

EFFICACY OF SMC / WHS WORKS TAKEN UP IN MGNREGS IN AP ON PILOT SCALE

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Abstract

National Rural Employment Guarantee Scheme (NREGS) is one of the most important programmes ever launched for rural India. A large number of Soil & Moisture Conservation (SMC) / Water Harvesting Structure (WHS) works, which are already proved to be effective in soil & moisture conservation / water harvesting are taken up under MGNREGS in Andhra Pradesh in all the districts. The implementers felt that there is a need for evaluating the efficacy (capability of producing the intended effect) of such important work components which are considered to be highly useful in ensuring sustainable livelihood opportunities.

This evaluation study is done on a pilot scale by DHAN Foundation, with a request by the Department of Rural Development, Govt. of Andhra Pradesh in three districts namely Adilabad, Chittoor and Srikakulam which are representing Telangana, Rayalaseema and Coastal Andhra regions in Andhra Pradesh. This study is carried out in 15 Mandals and in 30 Grama panchayats in three districts and interviewed 1,258 households. Stratified Random sampling method was adopted for the study. The data thus collected through interview schedules, focus group discussions and case studies are analysed to draw inferences.

The results of the perceptions of usefulness were rated as High, Medium and Low and have been collated, consolidated and interpreted to make a concrete meaning out of them. On overall usefulness and efficacy of the works, the works which has given most prioritized and more useful to the people are listed out (each district wise for the three studied districts).

Background

The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), the largest rural employment scheme was launched by the Govt. of India (GoI) by notifying Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) on 7th Sept 2005. The MGNREGS has become popular because of the main focus on its core objective of providing guaranteed wage employment to the rural unemployed. But, the scheme has also another important in-built objective of creating durable assets for strengthening the livelihood resource base of rural poor and thereby maximizing the benefits out of the huge expenditure involved in implementing the scheme.

An overview of different works taken up under MGNREGS

The works are being taken up in the Project mode approach. This facilitates to take up the works in a more purposeful way for monitoring and technical supervision of works. As per the Act, the focus of the Scheme is on the following works in their order of priority for achieving the set objectives:-

¹ Conference speaker

- a. Soil & Water conservation and water harvesting;
- b. Drought proofing (including afforestation and tree plantation);
- c. Irrigation canals including micro and minor irrigation works;
- d. Provision of irrigation facility to land owned by households belonging to the Scheduled Castes and Scheduled Tribes or to land of beneficiaries of land reforms or that of the beneficiaries under the Indira Awas Yojana of the Government of India;
- e. Renovation of traditional water bodies including desilting of tanks;
- f. Flood control and protection works including drainage in water logged areas;
- g. Any other work which may be notified by the Central Government in consultation with the State Government.

Usefulness of MGNREGS works – Need for an evaluation

The implementation of MGNREGS encompasses two major objectives, namely 1) providing direct employment opportunities to the rural unskilled laborers and 2) creating durable assets useful for sustainable livelihood opportunities to a larger community. Since huge cost is involved in this scheme, the stakeholders may be interested to know how efficiently and effectively the scheme is being implemented. Since the second objective only is under our purview now, our concern is about knowing the effectiveness of the works implemented under MGNREGS in serving their intended purpose.

The work components such as field bunding, Afforestation / horticulture development, tank silt application, construction of percolation ponds & farm ponds, de-silting of tanks & water ways, loose rock check dams, etc. which are already proved to be effective in soil & moisture conservation / water harvesting are taken up under MGNREGS in AP. Even then, it becomes necessary to assess whether such works completed till date are actually capable of producing the expected results for the benefit of the targeted groups so as to take up necessary corrective measures wherever required. Also, such assessment will be useful in identifying the component(s) which are more beneficial to the larger community for suitable re-allocation of funds. Thus, there is a need for evaluating the efficacy (capability of producing the intended effect) of such important work components which are considered to be highly useful in ensuring sustainable livelihood opportunities.

Evaluation Study and Data Collection Design

Considering the constraint of conducting the evaluation study in the absence of base line data within a short period of time, we have adopted the simple and economical method of evaluation as a pilot one based on our proposal and as per the ToR. The components of the proposed evaluation process are:

- Sample design.
- Design of schedules (questionnaires) and data collection from the respondents selected through stratified random sampling technique.
- Conducting case studies and comparisons with control areas.
- Conducting and Focus Group Discussions.
- Analysis of data collected from the sample respondents, validating through the results of case studies and Focus Group Discussions.
- Preparation of evaluation report.

Stratified Random Sampling:

For the present evaluation study, we adopted the “stratified random sampling” by selecting the samples randomly from different strata identified such as Regions, Districts, Mandals and Villages. The three individually homogeneous regions of Andhra Pradesh namely Telangana, Rayalaseema and Coastal Andhra are considered as first level strata. To represent these regions, Adilabad district for Telangana region, Chittoor district for Rayalaseema region and Srikakulam district for Coastal

Andhra region are selected for the evaluation study in consultation with the Directorate of MGNREGS, Hyderabad.

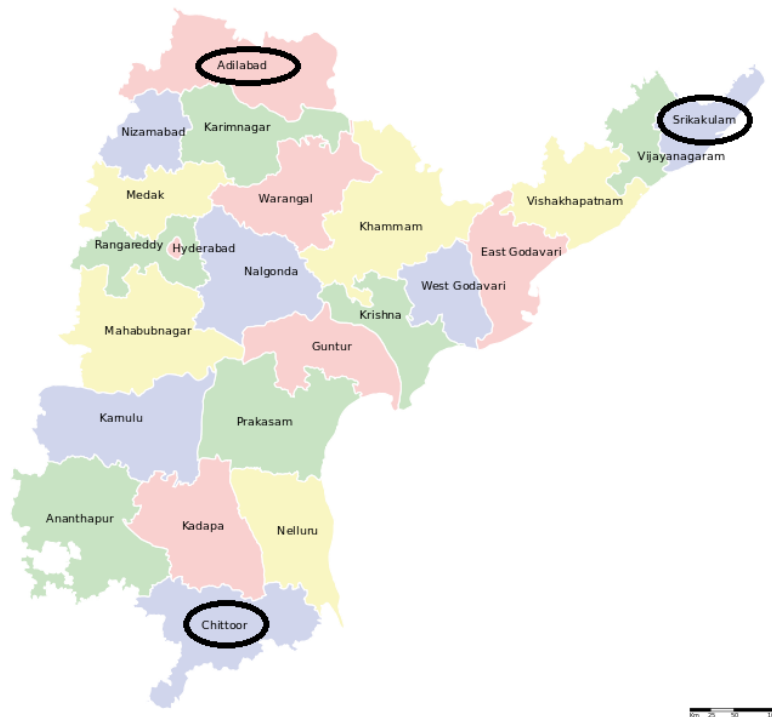


Figure 1. Andhra Pradesh Map showing three representative districts

Then, we have selected five sample Mandals randomly in each of the above mentioned sample districts as the second level strata. After selecting the sample Mandals, two sample Grama Panchayats (GPs) were selected randomly in each of the sample Mandals as the third level strata. Thus, there are 30 sample Grama Panchayats for our study. Then we have selected 40-45 respondents randomly from each Grama Panchayat for collecting data through schedules. The sample design is shown pictorially below:

