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# **Assessment of Economic Impacts of MGNREGA in Selected Two Villages of Karnataka State using Social Accounting Matrix (SAM)**

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## Abstract

Public investment on rural infrastructure development, as done under employment Guarantee Act (MGNREGA), besides providing income, employment and livelihood security to rural labor force, is expected to have positive impacts on other sectors of the rural economy as well. This includes benefit to both farm and non-farm of the rural economy. Therefore, using framework of local economy wide modeling, particularly Social Accounting Matrix (SAM), we have analyzed direct and total economy wide impact of MGNREGA in two different dryland villages of Karnataka state of India: One village is in Tumkur district (Belladamadugu village) in Southern region and the other in Bijapur district (Markabinahalli village) in Northern region of Karnataka. SAM analysis was carried out collecting both primary as well as secondary data for the agricultural year 2012-13 (From 1st June 2012 to 31st May 2013). Purposive sampling was done for collection of data from the households. Following ICRISAT VDSA Study criteria, farm households were classified into five strata namely, landless households, and marginal, small, medium and large land holding households; and farming sector data were collected from the stratified random sampling of these households. In additions, data was collected from different economic agents including shops (Agricultural input shop, canteen, Provision store) and service providers (tailor, barber, drivers, labourers and so on) regarding details of employment provided, receipts and expenditure. Then, we have constructed SAM of 82X82 sizes for the analysis. Multiplier effect of MNGREGS on the whole village economy of Markabinahalli and BM villages was 1.9 and 1.45, respectively. This suggests for a very weak multiplier impact of the MGNREGA interventions. Likewise, we have also estimated income, output and employment multiplier of the MGNREGA interventions in each of the village. On the whole, the direct and total impact of MGNREGS on village economy was weak due to several factors, among them the important factors were the high level of leakage of MGNREGA expenditure on several materials and machines use that were brought from outside of the village economy. At the end, this study also suggests policy measures for enhancing multiplier impact of the MGNREGS program interventions in the local economy.

**Keywords:** Social Accounting matrix, Village Economy wide modelling, MGNREGA, Karnataka, India

**JEL** Q, D1, E16, J121, J43

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## 1. Introduction

### 1.1 Background and Context of MGNREGA in Karnataka

India is the third largest economy in the world with reference to GDP on purchasing power parity (and tenth largest economy on nominal basis (World Bank, 2014). One of the biggest challenges India faces is to provide livelihood security to its citizens especially to rural mass beset with seasonal unemployment. Government of India as well as the state governments have given due importance to employment generation and poverty alleviation in rural India in all of their developmental plans and budgetary allocations since independence. This challenge grew in to gigantic proportions and became pressing urgency to the policy makers when the Indian population had grown by 1.43 percent per annum during 2004-05 to 2006-07 and labour force had grown by 2.02 percent per annum as per eleventh plan document (Yadav and Panda, 2013) Coupled with a high rate of unemployment of 5.3 and 8.28 percent of labour force measured on usual principal status and current daily status as per NSSO 61st round survey of 2004-05 (Datt and Mahajan, 2013). Unemployment rates on current daily status were much higher than those on the basis of usual status which underlies the fact that instead of open unemployment, the more serious problem is under-employment. This indicates non availability of regular employment for a majority of workers. To face this challenge, Government of India launched many programmes for job creation from time to time. Prominent among those are Swarnajayanti Gram Swarojgar Yojana (SGSY), Swarnajayanti Shahari Rozgar Yojana (SSRY) and Integrated Rural Development Programme (IRDP) among the old ones and National Food For work programme (NFWP), Sampoorna Grameen Rozgar Yojana (SGRY) and MGNREGS among the new ones (Anonymous, 2012).

In Karnataka 71% of workforce is engaged in agriculture and other allied activities and 70 percent of the population lives in rural areas. While the absolute contribution of agriculture to state economy is increasing, the relative contribution is declining over the years due to better growth of manufacturing and secondary sector. Primary sector's contribution was 59 percent during 1960-61 which fell to 19 percent during 2007-08. The state has ten agro-climatic zones, of which five are predominantly dry zones. These dry zones account for 71 percent of the cultivated area with 72 percent of operational holdings belonging to small and marginal farmers. The state has 62 lakh agricultural labourers.

The rural employment in the Indian economy has grown at 2.34% per annum during 1999-2004 and is characterized as "distress-driven" as agriculture is in the phase of low productivity, poor competitiveness and adverse climatic conditions. There has been rise in labour participation and employment of women and older age cohorts in rural areas an indication of the nonworking population pushed to labour market for forced employment due to acute distress in the rural areas. (NSSO 2005)

The National Rural Employment Guarantee Act (NREGA) that came into force on February 2, 2006 brought a ray of hope in securing livelihood for vulnerable section of rural population and here the role of 'reservation wage' deserves to be examined. MGNREGA has the objective to enhance livelihood security to the rural poor with inclusive growth. It guarantees

at least one hundred days of wage employment to every rural household family whose members are ready to do unskilled manual work.

MGNREGA is the first attempt guaranteeing wage employment at macro level with objective to ensure wage employment, and sustainable development through natural resource management. The Act also envisions strengthening democracy at the grass root levels, bringing transparency and accountability in governance.

In Karnataka, MGNREGS was implemented in three phases; the first phase (2006-07) covered five districts, the second phase, six districts and third phase (from 2008) covered all the 27 districts. The said programme is expected to provide not only wage employment during lean periods of financial year but also create durable assets with lasting effects and have a multiplier effect on different sectors of village economy. With this background, present study attempted to study the impact of MGNREGA on village economy through its linkages with different sectors with the help of multiplier effects on households, income and output.

## 1.2 Specific objectives of the study

1. Developing an empirical village level Social Accounting Matrix (SAM) for two villages in Karnataka, one in Tumkur district in Southern region and the other in Bijapur district in Northern region. SAM analysis of impacts of MGNREGA interventions, and investment multiplier effects in the selected villages.
2. Policy simulations using SAM to form alternate policy measures, and analysis of implications of MGNREGA on the synergies between safety nets and agricultural and rural development interventions; labour wage rate, labour scarcity (and out migration), farm production and other major changes brought in agricultural activities in the selected villages of Karnataka. This includes analysis of multiplier effects of MGNREGA and direct and total village wide economic effects of the MGNREGA program interventions in the selected villages.
3. Based on results of the SAM, derivation of policy recommendations for welfare of the village economy.



## 2. Review of past studies

There are few empirical studies using Village SAM in India. Some of the notable recent studies on SAM in India were conducted by Arjunan Subramanian 2007, Hirway et al, 2008 and Usami 2008. This review section here provides a key highlight of each of the three major studies on village SAM that were undertaken in the past. This includes a broad framework, methodology used for construction of SAM and developing multipliers, and the economic impact of MGNREGA on the key sectors of village economy. The comprehensive review of these studies also provide audience an overview on methodology and steps for construction of village SAM, and for analysing the policy measures to understand implications of MGNREGA Scheme or other major public interventions in the local economy.

**A.** Subramanian study (2007) analyses distributional effects of Agricultural Biotechnology in a Village Economy, using production of Cotton as a case study in India. Key highlights from the study are summarized below.

**a)** Key features of the study: A micro SAM multiplier model was constructed for Kanzara, a predominantly cotton growing village in Maharashtra state, to study the impact of technological progress on household incomes and distribution. The direct effects which reflect the nature of technology, captured by partial equilibrium approach and indirect affects that are brought about by technology in terms of employment and wages were analysed.

**b)** Methodology and analytical framework followed in the study: In this study, the SAM combined diverse data on all aspects of an economy such as production, consumption, savings and investment, income generation and distribution, transfers and external trade, and income flows, and it presented these data as a set of consistent accounts in the form of a square matrix. Each row contained receipts accruing to that account, and the corresponding column showed how that account's total receipts were spent on or distributed to other accounts. For any account, total receipts and total expenditure must tally, and so each account's row and column totals are the same.

For each production activity, the rows contained payments received by the activity for the commodity it produces and sales to the commodity account. The corresponding column account broke up total output into value of intermediates, payments to factors, profits accruing to the owners of the activity, taxes to the village government, maintenance expenses, and taxes to the rest of India (ROI).

The commodity row account gave the components of total demand such as intermediate use, consumption demand by household groups, investment and maintenance demand, change in stocks and exports. The commodity column accounts showed what part of each commodity's total supply comes from each production activity, stocks and imports from the rest of the country.

