Chapter 10
Inter-sectoral Linkages and Multipliers of MGNREGA in a Rainfed Village in Karnataka: Applications of Social Accounting Matrix (SAM)

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10.1 Introduction

Overall economy of India has been growing over 7–8% over the last one decade, however, unemployment and poverty situation are also rampant across the country. Over 50% of its population in India cannot make two dollars a day for living, and are living under acute situation of poverty. Even after 70 years of Independence, almost 1/3rd of the world's poor populations are concentrated in India alone. Thus, providing employment to swallowing pool of growing population and uplifting the mass population out of the poverty are now the two gravest concerns in India, one of the fastest growing economies in the world recently.

Since the initiation of first five year planning period in India since 1951 reduction of unemployment through creation of jobs and poverty alleviation are the major objectives of the strategy and planning process in India. Both unemployment and poverty are also in fact interlinked. Poverty reduction can be achieved only by increasing purchasing power of the poor which depends on providing them employment. Hence, most of the poverty alleviation programmes attempted in India

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since independence till to-date are somehow linked at employment generation, particularly for employment generation in rural sector (Yadav and Panda 2013). However, only limited success has been achieved in terms of reduction of rural poverty in India, and it is still an unfinished development agenda in India. Since, the work force[1] growth in India has always outpaced the growth of job creation and provision of public and private sector employment.

During 1983–94, unemployment rate decline from 8.3 in 1983 to 5.9% in 1994. However, after adopting liberalization policies in several sectors including agri-cultural, the unemployment in India rose to a decade high levels of 7.32 and 8.28% during 1999–2000 and 2004–05, respectively (Yadav and Panda 2013). The increased on unemployment in early 2000s was not all due to high population growth but was also partly due to structural changes in economy, and with rapid pace of growth of share of service sector in the economy. Interestingly, the overall economy grew at very rapid pace during the period of 1990s and early 2000s, but unemployment did not decline rather it further grew, creating a further rift in farm and non-farm sectors of the economy, and social tensions across the regions. Hence, it was felt necessary to provide jobs to swelling rural population specially in periods of agriculture to address the rapidly growing problems of unemployment and underemployment in rural areas in early 2000s. As a remedial measure to the growing unemployment and distress in the rural areas in early 2000s, the Government of India, then led by UPA government, enacted the National Rural Employment Guarantee Act (NREGA) 2005 to address rising unemployment and chronic level poverty in the country, by providing a minimum survival level of 100 days of constitutionally guaranteed wage employment in a year to every household in rural India. The employment to be delivered by the local authority across the rural India. This programme was renamed as MGNREGA and was also made as a nationwide programme in 2009.

With this background, this chapter quantified village economy wide inter-sectoral linkages of MGNREGA. More specially, taking a dryland village of a northern Karnataka state, in the following section, we provide various inter-sectoral linkages of the economic activities and transfers of goods and services across the sectors (agents) within the village economy. This is done by taking framework of social accounting matrix (SAM) (details on SAM are in Bellu 2012; Thorbecke 2000). Then, we present the detailed results on direct, indirect, and total effects of the MGNREGA interventions in a village wide context. Then, at the end of the chapter, we provide conclusions and implications out of the empirical analysis for improving implementation of MGNREGS programme.

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[1]All the persons who are actually engaged in economically productive activities constitute work force and those who are either part of work force or are willing to be part of it are said to constitute labour force. Thus labour force connotes a larger meaning than work force.

10.2   Inter-sectoral Linkages of MGNREGA in an Economy

An economy consists of three broad sectors, namely agriculture, industry and service sector. Each sector has several different sub-sectors (Bellu 2012). Agriculture is considered to be the primary sector and a pre-cursor for development of all other sectors of the economy (Mellor 1976). This is also to ensure adequate employment and food security to all, including to industrials and service sectors of the economy (see, Mellor 1999). Agriculture is in fact a low productivity sector with surplus labour that should generate surplus labour and food for the growth of other sectors of the economy (Mellor 1999; Lewis 1954).

As agriculture productivity and farm income grows, it would generate additional demand for manufacturing goods and services, ultimately also helping to expansion of manufacturing goods and services in the economy. This type of backward and forward linkage of agriculture with the manufacturing and other sectors of the economy would also generate multiplier effects in the local economy (Mellor 1976, 1999), when there is an additional investment in terms of expanding demand of the primary sectors. An economy with strong linkages of backward and forward would also ensure for higher multiplier effects and higher growth in the economy as such via increased demand for input and production of additional outputs and feedback effect in the economy (Thorbecke 2000; Bellu 2012).

