Strategies for Water Management Activities under MGNREGS for Generating Better Employment Opportunities and Social Welfare

A study under the Small Grants Programmeof SRTT

Research Report Prepared by
Institute for Resource Analysis and Policy, Hyderabad

April, 2013

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Institute for Resource Analysis and Policy

1. Introduction

Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) is eulogized by many researchers as the foremost social protection initiative for eradicating rural poverty and unemployment; and reducing vulnerability, by way of generating demand for productive labour force in villages; providing private incentives for management of common property resources (for instance, Shah, 2009); and enhancement of environmental services (see for instance Shah, 2009; Tiwari *et al.*, 2011). However, field evidence suggests that performance of the scheme, both in terms of creation of employment and sustainable rural assets has been abysmal. In fact, of late, its ability to produce avowed outcomes has become a controversial issue among policy makers, academia and media.

In fact, the design of the scheme itself is short-sighted as it does not consider the unemployment scenario in the villages, the specific needs of unemployed people vis-à-vis wage rates, rural labour dynamics and employment generation potential of public works that can be taken up in different regions. Singh and Gill (2010) reported that in Punjab, only 28 per cent (in 2008-09) and 38 per cent (in 2009-10) of the job card holders were provided with employment. Whereas in Maharashtra, those who were provided with employment could work only for a few days: ranging from minimum of 22 to maximum of 29 man days of work per household between 2006-07 and 2009-10 (Shah, 2012). Similar situation exist in Kerala and Bihar where there is too little of land availability for taking up any public works. As a result, there has been widespread over-allocation of funds, with resultant "manufacturing" of work and misuse of funds by the local Panchayats; and the undeserved claiming the benefits, leaving the most deserving people under complete neglect.

Also, it is hard to find sufficient unemployed people in the villages who are willing to work for the scheme and avail off the benefits. The main reason is what MGNREGS offers in terms of income gain for labourers is too little to make respectable living. This is evident from the low daily wage rates and a fewer number of days of work offered to households under MGNREGS in some of the economically poor States, such as Bihar; Orissa; and West Bengal[1],from where large number of unemployed people migrates to States which are economically prosperous. If villagers get economic prosperity on migration, nothing negative can be linked to it (RTBI, 2009).

Further, the nature of water management activities chosen under the scheme and the manner in which these activities are planned and implemented in different regions, with least attention paid to the physical and socio-economic realities of the regions concerned generate several negative welfare effects (Bassi and Kumar, 2010). Ghose (2012) argued that in situations where land is privately and unequally held, it is difficult to create productive assets under MGNREGS. Jacob (2008) points out that the "Rural Employment Scheme" has made virtually zero impact on the livelihood security of Orissa's rural poor.

There is a great need to identify the type of land and water based interventions that can be taken up in different typologies of rural areas (based on agro-climatic, hydrological and

[1] In 2011-12, wage rate offered in Bihar was Rs 130 per man-day but only 38 man days of work was provided to each household. Similarly in Orissa wage rate was Rs 122 per man day and no of days of work offered was only 33 per household; and in West Bengal wage rate was Rs 132 and only 27 man-days of work was provided to each household.

geological factors) that would promote water security for the poor. These interventions should guide the employment models that can be adopted in these typologies to produce intended benefits. Rural areas in the Vidarbha region of Maharashtra will be selected for the survey. The district of Chandrapur, which is a tribal dominated district of the State, was selected for the study and total of four villages were surveyed.

2. MGNREGS and Its Implementation in Vidarbha Region of Maharashtra

Vidarbha region was selected for the study owing to the reason that the region has been in focus for rural distress caused by crisis in agriculture, manifested by high incidence of farmer suicides, and rural-urban migration.

In this section, we would discuss the rural employment scenario and achievements under MGNREGS in Maharashtra, with particular focus on Vidarbha region. Since a large proportion of the work implemented under MGNREGS are related to water management in the form of water conservation works, water harvesting and drought proofing, we would first discuss the overall water resource development scenario in Maharashtra in general, and Vidarbha region in particular. We would then go on to discuss the employment scenario in the State and the regional scenarios prior to MGNREGS implementation. Thereafter, we would discuss the nature of activities carried out under MGNREGS, the financial achievements, and the achievements in terms of employment generation in the context of Vidarbha region.

2.1 Water Resources in Maharashtra

The State lies between lat 15°35’ and 22°02’ N and log 72°36’ and 80°54’E. The state has a tropical monsoon climate. The annual rainfall varies from 400 mm in certain parts of Marathwada to 6000 mm in the western Ghat region. Figure 2 shows the isohyets of Maharashtra. It can be seen that parts of western Maharashtra and Konkan region have very high rainfall, with its values exceeding 2500 mm, annually.

The Sahyadri mountain range provides a physical backbone to the State on the West, while the Satpuda hills along the north and Bhamragad-Chiroli-Gaikhuri ranges on the East serve as its natural borders. The State has five distinct physiographic regions, namely Deccan Plateau, Central Highlands, Eastern Chhotanagpur Plateau, Western Ghats and Coastal Plains.

The average rainfall of state is around 1300 mm of which 88% occurs during June to September and remaining between October and December. This uneven distribution of rainfall has an important bearing on the State’s water resources planning. One-third area of the State falls under rain-shadow region with scanty rainfall. Nearly 1/4th of the drought prone area of the country is in the State of Maharashtra.

2.1.1 River basins, surface water resources, and dependability

The geographical area of the state is divided into basins of Krishna, Godavari, Tapi, Narmada and narrow basins of west flowing rivers of Konkan (Figure 1).

Table 1 gives the total renewable water availability and utilizable surface water resources of the basin which fall fully or partly in Maharashtra (source: based on GOI, 1999). As can be seen from Table 1, the utilizable water resources of some basins are far less than the renewable water resources, the difference being highest for the West-flowing Rivers located south of Tapi. This is due to topographical and other constraints, particularly lack of viable sites for impounding the water.

Thus the figures are not suggestive of the total amount of surface water available for development inside Maharashtra State. The average annual availability in above basin within

Maharashtra territory is anticipated as 163.82 BCM, out of which permissible use as per inter-state tribunal award is 125.94 BCM (Sodal, 2006).

Nearly, 89% of the State's geographical area falls in the three major river basins, viz., Godavari, Krishna and Tapi. While Krishna is considered to be a water-scarce basin, Godavari and Tapi are water-rich basins. The part of Godavari basin which is falling in Maharashtra's administrative territory, is the upper catchment of the basin. In the case of Krishna river basin, the upper catchment area extends over parts of Maharashtra and Karnataka.

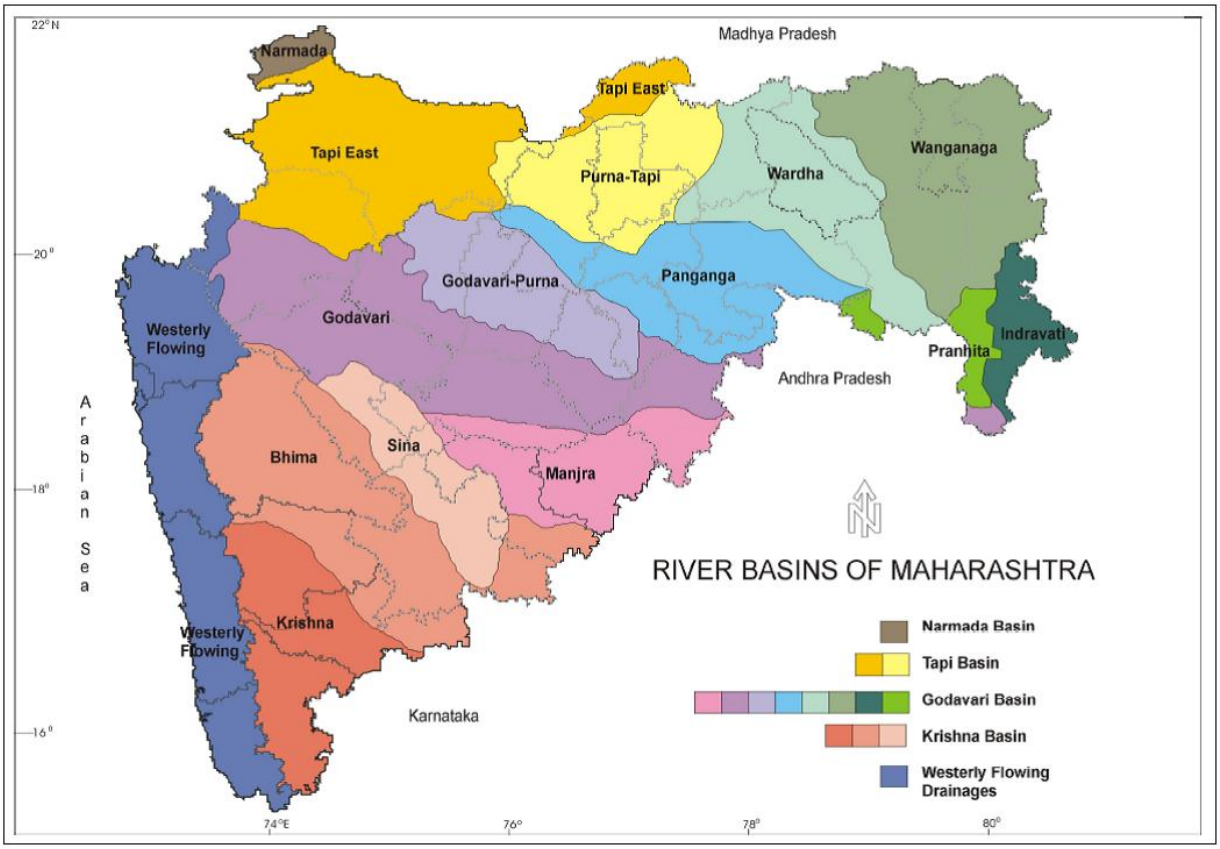


Figure 1: Map showing river basins of Maharashtra
(Source: GSDA and CGWB, 2011)

The amount of utilizable water resources which can be tapped by Maharashtra State depends on the percentage area of the basin falling within the State and the amount of water allocated by various interstate water dispute tribunals to the State from the respective basin. The relevant tribunal awards for Maharashtra are Godavari Water Disputes Tribunal (GWDT), Krishna Water Disputes Tribunal (KWDT) and Narmada Water Disputes Tribunal (NWDT).

The Godavari Water Dispute Tribunal Award (1980) allows the party States to utilize the water from the main river up to certain designated points within their territory, and does not specify the quantum of water. As per the award, Maharashtra can harness for beneficial uses all waters of Godavari up to the Paithan dam site on the Godavari main river, and up to Siddheswar dam site on Purna River, a tributary of Godavari. In addition, the award provides for diversion of 80 TM (i.e., 2,266 MCM) of the Godavari water from Polavaram Project to Krishna River upstream of Vijayawada Anicut. The water thus diverted in the Krishna will be shared among Andhra Pradesh, Karnataka, and Maharashtra as 45 TMC by Andhra Pradesh and 35 TMC by Karnataka and Maharashtra.

The KWDT had allocated 560 TMC (15,859 MCM) of the total 2060 TMC of dependable yield assessed at Vijayawada site to Maharashtra in 1973. The allocation was subsequently

reviewed in 2004 and a further allocation was made from the newly assessed dependable yield of 2173 TMC.

Table 1: The river basins falling in Maharashtra (fully or partly) and their surface water potential

Name of the River Basin	Total Basin Area (sq. km)	Area of the Basin within Maharashtra (Sq. Km)/% Area of the Basin in Maharashtra	% Area of Maharashtra covered by the Basin	Total Renewable Surface Water of the Basin (75%) Dependability (MCM)	Total Utilizable Surface Water Resources of the Basin (BCM)
Godavari	312812.0	152199/48.65	49.40	80550.0	76300.0
Krishna	258948.0	69425/26.80	22.5	60140.0	58000.0
Tapi	65145.0	51504/79.06	16.7	14500.0	14500.0
Narmada	98796.0	1538/1.55	0.50	34500.0	34500.0
Mahanadi	141589.0	238/0.17	0.07	66900.0	49990.0
West Flowing Rivers South of Tapi*	113067.0	32806/29.01	10.70	200940.0	36210.0
Total		307710	100.0	457530.0	269500.0

Note: No break up of renewable water resources for the basins which are falling fully in Maharashtra, i.e., in the Konkan region is available.
(Source: based on Table 3.6 & Annexure 3.1, p 420-42, GoM, 1999)

The ultimate irrigation potential of Maharashtra through both surface water and ground water resources was estimated as 12.6 m. ha. Surface irrigation potential to the tune of about 0.27 m. ha was created in the State prior to 1950. Since agriculture is prominent occupation of the rural population, the State has concentrated on construction of irrigation projects after Independence. Thus, it had witnessed a manifold increase in irrigation potential creation. By 2005, I had created 4.0 m. ha of irrigation potential from surface water resources. For this, it had constructed almost 2700 major, medium and minor irrigation projects (Sodal, 2006).

The share of major, medium, minor (State sector) and minor (Local sector) irrigation projects in the total irrigation potential created was 44.06 per cent, 13.40 per cent, 19.96 per cent and 22.58 per cent respectively. The additional irrigation potential created during 2005-06 was 1.17 lakh hectares showing an increase of 2.2 per cent over the cumulative achievement by the end of June 2005. The actual utilization of irrigation potential in 2005-06 was 20.13 lakh hectares (38.05 per cent) as against the potential of 51.73 lakh hectares created up to the end of June 2005 (Source: GoM, 2007).

2.1.2 Geology, geo-hydrology and groundwater resources

The State of Maharashtra has a heterogenous geology. Nearly 75 per cent of the State's geographical area is underlain by hard rock formations of Deccan Trap origin. Around 15% of the area is underlain by crystalline formations in the districts of Chandrapur, Bhandara, Garhchiroli and part of Nagpur district in Vidarbha region. Nearly, 10 per cent of the geographical area is underlain by alluvial formations extending from Dhule, Jalgaon, Buldhana and Amravathi districts, covering only portions of these districts' total geographical area.

The total renewable groundwater resource in the State was estimated to be 32961 MCM and the net groundwater available for utilization is 31214 MCM. Out of these, 1508 MCM is

earmarked for domestic and industrial requirement and the remaining is available for future irrigation.

Between 1988 and 2004, the groundwater use has increased by 4030 MCM, from 11050 to 15090 MCM. The present irrigation draft is to the tune of 14,240 MCM. Thus at the aggregate level, the net groundwater balance in the State is positive. But, using these aggregate figures for planning of groundwater development schemes would be disastrous. The reason is that a major portion of the un-utilized groundwater exists in the areas where demand for groundwater does not exist for either irrigation or drinking and/or is in areas, which are not favourable for development. This suggests the presence of areas which face over-exploitation of groundwater, particularly those areas which receive low rainfall and have semi-arid climatic conditions, and which do not have large areas under surface irrigation.

2.2 Irrigation Development in Maharashtra State and Vidarbha Region

2.2.1 Surface irrigation schemes

With half of India's dams located within its territory (Sodal, 2006), Maharashtra has one of the largest numbers of surface water reservoirs in the country (Figure 2). As on 1998, the State had a total reservoir storage capacity of 22.1 km^3 and 12.9 km3 of storage under construction. They together accounted for 14% of the total storage capacity of 250 km^3 of storage in the Country at that point of time (source: Water and Related Statistics, CWC, 1998).

