

Impact Assessment of Environmental Benefits through MGNREGA Project (2013-19)

Synopsis



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A2/18, Safdarjung Enclave
New Delhi 110 029 India
T: +91 11 4949 5353
F : + 91 11 4949 5391
E: info@giz.de
I: www.giz.de

Responsible

Mr. Rajeev Ahal,
E: rajeev.ahal@giz.de
Director, Natural Resource Management

Authors

Sunil Kumar, Rajesh Kumar Pant, Basant Kumar Mishra and Sonal Kulshreshtha
Synergy Technofin Private Ltd.

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Context

The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) came into effect since 2006 and aims at enhancing the livelihood security of people in rural areas by guaranteeing 100 days of wage-employment in a financial year to a rural household whose adult members volunteer to do unskilled manual work. The Act also seeks to create durable assets to augment land and water resources, improve rural connectivity and strengthen the livelihood resource base of the rural poor.

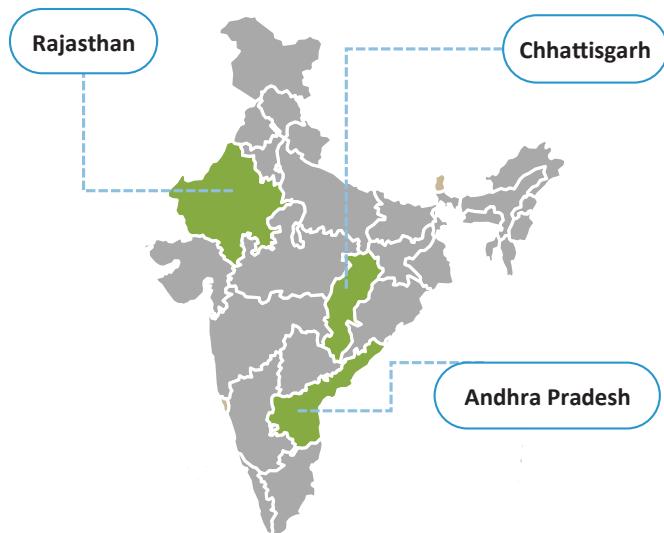
An Indo - German bilateral project on Environmental Benefits through Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA-EB) was commissioned by Federal Ministry for Economic Cooperation & Development (BMZ) of Germany in 2013 and was jointly implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), India and Ministry of Rural Development (MoRD), Government of India (GoI) since 2013 for five years and later extended for one additional year. This bilateral project has a special mandate to capacitate the local governing entities of villages known as Gram Panchayats (GPs) (Village Councils) for incorporating and implementing more than 65 per cent Natural Resource Management (NRM) works in the annual plans of MGNREGA popularly called as Labour Budget. The project also had other key activity to demonstrate the innovative technical NRM interventions with intended outcomes for positive environmental benefits. The cross-cutting agenda of gender inclusivity and to show case for the contributions to Sustainable Developmental Goals (SDGs) were also other important activities of the project.

The project had three partner states of Rajasthan, Chhattisgarh and Andhra Pradesh which represented the 3 different agroclimatic zones and North-western, Central and Southern India as well.

Each partners state provided two district and within each district on block as project pilot area and in each block 2 Gram Panchayats (GPs) – the lowest governing body in Indian democratic system, as sites of demonstrations. Thus, project started with 12 GPs in nutshell, which later become "Light Houses" and 5 best innovative pilots among 24 (2 Pilots per GP) technical demonstration are being scaled up widely in the three partner states and one related to Geographical Information System (GIS) based planning process for MGNREGA is rolled out at national scale by political partner MoRD.

The impact assessment has been conducted to derive empirical evidences from project interventions to deliver not only environmental, but also the economic and social benefits to conserve natural resources in rural areas of different agroclimatic zones with specific intention to improve water availability and sustained livelihoods. Impact Assessment team has put best efforts to assess the project activities through In-Depth Interviews (IDIs), Focus Group Discussions (FGDs) with project stakeholders to get primary information and some document appraisal such MGNREGA MIS and GP records etc. The previous project reports from implementation partners in each state were considered as sources of secondary information. However, the scope of this study was not to asses the interventions on technical or scientific basis, hence the outcomes of the study are limited to quantitatively and qualitative parameters of Relevance, Effectiveness, Efficiency and Sustainability of the project interventions.