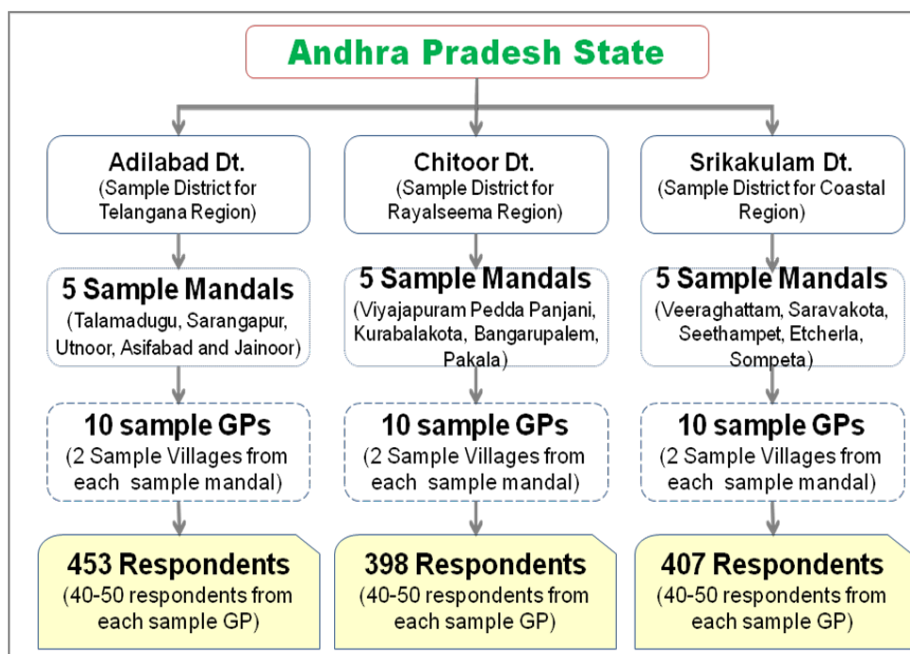


Figure 2. Sampling design for Evaluating MGNREGS in Andhra Pradesh

Table 1. Brief overview of Andhra Pradesh State in MGNREGS

Brief overview about Andhra Pradesh	
Total No. of Districts under MGNREGS	22
Total No. of Mandals	1,098
Total No. of Grama Panchayats	21,862
Total No. of habitations	69,039
Total No. of Job cards issued	1,32,49,737
Total No. of Labour groups (SSS) Registered	5,05,693
Total No. of Labour in Labour Groups	93,62,258
Total No. of works completed	28,82,620
Total value of works completed in lakhs `	34,22,367.08

Table 2. Study Area Hydrological parameters

District	Average Rainfall in mm.	Rainfall during 2012 in mm.	Soil type		Average depth of ground water in feet
			Predominant	Marginal	
Chittoor	918.10	631.10	Red	Red loamy	250 – 400
Adilabad	1,158.00	1,250.00	Black cotton	Red loamy	100 – 120
Srikakulam	1,162.00	743.50	Red, Sandy	Black cotton	40 - 100

(Source: Primary and Secondary data collected during the study)

The details of the Sample Districts, Mandals and sample Grama Panchayats thus selected by following the stratified random sampling method for each of the sample districts are furnished below:

Adilabad District:

Five Mandals are selected in Adilabad district based on stratified Random sampling method. Simultaneously, 10 Grama Panchayats are selected totally from the selected five mandals in the district. The selected five mandals are – Asifabad, Utnoor, Talamadugu, Sarangapur and Jaipur.

Chittoor District:

Five Mandals are selected in Chittoor district based on stratified Random sampling method. Simultaneously, 10 Grama Panchayats are selected from the selected five mandals in the district. The selected five mandals are – Pedda Panjani, Kurabalakota, Pakala, Vijayapuram and Bangarupalem.

Srikakulam District

Five Mandals are selected in Srikakulam district based on stratified Random sampling method. Simultaneously, 10 Grama Panchayats are selected from the selected five mandals in the district. The selected five mandals are – Veeraghattam, Etcherla, Saravakota, Seethampeta and Sompeta.

Analytical process to arrive at the results of the study

The data thus collected through interview schedules, Focus group discussions and case studies are analysed to draw out inferences. Such inferences are validated further with the field observations to arrive at the results of the Evaluation study conducted in the sample Grama Panchayats and presented in chapter 4.

The techniques which are mostly qualitative processes adopted for the impact evaluation are outlined in the diagram below:

