Chapter 6

Multiplier Effect of MGNREGA in the Village Economy: an Analysis Using Social Accounting Matrix

The infrastructural development and the shift in demand patterns among households due to increase in income with the participation in MGNREGA has triggered a new interest in an analysis of inter-sectoral linkages. The demand for non-farm product such as barber, transport, education and carpenter will increase with the increase in income directly (MGNREGA participation) and indirectly (increase in farm production with increasing rural infrastructure). Hence it is necessary to strengthen the linkages between agriculture and the rural non-agricultural sector significantly. An analysis of sectoral linkages using the social accounting matrix (SAM) based multipliers has recently become popular due to its ability to provide an overall impact unlike linkage measures provided by the conventional input–output matrix. In this chapter we have assessed the effect of employment guarantee programme to households in a social accounting matrix (SAM) framework. While similar analysis have been done in the past, neither of these took into account the effect of employment guarantee programme in rigorous way with micro-level data. The present Chapter proposes to determine the multiplier effect of MGNREGA on the basis of the calculated social accounting matrix (SAM) in respect of four surveyed villages.

The section 6.1 of the chapter presents the multiplier impact of MGNREGA. The section 6.2 discusses about the possible impacts of MGNREGA works on the village economy from the demand side. The barriers on the path of effectiveness of multipliers i.e. supply side constraints are dealt in section 6.3. The section 6.4 presents a summing up of the chapter.

6.1 Multiplier Impact of MGNREGA

6.1.1 Social Accounting Matrix (SAM) for the Villages

In the first chapter we have seen that the full circular flow of income is captured in SAM frame work in a comprehensive way. The flow takes into account production to factor incomes, household income to household consumption, and back to production. The village SAM for our studied villages have four components: (1) production activities, such as crop husbandry, animal husbandry, construction, self-employed and service holders in manufacturing, government and private services; (2) factors of production, such as capital and labour; (3) institutions like households and Village Panchayat, etc. and (4) "outside the village," consisting of values of sectors and labour going out of the village and coming into the village. The number of production sectors varies depending on the goods and services produced within the village. There are 65 producing sectors both in Manikpur and Ramchandrapur Ditiyakhanda whereas there are 66 and 63 production sectors in Dwariparain and Bajesukdebpur respectively. Economic activity of one commodity is related to economic activity of other commodity. The available data is collected directly on commodity basis for inputs and outputs. SAM is a commodity by commodity matrix, which is derived from use and supply matrices. Detailed information was collected about the activities, costs, and revenues from different sources and in particular from panchayats. Details were also collected about the workings of MGNREGA in the villages. The village SAM for one village among the four studied villages is given in the appendix in table A11.

6.1.2 Output and Employment Multipliers

The output multiplier for a sector is the change in total value of production by all the sectors of the economy due to increase in one unit of final demand for that sector's output. For example, if one unit of final demand is increased in the animal husbandry sector (i.e., milk), it will require more feed for livestock (different crops). In turn, the increase in the demand for the output of these crops will necessitate additional production of seed, fertilizers, labour, etc. The increased employment of labour will result in their higher incomes, which will increase expenditures. The increased expenditure will need more output and so on. These are called indirect requirements. These direct and indirect requirements result in the "output multipliers" estimated by the SAM multiplier matrix given in appendix in Table A14.

Table 6.1.1 gives the total output and employment multiplier. The employment multiplier gives an estimate of the direct and indirect employment changes resulting from a change in unit output. The employment multiplier is obtained by multiplying the output multiplier of each sector with the respective employment coefficient. The employment coefficient of each sector gives the number of person-days generated to produce per unit of output (say for per thousand rupees). The inverse of the SAM (only those sectors for which there is production in village is taken for the inverse) is given in appendix in Table A14. Each column of this inverse (taking production sector) gives the increase in output of different sectors because of one unit increase in the final demand of that sector. The sum of primary input sector gives the corresponding income multiplier. The total of rows of institutions like households gives the impact on the incomes of various sections of the households.

We have derived sector wise multiplier on output and employment for our studied villages. But for the sake of getting an overall view and comparability, we have calculated aggregate

multiplier on output and employment for four villages, having multiplied a sector multiplier with its output share in the respective village economy and adding them out.

Table 6.1.1: Open Village Economy Output and Employment Multipliers

Bajesukdebpur						Ramchandrapur					
Sector	Share in total output (A)	Open Village Economy Output multiplier (B)	Open Village Economy Employment multiplier (C)	(A) X (B)	(A) X (C)	sector	share in total output (A)	Open Village Economy Output multiplier (B)	Open Village Economy Employment multiplier (C)	(A) X (B)	(A) X (C)
Rice	0.405	1.623	1.25	0.657	0.51	Rice	0.361	1.555	0.610	0.561	0.220
Pulses	0.065	1.430	0.33	0.093	0.02	Sesame	0.047	1.572	0.396	0.074	0.019
Sunflower	0.003	1.692	0.43	0.004	0.00	Animal husbandry	0.071	1.194	0.345	0.084	0.024
Animal husbandry	0.096	1.677	0.90	0.161	0.09	Vegetable	0.012	1.045	0.142	0.013	0.002
Vegetable	0.151	1.093	0.39	0.165	0.06	Pump set	0.002	1.101	0.010	0.002	0.000
Power tiller	0.035	1.211	0.28	0.042	0.01	Power tiller	0.034	1.166	0.243	0.039	0.008
Construction	0.087	1.155	0.30	0.100	0.03	Construction	0.228	1.176	0.255	0.268	0.058
Education	0.033	1.286	0.55	0.042	0.02	Education	0.012	1.140	0.291	0.014	0.003
Carpenter	0.013	1.347	0.62	0.018	0.01	Barber	0.015	1.400	0.749	0.021	0.011
Grocery	0.072	1.066	0.24	0.077	0.02	Carpenter	0.040	1.206	0.388	0.048	0.015
Transport	0.041	1.278	0.46	0.052	0.02	Grocery	0.148	1.058	0.166	0.157	0.025
Aggregate Multiplier				1.412	0.77	Transport	0.031	1.105	0.209	0.034	0.006
Source: Field survey & authors own calculation						Aggregate Multiplier				1.315	0.392