10.2.1   Impact of MGNREGS on the Village Economy

When MGNREGA was enacted in 2005, it was envisaged to strengthening employment and livelihood security of rural poor by ensuring minimum level of 100 days of employment to the households, at the same time also benefiting other sectors of the economy—and the village economy as such—by creating assets and public goods in the rural areas. In this process, it is expected that not only the households who participate in the MGNREGA work activities but other better-off households in the rural areas would also be benefited from MGNREGA due to transfer and inter-sectoral linkage effects across the sectors, and through the multiplier effects in the local economy (see Hirway et al. 2008).

A large number of empirical studies on MGNREGS available so far have focused largely on the efficacy of the scheme in achieving targets set under the 2005 Act. As a result, these studies have considered only direct employment creation through this programme, but neglecting the indirect and intersectoral linkages and village economy wide impacts produced by the MGNREGS investment done in the village economy (Hirway et al. 2008; Vani et al. 2015). In this context, this chapter assesses the economic impact of MGNREGS in a Markabbinahalli village in Bijapur district located in northern Karnataka state.

10.2.2   Socioeconomic Profile of Markabbinahalli Village

Markabbinahalli is a typical dryland village in Karnataka, and located in a vast track of semi-arid tropical region of India. There is neither a dug well, nor a canal or river to provide irrigation water for growing crops, hence farmers have to totally depend upon rainfall for farming purpose. Though this village is located nearby a seasonal river, by the name '*Doni*', its water is very saline and is unfit for irrigation. Because of the salinity of river water, groundwater in the village has also become saline, and not useful for irrigation as well as for drinking purpose. In this respect, farmers' in the village practice purely rainfed agriculture, a unique feature of farming in the village, and is also the reason for selecting to study[2] the inter-linkages effects of MGNREGA interventions. Other features and farming characteristics of the village are described in Vani (2015).

There are about 400 households in the village with a population of 2,545 persons. This is a predominantly agrarian village with majority of the households depending on agricultural wage employment (41%) for their livelihood, followed by farming (39%), caste-based occupations (7%), non-agricultural labour (8%) and others (5%) (Desai et al. 2012).

Out of about 1,000 ha of geographical area of Markabbinahalli village, 935 ha is under agricultural use (rainfed farming). About 90% of land is deep to medium black cotton soil and the remaining 10% of area comprises of medium black sandy loam soil. This village receives a rainfall of about 625 mm per annum within just 40 rainy days in a year (Details in Vani 2015; Desai et al. 2012).

10.3   Social Accounting Matrix (SAM)

Social accounting matrix (SAM) framework is used to study the inter-sectoral linkages within the village economy, and to analyze village economy wide impact of MGNREGA interventions. A SAM is an organized matrix representation of the accounts and transactions of different activities, actual or imputed, within an economy and with respect to the rest of the world (Adelman et al. 1988). In other words, SAM is a square matrix and an extension of Leontief input output matrix and is a useful tool to summarize an economy and its financial as well as non-financial (barter) transactions, occurring in a year, in a meaningful way with flexibility to add social dimensions (Subramanyan 2007; Adelman et al. 1988).

SAM works on double accounting principle of formal accountancy which states that every debit must be accompanied by corresponding credit in the books of accounts. Every row in SAM records a receipt for respective account and every

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[2]This village is also part of Village Dynamics in South Asia (VDSA) Study conducted by ICRISAT, and so large set of households and other basic features of data about the village, even historical changes, are.

column in SAM records a payment from the same account (details are in Subramanian and Sadoulet 1990). Row and column total should match for each account in SAM. For the present study, a SAM of 82×82 size was constructed. Schematic representation of SAM constructed for the present study is given in Table 10.1. A brief discussion on major account is done in the following sections below.

10.3.1 Assumptions of the Village SAM

We have constructed village SAM for Markabbinahalli village with assumptions and restrictions on certain activities of SAM, as listed below. Details on these assumptions for construction of village SAM can be found in Bellu (2012) and Thorbecke (2000).

- The village economy is an open economy, i.e. there is free movement of goods and services between the village and the rest of the world.
- The village economy has the price elasticity of supply equal to infinity, i.e. the village economy does not suffer from supply side constraints.
- The economy is demand constrained, so that any increase in demand or monetary injection from exogenous account is met by the necessary production.
- All households are the owners of the factors of production. Therefore, all the factor incomes shall accrue to the household account in the SAM directly or indirectly.
- All the adjustments are quantity adjustments and prices do not vary. Input prices do not change either in response to changes in input demand and the production technology stays unaltered.
- Economic agents take prices as given and value of all income elasticity is unitary.
- The relationship between endogenous and exogenous variables are linear (i.e. hypothesis of lack of substitution between different inputs and factors for all productive sectors and between different final goods for all institutions).
- All the elements of coefficient matrix are assumed to be fixed, i.e. a_{ij} or average expenditure propensities must be calculated from SAM as parameters and marginal expenditure propensities are equal to average expenditure propensities.
- Expenditure equals income in endogenous accounts.
  Due to above assumptions SAM is a static analysis.