The factor accounts showed how factor incomes were generated and distributed to households and other institutions. The household and other institutional accounts showed the sources of each institution's income along the row and the objects of expenditure in the column. The capital account showed each household group's savings, and the column account broke up total investment in physical assets within the village and net capital

outflows. The ROI row account showed payments such as transfers, taxes, interest payments on bank loans made by the village to the ROI.

The corresponding column account showed payments received by the village such as transfers, wages received by villagers working outside the village and payments for sales outside the village.

**c) Key Findings of the study:** This study reported that Bt cotton was associated with a substantial overall generation of rural employment, especially for hired female and family male agricultural labour. While labour requirements for pest control decreased, more labour was employed for harvesting. This had unequal implications for different households. Cotton harvesting is largely carried out by hired female labourers, whose employment opportunities and returns to labour improved. Pest control, on the other hand, is often the responsibility of male family members, so that Bt technology reduced their employment in cotton production. However, the SAM results showed that, the saved family labour can be re-employed efficiently in alternative agricultural and non-agricultural activities, so that the overall returns to labour increase.

Under irrigated conditions, aggregate household incomes were higher with Bt cotton than with conventional cotton, they were somewhat lower in rain-fed cultivation. Large farm households benefitted significantly from dry land Bt cotton adoption, much more than their small counterparts. The reason for this seeming paradox is the importance of indirect effects, especially the role of opportunity income for saved management time. The returns to saved management time in alternative activities appeared to be higher for large than for small farmers. This is because of the fact that large farmers are often better educated and have better resource endowments, which facilitates access to employment and self-employed activities. In spite of higher benefits from Bt cotton for small farmers in a mere farm-level assessment, different opportunity incomes of saved management time led to a situation where large farmers benefitted much more from Bt adoption in an economy-wide framework. So, large farmers had a bigger incentive to use the technology. However, these scale effects were not inherent to the technology.

Agricultural growth and distribution of benefits from technological progress also depend on the nature of rural markets, the level of rural infrastructure and transaction costs of market participation. Policies that reduce such market distortions are important complements to price and technology instruments in order to promote rural development.

Agricultural biotechnology which is broad based (however, currently confined to only a few crops and traits), has better potential than any previous technological development in increasing employment and output in the semi-arid tropics with no known adverse effects on health and the environment. The safety and regulatory concerns associated with transgenic crops also constitute a major hurdle for developing countries, because many lack the regulatory framework and technical capacity necessary to evaluate these crops.

Agricultural biotechnology could have greater potential to benefit regions that were previously untouched by the Green Revolution. Current cross-country evidence also showed that plant biotechnology can contribute to improving yields and reducing risk for resource-poor farmers. However, these developments can be more effective if combined with a broad-

based agricultural growth that includes developing rural infrastructure, efficient markets to improve input and output delivery systems and better access to credit facilities.

**B.** Hirway et al., (2008) analysed economic impact work undertaken under the National Rural Employment Guarantee Act (NREGA) on key outcome indicators and gender issues in the village economy. Some of the important highlights from the study are summarized below.

**a)** Key features of the study: Social Accounting Matrix was constructed for Nana Kotada village in Gujarat State. Different sectors of the village economy were analysed to understand its dynamics. It aimed mainly at studying the direct impact of MGNREGS works on reducing unpaid work of poor, especially women, which is characterized by low productivity, low returns and is time consuming and its indirect effect on the village economy.

**b)** Methods followed in the study: Two sources of data were used for the study. Indian time use survey conducted in 1998-99 was the main source and the focus-group discussions organized in the village served as the supplementary source.

The SAM constructed for Nana Kotda village consisted of 55 producing sectors, including 13 agricultural sectors, 25 manufacturing sectors and 17 service sectors; 2 factors of production viz; labour and capital; 2 institutions comprising of households and government and transactions with the external world like exports and imports.

NREGS works were treated as external shocks on the village SAM. Impact of the substitution of unpaid work by NREGS assets/infrastructure on the village economy was analysed by estimating output, income and employment multiplier.

Output multiplier is the total value of production by all the sectors of the economy required to satisfy one unit of final demand for that sector's output. The direct and indirect income changes resulting from a one unit change in output was estimated by the income or value-added (labour + capital) multiplier. This study also provided an estimate of the direct and indirect employment changes that resulted from a change in unit output, given by the employment multiplier.

**c)** Key findings of the study: In the study sites, the poorest households formed only 2.48 per cent of the total participating households in MGNREGS works. The reason for this poor participation was the migration of those households to neighbouring villages to work on farm and non-farm activities. There usually existed a long-term contract with the employers, which ensured continuous employment for several days due to which MGNREGS had little effect on migration.

Around 15,494 hours of women and 3,315 hours of men were spent on unpaid work that could be reduced by NREGS works. However, the study also mentioned that there was no guarantee of work given under NREGS. The implementers of MGNREGS were not interested in ensuring guarantee of work, and the workers were not capable of demanding work as a right.

No efforts were made by the implementers of MGNREGS to design works that suit women. At the time of the study, their drudgery was not reduced.

The output multipliers indicated the coefficients by which the outputs will increase if there is an increase in the expenditure on NREGA works. For example, if the expenditure on the consumption of wheat increases by Rs. 1,000 because of some MGNREGS works, its impact in terms of increase in total production of wheat will be Rs.1,793 (1,000 x 1.793).

One unit increase in demand for wheat will increase the income of marginal farmers by 0.320 units, of small farmers by 0.188 units, of large farmers by 0.189 units, and of all households (which also include labour households, households self-employed in non-agriculture, and households in services) by 0.040 units.

The employment multiplier gives an estimate of the direct and indirect employment changes resulting from a change in unit output. One unit of increase in the demand for labour will cause an increase of 0.338 units of income from wheat, 0.305 units of income from Sorghum, and so on.

The multipliers obtained were relatively small because of the leakages observed. More than half of the backward and forward linkages of new demand generated were not absorbed within the village economy. Commodities imported from outside the village satisfied them.

The multiplier impact on the village economy can be enhanced by undertaking several activities including some manufacturing activities albeit on small scale, within the village and plug the leakage.

The values of the multipliers may also increase through selection of right kind of works. For example, availability of water supply will encourage farmers to introduce changes in agriculture that may increase the values of the multipliers.

By adopting a strategy of aiming MGNREGS activities at increasing the production of goods and services that are consumed in the village, the value of the multipliers can be maximized. The larger the share of the consumption of the goods and services produced in the village, the larger will be the values of the multipliers.

The values of the multipliers can also be increased by improving the export of goods and services produced in the village.

Similarly, the larger the increase in, the larger will be the values of the multipliers. There is therefore a need to develop a strategy that maximizes the values of the multipliers to maximize the benefits accruing to the village.

**C. A Study by Usami 2008 on “Construction of Regional Social Accounting Matrix with Natural Resource Accounts: Linking Village/Industry Level Data to Regional Level Studies”.**

**a) Key features of the study:** This study had constructed regional (village) SAM to quantify the impacts of globalization on rural economy. It also addressed inter-industry interactions in a region, inter-region interactions through trade in commodities, labor migration, and impacts of globalization on classes of households. It also measured the induced effects from village to local markets, and to rest of India. This study had also addressed environmental

problems such as depletion of water, changes in land use patterns and the resulting degradation of different types of land. This was a regional SAM with natural resource accounts. The village SAM for Kanzara in Maharashtra State was constructed based on ICRISAT village survey data. Construction of two SAMs in two different years (1984-85 and 2003-04), following the same methodology, made them comparable, since a SAM is snap shot of the structure of an economy at a given point of time.

#### **b) Selected findings of the study**

Over the years, the village economy became interdependent on outside economy in both commodity market and financial market. However, a village SAM alone failed to capture the entire mechanism of interdependence between a village and market town. Introduction of financial assets and liabilities accounts through additional rows and columns enabled incorporation of financial flows in to a SAM. This, in turn, facilitated analysis of interdependence of the village economy with market town economy through financial transactions, in addition to factor income receipts and payments.

Integration of interactions between economic activities and environment was made possible by the construction of regional SAM. A regional SAM with natural resource accounts helped in the analysis of extent of depletion of natural resources resulting from production activities as well as household consumption and its impact on the economy.