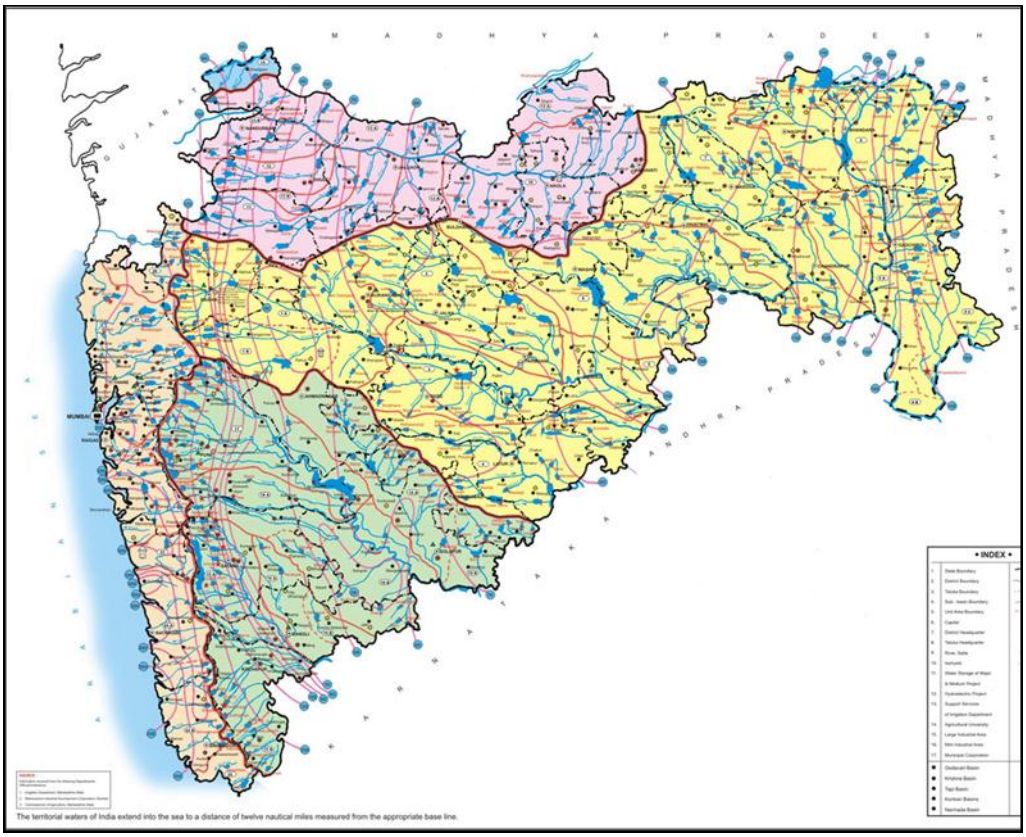


Figure 2: Map showing distribution of surface reservoirs in Maharashtra

By the end of June 2007, a total of 66 major, 233 medium and 2777 State sector minor irrigation projects were built in the State. The State had carried out a Water Audit of selected Major, Medium and State-run minor irrigation projects as on October 15, 2008. This covered 52

major projects (73 reservoirs), 199 medium project (having 201 reservoirs), and 1756 minor projects, with a total of 2007 projects. It showed that all the sub-basins of the WFRs of Konkan south of Tapi were water abundant, with more than 12,000 m^3 of water available per ha of CCA. Whereas, in the case of Godavari basin, three sub-basins were deficit basins, four were normal, one water surplus and one water-abundant. In the case of Krishna, out of a total of five sub-basins, two are highly deficit, two normal and one was water-abundant. In the case of Tapi also, out of the five sub-basins, three were in the deficit category and the remaining two in the normal category (Table 2).

Table 2: Categorization of river basins and their sub-basins according to water availability

Sr. No	Name of River Basin	Name of Sub-Basin	Classification for planning on the basis of water availability per Unit CCA
1	Godavari	Upper Godavari	Normal
		Lower Godavari	Deficit
		Purna	Do
		Manjra	Do
		Godavari-Sudha-Swarna	Normal
		Painganga	Do
		Wardha	Do
		Middle Wainganga	Surplus
		Lower Wainganga	Abundant
2	Tapi	Purna	Deficit
		Girna	Do
		Panzara	Normal
		Middle Tapi (Satpuda)	Normal
		Middle Tapi (South)	Deficit
3	Narmada	Narmada	Surplus
4	Krishna	Upper Krishna (west)	Abundant
		Upper Krishna (east)	Highly deficit
		Upper Bhima (up to Ujjani)	Normal
		Remaining Bhima	Normal
		Sina-Bori-Benetura	Highly Deficit
5	West Flowing Rivers in Konkan	Demanganga-Par	Abundant
		North Konkan	Do
		Middle Konkan	Do
		Vashishti	Do
		South Konkan	Do
		Terekhol-Tillari	Do

(Source: Government of Maharashtra, 2009)

Here, the water surplus basins are those where the total water available is in the range of 8000-12,000 m^3 per CCA, normal sub-basins are those where the availability is in the range of 3000-8000 m^3 per CCA, deficit basins are those with water availability in the range of 1500-3000 m^3, and highly deficit basins are those with water availability less than 1500 m^3 per CCA.

The water audit report for the irrigation year 2007-08 shows that out of a total design live storage capacity of 27,773 MCM, the actual live storage on 15th October, 2007 was 24,442 MCM. Out of this, a total of 16,806 MCM was diverted for irrigation through canals, and reservoir and river lift. Direct water use from the reservoirs for irrigation was 1844 MCM, which accounted for

9.1 per cent of the total irrigation water use. The total water loss on account of evaporation from the reservoirs was 3878 MCM, which accounted for 16 per cent of the total live storage of these reservoirs. The loss was lowest for major reservoirs (13%) and highest (24%) for medium reservoirs. In the case of minor reservoirs, the loss was 22 per cent of the total live storage. The un-utilized storage (excluding the hot weather inflow and design carry over) at the end of the irrigation year 2007-08, as against the total live storage recorded on 15th October, 2007, was 7.5 per cent (i.e., 1630 MCM).

2.2.2 Groundwater irrigation

Groundwater is a major source of water not only for drinking and domestic uses, but also for irrigation in the State. In the early stage of groundwater development, open wells formed the major source of irrigation. Cheap electricity and rural electrification triggered intensive and extensive groundwater use. There are around 17.42 lac wells for a total of 137 lac operational holdings in the State, of which 16.45 lac are open wells.

As per the most recent estimates, out of the total 1505 watersheds in the States, 76 are 'overexploited', i.e., the groundwater development is more than 100 per cent of the recharge and the water table during both pre and post monsoon shows a declining trend. Twenty watersheds are categorised as 'critical' where groundwater draft is more than 90 per cent of the recharge and where water table, either during pre or most monsoon or both shows significant declining trend and 163 watersheds are categorised as 'semi-critical' where groundwater development is between 70 and 90 per cent of the recharge and where water table in both pre or post monsoon interval, shows declining trend. A Map of Maharashtra State with the watersheds falling in different categories vis-à-vis stage of groundwater development is shown in Figure 6.

Hence, as per the official estimates, groundwater over-exploitation is a problem which has affected hardly 5 per cent of the State's geographical area. But, these estimates are far from the reality as far as the stage of groundwater development in the State is concerned, if the minor irrigation statistics on the extent of well failures is any indication. Minor Irrigation Census dated as far back as 2001 showed that, 9.3 per cent of the dug wells, 4.3% of the shallow tube wells and 10.7% of the deep tube wells in the State had failed, and a slightly larger percentage of the wells are not in use. The percentage is 10.9 for dug wells, 7.9 for STWs, and 13.6 for deep tube wells. Further, out of the 77,708 deep tube wells, 59.9 per cent suffered from poor discharge (Source: authors' own analysis using Minor Irrigation Census data 2001). These figures suggest that the extent of over-exploitation is much larger than what the official figures of groundwater balance suggest.

One reason for this anomaly, as pointed out by Kumar and Singh (2008) is that the groundwater outflows or the base flow, which reduces the amount of utilizable groundwater in the natural recharge and induced recharge into the aquifer, is not taken into account while estimating the net groundwater balance (also see Kumar *et al*., 2012).

There are also issues relating to the estimation of draft. The groundwater withdrawal figures are heavily under-estimated, because except for Latur and Osmanabad, the draft from irrigation bore wells and tube wells have not been fully accounted for. It is a well-known fact that there are large numbers of bore wells/ tube wells, which are not electrified, but serve as the main source of irrigation in all the parts of the State. The exact statistics about their number is not available. Further, it appears that much of the areas categorized as 'groundwater abundant' are those which are hilly. Not only that these areas are not suitable for groundwater exploitation, but they do not hold much groundwater due to steep groundwater flow gradients.

2.3 Rural Employment Scenario in Different Regions of Maharashtra Prior to MGNREGS

As per the Census of India-2011, there is a decline in cultivators from 46.1 per cent in 1961 to 24.8 per cent in 2001 which may be attributed to the shift of employment in other sectors as a result of industrialization (Misra, 2012). Over the years, employment pattern in the state has undergone a drastic change as the share of agriculture and allied activities has considerably declined from about 70 per cent in 1961 to 45 per cent in 2001, while the share of activities other than agriculture has increased. Compared to the urban areas where non-agricultural activities dominate the employment scenario, there is a lot of scope to increase these activities in rural areas of the state to reduce the pressure of population on land available for agriculture (Misra, 2012).

The main workers share in terms of percentage of total workers, reduced to 84.82 per cent in 2001 from 90.96 per cent in 1981. But the share of marginal workers in terms of percentage to total workers, increased to 15.18 per cent in 2001 from 9.04 per cent in 1981 (Table 3). Though, the proportion of cultivators declined from 35.12 in 1981 to 28.56 in 2001, the proportion of agricultural labourers has remained nearly unchanged. In 2001 (prior to MGNREGS), agricultural labourers were 26.85 per cent of the total workers (Table 4).

Table 3: Employment Scenario in Maharashtra

Activity	**1981**	**1991**	**2001**
Total Workers	26718230	33910366	42053330
Main Workers	24301793	31006109	35670836
Main Workers Share in Total	90.96	91.44	84.82
Marginal Workers	2416437	2904257	6382494
Marginal Workers Share in Total	9.04	8.57	15.18

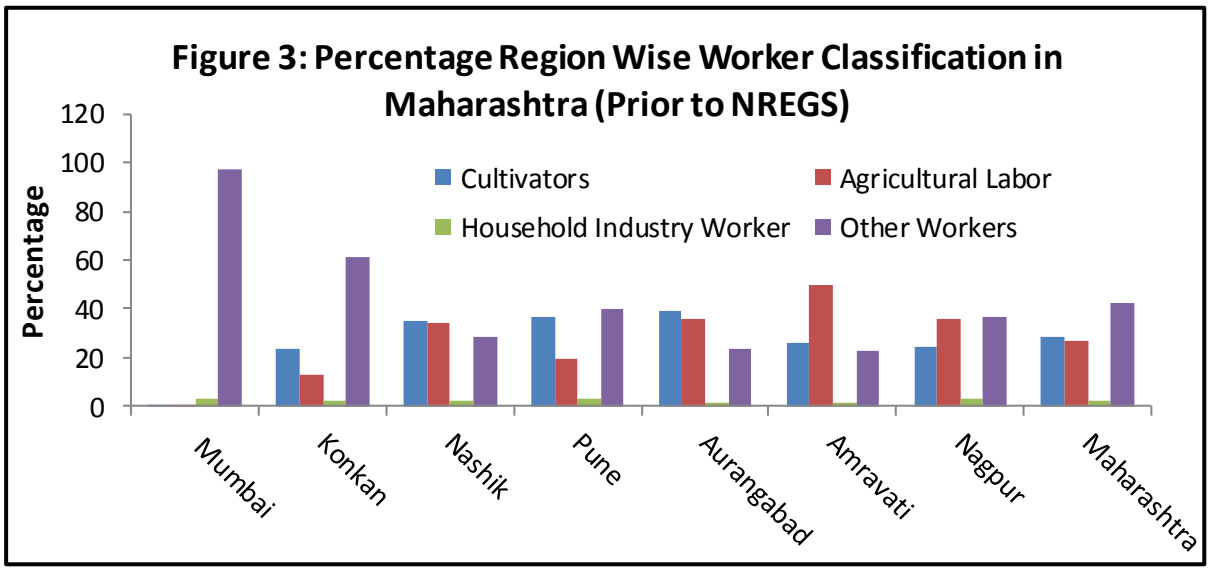
(Source: Census of India 1981, 1991, & 2001; and Planning Commission, 2005)

Table 4: Percent composition of workers in Maharashtra by major economic activity

Activity	**1981**	**1991**	**2001**
Cultivators	8535910 (35.12)	10172108 (32.81)	12009903 (28.56)
Agricultural Labourers	6470855 (26.63)	8313223 (26.81)	11290945 (26.85)
Household Industry Workers	620506 (2.55)	498431 (1.61)	1046149 (2.49)
Other Workers	8674522 (35.69)	12022347 (38.77)	17706333 (42.10)
Total	**24301828**	**31006109**	**42053330**

Note: Figures in the brackets represent percentages
(Source: Primary Census Abstract – 1981, 1991, and 2001)

Percentage composition of workers in each region of Maharashtra (prior to MGNREGS) is presented in Figure 3. Except for Mumbai, all regions have cultivators and agricultural labourers among total workers. In terms of percentage to total workers in each region, highest proportion of cultivators were in Aurangabad (38.8 per cent), followed by Pune (36.7 per cent), Nashik (34.8 per cent), Amravati (25.9 per cent), Nagpur (24.4 per cent), and Konkan (23.5 per cent). Whereas, highest proportion of agricultural labourers were in Amravati (50 per cent), followed by Nagpur (35.7 per cent), Aurangabad (35.6 per cent), Nashik (34.4 per cent), Pune (19.8 per cent), and Konkan (13.2 per cent). In all the regions, proportion of household industry workers was lowest in comparison to other workers. Overall, Maharashtra had about 28.6 per cent cultivators, 26.8 per cent agricultural labourers, 2.5 per cent household industry workers, and 42.1 other workers in 2001.



(Source: Census of India, 2001)

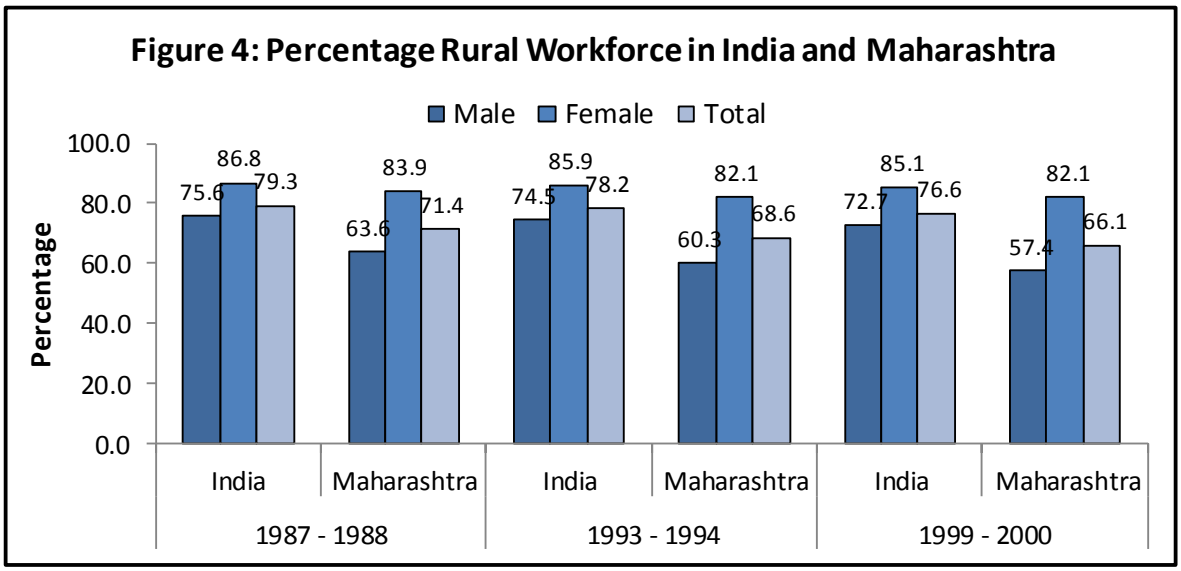
Table 5 shows the distribution of the work force in rural and urban areas of Maharashtra during two census years. Between 1991 and 2001, proportion of main workers has reduced from: 89 per cent to 81 per cent in rural areas; and 97.5 per cent to 93 per cent in urban areas. However, during the same time period, proportion of marginal workers has increased from: 11 per cent to 19 percent in rural areas; and 2.55 per cent to 7.37 per cent in urban areas.

Table 5: Distribution of workforce by rural and urban areas (figures in lakh)

Activity	1991			2001		
	Total	Rural	Urban	Total	Rural	Urban
Total	339.10	240.33	98.77	420.53	281.07	139.47
Main	310.06	213.81	96.25	356.71	227.52	129.19
	(91.44)	(88.96)	(97.45)	(84.82)	(80.95)	(92.63)
Marginal	29.04	26.53	2.52	63.82	53.55	10.28
	(8.56)	(11.04)	(2.55)	(15.18)	(19.05)	(7.37)

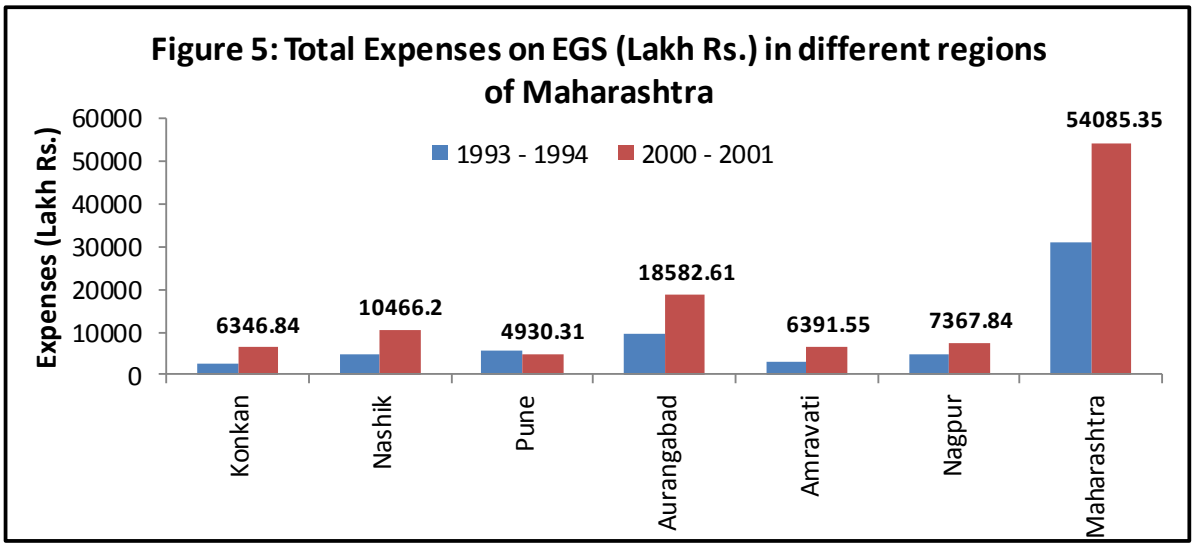
Note: Figures in the brackets indicate percentage
(Source: Primary Census Abstract 1991 and 2001)

Overall, total rural work force in Maharashtra declined from 71.4 per cent in 1987-88 to 66.1 per cent in 1999-2000 (Figure 4).This decline is mainly is due to reduction in the proportion of male workers from 63.7 per cent in 1987-88 to 57.4 per cent in 1999-2000. During the same time period, proportion of female workers remained more or less constant. Nevertheless, the proportion of total rural workers in Maharashtra was found to be less than the national average in all the three time periods under consideration (Figure 4).



