MGNREGA Sameeksha (2014), 146 lakh works have been taken up since the beginning of the Scheme, of which about 60 per cent have been completed. Of these works,

• 19 per cent relate to rural connectivity (e.g. village roads)

• 25 per cent relate to water conservation and water harvesting

• 14 per cent relate to irrigation canals and renovation of traditional water bodies

• 13 per cent relate to flood protection and drought proofing

• 13 per cent relate to land development

• 14 per cent relate to work done on private lands (lands belonging to small and marginal farmers/SCs/STs/Below Poverty Line (BPL) households/Indira AwasYojana (IAY) and land reform beneficiaries)

So far as the West Bengal scenario is concerned, we present below an idea regarding the works done under NREGS in the last few years towards creation of assets.

Table 6.2: Works done under NREGS in West Bengal in last few financial years:

Works	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Number of Ongoing Works[in lakhs]	5.86	21.69	2.357	2.32	3.97	6.06
Number of Completed Works	5.08	5.10	2.11	2,45,345	1,82,494	1,67,827

Source: www.nrega.nic.in

The table shows that the number of completed works shows a downward trend. Not only that, the gap between the number of ongoing works and that of completed works has been ever widening except 2012-13.

In the light of the above proceedings, the present study has tried to investigate whether introduction and persistence of different kinds of works and the resulting asset creation related to agriculture under NREGS has any impact on the cropping intensity of West Bengal over the years. We know that agriculture has been occupying a prime position in West Bengal economy

since independence. The backdrop of the significant role of agriculture in West Bengal economy and taking into account the emphasis given in the NREG Act to create long term assets with a view to enhance agricultural productivity, we consolidate the matter of selection of West Bengal as the subject of study. Moreover, as far as our warm up study goes, no objective investigation has been undertaken so far to examine the influence of asset creation under NREGS on agricultural activities in West Bengal.

Here within West Bengal, we have taken each NREGS implemented district as the unit of study and three asset creation activities relevant to agriculture, viz, provision of irrigation facilities, micro irrigation works and rural connectivity works whose impact on agriculture would be evaluated. We consider only the said asset creation activities because only these three asset creation activities related to agriculture were mainly done in the entire reference periods through NREGS in West Bengal.

Provision of Irrigation facility implies arranging irrigation facility through NREGS work in the land owned by the households belonging to the SC, ST or in the land of the beneficiaries of land reform or that of the beneficiaries of IAY of the government of India. In West Bengal, as regards number of works done under this head, most of the districts are less than moderate performers on the question of this kind of asset creation. On the extreme ends, Darjeeling (DGHC) is the worst performer, because the extent of creation of this facility was minimal in the district. On the other hand, West Midnapur has done comparatively better than others. Thus there is wide scale fluctuation across the districts as regards creation of this kind of asset. We below present a glimpse over the variation in this kind of works done for the relevant years i.e, 2006-07 to 2013-14.

Table 6.3: Coefficient of Variation across districts in the works done under provision of irrigation facilities in NREGS for different years.

Year	Coefficient of Variation
2006-07	184.75
2007-08	184.75
2008-09	110.23
2009-10	149.29
2010-11	143.53
2011-12	184.05
2012-13	186.63
2013-14	195.45

Source: Calculation made by the researcher on the data from www.nrega.nic.in

The above table shows that there seems wide scale variation across the district in the number of works done under provision of irrigation facilities in almost all the years. Micro irrigation means construction of irrigation canals for micro irrigation activity in the public land. Again simply considering the number of works done, majority of the districts appear at par as far as creation of this kind of facility is concerned. Again DGHC has not done well as long as its year wise performance goes, whereas Birbhum, Burdwan and Purulia are the better performers.

Table 6.4: Coefficient of Variation across districts in the works done under micro irrigation facilities in NREGS for different years.

Year	Coefficient of Variation
2006-07	214.63
2007-08	163.24
2008-09	102.24
2009-10	115.72
2010-11	68.84
2011-12	75.87
2012-13	80.12
2013-14	75.44

Source: Calculation made by the researcher on the data from www.nrega.nic.in

As regards number of micro irrigation works done across districts, Table 6.4 stands by the fact that the extent of variation has come down over the years establishing the proposition that there appears relatively more parity than the previous kind of works done across districts.

Rural connectivity covers construction of village roads through NREGS works. The extent of works done on this kind of asset appears much more commendable as compared with the previous ones. In all the districts except DGHC, a moderate performance has been sustained. However, on this count, West Midnapur and Birbhum have done really well.

Table 6.5: Coefficient of Variation across districts in the works done under rural connectivity through NREGS for different years.

Year	Coefficient of Variation
2006-07	134.01
2007-08	134.01
2008-09	90.2
2009-10	105.22
2010-11	77.91
2011-12	84.58
2012-13	66.18
2013-14	49.15

Source: Calculation made by the researcher on the data from www.nrega.nic.in

Rural connectivity works through NREGS have been done more or less uniformly across districts in the relevant years. Moreover, for most of the years, we observe a downward trend in the degree of variation over the works done across districts under this head.

We have considered cropping intensity as the outcome variable which is measured by the percentage of gross cropped area to the net sown area. Cropping intensity can be regarded as a proper measure of multiple cropping on a specific plot of arable land. In this connection, alternative measures like crop diversification could be accommodated, but the concept of cropping intensity in fact acts as a super set in this regard. Enhancing cropping intensity is primarily the decision of the farmer. It is observed that all the farmers in West Bengal cultivate paddy in the rainy season where little amount of fertilizer as well as irrigation facilities are required. But in the post rainy season, the farmer has to decide whether he will continue his production or not. If a large number of farmers agree to do that, then the cropping intensity of the district would increase.

In West Bengal, cropping intensity has increased for most of the districts during the period 2006-07 to 2013-14. Table 6.6 below reflects the fact.

Table 6.6: Average Annual Growth Rate of Croppnig Intensity of different districts during the period 2006-07 to 2013-14

District	Average Annual Growth Rate(in % term)
N 24 Pgns	30.6
S 24 Pgns	67.7
Bankura	7.5
Birbhum	70.1
Burdwan	-44.2
Coach	69.2
DGHC	95.8
D Dinajpur	35.2
U Dinajpur	92.3
E Medinipur	-42.2
Hooghly	65.7
Howrah	-41.1
Jalpaiguri	44.7
Maldah	58.6
Murshidabad	6.5
Nadia	6.2
Purulia	101

W Medinipur	158

Source: Calculated by the researcher from the "Estimates of Area & Production of Principal Crops in West Bengal" of different years compiled by Evaluation Wing, Directorate of Agriculture, Government of West Bengal.

It is to be noted that the period we considered refers to the initial eight years of the implementation of NREGS. It is observed from the table that in majority of the districts except Burdwan, East Medinipur and Howrah, cropping intensity has increased during the referred period. Thus, we make an apprehension that this increase in cropping intensity might be a positive response towards asset creation through NREGS during the same tenure. The farmer may be encouraged to cultivate in the post rainy season in his own land if irrigation facilities are sufficiently available. In West Bengal, the expansion of irrigation facilities is done mainly through NREGS in the last decade (Different statistical abstracts published by Government of West Bengal in different years). It is easily understandable that provision of irrigation facilities and micro irrigation are expected to influence the cropping intensity. In West Bengal, a gigantic size of the farming households are marginal farming households whose members remain immensely concerned about the marketability of their produce. Again, the exposure to market of their produce badly depends on availability of rural infrastructure consisting largely of rural connectivity. Rural connectivity works under NREGS can improve the condition of rural infrastructure, and the farming households may become confident enough to go for the second crop production which in turn will increase in cropping intensity. Thus the inclusion of rural connectivity, not to mention about the other two, is justifiable.

Hence, we want to investigate whether expansion of asset creation through NREGS has been able to play any significant role through encouraging mainly the marginal farmer households of West Bengal to move towards multiple cropping.