Water, forest and land use accounts, representing natural resources account, were introduced into the conventional regional SAM. These natural resource accounts were measured in both physical and monetary terms. Water resource accounts consisted of both stock and flow accounts. However, since it was very difficult to get information on stock water in groundwater, reservoirs, lakes and tanks and the stock water for rivers is not well defined, only water flow accounts was considered.

Supply and use of water by the households as well as economic activities were measured in the flow accounts and were linked to the regional SAM. Likewise, asset account and flow account together formed the forest accounts. Stocks of standing timber were recorded in the forest asset account. Supply and use of forest products, including, timber, NTFP like wild plants and honey, forest services like livestock grazing, recreation and tourism, and carbon storage, by economic activities formed the content of forest flow accounts.

Use of land for production and consumption, in physical terms, was shown in the land use accounts. Cultivated land, fallow land, forestland, and other land were the classes of land use included.

### 3. Methodology and Analytical Framework

This section provides a brief on the methodology and analytical framework that we have used in construction of village SAM

#### 3.1 Social Accounting Matrix

A Social Accounting Matrix (SAM) is an organized matrix representation of all transactions and transfers between different production activities, factors of production and institutions (Like households, corporate sector and government) within the economy and with respect to the rest of the world. (Saluja and Bhupesh, 2006). In the SAM all the transactions in the economy are presented in the form of a square matrix. Each row of the SAM gives receipts of an account while the column gives the expenditures. The total of each row is supposed to be equal to total of each corresponding column.

Assumptions used for construction of SAM

- Static economic conditions i.e., price, population, employment, state of technology remains same.
- Supply is perfectly elastic. SAM models assume a Keynesian demand-driven system without resource constraints.
- Production utilizes linear, fixed-proportion technologies and the average and marginal expenditure propensities are the same.

The task of designing a village SAM includes identifying the major production activities in the village, factors used in village production, village institutions for production, consumption, and marketing and exogenous institutions and capital accounts. Entries in a village SAM include intermediate input demands between production sectors, income (value added) paid by the production sectors to different types of labor (male or female, educated or uneducated, or different ethnic groups) or attributed to land or capital, the distribution of labor, land and capital value added across different household groups, the distribution of household groups' expenditure across consumption of domestically produced goods and services, savings and imports, government account collects taxes from commodities and households and redirects this income within the system (to government demand for goods and services, transfers to production activities or household groups), saves it or uses it to pay foreigners (for imported goods and services or repayment of debt). Village SAM contains activity account, commodity account, factor account, Household (HH) account, government account, savings-Investment(S-I) account, rest of the world.

Using SAM multipliers, key sectors of the village economy can be identified; The SAM multipliers can be obtained as follows

Bellù (2012) provided the methodology to work out multiplier effects from a social accounting matrix. According to this methodology, if  $Y$  is the vector of total expenditure of the different endogenous accounts (which is also equal to income of same account) in the SAM and  $X$  is the exogenous expenditure made by residents of village then the relation between  $Y$  and  $X$  can be illustrated as following using 'I' an identity matrix and 'A' a coefficient matrix.

$$Y=AY+X$$

This can be rearranged as following

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

'A' is the coefficient matrix prepared from the SAM by dividing each cell value by its respective column total after excluding exogenous accounts from SAM. Here the term (I-A)<sup>-1</sup> is multiplier matrix and X is exogenous shock vector which after multiplication with multiplier matrix provides us with multiplier effect for that exogenous shock.

Output, employment and household income multipliers are sum of all cells in (I-A)<sup>-1</sup>X matrix for commodity account, labour services sub account and household account, respectively.

To quote Arjunan Subramanyam, "The SAM methodology is most suited for small economies such as the village economy where most economic transactions are tractable and verifiable. A village SAM is designed to capture the complex inter-linkages among village production activities, village institutions and the rest of the world. They summarize and neatly illustrate the flow of inputs, outputs, and income between food production and other production sectors in the village, the flow of income between production activities and village households, the channelling of household incomes into consumption and investment, and the exchange of goods and factors between the village and the rest of the world. Most of these SAMs are however based on sample surveys and diverse sources of data and hence, share the same weakness as national SAMs (see for instance, Subramanian and Sadoulet, 1990).

The SAM as an accounting framework is most suited for small economies where most of the economic transactions can be traced and are likely to have discrepancies that are much less severe than for national SAMs that are based on diverse data sources and are both intractable and unverifiable. Checking and cross-checking the questionnaire on transactions between households within the village several times while still in the field, and paying several visits to each household tracking within village transactions left us with very few inconsistencies in the SAM at the end. These detailed data from the questionnaire with both origin and source of each transaction made the transition from survey data to a consistent village SAM easier. The discrepancies between the row and column totals were less than 5 percent of each other".

### 3.2 Study area

Present study was taken up in two villages viz; 1) Markabinahalli village in Basavana Bagevadi Taluka of Bijapur district in Karnataka. This is a completely dry farming village with no bore well / dug well irrigation since the ground water is saline. 2) Belladamadugu village in Madhugiri Taluk of Tumkur district. In this village rain water is supplemented with ground water for crop cultivation. ICRISAT, the funding agency for the present study, has adopted these villages for conducting its VDSA (village Dynamics in South Asia) study in Northern Karnataka and Southern Karnataka, respectively (Figures 1, 2 and 3).

Assessment of Economic Impacts of MGNREGA in Selected Two Villages of Karnataka State using Social Accounting Matrix (SAM)