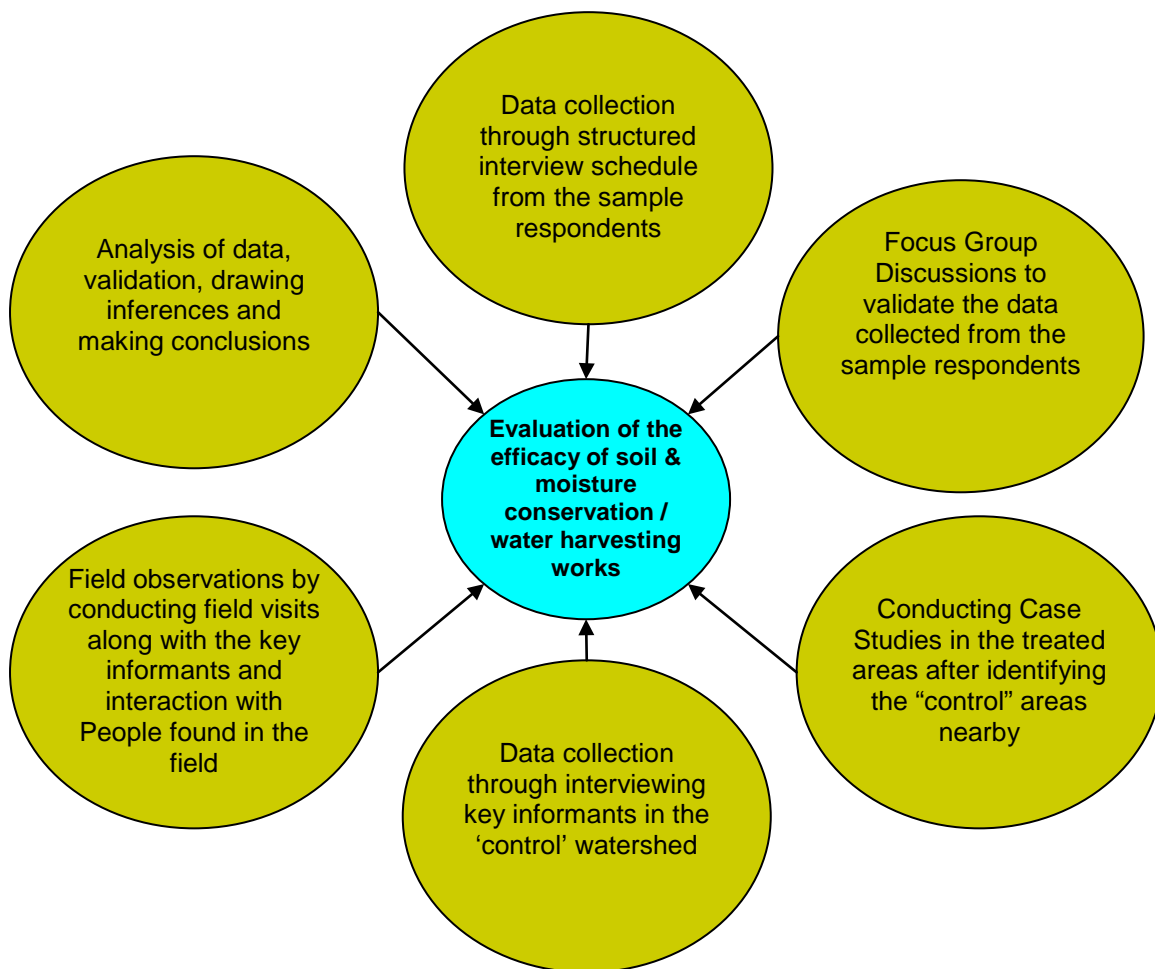


Figure 3. Outline diagram of evaluation study design

Based on our past experience in the field of soil & moisture conservation and rain water harvesting, “Templates” are designed for using them as “Standards” for assessing the usefulness of different work components executed under MGNREGS in the conservation of soil & moisture / water harvesting.

Analysis of Data and Results

The aim of this study is to evaluate the efficacy of Soil & moisture Conservation / Water Harvesting works taken up under MGNREGS in Andhra Pradesh during the last six years. Such evaluation is essential in understanding the success or failure of previous conservation measures and readjusting accordingly in the future planning.

This study is taken up in three selected districts on pilot scale. In the three selected districts namely Srikakulam, Adilabad and Chittoor, the sample is taken in five mandals in each district and two Grama Panchayats in each Mandal. Thus, the total sample size came as 30 Grama Panchayats in 15 Mandals in three districts. The district / Mandal wise respondents details are as follows:

Analysis of the data collected through ‘Schedules’:

To make the evaluation meaningful without subjectivity, the unbiased approach of the field investigators engaged in interviewing the sample respondents is the most important requirement. Based on the data collected through ‘Schedules’, we assessed that the following works were taken up in the three districts in selected sample villages:

Table 3. Types of SMC / WHS works taken up in MGNREGS (District wise)

S.No.	Chittoor	Adilabad	Srikakulam
01.	Earthen bunding	Earthen bunding	Earthen bunding
02.	Tank silt application	Check dam	Check dam
03.	Desilting of tank /check dam	Desilting of tanks	Percolation tank
04.	Supply channel	Supply channel	Supply channel
05.	Drainage channel	Tank silt application	Desilting of tanks / canals
06.	Bund plantation	Water absorption trench	Bund plantation
07.	Block plantation	Bund plantation	Block plantation
08.	Water absorption trench	Block plantation	Drainage channels
09.	Land leveling	Land leveling	Tank silt application
10.	Farm ponds	Land devt – ploughing	Farm ponds
11.	Stone bunding	Farm ponds	Dug wells
12.	Percolation tanks	Percolation tanks	Land Leveling
13.	Continuous contour trenches	Jungle clearance	Open wells repair / new construction
14.	Rock fill dams	Rock Fill Dam	Water Absorption Trenches
15.	Check wall / Check dam	-	Rock Fill Dams

Soil and moisture Conservation Measures

A soil and moisture conservation measure contributes to the following purposes generally:

1. Reducing soil erosion / soil loss
2. Enhancing soil nutrients in dry lands
3. Increasing infiltration & conserving soil moisture
4. Protecting banks / side slopes from scouring
5. Enhancing crop production

Water harvesting measures are having the following purposes:

1. More storage of water
2. Enhanced recharge of ground water
3. Drought mitigation
4. Enhanced availability of water for domestic and cattle needs
5. Supplementary / life saving irrigation for crops

Assessment criteria for usefulness of SMC works:

To minimize the effects of soil erosion, the MGNREGS programme has allowed the implementation of SMC programmes. Soil and moisture conservation works fulfills different types of purposes. The following table indicates how MGNREGS works contributed for different purposes leading to SMC measures:

Table 4. Assessment criteria for usefulness of SMC works

Components	Attributes / Purpose	Works contributed under MGNREGS
Soil and Moisture Conservation measures	Reducing soil erosion / soil loss	Field / stone bunding, Land leveling, Water absorption trenches, CCT, Land development (ploughing), Rock fill dams
	Enhancing soil nutrients in dry lands	Tank silt applications to dry lands
	Increasing infiltration & conserving soil moisture	Field bunding, Tank silt application to dry lands, CCT, Water Absorption Trenches, Land leveling
	Protecting banks / side slopes from scouring	Stone / Field bunding, bund plantations, Water Absorption trenches, land Leveling, Feeder Channel, RFD
	Enhancing crop production	Field bunding, Tank silt application to dry lands, Land leveling, Land development (ploughing)

Assessment criteria for usefulness of WHS works:

Water harvesting works fulfils different types of purposes. The following table indicates how MGNREGS works contributed for different purposes and purpose wise, WHS works are listed as follows:

Table 5. Assessment criteria for usefulness of WHS works

Components	Attributes / Purpose	Works contributed under MGNREGS
Rain water harvesting measures	More storage of water	Check dam, Desiltation of tanks, Farm ponds, Percolation tanks, supply channels
	Enhanced recharge of ground water	Check dam, Desiltation of tanks, Percolation tanks, Water Absorption trenches
	Drought mitigation	Check dam, Desiltation of tanks, Farm ponds, Percolation tanks
	Enhanced availability of water for domestic and cattle needs	Desiltation of tanks, Check dam, percolation tanks
	Supplementary / life saving irrigation for crops	Farm ponds, Percolation tanks, Check dams, Desiltation of tanks

Analysis on Efficacy of Soil and Moisture Conservation Works:

Lack of soil and moisture conservation practices is due to the fact that inappropriate land management practices coupled with intensive rainfall and steep terrains resulted in big gullies, top soil erosion and poor soil fertility. To minimize the effects of soil erosion, the MGNREGS programme has allowed implementation of SMC works. The consequences of different measures were assessed in this study in different land uses to evaluate the efficacy of the SMC / WHS works by comparing with the situation before / without MGNREGS programme. Soil and moisture conservation purpose wise analysis is narrated below:

Reducing soil erosion / Soil loss

The soil and moisture conservation works like field / stone bunding, Land leveling, Water absorption trenches, CCT, Land development (ploughing), Rock fill dams are contributing towards arresting soil erosion in the fields. Totally; 1,943 members were responded and shared about the usefulness of soil & moisture conservation works and their efficacy in soil erosion control. Out of them, 530 respondents

(27.28%) rated the efficacy of works taken up under MGNREGS as “good”; 1,238 respondents (63.71%) felt that the efficacy of works taken up under MGNREGS as “medium” and another 9.01% of the respondents (175 members) rated that the efficacy of works taken up under MGNREGS as “Low” (Source: Consolidated Data from the ‘Schedules’ prepared for the study).