6.2 Data and Methodology:

We have taken in all 18 districts (except the Kolkata Metropolitan) in West Bengal where NREGS has been implemented. Since, NREGS was implemented in West Bengal from 2006-07, we have taken that year as the base year and subsequently studied the progress through different years up to 2013-14.[38] In this way, we track the chronological variation in cropping intensity after implementation of NREGS starting from a base year when it was initiated Thus we have a panel data comprising of 18 districts(cross section units) and 8 time periods. Hence we have 144 pooled observations.

Our a priori hypothesis is that, variation in cropping intensity is likely to be influenced positively by provision of irrigation facilities, micro irrigation works, rural connectivity works all of which are undertaken in NREGS, average rainfall and average harvest price of the principal crops.[39]

In our study, we are considering the lagged value of the indicators like 'provision of irrigation facility', 'micro irrigation' and rural connectivity'. Actually most of the NREGS work is done in the post rainy season which is expected to give agricultural benefit at least in the next farming season. Hence asset creation through NREGS in the $(t-1)^{th}$ period in a particular district under three heads may influence cropping intensity of that district in the tth period because the farmer can enjoy the benefit of asset creation in the next period at the earliest. Likewise, farmers' general decision of a particular district to go for second crop and so on in the tth period would

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[38] Data on district wise cropping intensity, average rainfall and average harvest price has been available from the source we explored up to 2013-14. Hence, due to inadequacy of data, we could not proceed beyond 2013-14 as far as our source of data is concerned.

[39] Average rainfall in a district in a particular year is considered as an indicator of the overall agro-climatic condition of the same. Agricultural credit may influence the cropping intensity. But in West Bengal, most of the farmers are marginal in nature and most of the times; they have to depend on different kinds of agricultural credit mostly from informal sources. Besides that, district wise data of sanctioned agricultural credit over the time period is not available. Secondly, district wise data on use of machineries in cultivation is also not available. Thirdly, consumption of fertilizer might be important for productivity enhancement, but in this case it may not be an appropriate explanatory variable. Last but not the least, the average agricultural wage of the tth period in a particular district depends on the average agricultural wage of the same district in the $(t-1)^{th}$ period which in turn is highly influenced positively by NREGS works(Haque 2013, Reddy 2013). So this is not considered as an explanatory variable in our model.

depend on the average harvest price of principal crops of the previous period, i.e, $(t-1)^{th}$ period of that district. Only for 'rain fall' we consider the data of the tth period.[40]

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[40]Data on cropping intensity across districts of the relevant years and that for district wise average rainfall and average harvest price in the same relevant years are obtained from the "Estimates of Area & Production of Principal Crops in West Bengal" of different years compiled by Evaluation Wing, Directorate of Agriculture, Government of West Bengal, whereas data on 'provision of irrigation facility', 'micro irrigation' and rural connectivity' pertaining to NREGS are collected from official website of NREGS, i.e, www.nrega.nic.in

6.3 The Model and its Results:

The equation depicting the influence of three NREGS asset creation activities as well as average rainfall and average harvest price on the cropping intensity can be conceptualized as follows:

$$\ln crop\,\mathrm{int}_{it}$$
$$= f[proirrifclty_{i(t-1)}, microirriwrks_{i(t-1)}, ruralconnctvty_{i(t-1)}, avgrnfall_{it}, hprice_{i(t-1)}]$$

…….. (6.1)   Where i = 1….18 and t = 1…8

Here '$lncropint_{it}$' is 'log of cropping intensity of the ith district in the tth period, '$proirrifclty_{i(t-1)}$' implies total number of works completed under 'provision of irrigation facilities' of the ith district in the $(t-1)^{th}$ period.   Similarly '$microirriwrks_{i(t-1)}$' and '$ruralconnctvty_{i(t-1)}$' are total number of works completed under micro irrigation scheme and under rural connectivity scheme of the ith district in the $(t-1)^{th}$ period respectively. '$avgrnfall_{it}$' is average rainfall[41] of the ith district in the tth year and '$hprice_{i(t-1)}$' is average harvest price[42] of the ith district in the (t-1)th period.

Here we consider only three asset creation activities namely, 'provision of irrigation facility', 'micro irrigation' and rural connectivity' because only these three asset creation activities were mainly done in the entire reference periods through NREGS in West Bengal. In order to evaluate the impact of asset creation through NREGS on the cropping intensity in West Bengal, we adopt Random Effect estimation techniques suggested through Hausman test because the Hausman test yields the following results:

$\chi^2(5) = 4.03$ which is statistically not significant.

The results clearly lead us to accept that Random Effects model is consistent during the time of estimating Eq.(6.1). Moreover, according to Kmenta(1986), the dummy variables represent a lack of knowledge about the (true) model where we fail to include relevant explanatory variables that do not change over time (and possibly others that do change over time but not over cross-

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[41] Average rainfall of a particular district in a particular year is calculated by taking simple average of rainfall spread in different months.

[42] Average harvest prices of different principal crops cultivated in the post rainy season are calculated by taking simple average of prices of principal crops except rainy season crop(s) in each year of each district on the basis of constant price considering 2005 as the base year. The conversions were on the basis of consumer price index of the rural labourers of West Bengal published by Ministry of labour, Government of India in different years.

sectional units). Hence, it is better to express this ignorance through the disturbance term u_{it} which is precisely the approach suggested in the error components model (ECM) or Random Effects model (REM).We know that in the Random Effect model, the unobserved factors are not correlated with the explanatory variables. In our hypothesis, the explanatory variables are related to NREGS works and are assumed to be uncorrelated with other unobserved factors which may influence the cropping intensity of a particular district. Also 'average rainfall' can be considered exogenous and uncorrelated with the unobserved factors. In addition, in our study, we have a short panel data where number of cross sectional units (N) is greater than the number of time points (T). For a short panel data, Random Effects model becomes more appropriate. Moreover, according to Taylor's (1980) rule of thumb, if T>3 and (N-K)>9, where T implies number of time periods, N stands for number of cross section of individuals and K signifies number of explanatory variables, then Random Effect estimates are more efficient than the Fixed Effect estimates. Here T=8>3 and (N-K)>9, where N=18 districts and K=4 explanatory variables. Hence, by this rule, in the present condition, Random Effect estimates are more efficient than the Fixed Effect estimates. After carrying out the Random Effect estimation process, we get the following results:

Table 6.7: Results of Random Effect Estimation (Generalized Least Square) :

Dependent variable: *lncropint*

Variable	coefficient	Standard error
proirrifclty	3.54 e $^{-06}$	6.30 e $^{-06}$
microirriwrks	.0000243**	.0000141
ruralconnctvty	.0000129*	3.93e $^{-06}$
avgrnfall	.0005251*	.0001253
hprice	.0000572*	.000021
constant	5.170331*	.0574676

Number of observations   =   144

R^2: within = 0.2339   Wald $\chi^2(5)$ =   35.89*

between = 0.0006

overall = 0.0067

 '*' and '**' implies level of significance at 1% and 5% level.

6.4 Discussion:

On the basis of the results presented in Table 6.7, we can draw the following inferences:

(i) The NREGS work like 'provision of irrigation facility' has no impact in enhancing cropping intensity

(ii) Micro irrigation work through NREGS has created a positive impact on Cropping Intensity. But the impact is very small because the value of the co-efficient is very small (though it is statistically significant)

(iii)Same thing also happens in 'rural connectivity work' through NREGS. Its impact is very small so far as the value of the coefficient is concerned, but the estimated value is statistically significant.

(iv) Rain fall still plays a significant role to enhance the cropping intensity of West Bengal. The value of the coefficient is relatively large and also statistically significant.

(v) Harvest price also plays a significant role to enhance the cropping intensity of West Bengal. The value of the coefficient is small but statistically significant.

Thus in spite of the expansion of NREGS work, 'average rainfall' throughout the year and average harvest price of the previous period still play a major influential role among the farmers of West Bengal during the time of taking decision regarding expansion of agricultural activities in a given period.