Figure 1: Project States



Rajasthan Impressions

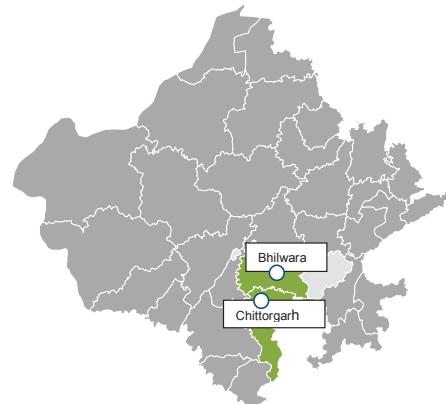
Rajasthan is the largest states of India in term of its geographical area of 342, 239 square kilometres divided into 33 districts, 295 blocks and 9894 GPs. It has 9 agroclimatic zones. The MGNREGA -EB project was piloted in Kankroliya Ghati and Nandrai GPs of Kotri block of Bhilwara and Abhaypur and Sehanwa GP of Chittorgarh block of Chittorgarh districts.

The project was implemented in partnership with MGNREGA divisions of the State, respective District and Block Rural Development departments of the Government and a technical partner Society for promotion for Wastelands Development (SPWD) based at Udaipur.

MAJOR INTERVENTIONS

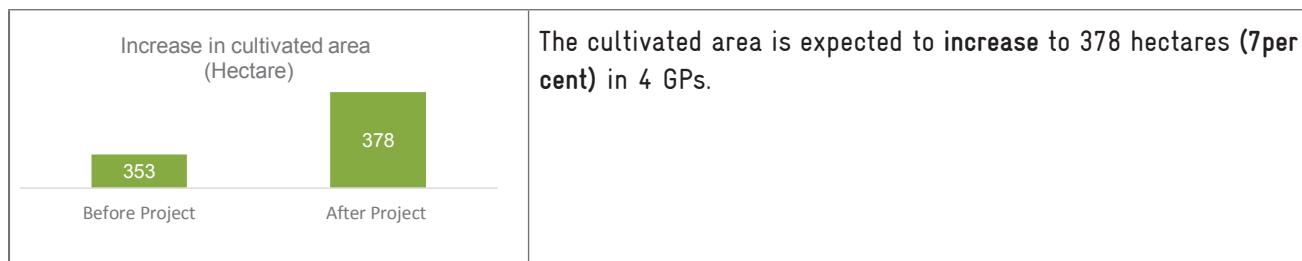
1. Pilot demonstrations of Drainage Line Treatments, Pasture Land Development, Horticulture on Wasteland, Renovation of Traditional Water bodies and Diversion Based Irrigation.
2. Innovative GIS based Convergent Planning Process for MGNREGA for state and national level.
3. Integrated Water Management Plan for Desert areas in partnership with private sector through Corporate Social Responsibility (CSR) mechanism of convergence.
4. Capacity Development and Knowledge management support to state and MoRD at national level.

Figure 2: Project Locations



MAJOR IMPACTS

4	Detailed Project Reports (DPRs) were developed first time for 4 pilot GPs with its implementation value of INR 80 million which is almost 4 times higher than its previous plans leading accomplishment of major NRM works under MGNREGA.
89	Assets are planned to be created through these 4 DPRs for water management wasteland development and afforestation.
Area under irrigation in Four GP (Hectare) <div style="display: flex; justify-content: space-around;"><div style="text-align: center;">471 Before Project</div><div style="text-align: center;">584 After Project</div></div>	Area under irrigation is expected to increase in 584 hectares (24 per cent), which is hitherto rain-fed in 4 GPs.



KEY ENVIRONMENTAL IMPACTS

- The water availability for irrigation due to DLTs is increased for approx. 500 hectares in pilot GP of Abhaypur, Chittorgarh

Figure 3: Check Dam over drainage line



- The ground water has risen so the open wells in the command area were witnessed with fetchable water.

Figure 4: Recharged open well



- Improved vegetative cover through productive use of wastelands being developed as horticulture block plantation site and other as pasture land leading to nutritional security of villagers as well as livestock along with improved revenue for GPs as harvesting of the fruits and fodders will be leased out to villagers.