Enhancing soil nutrients in dry lands by applying tank silt to agricultural lands

The soil and moisture conservation works like tank silt application to dry lands was contributed to enhance the soil nutrients in the dry lands effectively. Totally, 663 members were responded for this parameter. Out of the total respondents, 287 members (43.29%) rated the efficacy of applying tank silt to dry lands in enhancing soil nutrients as ‘Good’; 351 members (52.94%) of the respondents rated the efficacy as “Medium” and around 25 respondents (3.77%) felt that there is no much effect due to the tank silt application. Most of this category of respondents is not direct beneficiaries (mostly wage seekers from that village) (Source: Consolidated Data from the ‘Schedules’ prepared for the study).

Increasing infiltration & conserving soil moisture regime

The soil & Moisture conservation works like field bunding, tank silt application to dry lands, water absorption trenches, CCTs and land leveling works have major contributors for increasing the infiltration and conserving soil moisture regime. Totally, 658 members were responded for this parameter. Out of them, 207 (31.45%) respondents felt that the effect the works was “Good”, 346 (52.59%) respondents felt that the effect was “Medium” and 105 (15.96%) responded that no effect due to these activities. Most of these category respondents are not the direct beneficiaries, but mostly they are wage seekers (Source: Consolidated Data from the ‘Schedules’ prepared for the study).

Protecting banks / side slopes from scouring

The soil and moisture conservation works like field / stone bunding, bund plantations, water absorption trenches, land leveling, feeder channel and RFD works have contributed towards protecting side slopes of lands from scouring. Totally; 3,366 members have responded for the above parameter. Out of total respondents, 913 members (27.12%) rated the impact of soil and moisture conservation works taken up in their fields as “Good”; 2,037 members (60.52%) rated as “Medium” and 416 members (12.36%) felt that the impact was very low (Source: Consolidated Data from the ‘Schedules’ prepared for the study).

Enhancing crop production / improving the productivity of the lands

The soil and moisture conservation works like field bunding, tank silt application to dry lands, land leveling and land development (ploughing) have contributed towards enhancing the crop production / improving the productivity of the lands. On the parameter “usefulness in improving the productivity / enhancing the crop production in the lands”; 2,184 have responded. Out of them, 566 respondents (25.91%) responded that the efficacy of the works taken up under MGNREGS in their fields for enhancing crop production / improving the productivity of the lands as “good”; 1,262 respondents (57.79%) felt that the efficacy was “Medium” and another 356 respondents (16.30%) rated the efficacy as “Low” (Source: Consolidated Data from the ‘Schedules’ prepared for the study).

Table 6. Respondent's views on usefulness on Soil & Moisture Conservation (SMC) works

Type of works	Purpose serving	Response: Good / Medium	Response: Low
Field Bunding / Stone Bunding	<ul style="list-style-type: none"> • Reducing soil erosion / soil loss • Increasing infiltration and conserving soil moisture • Protecting banks / side slopes from scouring • Enhancing crop production 	<ul style="list-style-type: none"> • Able to minimize the first order gullies • Able to save the fertile soil • Able to see the soil moisture for long time in the field • Able to save the crop nearer to the bund • Able to raise the legumes and other crops like red gram, castor etc.. on the bund • Serving the objective of the work • Usage of local material for stone bunding 	<ul style="list-style-type: none"> • No waste weir / outlet construction to allow the excess water • No foundation for stone bunding • No wells in the influence zone • Not able to see the impact due to low rainfall • Respondents are not the direct beneficiaries, they are wage seekers and not able to see the impact
Tank Silt Application to dry lands	<ul style="list-style-type: none"> • Enhancing soil nutrients in dry lands • Increasing infiltration and conserving soil moisture • Enhancing crop production 	<ul style="list-style-type: none"> • Able to see the improvement in the fertility of the land • Able to get more yield from the tank silt applied land • Availability of soil moisture for longer time • Able to save the crop when there is delay in rain • Serving the objective of the work • Benefiting more number of farmers • Able to reduce the expenditure on usage of chemical fertilizers. 	<ul style="list-style-type: none"> • Not allowed this activity for cultivable lands • Not allowed for filling the undulations in the land through this activity • Not approved sufficient quantity of soil to the individuals • Immediate rainfall after silt application which leads to crop failure • Not giving priority for all caste people • Respondents are not the direct beneficiaries, they are wage seekers and not able to see the impact • Works were carried out with no ownership
Bund Plantation	Usefulness in recharging of wells below	<ul style="list-style-type: none"> • Able to bind the bund and gives strength to the bund • Able to save the fertile soil • Availability of soil moisture for longer time • Serving the objective of the work • Benefiting more number of farmers 	<ul style="list-style-type: none"> • Survival rate is very low • Only one variety of crops are growing under this activity (teak plants in select places). • Not able to visualize the impact due to small plants • Quality of plants supplied were not good • Providing watering facility to plants is a constraint and payments are also not timely. • Not allowed this for cultivable lands • Respondents are not the direct beneficiaries, but they are wage seekers and not able to see the impact
Block plantation / horticulture plantation	Usefulness in recharging of wells below	<ul style="list-style-type: none"> • Arrested the erosion as the land comes under cultivation • Able to save the fertile soil • Availability of soil moisture for longer time • The fallen leaves of plantation serves as mulching for inter crops. • More farmers got benefitted by bringing more area under cultivation • Serving the objective of the work • Benefiting more number of farmers 	<ul style="list-style-type: none"> • Survival rate is very low • Only one variety of crops are growing under this activity (Mango Plants) • Not able to visualize the impact due to small plants • Not allowed this for cultivable lands • Respondents are not the direct beneficiaries, but they are wage seekers and not able to see the impact • Quality of plants supplied were not good • Providing watering facility to plants is a constraint and payments are also not timely