Figure 1-Location of Bijapur and Tumkur, the selected districts in Karnataka

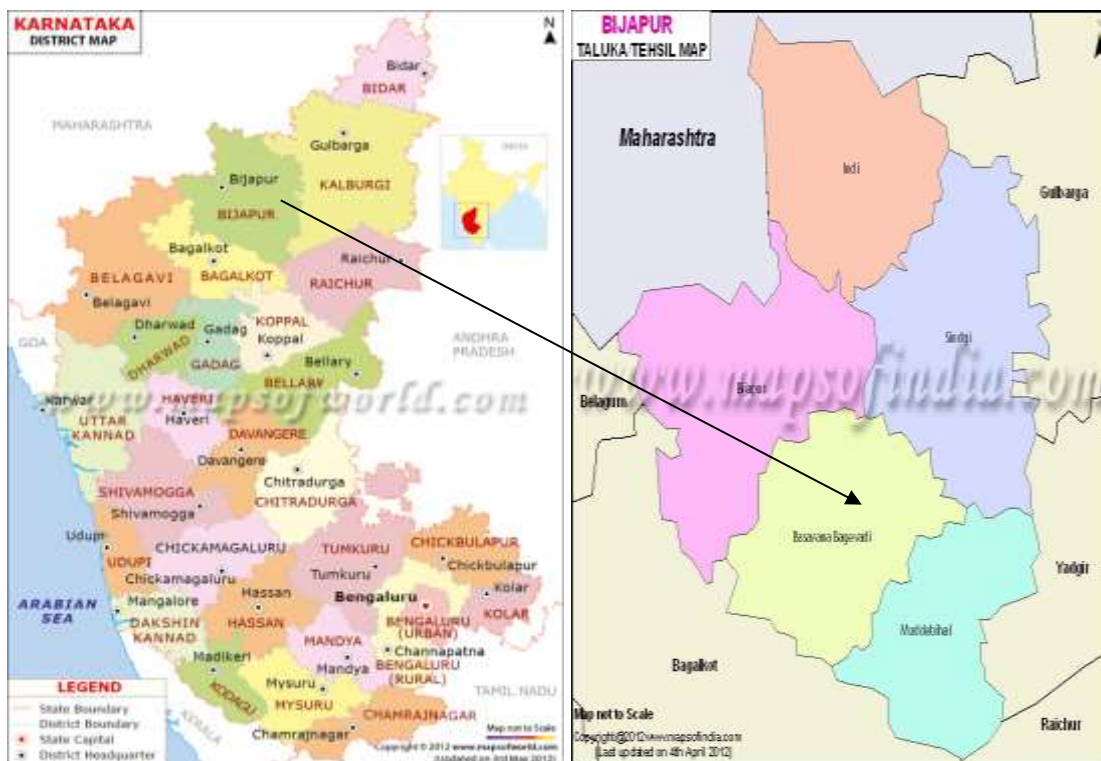


Figure 2 Location of Basavana Bagewadi taluk in Bijapur district



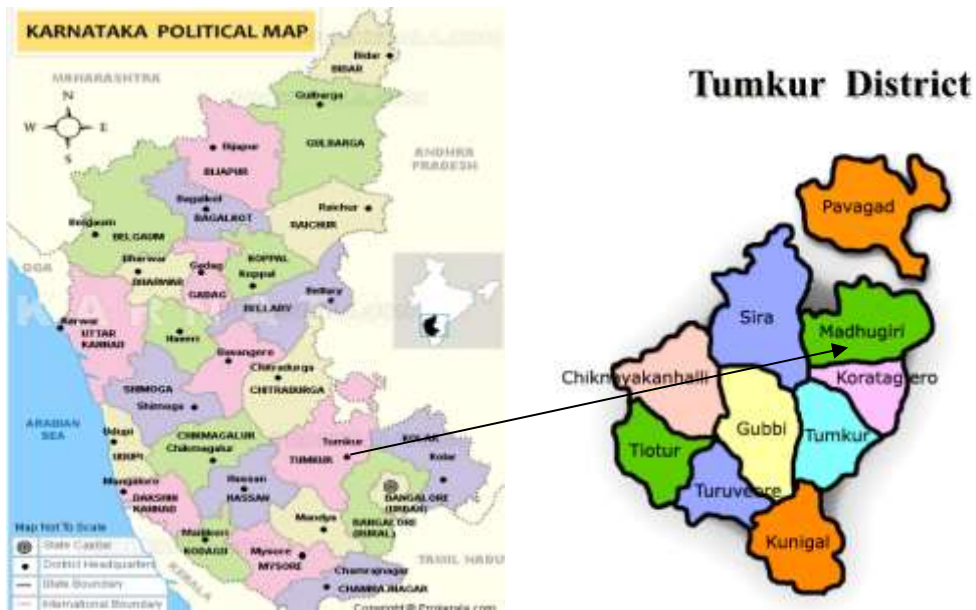


Figure 3 Location of Madhugiri taluk in Tumkur district.

Table 1 A brief profile of Villages selected for the study (2012-13)

<b>Particulars</b>	<b>Markabinahalli</b>	<b>Belladamadugu</b>
Location (District)	Bijapur	Tumkur
Rain fall	625 mm	650 mm
Total population	2545	1325
Male	1387	670
Female	1158	655
Households	400	276
Agricultural land	936 ha	364 ha
Soil type	Deep black cotton	Red sandy loam
Cropped area		
Kharif	385 ha	295 ha
Rabi	526 ha	45 ha

Table 2 Cropping Pattern in the Villages selected for the study (2012-13)

<b>Season</b>	<b>Markabinahalli</b>	<b>Belladamadugu</b>
Kharif	Pigeon pea, Cotton, Onion, Sunflower	Ground nut, Paddy, Finger millet, Horse gram, Cowpea, Flowers and Vegetables, Fodder Maize
Rabi /Summer	Wheat, Chickpea, Sorghum	Paddy, Ground nut, Flowers and Vegetables, Fodder Maize
Perennial	Mango	Areca nut, Coconut, Tamarind, Mango

### 3.3 Data and Sampling Design

An exhaustive list of villagers engaged in different occupations in both the selected villages, different categories of households in those villages and the sample size is presented in Tables 3 and 4.

Table 3 Occupational structure and sample size in the selected villages

Sl. No.	Occupation	Markabinahalli		Belladamadugu	
		Total	Sample	Total	Sample
1	Hotel (including small tea shops)	7	3	4	4
2	Gents tailors	2	1	1	1
3	Ladies tailor	9	2	0	1
4	Provision store	7	3	1	1
5	Cobbler	1	1	0	0
6	Chilly grinding mill	1	1	0	0
7	Rava grinding mill	1	1	0	0
8	Grinding mill	2	2	1	1
9	Agri-input and grain merchant	5	5	0	0
10	Charcoal trader	3	3	0	0
11	Cycle repair shop	1	1	0	0
12	Black smith and carpenter	2	2	0	0
13	Gold smith	1	1	0	0
14	Govt. school cook	4	4	3	3
15	Brick making	0	0	4	1
16	Leaf plate making	0	0	80	10
17	Bidi making	0	0	5	5
18	SHG(SKDRDP)	3	2	47	Over all
19	Dairy	0	0	99	15
20	Private salaried	#	#	6	2
21	Dairy secretary	0	0	1	1
22	Dairy tester	0	0	1	1
23	TV cable operator	0	0	1	1
24	Pigmi collector	0	0	1	1
25	painter	0	0	3	1
26	Drum player	0	0	1	1
27	Anganwadi workers	4	4	2	2
28	Government hospital worker	1	1	0	0
29	Tractor driver	12	2	3	1
30	Goods lorry driver	2	2	0	0
31	Passenger auto driver	4	3	0	0
32	Luggage auto driver	5	5	8	4
33	Truck driver	1	1	0	0
34	Panchayath employees	6	6	1	1
35	LIC Agent	1	1	0	0
36	Mason workers	10	6	0	0
37	Post office	1	1	0	0
38	Govt. School	3	3	1	1
39	Pvt. School	1	1	0	0
40	Pvt. Tuition	2	2	0	0
41	Anganwadi Centre	2	2	1	1
42	Barber	2	2	1	1
43	Registered doctors	2	2	0	0
44	Unregistered doctors	2	1	0	0
45	Unregistered liquor shop	2	0	2	0

46	Govt. Primary Health Centre (Ayu)	1	1	0	0
47	Public Distribution system shop	1	1	1	1
48	Kerosene supply shop	1	1	0	0

Source: \*Markabbinahalli Village at a Glance (2010) published by ICRISAT.

\*\* Markabbinahalli Gram Panchayat records

\*\*\* Survey by research fellows

Table 4 Classification of Households based on land holding size and sample size in the selected villages

Category	Holding size in hectares	Markabinahalli		Belladamadugu	
		Total	Sample	Total	Sample
Landless	<0.1	110	6	26	5
Marginal	0.1 - < 1	43	3	142	7
Small	1 - < 2	89	4	58	7
Medium	2 - < 4	86	4	35	5
Large	> 4	72	3	15	1

Source: \*Markabinahalli Village at a Glance (2010) published by ICRISAT.

\*\* Markabinahalli Gram Panchayat records

\*\*\* Survey by research fellows

## Markabinahalli

For the study both primary as well as secondary data were collected for the agricultural year 2012-13 (From 1st June 2012 to 31st May 2013). Purposive sampling was done for collection of data from the households. Following ICRISAT VDSA Study criteria, households were classified into five strata namely, landless households, and marginal, small, medium and large land holding households as indicated in Table 4.

From each household stratum only five percent of households were chosen as representative samples. They were chosen in such a way as to represent villagers of all occupations practiced villagers to and truly reflect the village economic conditions. Primary data was collected from different economic agents including shops (Agricultural input shop, canteen, Provision store) and service providers (tailor, barber, drivers, labourers and so on) regarding details of employment provided, receipts and expenditure. Secondary data was collected from Government institutions (Gram Panchayat, Anganwadi Centre, School, Post Office, Health Care Centre, financial institutions located in Devarhippargi & Satihal and ICRISAT VDSA database) and official websites <http://nrega.nic.in/netnrega> and <http://panchamitra.kar.nic.in>. Structured questionnaire were prepared and used to collect

data from villagers. In the questionnaire information on the transaction both within and outside were recorded separately and source wise.

The sample to included people belonging to different social groups like caste, religion, occupation. This is because there is bound to be difference in their consumption pattern, festival spending, expenditure on durables etc. Hence leaving a social category means underestimation or overestimation of expenditure or income.

Household consumption data was collected for only one month and was multiplied by 12 to get the consumption for a year. Data on all items of consumption (both on items of durable and non-durable in nature) was collected from representative households.

For the present study a SAM of 82X82 sizes was constructed.

### **Belladamadugu**

The SAM is constructed using primary data from 25 households, 21 farmers, 10 leaf plate makers, 4 luggage auto transport operators, 10 households involved in services, 22 participants of MGNREGA and 35 non participants of MGNREGA and secondary data pertaining to village statistics and MGNREGA works undertaken from village panchayath, post office, government school, Anganwadi, SHGs and official website of MGNREGA. The SAM was first developed to find the key sectors significantly contributing to the village economy and to assess the contribution of MGNREGA to the livelihood security.