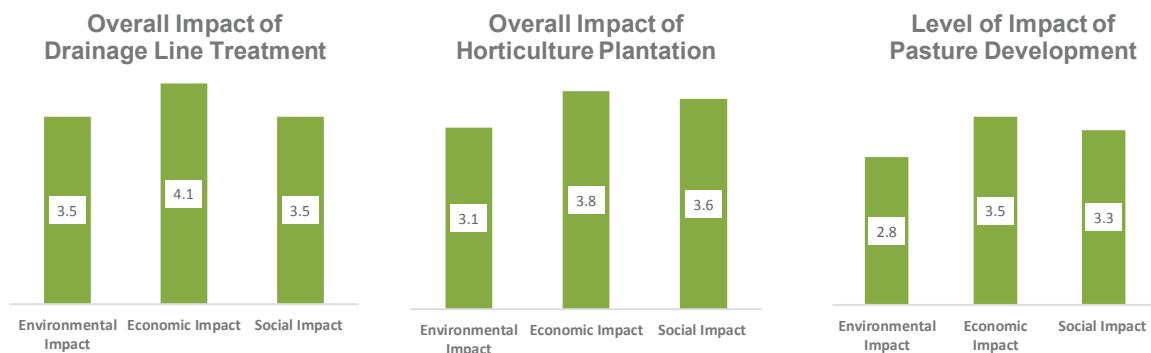
Figure 5: Horticulture Plantation



Figure 6: Fodder harvesting from plantation site



Based on primary inputs and ratings from stakeholders on scale of 1-5 for Environmental, Economic and Social impacts were quantified to understand the importance of such initiatives among the beneficiaries and project facilitators associated with MGNREGA in the pilot GPs. The impression was higher on economic impact which means the livelihoods are being improved followed up with improved understanding environmental benefits and a sense of social responsibility to conserve the natural resources.



IMPACT OF BREAKTHROUGH INNOVATION OF GIS BASED PLANNING PROCESS

GIS assisted participatory and convergent planning process for which Rajasthan emerged as pioneer state in developing and scale it up across the state and nation in partnership with other technical partners from other two project states and MoRD, in streamlining the priority of individual works based on the water budget analysis and critical needs of the villages such as draught proofing to secure the livelihoods. The other synonymous knowledge products were developed to support the rollout of this innovative planning process in the state as well at national level through MoRD.

Figure 7: Cross Section Profile of the Command Area

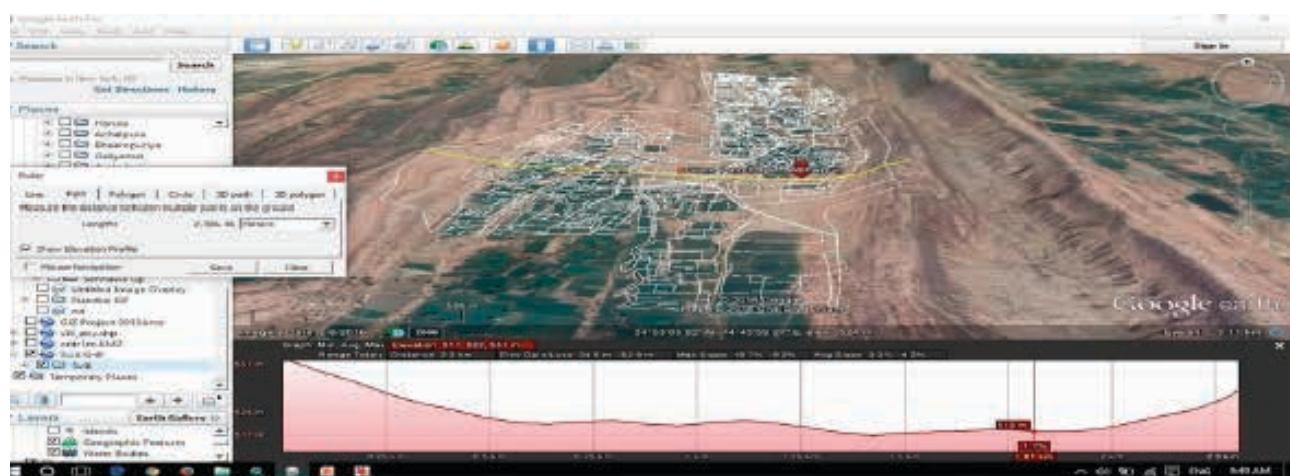
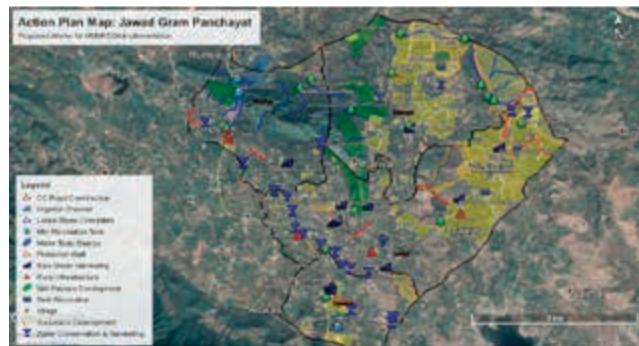