Continuation of table 6.1.1……..

	Manikpur						Dwaripara				
sector	share in total output (A)	Open Village Economy Output multiplier (B)	Open Village Economy Employment multiplier (C)	(A) X (B)	(A) X (C)	sector	share in total output (A)	Open Village Economy Output multiplier (B)	Open Village Economy Employment multiplier (C)	(A) X (B)	(A) X (C)
Rice	0.629	1.698	0.789	1.067	0.496	Rice	0.196	1.594	1.016	0.312	0.20
Potato	0.037	1.774	0.417	0.065	0.015	Potato	0.401	1.917	0.683	0.769	0.27
Sesame	0.013	1.276	0.225	0.016	0.003	Sesame	0.059	1.738	0.282	0.102	0.02
Animal husbandry	0.069	1.806	0.883	0.125	0.061	Animal husbandry	0.079	1.755	0.947	0.138	0.07
Vegetable	0.035	1.864	0.311	0.065	0.011	Vegetable	0.046	1.938	0.445	0.090	0.02
Pump set	0.051	1.136	0.086	0.058	0.004	Pump set	0.028	1.145	0.091	0.033	0.00
Power tiller	0.025	1.185	0.248	0.030	0.006	Power tiller	0.027	1.194	0.300	0.033	0.01
Construction	0.061	1.126	0.239	0.068	0.014	Construction	0.039	1.232	0.286	0.048	0.01
Education	0.007	1.597	0.922	0.012	0.007	Education	0.003	1.181	0.336	0.004	0.00
Barber	0.002	1.324	0.503	0.003	0.001	Barber	0.004	1.645	1.011	0.007	0.00
Carpenter	0.007	1.218	0.341	0.008	0.002	Carpenter	0.009	1.155	0.261	0.010	0.00
Grocery	0.053	1.346	0.292	0.072	0.016	Grocery	0.039	1.078	0.283	0.042	0.01
Transport	0.011	1.232	0.303	0.013	0.003	Potato Vendor	0.060	2.729	0.041	0.165	0.00

Aggregate Multiplier	1.603	0.640	Transport	0.009	1.16	0.28	0.010	0.00
Source: Field survey & authors own calculation			Aggregate Multiplier				1.763	0.630

The output multipliers in Table 6.1.1 indicate the magnitude by which the outputs will increase if there is an increase in the expenditure owing to an external stock (here, MGNREGA works). For example, if the expenditure on the consumption of rice increases by Rs. 1,000 because of some MGNREGA works in Dwaripara, its impact in terms of increase in total production of rice will be Rs. 1594 (1,000 x 1.594). Output multiplier of rice is highest (1.698) in Manikpur and output multiplier for potato is highest (1.917) in Dwaripara. Rice is produced three times in village Manikpur. On the other hand village like Dwaripara in Hooghly district is known as potato bowl in West Bengal. The output multiplier for sesame is highest in Dwaripara. Sesame is produced after the cultivation of potato in same land in the village. So it is clear from the above table that the value of multiplier is more for that commodity which has a specialization within the village. But we need the help of a common indicator namely aggregate multiplier for comparison across villages. In that section we can see an interesting finding that the village with more labour intensive agricultural production will generate higher magnitude of aggregate multiplier. The multipliers are also relatively high in those villages where most of the goods and services demanded by the villager's are produced within the villages. The aggregate output multiplier in Dwaripara village is highest (1.763) followed by Manikpur village (1.603).The multiplier for the village Bajesukdebpur and Ramchandrapur Ditiyakhanda are 1.412 and 1.315 respectively. The difference in the values of multipliers arises from the output and income structures in the village economy. There are multiple cropping in village Dwaripara and Manikpur. Dwaripara is a part of Hooghly district which is known as center of potato in the winter season and after the harvesting

of potato, sesame and different kind of vegetable are cultivated in the fertile potato ground. So in the same land, the farmers of Dwaripara get a lucrative profit. Manikpur village is famous for rice production. Rice is produced for three times (Aush, Amon and Boro). Along with rice, vegetables and sesame are also produced in the village. But in case of Bajesukdebpur and Ramchandrapur Ditiyakhanda rice is produced only in the rainy season and the production of vegetable is relatively in small scale. If we compare between Bajesukdebpur and Ramchandrapur Ditiyakhanda, the first one is more productive than second village.