6.5 Investigation on variation of cropping intensity across districts:

Hausman test is based on certain extreme assumptions. It is observed that random effect estimation procedure can be applied if and only if (i) the cross sectional units are random in nature and (ii) individual error component are uncorrelated with the explanatory variables. But in West Bengal we have considered 18 out of 19 districts. Hence, the selected districts are not fully random in nature. Besides that Table 6.3, Table 6.4 and Table 6.5 show that still there exist inter district disparity in number of works related to asset creation completed through NREGS. So there may be some district specific unobserved factors which may influence NREGS work in different districts. Further, we have a panel data set where there are no time invariant variables. Hence Fixed Effects model can be attempted. On the basis of the above logic and to identify the district specific effect on cropping intensity in NREGS implementation periods we further consider Fixed Effects model which is given in Eq. 6.2[43]

$$\ln crop \operatorname{int}_{it}$$

$$= \sum_{i=1}^{18} \alpha_i D_i + \beta_1 proirrifclty_{i(t-1)} + \beta_2 microirriwrks_{i(t-1)} + \beta_3 ruralconnctvty_{i(t-1)}$$

$$+ \beta_4 avgrnfall_{it} + \beta_5 hprice_{i(t-1)} + u_{it}$$

…………………(6.2)

Ignoring the intercept term, we are using 18 district specific dummies to avoid dummy variable trap along with four covariates [already considered in Eq (6.1)] to estimate the fixed effects model which can also be recognized as Least Square Dummy Variable model. We observe the following results summarized in Table 6.8 below.

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[43] Initially we have done least square dummy variable technique considering the time dummy. It is observed that all the values of the coefficients of the time dummies are positive and statistically significant. So 'Time Effect' is present. This establishes the fact that cropping intensity has increased in West Bengal in the post NREGA implementation period.

Table 6.8: Results of the fixed effect model where dependent variable is '*lncropint*'

Variable	Coeff.	Std. Err.
proirrifclty	3.42e-06	6.27e-06
microirriwrks	.000023**	.0000141
ruralconnctvty	.0000127*	3.92e-06
avgrnfall	.0005509*	.0001257
hprice	.000055[*]	.0000209
N 24 PGNs	5.271071*	.0347517
S 24 PGNs	4.975013*	.0372776
Bankura	4.995812*	.0360162
Birbhum	5.089118*	.0390868
Burdwan	5.173626*	.0390593
Coachbihar	5.259618 *	.0438369
Darjeeling	4.890647 *	.0476274
D Dinajpur	5.131004 *	.0383286
U Dinajpur	5.173005*	.040206

E Midnapore	5.161753*	.0424566
Hooghly	5.512903*	.0338815
Howrah	5.248352*	.0323004
Jalpaiguri	4.999936*	.0500376
Maldah	5.275942*	.0378031
Mushidabad	5.432765*	.037974
Nadia	5.470713 *	.0378901
Purulia	4.748745 *	.0409851
W Midnapore	5.126821*	.0386546

R^2= 0.9999

F(23,120) =94435.26   Prob> F   = 0.0000

*=> significant at 1% level and **=> significant at 5% level.

6.6 Discussion:

In all the districts the parameter estimate is statistically significant. So we can say that cropping intensity has increased in all the districts of West Bengal between 2006-07 and 2013-14 (the time period when NREGS work was gradually expanding in all the districts). Apart from this, except provision of irrigation facilities, all other factors remain statistically significant as before but having meager marginal impact barring average rainfall. So with respect to this bag of explanatory variables, the Random Effect and the Fixed Effect models produce almost same results.

6.7 Observations:

We know that creation and maintenance of durable and sustainable assets under NREGS is of pivotal importance so far as the objective of the scheme is concerned. Hence, it cannot be undermined alongside the objective of employment generation under the scheme, especially keeping in view the fact that, it will ultimately reduce the dependence on the scheme. Again, durability and sustainability of the assets creation can largely be examined by their impact on agriculture.

The improvement in irrigation capacity, apart from bringing new area under cultivation, can also improve crop yields due to availability of more water, and result in multi-cropping as well. Running in tandem, the present paper attempts to explore whether NREGS in West Bengal, after its implementation has been able to convert the mono cropping areas into multi-cropping ones or not. Towards this end, it was justifiably hypothesized that cropping intensity would be a proper measure and thus was considered the outcome variable.

From the present study covering all the NREGS implemented districts of West Bengal and the eight years of its implementation, we found that, cropping intensity has increased in almost all the districts of West Bengal between 2006-07 and 2013-14.This has been evident from the results of Least square dummy variable (LSDV) techniques incorporating district specific dummies. The NREGS work like 'provision of irrigation facility' has no impact in enhancing cropping intensity. Micro irrigation work through NREGS has created a positive impact on Cropping Intensity. But the impact is very small because the value of the co-efficient is very small (though it is statistically significant). In case of 'rural connectivity work' through NREGS, its impact is also very small so far as the value of the coefficient is concerned, but the factor is statistically significant. It is observed that rain fall still plays a significant role to enhance the cropping intensity of West Bengal. Thus in spite of the expansion of NREGS work, 'average rainfall' throughout the year still influences the farmers' decision regarding expansion of agricultural activities. Hence NREGS asset creation activities have not generated so far any commendable impact on agrarian scenario in West Bengal. It has also been observed that the cropping intensity is significantly influenced by the average harvest price of principal crops in

the post rainy season as far as their statistical significance is concerned. But the marginal impact is not so strong. [44]

Referring to Table 6.2, it is observed that the number of ongoing works was on the rise in successive periods. If those works were completed in subsequent periods, then the positive influence on productivity of agriculture might not be done away with which the present study has not exercised. However, creation and maintenance of NREGS assets must go hand in hand in order to accomplish the objective of attaining durability and sustainability of the assets. In West Bengal numerous surveys and anecdotal evidences suggest that the job of maintenance has not been up to the mark.[45] Perhaps, that is the reason why many assets created under the scheme have not generated the anticipated benefit and as a result the aim of enhancement of productivity in agriculture with the help of NREGS assets has gone futile.

In the following chapter, the empirical task we carry out pertains to assessing the impact of NREGS on generation of female employment. This is again a quasi experimental study based on primary household level data.

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[44] The researcher certainly admits the fact that the study faces the limitation of not covering up adequate time points in the post NREGS implementation period in order to evaluate the impact of NREGS asset creation on cropping intensity, especially taking into account that NREGS in West Bengal did not gear up from its very inception.

[45] The National Rural Employment Guarantee Scheme (NREGS) West Bengal: A Study of Sustainable Livelihood Models. Lead Researchers- Karthik Raghavan, Niki Singh, Saswata Das, Shardul Bist, Subhamoy Das, Unnati Gajjar, Veena Singh, Vibha Singh. Special Contributors: Development of Research and Communication Service Centre (DRCSC) www.drcsc.org/resources/MICA_NREGS.pdf

CHAPTER- 7:

Employment Generation among Women in

NREGS: a Synthesis on the basis of Micro Level

Field Investigation

Employment Generation among Women in NREGS: a Synthesis on the basis of Micro Level Field Investigation

7.1 Introduction:

The basic objective of this employment guarantee scheme is to arrange 100 person-days of guaranteed employment for each willing household. Like traditional public works programmes this also offers a unique opportunity for women to earn cash incomes in a context where, too often, the ability of women to work outside the home is severely constrained by social norms. Actually the NREGS has different progressive provisions to incentivize participation of women in the programme. This act had an objective to ensure that women have equitable and easy access to work, decent working conditions and equal payment of wages to keep gender equity in informal sector which certainly is expected to have spillover effects on other sectors. But in a male dominated society, it is sometimes difficult to believe that within a household, women's decision to avail of employment under the NREGS would get precedence over the decision of the male members.