Field survey was made to collect primary data from 127 village households representing different sectors and from each household stratum only five percent and above of households was chosen as representative samples. They were chosen in such a way as to represent villagers in most or all occupations practiced by villagers and truly reflect the village economic conditions. In the questionnaire, information on the transaction both within and outside were recorded separately and source wise. The sampling size is taken care to nearly represent all sectors of the rural economy.

For this research study, a 64 X 64 sector Social Accounting Matrix is constructed to identify the key sectors and their contribution of MGNREGA towards village economy.

## 4. Results and Discussion

### Markabinahalli

Table 5 shows the aggregated SAM of 16X16 sizes for Markabinahalli village for the agricultural year 2012-13. This SAM consisted of two production activities viz; agriculture and charcoal making and two service sector activities viz; trade and others. 'Others' included tailor, barber, SHG, transport service providers and so on. Accounts other than production and service sector activities included in SAM were institution (comprising of Households, Panchayat and Temple) and Factors of production (labour and capital services). Labour services sub-account included family and hired labour. All the accounts mentioned above constituted endogenous accounts except for Panchayat and exogenous accounts comprised of Panchayat, savings and investment account and rest of the world account. Household account was the largest of all the accounts which revealed importance of household spending in the village economy. Agriculture was the second largest account showing a dominant role played by Agriculture. MGNREGS was treated as a separate activity to assess the multiplier effect of investment under the scheme on village economy.

Table 5 Aggregated Social Accounting Matrix for Markabinahalli Village for 2012-13(values in Rs. lakhs)

	ACTIVITY					COMMODITY				
	AGRI	CHAR	MGNR EGP	TRD	OTH	AGRI	CHAR	MGNR EGP	TRD	OTH
AGRI	0.0	0.0	0.0	0.0	0.0	342.4	0.0	0.0	0.0	0.0
CHAR	0.0	0.0	0.0	0.0	0.0	0.0	18.3	0.0	0.0	0.0
NREGP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0
TRD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	174.2	0.0
OTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	265.4
AGRI	11.0	0.0	0.0	72.3	0.0	0.0	0.0	0.0	0.0	0.0
CHAR	0.0	0.0	0.0	8.2	0.0	0.0	0.0	0.0	0.0	0.0
NREGP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TRD	20.1	0.0	0.0	5.0	0.1	0.0	0.0	0.0	0.0	0.0
OTH	29.2	0.0	0.0	2.2	0.7	0.0	0.0	0.0	0.0	0.0
LABOUR	86.8	9.2	4.2	4.2	2.4	0.0	0.0	0.0	0.0	0.0
CAPITAL	36.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOUSE	81.9	9.2	0.0	42.3	135.7	0.0	0.0	0.0	0.0	0.0
INST	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
S&I	58.5	0.0	0.0	0.0	2.6	11.0	0.0	0.0	0.0	0.0
ROW	18.7	0.0	10.8	40.1	123.3	0.0	0.0	0.0	0.0	0.0

TOTAL	342.4	18.3	15.0	174.2	265.4	353.3	18.3	15.0	174.2	265.4
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	FACTOR SERVICES		HOUSE	INST	S&I	ROW	Total
	LABOUR	CAPITAL					
AGRI	0.0	0.0	0.0	0.0	0.0	0.0	342.4
CHAR	0.0	0.0	0.0	0.0	0.0	0.0	18.3
NREGP	0.0	0.0	0.0	0.0	0.0	0.0	15.0
TRD	0.0	0.0	0.0	0.0	0.0	0.0	174.2
OTH	0.0	0.0	0.0	0.0	0.0	0.0	265.4
AGRI	0.0	0.0	34.0	0.0	0.0	236.0	353.3
CHAR	0.0	0.0	10.1	0.0	0.0	0.0	18.3
NREGP	0.0	0.0	0.0	0.0	15.0	0.0	15.0
TRD	0.0	0.0	14.5	0.0	5.0	129.4	174.2
OTH	0.0	34.2	101.7	0.0	0.4	97.1	265.4
LABOUR	0.0	0.0	10.4	3.6	0.0	52.1	172.8
CAPITAL	0.0	0.0	47.5	0.0	0.0	0.0	83.9
HOUSE	167.8	0.0	48.0	46.9	60.4	27.0	619.1
INST	0.0	0.0	0.1	0.0	0.0	65.1	65.6
S&I	0.0	2.1	117.0	15.1	0.0	0.0	206.2
ROW	5.0	47.5	235.9	0.1	125.3	0.0	606.7
Total	172.8	83.9	619.1	65.6	206.2	606.7	

Footnote: 1USD = Indian Rs. 57.5 (annual average for the year 2012-13)

Where AGRI.: Agriculture, CHAR: Charcoal, TRD: Trade (includes both Agro-input and commodity), OTH: Other service providers, HOUSE: Households, INSTI: Institutions (Panchayat and Temple), S& I: Savings and Investment, ROW: Rest of the World

Tables 6 & 7 provide the multiplier effect of MNGREGS. From the results presented in Table 6 it is evident that multiplier effect of MNGREGS on the whole village economy of Markabinahalli was very weak as indicated by a multiplier value of the magnitude 1.855 (total of all 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 economy increases by 28 paises. Of these 44 accounts 11 accounts had zero or negligible multiplier value. Among service providers highest multiplier value was for provision stores (0.037) followed by hired machinery services (0.011), other commodity trade (0.01). Among production activities, other commodity had highest multiplier value of (0.012) followed by Jowar commodity (0.01) and charcoal making (0.008).

Table 6 Impact of Rs. 10 lakh additional investment in MGNREGS on Markabinahalli village Economy (A simulation)

Particulars	Multiplier Effect	Impact for Rs. 10 lakh (Rs.)	Base Value for Agriculture Year 2012-13 (Rs.)	Percentage Impact
Hired labour services	0.2884	2,88,438	98,75,531	2.92
Small family households	0.0950	95,019	92,88,363	1.02
Landless family households	0.1071	1,07,097	1,12,82,571	0.95
Repair and maintenance shop	0.0006	633	72,000	0.88
PDS shop	0.0073	7,277	9,07,825	0.80
Private School	0.0040	4,021	5,20,028	0.77
Provision store	0.0370	37,015	50,31,080	0.74
Doctor	0.0068	6,795	9,22,101	0.74
Barber	0.0012	1,192	1,64,250	0.73
Grinding mill	0.0023	2,294	3,16,240	0.73
Canteen	0.0051	5,108	7,05,050	0.72
Others commodity trade	0.0103	10,314	14,65,594	0.70
Gold smith	0.0002	226	32,600	0.69
Tailor	0.0042	4,192	6,13,825	0.68
Marginal family households	0.0696	69,632	1,04,40,276	0.67
Medium family households	0.0568	56,790	1,06,52,084	0.53
Charcoal making	0.0078	7,781	18,29,654	0.43
Black smith	0.0016	1,632	3,91,902	0.42
Jowar commodity	0.0103	10,332	25,69,774	0.40
Machinery hired out	0.0109	10,885	31,28,018	0.35
Capital services	0.0292	29,178	83,84,979	0.35
Temple	1E-05	7	2,145	0.33
Other commodity	0.0116	11,622	38,31,617	0.30
Large family households	0.0597	59,690	2,02,44,151	0.29
Post office	0.0042	4,184	16,81,297	0.25
Family labour services	0.0099	9,938	74,00,994	0.13
Cobbler	0.0002	216	1,82,400	0.12
Wheat commodity	0.0027	2,646	25,22,986	0.10
Transport service provider	0.0055	5,490	88,91,502	0.06
Pigeon pea commodity	0.0026	2,555	88,80,075	0.03
Chickpea commodity	0.0022	2,232	83,25,896	0.03
Agri-inputs trade	0.0011	1,055	35,14,000	0.03
Total	1.8555	18,55,486	16,90,99,228	1.10

Footnote: 1USD = Indian Rs. 57.5 (annual average for the year 2012-13)



Table 7 Summary of impact of Rs. 10 lakh additional Investment in MGNREGS on Markabinahalli Village Economy

Particulars	Base Value for Agriculture Year 2012-13 (Rs.)	Multiplier value	Impact of Investment in MGNREGS	
			Rs.	% change
Output Multiplier	8,15,28,134	1.14	11,39,000	1.40
Employment Multiplier	6,19,07,445	0.30	2,98,000	0.48
Household Income Multiplier	1,72,76,525	0.39	3,88,000	2.25

Footnote: 1USD = Indian Rs. 57.5 (annual average for the year 2012-13)

But since the size of each account and multiplier value for each account differed due to expenditure under MNGERGS was different, increase in value of these accounts when the final demand for MGNREGS in Markabinahalli increases by Rs. 10 lakhs (Hypothetical) is presented in Table 6.