Trenches / Water Absorption trenches (WAT)	<ul style="list-style-type: none"> Reducing soil erosion / soil loss Increasing infiltration and conserving soil moisture Enhancing crop production 	<ul style="list-style-type: none"> Reduces the flow velocity of water and erosion of the soil Increases the soil moisture Protects downstream fields from the runoff Protecting the crops from floods Arrests the cattle grazing on the hillocks Increases the ground water table in the nearby wells Serving the objective of the work 	<ul style="list-style-type: none"> No waster weirs for releasing the excess water No presence of hillocks Not executed this activity in most of the areas and people are not able to visualize the impact Execution through manual labour is not possible
		<ul style="list-style-type: none"> 	
Land Leveling / Land Development	<ul style="list-style-type: none"> Reducing soil erosion / soil loss Increasing infiltration and conserving soil moisture Protecting banks / side slopes from scouring Enhancing crop production 	<ul style="list-style-type: none"> Reduces the flow velocity of water in the land Reduces the slope of the land and thereby erosion of soil Serving the purpose and getting additional land under cultivation Maximum quantity of rain water percolates, thus improves underground Water levels Serving the objective of the work Expansion of cultivable land 	<ul style="list-style-type: none"> Not utilizing the land for any cultivation of crops Not able to level the land fully due to hardness of soil and presence of stones Even after work completion presence of undulated land which is not suitable for cultivation Execution of this activity through manual labour is difficult Existence of stones in the land Respondents are not the direct beneficiaries, they are wage seekers and not able to see the impact
Rock Fill Dams	<ul style="list-style-type: none"> Reducing soil erosion / soil loss Protecting banks / side slopes from scouring 	<ul style="list-style-type: none"> Arrests the widening and deepening of gully Reduces the runoff velocity and controls the soil erosion Arrests the siltation of existing structures in downstream side 	<ul style="list-style-type: none"> Not serving the purpose due to low quality of structures Not able to visualize the impact

Analysis on efficacy of Water Harvesting Measures:

Treatment of gullies and streams through check dams, percolation tanks and promotion of farm ponds could harvest water mainly for surface irrigation in dry tracts, which was supplemented by shallow and deep wells. These structures play a greater role in stabilizing agriculture in dry lands. As part of the evaluation, the purpose of water harvesting measures was analyzed and how these structures would influence each purpose is discussed below:

More storage of water

Check dams, desiltation of tanks, farm ponds, percolation tanks, supply channels kind of works are mainly contributing towards more storage of water. More storage of water through water harvesting structures is possible. But, for this parameter, totally 651 respondents shared their views in all 3 districts. Out of them, 291 respondents (44.70%) said that the water storage increase was “Good”, 313 respondents (48.08%) said that the increase in storage was “Medium” and around 7.22% of the respondents (47 members) said that the increased storage was “Low” (*Source: Consolidated Data from the ‘Schedules’ prepared for the study.*)

Enhanced recharge of ground water in the nearby open / bore wells

The water harvesting works like check dams, desiltation of tanks, percolation tanks and water absorption trenches have contributed towards enhancing recharge of ground water in the nearby open / bore wells. **“Enhanced recharge of ground water in the nearby open / bore wells”** is possible due to water harvesting measures. This was shared by 629 respondents totally in all the three districts. Out of them, 220 respondents (34.98%) said that recharge of wells in and around the structures constructed under MGNREGS was “Good”, 325 respondents (51.67%) said that the recharge of wells was “Medium” and another 84 respondents (13.35%) said that the recharge of wells was “Low” (*Source: Consolidated Data from the ‘Schedules’ prepared for the study*).

Drought Mitigation

The water harvesting works like check dams, desiltation of tanks, farm ponds and percolation tanks have helped towards drought mitigation. Most of the water harvesting measure would help in mitigation of drought in an effective manner. Drought mitigation through water harvesting measures was shared by 628 respondents in all the three districts. Out of them, 230 respondents (36.62%) said that drought mitigation due to water harvesting measures was “Good”, 347 respondents (55.26%) said that the drought mitigation due to water harvesting measures was “Medium” and another 51 respondents (8.12%) said that the drought mitigation was “Low” (*Source: Consolidated Data from the ‘Schedules’ prepared for the study*).

Enhanced availability of water for Domestic and Cattle Needs

Water harvesting measures like desiltation of tanks, check dams, percolation tanks, etc. would fulfill the needs of both human and livestock in the villages. For the above parameter 638 respondents shared their views. Out of them, 265 respondents (41.54%) said that increased availability of water to domestic and cattle needs due to water harvesting structures constructed under MGNREGS was “Good”, 325 respondents (50.94%) said that the increased availability of water for domestic and cattle needs was “Medium” and another 48 respondents (7.52%) said that the increased availability for domestic and cattle needs was “Low” (*Source: Consolidated Data from the ‘Schedules’ prepared for the study*).

Supplementary / life saving irrigation for crops

The water harvesting works like desiltation of tanks, check dams, farm ponds, percolation tanks would contribute for providing life saving irrigation / supplementary irrigation for the crops during critical growth stages of crops. Overall, 40.92% of the members (257 Nos.) felt that the usefulness of the structures for providing life saving irrigation to crops was “Good”, 51.12% of the members (321 Nos.) felt that the usefulness was “Medium” and 7.96% of the respondents (50 members) felt that there was not much usefulness due to water harvesting structures for life saving irrigation of crops (*Source: Consolidated Data from the ‘Schedules’ prepared for the study*).

Table 7. Respondent’s views on usefulness on Water Harvesting structure (WHS) works

Type of works	Purpose serving	Response: Good / Medium	Response: Low
Check Dam	<ul style="list-style-type: none"> • More storage of water • Enhanced recharge of ground water in the nearby open / bore wells • Drought mitigation • Enhanced 	<ul style="list-style-type: none"> • Able to see the eroded fertile soil in the water spread area of check dam • Able to arrest the extension of gully • Reduction of velocity of water in the drainage line • Drainage channel not widened further after check dam construction. Due to this, the 	<ul style="list-style-type: none"> • Respondents are not the direct beneficiaries, they are wage seekers and not able to see the impact • Labour felt that the check dam is not useful directly to them • Not able to see the impact due to low rainfall • No proper key-in which leads to scouring