Figure 8: Action Plan Map for a Gram Panchayat



- Two exemplary plans based on GIS methodology, first one exclusively for holistic NRM works (2017) for a GP and other as intergraded development plan (2018) inclusive of both NRM & non- NRM works for two GPs are being benchmarked for rest of the plans to be extended across state and nation. Both the plans are available with GIZ and MoRD for further reference.
- Rajasthan team contributed for technical content to develop a promotional animated documentary for awareness on GIS assisted planning process for officials of MGNREGA. The documentary is now hosted at the video library of official website of MGNREGA (http://nrega.nic.in/netnrega/Library_link.aspx)¹
- A handbook on "Integrated INRM GIS-based GP Plan" was developed and launched by MoRD in June2017 as a guide to develop holistic NRM works based plans under MGNREGA.
- Saksham – A marathon series of capacity building training programme initiated by MoRD in 2017 on GIS based planning process which was majorly led by Rajasthan team and supported by other partner states. Saksham Plus – the imrpoved version of training module within the Rajasthan was administered and 4086 MGNREGA officials were capacitated during 2018. The state team also capacitated other 1075 officials of other states at national level in 2018 itself going beyond project territories of 3 states.
- e-Saksham - The digital online version of Saksham Plus for reaching out to all over India GP and Block level officials, was designed in partnership with state team which is now mainstreamed as it is being hosted on MGNREGA's official website.
- GIS Facility Centre – the idea was conceived by Rajasthan and 11 such centres were established in different district HQs to provide a convenient environment for technical functionaries to access the IT facilities and get troubleshooting support from the project GIS experts. The other two partner states also adapted the idea and established similar facilities; 7 in Chhattisgarh and 8 in Andhra Pradesh.

Figure 9: GIS Facility Centre



- So far, the capacities of all the 1736 Junior Technical Assistant has been built to and out of 9894 GP, the 7322 (74per cent) plans have been developed and out of that 4185 (42per cent have been approved for its

¹(<https://youtu.be/8ah8oRmZd4s>)

implementation by respective district authorities. The following figures gives information on the improved expenditure for per household in the states after the adoption of GIS based planning process, thus leading to enhanced developmental intervention sin the rural areas of the state under MGNREGA.

INR 7,276	Average cost per household before GIS planning for all GP in state.
INR 29,300	Average cost per household after GIS planning for INRM in state.
INR 59,271	Average cost per house hold after GIS planning for NRM & Non-NRM

OTHER MILESTONES

- Training Module & Training on mainstreaming of Gender & Environmental Benefits in Mahatma Gandhi NREGA in 2016 is the exclusive knowledge product which further can be used by state and MoRD in near future to make MGNREGA works more gender inclusive.
- Model Estimate and Designs booklet for permissible works under MGNREGA which can act a guidebook for planners and implementation functionaries of MGNREGA.
- The capacities at GP level functionaries of MGNREGA were also built for quality implementation of the technical demonstrations and later its replication beyond project period.

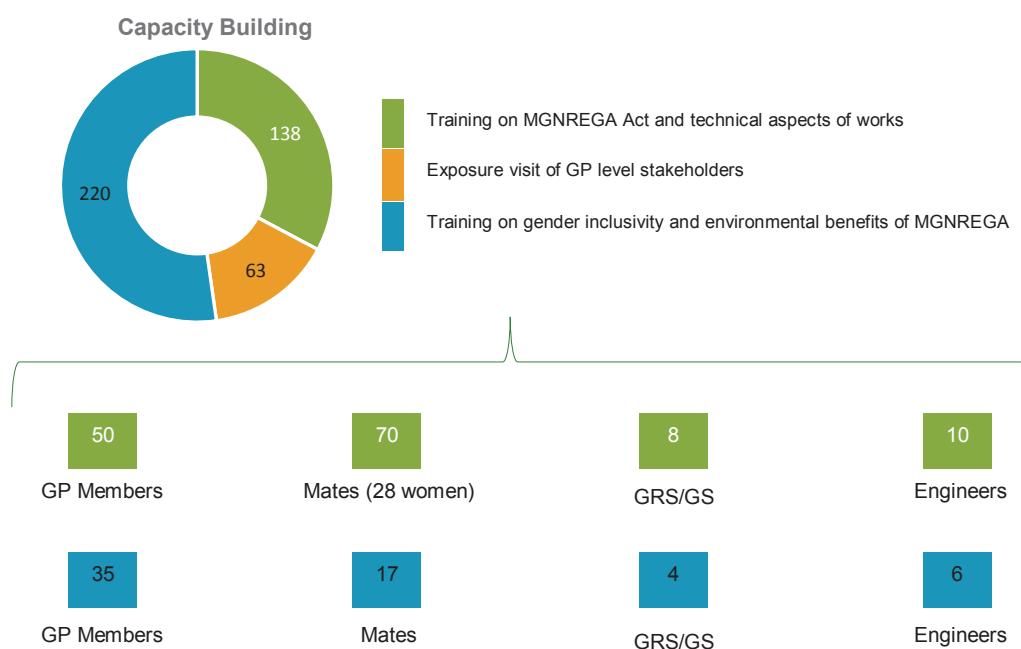


Figure 10: Training of GP level stakeholders



INSTITUTIONAL RESPONSE FOR WAY FORWARD

Rajasthan state has come forward to propose the following key action points based on the learning of the MGNREGA-EB project and officials are quite keen to continue the partnership with GIZ for strengthening the rural livelihood base through technical cooperation.