Table 10.1 Schematic representation of SAM constructed for the present study

Receipts \ Expenditure	Activities	Commodities	Factors	Household	Institutions	Savings and investment	ROW
Activities	–	Domestic production	–	–	–	–	–
Commodities	Intermediate inputs	–	–	Household consumption	Consumption	Stocks	Exports
Factors	Value added	–	–	Value added	Factor payments	–	Factor earnings
Household	Profit	–	Factor payments	Inter-household transaction	Financial transfers	Imputed value of own inputs	Remittances
Institutions	–	–	–	Taxes and donations	Financial transfers	–	Receipts
Savings and investment	Imputed value of own inputs	Drawings from stocks	–	Savings	Savings	–	Deficit BOP
ROW	Imports	–	Factor payments	Payments	Payments	Surplus BOP	–

Note: *ROW* Rest of the world, *BOP* Balance of payment

10.3.2 Different Accounts and Components of Village SAM

Major activities and components of the village SAM constructed are summarized in this section. Detailed information pertaining to these activities in the studied village can be found in Vani et al. (2015). Likewise, theoretical aspects of these elements are discussed in Bellu (2012) and Thorbecke (2000).

Activities The activity account represents here production activities in the village economy. Activity account in column makes payment for all services and goods procured as input in the process of production. Whereas, in the row, activity account can receive money payment from only commodity account for domestic supplies of goods and services (Thorbecke 2000; Subramanian and Sadoulet 1990).

Agriculture production and Charcoal making were considered as the production activity. Likewise, service sectors-related activities included the following: agricultural inputs trade, agricultural commodity trade, charcoal trade, machinery services, tailor, barber, grinding mill, repair and maintenance, private school, government school, government Ayurvedic hospital and SHGs. Within agriculture, production of jowar, wheat, pigeon pea, cotton and chickpea crops were considered as individual production activity, while minor crops such as sunflower, safflower and onion along with livestock were clubbed together and were considered as other agricultural enterprises.[3]

Commodities In this study, commodity accounts consider the same items as those under activity account. Commodity account supplies the goods and services to the village economy and rest of the world, and in turn receives the money from respective accounts. In the column, commodity account makes payment to activity account, and to savings and investment accounts for domestic supplies and for previous year's saved/remained goods, respectively (see, Bellu 2012).

Factors The factor account in this study consists of two components, namely labour services and capital services. Labour services component can be classified either into hired and family labour services or into male and female labour services as per the need. We grouped labour as hired and family labour uses. Labour receives capital services from different activities, receives contribution made by capital, and similarly it receives remuneration for providing labour to the different activities. Since factors of production are owned by households, these two sub-accounts of factor account transfer the money received to household account (details in Subramanian and Sadoulet 1990).

Institutions In this case, the institution account represents households (by land holding size sub-category), the village local government (in the present study *Gram Panchayat*), and religious institutions (here it is the Temple). The household is shown to be separated from the Institution column in SAM. The village local government collects funds from state government and also tax from residents of the

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[3]Other agricultural enterprises are referred to as "Others" in original 82 × 82 SAM.

village. Tax collected is transferred to the state government through rest of the world. Gram Panchayat also spends funds received from the state government on developmental and non-developmental activities. Subsidies, pension, grants and aids are shown as financial transfers. Likewise, temple institution receives donations from the villagers and spends it on various religious activities. If donations exceed expenditure then it is a savings of temple institutions.

Households Households account makes payment for purchases made by households within and outside the village economy. It receives the income earned by households from different occupations both within and outside the village economy (Bellu 2012). Remittances sent and received are also channelled through this account. In this study, households were divided into five VDSA[4] categories, namely landless, marginal, small, medium and large as presented in Table 10.2. These households in each category were selected for survey with proportionate and purposive sampling framework as noted earlier.

Savings and Investment Accounts The saving and investment account receives the savings of the households (including cash in hand and stock of goods remaining at the end of the year including crop and livestock outputs). Savings were derived as the residual at the end of the year after deducting the consumption from opening stock at the start of the year and quantity supplied during the year (Bellu 2012). In this study, Gram Panchayat is assumed to invest in MGNREGP, first, Panchayat transfers money to savings and investment accounts and from there, it is channelled to MGNREGP commodity account, which is considered here as an investment.