(Source: NSSO, 43rd, 50th, &55th Round; and Census of India, 1991,& 2001)

Total expenditure on employment guarantee schemes (EGS) in Maharashtra increased from Rs 30855.24 lakh in 1993-94 to Rs89265.06lakh in 2001-02.In terms of percentage increase in spending on EGS between 1993-94 and 2000-01 in different regions of State, highest increase was in Konkan (162 per cent), followed by Nashik (111 per cent), Amravati (102 per cent), Aurangabad (93 per cent), and Nagpur (50 per cent). Whereas in Pune region it declined by 15 per cent (Figure 5). As a percentage to total spending in the entire State during 2000-01, highest expenditure on EGS was in Aurangabad region (34.4 per cent), followed by Nashik (19.4 per cent), Nagpur (13.6 per cent), Amravati (11.8 per cent), Konkan (11.7 per cent), and Pune (9 per cent) regions.

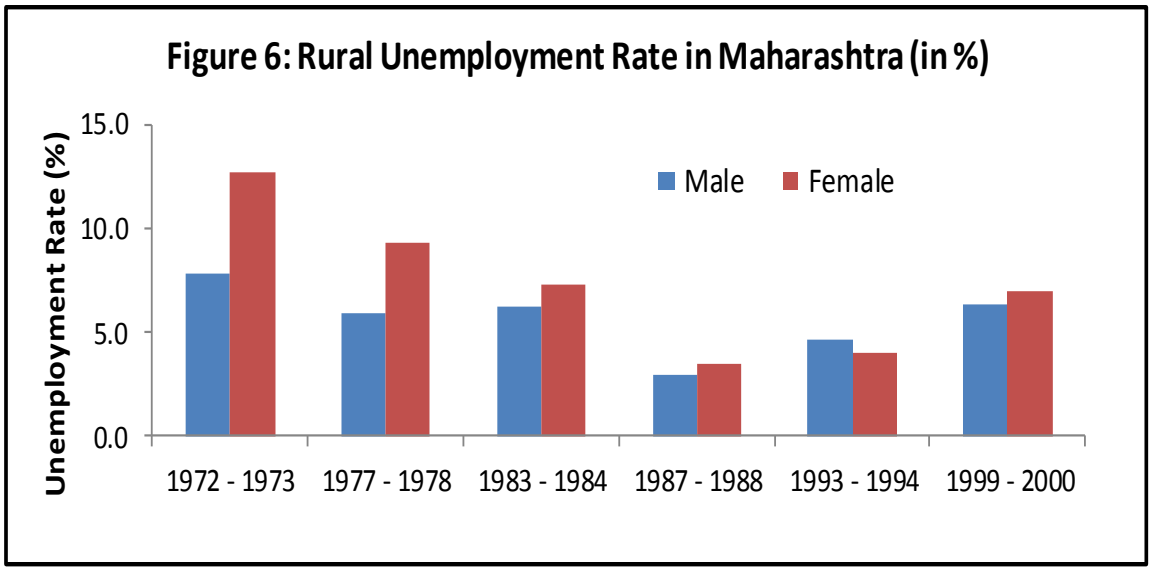


(Source: Monthly progress report of EGS, Department of planning, GoM)

In terms of employment generation by EGS, total number of man days generated was more or less stable from 1993-94 to 1999-00 (average of 938 lakh man-days per year). However there was a drastic increase in employment generation in 2000-01 and 2001-02 (average of 1,365 lakh man-days per year). This also correspond withincrease spending on employment guarantee scheme, i.e., from Rs 45,586 lakh in 1999-00 to Rs 89,265 lakh in 2001-02. This sudden surge in

both expenditure and employment generation was due to drought conditions in many districts (GoM, 2002). As a percentage to total number of man days generated through EGS during 2001-02 in the entire State, highest was in Aurangabad region (40 per cent), followed by Nashik (17.7 per cent), Nagpur (12.6 per cent), Amravati (11 per cent), Konkan (10 per cent), and Pune (8.7 per cent) regions. Further, wage offered under EGS during 2001-02 in the State was estimated to be only Rs 33.12 per man-day of work.

Figure 6 presents the trend in rural unemployment rate in Maharashtra. Overall, rural unemployment rates have fallen from 1972-73 up to 1987-1988, but have shown a rise in 1993-94 and 1999-2000. Male unemployment rate declined from 7.8 per cent in 1972-73 to 5.85 per cent in 1977-78 before rising to 6.25 per cent in 1983-84. From there onwards, it has fallen drastically to 2.9 per cent in 1987-88 before rising again in 1993-94 (4.6 per cent) and 1999-2000 (6.3 per cent). On the other hand, female unemployment rate has fallen from 12.7 per cent in 1972-73 to 3.5 per cent in 1987-1988 before rising to 4 per cent in 1993-94 and increasing to 6.9 per cent in 1999-2000. Overall, rural unemployment rate in Maharashtra was4.3 per cent in 1993-94 and6.5 per cent in 1999-2000.



(Source: NSSO 55th round and GoM, 2002)

2.4 Overview of MGNREGS Implementation in Maharashtra, with Focus on Vidarbha

In Maharashtra, the Employment Guarantee Scheme (EGS) was initiated way back in 1972. The scheme was given the constitutional validity by Maharashtra Employment Guarantee Act, 1977. The Act called for guaranteed employment to every adult person in rural areas. Based on the experience with EGS in Maharashtra, the Central government enacted the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA, 2005. The act provides for 100 days of guaranteed employment to each rural household in a financial year for unskilled manual work. At present the Act covers the entire rural areas of the country. As per the schedule I of the Act, the work under Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) will be essentially creation of sustainable rural assets.

After MGNREGA, REGS in Maharashtra was merged with MGNREGS. The scheme was launched in three different phases, depending on the backwardness index of various districts in the State (Shah, 2012). Low productivity; low wages; and proportion of SC and ST population were considered for computing this index. First phase of the scheme was launched on February, 2006 in twelve districts viz. Dhule, Nandurbar, Ahmednagar, Aurangabad, Nanded, Hingoli,

Yavatmal, Amaravati, Gondiya, Bhandara, Chandrapur and Gadchiroli. This was followed by six more districts viz. Thane, Vardha, Buldhana, Osmanabad, Akola and Vashim in the second phase. In the third phase (April 2008 onwards), all the remaining districts were brought under the purview of MGNREGA.

Vidarbha is one of the most distressed regions in Maharashtra. About 50,481 farmers' suicides have been reported from this region (NCRB). The main reasons for these suicides include: stress of agrarian crisis; loan; low price for yield; high prices for seeds; pest attacks; insufficient seeds or pesticides at market level; crop disease; crop failure; and, over use of fertilizers and pesticides (Mishra et. al., 2006 & TISS 2005). As a result, most of the marginal, small and medium farmers are engaged in MGNREGS works in this region. For labourers, work performed under MGNREGS is the main source of livelihood activity after the farm labour work (Premsagar, 2012).

As per the provisions of MGNREGA Act, the job card has to be issued by the Gram Panchayat within 15 days of receiving application for work. Further, employment should also be provided within 15 days of issuance of job card, failing which unemployment allowance has to be paid to the applicant. Performance of MGNREGS in this respect is quite abysmal in the state as only 1/3rd of the households who applied for work from 2006-07 to 2009-10 were issued job cards. Similarly, for districts falling under Vidarbha, number of job cards issued against the applications was found to be substantially low for all the years under consideration (Table 6). In 4 out of 11 districts in the region, i.e. in Bhandara; Gondia; Gadchiroli; and Chandrapur, job cards issued against the applications (in % terms) has come down between 2006-07 and 2009-10. In 2009-10, the proportion of job cards issued was highest in Amravati (42.6) district, followed by Akola (41.4), Yavatmal (40.92), Gondia (39.8), Chandrapur (39.7), Bhandara (38.5), Buldhana (38.4), Wardha (37.9), Washim (37.2), Gadchiroli (34.7), and Nagpur (0.07)districts.

Table 6: Percentage of job cards issued under MGNREGA in Nagpur Region

Districts in Vidarbha Region	2006 – 07	2007 – 08	2008 – 09	2009 – 10
Nagpur	-	0.07	0.075	0.07
Wardha	36.83	37.85	37.85	37.85
Bhandara	39.74	38.52	38.52	38.52
Gondia	40.59	39.83	39.83	39.83
Gadchiroli	34.42	34.36	34.36	34.36
Chandrapur	39.85	39.76	39.76	39.76
Amravati	42.48	42.62	42.62	42.62
Washim	33.65	37.18	37.18	37.18
Yavatmal	39.28	40.92	40.92	40.92
Akola	41.37	41.37	41.37	41.37
Buldana	38.19	38.36	38.36	38.36
Maharashtra State	**32.29**	**33.8**	**33.8**	**33.8**

(Source: Shah, 2012)

Though the scheme does not favour any social group, it was expected that it will self-select the weaker section and the poor. However, figures presented in table 7 shows that only 10-11 percent of households belonging to SC and ST category received job cards as against 75-78 per cent for other categories in the entire State. Similarly, there was no major improvement in the 11 districts falling under Vidarbha, in terms of proportion of job cards received by SC and ST community between 2006-07 and 2009-10.

Table 7: Share of SC, ST and other category in job card issued

Districts in Vidarbha	2006 – 07	2009 -10

Region						
	SC	ST	Others	SC	ST	Others
Nagpur	-	-	-	6.45	2.15	91.4
Wardha	6.03	5.1	88.87	5.83	4.93	89.24
Bhandara	4.37	1.33	94.3	4.37	1.32	94.31
Gondia	2.65	2.12	95.23	2.66	2.18	95.16
Gadchiroli	13.83	36.37	49.8	13.82	36.37	49.81
Chandrapur	6.51	9.28	84.21	6.84	10.31	82.5
Amravati	3.39	1.84	94.77	3.35	1.83	94.82
Washim	17.64	6.54	75.82	17.11	6.36	76.53
Yavatmal	10.59	20.12	69.29	10.54	19.56	69.9
Akola	16.02	4.77	79.21	16.02	4.77	79.21
Buldana	7.04	0.89	92.07	6.97	0.89	92.14
Maharashtra State	**9.78**	**12.06**	**78.16**	**9.92**	**10.72**	**79.36**

(Source: Shah, 2012)

In terms of employment generation, the scheme has failed to live up to its expectations. The actual employment generation in Maharashtra is much below the 100 days per household mark. From 2006-07 to 2009-10, it varied from a lowest of 22 man-days per household to a highest of 29.7 man-days per household. Though the number of jobs created per year in man-days increased substantially from 2006-07 to 2008-09 (from 20 to 329 lac), the number of HHs which demanded jobs also increased remarkably. Similarly in all the11 districts of Vidarbha region, the employment generation was poor (Table 8). In 2009-10, Yavatmal recorded average man-days of 92.2 per household. However, in other districts of the region it was still low, with the highest of 36.7 man-days per household in Akola, followed by 33 in Wardha, 29.3 in Buldhana, 27 in Bhandara, 26.9 in Washim,26.8 in Amravati , 25.6 in Gondia, 23.2 in Chandrapur, 12 in Nagpur, and 3.2 Gadchiroli.

Table 8: Employment Generation

Districts in Vidarbha Region	Total Man days of Work Generated (in Lac)				Average Man days per household per year			
	2006–07	2007–08	2008–09	2009–10	2006–07	2007-08	2008–09	2009–10
Nagpur	-	-	-	-	-	-	-	12.00
Wardha	-	0.69	0.84	0.91	-	17.35	16.93	33.08
Bhandara	-	13.07	24.30	11.77	-	25.53	31.35	27.01
Gondia	0.58	18.00	34.54	7.44	4.68	28.81	36.87	25.56
Gadchiroli	2.24	13.22	20.09	7.17	19.44	31.73	36.34	3.18
Chandrapur	2.52	5.10	3.68	3.29	19.78	20.42	13.29	23.17
Amravati	3.04	10.82	12.81	4.46	28.23	34.90	37.57	26.78
Washim	-	0.36	1.18	0.33	0.00	25.36	28.27	26.90
Yavatmal	0.05	2.72	10.94	4.35	8.82	31.00	44.72	92.16
Akola	-	0.54	1.21	0.14	-	25.94	33.56	36.68
Buldana	-	0.76	5.70	2.36	-	25.88	27.58	29.33
Maharashtra State	**20.00**	**122.52**	**329.84**	**108.99**	**22.06**	**29.70**	**28.40**	**26.04**

(Source: Shah, 2012)

In the State, the wages offered under MGNREGS range from as low as Rs 57 in 2006-07 to Rs 79.5 in 2009-10. This indicates that average wage payment under scheme is substantially low to keep unemployed interested in applying for MGNREGS jobs. However, in 6 districts of Vidarbha, i.e. Amravati, Buldhana, Gadchiroli, Nagpur, Wardha and Washim, average wage rate offered per man-day of work in 2009-10 was in excess of Rs 100.

Table 9: Average wage payment in Rs per day under MGNREGS

Districts in Vidarbha Region	2006 – 07	2007 – 08	2008 – 09	2009 – 10
Nagpur	-	-	-	116
Wardha	-	69.9	93.03	105.8
Bhandara	47	52.61	58.08	56.6
Gondia	56.69	59.2	62.32	67.03
Gadchiroli	93.88	92.85	97.08	101
Chandrapur	58.07	60.95	72.84	78.41
Amravati	61.9	80.92	84.91	101.53
Washim	-	94.42	89.46	101.27
Yavatmal	64.41	111.42	110.3	106.61
Akola	-	78.52	75.77	76.71
Buldana	-	84.55	131.44	177.43
Maharashtra State	**57.3**	**74.3**	**75.66**	**79.45**

(Source: Shah, Deepak, 2012)

The works undertaken under MGNREGS in Maharashtra were mainly on water and soil conservation; irrigation; afforestation and land development. In 2008-09, total of 89,205 works were completed in the State with most of them relating to: water conservation and harvesting (48.6%); drought proofing (18%); rural irrigation (13.2%); and renovation of water bodies (12.8 per cent) (Table 10).In terms of proportion to total works completed in the State, maximum was in Amravati district (12.4%) of Vidarbha region. In other districts of the region also accounted for significant proportion of the works executed. These districts include: Buldhana (5.9 per cent); Yavatmal4456 (5 per cent); Chandrapur (4.9 per cent); and Gondia (4.6 per cent). In Akola, Buldhana, Nagpur, Wardha, Washim, and Yavatmal maximum proportion of work was on drought proofing; in Bhandara and Gondia it was on rural irrigation; in Amravati and Gadchiroli it was on water conservation and harvesting; and in Chandrapur it was on renovation of water bodies.

Table 10: Type of works undertaken during 2008 – 09

Districts in Vidarbha Region	Total Works	Percentage Share of								
		RI	FC	WCH	DP	MI	ILD	WB	LD	Others
Nagpur	42	-	-	-	100	-	-	-	-	-
Wardha	528	-	-	-	85.23	11.74	0.19	2.84	-	-
Bhandara	1665	53.27	-	22.22	1.57	2.04	0.12	16.82	1.26	2.7
Gondia	4110	44.31	0.07	25.11	6.59	0.1	0.07	21.75	0.61	1.39
Gadchiroli	3005	22.73	0.07	34.04	10.24	-	11.65	16.87	4.33	0.07
Chandrapur	4389	3.26	0.07	2.57	20.44	0.27	-	71.36	0.23	1.8
Amravati	11032	10.79	0.05	61.87	7.95	2.26	2.42	1.52	0.34	12.8
Washim	1771	3.11	-	36.48	42.18	3.16	1.69	8.92	2.43	2.03
Yavatmal	4456	5.34	0.81	18.38	32.21	0.22	0.02	32.94	0.74	9.34
Akola	2253	0.31	-	18.29	79.81	-	0.04	0.13	0.8	0.62
Buldana	5238	7.33	-	13.1	76.63	-	-	0.02	1.53	1.39

Maharashtra State	89205	13.17	0.31	48.6	18.01	0.62	0.61	12.78	3.63	2.2

(Source: Shah, 2012)

Note: RI = Rural Irrigation; FC = Flood Control; WCH = Water Conservation and Harvesting; DP = Draught proofing; MI = Micro Irrigation; ILD = Irrigation Facility and Land Development; WB = Water Bodies (Renovation of water bodies); LD = Land Development.