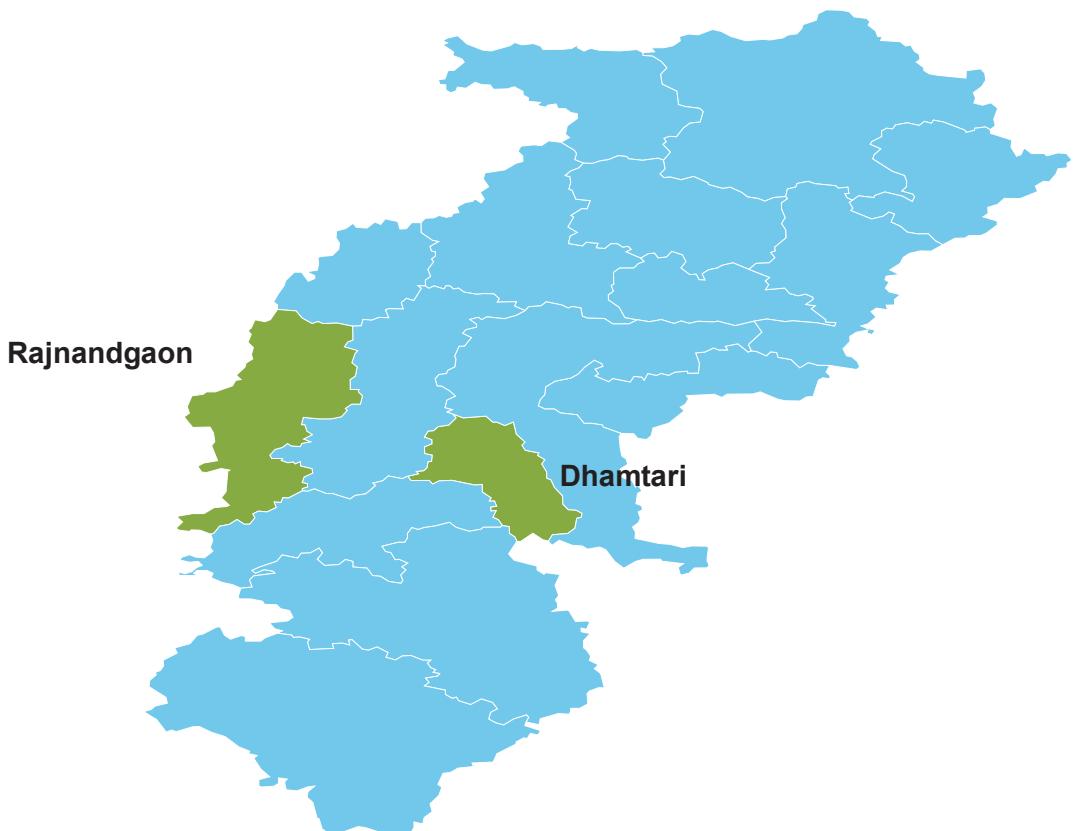
A	State have plans to mainstream the project learning
I.	All 9894 GP have to their respective own integrated GIS assisted plans.
II.	Implementation of GIS based GP plans in saturation mode targeting 2 GPs per block in 3 years as directed by MoRD.
B	Potential for Technical Cooperation with GIZ
I.	Piloting of innovative practices through Integrated Water Resource Management (IWRM) planning through
a.	Efficient rainwater harvesting in desert areas.
b.	Artificial recharge in over exploited areas in partnership with Central Ground Water Board, Ministry of Water Resources
C	Promoting water use efficiency in command and non-command areas.
II	Package of practices for strengthening natural resources base and livelihoods for each agro-climatic zone within the state.
III.	Nurturing convergence with line department and resource agencies/private sector

Chhattisgarh Impressions

Chhattisgarh is abundant in natural and mineral resources. The state has a Geographic Area of approx. 1,35,191 square kilometres and around 45.95 per cent of the land is under forest cover. The topography of the state includes mountains in the north and south while fertile plains in the central region. The state is divided into three distinct agro-climatic zones, 27 districts, 146 blocks and 10,976 Gram Panchayats (GPs). In Chhattisgarh, the MGNREGA - EB project was piloted in Gram Panchayats of Parkhanda and Nari in Kurud block of Dhamtari district and Gram Panchayats of Jhandatalab and Bijnapur & Siwnikalan (erstwhile one GP) in Dongargarh block of Rajnandgaon district in the year 2014 -15.

The project was implemented in partnership with MGNREGA divisions of the State, respective District and Block Rural Development departments of the Government and technical partners Agrocrats Society for Rural Development (ASORD), Samarthan and Yuva Mitra.

Figure 1: Pilot Location Map



The project was implemented in partnership with MGNREGA divisions of the State, respective District and Block Rural Development departments of the Government and technical partners Agrocrats Society for Rural Development (ASORD), Samarthan and Yuva Mitra.