Rest of the World (ROW) This ROW account represents the economy outside the village selected for SAM analysis (Bellu 2012). If any agent of economy (activity, institutions) spends on goods and services from outside the village, then it is channelled through the rest of the world account. Rest of the world account also channels in remittances, receipts and income from outside the village economy. In this study, to balance the account within SAM framework, balance of payment (BOP) is also assumed in the village economy, like every country has BOP account.

10.3.3 Calculation of Multiplier

Using the standard framework of SAM analysis, the empirical estimated SAM model is written as

$$y_j = \sum_i w_{ij} + \sum_i x_{ij},$$

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[4]VDSA: Village Dynamics studies in South Asia, A Project undertaken by ICRISAT, Hyderabad.

Table 10.2 Households classification by landholding size and sampling framework used in Markabbinahalli, Karnataka, 2013

Category	Land classification[a] (ha)	No. of households in the village[b]	Sample size
Landless	<0.1	110	6
Marginal	0.1 to <1	43	3
Small	1 to <2	89	4
Medium	2 to <4	86	4
Large	>4	72	3
Total		400	20

Source [a]Markabbinahalli village at a glance produced by ICRISAT (Desai et al. 2012)
[b]Markabbinahalli Gram Panchayat records

where y_j is the jth column total and a vector of y_j would constitute Y vector. W is a matrix of endogenous accounts with elements w_{ij} and X is a matrix of exogenous accounts with elements x_{ij} (Details in Bellu 2012).

In the SAM model, the activity, commodity, factor and household accounts were assumed to be endogenous, as a standard practice of SAM analysis (Thorbecke 2000). Exogenous accounts were considered as public administration (Village Panchayat), savings and investment account and rest of the world account. These exogenous accounts were aggregated because expenditure from these accounts was all exogenous types (Bellu 2012).

Upon dividing each cell of SAM by its respective column total we get coefficient matrix A whose elements are a_{ij}. Mathematically, it can be represented as

$$a_{ij} = \frac{w_{ij}}{y_j}.$$

The above equation can be written as

$$Y = AY + X.$$

After some rearrangements the above equation can be written as

$$(I - A)Y = X.$$

And further, the above equation can be written as

$$Y = (I - A)^{-1}X = MX,$$

where M is a SAM multiplier matrix, consisting of coefficients m_{ij}. Coefficient m_{ij} is the total impact on account i because of a unit shock in account j.

In our case, we estimated three types of multipliers, namely, output, household income and employment multipliers. This was done selecting activity column for which multipliers were to be calculated and then all row values for commodity accounts, labour accounts and household accounts were summed up, respectively.

Percentage change in output of a particular sector can be referred to as percentage impact.

This was calculated as

$$\text{Percentage\_impact\_on\_}i\text{th\_account} = \frac{m_{ij} * x_{ij} * 100}{B_i},$$

where, m_{ij} is multiplier value for ith account due to a unit shock in jth account, x_j is amount of shock in jth account, B_i is the base value of ith account.

Note: A multiplier value of 2 is interpreted as 200% increase on that account only if $B_i = x_j$. That is, one unit of exogenous shock produces two unit of total output in the economy.

10.3.4 Sampling Framework and Data Collection

For the study, both primary and secondary data were collected for the full cycle of agricultural year 2012–13 (From 1 June 2012 to 31 May 2013). Purposive sampling was done for collection of data from the households. Following ICRISAT–VDSA study criteria and Government of India census survey criteria, households were classified into five strata, namely, landless households and marginal, small, medium and large land holding households as indicated in Table 10.2. From each household stratum only 5% of households were chosen as representative samples. They were chosen in such a way as to represent all occupations practiced in the target village, so that the sample truly reflected the village economic conditions.

Primary data regarding details of employment provided, receipts and expenditure were collected from different economic agents including shops (Agricultural input shop, canteen[5], provision store) and service providers (tailor, barber, drivers, labourers, and so on). Structured questionnaire were used to collect data from villagers. In the questionnaire information on the transaction both within and outside the village were recorded separately and sourcewise.

Secondary data were collected from Government institutions (Gram Panchayat, anganwadi centre, school, post office, healthcare centre, financial institutions located in Devarhippargi and Satihal towns, and ICRISAT VDSA database) and official websites http://nrega.nic.in/netnrega and http://panchamitra.kar.nic.in.