The above multipliers may be called as open economy village multiplier due to the effect on the village economy as well as the economy as a whole of a country. The multipliers, as can be seen below, are relatively small. This is because there are leakages; it is estimated that more than half of the backward and forward linkages of new demand generated are not absorbed within the village income, but rather are satisfied by commodities obtained from outside the village. Not only that the intermediate goods like fertilizer, different construction materials, most of the grocery items and wood etc. are used to produce goods within the village which are imported from outside the village. So the indirect inducement of the value addition in production and employment generation due to increase in direct demand of commodity from the extra earnings through MGNREGA work is not entirely within the village. It has a contribution in production of outside economy. So we have to eliminate the effect of intermediate goods to find out the actual effect within the village economy. In this respect we have found a proportion of value addition with respect to total production within the village. After the multiplication of this proportion with the open economy Output Multiplier of the respective village, we get Village Output Multiplier or closed economy output multiplier of the village. This is termed as Village Output Multiplier because we are considering only the effect on local village economy. We have got the Village

employment Multiplier or the closed economy output multiplier of the village after the multiplication of Village Output Multiplier with the labour coefficient of the respective goods and services. As in the above the individual multipliers are not comparable across villages, we have derived aggregate Village or closed economy output and employment multiplier averaging the multiplier of individual goods and services with a weight of proportional contribution in the production process.

Table 6.1.2: Closed Village Economy Output and Employment Multipliers

	Bajesukdebpur					Ramchandrapur Ditiyakhanda				
Sector	share in total output (A)	Closed Village economy output multiplier (B)	Closed Village economy employment multiplier (C)	(A) X (B)	(A) X (C)	sector	share in total output (A)	Closed Village economy output multiplier (B)	Closed Village economy employment multiplier (C)	(A) X (B)	(A) X (C)
Rice	0.405	1.407	1.150	0.569	0.465	Rice	0.361	1.211	0.442	0.437	0.159
Pulses	0.065	0.689	0.124	0.045	0.008	Sesame	0.047	1.184	0.456	0.056	0.022
Sunflower	0.003	1.107	0.447	0.003	0.001	Animal husbandry	0.071	0.985	0.156	0.069	0.011
Animal husbandry	0.096	1.579	1.083	0.152	0.104	Vegetable	0.012	0.778	0.020	0.010	0.000
Vegetable	0.151	0.135	0.007	0.020	0.001	Pump set	0.002	0.185	0.000	0.000	0.000
Power tiller	0.035	0.405	0.046	0.014	0.002	Power tiller	0.034	0.343	0.063	0.012	0.002
Constructi	0.087	0.162	0.023	0.014	0.002	Constructi	0.228	0.205	0.036	0.047	0.008

on						on				
Education	0.033	0.639	0.317	0.021	0.010	Education	0.012	1.140	0.293	0.014	0.003
Carpenter	0.013	0.812	0.489	0.011	0.007	Barber	0.015	1.400	1.027	0.021	0.015
Grocery	0.072	0.115	0.008	0.008	0.001	Carpenter	0.040	0.454	0.171	0.018	0.007
Transport	0.041	0.596	0.214	0.024	0.009	Grocery	0.148	0.108	0.007	0.016	0.001
Aggregate Multiplier				0.882	0.610	Transport	0.031	0.585	0.080	0.018	0.002

Source: Field survey & authors own calculation

Aggregate Multiplier		0.717	0.231

Continuation of table 6.1.2……..

Manikpur						Dwaripara					
Sector	share in total output (A)	Closed Village economy output multiplier (B)	Closed Village economy employment multiplier (C)	(A) X (B)	(A) X (C)	Sector	share in total output (A)	Closed Village economy output multiplier (B)	Closed Village economy employment multiplier (C)	(A) X (B)	(A) X (C)
Rice	0.629	1.254	0.369	0.788	0.232	Rice	0.196	1.179	0.566	0.231	0.111
Potato	0.037	1.075	0.248	0.040	0.009	Potato	0.401	1.116	0.341	0.448	0.137
Sesame	0.013	0.842	0.069	0.011	0.001	Sesame	0.059	0.934	0.245	0.055	0.014
Animal husbandry	0.069	1.556	1.089	0.108	0.076	Animal husbandry	0.079	1.500	1.050	0.118	0.083
Vegetable	0.035	0.291	0.011	0.010	0.000	Vegetable	0.046	0.462	0.020	0.021	0.001
Pump set	0.051	0.215	0.000	0.011	0.000	Pump set	0.028	0.259	0.000	0.007	0.000

Power tiller	0.025	0.458	0.082	0.012	0.002	Power tiller	0.027	0.398	0.074	0.011	0.002
Construction	0.061	0.154	0.021	0.009	0.001	Construction	0.039	0.266	0.057	0.010	0.002
Education	0.007	1.597	1.414	0.012	0.010	Education	0.003	1.181	0.328	0.004	0.001
Barber	0.002	1.324	0.636	0.003	0.002	Barber	0.004	1.645	1.625	0.007	0.007
Carpenter	0.007	0.454	0.147	0.003	0.001	Carpenter	0.009	0.376	0.089	0.003	0.001
Grocery	0.053	0.123	0.008	0.007	0.000	Grocery	0.039	0.130	0.011	0.005	0.000
Transport	0.011	0.565	0.144	0.006	0.002	Potato Vendor	0.060	0.404	0.016	0.024	0.001
Aggregate Multiplier			1.019	0.336		Transport	0.009	0.646	0.123	0.006	0.001
Source: Field survey & authors own calculation						Aggregate Multiplier				0.951	0.361

From the table 6.1.2 we can see that village multiplier is less than the open economy Multiplier. In case of Dwaripara and Manikpur all kind of open economy Multiplier was higher relative to Bajesukdebpur and Ramchandrapur Ditiykhanda. But Village employment multiplier is higher in Bajesukdebpur village. Because the production process is primitive and most of the intermediate come from within the village. Since the main source of income is non-farm activity like tailoring where raw material come from outside the village and finished goods exported to outside the village, the local shocks can not effect so much in Ramchandrapur Ditiykhanda and the village output (0.717) and village employment multiplier (0.231) are smaller relative to other study villages.