Maximum impact was observed in Hired labour services (2.92 percent), the expected area where MGNREGS had been expected to have the highest impact. But this increase was very small due to low intensity of MGNREGS works and very large size of agricultural labour services (Rs. 86.8 lakhs, 50.23 percent of total labour receipts in the village) and very weak linkages of MGNREGS with rest of the accounts. This 2.92 percent impact on labour account is equal to 961 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 9 households under MGNREGS.

Second largest impact was observed on small family households (1.02 percent) followed by landless family households (0.95 percent), repair & maintenance shop (0.88 percent), PDS shop (0.80 percent) and Private School (0.77 percent).

On the whole impact of MGNREGS on village economy was only 1.1 percent but in labour equivalents it implies 6184 labour days or full time employment to 18 households at the rate of 340 days of employment per year per household. This impact is very weak keeping in view the objective of livelihood security within framework of MNGREGA. In essence, indirect impact of MGNREGS on labour employment was 84.46 percent of total impact of 1.1 percent.

In Table 7, multiplier effects of Rs. 10 lakhs investment in MGNREGS are presented as output, employment and household income multipliers. 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, which was to the tune of 2.25 percent followed by output (1.40 percent) and the least impact was on employment, to the tune of 0.48 percent.

#### 4.1 Reasons for low impact of MGNREGS

Reasons for less impressive performance of MGNREGS in terms of making an impact on village economy could be listed as follows.

1. MGNREGS was carried out on a very small scale in the village. Total outlay spent on MGNREGS in the year 2012-13 was of Rs. 15 lakhs. This sum is even lesser than the size of charcoal making activity which provides employment throughout the year.
2. Linkages of MGNREGS with other accounts were very weak. MGNREGS spent money only on hired labour services in the village. Material components were procured from outside the village.
3. Proportion of labour component in the overall outlay for MGNREGS was just 28 percent as against 60 percent mandated. This sum was Rs. 4.2 lakhs, just 2.43 percent of total labour income in the village.
4. Income for labourers from MGNREGS wasn't so attractive a proposition in Markabbinahalli. Agricultural wage rate (Rs. 300 per day) and non-farm wage rate (Rs. 350 per day) in the study area are much higher than the MGNREGA wage rate of Rs. 174 per day. On an average, in a year, a family worked for 27 days under MGNREGS, 80 days in non-farm activities and 253 days in agriculture sector. With the prevailing wage rates in different activities, the total family income was Rs. 1, 08,598. Income from MGNREGS (Rs. 4698) formed only 4.32 percent of the total annual family income. So, the workers in the village were not attracted to MGNREGS works.
5. Another theory could be the operation of backward bending supply curve theory of labor, because of which the labourers prefer leisure to working for low wage rate in MGNREGS, since higher income can be realized by offering less person days of labour at a higher wage rate. This could be the major reason for poor performance of MGNREGS in the village in terms of SAM multipliers.
6. Instead of MGNREGS being demand driven, had been driven with supply focus. Since seasonal migration to nearby towns and far-off places like Solapur and Bangalore fetched higher returns to them, local people, especially the local leaders were not showing zeal for successful implementation of the scheme. Income flow into the village economy from temporary labour migration stood at Rs. 52.1 lakhs, 13 times that of labour earnings from MGNREGS.

Table 8 MGNREGS works in Markabinahalli: 2012-13

Work	Official records		
	Total person days of work provided	Total amount disbursed (Rs.)	MGNREGA wage rate (Rs. Per day)
RGSK construction	3996	10,07,000	155
Tree planting			
Weed removal			

Footnote: 1USD = Indian Rs. 57.5 (annual average for the year 2012-13)

### Belladamadagu

Considering the distribution of income across different categories of farmers (Table 9), it is apparent to note that the marginal households possess most of the total household income, followed by medium households, small households, large and landless households. Thus, the village economy of Belladamadagu is a neat indicator of equity since marginal households hold around 40 percent of the household income in the village, followed by medium farmers (22%), small farmers (20%), and land less households (6%). Thus, 66% of the household income is with landless, small and marginal farmers and this has been possible due to prominent dairy activity among marginal land households in Belladamadagu. This also reflects that Dairy activity has been rendering yeomen service to landless, marginal and small farmers by gainfully engaging their surplus labor activity on the farm and empowering them economically in general and empowering farm women among the households in particular.

Table 9 Income distribution among the Belladamadugu village households (unit in lakh Rs)

	Classification of households based on landholdings	Number of households in the village	Family labor income	Hired labor income	Total labor income	Other sources of income	Total HH income
Landless households	<0.1ha	26	2.35	11.25	13.60	6.44	20.04
Marginal households	0.1–<1ha	142	17.58	25.29	42.87	87.78	130.65
Small households	1- <2 ha	58	12.18	6.20	18.39	45.24	63.62
Medium households	2- <4 ha	35	14.91	4.54	19.45	48.66	68.12

Large households > 4 ha	15	5.22	2.89	8.12	26.26	34.38
Total	276	52.26	50.18	102.44	214.40	316.83

Footnote: 1USD = Indian Rs. 57.5 (annual average for the year 2012-13)

### Basic results from SAM

The key sectors of the Belladamadagu village are identified from among the 28 sectors based on the weighted multiplier (Table 10). Dairy co-operative and Dairy having highest weighted multiplier Rs. 231.91 lakh and Rs.211.66 lakh respectively are the top most sectors of the village which play crucial role in the village economy. The dairy sector has the highest level of activity (Rs. 64.85 lakh) and the highest total multiplier effect (3.50). It depicts that the village livelihood depends largely on livestock. Sheep and goat rearing enterprises have an apparent effect and significant impact on the village economy.

### Value addition

Harvesting and processing of Tamarind is the most important village production activity which recorded the highest column multiplier of 3.27, magnitude of the activity (Rs.48.75 lakh) and weighted multiplier of Rs. 159.65 lakh. Even though Self Help Groups have higher level of activity (Rs. 54.31lakh) than Harvesting and processing of tamarind (48.75), due to higher inter-sectoral linkage between harvesting and processing of tamarind activity with other sectors it has greater multiplier effect (3.27) compared with SHGs activity (2.71), Tamarind harvesting stands out. Other village production activities are brick making, leaf plate making and beedi making. Even though the weighted multiplier of leaf plate making activity is relatively low (Rs. 55.52 lakh), it plays an important role in village economy as 30 per cent of the village households are involved in this activity. Among the agricultural activities, cultivation of rainfed groundnut, cultivation of paddy crop and flower crops are significantly contributing to the village economy and livelihood of farmers. Groundnut is the major crop in rain fed condition (515 acres) and is grown on a small area in irrigated condition (33 acres). Accordingly, rainfed groundnut cultivation has considerable impact on the village economy with multiplier effect of 2.91 and weighted multiplier of Rs. 138.4 lakh. Paddy and flower crop cultivation have commercial importance in the village economy with weighted multiplier of Rs. 98.88 lakh and Rs. 39.72 lakhs. MGNREGA with weak column multiplier (1.45) and weighted multiplier (Rs. 1.92 lakh) occupied the last position (27th) among all sectors of the village economy, as MGNREGA works are modest in the village.

The proportion of sectoral contribution to the village economy based on the weighted multiplier is in Fig 4. Livestock activities such as dairy (14%), sheep and goat rearing (5%) occupy nearly 19 per cent of the village transactions. Village production activities such as tamarind harvesting and processing (11%), brick making (9%) and leaf gathering and leaf plate making (4%) share about 24 per cent of the total village economy transaction. Cultivation of crops such as Groundnut in rainfed condition (9%), paddy (6%) and flower crops (3%) share 18 per cent of the transactions of the village. Similarly, Dairy co-operative

(15%) and SHGs (10%) share significantly in the village transactions. MGNREGA has negligible transaction (0.13%) in the village economy. Only 14 per cent of the transactions are made by the remaining sectors.