3. Design Issues in the Employment Generation Model of MGNREGA

The states such as Punjab, Kerala and Maharashtra reported that performance of NREGS in terms of employment generation is very poor. Singh and Gill (2010) reported that in Punjab, only 28 per cent (in 2008-09) and 38 per cent (in 2009-10) of the job card holders were provided with employment. Further, more than one-half of jobs created were confined to only five districts of the state. But, there is no systematic analysis of the root cause of this problem of abysmal performance of the scheme. Instead of analyzing the problem, the government is keen to increase the allocation for MGNREGA to create a greater impact on poverty.

The key argument by the policy makers and the scholars alike (see Shah, 2009 for instance) is that MGNREGS benefits only the poor and the work-linked payment reduces the error of inclusion of the undeserving in the scheme. Perhaps, this is merely based on the observation that the number of households reporting for work is much smaller than that of job card-holders. But, for this argument to hold water three conditions need to be satisfied.

First: there should be sufficient employment opportunities created in the villages for all job card holders through public works. *Second*: there should be sufficient demand for the low-paid wage labour under MGNREGA from the really deserving ones, or in other words NREGA work should offer sufficient incentive for the poor people, who are dependent on year round wage labour for their survival. In other words, the allocation under MGNREGA scheme in a state should match with the demand in the respective state. Third: employment from MGNREGA is available during the lean season for the wage labourers.

Unfortunately, none of these conditions are met in MGNREGA programme. The employment potential of villages in term of number of days of wage labour that the villages can create through public works such as construction/renovation or water bodies, road construction etc. has never been studied. Nor, has there been any real assessment of the unemployment situation in the rural areas across the country. Firstly, availability of land for undertaking public works is open to question, particularly in agriculturally more prosperous states. Out of the India's total geographical area (which is about 329 m. ha), in 2007-2008, only 13 per cent, i.e., 42.4 m. ha was barren and fallow (Source*:* Directorate of Economics and Statistics, Department of Agriculture and Cooperation). Against this, the agricultural prosperous state of Punjab has only 1 per cent (Tiwana *et. al.,* 2007); and Kerala has about 3.6 per cent of total geographical area as barren and fallow land *(Source: Directorate of Economics and Statistics*). Situation is even more precarious in Bihar, which also has a high rate of rural poverty and unemployment.

Thus, whether deserving or undeserving, people are left out of getting any employment as there is too little of land available for taking up any public works such as pond digging or construction of roads. Further, activities such as de-silting of ponds, cleaning of village drains and minor canals etc. undertaken in various States would not result in 100 days of employment for each of the registered job-card holders (Figure 2). At national level, only 8 per cent of households provided with work completed 100 days of employment during 2011-12. But villagers are still happy to get job-cards as after 15 days of application for work, they become eligible for a daily unemployment allowance (as per GOI, 2008), in case no employment is offered to them. There is no reason to believe that only the most deserving among the job card holders demand jobs or at least demand compensation for non-employment. It is quite likely that the poor, unemployed

people, instead of waiting for opportunities in their village, either go for work in others' farms or migrate to towns and cities in search of regular labour.

Secondly, it is hard to find sufficient unemployed people in the villages who are willing to work for MGNREGS and avail off the benefits. According to some estimates, there are about 3.2 crore people in rural India who are unemployed and looking for jobs (Source: GOI Report, 2010). In the financial year 2010-11, funds available under MGNREGS for paying wages was around 32,000 crore (also includes carried over balance of previous year). Considering that each employed unskilled labourer gets Rs. 10,000 in a year, some 3.2 crore jobs were required to be created in 2010-11. Thus, even if these official statistics of unemployment rate are reliable, NREGS still has sufficient funds to provide 100 days of work to all the unemployed people in the villages, provided the allocation across states reflects the employment situation in these states.

But in reality, this is not so. In many cases, fund allocation is far in excess of their genuine needs. Even in states like Bihar where unemployment is high, large numbers migrate to states, which are economically prosperous and where labour is in short supply, to work in farms and elsewhere instead of seeking wage labour under MGNREGA[2]. This dichotomy is because what NREGS offers in terms of income gain for labourers is too little to make respectable living. Here it is important to note that the employment generation through MGNREGA is generally poor in densely populated states like Bihar which have extremely low per capita land availability. As per one estimates, annually about 52 lakh poor people from Bihar alone migrate to other states in search of better livelihood opportunities. MGNREGS has actually adversely affected the labour market by providing migrant labourers with better and sometimes unfair bargaining power. As was found in the state of Punjab, in addition to increased wages, agricultural labourers were demanding free accommodation, and many other daily facilities. It is hard to believe that such labourers will stay back for MGNREGS works. Thus getting required number of unemployed people in villages to work under MGNREGS is highly improbable. In many instances, gram Panchayats "manufacture" public works, which get executed with the help of machinery. This leads to corruption and embezzlement of funds. We would discuss about it in the subsequent section.

Thirdly, in some cases, people do apply for job cards as security measure but they may not go for public works offered by the PRIs, as the opportunity costs are high. This is because the NREGA work is also available during the peak season, when demand for farm labour is high.

Over and above these points, lastly, as found during our interface with villagers in the states of Haryana, Maharashtra and Rajasthan that village Sarpanch, rural elite and local government officials connive to get work completed by involvement of local contractors and use of machinery (not allowed as per GOI, 2008). They report this as work taken-up under NREGS and get hold of all the funds which is actually allocated to the poor and the needy. In return they offer only a small proportion (10-20 per cent) of the money to job card holders. Such practices are quite common as at least 50 per cent of the works has to be allotted to gram Panchayat for execution, as per the GOI, 2008. Singh and Gill (2010) and Kumari (2010) identified some other practical problems which have resulted in poor employment generation under NREGS. These problems include: lack of transparency; absence of social audit; proper project planning; professional staff; delayed payments; fake muster rolls; and fund locking.

Thus, faulty design of MGNREGS, which does not consider the employment generation potential in the villages through public works, the number of unemployed people in the villages and their demands vis-a-vis wage rates, and the labour dynamics, leads to over-allocation of funds, and the resultant manufacturing of works by the Panchayats, embezzlement of funds, the ineligible claiming the benefits of the scheme, while the most deserving losing the opportunity.

[2] Millions of rural people from Bihar and central India migrate to states such as Punjab, Maharashtra, Haryana, and Kerala during the agricultural season to work in the farms and thus not available for doing public works.

Obviously, the solution does not lie in allocating more days of labour, but in targeting NREGS funds to areas where rural employment scenario is poor, and where avenues exist for generating employment through public works.

The employment generation model based on public works would be sustainable and would be able to generate welfare under the following conditions. The total amount of funds allocated for paying wages is based on either the total potential of the region to generate employment through public works, or the total demand for employment, whichever is smaller. Therefore, two scenarios are possible. Under scenario 1, wherein the demand for low paid wage labour is higher than the total amount of employment that can be generated through public works, it is quite likely that work would be 'manufactured', if enough funds are made available. This would particularly be the case when the overall administration of the scheme implementation is poor. Under scenario 2, wherein the demand for employment is lower than the employment generation potential of public works, there is a likelihood of people, who work as farm labourers, reporting to such works, causing a distortion in the labour market of the region. But these two phenomena can happen only if the total wage earned from participating in public works is better than net cash earnings the local unemployed people can get from outmigration (in the first scenario) or from working in local farms for the same amount of labour (in the second scenario).

4. Description of Chandrapur District: The Study Area

Chandrapur district is located in the eastern part of the Maharashtra State and lies between $78^0$48' to $79^0$59' E Latitudes and $19^0$27' to $20^0$43' North Longitudes, covering a total geographical area of about 10,920square kilometers (Km^2). The district is surrounded by Nagpur, Bhandara and Wardha districts in the north, Gadchiroli district in the east, Yavatmal district in the west, and Adilabad district of Andhra Pradesh in the south. The eastern boundary is demarcated by the Wainganga river, the western boundary by the Wardha river, and the southern boundary by Wainganga River and Manikgarh hills. This district is divided into 4 sub-divisions having 15 talukas, 14 towns and 1791 villages.

According to 2011 Census, total population of Chandrapur district is 2194262 of which 1120316 are males and 1073946 are females. About 64.9 per cent of the total population resides in rural areas. The population density in the district is around 192 per square km. The average literacy rate in the district is 81.35 per cent with male and female literacy rates of 88.73 per cent and 73.65 per cent respectively. In rural areas literacy rate is slightly lower at 76.77 per cent.

The district receives an annual average rainfall of about 1337 mm with 66 average normal rainy days. Agriculture is the main livelihood activity in the region with almost 41.5 per cent of the total area of the district under cultivation. Further, 35.5 around per cent is under forest, 8.4 per cent of the land under non-agricultural use, 5.1 per cent under permanent pastures, 3.4 per cent is cultivable waste land, 1.1 per cent under tree crops and sacred groves, 2.4 per cent is barren and uncultivable land, and 2.7 per cent is under fallows (current and other).

In 2008-09, cropped area in the district was around 532 thousand hectares, out of which only 22 per cent was irrigated and rest was rain-fed area. Majority of sown area is irrigated through groundwater which constitutes nearly 64 per cent of gross irrigated area. In 2006-07, there was total of 19,278 wells (open and bore wells), out of which about 56 per cent were energized. Major crops include oilseeds, cereals, cotton, and pulses which constitutes about 76.2 per cent of the cropped area. A small proportion (1.9 per cent) of the cropped area was also under horticulture crops. The total livestock population in the district was around 873 thousand in 2008-09. However, majority of cattle were local low yielding varieties (Table 6).

The total wetland area in Chandrapur district is nearly 46,948 ha. Out of the total area under wetlands, proportion of area under: tanks/ponds is 36.84 per cent; reservoir/barrage is

20.62%; and rivers and streams is 41.48 per cent (NWIA, 2010). Canals, open wells, and bore wells are the main sources of irrigation in the district. Water for drinking and other domestic uses is sourced from hand pumps, PWS, open wells and dug wells. Nearly 44 per cent of the population in the district is served by hand pumps, followed by dug well/open well (38 per cent) and PWS (18 per cent). Water quality is a major concern especially in the case of water sourced from dug wells and open wells. Nearly 61 per cent of the population in Chandrapur district was reported to be affected by contaminated water sources (UNICEF).

Table 6: Livestock Categories

Livestock	Male ('000)	Female ('000)	Total ('000)
Non descriptive cattle (local low yielding)	340.1	230.9	571.1
Crossbred cattle	6.9	20.5	27.4
Non-descriptive buffaloes (local low yielding)	63.5	87.2	150.8
Graded Buffaloes	0.2	1.0	1.2
Goat	69.6	18.4	88.1
Sheep	10.3	24.4	34.7

(Source: Agriculture contingency plan for Chandrapur district)

5. Study Objectives, Approach and Methods

5.1 Objectives

1. Quickly evaluate the performance of MGNREGS in sample villages of selected state in terms of employment generated against the unemployment situation, sustainability of the assets created and their impacts.

2. Identify the reasons for success/failure of the schemes.

3. Assess the macro climatic, hydrological, geological and topographical realities in the rural areas in the selected area.

4. Evolve broad strategies for rural water management in the region, and the specific interventions that are based on land and water, thereof.

5. Assess the real employment generation potential of public works relating to rural water management, and compare against unemployment situation in rural areas.

6. Work out rural employment models that can be promoted under public works in the region.

5.2 Approach and Methodology

Objective 1: The employment creation in the villages in terms of the total number of days of work received by the labourers in a year, will be compared against the unemployment situation vis-à-vis the total number of wage workers, and the number of days for which they are jobless in a year.

For analyzing the impacts of WM interventions, the condition of water levels in irrigation wells and domestic water supply sources, traditional water bodies (ponds, tanks), reservoirs built etc., would be studied against that in the control villages from the area. Field survey will be conducted for realizing the above objective.

Objective 2: This would be analyzed in relation to the unemployment scenario in the villages and the region under consideration, the specific needs of unemployed people in the villages, the rural labour dynamic, reasons for rural-urban migration, and how far the aspirations of the labour force in the villages are met by the schemes chosen. Effort will be made to see whether the people who receive wage employment are those who actually deserve it. Data collected from field survey will also be used here.

Objective 3:The conditions of the rural areas will be analyzed on the basis of field visits and physical observation of work sites, and data collected from the secondary sources such as from the state groundwater departments, Central Ground Water Board, state water resources departments and Indian meteorological department.

Objective 4: Analysis undertaken for objective 1-3, will be supported by expert knowledge to evolve broad strategies for rural water management and specific land and water based interventions for the region that can be taken up under public works.

Objective 5:For this, availability of common land for undertaking the related public works and the number of days of wage labour that can be created through these works will be assessed.

Objective 6: The employment generation potential would be compared against the rural labour dynamic in the villages, and the unemployment scenario.

6. Results from the Survey

6.1 Physical Environment of the Study Area

The scope of generating employment under MGNREGS through water related activities depends on the physical feasibility of implementing the water oriented interventions that are permissible under the scheme. This is determined by the physical settings, particularly topography, drainage pattern, geology and hydrology. Here we consider only the engineering feasibility, and not economic viability. For instance, in a plain land with no surface drainage, storage interventions for capturing runoff, which occurs in sheet form, will not be feasible. In a ravine area, where the soils are loose and have no hard strata underlying the soils, it is difficult to build a structure to stop water flows. The foundation of the structure would be highly unstable. Similarly, in a river or stream with shallow embankment, it would be difficult to build water impounding structure such as a dam for creating reservoir storage.

6.1.1 Drainage, topography and rainfall

The district of Chandrapur, which falls in the upper catchment of Godavari river basin, is a well-drained area. Three major tributaries of the river Godavari, i.e. Wardha, Wainganga, and Penganga flow through the region. It also has a hilly and mountainous terrain. The average annual rainfall is about 1420 mm. The eastern part of the region receives more rainfall than in the west. This is an “assured” rainfall zone; saving from droughts. The number of rainy days in a year is in the range of 60-70. The region is located at an altitude of 150-300m.

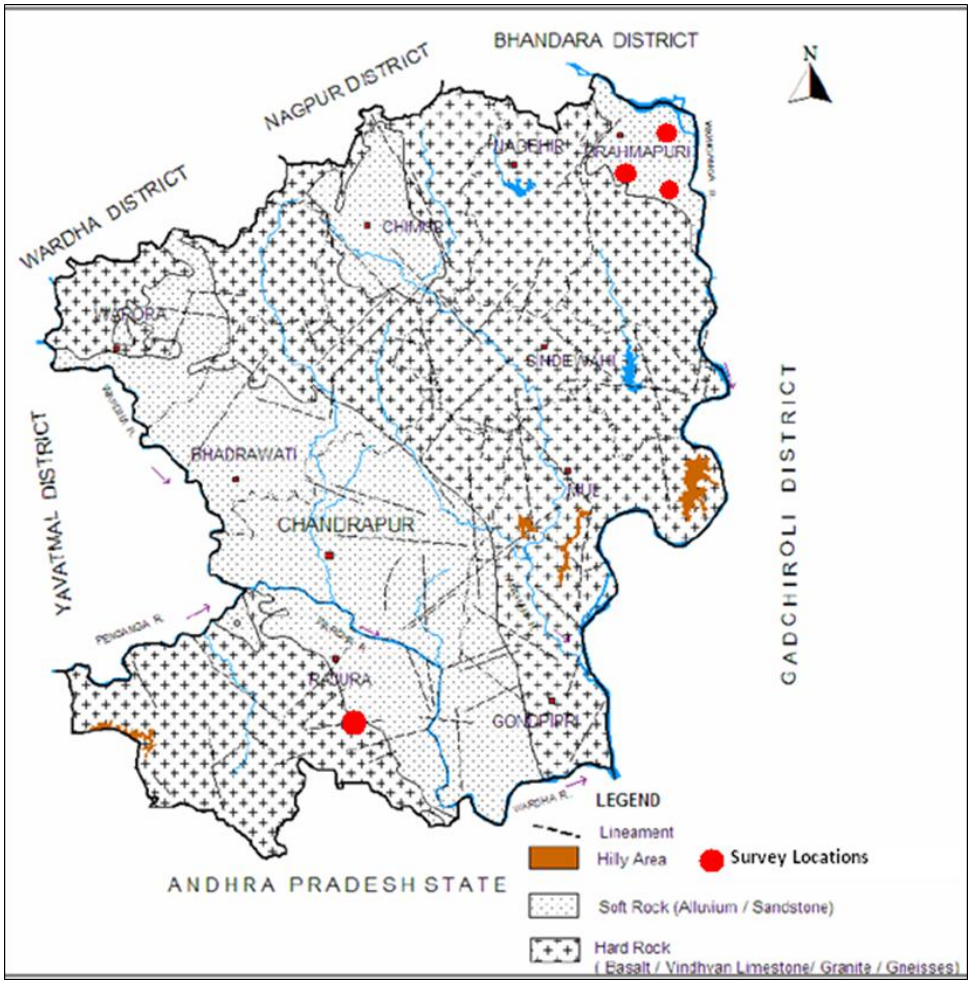
6.1.2 Climate

The region has semi-arid climate. December is the coldest month. The average maximum temperature during December is 28.2 °C, and the average minimum temperature is 11.6 °C. The

southern part is comparatively warmer than the north, which ranges between 29.6 °C and 14.6 °C. The daily mean temperature starts rising from the month of February, and May is the peak summer month when mean maximum temperature goes up to 47 °C and minimum temperature is 28 °C to 29 °C. In severe heat periods, the temperature is among the highest in the South Asia. However, temperature drops after May with the onset of monsoon, which lasts from June to September when it is hot and humid.