6.2 Possible Impact of MGNREGA Works on the Village Economy from the Demand Side

The total cost of the public works was spent on labour, i.e., wages (there was no material cost) in the studied villages. The effect of this new injection ("cost" from the standpoint of government

spending and "new income" received from the standpoint of participating beneficiaries) on the economy is arrived at in accordance to the prevailing expenditure patterns of households that received this income. Out of this, the labour households spend on items that are produced inside the village (rice, pulses, vegetable and education etc.) while the rest was spent on items that were imported or bought from outside the village (clothing, pesticides, etc). By distributing the amount among the sectors in the ratio of household expenditure, we get the increase in direct final demand of goods and services. It is then multiplied with the inverse matrix and, by adding these; we get an additional output; additional value-added and additional household income in the village economy. This is called indirect effect of MGNREGA.

The households have received Rs. 16, 91,360 from MGNREGA job and out of this, the labour households spend Rs. 7, 29,001 (approximately 43.10 per cent of the total household income from MGNREGA) on items that are produced inside the village (rice, pulses, vegetable and education etc.) while the rest was spent on items that were imported or bought from outside the village Bajesukdebpur (clothing, pesticides, etc). The expenditure share on goods and services produced within the village economy out of total cost received from MGNREGA in Manikpur was 46 percent. The shares of direct demand from MGNREGA income are 42 percent and 72.38 percent in Dwaripara and Ramchandrapur Ditiyakhanda respectively. The multiplier effect in a village depends on the number of commodities produced in the economy and percentage expenditure on village produced commodity from the MGNREGA earnings.

6.2.1 Possible Increase in Output from the Demand Side through Increased Expenditure:

The effect will be in terms of the increase in expenditure on items produced in the village and also on items brought from outside the village. If there is excess capacity or capacity created due

to creation of asset through MGNREGA work, the production in the village economy will be increased with increase in demand.

Table 6.2.1: Increased Output in Sectors Achieved through Increased Expenditure of labour Households under MGNREGA Works (in Rs.)

Sector	Bajesukdebpur			Sector	Ramchandrapur Ditiyakhanda		
	Base	Increase	Growth in output (%)		Base	Increase	Growth in output (%)
Rice	10537600	236999	2.25	Rice	1450505	59846	4.13
Pulses	1696786	87386	5.15	Sesame	189648	1253	0.66
Sunflower	67640	3130	4.63	Animal husbandry	283603	49797	17.56
Animal husbandry	2502552	128590	5.14	Vegetable	49200	30846	62.69
Vegetable	3933985	201924	5.13	Pump set	8700	225	2.58
Power tiller	907875	21373	2.35	Power tiller	136000	3191	2.35
Construction	2256830	111386	4.94	Construction	916068	24133	2.63
Education	850320	41403	4.87	Education	48000	8656	18.03
Carpenter	346500	16654	4.81	Barber	60000	3902	6.5
Grocery	1869802	97762	5.23	Carpenter	159200	3479	2.19
Transport	1062348	41886	3.94	Grocery	596717	26405	4.43
Total	26032238	988,493	3.8	Transport	124800	15469	12.39
				total	4022441	227201	5.65

Source: Field survey & authors own calculation

Continuation of Table 6.2.1……..

	Manikpur				Dwaripara		
Sector	Base	Increase	Growth	Sector	Base	Increase	Growth

			in output (%)				in output (%)
Rice	15491991	240587	1.55	Rice	2739007	99296	3.63
Potato	908232	80607	8.88	Potato	5615600	50786	0.9
Edible oil	316572	76341	24.11	Sesame	825057	3564	0.43
Animal husbandry	1710508	106267	6.21	Animal husbandry	1104069	55680	5.04
Vegetable	861140	160452	18.63	Vegetable	650072	91792	14.12
Pump set	1267860	24087	1.9	Pump Set	398550	4667	1.17
Power tiller	621000	19894	3.2	Power tiller	383600	7548	1.97
Construction	1494004	59673	3.99	Construction	547250	19603	3.58
Education	180000	21622	12.01	Education	45000	12941	28.76
Barber	60000	13406	22.34	Barber	60000	5337	8.89
Carpenter	162800	9146	5.62	Carpenter	123000	6765	5.5
Grocery	1311363	135407	10.33	Grocery	539746	46091	8.54
Transport	261500	24080	9.21	Potato Vendor	845000	0	0
total	24646970	971568	3.94	Transport	123800	14087	11.38
				total	13999751	418158	2.99

Source: Field survey & authors own calculation

The above Table 6.2.1 shows that the absolute increase is highest in agriculture followed by self-employed in non-agriculture in the studied villages. But in percentage growth, non-agricultural sector has grown much more than agricultural sector. The economy with lower base has risen in a higher rate. The production of rice increases by 4.12 percent in Ramchandrapur Ditiyakhanda followed by Dwaripara with 3.63 percent. The production of pulses and sunflower are increased by 5.15 percent and 4.63 percent respectively in village Bajesukdebpur. On the other hand the production of potato and Sesame are increased by 0.9 percent and 0.43 percent respectively in Dwaripara. But the increase in potato is much more in Manikpur. The increase in income from

grocery, barber and education are significant than other sector in the study villages. The overall increase in production for the village economy is 5.65 percent in Ramchandrapur Ditiyakhanda followed by Manikpur (3.94 percent). But the overall increase in production for village Bajesukdebpur and Dwaripara are 3.8 percent and 2.99 percent respectively. The above analysis further supports the statement of lower overall growth in a large production base.