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[5]Canteen is a service providing entity including tea shop. Canteen and tea shop differs only in respect of no. of different services provided to customers.

10.4 Inter-sectoral Linkages of MGNREGS Expenditure

Table 10.3 provides SAM of 82 × 82 dimension coerced to 16 × 16 dimensions. From SAM, multipliers were estimated, as noted earlier. Table 10.4 provides a matrix of aggregate multipliers (aggregate of output, employment and income multipliers). From this table it is evident that highest inter-sectoral linkages were through other commodity trade[6] based on highest multiplier value of 3.74, among all endogenous accounts. Other commodity trade was followed by charcoal making (3.63), cotton trade (3.53) and jowar (sorghum) trade (3.51).

On the whole, trade leads in inter-sectoral linkages and therefore a rupee of additional expenditure in trade brings more prosperity to village than any other activity. Agriculture is second in the list of activities having high inter-sectoral linkages followed by charcoal. MGNREGS was ranked at much lower level among all activities based on multiplier value (Table 10.3). In fact Government services like anganwadi, school and ayurvedic hospital had better multiplier values than MGNREGS. Trade alone provides employment equal to that provided by MGNGREGS and charcoal making, which employs workers throughout the year, and provides more employment than that by trade.

MGNREGS had very low multiplier value due to both low inter-sectoral linkages and high proportion of spending going to rest of the world. Out of total spending of ₹ 1.5 million (or 15 lakhs), only 28% was spent on labour and rest of the expenditure was incurred on materials which were purchased from outside the village. From MGNREGS accounts, within the village economy, its expenditure was only on labour component; hence the multiplier value for MGNREGS will be always less than the multiplier value for hired labour services (3.05).

10.4.1 Analysis of Impact of MGNREGS

Tables 10.5 and 10.6 provide the multiplier effect of MNGREGS. From the results presented in Table 10.5 it is evident that multiplier effect of MNGREGS on the whole village economy of Markabbinahalli was very weak as indicated by a multiplier value of the magnitude 1.86 (total of output, employment and income multiplier values). Of the 44 endogenous accounts, multiplier value was highest for hired labour services (0.288) followed by landless family households (0.107), small family households (0.095), marginal family households (0.069) and large family households (0.059).

A multiplier value of 0.288 implies that if the final demand for MGNREGS in the economy increases by 1 Rupee the demand for hired labour services in the

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[6]Other commodity trade includes trade of sunflower, safflower, onion, milk, egg and any other agricultural/animal products or by-products which are not included in other category of agricultural products.

Table 10.3 Aggregated social accounting matrix for Markabbinahalli village (values in Rs. 000')

	Activity					Commodity					Factor services		HOUSE	INST	S&I	ROW
	AGRI	CHAR	NREGA	TRD	OTH	AGRI	CHAR	NREGA	TRD	OTH	L	C				
AGRI	0	0	0	0	0	34,237	0	0	0	0	0	0		0	0	0
CHAR	0	0	0	0	0	0	1,830	0	0	0	0	0	0	0	0	0
NREGA	0	0	0	0	0	0	0	1,503	0	0	0	0	0	0	0	0
TRD	0	0	0	0	0	0	0	0	17,420	0	0	0	0	0	0	0
OTH	0	0	0	0	0	0	0	0	0	26,539	0	0	0	0	0	0
AGRI	1,096	0	0	7,234	0	0	0	0	0	0	0	0	3,403	0	0	23,600
CHAR	0	0	0	820	0	0	0	0	0	0	0	0	1,010	0	0	0
NREGA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,503	0
TRD	2,014	0	0	500	12	0	0	0	0	0	0	0	1,454	0	500	12,940
OTH	2,919	0	0	216	73	0	0	0	0	0	0	3,420	10,165	0	35	9,711
L	8,675	915	422	416	241	0	0	0	0	0	0	0	1,035	364	0	5,208
C	3,634	0	0	0	0	0	0	0	0	0	0	0	4,751	0	0	0
HOUSE	8,185	915	0	4,226	13,572	0	0	0	0	0	16,777	0	4,798	4,688	6,044	2,703
INSTI	0	0	0	1	46	0	0	0	0	0	0	0	7	1,505	0	6,510
S&I	5,845	0	0	0	262	1,096	0	0	0	0	0	214	11,695	0	0	0
ROW	1,869	0	1,081	4,006	12,333	0	0	0	0	0	500	4,751	23,591	7	12,534	0
Total	34,237	1,830	1,503	17,420	26,539	35,333	1,830	1,503	17,420	26,539	17,277	8,385	61,907	6,563	20,616	60,672