As a matter of fact, several factors may be active either jointly or single handedly across different regions and communities behind generation of female employment among rural households through NREGS especially for married female members and these are (i) inter-household factor(s) (ii) woman specific factor(s) and (iii) intra-household factor(s). Considering all the factors simultaneously still no investigation has been done to identify the specific factor(s) which is (are) much more responsible to influence employment generation among rural women (mainly married) through NREGS. Against this backdrop we want to investigate the effectiveness of NREGS in the agriculturally backward areas to generate female employment in the scheme and to this end, it makes an empirical exercise with intent of objectivity. Here we have considered ratio of female man days to total man days of a household in an entire reference year as the outcome variable. This quasi experiment study is totally based on primary data collected from four gram panchayats of two randomly selected blocks of Birbhum district of West Bengal considering 2012-13 as the reference period.

7.2 Sample design and methodology:

So far as selection of sample district, block, GP and households are concerned, an identical procedure is followed as that in chapter 5. In other words, we used the same sample units for carrying out two separate empirical exercises in order to examine the impact of NREGS on two very important distinctly manifested dimensions.

The main objective of 'impact evaluation' is to assess whether a scheme or intervention has achieved its intended outcomes (here inclusiveness of women or simply generation of female employment in NREGS). NREGS is a public policy initiated by the Government of India and at present it has almost been implemented in all the implementable districts of India but the intensity is different. It may be reiterated that we have to investigate whether expansion of NREGS is able to help the female job-card holders to get more employment through NREGS or not. Here due to practical constraints, randomized experiment is not possible during the time of evaluating the effectiveness of this policy because it is difficult to find sufficient number of poor rural households in a locality who still did not participate in this scheme. So we have to depend on 'quasi-experiment' which can be carried out in a realistic setting more often than randomized experiment because evaluation of the scheme occurs after important funding have been made and researchers cannot randomly assign people to treatment group and control group. Participation in NREGS is mainly through self-selection mechanism. Hence, we have chosen those households in the 'treatment group' category who have got larger benefits of NREGS through securing large number of person-days of employment in the entire reference period. Alongside, during the time of choosing 'comparison group' instead of 'control group', we carefully have to consider those households as sample that not only have comparable socio-economic background with treatment group but also have participated less or 'zero' person-days in NREGS in the entire reference period.

Hence, like those in chapter 5 two kinds of households are selected in our experiment according to the number of days they got employment in NREGS in the reference period 2012-13. The beneficiary households of the sample gram panchayats who got 60 person-days or more through NREGS in the entire reference period and the households who received 15 or less person-days

job in those same sample gram panchayats in the entire reference period[46] are respectively earmarked as treatment group and comparison group respectively. All such households were surveyed on the basis of our well designed questionnaire. The agro-climatic and farming conditions were almost identical in the sample villages, where predominance of mono-cropping was observed. The sample villages were not particularly prosperous, and the residents in the survey area had limited opportunities for alternative employment in the local private non-farm sector and elsewhere. This is substantiated by the following illustrations.[47]

As regards employment in private nonfarm activities within the sample villages, on the basis of Table 7.1 it is observed that nearly 54% households from treatment group are not engaged in the same and another 42% households are engaged for less than 40 days in the entire year corresponding to the reference period. Again around 54% of the sample households belonging to comparison group do not have access to private nonfarm activities and another 46% have less than 40 man-days of work in the entire reference period. Moreover in almost all sorts of nonfarm engagement, the wage rate per man- day is Rs 100 which is not at par with NREGS wage rate. Thus it is imperative that problem of joblessness in our study areas be reduced by formulating a comprehensive policy for employment like NREGS.

Table 7.1: Distribution of private nonfarm activities among the sample households in terms of man-days

Number of man-days in private nonfarm activities	Treatment group	Comparison group
Nil	97(53.89%)	57(53.77%)
01-40	75(41.66%)	29(46.23%)
41-100	08(4.45%)	0
Total	180(100%)	106(100%)

Source: Field survey conducted by the researcher

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[46] These thresholds are chosen bearing a compatibility with the overall trend of the study area.

[47] The observations are same as envisaged in chapter 5.

Thus on the basis of Table 7.1 we can say that in the study area, there are little opportunities for alternative supplementary employment beyond agriculture which urgently necessitates for a comprehensive public works program.

The urgency for a comprehensive public works scheme is further accentuated if we get an idea regarding employment of female in private nonfarm activities within the village. Table 7.2 shows that nearly 74% households from treatment group had reported that their female members were not engaged in any kind of private nonfarm activities and nearly 24% households have females who are engaged for less than 40 days in the entire year corresponding to the reference period. Again around 73% of the sample households belonging to comparison group possess female members who do not have access to private nonfarm activities and another 18% have less than 40 man-days of work throughout the year. Only 2% of the sample households belonging to treatment group and 9% of the sample households belonging to comparison group managed to get moderate man-days of employment and that is mainly as domestic worker in the locality or near-by locality. We have already mentioned that our study area is not economically solvent. Hence possibility of employment generation among female as domestic worker is also very restricted.

Table 7.2: Distribution of private nonfarm activities among the female members of households in terms of man-days

Number of female man-days in private nonfarm activities	Treatment group(no. and % of HHs)	Comparison group(no. and % of HHs)
Nil	133(73.89%)	77(72.64%)
01-40	43(23.89%)	19(17.93%)
51 and above	4(2.22%)	10(9.43%)
Total	180(100%)	106(100%)

Source: Field survey conducted by the researcher

A significant characteristic of the region we studied is that there is almost no incidence of distress migration. More than 90% households within the treatment group do not migrate in the lean period and above 95% households belonging to comparison group are non migrants. Although the reason behind non migration is not explicitly cited by the sample households, yet we apprehend that for these people, the cost of migration might be very high.

Table 7.3: Incidence of daily distress migration among sample household

Number of days of daily distress migration	Treatment group	Comparison group
Nil	163(90.56%)	101(95.28%)
01-50	09(5%)	04(3.77%)
Above 50	08(4.44%)	01(0.9%)
Total	180(100%)	106(100%)

Source: Field survey conducted by the researcher

Table 7.3 depicts the incidence of migration outside the village among the sample households. Besides the fact that a large section within the treatment and comparison group do not migrate, we also observe that 5% households from the treatment group and a little over 3% households from the comparison group migrate for less than 50 days throughout the whole year. Thus, with immediate effect we can anticipate as a corollary that there is no question of female migration outside the village and that is by our observation in the study area. As a consequence, the possibility of generation of female employment on that front undoubtedly gets negated.

As mentioned earlier that the chosen study area in Birbhum district is predominantly mono-cropping in nature. Further, the sample farming households both in the treatment group and comparison group are mostly marginal farming households. Apart from this, a gigantic portion of the sample households within both groups belongs to agricultural labour class. Moreover,

illustration of Table 7.1, Table 7.2 and Table 7.3 brings out that a remarkable size of sample households have little or no access to either private nonfarm activities within the village or migrated job available outside their villages, implying very meager sources of alternative employment opportunities not to mention about the female community. Thus the sample households in the study area are not only poor; their poverty is also accompanied by limited or no employment opportunities in the agriculturally lean period, making them absolutely vulnerable. Moreover, it is not difficult to introspect that the female members of these households need emphasized priority so far as their employability is concerned. It is here where expansive and inclusiveness character of NREGS pertaining to women becomes imperative.

The survey work was done between June and August 2013. So this experiment is based on cross-sectional primary data. Different socio-economic information was collected from the sample households. The Focus Group Discussions (FGDs) were also conducted in all the selected villages with the village community including workers to substantiate the data collected from the individual worker.

Bearing similarity with chapter 5, total number of sample households is 286, out of which 180 households got 60 man-days or more through NREGS in the entire reference period and 106 households received 15 or less person-days job in the same reference period[48]. The first set of households is referred to as the treatment group and the second set of households is called the comparison group in the entire future analysis. The underlying empirical exercise is in its essence an impact evaluation study, where, we try to understand whether NREGS becomes efficient to generate rural public non-farm employment to female members and to identify the ex-factor(s) (if any) which can influence women's participation in NREGS. In other words, the observations are truncated for impact evaluation intending to evaluate whether more number of NREGS person-days received by the household implies proportionately more participation of female in the same or it is further substantiated by other factors.