Table 10 Key Sectors of Belladamadugu using weighted multiplier

<b>Key sectors</b>	<b>Level of activity (Lakh Rs) A</b>	<b>Column multiplier (= column total of inverted SAM) B</b>	<b>Weighted multiplier (lakh Rs) C = A*B</b>
Dairy co-operative	64.85	3.58	231.91
Milk production	60.52	3.50	211.66
Tamarind harvesting and processing	48.75	3.27	159.65
SHG	54.31	2.71	147.05
Cultivation of Rainfed Groundnut	47.53	2.91	138.14
Brick Making	52.00	2.56	132.86
Paddy cultivation	37.08	2.67	98.88
Sheep and goat rearing	26.96	2.93	78.98
Leaf plate making	20.49	2.71	55.52
Flower crops cultivation	14.18	2.80	39.72
MGNREGA	1.32	1.45	1.92

Footnote: 1USD = Indian Rs. 57.5 (annual average for the year 2012-13)

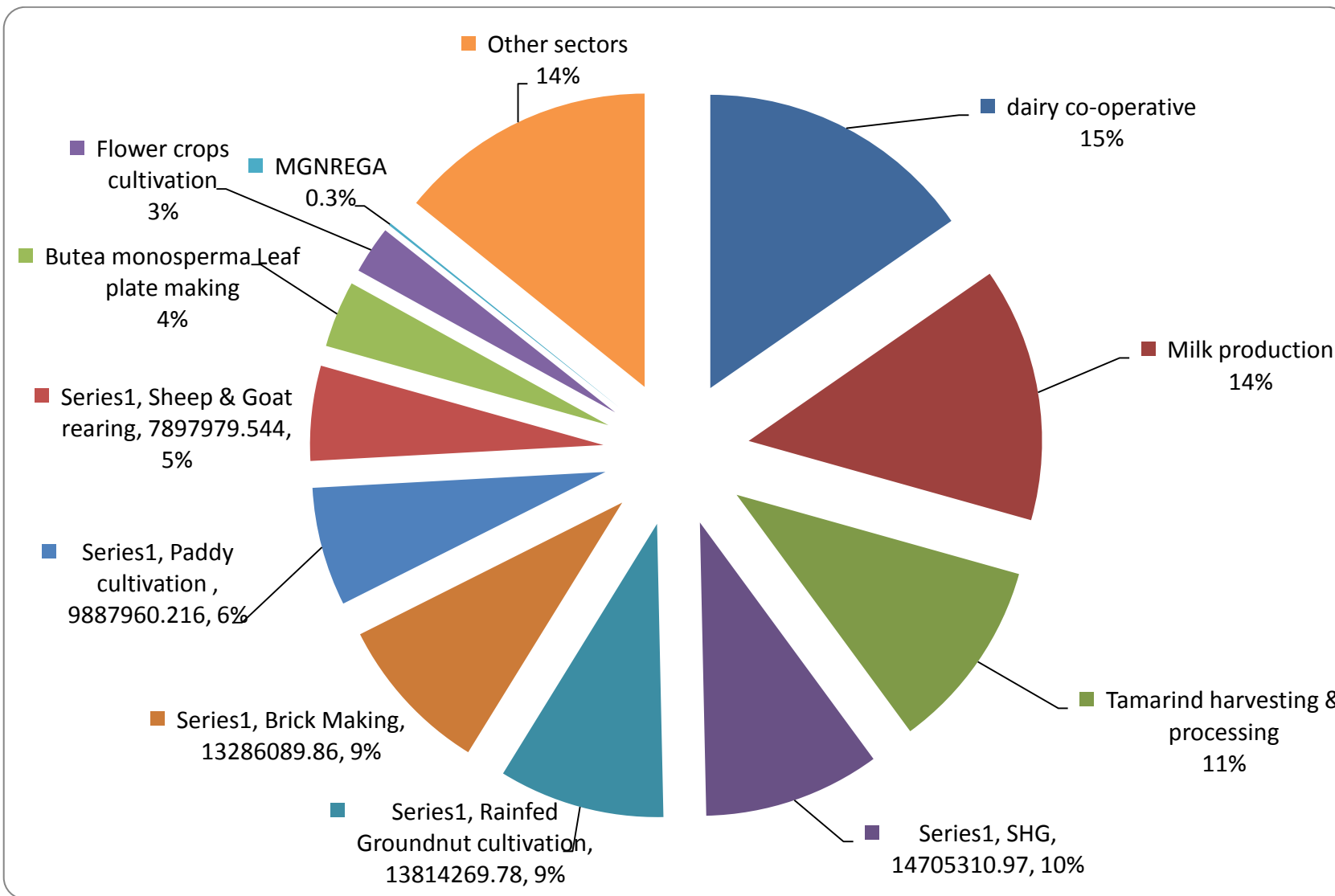


Figure 4 Key Sectors of Belladamadagu: weighted multiplier

The output, employment and income multipliers for the village sectors are presented in Table 11.

### Milk production and Dairy co-operative

For Rs 1 increase in the final demand of milk dairy co-operative sector, the direct, indirect and induced increase in the output of all sectors in the village is Rs 2.52 of which Rs. 1.19 is the increase in the dairy co-operative output, Rs 0.89 is increase in output of dairy, Rs 0.13 is the output of SHG's, Rs 0.08 is the output of paddy. Due to milk sector demand, flow of income to households is Rs 0.81 of which Rs 0.50 is for poor farm households and Rs 0.31 is for middle income households. Increase in employment in the village is worth Rs 0.23.

For Rs 1 increase in the final demand of dairy sector, the direct, indirect and induced increase in the output of all sectors in the village is Rs. 2.08 of which Rs. 1.22 is the increase in output of dairy, Rs 0.26 is the increase in the dairy co-operative output, Rs 0.17 and Rs 0.11 is increase in output of SHGs and Paddy sector respectively. Increase in employment in the village is worth Rs 0.33. Flow of income to households is Rs. 1.10 of which Rs 0.68 is for poor farm households and Rs 0.42 is for middle income households.

Table 11 Output, Employment and Income multipliers of key sectors in Belladamadugu

Key Sectors	Output multiplier	Employment multiplier	Income multiplier
Dairy (co-operative)	2.52	0.23	0.81
Milk Production	2.08	0.33	1.10
Tamarind harvesting and processing	1.47	0.55	1.26
SHG	1.45	0.03	1.10
Rainfed Groundnut cultivation	1.88	0.49	0.62
Brick Making	1.37	0.28	0.91
Paddy cultivation	1.50	0.23	0.98
Sheep and goat rearing	1.39	0.42	1.12
Leaf plate making	1.41	0.29	1.02
Flower crops cultivation	1.50	0.28	1.03
MGNREGA	1.08	0.17	0.20

### Tamarind

For Rs. 1 increase in the final demand of tamarind harvesting and processing activity, the direct, indirect and induced increase in the output of all sectors is Rs. 1.47 of which Rs 1.00 is the direct increase in output of tamarind processing activity, Rs 0.20 is increase in the SHGs output, the output of provision store, paddy and dairy increase by Rs. 0.09, Rs. 0.04 and Rs. 0.03 respectively. For one rupee increase in final demand for tamarind, total labor

employment increases by Rs.0.55, the highest employment generation activity among the key sectors in the village. Due to tamarind, flow of income to households increases by Rs. 1.26 of which Rs. 0.84 is for poor farm households and Rs. 0.42 is for middle income households.

### **Self Help Group (SHG)**

For Rs. 1 increase in the final demand of SHG activity, the direct, indirect and induced increase in the output of all sectors is 1.47 of which Rs. 1.19 is increase in SHGs output, increase in the output of provision store and paddy cultivation is Rs. 0.09 and Rs. 0.03 respectively. The increase in employment in monetary terms is modest Rs. 0.03 in the village economy. Flow of income to household's increased by Rs. 1.10 of which Rs. 0.85 is for poor households and Rs. 0.25 is for middle income households.

### **Groundnut**

For Rs. 1 increase in the final demand of rainfed groundnut activity, the direct, indirect and induced increase in the output of all sectors is Rs. 1.88; of which increase in groundnut output is Rs.1.35, and increase in output of Dairy is 0.22, and increase in the output of SHGs Rs. 0.10. Due to one rupee increase in final demand of rainfed groundnut, the employment in the village increases by Rs. 0.49. Flow of income to village households increases by Rs. 0.62 which is the lowest increase in income among the key sectors of which Rs. 0.42 is for poor farm households and Rs. 0.20 is for middle income households. Thus SAM also portrays the income distribution angle in development process.