Where *Agri* Agriculture, *Char* Charcoal, *TRD* Trade (includes both Agro-input and commodity), *OTH* Other service providers, *L* Labour services (including family labour), *C* Capital services, *HOUSE* Households, *INSTI* Institutions (Panchayat and temple), *S&I* Savings and investment, *ROW* Rest of the world

Table 10.4 Aggregate multipliers[a] for selected accounts in SAM of Markabbinahalli village (2012–13)

Rank	Particulars	Aggregate multiplier
1	Others commodity trade	3.74
2	Charcoal making	3.63
3	Cotton trade	3.53
4	Jowar trade	3.51
5	Wheat trade	3.46
6	Anganwadi centre	3.37
7	Pigeon pea trade	3.35
8	Chickpea trade	3.20
9	Repair and maintenance shop	3.12
10	Family labour services	3.09
11	MGNREGS	1.86
12	Machinery hired out	1.41
13	Agri-inputs trade	1.40
14	PDS shop	1.05
15	SHG	1.00

Note Multiplier value of selected accounts are presented here, details results can be found in the authors' another publication, Vani (2015)

[a]It is inclusive of all the three multipliers, namely employment, income and output multiplier

economy increases by 28 paise. Of these 44 accounts 11 accounts had zero or negligible multiplier values. But since the size of each account and multiplier value for each account differed due to expenditure under MGNREGS was different, increase in value of these accounts when the final demand for MGNREGS in Markabbinahalli increases by ₹ 1 million (or ₹ 10 lakhs (hypothetical) are presented in Table 10.5.

Maximum impact can be observed in hired labour services (2.92%), the area where MGNREGS had been expected to have the highest impact. But this increase is likely to be very small due to low intensity of MGNREGS works and very large size of agricultural labour services (₹ 8.68 million, 50.23% of total labour receipts in the village) and very weak linkages of MGNREGS with rest of the accounts. This 2.92% impact on labour account is equal to 961[7] labour days or providing full-time employment to three households in a year at the rate of 320 days of employment in a year or 100 days of employment for nine households under MGNREGS.

Second largest impact was observed on small family households (1.02%) followed by landless households (0.95%). From simulations, on the whole, impact of

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[7]Rs. 288,438/Rs. 300 per day = 961.46 labour days, Rs. 288,438 will be the increase in labour account due to Rs. 1 million (or Rs. 10 lakh) of additional investment from Table 5 and Rs. 300 was the prevailing wage rate for agriculture in the studied village.

Table 10.5 Impact of additional investment by MGNREGS activity in a village economy of Markabbinahalli, Karnataka, 2013 (a policy simulation)

Particulars	Aggregate multiplier for MGNREGS	Additional impact by injection of another Rs. 1 million (in Rs.) in MGNREGA	Base value for agriculture year 2012–13 (in Rs.)	Percentage change (impact)
Hired labour services	0.2884	288,438	9,875,531	2.92
Small family households	0.0950	95,019	9,288,363	1.02
Landless households	0.1071	107,097	11,282,571	0.95
Provision store	0.0370	37,015	5,031,080	0.74
Marginal households	0.0696	69,632	10,440,276	0.67
Medium households	0.0568	56,790	10,652,084	0.53
Charcoal making	0.0078	7,781	1,829,654	0.43
Capital services	0.0292	29,178	8,384,979	0.35
Other commodity	0.0116	11,622	3,831,617	0.30
Large family households	0.0597	59,690	20,244,151	0.29
Family labour services	0.0099	9,938	7,400,994	0.13
Wheat commodity	0.0027	2,646	2,522,986	0.10
Transport services	0.0055	5,490	8,891,502	0.06
Pigeon pea commodity	0.0026	2,555	8,880,075	0.03
Total	1.8555	1,855,486	169,099,228[a]	1.10[b]

Note Results for selected accounts are presented here, details results can be found in the authors' another publication, Vani (2015)
[a]This is not exactly column total since it also includes the value of other accounts, which had zero multiplier value, not shown in table
[b]1.10 is not the column total, instead 1.10 = (Rs. 1,855,486/Rs.169,099,228) × 100

Table 10.6 Summary of impact additional investment of Rs. 10 lakhs in MGNREGS in village economy of Markabbinahalli (from a policy simulation)

Particulars	Base value for agriculture year 2012–13 (Rs.)	Multiplier value	Impact of additional investment in MGNREGS	
			Rs.	% change
Output multiplier[a]	81,528,134	1.14	1,139,000	1.40
Employment multiplier[b]	61,907,445	0.30	298,000	0.48
Household income multiplier[c]	17,276,525	0.39	388,000	2.25