Type of works	Purpose serving	Response: Good / Medium	Response: Low
	availability of water for Domestic and cattle needs <ul style="list-style-type: none"> • Supplementary / life saving irrigation for crops 	adjacent lands of farmers were saved. <ul style="list-style-type: none"> • Useful for cattle drinking water purpose • Able to see the improvement in ground water level in wells • Able to irrigate area through ground water recharge by check dam • Able to get higher yields due to adequate moisture content in the soil • Proper site identification for construction of structure • No leakages in the structure 	
Desiltation of tanks	<ul style="list-style-type: none"> • More storage of water • Enhanced recharge of ground water in the nearby open / bore wells • Drought mitigation • Enhanced availability of water for Domestic and cattle needs • Supplementary / life saving irrigation for crops 	<ul style="list-style-type: none"> • Storage of water for longer period in the excavated pits. • Improvement in dead storage capacity thereby utilization for livestock drinking water purpose, fish rearing, domestic use • Observed the ground water recharge in command area • Able to see the improvement in the fertility of the land • Able to strengthen the tank bund • More number of farmers got benefitted • Enhancement in crop production • Availability of soil moisture for longer time • Able to save the crop when there is delay in rain • Stabilization of tankfed agriculture in the command area of the tanks. 	<ul style="list-style-type: none"> • Not able to visualize the impact due to low rainfall • Not followed the technical standards like not following the berm, manipulation of measurements and dumping the soil in the tankbed itself • Not allowed the tank silt application work for cultivable lands • Not approved sufficient quantity of silt to the individuals • Not giving priority for all caste people • Low rainfall • Immediate rainfall after silt application which leads to crop failure • Respondents are not the direct beneficiaries, they are wage seekers and not able to see the impact
Farm Ponds	<ul style="list-style-type: none"> • More storage of water • Drought mitigation • Supplementary / life saving irrigation for crops 	<ul style="list-style-type: none"> • More number of beneficiaries used the available water for watering mango plants • Able to provide supplementary irrigation for groundnut during critical stages of crop growth. • Useful for cultivating kitchen garden crops. • Availability of water for longer period. 	<ul style="list-style-type: none"> • Less depth of the pond is done. • No awareness / wrong perception on farm ponds among the community • Not utilizing for cultivating any other crop except mango • Water storage period is low as depth of the pond is very less • No technical standards followed like provision of inlet and outlet • Respondents are not the direct beneficiaries, they are wage seekers and not able to see the impact
Percolation Tank	<ul style="list-style-type: none"> • More storage of water • Enhanced recharge of 	<ul style="list-style-type: none"> • Ground water recharge is happening in the wells in downstream side of the structures. 	<ul style="list-style-type: none"> • Site feasibility is not good. • Less depth of the percolation tank. • Not utilizing for any cultivation of crops

Type of works	Purpose serving	Response: Good / Medium	Response: Low
	ground water in the nearby open / bore wells <ul style="list-style-type: none"> • Drought mitigation • Enhanced availability of water for Domestic and cattle needs • Supplementary / life saving irrigation for crops 	<ul style="list-style-type: none"> • Useful for cattle drinking water purpose • Useful for cultivating kitchen garden crops on PT bund • Availability of water for longer period • Minimizes the risk of crop failure due to uneven rainfall, as the availability of water moisture regime exists. 	<ul style="list-style-type: none"> • No technical standards followed like provision of outlet / inlet. • Respondents are not the direct beneficiaries, they are wage seekers and not able to see the impact
Supply Channel	<ul style="list-style-type: none"> • More storage of water • Enhanced recharge of ground water in the nearby open / bore wells • Protects the side slopes from scouring 	<ul style="list-style-type: none"> • Cleaned channel improves the water flow into tank • Arrest the soil erosion which minimises the siltation of tank • Able to reduce the extension of gully • Recharge of well through increase in water storage period for long time • Cleaned channel allows the water flow directly in to the tank without disturbing the lands on both sides of the channel • Serves the purpose of the work 	<ul style="list-style-type: none"> • Not able to see the impact due to low rainfall • Technically, not maintained the berm and side slopes for the channel • Respondents are not the direct beneficiaries, they are wage seekers and not able to see the impact • Dumping of excavated soil on both sides of the channel & ramming the soil is not good.

Focused Group Discussions – Outcomes:

Validating responses of respondents (villagers) is part of the methodology and the process followed to do so is organizing the Focused Groups Discussions (FGDs) in the villages. In all three districts FGDs were carried out in MGNREGS study area (two sample panchayats in each of the five mandals in each district). After data collection from the respondents, grama sabha meetings were organized with the core group containing mates, direct beneficiaries, wage seekers, non-beneficiaries like school teachers, post man etc. in the villages selected based on the maximum number of works grounded (treatment village) and village where less number or without MGNREGS works (control village).

The FGD was used as a forum to understand the nitty-gritty's of MGNREGS, cross checking the outcomes of the interview schedules and to get suggestions for improvement (policy changes) of the scheme. The outcomes (District wise) of the FGDs are as follows:

Chittoor District

Activity related:

- Tank Silt application works should be allotted in non-agriculture season (preferably from March to June) there by more number of farmers can get benefit out of this activity. Moreover, silt application should be allowed for all cultivated lands (presently allowed only for fallow lands) and more than 5 years mango orchards (presently allowed only less than 3 years mango orchards only) as farmers are interested in applying as it enhances crop yields and reduces the application of chemical fertilizers.
- Tank silt application work should be allotted to all caste people as it is very essential and helpful for agriculture lands, but presently priority is given for only SC and ST lands.

- Silt application should be allowed every year for the same farmers / land as it decreases dependency on inorganic fertilizers and enhances soil fertility.
- Tank silt application should be allowed for closing of defunct wells in the villages and for filling the undulations (uneven) in cultivable lands.
- Under tank silt application, the ceiling on number of tractor loads per acre and number of loads per farmer has to be increased.
- Tank silt application should be allowed from more than one tank in a village in a season mainly to facilitate more farmers to take up the activity (present policy of one tank is time consuming and cannot accommodate more farmers).
- Tank silt application need to be promoted in large scale, but due to ceiling of labour days all the farmers could not take up this activity.
- Sanctions for mango plantation works is taking 3 - 4 months, water & maintenance charges are being paid for only initial 2 years. The villagers suggested that this can be paid up to three years.
- Due to promotion of only mango, no diversity in horticulture plantation may leads to problems in future.
- Most of the farmers felt that there is a need for field bunding in orchards for ensuring soil and moisture conservation in orchard fields.
- Watering charges should be paid to all farmers (even for bore well owners, but without drip / sprinkler facility) taken up mango plantation, since they should also engage labour or tractors for watering (as social audit team has recommended for recovery of such payments, the farmers requested this).
- As per present guidelines, mango plantation is not giving for second time for the same beneficiary for different land, people says this has to be changed.
- Tank desiltation was very useful since the water stored in the dead storage created is being used for livestock drinking and used for second crop in some tanks.
- Minimum depth of soil has to be excavated to create dead storage in the tank water spread area.
- Most of the farmers felt that bush clearance (jungle clearance) activity is just waste of money since they are forcing us to take up this activity.
- There should be a provision for planting coconut trees on bunds in addition to teak plants.