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[48] Minimum number of person-days as a whole a sample household belonging to comparison group had worked through NREGS was 12.

7.3 The Model and its Results:

We have already mentioned that, the outcome variable is the ratio of female man days to total man days received by the sample household through NREGS in the entire reference period (*rofnregs*) and *rofnregs* $\in [0,1]$. Intuitively it may be assumed plausible that a female member of a household can seek proportionately more man-days of employment through NREGS if the household she belongs to can manage more man-days of employment resulting in the increase in the value of outcome variable. But, it is observed from our field investigation that seeking more man-days of employment through NREGS from the point of view of a household does not in all cases indicate that female members of those households will participate intensively in this public employment scheme. It came out from our field investigation that there exist considerable number of sample households who managed more than 60 person-days of employment through NREGS, but the participation of the female members of those households in NREGS is very poor and in some situations it was zero. Besides that there are a few sample households who could not manage high person-days of employment through NREGS in the entire reference period but the proportionate participation of the female job-card holders of those households is considerably high.

Out of our 286 sample households, there are 118 households (both belonging to treatment and comparison group) where the female members of the sample households did not do any work in person-day through NREGS in the entire reference period and the outcome variable in terms of positive integer is available in the remaining 168 sample households but the value of it is in any case not more than 1^{49}. Actually only among two households, its female members have participated maximum 80 person-days of employment and the value of the outcome variable is 0.8. So it is clear that female employment in person-days through NREGS takes not only strictly

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[49] Maximum man-days female members get the work must not be more than the household as a unit can seek in a particular accounting year.

positive values but it also takes on zero[50] with positive probability. So we can take the help of Type-II Tobit model in this impact evaluation.[51]

Here truncation in the sample is observed in our investigation and it is due to incidental truncation[52] as well as truncation due to survey design. So the taken sample is non-random in nature.

On the basis of our observations from the field survey, it is hypothesized that participation of female in NREGS depends on several factors: (i) inter household factor(s), (ii) women specific factor(s) and (iii) intra-household factor(s). All those three types of factors are considered simultaneously in the 'Generalized Tobit' regression equation[53] for impact evaluation.

As a matter of fact, to judge the effectiveness of NREGS to generate employment among female job-card holders one has to depend on impact evaluation technique. Besides that, here both intra as well as inter household factors are considered simultaneously to investigate the relative strength of the factors responsible to influence employment generation among female job-card holders through NREGS. This study will help us to derive few policy implications related to this factor which will be narrated in the last part of this chapter.

Possible factors which may influence female employment generation in NREGS:

treatdummy$_i$ => The variable takes the value 1 if the ith household as a unit got 60 or more person-days of NREGS work in the entire reference period (i.e. if the sample households belong

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[50] It is the situation of corner solution.

[51] Type II Tobit model is applied in the presence of missing data problem-i.e. when we truly have sample selection issue. Since we have a sample in which information on the regressand is available only for some observations, therefore it is called a censored sample.

[52] It is the decision of a household whether to participate in NREGS or not. In our sample all the households have participated in NREGS in the entire reference period but we observe huge heterogeneity during the time of securing employment through this public works scheme in the entire reference period. So for impact evaluation sample is designed by the surveyor.

[53] It is a censored regression model as well as a truncated regression model where the sample is non-random and we do not observe any information about certain segment of the population i.e. the rural households in our survey region who worked more than 15 but less than 60 person-days in NREGS in the entire reference period. Actually in our investigation we have targeted a particular subset of population, entirely ignoring the other segment of population.

to treatment group) and it is 0 if the ith household receives 15 or less number of man days of work under NREGS(i.e. if the sample households belongs to comparison group)[54]. This variable here represents the inter-household factor which will influence '*rofnregs*'. Intuitively we can say that a female job card holder will get increasingly more man-days of employment if and only if the household she belongs to, can manage good number of man-days of employment in the entire reference period. But in actual practice for a considerable number of sample households belonging to 'treatment group' female members did '0' man- days of employment or very few man-days of employment in the entire reference period. Hence, '*treatdummy*' although may influence '*rofnregs*', yet the relationship may neither be monotonic nor be having one to one correspondence.

We know that NREGS is operated through self-selection mechanism. Besides that, this policy is implemented through local panchayat. So following Kundu (2015), this variable can be endogenous in nature which may generate sample selectivity problem.

tfmember$_i$=> Total number of female members in the ith household. This variable may have a bearing on the total number of days of NREGS work obtained by female members in the household. Actually in our survey area all the adult female members of the sample households are job-card holders. So it is expected that more employment through NREGS among the adult female members can be managed if the household has more female job-card holders.

natureowrk$_i$=> It is considered as a female specific factor and here expressed in dummy. In our study area, the main task done under NREGS was digging of soil and that is 60 cubic feet to complete one man-day work. It came out from our field investigation that such type of work is considered physically constraining for female job card holders both of treatment as well as comparison group. During the time of field survey, the respondent of each sample household was asked: "do they consider the nature of work assigned to them under the program physically challenging for women?" We asked them to answer in affirmative or negative (i.e, yes or no). Thus, in the cases, where the answer is affirmative we took 1 and otherwise 0[55]. Interestingly

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[54] The variable is considered here as latent variable because to get consistent estimator in our Type-II Tobit model, initially we have to take the Probit estimation which can be done through Eq.(2) narrated later.

[55] Out of 180 sample households belonging to 'treatment group' the answer was affirmative among 59 sample households i.e. the female members of those households in spite of being job card holders cannot participate in NREGS or can participate very few man-days exclusively because of the nature of work assigned to them which

women are not excluded from job-card holding, but the nature of job are sometimes possibly active against women of some sample households for working under NREGS[56].

familyprmtr$_i$=> This is an intra-household factor and is narrated as a 'dummy' regressor. An important factor which can influence participation of female members in NREGS is whether there are facilities in the workplace pertaining to women like child care facilities and/or availability of work not far from home. In our study area, the first kind of facility was not at all observed and this feature is rampant across the country as mentioned earlier (Dasgupta and Sudarshan, 2011). So we interrogated about the second facility which is sometimes highly related with the first one. Actually due-to lack of availability of child care facilities, most women who have children mainly below 6 years cannot bring them to the worksite as it is not considered as safe place for them. They are also restricted by the other members of their households to participate in NREGS. Besides that among a considerable number of sample households, it is observed that the women married members have to look after the elder members of the household. So if they are not offered job nearer to their native village, they cannot participate in NREGS in spite of their willingness mainly due to their household work pressure reflecting family parameters. It came out from our field investigation that 27 sample households belonging to treatment group and 37 sample households belonging to comparison group reported that the female members cannot participate in NREGS work because to do that they had to travel far distance from their native village which is not possible for them due to family parameters. Here the variable as we have already mentioned previously is dummy in nature taking value 1 for 'yes' and '0' for 'no' to the following question; "do you find it difficult for the female member to go and work under NREGS after sustaining the household work pressure"? Thus out and out family parameter plays a vital role in determining the participation of women itself in the scheme

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they are physically incapable of. In case of 'comparison group' households, the number was 46 out of 106. This information indicates that a household as a whole can manage good man-days of employment through NREGS in an entire reference year but that does not mean that female members of those households can seek proportionately more man-days of employment. Actually in some cases there may be barriers from their own home and also from the local NREGS officials citing the reason that women are mostly incapable of doing such heavy manual work. In such cases, in spite of their willingness they cannot participate in NREGS more intensively.

[56] Interestingly among the female-headed households, the female members worked through NREGS. So in those households the value of 'natureowrk' is 0.

and if yes, the intensity of it. The underlying factor functioning implicitly with the prevailing one is the socio-cultural norm. A very notable feature observed in the study area was that the female participation in the program is guided by socio-cultural factors nourished either consciously or subconsciously by the male members of the household. So this variable stands for the socio cultural norms in general and bindings in particular attached with the ith household. So if the work is not available closer to a household's dwelling, generation of female employment is constrained either due to pragmatic reason like household work pressure or exclusively due to socio-cultural binding on married women members or both. The variable '*familyprmtr*' captures the whole flavor here.