MAJOR INTERVENTIONS

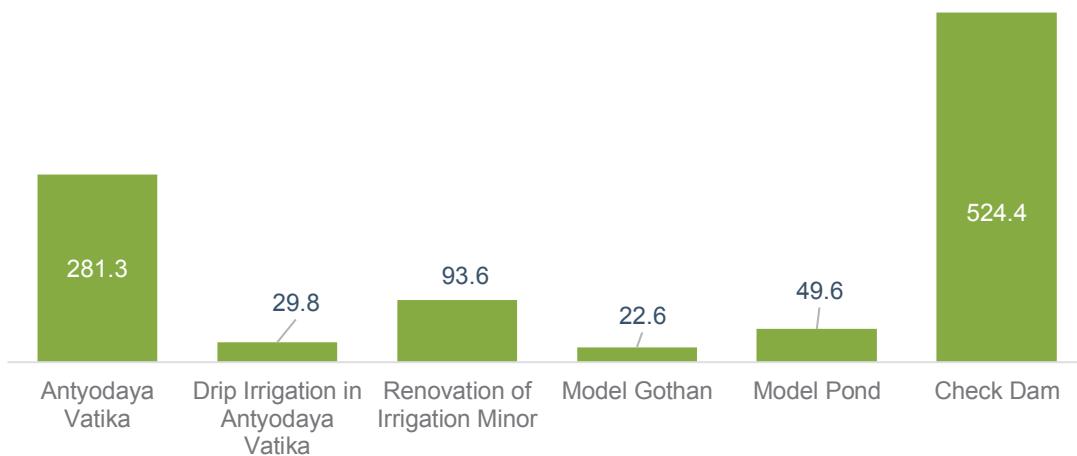
1. Pilot demonstration of:
 - a. Drainage Line Treatment
 - b. Minor Renovation and Lining (Participatory Irrigation Management)
 - c. Model Village Pond
 - d. Model Gothan
2. Capacity building of Mates through 'Mate School' pilot in two blocks.
3. Capacity building for GIS based convergent planning process of MGNREGA officials in the state.

KEY ENVIRONMENTAL IMPACTS

For effective demonstration of NRM works, the project followed a landscape approach in implementation selected works and on the recommendation of State Steering Committee (18th May 2016), project was increased from 2 GPs to 13 GPs in both the districts to cover a significant stretch for similar type of interventions and to visualise the aggregated environmental benefits.

In Dhamtari district, during 2016 -18, Integrated Natural Resource Management (INRM) works worth 115 Lakhs (70 Lakhs under MGNREGA and 45 Lakhs under Pradhan Mantri Krishi Sinchayee Yojana, PMKSY) were budgeted and Antyodaya Vatika, Drip Installation, Model Pond, Model Gothan and Check Dam interventions were undertaken during the period.

Dhamtari Field Demonstrations Budget (Amount in INR Lakh)



The MGNREGA-EB project followed a multi-pronged approach comprising of field demonstrations, exposure visits and other capacity building measures such technical trainings of the stakeholders.

DRAINAGE LINE TREATMENT IN RAJNANDGAON DISTRICT

In consultation with the gram panchayat members, drainage line treatment project has been undertaken in 13 GPs in the Dongargarh block in Rajnandgaon District. 165 structures for soil and water conservation have been constructed across the 15 km long drainage line including gabions, check dams, stop dams, loose boulder structure, rapta dams etc.

450 members from other blocks and districts trained on replication of DLT model and One Standard Operating Procedure (SOP) on DLT works was developed. The intervention has resulted in increase in productivity of rice by 4-5 Q/ Acre in the command area.

The intervention has also provided climate resilient livelihoods opportunities in the command area of treated drainage line and 5 livelihood models' guidelines have been developed. The benefits have impacted 1254 farmers getting assured irrigation for single crop and 376 farmers will get assured irrigation for Kharif & Rabi crops.

DLT based MGNREGA-EB works amounting INR 1 Crore sanctioned in the district Rajanandgaon based on the pilot DLT demonstrated by project.