[a]Output multiplier includes jowar, pigeon pea, chickpea, wheat, cotton, charcoal and other commodities produced within village and all services provided in the village, i.e. trader, tailor, barber, PDS shop, anganwadi centre, government hospital, etc.
[b]Employment multiplier includes hired and family labour
[c]Household income multiplier includes landless, marginal, small, medium and large family households

additional investment of ₹ 1 million (or 10 lakhs) in MGNREGP was only 1.1% increase in total volume of transaction in aggregate or ₹ 1,855,486 (Table 10.5), but in labour equivalents it implies 6,184 labour days or full time employment to 18[8] households at the rate of 340 days of employment per year per household. That is, the indirect impact on labour employment was 84.46%[9] of total impact of 1.1%. The impact was very weak keeping in view the primary objective of livelihood security embedded in the framework of MGNREGA activities.

In Table 10.6, simulation results for multiplier effects of an additional investment of ₹ 1 million (₹ 10 lakhs) investment in MGNREGS are presented as output, employment and household income multipliers in a summarized form. Of all the three multiplier effects, output had highest value of 1.14 followed by household income (0.39) and employment (0.30), but the highest impact was on household income (2.25%) followed by output (1.40%) and the least impact was on employment (0.48%).

Output multiplier value of 1.14 for MGNREGP activity implies that for an additional rupee of investment made in the programme, there will be 1.14 times increase in the demand for output in the economy over existing demand for output. Similarly, an employment multiplier value of 0.3 for MGNREGP activity means that for an additional rupee of investment made in MGNREGP there will be 0.3 times increase in demand for labour in the economy. A household income

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[8]Here, all calculations are done at prevailing agricultural wage rate of Rs. 300 per day. Rs. 1,855,486/Rs. 300 per day ≈6,184 labour days. This means 6,184 labour days/340 days per household ≅18 households (person) would be given a full year of employment of 340 days of employment per year.

[9]100 − (961/6,184) * 100 ≈ 84.46.

multiplier value of 0.39 for MGNREGP activity implies that due to additional investment made in MGNREGP activity, income of households increase by 0.39 times over the existing income level in the economy.

10.4.2   Possible Reasons for Low Impact of MGNREGP on the Village Economy Could be as Follows

1. Scale of MGNREGP operation: MGNREGP in the village was carried out on a very small scale. Total outlay in MGNREGP in year 2012–13 was to the tune of ₹ 1 million (15 lakhs). This sum is too low compared to the size of the village economy, i.e. only 0.89%[10] of the total of all endogenous accounts of SAM.
2. Poor Linkages: Linkages of MGNREGP with other accounts were very weak, due to less proportionate expenditure on hired labour services in the village. All material components used by the MGNREGS for construction of building were procured from outside the village which amounted to ₹ 10.81 lakhs, about 72% of total expenditure incurred under MGNREGS. Most of the fund out of material expenditure was incurred on purchase of cement, bricks and steel for construction of Rajiv Gandhi Seva Kendra in Markabbinahalli village. This reflects the fact that projects with high capital needs and long gestation periods have lower multiplier effects at least in short[11]-run period. Thus, there was weak linkage between MGNREGP and rest of the economy. Hence, MGNREGP could not make any perceptible impact on village economy.
3. Material to Labour Ratio: The proportion of labour services among overall outlay was only 28% as against 60% mandated. This sum was ₹ 4.2 lakh, only a meagre 4.25%[12] of total labour income in the village.
4. Wages under MGNREGS: Agricultural wage rate (₹ 300 per day) and non-farm wage rate (₹ 350 per day) in the study area were higher than the MGNREGP wage rate of ₹ 174 per day. On an average, in a year, a family worked for 27 days under MGNREGP, 80 days in non-farm activities and 253 days in agriculture sector. With the prevailing wage rates for different activities, the total family income was Rs. 10,859,814.[13] Income from MGNREGP (₹ 4,698) formed only 4.32% of total annual family income. Hence, workers were also not attracted to MGNREGP works (Details in Vani et al. 2015).

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[10](1,500,000/169,099,228) * 100 = 0.89%, as shown in last row–fourth column in Table 5.

[11]In this study, we have only estimated multiplier value in a year period, these infrastructures remains in village for long period and would have other indirect benefits which have not been captured in this study. This is a limitation of a SAM based analysis in static framework, as well.

[12]Rs. (420,000/Rs. 9,875,531) * 100 = 4.25%, as shown in first row–fourth column in Table 5.