Only 12 sample households belonging to treatment group and 15 sample households belonging to comparison group replied during the time of field investigation that they would not send the female members of their households in NREGS work due to '*natureowrk*' and '*familyprmtr*' both. It is tested that no correlation exists between, '*natureowrk*' and '*familyprmtr*'. Hence we can rule out the possibility of multi-co linearity during the time of estimating Eq.(7.1).

bpl_i=> this variable symbolizes whether i[th] household belongs to BPL or APL category. It is 1 for BPL and 0 for APL. The intention is to investigate whether BPL category households are more prone to send their female members in NREGS job market or not.

So the original equation we need to estimate is:

$$rofnregs_i$$
$$= \alpha_0 + \alpha_1 treatdummy_i + \alpha_2 tfmember_i + \alpha_3 natureowrk_i + \alpha_4 familyprmtr_i + \alpha_5 bpl_i + \varepsilon_i$$
……..(7.1)

Here ε_i is assumed to be normally distributed. We know that NREGS is mainly demand driven. Still the intensity of participation among the households in this public works scheme is likely to be based on unobserved factors which are accommodated in ε_i in Equation (7.1) which means selection is likely to be correlated with ε_i (Kundu, 2015). So here '*treatdummy*' is initially considered as 'endogenous variable in nature in Eq.(7.1). So during impact evaluation, to tackle the possible problem of selectivity bias we have to depend on Two Steps Treatment effect model developed by Heckman because here the value of the explained variable is observed both for the treatment group and also for the comparison group. In the following selection equation, we will

consider two factors i.e. '*psdummy*' and '*tearningsland*' which can influence '*treatdummy*' of Eq. (7.1) but those two variables do not appear as explanatory variables in Eq.(7.1).

Number of days that the ith household got employment in different kinds of jobs i.e. in private non-farm sector in the locality or outside the locality excluding NREGS in the entire reference period may likely to have an influence on the number of man days of the NREGS work participated by the household. But in our observation it is tested that those days have no influence on participation through NREGS because of very low presence of private non-farm employment opportunity in the study area. So this factor is ignored in Eq.(7.2) below[57].

The possible factor(s) which may influence the intensity of participation in NREGS i.e. '*treatdummy*' of Eq.(7.1) is now discussed below.

psdummy$_i$ => *psdummy* indicates 'Panchayat specific' dummy. Field survey has shown that getting jobs (and even number of man days of jobs) under NREGS depends to a large extent on the efficacy of the local panchayat. Along with this, political clientalism and affiliation to the household by the ruling party play a vital role as well. As most of the households are not explicit about their political stand, here we took the '*psdummy*' indicating whether they are satisfied with the overall work of the panchayat or not (1 if yes, 0 if no) to capture the flavor of all the above facts. Here, it must be mentioned that we observed heterogeneity as well as mixed response in this regard, implying no one to one correspondence between like values of *treatdummy* and *psdummy*. Hence there is no reason to believe that the households belonging to treatment group are assigned value 1 in respect of *psdummy* and vice versa. In our field investigation 46 out of 180 sample households of 'treatment group' and 73 out of 106 sample households belonging to comparison group reported that they were not satisfied with the work of the local panchayat.

tearningsland$_i$=> Net farm income from owned land of the ith sample household in the entire reference year. In our investigation 65 out of 180 sample households belonging to 'treatment group' and 39 out of 106 sample households belonging to 'comparison group' were land owners though all of them are marginal farmers. It has already been mentioned that the survey area is mainly mono-cropping area. But sometimes they cultivate different horticultural product during post rainy season from which their net-farm income enhances. So, there is a possibility that

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[57] It is used to address the issues of self-selection and the estimation of treatment effect model when there is non-random allocation of subjects to treatment and comparison group as is generally the case with observational data.

members of these landholding farm households will seek less employment through NREGS for these farm activities because the farm income is a source of income of the landowners. This variable in accommodated in Eq.(7.2). As described in chapter 5, we have calculated net total farm income of the marginal farmer households by first computing their value of total output sold (total output sold x market price). Then we add total value of output kept for self consumption (amount x market price) and thus get the value of total output produced (Total Revenue). After that we calculate the total cost of cultivation under different heads (Total Cost).[58] Finally after subtracting total cost from total revenue, we can get net total farm income in monetary terms.

Thus we discover that, although NREGS is operating under self-selection mechanism, there may be some factor(s) due to which a household demands job but cannot always get that when demanded. This factor is tested through '*psdummy*'. Besides that there may be another factor due to which the household itself is not willing to secure more man-days of employment through NREGS. So through 'selection equation' we want to identify the factors due to which we observe heterogeneity among the households during the time of getting jobs through NREGS in terms of total man days in the entire reference period in our survey region   The selection equation is expressed as:

$$treatdummy_i = \beta_0 + \beta_1 psdummy_i + \beta_2 tearningsland_i + \mu_i ……..(7.2)$$

We have already mentioned that to do the impact evaluation, we have to depend on Treatment effect model developed by Heckman (because the value of '*rofnregs*' is observed both for the treatment group and for the comparison group). It can also be here called Type-II Tobit model or generalized Tobit model and this is identical to the Heckman model. The difference between the Heckman type model and Tobit-II type model is that in Heckman type model we have to perform Two step estimation but Tobit-II type model prefers maximum likelihood estimation. Here this method is applied after considering possible existence of sample selection bias. If it exists, then to get consistent estimate of the Type II Tobit model we have to consider another explanatory variable ' $\hat{\lambda}_i$ ' (Inverse Mill's ratio, which we can get through applying Probit model in selection

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[58] Here total cost includes cost of seeds, hand tractors/bullocks, different fertilizers at purchase price, pesticides at purchase price, water, hired labour in terms of total wage bill and other costs if any.

equation apart) with the already mentioned explanatory variables mentioned in Eq.(7.1) . Let us first cite the result of the selection equation in Table 7.4

Table 7.4: Probit model; narrated through Eq.(7.2)

Dependent variable: '*treatdummy*'

Name of the variable	Co-efficient	Standard Error
tearningsland	-0.0000751**	0.0000395
psdummy	3.4612*	0.386
constant	-.7969*	.154

*=> significant at 1% level   and **=> significant at 5% level

In the Type-II Tobit model, we can have the Inverse Mill's ratio $\hat{\lambda}_i$ for each 'i' and then we have to apply simple Tobit model to estimate $\hat{\alpha}_i$ considering $\hat{\lambda}_i$ as additional variable. The result is shown in Table 7.5.

[133]

Table 7.5- Two step Treatment Effect Estimation in Tobit-II model:

Dependent variable: '*rofnregs*'

Name of the variable	Value of the Marginal co-efficient	Standard error
treatdummy	0.17894*	0.0301
tfmember	-0.18102	0.31
natureowrk	-0.3549*	0.0297
familyprmtr	-0.1215*	.0272
bpl	0.0311	0.0287
constant	0.3151*	.04785
$\hat{\lambda}_i$	-0.262*	0.0291

Wald $\chi^2(5) = 340.63*$

*=> significant at 1% level

As the value of the coefficient of $\hat{\lambda}_i$ is statistically significant we can reject the null hypothesis and say that two step treatment effect model in this Type-II Tobit model is appropriate.