Figure 2: Drainage Line Treatment



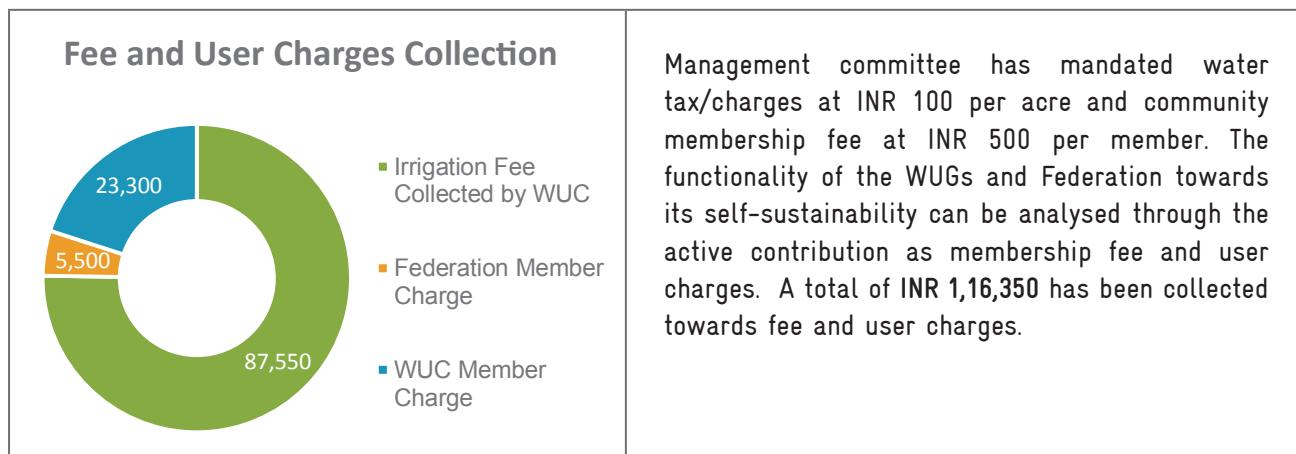
A data was collected in the project villages conducted for all the structures and amazing outcomes were derived till the end of year 2018. Please refer table below for the improved irrigation facility for farmers of the project area.

Name of Structure	Number of Structure	Irrigated Land (Acre)	Number of Farmers	Soil Erosion Checked (cum)
Stop Dam	35	2488	725	NA
Stop Dam cum Rapta	7	183	222	NA
Gabion	38	51	158	39870
Loose Bowdler Structure	20	26	31	3570
Pond/Farm Pond	30	117	106	
Borewell Recharge	12/35		12	
	Total	2839	1254	43440

PARTICIPATORY IRRIGATION MANAGEMENT IN DHAMTARI DISTRICT

The concept of Participatory Irrigation Management (PIM) was introduced for equitable distribution of water for irrigation purpose, in convergence Pradhan Mantri Krishi Sinchayee Yojana (PMKSY). 87 Water User Groups (WUGs) were formed in pilot GP (Goji) and 10 members are elected as governing board members, which has been approved by the Gram Sabha. The bank account of federated WUGs has been opened for the deposit of membership fee and water usage charges from the 2 km long minor renovated.

Figure 3 Minor Repair and Lining in Goji GP



Two trainings were organised in Goji pilot gram panchayat covering a total of 78 WUGs members. The main objectives of training were to orient the participants on different aspects of participatory irrigation management, norms and structure of water user association, different aspects of farmer's producer organisation (FPO), development of the institutional mechanism of the developed assets through community-based organisation of user groups. The training also covered the role and functioning of governing board along with the complete knowledge of PIM Act of state and as per the act what are the different rules and regulations of WUA.

Exposure visit was organised for group leaders of labour group and mates as a part of the on-site training in different villages which provided opportunity to them to see the community initiatives in the neighbouring areas and motivated do best work in their respective villages and group leader and PRI member. Technical Assistants were also provided exposure visit to "Yuva Mitra", Nashik for understanding of the PIM approach.

MODEL VILLAGE POND IN DHAMATRI DISTRICT

The pond is situated in the centre of village Parkhanda and in the past before MGNREGA -EB project, the excess back flow water of exit drain, the pond walls always get damaged, as there was no proper inlet and outlet. Through the project, the inlet and outlet of pond was redesigned, and a diversion dam and diversion channel were also constructed to reduce the flow of water into the pond. The bathing place was also built for the communities, as well as the construction of walking path way and plantation on bunds. The intervention resulted into control of flood like situations and restoration of community asset. A summary of project finances has been provided below:

Sl. No.	Financial Year	Name of Panchayat	MGNREGA Amount (in Lakhs)	PMKSY Amount (in Lakhs)	Total (in Lakhs)
1	2014 - 15	Parkhanda	24.31	24.5	48.81

Figure 4: Model Village Pond at Parkhanda GP



MODEL GOTHAN IN DHAMTARI DISTRICT

Model Gothan has been envisaged for providing shelter to domestic cattle that are previously grazing opening and come for rest a designated place in the village. The key features of this model are drinking water pond, shade and fodder trees and vermicompost units. The Model Gothan was completed in month of May 2018 and the institutional system for the maintenance and income has also been developed.

Farmers' Club consisting of 20 members has been formed to operationalise the vermicompost units and will be responsible for the maintenance of the Gothan and income generation from the production and sale of vermicompost from the cow dung.

Model Gothan training was organised for GP functionaries, Self Help Group (SHG) members and Technical Assistants under MGNREGA for scaling up the initiative to more GPs. A total of 120 trainees were trained at Parkhanda.