The relative humidity is very high during monsoon, exceeding 70 per cent. But after the monsoon, humidity goes down rapidly and in summer it is as low as 20 per cent. The prominent wind direction is from south to north. In summer the wind blows from east to south and, during the monsoon, from south to east. During winter, the wind direction changes from north to east. It is characterized by the violent winds, indicating the approach of the hot season which lasts till the middle of June.

6.1.3 Geology and hydrology



The underground formations in the region are characterized by wide heterogeneity with granite gneiss (on the eastern side), lower Gondwana formations, Penganga beds, Vindhyan super group and patches of alluvium. All the formations except alluvial patches have very poor groundwater potential and cannot hold much water.

Figure 7 Geological Map of Chandrapur District Map showing Survey Locations
(Source: Central Ground Water Board, 2009)

The region witnesses large amount of runoff because of the high rainfall, hilly and mountainous terrain underlain by hard rock formations, and it forms part of the rich water-yielding catchment of Godavari. The outflow of groundwater from the hilly formations creates stream-flows during the non-monsoon months in the tributaries. The geology of Chandrapur

district is depicted in Figure 7. The survey locations are also indicated in the same map. The drainage map of Chandrapur district with taluka boundaries is presented in Figure 8.

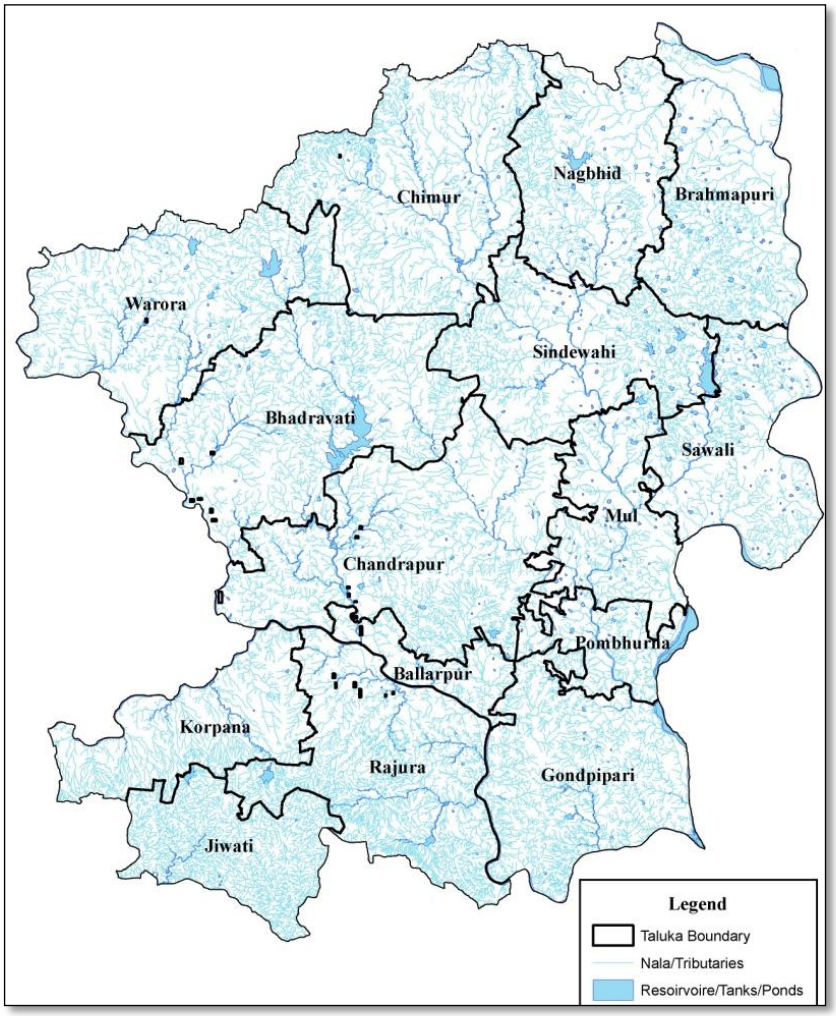


Figure 8: Drainage Map of Chandrapur District
(Source: Ground Water Survey and Development Agency, Pune)

6.2 Profile of the Sample Villages

A total of 4 villages were surveyed for the study. In one of the villages, i.e. Tembhurwahi, MGNREGS interventions on water conservations were mostly for the benefit of individual farmers' whereas in other villages it was for both individuals and community. Demographic details of the selected villages are presented in table 7. A brief profile of selected villages is as follows:

Table 7: Details of the selected villages

Selected Village	Taluka	No of Households			Population	Total Village Area (sq.km.)	Agricultural Area (Ha)	Irrigated Area (Ha)	Forest Area (Ha)	Common Area (Ha)
		APL	BPL	Total						
Tembhurwahi	Rajura	262	24	286	1335	684.5	626	132	11.72	0.52
Rampuri	Brahmapuri	82	80	162	652	345.56	133	104	121.36	37.60
Baradkinhi	Brahmapuri	524	160	684	2771	-	-	-	-	-

Mendki	Brahmapuri	1019	122	1141	4185	563.0	573	230	8.36	36.71

(Source: As per the data provided by respective Gram Panchayats)

1] **Village Tembhurwahi:** It is located in Rajura block of district Chandrapur, Maharashtra. The village is situated about 120 km to the North of Adilabad town, Andhra Pradesh. The village is spread over 684.5 square kilometres with a total population of 1335and 286 households, comprising 262 APL and 24 BPL families. Total agriculture area in the village is about 626 hectares, of which only 21 per cent is irrigated. As per the survey, for most of the households, agriculture is the primary occupation and an existing tank is the major source of irrigation. Main crops include: paddy, cotton, and soya bean in Kharif season; wheat in Rabi season; and some farmers (mainly those having dug wells in the catchment area of irrigation tank) grow vegetables in summer season. MGNREGS works were started in 2010 and were mainly on construction farm ponds and village roads.

2] **Village Rampuri**: It is located in Brahmapuri block of Chandrapur district. It is situated at a distance of about 30 km from Brahmapuri town. The village is spread over an area of 345.56 square kilometers. About 121 hectares of area is under forest. Out of the total agricultural area of 133 hectares, 78.2 per cent is irrigated. The total population of the village is 6552. Out of total of 162 households, nearly 80are below poverty line. For most of the people, agriculture is the main source of livelihood activity and major irrigation sources include irrigation ponds, water diverted through small check dams and dug wells. Kharif paddy is the major crop in the area. MGNREGS was launched in 2006 and major works taken up include: construction of small check dams; pond de-silting; construction of village roads and individual household latrines.

3] **Village Baradkinhi**: It is situated in Brahmapuri block of district Chandrapur. The total population of the village is 2771. Out of total of 684 households, 622 belong to General, 52 to SC, and 10 to ST families. Further, 160 households are in below poverty line category. Most of the people in the village are either in agriculture or working as labourers. Major irrigation source is a pond. MGNREGS was launched in 2010 and major works taken up include: pond de-silting; and road construction.

4] **Village Mendaki:** It also falls in Brahmapuri block of Chandrapur district. Village has a total population of about 4185. Out of total of 1141 households, 237 belong to SC; 36 to ST; 472 to OBC; 238 to non-tribal and 158to other families. Further, about 122 households are in below poverty line category. Total agricultural area is 573 hectares, out of which about 40 per cent is irrigated. Majority of households depend on agriculture as their main source of livelihood activity. In Kharif, paddy is the main crop which is sown in nearly 378.61 hectares. In Rabi season, chick pea crop is taken in nearly 120 hectares of land. Major irrigation source is ponds. MGNREGS started in 2006 and major works taken up include: pond de-silting; tree plantation; and road construction.

6.3 Performance of MGNREGS in the Study villages

A total of 120 families, comprising General; SC; ST; and OBC households were surveyed from the selected villages. A socio-economic profile of the households is given in table 8. A total of 37 people belonging to General, 88 to SC, 50 to ST, and 290 to OBC categories were covered by the survey. Average family size (No of people/household) varied from 3.2 in village Rampuri to 4.7in village Baradkinhi. Within the villages, highest average family size was of: SC Households in Baradkinhi village (6.0); ST households in Tembhurwahi (4.7) and Mendaki (4.0) villages; and OBC households in Rampuri village (3.7).

Overall, the average annual family income (in Rs/household/annum) in all the villages is quite low (Table 8). It was highest in village Tembhurwahi (Rs 23,500), followed by Baradkinhi (Rs 20,266), Rampuri (Rs 18,714), and Mendaki (Rs 18,457) villages. In terms of average annual household income within the villages, SC households had the highest income in Tembhurwahi (Rs 25,000), Rampuri (Rs 19,666), and Mendaki (Rs 25,000); and ST households had it in Baradkinhi (Rs 21,500).

Table 8: Socio-economic profile of the surveyed households

Caste Category	Tembhurwahi Village (N*=20)		Rampuri Village (N*=35)		Baradkinhi Village (N*=30)		Mendaki Village (N*=35)	
	Avg. Family Size	Average Annual Income (Rs/HH)	Avg. Family Size	Average Annual Income (Rs/HH)	Avg. Family Size	Average Annual Income (Rs/HH)	Avg. Family Size	Average Annual Income (Rs/HH)
General	-	-	-	-	-	-	3.4	13,910
SC	3.5	25,000	2.8	19,666	6.0	17,500	3.5	25,000
ST	4.7	20,000	2.3	19,000	5.5	21,500	4.0	15,000
OBC	4.4	24,285	3.7	18,157	4.4	20,625	3.8	18,071
Overall	**4.4**	**23,500**	**3.2**	**18,714**	**4.7**	**20,266**	**3.6**	**18,457**

N* is the number of households surveyed in each selected village
(Source: Authors' own analysis using primary data)

6.3.1 Status of un-employment situation in the villages prior to NREGA

In all the selected villages, job seekers are engaged in farm labour work during Kharif season and do Muhua flower and tendu leaves collection during summers. Some people also migrate to Madhya Pradesh to work on tendu leaves collection for about a month during summers. In the remaining non-agricultural season (period between November and March), they look for employment opportunity outside their village, mainly to work in industries in Chandrapur and Ballarpur towns. Prior to launch of MGNREGA, nearly 15 per cent of the population in village Tembhurwahi, 64.5 per cent in village Rampuri, 11 per cent in village Baradkinhi, and 25 per cent village Mendaki were either un-employed or in search of employment during non-agricultural season.

With respect to proportion of family members who take up farm labour work in a year, almost 87 per cent of males and 73 per cent of males in Tembhurwahi; 90.5 per cent of males and females in Rampuri; 95 per cent of males and females in Baradkinhi; and 69 per cent of males and 75 per cent of females get engaged in such works during agricultural season (Table 9). Similarly a high proportion of people, ranging from 68.6 per cent to 94.4 per cent males; and 73 per cent to 95.5 per cent females take up non-farm labour work. In all the villages, proportion of ST population who take up both farm and non-farm labour work was quite high in comparison to members of other caste groups.

Table 9: Village and social group wise proportion of people who take up labour work

Particulars	General		SC		ST		OBC		Overall	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Tembhurwahi Village										
No of adult members in surveyed HHs	-	-	4	2	6	6	22	18	32	26
Proportion who do farm labour work	-	-	75.0	100.0	100.0	100.0	86.36	61.1	87.5	73.07

Proportion who do non-farm labour work	-	-	75.0	100.0	100.0	100.0	81.81	61.1	84.37	73.07
Rampuri Village										
No of adult members in surveyed HHs	-	-	11	12	6	9	25	21	42	42
Proportion who do farm labour work	-	-	81.8	66.7	100.0	100.0	92.0	100.0	90.5	90.5
Proportion who do non-farm labour work	-	-	81.8	66.7	100.0	100.0	92.0	100.0	90.5	90.5
Baradkinhi Village										
No of adult members in surveyed HHs	-	-	9	8	4	3	40	34	53	45
Proportion who do farm labour work	-	-	88.9	87.5	99.9	99.9	97.5	97.1	94.4	95.5
Proportion who do non-farm labour work	-	-	88.9	87.5	99.9	66.6	90.0	82.4	88.9	82.2
Mendaki Village										
No of adult members in surveyed HHs	14	11	14	13	1	1	22	23	51	48
Proportion who do farm labour work	64.3	90.9	57.1	69.2	100.0	100.0	77.3	69.6	68.6	75.0
Proportion who do non-farm labour work	85.7	100.0	64.3	76.9	100.0	100.0	86.4	69.6	80.4	79.2

(Source: Authors' own analysis using primary data)

Average number of days of farm and non-farm labour work (per person per annum) for all the selected locations is presented in figure 9. Overall, average number of days of involvement in labour work (both farm and non-farm) was highest in village Rampuri (139.5), followed by Tembhurwahi (101), Mendaki (79.7), and Baradkinhi (55) villages. For both males and females, average number of days of farm labour work performed was highest in village Tembhurwahi (98 and 93 respectively), followed by Rampuri (91 and 87 respectively), Baradkinhi (61 and 83 respectively), and Mendaki (58 and 60 respectively). Whereas, average number of days of non-farm labour work performed by male members was highest in Rampuri, followed by Tembhurwahi, Mendaki and Baradkinhi villages; and for females members, highest was in Rampuri, followed by Mendaki, Tembhurwahi, and Baradkinhi villages.

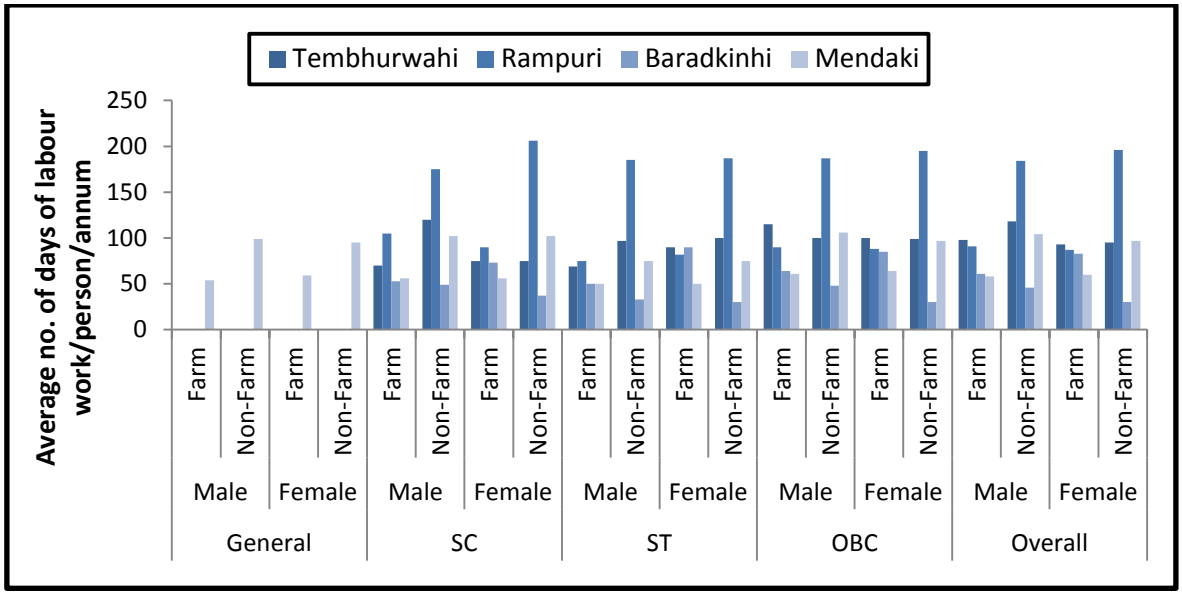


Figure 9: Village and social group wise average number of days of labour work per year
(Source: Authors' own analysis using primary data)

Average number of days of labour work performed (farm and non-farm) for male and female members belonging to SC and ST households was highest in village Rampuri, except for ST female members engaged in farm labour where it was in village Tembhurwahi and Baradkinhi. Whereas, for OBC male and female members, work performed was found to be highest in: village Tembhurwahi for farm labour; and village Rampuri for non-farm labour activities.