### **MGNREGA**

For 1 Rs increase in final demand of MGNREGA, the total increase in income of households is Rs 0.20 of which Rs 0.17 is for poor farm households and Rs 0.03 is for middle income households. This modest multiplier of MGNREGA shows that MGNREGA is yet to make economic impact in the village economy of Belladamadagu.

Considering the SAM multipliers and the proportion of weighted activities in Belladamadagu, the dairy and dairy co-operative are the two key sectors exhibiting large multiplier effects. This has resulted in both efficiency and equity in income distribution. Thus milk production and cooperative dairy together have the potential to empower economically the farmers as well as in economic empowerment of farm women. Farmers are rational with respect to their economic association with dairy. In addition, harvesting & processing of tamarind contribute next to dairy with multiplier of 3.27, and SHG (2.71). The income from tamarind processing (Rs.48.75 lakh) and SHG (Rs. 54.31) turn out to be next to dairy in economic activity in the village.

Flower crops have higher multiplier (2.80) than SHG's (2.71), brick making (2.56) and paddy (2.67), in the village, but flower production is limited as it is constrained by access to ground water.

MGNREGA has made modest impact on village economy since the multiplier is low (1.45). MGNREGA can play an efficient role by focussing on activities which have higher multiplier in the village including, but not limited to, tamarind processing, cultivation of groundnut, leaf



plate making. This enhances output and income of rural women tool towards equitable distribution of income of households.

### Reasons for weak SAM multipliers for MGNREGA

The reasons for weak SAM multipliers for MGNREGA, could be traced to wage and income differentials between MGNREGS and agriculture as well as non-farm sectors. Agricultural wage rate (Rs. 200 per day) and non-farm wage rate (Rs. 300 per day) in the study area are substantially higher than the MGNREGA wage rate of Rs. 174 per day by 44 percent. An average village family worked for 17 days under MGNREGP, 64 days in non-farm activities and 242 days in agriculture. At the current wage rates, the annual family wage income from all sources is Rs.70558. The wage income from MGNREGA (Rs. 2958) here forms a meagre 4.19 percent of total annual family wage income. Therefore, even if the households were willing to work, their reservation wage in MGNREGA is relatively low that deters them to offer their labor for MGNREGA activities. In addition, on a positive note, MGNREGA is playing the role of MSP for labour wage since the wage rate in non-agricultural activities as well as in agriculture activities is higher than Rs. 174. Thus, the MGNREGA output multipliers are weak and have played a crucial role in providing the downward threshold for the wage rate, increasing the wage incomes for rural households. With the higher multiplier for tamarind harvesting and processing as well as for leaf gathering and leaf plate making, compared with MGNREGA activities, is a prima facie indicator of the positive role played by MGNREGA in increasing the output multipliers of labor intensive activities such as dairy, dairy cooperative, tamarind harvesting and processing and leaf plate making.

Table 12 MGNREGS works in Belladamadugu: 2012-13

Work	Official records		
	Total person days of work provided	Total amount disbursed (Rs.)	wage payment (Rs.)
Road and gokatte construction	771	1,67,507	1,19,505

Footnote: 1USD = Indian Rs. 57.5 (annual average for the year 2012-13)

## 5. Conclusions and Policy Implications

The village economy wide multiplier value of intervention, i.e., column multiplier value estimated in the study, was the highest for dairy cooperative (3.58), and followed by dairy (3.5), tamarind harvesting and processing (3.27) and so on. The column multiplier for MGNREGA was a modest 1.47. This means that for every 1 Rs. increases in final demand of dairy cooperative, the output of the entire economy would increase by Rs.3.58, while that due to tamarind harvesting and processing the output of the entire economy increase by 3.27. The output multiplier for MGNREGA is far lower than other output indicators. This indicates that MGNREGA is yet to make a major economic impact in the village economy of Belladamadagu.

SAM multiplier analysis indicated that in water starved Belladamadagu village, a dryland community, dairy and dairy co-operative have the highest potential in generating income for all categories of farmers followed by activities such as tamarind harvesting, processing and leaf plate making. As labour is economically scarce, larger welfare gain will be achieved if MGNREGA is activated towards tamarind processing and leaf plate making activities to benefit women members of farm labour. By this arrangement, direct, indirect and induced incomes in all the sectors will be to the tune of Rs. 5.98 (3.27+2.71) for every rupee increase in final demand for tamarind processing and leaf plate making. Big push through MGNREGA may be required for cultivation of flower crops, irrigated groundnut and brick making activities. At present, MGNREGA is yet to make economic impact in the village economy, as reflected in its poor multiplier effect. The role of MGNREGA can be enhanced by supporting the key sectors identified in the study such as harvesting and processing of tamarind, leaf plate making and groundnut cultivation.

To make MGNREGA works more effective and beneficial to the village community, these issues to be addressed, which may require strong local leadership and entrepreneurship to address reallocation of the resources from low productive to high productive sector. For example, some of the changes needed in implementation of MGNREGA are listed below.

- a) Procedural complexities in MGNREGA need to be simplified to reduce the transaction costs and increase the number of works undertaken in the village.
- b) Mission mode culture needs to be inculcated to improve MGNREGA operation in the village.
- c) Activities with higher multiplier values like tamarind processing and leaf plate making need to be brought under the purview of MGNREGA works for the scheme to have better impact on the village economy.
- d) Local Panchayat office bearers and members need to provide good leadership and improved governance with respect to programme implementation.
- e) The works to be selected under the scheme need to address issues related to creating better amenities, improving quality of life and increasing farm productivity, including inter alia, better sanitation, rain water harvesting, tree planting, supply of good drinking water, rural connectivity, rejuvenation of traditional water bodies and land improvement on individual farms.

- f) Ensuring good quality in work execution and financial transparency would go a long way in motivating the villagers to make the best use of MGNREGS and further strengthen the inter linkages in the village economy.

## 6. References

- Anonymous** 2012. Indian Economy, Upkar Prakashan, Agra.
- Anonymous** 2014. Gross Domestic Product: World Development Indicators Database, World Bank, 1st July 2014, Web Published.
- Arjunan Subramanyan** 2007. Distributional effects of agricultural biotechnology in a village economy: The case of Cotton in India. Ph.D. thesis, University of Hohenheim, Germany.
- Bellu and Lorenzo Giovanni** 2012. Social Accounting Matrix (SAM) for analysing agricultural and rural development policies
- Datt G and Mahajan A** 2013. Indian Economy, S. Chand & Company Pvt. Ltd New Delhi.
- Datt G and Mahajan A** 2013. Markabinahalli Village at a Glance, International Crops Research Institute for the Semi-Arid Tropics, Patancheru, Andhra Pradesh.
- Desai TS, Nageshwara Rao GD, Kiresur VR, Bantilan MCS** 2012. Markabinahalli Village at a Glance, International Crops Research Institute for the Semi-Arid Tropics, Patancheru, Andhra Pradesh.
- Indira Hirway, Saluja MR and Bhupesh Yadav** 2008. The Impact of Public Employment Guarantee Strategies on Gender Equality and Pro-poor Economic Development. UNDP Research Project No. 34
- Saluja MR and Bhupesh Yadav** 2006. Social Accounting Matrix for India 2003-04. India Development Foundation, India.
- Subramanyan and Arjuna** 2007. Distributional effects of agricultural biotechnology in a village economy: The case of Cotton in India. Ph.D. thesis, University of Hohenheim, Germany.
- Subramanai Shankar** 1996. Production and Distribution in a dryland village economy, page: 59-100. A book chapter in TAYLOR, EDWARD J. AND IRMA ADELMAN, 1996 (eds). In Village Economies – The Design, Estimation, and Use of Village wide Economic Models. Cambridge University Press.
- Taylor, Edward J and Irma Adelman** 1996. Village Economies – The Design, Estimation, and Use of Village wide Economic Models. Cambridge University Press.
- Usami and Yoshifumi** 2008. Construction of Regional Social Accounting Matrix with Natural Resource Accounts: Linking Village/Industry Level Data to Regional Level Studies, College of Life and Environmental Sciences, Osaka Prefecture University, Japan

**Vedini KH** 1997. Interdependence of agricultural and livestock enterprises in a village in Sirataluk of Tumkur district, Karnataka. Ph.D. thesis, University of Agricultural Sciences, Bangalore.

**Yadav N and Panda M** 2013. Indian Economy, Arihant Publication (India) Limited, Meerut.

<http://nrega.nic.in/netnrega>

<http://panchamitra.kar.nic.in>