6.2.2 Possible Increase in Household Income from the Demand Side through Increased Expenditure

The effect of the increase in output of sectors having production in the village will increase the income of the hired workers as well as those receiving capital incomes. This will again have an impact on the expenditure structure of different occupational households. Of the additional gross value-added (GVA) generated in the village Bajesukdebpur, 81.46 percent is contributed by labour (from inside and outside the village) and 18.54 per cent is contributed by capital. In case of Dwaripara village, 71.83 percent is contributed by labour and 28.17 per cent is contributed by capital. The sharing between labour and capital in Ramchandrapur Ditiyakhanda are 62percent and 38 per cent respectively. Manikpur is relatively capital intensive village and the sharing between labour and capital are 57.04 percent and 42.95 percent. Of the 81 percent labour contribution in Bajesukdebpur, 71.52 percent is contributed by internal male labour, 15.14 per cent is contributed by internal female labour, and the rest is contributed by labour from outside. In Dwaripara village the contribution of internal male and female labour are 79.69 percent and 17.92 percent, and the rest is contributed by labour from outside. On the other hand only 8.53 percent labour is hired from outside of Manikpur village and 71.37 percent is contributed by

male internal labour. The contribution of female labour (8.65 percent) is very poor in Ramchandrapur Ditiyakhanda with respect to other study village.

Similarly, we can consider the increased income of households. The share of farmers is 34.03 per cent, followed by agricultural labour households (31.01 per cent) in Bajesukdebpur. The share of income of famers and agricultural labour in Dwaripara are 49.88 percent and 31.95 percent respectively. Increased household incomes arising from MGNREGA works and the cumulative impact of the expenditure on occupation-wise household income, is given in the Table 6.2.2.

Table 6.2.2: Percentage Growth in Household Income of MGNREGA Activity through Multiplier Effect

Main occupation	Bajesukdebpur	Manikpur	Dwaripara	Ramchandrapur Ditiyakhanda
Farmer	2.26	2.47	2.21	2.51
AL	1.63	2.77	2.45	2.19
SENA	0.94	2.88	1.52	0.49
RE	0.13	0.25	0.24	0.2
OL	0.72	2.7	0.96	0.18
Total	0.98	2.15	1.77	0.66

Source: Field survey 2016-17 & authors own calculation

The increase in household income is smaller than that in output because all output does not go to income. The table shows that the overall increase has been 0.98 percent and 1.77 percent of the base income in Bajesukdebpur and Dwaripara. But the highest growth (2.15 percent) has been achieved in Dwaripara. Since Ramchandrapur Ditiyakhanda is lagging behind with respect to goods and services produced within the village consumed by the villagers, the overall percentage change in income is quite low than the other village. The highest increase in income has gone to

agricultural labour and farmers in most of the villages, as the demand for food has increased from MGNREGA incomes. The regular employed households have experienced the lowest increase. It needs to be added that when we add the direct incomes generated under the MGNREGA works, the total increase in household incomes will be much more and plays a significant role in rural livelihood.

6.2.3 Possible Increase in Indirect Employment Generation from the Demand Side through Increased Expenditure:

The employment multiplier for different sectors can be interpreted as the number of persondays generated in the economy owing to an increase in the output in a sector, caused by increased consumption of that product arising from an external shock in the form of an increase in income of labour. For example, if there is an additional expenditure on rice because of an increase of expenditure by labour, the final demand for rice increases and the employment in terms of person-days generated in the whole of the economy (owing to an increase in production of this sector) will also increase as per the value of the multiplier. Similarly, multipliers in all sectors are multiplied by the additional expenditures allocated to the labour in respective sectors. This will give us estimates of the employment generated in the economy owing to changes in different sectors. To get detailed information on employment generated in each sector, we have multiplied the employment coefficients of each sector by the sector-wise effect of the MGNREGA works (already undertaken) on output. The additional employment generated is depicted in the Table A13 given in the appendix.

The table shows that the multipliers of the non-agriculture sectors are higher than those of the agricultural producing sectors (such as rice) in most of the study villages. When there is an increase in the income of labour households owing to MGNREGA wages, they spend more on personal care, other services, fruits and vegetables, education, and all other service-providing sectors. Because of this spending, the output of these sectors rises, which requires more people and creates more person days in the economy.

Village Manikpur is more efficient in paddy production and Dwaripara is famous for potato production. But the growth rate of employment in two sectors in each village is lowest respectively. Other than tailoring, Ramchandrapur Ditiyakhanda is inefficient in all kind of productive activity. But the overall growth rate of employment (3.88 percent) is higher than other study villages. So we can say that small and productively inefficient village specifically the village with agricultural backwardness gets the more benefit due to introduction of MGNREGA. Since we have assume a Leontief production function i. e. coefficient of production is fixed for SAM, the employment growth rate of men and women are equal. But the share of women in production sectors is relatively lower than men. So if we consider the women employment as a whole, we can see that it is very trivial increase with respect to total increase in employment.