6.3.2 Extent of migration from the villages for employment before NREGA

Most of the migration in the selected villages takes place between November and March when there is no farm related work. Many people migrate to nearby towns in search of jobs and many other migrate to the state of Madhya Pradesh to work as tendu leaves collector. Prior to launch of MGNREGA, around 2-3 per cent of the population from Rampuri village, 7 per cent of the population from Baradkinhi village, and 25 per cent of the population from Mendaki village used to migrate. The duration of migration varied from 30 to 60 days. Even after the launch of MGNREGA in the respective villages, the migrations continue. As a result there is a low demand for MGNREGS work from the village community. In Rampuri village alone, MGNREGS works worth Rs 1 crore has been sanctioned and approved but has not started because there is no demand for work from the job card holders.

6.3.3 Description of the assets created under MGNREGS

In village Tembhurwahi, works related to farm ponds and village roads construction were taken up. Total of 10 farm ponds and 6 village roads were constructed during 2012-13. It is interesting to note that farm ponds were constructed using tractors and machinery without involvement of any manual labour. Such works were sanctioned and approved by the agriculture department. On an average Rs 35,000 was spent on construction of each farm pond which measures around 2 acres.

In village Rampuri, de-silting of one pond, tree planting, and construction of one check dam were completed during 2012-13.In addition, construction of about 76 double pit individual household latrines is planned for 2013-14. However, construction of each latrine provides only 19 man-days of unskilled labour work. In village Baradkinhi, ponds de-silting; and construction of check dams and village roads were taken up. In Mendaki village, de-silting of 3 ponds; raising of 1

plant nursery and tree plantation; and construction of 4 village roads were completed during 2012-13.Plants raised in nursery include species of *Pongamia* (Karanj),Gulmohar, Eucalyptus, Fever nut (Sagargoti), Gooseberry (Aamla), Soapnuts (Reetha), Cashew and Tamarind.

Proportion of people who were engaged in various works over the years is given in table 10. In village Tembhurwahi and Baradkinhi, majority of people were engaged in road construction. In village Rampuri, de-silting of tanks/ponds and cleaning of irrigation canals engaged maximum proportion of people. Whereas in village Mendaki, de-silting of tanks/ponds and road construction employed maximum proportion of people. Works related to digging of wells and farm ponds; construction of check dams; and tree plantations engaged least proportion of people.

Table 10: Proportion of people engaged in various MGNREGS works

Year	Nature of Work	Proportion of people involved in a specific work (in terms of % to total number of people under respective category in each village)							
		Tembhurwahi		Rampuri		Baradkinhi		Mendaki	
		Male	Female	Male	Female	Male	Female	Male	Female
2008-09	Irrigation canal cleaning	-	-	9.5	7.1	-	-		
	Tank/pond de-silting	-	-	19.0	19.0	-	-		
	Tank/pond de-silting and road construction	-	-	-	-	-	-	11.8	16.7
	Tank/pond de-silting and irrigation canal cleaning	-	-	31.0	33.3	-	-		
	Tank/pond de-silting and check dam construction	-	-	-	-	-	-	2.0	2.1
2009-10	Tank/pond de-silting	-	-	7.1	7.1	-	-		
	Tank/pond de-silting and road construction	-	-			-	-	19.6	29.2
	Tank/pond de-silting and irrigation canal cleaning	-	-	21.4	23.8	-	-		
	Digging of farm ponds	-	-	-	-	-	-	2.0	8.3
2010-11	Road construction	65.6	65.4	-	-	30.2	46.7	-	-
	Tank/pond de-silting	-	-	2.4	2.4	-	-	2.0	2.1
	Tank/pond de-silting and irrigation canal cleaning	-	-	59.5	66.7	-	-	-	-
	Tank/pond de-silting and road construction	-	7.7	-	-	-	-	41.2	60.4
	Tree plantation and road construction	-	-	-	-	-	-	2.0	-
	Irrigation canal cleaning and farm pond digging	-	-	7.1	2.4	-	-	-	-
2011-12	Road construction	65.6	69.2	-	-	35.8	51.1	-	-
	Tank/pond de-silting	-	-	2.4	-	-	-	-	-
	Well digging	-	-	-	-	1.9	2.2	-	-
	Tank/pond de-silting and irrigation canal cleaning	-	-	7.1	2.4	-	-	-	-
	Tank/pond de-silting and construction of check dams	-	-	2.4	2.4	-	-	-	-
	Irrigation canal cleaning and digging of farm ponds	-	-	66.7	71.4	-	-	-	-
	Well digging and	-	-	-	-	5.7	11.1	-	-

	construction of check dams								
	Tank/pond de-silting and road construction	-	7.7	-	-	-	-	43.1	54.2
	Road construction and tree plantation	-	-	-	-	-	-	2.0	-

(Source: Authors' own analysis using primary data)

6.3.4 Employment generated through MGNREGS over the Years

Details on the proportion of people who applied for job registration and who actually got registered are given in table 11. Overall, a high proportion of people belonging to different caste categories applied for registration and all of them were able to get their names registered in the job cards. However, there was a wide variation in the amount of time taken by gram panchayat for issuing job cards. In terms of average number of days per household, it took 5.8 days in village Rampuri; 20 days in village Baradkinhi; 30 days in village Tembhurwahi; and 60 days in village Mendaki for issue of job cards to registered members. Thus in three of the four villages, MGNREGA guideline that the job cards should be issued within 15 days of applying for registration was not met.

Table 11: Details on status of registration under MGNREGS

Particular	General		SC		ST		OBC		Overall	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Tembhurwahi Village										
People who applied for Job registration (%)	-	-	100.0	50.0	83.3	100.0	90.9	83.3	90.6	84.6
People who got registered (%)	-	-	100.0	50.0	83.3	100.0	90.9	83.3	90.6	84.6
Average no. of days for receiving job cards	-	-	30	30	30	30	30	30	30	30
Rampuri Village										
People who applied for Job registration (%)	-	-	100	50	83.3	77.8	92.0	100	92.9	81
People who got registered (%)	-	-	100	50	83.3	77.8	92.0	100	92.9	81
Average no. of days for receiving job cards	-	-	6	6.2	5.6	5.9	5.7	6	5.8	5.8
Baradkinhi Village										
People who applied for Job registration (%)	-	-	88.9	100.0	100	100	97.5	94.1	96.2	95.6
People who got registered (%)	-	-	88.9	100.0	100	100	97.5	94.1	96.2	95.6
Average no. of days for receiving job cards	-	-	20	20	20	20	20	20	20	20
Mendaki Village										
People who applied for Job registration (%)	92.9	90.9	85.7	76.9	100.0	100.0	90.9	87.0	90.2	85.4
People who got registered (%)	92.9	90.9	85.7	76.9	100.0	100.0	90.9	87.0	90.2	85.4
Average no. of days for	60	60	60	60	60	60	60	60	60	60

receiving job cards										

(Source: Authors' own analysis using primary data)

In terms of application for employment, a significantly lower proportion of people requested for jobs than those who got registered. But over the years (between 2008-09 and 2011-12), proportion of people applying for employment has increased (Table 12). For male workers, it increased from 66.7 per cent (2008-09)to 83.3 per cent (2011-12) in village Rampuri; from 17.6 per cent (2008-09) to 56.9 per cent (2011-12) in village Mendaki; and from 30.2 per cent (2010-11) to 39.6 per cent (2011-12) in village Baradkinhi. For female workers, it increased from 61.9 per cent (2008-09) to 81 per cent (2011-12) in village Rampuri; and from 27.1per cent (2008-09) to 79.2 per cent (2011-12) in village Mendaki, whereas it remained constant (67 per cent) in village Baradkinhi. In village Tembhurwahi, proportion of males and females who applied for jobs between 2010-11 and 2011-12 remained constant at 78.1 per cent and 54.1 per cent respectively.

Almost all the people who applied for employment were provided with jobs (Table 12). However, proportion of people who actually worked on the given jobs between 2008-09 and 2011-12 was slightly less than those who were provided with employment. On an average, nearly 3 per cent of the males in village Tembhurwahi; 2.5 per cent of the females in village Rampuri; 4 per cent of the females in village Baradkinhi; and 2.5 per cent of males in village Mendaki were not interested in taking up given MGNREGS jobs.

Table 12: Status on employment applications made under MGNREGS

Particulars		**Proportion of people (in terms of % to total number of people in respective category)**											
		Who requested for jobs				**Who were given jobs**				**Who actually worked**			
		2008-09	**2009-10**	**2010-11**	**2011-12**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2008-09**	**2009-10**	**2010-11**	**2011-12**
Tembhurwahi Village													
SC	Male	-	-	75	75	-	-	75	75	-	-	75	75
	Female	-	-	50	50	-	-	50	50	-	-	50	50
ST	Male	-	-	83.3	83.3	-	-	83.3	83.3	-	-	83.3	83.3
	Female	-	-	100	100	-	-	100	100	-	-	100	100
OBC	Male	-	-	77.3	77.3	-	-	77.3	77.3	-	-	72.7	72.7
	Female	-	-	39.3	39.3	-	-	39.3	39.3	-	-	39.3	39.3
Overall	**Male**	**-**	**-**	**78.1**	**78.1**	**-**	**-**	**78.1**	**78.1**	**-**	**-**	**75.0**	**75.0**
	Female	**-**	**-**	**54.1**	**54.1**	**-**	**-**	**54.1**	**54.1**	**-**	**-**	**54.1**	**54.1**
Rampuri Village													
SC	Male	45.5	18.2	81.8	81.8	36.4	18.2	81.8	81.8	36.4	18.2	81.8	81.8
	Female	25.0	16.7	58.3	58.3	25.0	16.7	58.3	58.3	16.7	16.7	50.0	50.0
ST	Male	66.7	0	66.7	66.7	66.7	0	66.7	66.7	66.7	0	66.7	66.7
	Female	66.7	22.2	77.8	77.8	66.7	11.1	77.8	77.8	66.7	11.1	77.8	44.4
OBC	Male	76.0	0	88.0	88.0	76.0	0	88.0	88.0	76.0	0	88.0	88.0
	Female	81.0	0	95.2	95.2	81.0	0	90.5	95.2	81.0	0	90.5	95.2
Overall	**Male**	**66.7**	**4.8**	**83.3**	**83.3**	**64.3**	**4.8**	**83.3**	**83.3**	**64.3**	**4.8**	**83.3**	**83.3**
	Female	**61.9**	**9.5**	**81.0**	**81.0**	**61.9**	**7.1**	**78.6**	**81.0**	**59.5**	**7.1**	**76.2**	**78.6**
Baradkinhi Village													
SC	Male	-	-	0	33.3	-	-	0	33.3	-	-	0	33.3
	Female	-	-	50.0	75.0	-	-	50.0	75.0	-	-	37.5	62.5
ST	Male	-	-	16.7	16.7	-	-	16.7	16.7	-	-	16.7	16.7
	Female	-	-	100.0	100.0	-	-	100.0	100.0	-	-	100.0	100.0

OBC	Male	-	-	37.5	42.5	-	-	37.5	42.5	-	-	37.5	40.0
	Female	-	-	70.6	64.7	-	-	70.6	64.7	-	-	67.6	64.7
Overall	**Male**	**-**	**-**	**30.2**	**39.6**	**-**	**-**	**30.2**	**39.6**	**-**	**-**	**30.2**	**37.7**
	Female	**-**	**-**	**66.7**	**66.7**	**-**	**-**	**66.7**	**66.7**	**-**	**-**	**60.0**	**64.4**
Mendaki Village													
General	Male	7.1	7.1	35.7	42.9	7.1	7.1	35.7	42.9	7.1	7.1	35.7	42.9
	Female	27.3	36.4	90.9	100.0	27.3	36.4	90.9	100.0	27.3	36.4	90.9	100.0
SC	Male	14.3	14.3	50.0	50.0	14.3	14.3	50.0	50.0	7.1	7.1	50.0	50.0
	Female	23.1	30.8	69.2	69.2	23.1	23.1	69.2	69.2	15.4	23.1	69.2	69.2
ST	Male	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Female	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
OBC	Male	22.7	36.4	59.1	68.2	22.7	36.4	59.1	68.2	22.7	31.8	54.5	63.6
	Female	26.1	47.8	73.9	73.9	26.1	47.8	73.9	73.9	26.1	47.8	73.9	73.9
Overall	**Male**	**17.6**	**23.5**	**51.0**	**56.9**	**17.6**	**23.5**	**51.0**	**56.9**	**15.7**	**19.6**	**49.0**	**54.9**
	Female	**27.1**	**41.7**	**77.1**	**79.2**	**27.1**	**39.6**	**77.1**	**79.2**	**25.0**	**39.6**	**77.1**	**79.2**

Note: During 2008-09 and 2009-10, no MNRGES works were undertaken in village Tembhurwahi and Baradkinhi.

(Source: Authors' own analysis using primary data)

In terms of average number of days of work requested per person, demand for MGNREGS jobs was quite low in selected villages. Average number of days of employment requested by male workers was: 60 (2010-11) and 90 (2011-12) in village Tembhurwahi; 26 (2008-09), 39 (2009-10), 47 (2010-11) and 68 (2011-12) in village Rampuri; 18 (2010-11) and 33 (2011-12) in village Baradkinhi; and 76 (2008-09), 74 (2009-10), 84 (2010-11) and 88 (2011-12) in village Mendaki. Similarly, average number of days of work requested by females was: 58 (2010-11) and 84 (2011-12) in village Tembhurwahi; 25 (2008-09), 50 (2009-10 and 2010-11) and 73 (2011-12) in village Rampuri; 19 (2010-11) and 39 (2011-12) in village Baradkinhi; and 78 (2008-09), 80 (2009-10), 89 (2010-11) and 97 (2011-12) in village Mendaki. Thus, despite 8 months of non-agricultural season, villagers give little priority to MGNREGS jobs and seek employment in other more gainful work which includes mahuva and tendu leaves collection; and working in industries.

Nevertheless, almost all the people were provided employment for requested number of days except in village Medaki (Table 13). In fact, number of days of employment provided per person was more than requested in village Rampuri. In 2012-13, 105households (24 per cent of the total households) were provided with more than 100 days of employment in Rampuri Gram Panchayat. However in village Mendaki, people did not work for the given number of days and this difference was quite significant. The main reason for this was delay in payment for their work. In some instances people were not paid for months as administrative procedure (e.g. preparation of muster roll, measuring of work by engineers) take plenty of time. In fact, people feel that there is a shortage of engineers who measures work resulting in delay in payments.

Table 13: Status on the duration of employment provided under MGNREGS

Particulars	2008 – 09		2009 - 10		2010 – 11		2011 – 12	
	Male	Female	Male	Female	Male	Female	Male	Female
Tembhurwahi								
Avg. no. of days of work requested per person	-	-	-	-	60	58	90	84
Avg. no. of days of work given per person	-	-	-	-	60	58	90	84
Avg. no. of days each person actually worked	-	-	-	-	60	58	90	82

Rampuri								
Avg. no. of days of work requested per person	26	25	39	50	47	50	68	73
Avg. no. of days of work given per person	30	26	50	50	50	50	68	73
Avg. no. of days each person actually worked	28	27	-	50	50	50	68	71
Baradkinhi								
Avg. no. of days of work requested per person	-	-	-	-	18	19	33	39
Avg. no. of days of work given per person	-	-	-	-	18	19	33	39
Avg. no. of days each person actually worked	-	-	-	-	18	18	32	39
Mendaki								
Avg. no. of days of work requested per person	76	78	74	80	84	89	88	97
Avg. no. of days of work given per person	70	64	72	76	80	88	86	96
Avg. no. of days each person actually worked	45	53	45	58	55	61	54	65

(Source: Authors' own analysis using primary data)

As per the MGNREGS norms, every person who has been provided with employment has to work for 8 hours in a day. In Tembhurwahi, both males and females worked for the stipulated number of hours. However in other villages, average number of hours put in by each worker was less. In village Rampuri, it was 8 hours for males and 6.8 hours for females; in village Baradkinhi, it was 7.6 hours for males and 7.8 hours for females; and in village Mendaki, it was 7.8 hours for males and 7.7 hours for females (Table 14).

Table 14: Number of hours of labour on MGNREGS works

Villages	**Average number of hours of work (hour/person/day)**									
	General		**SC**		**ST**		**OBC**		**Overall**	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Tembhurwahi	-	-	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Rampuri	-	-	8.0	6.5	8.0	7.0	8.0	6.8	8.0	6.8
Baradkinhi	-	-	8.0	8.0	8.0	8.0	7.5	7.7	7.6	7.8
Mendaki	7.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.8	7.7

(Source: Authors' own analysis using primary data)

Average amount of wage received per person and proportion of people (out of those who worked) who actually received wages are given in table 15.In 2008-09, average amount of wage received was in the range of Rs 40-68 for males and Rs 40-70 for females. In 2009-10, it was Rs 50-85 for males and Rs 53-80 for females. It increased to Rs 77-150 for males and Rs 71-150 for females in 2010-11; and to Rs 100-192 for males and Rs 92-180 for females in 2011-12. Thus within a year, there were wide variations in the amount of wages received by the people. Further, people were of the opinion that even the higher wages received in 2011-12 were not enough considering the kind of laborious work they do under MGNREGS. Also, there are other less laborious work options available in the nearby area where same or higher amount of wages can be earned.