Implementation related:

- MGNREGS should be merged with agriculture (Provision for 50% payment from MGNREGS funds to selected agriculture activities) or MGNREGS should be applied for agriculture activity at least during one season in a year.
- People are not aware of all types of works which could be implemented under MGNREGS. Hence, some of the activities are not yet grounded (not even created awareness among the labourers and farmers).
- Most of the farmers are not giving priority for the water harvesting structures like farm ponds construction in their lands due to lack of awareness.
- Most of the farmers felt that this scheme is making agriculture to decline and the works carried out in this scheme have no ownership of the community.
- Some of the beneficiaries felt that there should be provision for desiltation after 5 years in farm ponds.
- No. of labour days per family has to be increased.
- For land leveling, machinery (JCB) should be allowed under material component (40%) as it is impossible to carry out the land leveling activity with manual labour.
- Cement works should be allowed (like check dams, surplus weirs to percolation tanks, repair of tank surplus weirs and sluices) for conservation of existing structures in a large scale. This will help for the already existing structures to ensure its efficacy with less / limited expenditure.
- Technical knowledge of technical staff and field staff is not satisfactory. Hence, quality of works could not be ensured.

- MGNREGS works has to be implemented only during off season to avoid shortfall of labour for agriculture works.
- Works should be sanctioned based on farmers need and not as per project directions or targets.
- Implements for execution of works like spade, crow-bar etc., should be timely supplied to labour groups or wage seekers.
- Timely payments should be ensured (delay in payments leads to decrease in labour turn over).
- Biometric system of payments has to be changed as it is very problematic for aged and differently abled persons (direct transfer to personal accounts could be promoted).
- SSS group members need to be oriented because they are not following groups norms or dynamics.

Reasons for slow progress in MGNREGS (control villages)

1. Most of the families in control villages are big farmers, government job holders or migrants.
2. More of mango orchards existence in the area and very less common lands.
3. More plain and cultivated lands with irrigation facility.
4. Most of the working force is migrated and those who stays in the village are aged and women.
5. Delay in labour payments or leakages.

Srikakulam District

The FGDs were organized in Srikakulam district in six grama panchayats in five Mandals. The details of outcomes of the FGDs are as follows:

Activities related:

- Top priority should be given for Percolation tanks, Plantation, Open wells and Tank works.
- Bush clearance on hillocks (in between cashew trees) need to give top priority, because dependency on them is very high.
- Demand for community bore wells is very high, if provided they would go for cultivation of vegetables, maize, watermelon which would enhance their income almost by 50%.
- Need to give top priority for repair or reconstruction of sluice and surplus weir for tanks instead of just desiltation mainly to increase the tank system efficiency.
- Tank silt application should be taken up every year and open well excavation need to be introduced.

Implementation related:

- The respondents felt that the MGNREGS works need to apply for agriculture activities atleast for one season in a year. This will help the farmers to take up the needed labour works with MGNREGS funds. MGNREGS should be applied to rainfed agriculture (but not for irrigated) with special attention on marginal farmers.
- The respondents felt that it needs to increase labour days for those who demand work even after completion of 100 days (mostly in families with more than two labours). This problem is coming in most of the families where two or more labours are engaged from the same family.
- Selection of mates should be done based on some criteria like literacy, learning ability and they should be properly trained.
- Technical Assistants (TA) in a mandal should have uniform workload to ensure quality of implementation. Few TAs are having the geographical boundary of more panchayats and few are having less in few Mandals in the District.

- Field assistants must be non local to ensure quality mainly to avoid local pressures. Field assistants need to be trained rigorously mainly to carry out need assessment of community for different types of needed works.
- Social audit teams should be from technical background and recoveries should be imposed based on field enquiry and not based on complaints received by the authorities. Due to lack of technical knowledge among the social audit team members, few of the good staff of EGS was penalized.
- Need to have one exclusive team at mandal level mainly for scrutiny of musters through surprise visits. This will help the quality of musters.
- More than 25% of households have more than two labours from the same family and they have completed 100 labour days. But still they are demanding for wage works. Hence, need to relook the ceiling of 100 days.
- The peak working season is January – May. But even in March, they couldn't get any wage works.

Adilabad District

In Adilabad district we conducted Focused Group Discussions (FGD) in all five mandals. In each mandal, we conducted in one of the two selected grama panchayats where we have done evaluation study. While conducting FGD, we considered the control area with treated area in the same mandal consisting of same geographical and soil conditions. The outcomes are as follows:

Activity related:

- Silt application to dry lands has given very good results in enhancing good yields.
- Silt application need to be done for all the farmers irrespective of caste and category of the farmers.
- The removal of cotton sticks should include under MGNREGS works.
- In this scheme, only pebbles are removed as part of land development. But, without removing big boulders, land could not be brought under cultivation by small and marginal farmers.
- In many plantation cases, the payments are not made even after the completion of works three years back, so labour charges did not paid till today.
- For Farm ponds, some maintenance fund should be provided yearly for maintaining the structure in good condition.
- In bush clearance activity, they are not removing entire bushes in the same year. Hence, farmers could not cultivate in their entire land.
- The field bunding works were executed in almost every mandal of the district. This activity was very useful to slopy lands and to the paddy fields.
- In silt application activity, farmers are unhappy about insufficient quantity of silt allowed for applying in their fields. The loads per acre need to increase.
- Survival rate of plantation activity in the study mandals (except in Jaipur mandal in Mancherial division) was not satisfactory. It is mainly because of lack of awareness and ownership.
- Land development and land leveling activities helped majority of the weaker section farmers belongs to SC / ST and brought uncultivated lands into cultivation.

Implementation related:

- Majority of the community expressed that the works executed under MGNREGS are very useful not only in the sense of employment creation, but in relation to increase the productivity of crops and increased incomes.
- The wage payments are not made regularly in most of the mandals (once in three to four months only).
- The gap between completion of one work to initiation of another work is very huge. It needs to be minimized to ensure regular cash flow to labour families.

- Under agriculture, only weed removal activity should be merged with MGNREGS.
- Should give approval to do treatment works in forest lands particularly in ridge area.
- The farmers in the district are mostly depending on rainfed agriculture. But, the focus on farm ponds and the mini percolation tanks is not significant.

Limitations of the results of the study:

The Pilot study has been carried out without a concrete baseline data for the 30 Grama Panchayats studied in three different districts in a span of quick three months. Though, the perceptions and variations in response on the usefulness measurements have been controlled and used by giving indicative measurement parameters such as rise in ground water level, soil moisture retention days in between dry spells, number of extended days of water storage, the triangulation method by conducting the Focused Group discussions minimised the gaps. The availability of secondary data for the Grama Panchayats wise on each work wise is not made available clearly to verify the amount spent on the works and usefulness of works as perceived by the people. Anyhow, the study is conducted with the following limitations:

1. Absence of baseline data to assess direct quantified impact
2. Non-availability of required secondary data
3. Extensive study in shorter duration
4. Results based on people perception and direct observation in the study area
5. Poor monsoon in two districts during 2012

Consolidated results:

Prioritized SMC / WHS works:

Based on the observations in the study areas during the study period and perception of the respondents at different stages of the study, the following are the prioritized Soil & Moisture Conservation / Water harvesting works as perceived by the respondents:

Table 8. Prioritized SMC , WHS works (district wise)

S.No.	Chittoor	Adilabad	Srikakulam
01.	Field bunding	Field bunding	Desiltation of tanks
02.	Desiltation of tanks	Desiltation of tanks	Land leveling
03.	Tank silt application	Tank silt application	Open wells
04.	Land leveling	Farm ponds	Block Plantations
05.	Block Plantations	Land leveling	Drainage channels

In Chittoor district in Rayalaseema region of the State, the works like Field Bunding, Desiltation of tanks, Tank Silt Application to dry lands, Land leveling and plantations were given high priority. Few case studies on these works were given in “Case studies” chapter.