Total number of observations is 286, and out of 286 observations, 110 are left censored at *rofnregs* ≤ 0 and remaining 176 are uncensored observations[59]. The value of Wald

[59] This is because no female member of our sample household has got 100 person-days of employment in the entire reference period. Maximum number of man-days the female member of a sample household got job through NREGS is 80 and minimum is 0. So the value of 'rofnregs' never exceeds 1 and always took value in the closed interval between '0' and 1

$\chi^2(5)=1039.48$ and is significant at 1% level which establishes goodness of fit of the above model and can conclude that the covariates used in the regression model are appropriate. The parameter estimate of $\hat{\lambda}$ is -0.262 and it is statistically significant. So sample selection bias problem is corrected after considering $\hat{\lambda}_i$ as another explanatory variable in Eq.(7.1). To justify this statement the result of our Probit regression mentioned in Eq.(7.2) is given in Table-7.4 which shows big influence of 'clientalism'[60] during the time of seeking employment through NREGS. It is also observed that if total earnings from land increases then the household will seek less man days of employment through NREGS.

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[60] 'Clientalism' is the favour a household can manage from local administration of receiving government services due to its loyalty for the political party whose members dominate in the local administration.

7.4 Discussion of the Results mentioned in Table 7.5 based on Eq.(7.1):

The results of the Two-step Tobit equation mentioned in Table-7.5 show that the value of the marginal coefficient is positive for the '*treatdummy*'. This implies that the ratio of man-days the female-member of the household has worked through NREGS and total man-days the household secured job through NREGS may increase if the household as a whole can secure more man-days of employment through this public employment generation scheme and the possibility of it will be much higher if the household is landless and can manage good favor from local panchayat. But the value of the parameter estimate is 0.17 which establishes total absence of one to one relation between the two variables i.e. the female job card holder may not always manage to secure more man-days of employment through NREGS even if the male members can manage that. Thus, this variable does not suffice to explain the heterogeneity in the value of the '*rofnregs*' among the sample households.

The absolute value of the marginal coefficient explained in Table 7.5 is highest for '*natureowrk*'. The negative significant value of its coefficient establishes the fact that lack of suitable type of work opportunity among the female job card holders from their physical standpoint is the main reason behind poor employment generation among female members in our study area through NREGS.

It is also observed that due to family parameters explicitly expressed through household work pressure and/or implicitly reflecting the socio cultural binding, a sizable number of female job card holders failed to participate in NREGS. Here it has to be remembered that this variable accommodates the household duty of the female job card holder or an implicit fact of social binding on the female members of a household or both. If the sample household has aged as well as child members, then female member has to look after them, and it becomes difficult for those female members to work in NREGS if it is offered to her at a distant place. So we can say that due to family obligation and absence of empowerment (intra-household decision making power) among themselves the female job card holders are prevented to participate in this employment generation scheme even if they are offered job in a slightly distant place from their native village.

Total number of female job card holder and BPL Category of the sample household have no significant effect to influence employment generation among female members of the household through NREGS.

7.5 Observations:

The present research work aimed to investigate the effectiveness of NREGS to generate employment among women. In this micro-level quasi-experimental study it is initially noticed that 'clientalism' is very much prominent for a sample household during the time of securing employment through NREGS in our study area. It is proved through selection equation that without loyalty to the political party whose members occupy the prime posts of panchayat, it becomes difficult for the poor rural households to secure more man-days of employment through NREGS. So the female job card holders are also deprived to secure more man-days of employment through this scheme. But that is not the only cause due to which we can say that there is heterogeneity in the employment generation among the women through NREGS in our study area. A large number of female job card holders cannot participate in this scheme due to lack of suitable type of work. Due to lack of physical capacity, a large number of female members do not prefer to work like 'digging of soil'. Sometimes they are prevented by the male members of their households to do this type of work. Besides that local panchayat sometimes have to arrange job in a distant village which may be more than five kilometers from the native village of the job card holders without arranging for any child care facility in those areas. The female job card holders due to different types of family obligations like looking after their children and elderly persons and lack of empowerment cannot participate in this employment generation scheme. They have to abide by the decision of the elders and mainly their husbands.

CHAPTER- 8: Conclusion

Conclusion

Eyeing on the broad theme of the thesis, i.e the "impact of NREGS on the rural economy: theory and empirics", we made an effort to study the impact of NREGS on four distinct dimensions concerning rural economy and rural poor through involving theoretical and empirical discourses. In chapter 4 involving theoretical model, maximum possible per man-day NREGS wage is determined at which the corresponding agricultural wage can help the marginal farmers to sustain their net farm income at least at subsistence level. The constructive impact of NREGS has been undeniable. A rise in NREGS wage may create a positive economic impact in the sense that it can improve the livelihood of the rural poor. But it has also contributed to rise in farm input costs and withdrawal of labour from farm sector therefore adversely affecting agricultural operation and crop prices viz, food prices. The motivation behind the present theory emerges from this adverse impact of NREGS on the agricultural ambience. Section 2 ends up with a culmination point where ceteris paribus, enhancement of NREGS wage above a critical level will stop agricultural activity in post rainy season in a multicropping framework. Again, keeping an eye on the broad objective of the theoretical study (viz, impact of NREGS on the rural poor), we evaluate the same in section 3 by looking at the impact of introducing NREGS on aggregate net benefit of the rural poor under the auspices of two different agricultural circumstances. In this regard, a prominent observation is that there arises no conflict between agriculture and NREGS from the point of view of the rural poor in mono cropping contexts, rather NREGS supplements agricultural employment and income there. Thus it is found that examining the impact of changes in the relevant policy parameters on aggregate net benefit in such contexts becomes redundant. But under certain conditions the double cropping systems will give more benefit for the rural poor than single cropping system. It is observed that hike of NREGS wage may not benefit the overall rural community. In other situations the effect is unambiguous.

Chapter 5 deals with the primary objective with which NREGS was devised. This quasi experimental study aimed to investigate the impact of NREGS on the livelihood of rural poor. During this course, livelihood of the rural poor has been epitomized by Average monthly income. The study reveals that the rural poor are benefitted from NREGS in terms of their income. However, the study observes that the heterogeneity in seeking employment through NREGS is panchayat specific. As a result, the performance of the implementation of NREGS

depends both qualitatively and quantitatively to a large extent on the efficacy of the panchayat. Further, for a few farming households, NREGS help them to enhance their net farm income which indicates exploration of asset creating potentiality of this scheme. Hence assuming status quo it is prudent to continue NREGS effectively to improve the livelihood of the rural people.

The motivation towards Chapter 6 was the indication given in chapter 5 in respect of exploration of asset creating potentiality of NREGS. We know that creation and maintenance of durable and sustainable assets under NREGS is of pivotal importance so far as the objective of the scheme is concerned. Hence, it cannot be undermined alongside the objective of employment generation under the scheme, especially keeping in view the fact that, it will ultimately reduce the dependence on the scheme. Again, durability and sustainability of the assets created can largely be examined by their impact on agriculture.

As far as our warm up study goes, no objective investigation has been undertaken so far to examine the influence of asset creation under NREGS on agricultural activities in West Bengal. Eyeing the present study from that angle certainly makes it contributory. It for the first time makes an attempt towards that end.

At the time of initiation of NREGS, it was expected that land development, water conservation, water harvesting, drought proofing, flood control etc. would help improving crop yields per unit of land in a sustainable manner. The improvement in irrigation capacity, apart from bringing new area under cultivation, was also expected to improve crop yields due to availability of more water, and result in multi-cropping as well. Running in tandem, the present paper attempts to explore whether NREGS in West Bengal, after its implementation has been able to convert the mono cropping areas into multi-cropping ones or not. Towards this end, it was justifiably hypothesized that cropping intensity would be a proper measure and thus was considered the outcome variable.

From the present study covering all the NREGS implemented districts of West Bengal and the eight years of its implementation, we found that, cropping intensity has increased in almost all the districts of West Bengal between 2006-07 and 2013-14.This has been evident from the results of Least square dummy variable (LSDV) techniques incorporating time dummies as well as district specific dummies. The NREGS work like 'provision of irrigation facility' has no impact in enhancing cropping intensity. Micro irrigation work through NREGS has created a

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positive impact on Cropping Intensity. But the impact is very small because the value of the co-efficient is very small (though it is statistically significant). In case of 'rural connectivity work' through NREGS, its impact is also very small so far as the value of the coefficient is concerned, but the factor is statistically significant. It is observed that rain fall still plays a significant role to enhance the cropping intensity of West Bengal. Moreover, average harvest price of the previous year also turns out to be statistically significant. Thus in spite of the expansion of NREGS work, 'average rainfall' throughout the year still influences the farmers' decision regarding expansion of agricultural activities. Hence, NREGS asset creation activities have not generated so far any commendable impact on agrarian scenario in West Bengal.