Further, only in certain years all the people who actually worked received wages (Table 15). In 2008-09, only 59.3 per cent of the males and 92 per cent of the females who actually worked received wages in village Rampuri. However, in 2009-10 only 66.7 per cent of the females received wages but all the males were able to get their wages. After 2009-10, proportion of males who received wages have gone down and it was only 74.3 per cent each in 2010-11 and 2011-12. In village Mendaki, proportion of females who received wages was less in comparison to males. Though proportion of females receiving wages has increased from 75 per cent (2008-09) to 94.7 per cent (2011-12), still all of them were not getting paid for their work. Similarly, in village Tembhurwahi, about 95 per cent of the females have received their wages. In village Baradkinhi, only 81.3 per cent of males and 66.7 per cent of the females received wages in 2010-11. Though in 2011-12, all the males were paid for their work, only 93 of the females received wages.

Further, amount of time it takes for wages to be deposited in beneficiaries' bank account is high. As per the MGNREGA guidelines, amount of work completed by people should be measured every week and wages should be paid accordingly. But due to dearth of engineers who measures work and other administrative hurdles (delay in preparing and checking electronic muster rolls, poor internet coverage in remote rural areas etc.), the amount of time taken for release of wages varies from 25-30 days. In certain cases, first week of wages were released after 60 days. Such delays put off people from applying to MGNREGS jobs as they are dependent on daily earnings for their existence and meeting day-to-day requirements.

Table 15: Actual amount of wages received and proportion of people who received wages for MGNREGS related works

Villages	Caste	Average amount of wage received (Rs/person/day)							
		2008-09		2009-10		2010-11		2011-12	
		Male	Female	Male	Female	Male	Female	Male	Female
Tembhurwahi	SC	-	-	-	-	150 (100)	145 (50)	150 (100)	145 (50)
	ST	-	-	-	-	150 (100)	150 (100)	173 (100)	168 (100)
	OBC	-	-	-	-	147 (100)	147 (100)	173 (100)	168 (100)
	Overall	**-**	**-**	**-**	**-**	**148 (100)**	**147 (94.7)**	**172 (100)**	**165 (94.7)**
Rampuri	SC	68 (100)	65 (100)	85 (100)	80 (100)	110 (100)	110 (100)	150 (100)	150 (100)
	ST	63 (75)	70 (83)	-	70 (0)	108 (100)	112 (100)	170 (100)	161 (100)
	OBC	68 (47.4)	69 (94.1)	-	-	118 (59.1)	116 (100)	192 (59.1)	180 (100)
	Overall	**68 (59.3)**	**69 (92)**	**80 (100)**	**76 (66.7)**	**113 (74.3)**	**114 (100)**	**174 (74.3)**	**170 (100)**
Baradkinhi	SC	-	-	-	-	-	126 (100)	141 (100)	135 (100)
	ST	-	-	-	-	100 (100)	100 (100)	145 (100)	123 (100)
	OBC	-	-	-	-	99 (80)	103 (60.9)	140 (100)	132 (90.9)
	Overall	**-**	**-**	**-**	**-**	**98 (81.3)**	**106 (66.7)**	**140 (100)**	**131 (93)**
Mendaki	General	40	40	50	53	77	73	105	105

		(100)	(66.7)	(100)	(75)	(100)	(90)	(100)	(91)
	SC	50 (100)	40 (50)	60 (100)	55 (33.3)	92 (100)	80 (100)	102 (100)	92 (100)
	ST	55 (100)	55 (100)	68 (100)	68 (100)	80 (100)	80 (100)	100 (100)	100 (100)
	OBC	52 (100)	44 (83.3)	85 (100)	60 (100)	80 (100)	71 (88.2)	100 (100)	93 (94.1)
	Overall	**50 (100)**	**43 (75)**	**60 (100)**	**58 (84.2)**	**82 (100)**	**75 (91.9)**	**101 (100)**	**96 (94.7)**

Note: Figures in parenthesis represents proportion of people who received wages with respect to the total number of people who actually worked within the respective category
(Source: Authors' own analysis using primary data)

No significant change was observed in the occupational profile of people post MGNREGS. Nevertheless, there was a slight decrease in proportion of people taking up farm labour work and increase in proportion of people taking up non-farm labour work. In Tembhurwahi village, for instance, there was a slight decrease in the proportion of males (from 9 per cent to 4.5 per cent) and females (from 11 per cent to 5.6 per cent) belonging to OBC category taking up farm labour work. However, proportion of OBC males (from 54.5% to 59%) and females (from 50% to 55.6%) taking up non-farm labour work increased after launch of MGNREGS. In Rampuri village, proportion of SC males and ST females undertaking farm labour has decreased marginally from 81.8 to 72.7 per cent and 88.9 to 77.8 per cent, respectively. Similarly in village Baradkinhi, proportion of OBC males doing farm labour work has come down from 35 to 32.5 per cent. In village Mendaki, proportion of males and females (under General category) performing labour work (farm and non-farm) has come down from 29 to 21.5 per cent and 45.5 to 36 per cent, respectively. However, proportion of males belonging to SC category doing non-farm labour work has increased from 21 to 29 per cent.

6.3.5 Condition of the physical assets created and the funds utilized

Under MGNREGS only kachcha roads are constructed. Though well-built roads would ease movement and improves access, technical standard of kachcha roads built under MGNREGS was very low. In all the selected villages, most of the road construction work was incomplete and was in danger of being washed away in the coming monsoon. Some other roads were not completed as seasonal stream flows in a perpendicular direction to it. Further, most of the farm ponds in village Tembhurwahi were constructed in the upland catchment of the only irrigation tank, resulting in reduced water flows in the water body. Many farmers have also constructed/constructing dug wells in the tank catchment area (in the area between farm pond and tank) which will further reduce the water flows into the tank. This will affect the irrigation in the tank command area and thereby would affect the crop yields and income returns. With respect to tree plantation on roadside, selection of some of the species, such as cashew trees (suitable in coastal areas), ignores the agro-ecology of the region.

Works related to de-silting of ponds; and construction of check dams appears to be more suitable as the region is underlain by hard rocks (basalt formations)and the practice is to use stored water directly for irrigating kharif paddy, and soya bean. Farmers were found to be satisfied with such interventions in village Mendaki and Rampuri as they were able to give life-saving irrigation to kharif paddy.

Various types of work completed in 2012-13, cost estimates, total expenditure, and number of man days utilized for village Mendaki and Rampuri are given in table 16. In village Mendaki, total expenditure on completed works was only 28.7 per cent of the cost estimates.

This indicates that either the initial estimates were inflated or required quantum of proposed work was not possible in the location. Further, the labour is to material ratio was 94:6, indicating that a very low amount of money was spent on materials. For road construction, only 9 per cent of the total expenditure was on materials which indicate that the roads must be of poor standard. In fact, our visits to the location suggest that most of the village roads constructed under MGNREGS is far from standard complete work and is in danger of being washed away in the coming monsoon. In terms of the wages, only Rs 104 has been paid for each man-day of work. This is quite low considering that the amount of wage for unskilled labour work in the State is about Rs 145 per man-day of work.

On the contrary, about 89 per cent of the cost estimates were actually spent in village Rampuri. Also, the labour is to material ratio (67:33) was better and close to MGNREGA guideline (60:40). The wages paid (Rs 145.75 per man-day) for the completed work was also in line with the State adopted rate. However, it is observed that the works such as construction of check dams does not generate enough employment, as only 26 per cent of the expenditure was on unskilled labour work.

Table 16: Details on types of completed work, cost estimates and fund utilization for Mendaki and Rampuri during 2012-13

Gram Panchayat	Type of work	Number	Total cost estimate (Lakh Rs)	Expenditure (Rs)		Labour is to material ratio	Total man-days of work provided
				Labour	Material		
Mendaki	Pond de-silting	3	33.04	919941	7590	99:1	7895
	Nursery	1	5.93	376141	30338	93:7	3418
	Tree plantation	1	3.11	69863	0	100:0	550
	Village road construction	4	71.09	1681365	168026	91:9	17489
	Overall	**9**	**113.18**	**3047310**	**205954**	**94:6**	**29352**
Rampuri	Pond de-silting	5	6053015	4811540	1165402	81:19	34205
	Pond de-silting	3	1539606	1415764	43747	97:3	Information is not available
	Village road construction	1	530502	224560	54494	80:20	2609
	Cement plug Bandhara	4	3160461	725970	2095051	26:74	2821
	Shirpur Style bandhara	1	2291904	957938	606653	61:39	6469
	Overall	**14**	**13575488**	**8135772**	**3965347**	**67:33**	**46104**

(Source: Authors' own analysis using data obtained from Gram Panchayat offices)

Several other planned works were either not taken up or completed because of no demand from villagers for MGNREGS work. For instance, in village Rampuri, 8 planned works worth Rs 76 lakh were not started and 7 other worth Rs 40 lakh were not completed. In some other cases, work could not be taken up because of inability of villagers to do the planned work through manual labour. For instance in village Tembhurwahi, sanctioned and approved work on digging of 13 new dug wells for irrigation purpose were not taken up as it requires blasting of underlain rocks which cannot be done by manual labour.

6.3.6 Impact of the assets on water availability in the villages

As per the discussions held with gram panchayat members and villagers, availability of water for irrigation has increased after the water management works (like pond de-silting, construction of check dam and farm ponds, well diggings) taken up under MGNREGS. In village Mendaki; Rampuri; and Baradkinhi, water stored in ponds and diverted from small check dams is directly used for irrigating kharif paddy. As per the latest records, irrigated area in Mendaki is 230 hectares (40 per cent of total cultivated area);and in Rampuri it is 104 hectares (78% of total cultivated area).Thus in these villages the interventions have only benefitted those farmers who practice agriculture and irrigate their fields.

In village Tembhurwahi, water stored in farm ponds (average size of 2 acres) is used for irrigating kharif paddy; and the shallow dug wells (about 6.5 m deep and constructed between farm ponds and the minor irrigation tank) are used for irrigating wheat in winter season and vegetables (tomato, brinjal) in summer season. However, this has come at a cost of reduced inflows to a minor irrigation tank, which is the major source of irrigation for majority of farmers. Thus in this village only a small fraction of farmers in the catchment area of existing tank has got the benefits at the cost of reduced availability of water to the farmers in the tank command area.

Table 17: Average (pre-post monsoon) water level fluctuation before (prior to 2005) and after (post 2005) implementation of MGNREGS

Location	Name of the Taluka	Average Water Level Fluctuation		Average Water Level Fluctuation per m of rainfall	
		Pre – MGNREGS	Post-MGNREGS	Pre – MGNREGS	Post-MGNREGS
Surbodi	Brahmapuri	2.23	2.24	1.96	1.90
Mendaki		8.59	5.75	7.82	4.46
Budhewada		3.91	5.08	3.65	4.52
Gangalwada		5.37	5.42	4.94	4.51
Delanwadi		4.06	5.06	3.83	4.24
Thutra	Rajura	3.11	5.28	3.19	6.33
Pandharpauni		9.17	9.93	9.46	10.65
Bhoyegaon		5.23	3.77	6.30	4.82
Arvi		6.06	6.97	6.24	7.66
Rajura		3.89	5.14	3.98	5.81
Warur Road		7.10	7.03	7.44	8.05
Lakkadkot		1.61	3.21	1.82	3.77
Tembhurwahi		5.11	5.41	5.28	6.03
Wirur Station		2.52	3.88	2.46	4.31

(Source: Authors' own analysis suing data provided by GSDA, GoM)

Table 17 presents the average water level fluctuations (pre-post monsoon) before (prior to 2005) and after (post 2005) implementation of MGNREGS in the observations wells at Brahmapuri and Rajura taluka. For well at village Mendaki, it is observed that the average rise in water column has reduced from 8.59 m to 5.75 m after MGNREGS. The contribution of rainfall to well recharge has been affected significantly resulting in a nearly 3.4 m decline in water level per m of rainfall after MGNREGS. This can be explained due to greater storage of runoff water generating from the forest catchment in the ponds de-silted under MGNREGS. As a result the recharge to the wells located in the downstream areas has reduced. However, in village Tembhurwahi, it was observed that the average rise in water column following monsoon has

increased from 5.11 to 5.41. Also there was 0.75 m rise in average water level per m of rainfall after MGNREGS. This can be attributed to growth in number of farm ponds in the tank catchment area which provides greater recharge benefit to wells through return flows from paddy fields.

6.4 Degree of success in realizing the MGNREGA objectives in the villages

6.4.1 Specific needs of the study area for improving rural livelihoods

Overall, about 17 per cent of the households in the selected villages were below poverty line. In all the villages' households belonging to other caste categories (which include General, OBC, and NT) was the major group. With respect to occupation, most of the households were engaged in agriculture and farm labour during the Kharif season. Further, households who practice agriculture were mostly of small and marginal farmers. Considering the subsistence nature of agriculture, people do take up labour work during non-agricultural season. In the period between April and May almost all the households (except for those in Tembhurwahi) either get engaged in tendu leaves and mahuva flower collection or move to nearby town to take up labour work in industries. The preference over other works is because they were able to earn more money for comparatively less laborious work than the ones performed under MGNREGS. Thus, the period in which people can be involved for MGREGS work is November to March for village Mendaki, Rampuri and Baradkinhi. For village Tembhurwahi, it is March to May as people gets busy with winter agricultural season.

6.4.2 Effectiveness of the scheme in meeting the requirement of the villages

In the surveyed villages, a very high proportion of households had job cards (as per the latest available data). In fact, in Rampuri and Tembhurwahi number of households with job cards was more than the total households in the village (Table 18). This indicates that certain section of the society is getting more benefits than the really deserving ones. With the exception of Rampuri, proportion of SC households with job cards was very low. It was only 9.4 per cent in Mendaki, 3.8 per cent in Baradkinhi and 15 per cent in Tembhurwahi. Similarly proportion of ST households with job cards was quite low in village Mendaki (8.7 per cent) and Baradkinhi (12.5 per cent). On the other hand, proportion of households with job cards in others category (includes households belonging to General, OBC and NT) was more than the number of households in most of the surveyed villages. It appears as if SC and ST households are not much interested in taking up MGNREGS jobs.

Proportion of job card holders who demanded employment was low (Table 18). In village Mendaki only 64 per cent; in village Rampuri 85 per cent; in village Baradkinhi 76 per cent; and in village Tembhurwahi 50 per cent of the household demanded any work. Further, except from Tembhurwahi, the number of days of employment sought was below 100 days. On an average, it was only 58.9 days per household in Baradkinhi; 63.2 days per household in Mendaki; and 84.2 days per household in Rampuri. Clearly, the kind of work proposed under MGNREGS was not attractive enough for the rural people and they continue to look for other better work opportunities.

Table 18: MGNREGS employment status and wage rate for 2012-13

Sr. No.	Particulars	Mendaki	Rampuri	Baradkinhi	Tembhurwahi
1	Households (HHs) with job cards				
	SC	24 (9.4)	34 (81.0)	2 (3.8)	3 (15.0)
	ST	4 (8.7)	20 (74.1)	1 (12.5)	163 (194.0)

	Others	923 (109.8)	144 (154.8)	666 (106.7)	129 (71)
	Total	951 (83.3)	198 (122.2)	669 (97.8)	295 (103.0)
2	No of HHs which demanded work	606	169	511	147
3	Average no. of days of work demand per HH	63.2	84.2	58.9	126.0
4	No of HHs actually worked	520	168	511	147
5	Average no. of days of actual work per HH	52.7	77.2	55.2	114.9
7	Proportion of HHs (w.r.t total no. of HHs with job cards)who completed 100 or more days of employment (%)	6.7	23.7	7.8	25.8
8	Average amount of wage paid per man-day of work (Rs)	139.1	173.8	196.2	223.0

Note: Figures in the parenthesis represents the proportion of households having job cards with respect to total number of households in the respective category.
(Source: Authors' own analysis using data compiled from MGNREGS website and Gram Panchayat offices)

In most of the surveyed villages (with the exception of Mendaki), all the households who demanded work were given work (Table 18). However, the number of days of actual work per household was lower than what was sought originally. It was lesser for 11 days per household in Mendaki; 7 days in Rampuri; 3 days in Baradkinhi; and 12 days in Tembhurwahi. Only 6.7 per cent of the households with job cards in Mendaki, 23.7 per cent in Rampuri; 7.8 per cent in Baradkinhi; and 25.8 per cent in Tembhurwahi could get 100 or more days of work. This indicates that the potential of work proposed under MNGRES was not enough to cater to the employment needs of the village community.

With respect to wages received during 2012-13, they were definitely higher as compared to period from 2008-09 to 2010-11 (Table 15 and 18). However, they were still less than what people earn from tendu leaves and mahuva flowers collection (about Rs 225-250/man-day). Further, delays in release of payment for MGNREGS work discourage people from taking up such jobs. For instance, in Mendaki and Rampuri it takes about 1-2 months for the release of payment for the work done during the first week. As a result people continue to be engaged in works other than those provided under MGNREGS.