The table A13 given in the appendix shows that employment in the village economy is 41,810 person-days and 19,762 person-days in Bajesukdebpur and Dwaripara. On the other hand total employment in the village Manikpur and Ramchandrapur Ditiyakhanda are 34,631person-days and 5,942 person-days respectively. Indirect employment generated in the economy in Bajesukdebpur because of MGNREGA interventions is 1242 person-days, an increase of 2.97 per cent in the person-days generated. Similarly the indirect employment generation is 564 person-days, 1,156 person-days and 230 person-days in Dwaripara, Manikpur and

Ramchandrapur Ditiyakhanda.If this indirect increase of 1242 person days of employment is compared to the direct increase in employment of 9,610 person days under MGNREGA works already undertaken in the village Bajesukdebpur, the former turns out to be 12.92 cent of the latter. The percentage is 15.78 and 15.5 in Dwaripara and Manikpur. On the other hand the ratio between increase in indirect employment and direct increase in employment due to MGNREGA work is 13.82 percent. This is a significant figure for all villages. It is interesting to note that the increase is less for women than for men in most of the study villages. In fact, the increase of 237 person days for women is about 19.08 per cent of the total increase (1242 person-days) in Bajesukdebpur, though under MGNREGA works women's share in the total person-days generated in that village is much more, i.e., 44.01 per cent of the total (4,230 person-days for women in the total of 9,610 person-days generated under MGNREGA). The women shares in total increase are 17.73 percent and 22.14 percent in Dwaripara and Manikpur. The share is very low (9.56 percent) in Ramchandrapur Ditiyakhanda with respect to other villages. This indicates the tiny share of women in mainstream employment in the village; through they are willing to work much more. It needs to be noted that indirect employment would have been much greater if a larger part of the additional income from MGNREGA was spent on local goods and services. However, since the village is less developed and not in self sufficient, more than half of the goods and services consumed in the village come from outside, with the result that the multiplier impact is reduced.

6.3   Barrier on the Path of Effectiveness of Multipliers – Supply Side Constraints

The SAM is the expansion of input-output model of Leontief where all coefficient of production is fixed. This means to produce goods and services requirement of input is in fixed proportion. The multiplier process of SAM is based on the mechanism of Keynesian multiplier where the model considers the demand side only. If there is exogenous demand in the economy, income of the households will increase who are involved in the production process which leads to further increase in demand in different sectors of the economy. This will enhance the production in the next round and the increase in production leads to increase in income. This process will continue and there is a multiplier effect in an economy. SAM is a model to capture the numerical value of multiplier in a general equilibrium frame work.

From the above analysis it is clear that excess capacity is the prior condition to hold the above mechanism. If there is full utilization of the resources, there is no possibility of new (secondary) income and employment generation in the economy and the multiplier will be ineffective. If the MGNREGA programme focuses on supply side improvement along with employment generation, the multiplier process can effectively contribute to the growth of village economy. This is possible if the MGNREGA programme caters to rural infrastructure development. In this respect we can identify the supply constraint in the economy and the sectors related to the scarce resources. Then the second step is to develop infrastructure on the priority basis in such a manner that we can augment the limited resource to break the supply bottleneck. So the objective of MGNREGA should be distribution oriented to production oriented. We can mention a flow chart of infrastructures which have to be developed under MGNREGA in priority basis to get better multiplier effect.

Figure 6.3.1: The Path to Influence Supply Side through MGNREGA

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                        ┌─────────────────────┐
                        │       MGNREGA       │
                        └─────────────────────┘

  Irrigation      Flood Control and    Land Development    Rural Connectivity
                     Protection

  Multiple          Stability in       Increase in Land    Improvement in
  Croping           Production         Supply              Marketing

  Increase in       Increase in        Increase in         Increase in Supply
  Supply            Supply             Supply              (secondary Effect)
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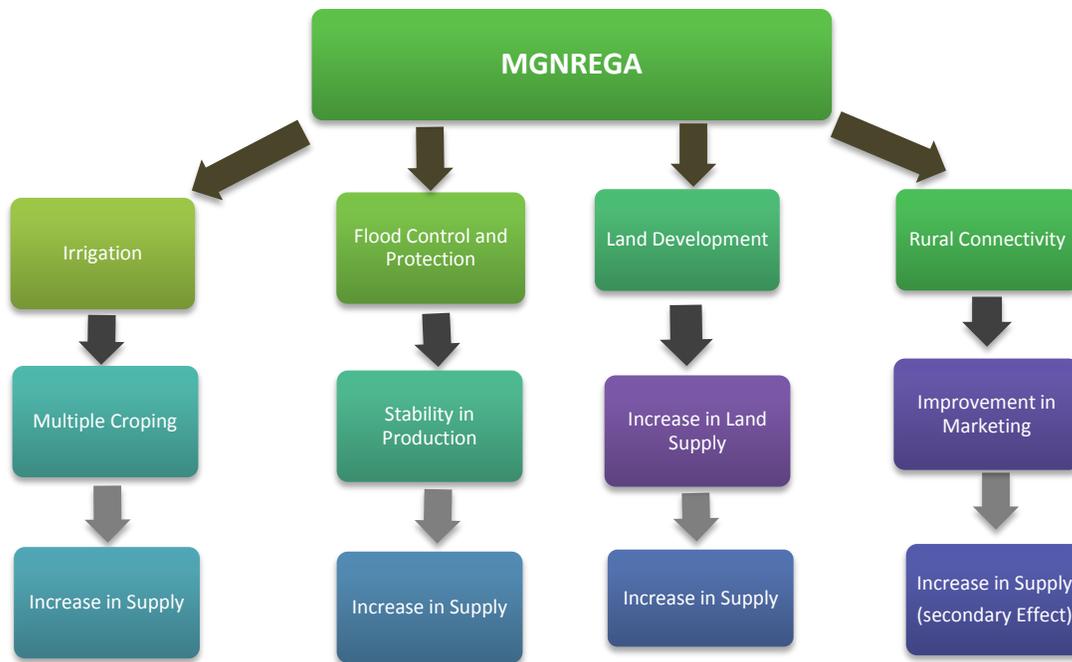
The assets generation under the MGNREGA can be broadly classified into two categories - assets generation in individuals' land and assets generation in community land. But both types of assets are important for rural development. Since majority of the poor and marginalized in rural India can be founded in agriculture and allied activities, which suffer from low productivity, as well as uncertainty arising from fluctuating production and incomes, MGNREGA can be planned in such a way that it stabilizes these sectors by reducing fluctuations and promotes their growth by raising labour productivity.