In Adilabad district of Telangana region of the State, the works like Field Bunding, Desiltation of tanks, Tank Silt Application to dry lands, farm ponds and land leveling were given high priority. Few case studies on these works were given in the “Case studies” chapter.

In Srikakulam district of Coastal Andhra Region of the State, the works like Desiltation of tanks, land leveling, open wells construction, plantations and drainage channels were given high priority. Few case studies on these works were given in the “Case studies” chapter.

Recommendations:

Based on the study in these three districts, we are recommending the following points as recommendations to the Directorate of MGNREGS, Andhra Pradesh in order to do continuous follow

up. This will help the policy makers to understand the changes taken place and benefits reaped by the beneficiaries of MGNREGS. Anyhow, we are recommending the following points:

1. Revisiting the works atleast once in 2 – 3 years to continue longevity of benefits
2. Quality of works with adequate technical standards
3. Saturating the works in watersheds / drainage basis
4. Introducing regular asset maintenance by the users by providing soft credit
5. Best practices documentation and dissemination through grama sabha
6. Scientific Action Research on varied contexts to understand the effects
7. Works taken up should improve total village ecology
8. Use of a perspective plan prepared by village panchayats
9. Setting up institutional mechanism for maintenance of assets
10. Capacity Building of the elected Panchayat Members

Conclusions

Soil and water are the essential natural resources (which are also scarce) of production, naturally the works concerned with their conservation and sustainable use have drawn the attention of the Rural Development Department, Government of Andhra Pradesh for examination on priority. Since huge cost is involved in this scheme, the Directorate of MGNREGS intended to know how efficiently and effectively the scheme is being implemented. The rapid appraisal on the usefulness of the MGNREGS in improving soil and water conservation has been taken up in 30 Grama Panchayats of 15 Mandals in three districts viz. Chittoor, Adilabad and Srikakulam representing Rayalaseema, Telangana and Coastal Andhra Pradesh Regions.

Contributions and Usefulness of MGNREGS on Soil and Water Conservation:

There are about 15 different types of works which contribute either directly or indirectly to fulfill the purpose of Soil and Water Conservation implemented under MGNREGS reviewed by adopting Stratified Random Sampling Techniques. Systematic questionnaires capturing the usefulness and extent of benefits in the beneficiaries' point of view, Focused Group Discussions at Grama Panchayat Level, comparing the changes between MGNREGS implemented (Treated) Vis-à-vis Non-implemented plots to assess and re-validate the responses, in the absence of baseline data.

Moreover, the rainfall received in the study districts has witnessed a great decline than the district average in Chittoor and Srikakulam except Adilabad wherein the rainfall received in the study period is much more than the district average annual rainfall. The significant impact and efficacy of the works implemented by and large depend on the quality of work implemented, amount of rainfall received, soil type, hydro-geomorphology of the study area. The results of the perceptions of usefulness rated as High, Medium and Low have been collated, consolidated and interpreted to make a concrete meaning out of them.

Rayalaseema Region / Chittoor district:

In Chittoor district, with an average annual rainfall of 918.10 mm, under MGNREGS; 3,501 number of soil & moisture conservation / water harvesting works have been implemented since phase – I, (i.e.), since 2006 in the selected sample villages. There are about approximately 10.73 lakhs person days of employment was generated through MGNREGS works and Rs. 11.58 Crores worth of works has been taken up in MGNREGS in the sample villages in the district.

On overall usefulness and efficacy of the works, the works which has given more use to the people are as follows:

Table 9. Prioritized works list in Chittoor district

Most prioritized / Most useful	Moderate prioritized and useful	Low priority and useful
Field bunding	Supply channel	Prosopis clearance
Desiltation of tanks	Percolation tanks	Water absorption trenches
Tank silt application	Bund plantations	Continuous Contour Trenches
Land leveling	Drainage channels	Surplus course
Block Plantations	Farm ponds	Check dam

Telangana Region / Adilabad district

In Adilabad district, 52 Mandals are there. Out of this, the results of usefulness have been collated and consolidated for 5 Mandals and 10 grama panchayats (@ 2 grama panchayats per Mandal). There are 3,449 items of soil & moisture conservation / water harvesting works have been implemented under MGNREGS that contribute for the purpose. Approximately 13.71 lakhs labour days are generated and worth of around Rs. 14.62 Crores have been spent towards MGNREGS in the sample villages in the district.

On overall usefulness and efficacy of the works, the works which has given more benefits to the people are as follows:

Table 10. Prioritized works list in Adilabad district

Most prioritized / Most useful	Moderate prioritized and useful	Low priority and useful
Field / Earthen bunding	Bund Plantation	Check dam
Desiltation of tanks	Block plantation	Land development – Ploughing
Tank silt application	Jungle clearance	Supply channel
Farm ponds	Percolation tanks	Surplus course
Land leveling	Water absorption trenches	Drainage channel

Coastal Andhra Region / Srikakulam District

Srikakulam, one of the coastal districts of Andhra Pradesh has been implementing MGNREGS from Phase II. The study conducted in five mandals and 10 GPs data shows the usefulness in preserving soil moisture and retaining the soil nutrient intact. There are 2,434 items of works have been implemented in MGNREGS that contribute to soil and water conservation. Approximately 14.23 lakhs labour days are generated and around Rs. 14.87 Crores have been spent towards MGNREGS in the sample villages in the district.

On overall usefulness and efficacy of the works, the works which has given more use to the people are as follows:

Table 11. Prioritized works list in Srikakulam district

Most prioritized / Most useful	Moderate prioritized and useful	Low priority and useful
Desiltation of tanks	Supply channel	Check dam
Land leveling	Jungle clearance	Percolation tank
Open wells	Block plantations	Earthen Bunding
Bund Plantations	Surplus course	Farm ponds
Drainage channels	Water absorption trench	Tank silt application to drylands

Way Forward

The Directorate of MGNREGS could commission a longitudinal study in the same Grama Panchayats and Mandals on Bi-annually by ensuring the quality of works implemented as per the designs. The Villagers could be empowered to voice the efficacy of works implemented at respective Grama sabha meetings. The best practices as well as effectively implemented works in different districts could be documented and used as a learning document for the implementers to do the MGNREGS works with a purpose of Soil and water conservation. Soil and Water is the wealth of our nation and we should protect them from getting deteriorated.

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