7. Major Findings

i. The average annual family income in all the surveyed villages was quite low. It was Rs 23,500 in Tembhurwahi, Rs 20,266 in Baradkinhi, Rs 18,714 in Rampuri, and Rs 18,457 in Mendaki.

ii. In the surveyed villages, the 'job seekers' under MNREGA were engaged in farm labour during kharif season and looked for other employment opportunities (within or outside their village) only during non-agricultural season (November to March). In Tembhurwahi, the non-agricultural season is only between March and May. A high proportion of males (ranging from 69% to 95%) and females (ranging from 73% to 95%) in the surveyed villages take up farm labour work. Similarly a high proportion of the people, ranging from 68.6% to 94.4% of males; and 73% to 95.5% of females take up non-farm labour work. Also, proportion of ST population which takes up both farm and non-farm labour work was quite high in comparison to those from other caste groups.

iii. Prior to launch of MGNREGA, nearly 11 per cent of the population in Baradkinhi, 15 per cent in Tembhurwahi, 25 per cent in Mendaki, and 64.5 per cent in Rampuri, were either un-employed or in search of employment during non-agricultural season. Out of this, 2-3 per cent of the population from Rampuri, 7% from Baradkinhi, and 25% from Mendaki used to migrate to nearby towns (Chandrapur or Ballarpur) to work in industries or to the state of Madhya Pradesh to work as Tendu leaf collector. The duration of migration varied from 30 to 60 days.

iv. The launch MGNREGA had no effect on migration in the surveyed villages as the same proportion of people continues to migrate in search of better employment opportunities. Similarly, within the villages, a large proportion of households continue to look for other better employment opportunities.

v. There was a lesser interest from weaker section of the society in getting MNREGS jobs. This is evident from the low proportion of ST and SC households who applied for job registration. For instance, in Mendaki, only 9.4% SC and 8.7% ST households; in Baradkinhi, only 3.8% SC and 12.5% ST households; and in Tembhurwahi, only 15% SC households applied for job cards. Further, even those who got registered showed little interest in taking up arduous labour work on offer under MGNREGS. This is evident from the low proportion of registered households who applied for jobs (around 68% in 2012-13) and less number of days of employment requested per household over the years (25-78 in 2008-09; 39-80 in 2009-10; 18-89 in 2010-11; and 33-97 in 2011-12).

vi. The proportion of people who actually worked was even lower. Overall, 64 per cent of the households with job cards actually worked during 2012-13 in the surveyed villages.

vii. Wages offered under MGNREGS was quite low to keep people interested in taking up such jobs. Though, over the year wage rate has increased (from a range of Rs 40-70 per man-day in 2008-09 to Rs 139-223 per man-day in 2012-13), they were still less than what people earn from other less laborious works (for example, from Tendu leaf and Mahuva flower collection).

viii. One of the other reasons which discourage people from taking up MGNREGS work was administrative delays in release of payment. For instance, in Mendaki and Rampuri it takes about 1-2 months for the release of payment.

ix. There was a wide-spread corruption in release of wages as only in some years all the people who actually worked received wages. For instance, in 2008-09, only 59.3% of the males and 92% of the females who actually worked received wages in village Rampuri. Similarly, in village Baradkinhi, only 81.3% of males and 66.7% of the females received wages in 2010-11.

x. In terms of engagement in various MGNREGS works, a high proportion of people were engaged in road construction in village Tembhurwahi and Baradkinhi; in de-silting of tanks/ponds and cleaning of irrigation canals in village Rampuri; and in de-silting of tanks/ponds and road construction in village Mendaki.

xi. The actual employment generation potential of works offered under MGNREGS was much below than 100 days per household per year in almost all the surveyed locations. During 2012-13, only 6.7% of the households with job cards in Mendaki; 23.7% in

Rampuri; 7.8% in Baradkinhi; and 25.8% in Tembhurwahi completed 100 days of employment.

xii. In most of the surveyed location, works related to water management and conservation has benefitted a selected individuals rather than the whole society. For instance, in village Tembhurwahi, construction of dug wells and farm ponds in the catchment area has resulted in reduced inflows to a minor irrigation tank, which is the major source of irrigation for majority of farmers. Similarly, in village Mendaki, greater storage of runoff water generating from the forest catchment in the ponds de-silted under MGNREGS has led to a nearly 3.4 m decline in water level per m of rainfall in the wells located downstream. Also, village roads construction work was found to be of inferior standard and was in danger of being washed away in the coming monsoon. Further, selection of some of the tree species, such as cashew trees (suitable in coastal areas) for roadside plantation works, ignores the agro-ecology of the region.

xiii. There were several instances where initial cost estimates were inflated or required quantum of work was not possible. For example, in village Mendaki, only 28.7% of the approved budget was actually spent on all completed work during 2012-13. Further there was a wide variation in the labour to material expenditure (as per MGNREGA it has to be 60:40). In village Rampuri, labour to material expenditure on pond de-silting work was 81:19; for village road construction, it was 80:20; and for construction of small check dam construction, it was 26:74.

A field visit to the four villages selected for the study was undertaken to bridge the gaps in our conceptions if any. Apart from the issue of quantitative and financial performance the visit has thrown up several qualitative pointers for consideration. The sleepy forecast villages Mendaki, Tembhurwahi, Brahmapuri, and Rampuri all except the last named all are in dire need of infrastructural facilities like roads for the use of the people and animals, tank water and farm ponds for agricultural farming. Hence the locally available labour is motivated to take up the wage work for such ends. Further in the non-agricultural season they need employment to fall back if not make a good buck for the rainy days. The tribals as well as other forest dwellers get themselves busy in Tendu leaf collection going to local forest if the resource is available, for the Forest Corporation or even going to far off places like Madhya Pradesh. Common with the forest dwellers (especially, tribals and SCs) the people of the villages collect Mahua flowers. This not only fetches them, Rs 1300 per quintal, but also provides raw material for their local brew made at household level for their consumption. Flower has a major utility and role on their daily life and religious chores and quite often serves as staple food.

Tendu leaves collection lasts for 15 to 30 days and sometimes even up to 60 days. Each individual earns about Rs 5000/- per month out of their engagement in the leaf collection stocking and weighing in this the agricultural lean period they will be having gainful employment for about 30 days. The rest of the time is available for MGNREGS works up till the onset of the agricultural season. Rice cultivation gives them a feeling of security for their food requirement. Rice is the main crop grown in kharif and some vegetables are grown in off season. It appears that the factors driven by optimal necessity which makes the MNREGS programme successful in these forest localities. The road works get completed according to the norms under MGNERGS undertaken by Panchayats.

The MGNREGS programme has two components of operations one by village Panchayats and the other by government departments. The total fund available under this programme head is divided into two parts 1) for that executed by Panchayats and 2) and that by departments respectively. It is seen that there is no synchronization of the two components. In fact departmental spending is very limited in these areas. Only Kachcha roads with Murram tops are

laid under panchayat MGNREGS works. They are not followed by metal topping by departmental spending .The two sets of expenditure stand apart in isolation. Taking the example of roads further it can be seen, that the kachcha roads constructed have the danger of getting washed away or become unfit during the subsequent rainy season.

A road already existed was replaced by metal top with funds available from local MLA's funds. Such gestures will not come forth for all the road work taken up for construction by Panchayats. The plant saplings planted under the programme need further attention for their upkeep.

8. Strategies for Water Management in the Region and their Employment Generation Potential

8.1 Specific Interventions based on Land and Water for Improving Water Situation

The normal annual rainfall (1901-1991) in district Chandrapur varies from about 1200 to 1450 mm. However, there is both temporal and spatial variation in the amount of rainfall received. In2002 and 2004, the average annual rainfall was below 800 mm. Further, between 1998 and 2007, western part received less rainfall (average annual rainfall of 1000 mm) as compared to the eastern part (average annual rainfall of 1400 mm) of the district.

The major ground water bearing formations in the district are alluvium, sandstones, basalt, and limestone. Among these, sandstones form the most potential aquifer. However most of the district is underlain by hard rocks which include basalt, limestone, granite and gneisses. The stage of ground water development for the district is only 16.29 per cent. It varies from 9.2 per cent in Chandrapur block to 39.6 per cent in Chemur block. In block Brahmapuri and Rajura (where survey was conducted) groundwater development is 30 per cent and 15.2 per cent respectively. The reason for comparatively high groundwater development in some blocks is because of occurrence of soft rocks (alluvium and sandstone) in a few parts which offers high groundwater potential. As a result of very low ground water draft, shallow water levels within 10 m below ground level are seen in almost entire district.

Out of the net annual groundwater availability of 879.52 MCM, the annual groundwater draft for all uses was estimated at 143.30 MCM (CGWB, 2009). Out of this, 68 per cent is for irrigational use; and 32 per cent for domestic and industrial uses. Out of total net irrigated area of 1.08 lakh hectares, about 33% is irrigated by groundwater. The major source of irrigation is dug wells followed by tube wells and bore wells. There are around 12 thousand dug wells and 182 bore wells/tube wells in the entire district. Additionally there are 884 ponds/tanks and 1195 other minor irrigation surface sources. However, the irrigated area is only 30.4 per cent of the net sown area. Thus there is a need to bring in more land under irrigation. Though it appears that there is huge scope for drilling additional wells for irrigation in the area, this is far from the truth. The region does not have much un-utilized groundwater potential. As mentioned in the previous section, there is a high degree of over-estimation of utilizable groundwater recharge in the area. Much of the water, which infiltrates the underground formations during rainy season, flows out to join the streams which drain out of the area. The region is already experiencing groundwater stress, with acute scarcity of drinking water during summer months.

Work related to pond de-silting; construction of small reservoirs; and cleaning of minor canals should also be continued. However, de-silting of ponds should consider the amount of silt that can be excavated from the pond and the topography of the region in order to avoid any increased soil erosion (Bassi and Kumar, 2010). Also, as the region experiences high temperature during summer months, water stored in the small dams should directly be used for irrigating winter crops, and in some cases can also be used to augment the existing water supply schemes. In alluvial flood plains areas (region north of Wainganga river valley), effort should be on

promoting micro-irrigation technologies especially for farmers who take vegetables during summers. In view of high rainfall in the western region of the district, works related to bund stabilization through afforestation; and measures to stop soil erosion and silting of existing ponds/tanks can also be taken up. However tree species should be selected as per the agro-ecology of the region. Also, construction of individual household latrines can also be promoted in this economically poor area.

8.2 Employment Generation Potential of Public Water Works

As per the analysis of data on the employment generation under MGNREGS in Maharashtra, public water works could produce average of only 39 man-days of work per household (Table 19). The maximum potential for job creation per household (43.3 man-days) was with drought proofing work. Next is with providing irrigation facility to SC/ST/IAY/LR (which includes construction of farm ponds and well digging) which generated 40.5 man-days per household. However, construction of dug wells in the hard rock regions of the State will require little manual labour as blasting of rock has to be done after a few metres of digging. Further, as seen in village Tembhurwahi, construction of farm ponds did not involve any manual labour and whole work was done thorough heavy machinery. Work on water conservation measures (such as digging of new ponds, construction of check dams) can generate 39.8 man-days of work per household. However, it was seen in village Rampuri that the check dam construction could not generate enough employment for unskilled labour work (Table 16).

Table 19: Employment generation under MGNREGS for completed public water works during 2012-13 in Maharashtra

Type of public water works	Total no. of works completed	No. of HHs employed per work	No. of man-days generated per work	No of man- days of employment per work
Water conservation	8636	53.50	2129.79	39.81
Renovation of traditional water bodies	3005	31.39	852.91	27.17
Flood control	29	475.24	14000.62	29.46
Drought proofing	6279	78.73	3406.29	43.27
Cleaning of irrigation canals	576	27.97	614.61	21.97
Irrigation facilities To SC/ST/IAY/LR	4093	89.02	3608.35	40.53
Land development	2405	35.81	854.53	23.86
Rural drinking water	7	1354.00	13439.29	9.93
Rural sanitation	47	0.11	1.66	15.60
Overall	**26954**	**61.43**	**2393.52**	**38.96**

(Source: Authors' own analysis using data compiled from MGNREGS website and Gram Panchayat offices)

However, tree plantations and embankment stabilization (which comes under flood control works) generated only 29.5 man-days of work per household. Similarly, every pond de-silting and cleaning of irrigation canals generated only 27 and 22 man-days of unskilled labour work per household respectively. Least amount of employment (man-days per household) was generated with rural water supply (9.93) and sanitation (15.6) works as they require involvement of more skill based workers. Thus, overall, employment generation potential of public water

works in the State is quite low, unless several different types of public works are executed under the scheme to cover the same beneficiary households.

9. Employment Generation Models for Chandrapur Region

As discussed in the earlier section employment generation through public water works taken up under MGNREGS is quite low. Only certain works relating to drought proofing, providing irrigation facility, and water conservation appear to provide about 40% of the guaranteed number of days of employment. Further, village road construction work is found to have provided about 43 man-days of work per household. However, considering a high proportion of households especially those belonging to ST category that look for farm or non-farm employment every year, works currently taken up under MGNREGS in Chandrapur region are not enough to provide required employment opportunities to the people. Additionally, the laborious nature of works proposed under MGNREGS and administrative delays in release of wages discourages many from taking up such works. This is quite evident from the low proportion of households who actually report for the MGNREGS work.

The employment generation model based on public works for any area should be based on what is technically feasible for the area and which would produce economic and social benefits, against what demand actually exists for employment amongst the communities. Even if demand for employment exists, if the scope for certain interventions does not exist, such interventions should not be taken up, as they would produce negative welfare benefits. But, on the contrary, even if sufficient demand for employment does not exist, but the interventions can produce certain socio-economic benefits other than direct employment, such as improved water supply, improved irrigation services from public systems or improved storage of water in the local water bodies, they can be taken up. In such cases, the scheme might have to attract labourers from neighbouring areas where rural unemployment rates are high, if those from the same locality are not willing to work. The information on the employment generation potential of different public works, furnished in Table 19, and a thorough study of the physical environment of the region (topography, hydrology, soils, geology, geohydrology and forest cover) and the existing public infrastructure, which would help identify the nature of interventions that are viable for the region, can be used to generate employment.

As most of the district is underlain by hard rocks and receives very high rainfall, water works related to pond de-silting, construction of check dams, cleaning of minor canals and embankments stabilization through afforestation should be continued. Further, digging of new wells and construction of farm ponds can also be promoted in areas which receive comparatively low rainfall but such interventions should be scientifically planned so that they do not reduce the inflows into the existing public reservoirs in the downstream areas. Though promotion of micro-irrigation technologies would not generate employment, but they will definitely have positive impact on water environment and farming returns in the alluvial flood plains area of the district. Construction of village roads can also be continued but they have to be upgraded from asset sustainability point of view.

At present, major amount of MGNREGS works in the surveyed area are implemented thorough Gram Panchayats due to which they are over-burdened. However, other governmental agencies such as forest department and agricultural department have shown little interest in proposing or implementing MGNREGS works. Thus, both Gram Panchayats and government agencies need to be strengthened in order to handle the administrative load of MGNREGS and strictly enforce its effective implementation including release of payments on time. Shortage of technical man-power who can review and measure works taken up under MGNREGS is another major problem.

To get 100 days of employment under MGNREGS, household members have to take up more than one kind of a work. But there is a big uncertainty whether households will be interested in taking such employment opportunities. Further, when other less arduous work options are available to villagers, it is really ambitious to expect them to take up MGNREGS jobs that too in the peak summer months.

10. Major Findings and Conclusions

In the surveyed villages, proportion of households who got registered for the scheme was high but who actually demanded employment and worked was low. Further, household members including those of SC and ST community do not show much interest in MGNREGS jobs as both the employment potential and wages offered for the hard labour work under MGNREGS is low. Additionally, delay in release of payments discourages members to take up such jobs. Household members still continue to depend on Muhua flower and Tendu leaves collection as their major livelihoods support activity during non-agricultural season. Some even migrate to nearby town or other states in search of better employment opportunity.

It was found that the employment created through public water works through MGNREGA, the main purpose the scheme was intended for, was very poor. While enough numbers of the unemployed persons are available in the surveyed villages, not all of them have sufficient incentive to participate in public water works, due to the high opportunity costs as both the wage rate offered and the employment potential was low. However, in some locations works such as construction of farm ponds have garnered community interest but the accrued benefits are private in nature.

Further, there is acute shortage of key administrative and technical staff required for proper implementation of the scheme. Also the capacity of rural local governments in performing their intended functions was found to be weak. With these realities, efforts should be on making local institutions and government agencies effective enough to handle the increased work load due to MGNREGS.

Our analysis suggests that water works such as pond de-silting, construction of small dams, cleaning of minor canals and embankments stabilization through afforestation should be continued, given the region's topography, hydrology, geo-hydrology and land use. Further, digging of new wells and construction of farm ponds can also be promoted in areas which receive comparatively low rainfall. However, such works should be scientifically planned so that they do not affect flow to the existing water bodies in the downstream areas. For plantation works, tree species should be selected as per the agro-climate of the region. In the alluvial flood plain areas of the district, micro-irrigation technologies can also be promoted. Also, constructed kachcha village roads should be upgraded for improving access and better use. Though the preferred works may not lead to households getting 100 days of employment unless they apply for more than one work, at least the created assets would have long term positive impact on improving rural livelihoods.

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