The figure 6.3.1 has mentioned the resource linked with production process and has indentified the path of increase in output. From our common parlance, it is seen that agricultural land is fixed. So we have to increase the gross cropped area. This is possible by multiple cropping through strong irrigational facilities. The irrigation works under MGNREGA are classified in three broad categories - micro irrigation works (canals), water conservation and harvesting (digging new tanks/ ponds, small check dams) and renovation of traditional water bodies

(desilting tanks/ponds, desilting of old canals, desilting of traditional open wells). Though the improvement in irrigation facilities mitigate the intensity of flood from water logging, MGNREGA work has specify some special type of work like drainage in water logged areas, construction and repair of embankments. Creation of these types of assets will protect the crop from natural calamities and ensure the stability in agricultural as well as aquatic production. In this respect we can mention the reduction of land fertility due to submergence of land with saline water from Aila in lower part of the districts Twenty Four Parganas South and North. Aftermath of the shock peoples of Sundarban has lost their livelihood from agriculture and fisheries related activity on which about 95 percent of the peoples are involved. The next priority should be given on increase the fertility of land and transforming the fallows land to agricultural land. The will increase the net cropped area in the production process. The previous three categories will enhance the productivity and total production in the economy which needs to be marketing. So our next priority should be given on road connectivity which will smooth the transportation of agricultural product and by product for marketing. Other type of work such as such as drought proofing will enhance the environmental sustainability.

6.3.1   Actual Scenario in Creation of Infrastructure in India and West Bengal through MGNREGA

Most of the economist has stressed on MGNREGA work as tool to boost rural economy by creating productive asset in rural area through MGNREGA and has mention in their research of the immense potentiality of MGNREGA to act as a big push. So it is important to think about the percentage of work completion over the number of work taken.

Table 6.3.1: Percentage of work completed over total work taken up

Year	West Bengal	INDIA

2006-07	56.2	47.2
2007-08	48	46.1
2008-09	54.5	43.8
2009-10	66.4	48.9
2010-11	58.1	50.8
2011-12	40.4	20.3
2012-13	38.5	15.8
2013-14	29.05	18.34
2014-15	13.98	14.52
2015-16	14.88	15.58
2016-17	1.58	2.74

Source: www.nrega.co.in

We know that asset must be indivisible for it's come to use. But only neat about fifty percent of work taken have been completed up to 2010-11 from the initiation of the programme. From the above figure it is clear that West Bengal has performed better than all India level. But the percentage of completion of works in total works taken up has decreased in many folds and the figure became 14.88 percent and 15.58 in West Bengal and all India in 2015-16 respectively. On other hand 136.97 percent fund has been used and 28.64 crore persondays have been created under the programme in West Bengal. On the other hand using 95 percent of its fund West Bengal has completed only 1.58 percent of total work taken up in 2016-17 where as the state stood the first position creating 31.25 crore persondays in 2017-18. This indicates the mismatch between fund utilization and actual work under MGNREGA.

6.3.2 Existing infrastructural situation of studied villages and contribution of MGNREGA

In most of the villages, it is observed that there is no problem of labour availability for agricultural production. But there is problem of shortage of capital and land. The marginal households are unable to collect money for purchasing durable high value capital goods through MGNREGA work and they can only purchase traditional capital for agricultural production. Along with this they have no collateral to get debt for capital financing. But they can hire capital from large farmer and finance fertilizer as well as other kind of agricultural intermediate inputs from MGNREGA wage. Since land availability is fixed by nature, we can increase gross cropped area by multiple cropping with strong irrigational facility in the studied villages. So the problem of water availability is the strong supply constrain in a village economy. The problem of marketing of village produced goods is another possible supply constraint. The road construction through MGNREGA will smoother the marketing process of village produced goods. All these are the direct impact of MGNREGA on reduction of supply constraint through MGNREGA. This will benefit the society with good quality of labour supply. In the table below we will discuss what have been changed in rural infrastructure in our study villages after the introduction of MGNREGA.