It is observed that the number of ongoing works was on the rise in successive periods. If those works were completed in subsequent periods, then the positive influence on productivity of agriculture might not be done away with which the present study has not exercised. However, creation and maintenance of NREGS assets must go hand in hand in order to accomplish the objective of attaining durability and sustainability of the assets. In West Bengal numerous surveys and anecdotal evidences suggest that the job of maintenance has not been up to the mark. Perhaps, that is the reason why many assets created under the scheme have not generated the anticipated benefit and as a result the aim of enhancement of productivity in agriculture with the help of NREGS assets has gone futile.

Chapter 7 aimed to investigate the effectiveness of NREGS to generate employment among women. In this micro-level quasi-experimental study it is initially noticed that 'clientalism' is very much prominent for a sample household during the time of securing employment through NREGS in our study area. It is proved through selection equation that without loyalty to the political party whose members occupy the prime posts of panchayat, it becomes difficult for the poor rural households to secure more man-days of employment through NREGS. So the female job card holders are also deprived to secure more man-days of employment through this scheme. But that is not the only cause due to which we can say that there is heterogeneity in the employment generation among the women through NREGS in our study area. A large number of female job card holders cannot participate in this scheme due to lack of suitable type of work. Due to lack of physical capacity, a large number of female members do not prefer to work like 'digging of soil'. Sometimes they are prevented by the male members of their households to do

this type of work. Besides that local panchayat sometimes have to arrange job in a distant village which may be more than five kilometers from the native village of the job card holders without arranging for any child care facility in those areas. The female job card holders due to different types of family obligations like looking after their children and elderly persons and lack of empowerment cannot participate in this employment generation scheme. They have to abide by the decision of the elders and mainly their husbands. This happens because most of the sample households either belonging to the treatment group or comparison group are economically poor and male headed where the intra-household decision making power of the women are very thin. Clearly it is apprehended from our field observations that although the women specific factor(s) like nature of works have separate entity, yet the intra-household factor(s) like family parameters are guided by socio-cultural factor(s) taking the form of binding for a household. As it is an age old characteristic inherited through generations, it cannot easily be done away with. Rather, the policies must be devised keeping in tandem with them.

CHAPTER – 9: POLICY IMPLICATIONS

POLICY IMPLICATIONS

The impact of NREGS and that of subsequently related policy changes need to be reassessed and it cannot be weighted in just political terms. In a nutshell, there is requirement of context specific and region specific policy design and implementation especially pertaining to NREGS wage escalation. It also comes out from the model that delay in payment of NREGS wage and work effort criteria in NREGS are very important factors affecting the decision of a labourer in choosing between agricultural work and NREGS work. So a few policies related to some important aspects of NREGS are here suggested:

1. Before hiking NREGS piece rate government should justify its practical impact on village economy because it should be remembered that it is not always possible for the small and marginal farmers to offer government declared minimum wage to his farm labourers. It is identified that enhancement of NREGS wage beyond a limiting value will stop agricultural production and government must refrain itself from reaching out that stage. Apprehension of proper rural employment scenario at village level is a prerequisite in this case. In double cropping region, areas with relatively large number of agriculturally unemployed casual landless labourers can only get the benefit of NREGS wage escalation and will make a positive impact on aggregate net pecuniary benefit to the rural poor.

2. Delay in payment of wages has remained a disadvantageous aspect of NREGS since its inception. It is observed that the beneficiaries have the only concern regarding the implementation of NREGS that the payment should be made in due time. The existing theory clearly shows why it is so. Yet sustenance of agriculture in non rainy season may necessitate a delicate policy mix. If the government plans to raise the NREGS wage, it may be accompanied by increase in work effort criteria under NREGS and/or delay in payment of wages ($\hat{\rho} \rightarrow \bar{\rho}$) so that availability of labour to agriculture does not drastically fall.

3. NREGS work should always be done not only as employment generation scheme but also as asset creation which can help the marginal farmers to improve their productivity as well as net farm income in their agricultural production resulting in a positive impact on

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the aggregate net benefit of the rural poor. This in turn necessitates an adequate increase in the allotment towards material cost in NREGS work as and when required.

4. The government should arrange work per man-day under NREGS in such a way that the assigned labourer has to work at least 8 hours effectively without shirking. This can be exercised in mono-cropping regions and in those agriculturally developed regions where employment of agricultural labourers is sufficiently large, because in that case the adverse impact on aggregate net benefit is somewhat dampened. This type of scheme implementation weakens the power of hindrance towards the supply of labour during the time of agricultural production.

5. Last but not the least, a holistic policy suggestion is that the government should strictly instruct to local panchayat to arrange jobs through NREGS only in the agricultural slack season. All the regions in India are not equally developed in agriculture. In many parts of India, we observe the presence of multiple cropping and in those areas the casual labourers are getting job as agricultural labourers more than 150 days annually. If it is observed that the region is agriculturally developed and even the small farmers are cultivating their own land with the help of hired labour more than once in a year then government can reduce the target days of employment generation of each willing household from 100 man-days. This only can reduce the possibility of choice of an agricultural labourer between private employment and public employment through NREGS mainly in the agricultural peak season. This only can help the marginal farmers to make their cultivation profitable even at subsistence level through controlling their labour cost.

Creation and maintenance of NREGS assets must go hand in hand in order to accomplish the objective of attaining durability and sustainability of the assets. In West Bengal numerous surveys and anecdotal evidences suggest that the job of maintenance has not been up to the mark. Perhaps, that is the reason why many assets created under the scheme have not generated the anticipated benefit and as a result the aim of enhancement of productivity in agriculture with the help of NREGS assets has gone futile.

6. The productive value of assets created by NREGS works can be enhanced with proper monitoring activities. It is observed that in case of assets in individual land monitoring is

not an issue rather, in case of assets created in community land, monitoring is an important factor. In specific, considering the feeble impact of provision of irrigation facility on cropping intensity, it is apprehended that the reason is that the number of works under this head has been dismal. Hence, there is need for enhancement of private ownership of assets created among the villagers and provision for maintenance of assets created.

7. Again, the listed number of works might appear insufficient to generate employment of at least 100 days based on location specific characteristics. In such circumstances, the productive value of NREGS works can also be enhanced by way of convergence.

8. Looking at the commendable impact of district specific dummies on the variation of cropping intensity, it is further recommended that the district level planning regarding the selection of work activities must be sensitized as par the local needs. In this connection, the study also suggests for good governance at the local level and participatory decision making in the selection of work activities.

We can also suggest some policy implications which may generate more employment among the female job card holders through NREGS and these are as follows:

9. Problem of 'clientalism' during the time of arranging employment among the village job seekers through NREGS should be minimized. A proper sensitization of the local administration in this regard is mandatory.

10. Women can as much as possible be allotted works such as plantation and the likes which are not heavily manual like digging of soil etc. This will to a large extent mitigate the reluctance and reservations of the concerned male members of the households to send their female counterparts to the work.

11. It must be strictly followed that the works be arranged for women near to their dwelling so that they can avail of the NREGS projects without being anxious about their children and elders in their home. Besides that, the local panchayat must make provisions for child care facilities at the worksites as enshrined in the NREG act. Either or both these

measures are expected to mobilize the women to participate more intensively in this employment generation scheme.

12. Results have shown that enhancement in the earnings from land will reduce the demand for NREGS works. As NREGS is an ongoing scheme, it must be optimally used for creation of proper ambience for turning the mono-cropping areas into bi-cropping and so on. This to large extent may reduce the pressure from demand side for the NREGS jobs.

CHAPTER- 10: References

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