[13]Rs. 300 per day * 253 days + 27 days * Rs. 174 per day + 80 days * Rs. 350 per day = Rs. 108,598.

5. Demand-Driven Programme: Instead of being a demand-driven programme, MGNREGP had become programme prepared and executed by office bearers as per their wishes. Hence local people did not show much interest in making the programme a success.

6. Migration: Since the village is nearer to Karnataka-Maharashtra state border and employment opportunities are better in nearby Solapur and district headquarter Bijapur, people tend to migrate to these places during drought year and Rabi and Summer seasons. Migrant workers earned wage income of ₹ 400–500 per day per person at the destination market, which was substantially higher compared to MGNREGS wage rate @₹ 174 per day per person. As a result, MGNREGA could not stop migration of workers to far away, but women and older persons who cannot travel far distance for higher wage employments (Details are in Vani 2015).

7. Awareness about MGNREGS: During survey work it was found that many of the villagers were unaware of the provisions of MGNREGS. This is also a reason for lower participation of workers for the programme—even among the pool of workers remained in the village and who were looking for the employment during slack period of farming. All of these also led to a weak supply driven programme in this particular village, unlike the case in other villages or other parts of Karnataka.

10.4.3   Limitations of the Study

This study has its own limitations in terms of methodology followed and the degree of generalization done based on the results obtained. These limitations can be summed up as follows:

(a) Status of MGNREGP in the village: Since MGNREGP was not implemented with vigour in the village, low value of multipliers was obtained. Hence, the result can neither be interpreted as failure of MGNREGP to generate employment and income nor its inherent capacity to generate employment and income.

(b) Characteristics of the selected Village: Since the village selected for the study follows a complete dry land agriculture, number of activities, volume and value of each activity are less than that would be possible in a typical wet land village.

(c) Institutional Setup: Since SAM is an analysis that takes into account institutions prevailing in the economy and MGNREGP is thought to be demand-driven programme, results obtained cannot be generalized to other areas with different institutional setup and different degree of demand for MGNREGP.

(d) Choice of study area: In this study, the sample village chosen did not represent the village with adequate MGNREGP expenditure. The choice of VDSA village of ICRISAT was mandated.

(e) Limited time availability for survey: Due to less time available for data collection work, instead of conducting census survey for entire households, we have adopted sample survey method for data collection work. This might have resulted in lower accuracy of estimates and also some errors in balancing the SAM, than the data that could have been gathered following the census method for the construction of the village SAM.

10.5   Conclusion and Implications

Inter-sectoral linkages and multipliers are the key concepts behind implementation of MGNREGA like rural development and employment schemes so that besides the direct benefit transfer to the programme benefited households in the rural areas, it can also benefit in terms of infrastructure development and asset creation in the village economy. Besides, by directly injecting over a million Rupees in a couple of months in a year in a rural village, and transferring this amount to rural poor, the MGNREGS also help in creation of additional demand for services in the rural economy, such as benefiting the local retail shop owners, allied services activities, transportation, production of food grains and vegetables within the local economy resulting in an increase in the purchasing power of large number of rural poor households. This in turn creates multipliers or inter-sectoral linkages in the village economy and its surrounding geographies. MGNREGS was thus envisaged in 2005 to provide employment during the lean periods of the year, and to offer benefits to large segment of the village economy.

However, it was found that in the studied village in Karnataka state, the programme had limited success in terms of generating higher employment and income multipliers. The reasons for lower value of multipliers in this particular village are discussed in details in earlier section. The key learning's from the outcomes can be stated in the form of necessary and sufficient conditions while implementing MGNREGS in other villages in dryland regions of India.

This includes creating awareness among all the stakeholders, including the workers, village leaders and Panchayat officials, about the programme and its provisions, well ahead of implementation of MGNREGS work in the village. This would also help workers to plan ahead of time, whether to stay in a village and work for MGNREGA activities or to migrate to other places in lean season of farming operations. The sufficient condition is efficient and enthusiastic leadership, well informed and responsible administration which will ensure that MGNREGS works would be taken in consultation with all stakeholders well in advance. Then, to develop strong inter-sectoral linkages in the village economy and to get better multiplier effects, the village administration needs to contain the leakages of MGNREGA amount for activity on machinery uses or skilled work or on materials and goods that would benefit more to the sectors outside the workers in the village and welfare of local village community. Of course, the distributional implication of

the programme appears to be significant, and the local Panchayat and MGNREGA agency have greater stake in the selection of proper work/activities, which determine what scales of income and employment multipliers are generated in the village economy, as discussed in the Chapter.

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