Table 6.3.2: An account of assets creation under MGNREGA in 2016-17 in studied Villages

Description Of Work	Number Of Project			
	Bajesukdebpur	Manikpur	Dwaripara	Ramchandrapur Ditiyakhanda
Cross Bandh	10 (5,79,568)	_	_	_
Construction of ICDS Center	_	_	1 (7040)	_
Construction of CC Road	_	2 (3,31,232)		1(47,696)
Construction of House (IAY &Griha Samridhi)	4 (66,880)	_	2 (26,400)	1 (3,696)

Land Development Work	_	5 (8,71,024)	_	3 (1,11,936)
Natun Khal Open To Baro Bill With Plantation Of Khal Bandh	_	_	_	1 (70,048)
Pond Excavation	9 (6,31,488)	_	_	_
Pond Pailing	2 (76,032)	_	_	_
Pond Re-Excavation	1 (54,032)	1 (20,592)	_	1 (12,320)
Re-excavation of Canal	_	_	2 (4,45,633)	_
Re-Excavation of drain	_	4 (89,584)	1 (1,49,600)	_
Road Site Strip Plantation	15 (2,56,080)	_	_	_
Suchi Sikhyangan	1(27,280)	_	_	_
Total cost of MGNREGA assets in Rs.	16,91,360	13,12,432	6,28,672	2,52,032
Percentage of Expenditure under productive assets	45.03	67.94	70.88	77.09
Total Village assets in Rs.	8,80,17,450	5,19,58,700	2,40,57,750	3,69,58,400
Percentage of MGNREGA assets in total village assets	1.92	2.53	2.61	0.68

Source: Field survey & authors own calculation

We calculated the total asset in the studied villages considering the residential house (as per GNP calculation norm) and any kind of productive asset (without land). From the above figure it is very much clear that the capital inflow through MGNREGA is very much insignificant with respect to total asset in the villages. The percentages of MGNREGA assets in total village assets in 2016-17 were 1.92 and 0.68 percent in Bajesukdebpur and Ramchandrapur Ditiykhanda respectively. Along with low level of allocation, about 30 percent fund is used to non-productive assets and this kind of investment was only in view of distributional aspect.

Nine ponds are excavated and one pond is re-excavated under MGNREGGA in Bajesukdebpur in 2016-17. The remaining works are not related to production. Though a canal is passing away

beside the village, it is not able to provide water in rabi monsoon. On the other hand five land developmental works and five pond re-excavation are done in 2016-17 in Manikpur. In Dwaripara village two canals are re-excavated. Three land developmental work, one pond re-excavation and one new canal excavation project was under taken in Ramchandrapur Ditiyakhanda. But from our survey experience it is found that ponds are used in very few times for irrigation. Because most of the ponds in most of the village are owned by large farmer and they are not interested for intensive cultivation due to a wage hike after the introduction of MGNREGA and low return of enhancing cost of input. On the other hand about 80 percent ponds are inside the village and cultivable lands are outside the village. The medium, small and marginal farmers who consist of major sections in rural Bengal are interested in multi cropping due to earn their livings. They depend on canal irrigation. But canal are used in its sub-optimal level due to the absence of sub-canal. So our objective is to develop the canal system like a blood vessel through MGNREGA that we can provide irrigation facility to each plot of a cultivable land.

6.4 Summing up

The multiplier analysis has shown that, the output and employment of the study villages have been increased. The aggregate output multiplier for open economy in Dwaripara village is highest (1.763) followed by Manikpur village (1.603).The multiplier for the village Bajesukdebpur and Ramchandrapur Ditiyakhanda are 1.412 and 1.315 respectively. The difference in the values of multipliers arises from the output and income structures in the village economy. We can see that closed economy village multiplier is less than the open village economy Multiplier. In case of Dwaripara and Manikpur all kind of open economy Multiplier was higher relative to Bajesukdebpur and Ramchandrapur Ditiykhanda. The increase in income

from grocery, barber and education are significant than other sector in the study villages. The overall increase in production for the village economy will be 5.65 percent in Ramchandrapur Ditiyakhanda followed by Manikpur (3.94 percent). But the overall increase in production for village Bajesukdebpur and Dwaripara will 3.8 percent and 2.99 percent respectively. The increase in household income is smaller than that in output because all output does not go to income. The highest increase in income has gone to agricultural labour and farmers in most of the villages. The multipliers of the non-agriculture sectors are higher than those of the agricultural producing sectors (such as rice) in most of the study villages. Indirect employment generated because of MGNREGA interventions will be increased by 2.97 percent, 2.85 percent, 3.34 percent and 3.88 percent in the person-days generated in Bajesukdebpur, Dwaripara, Manikpur and Ramchandrapur Ditiyakhanda. This is a significant figure for all villages. It is interesting to note that the increase in direct employment under MGNREGA is less for women than for men in most of the study villages. The women shares in total increase are 17.73 percent and 22.14 percent in Dwaripara and Manikpur. The share is very low (9.56 percent) in Ramchandrapur Ditiyakhanda with respect to other villages. This indicates the tiny share of women in mainstream employment in the village; through they are willing to work much more. Excess capacity is the prior condition to hold the above mechanism. If there is full utilization of the resources, there is no possibility of income and employment generation in the economy and the multiplier will be ineffective. The percentages of MGNREGA assets in total village assets in 2016-17 were 1.92 and 0.68 percent in Bajesukdebpur and Ramchandrapur Ditiykhanda respectively. Along with low level of allocation, about 30 percent fund is used to non-productive assets and this kind of investment was only in view of distributional aspect which will not increase production and multiplier effect will be less effective.