An overview of the project finances has been provided below:

Sl. No.	Financial Year	Name of Panchayat	MGNREGA Amount (in Lakhs)	PMKSY Amount (in Lakhs)	Total (in Lakhs)
1	2014-15	Parkhanda	9.02	5.4	14.42

Figure 5: Model Gothan at Parkhanda GP



GIS FACILITY CENTRES

The project established first in India, the GIS Facility Centre at the Thakur Pyare Lal Institute of Panchayat and Rural Development (TPIPRD), Nimora. The lab is assisting GPs in preparation of GIS based INRM plans as per the MGNREGA guidelines. The lab is also used to provide training to Technical Assistants who prepare and implement the INRM plans. The GIS facility centres have been scaled up in 6 districts of the state, the project in partnership with respective MGNREGA divisions

The GIS facility centres capacitated GPs and other officials to plan and implement environmental benefit works. 1765 GIS based INRM plans have been developed till Feb 2019 in the state.

Figure 6 GIS Based INRM Planning



MATE SCHOOL PILOT IN BOTH PROJECT DISTRICTS OF CHHATTISGARH

Mate is core on-ground functionary of MGNREGA working as onsite supervisor for execution of specified work. The Mate School concept was developed with an objective of capacity building of Mates so that they could deliver the task under MGNREGA in an effective and efficient manner and help in planning of works under MGNREGA. Mate Schools were piloted in Kurud block of Dhamtari and Dongargarh block of Rajanandgaon district.

Currently, there are approximately 50,000 Mates in Chhattisgarh. Mates are involved in supervising works such as digging of trenches, deepening of canals, nursery development, plantation etc. These works require technical knowledge as well as capability to lead the team of workers for successful execution of the work. A series of three training programmes on technical aspects of MGNREGA for mates were organised. The first training of three days covered modules on basic concepts of MGNREGA and INRM, watershed management, and plantation. The training methods involved use of different training aids like power point presentation, videos and field practicals.

Trainings have capacitated Mates with technical and supervisory skills to deliver their duties more effectively, which was reflected through quality of work delivered at the work site.

District	Number of trainings conducted in 2017-18	Number of participants
Dhamtari	4	30
Rajanandgaon	2	25

Figure 7: Mate Trainings

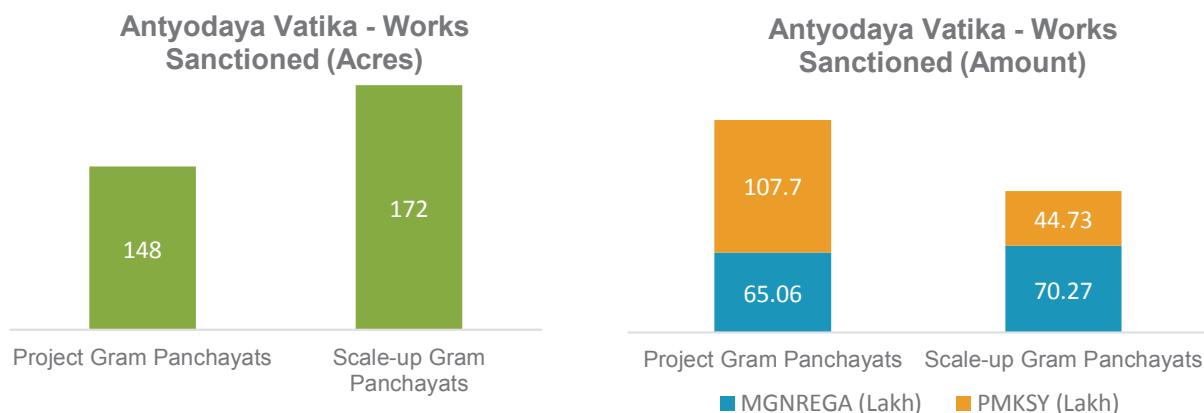


IMPACT OF BREAKTHROUGH INNOVATION OF ANTYODAYA VATIKA - HORTICULTURE PLANTATIONS

The piloting of Antyodaya Vatika model was undertaken in 15 locations of 9 project GPs, covering 148 acres and scaled up in 17 other GPs on 172 Acre in Kurud Block only.

Pilot GPs Covered Under Antyodaya Vatika			
S. No.	Financial Year	Panchayat	Area (acres)
1	2016-17	Joratarai	8
2	2016-17	Parkhanda	15
3	2016-17	Gudguda	7
4	2016-17	Sirsida	8
5	2016-17	Nari Phase – 2	10
6	2016-17	Mourikala	6
7	2016-17	Kathouli – 1	12
8	2016-17	Sindhouri kala	6
9	2016-17	Goji	15
10	2016-17	Nari Phase – 1	12
11	2015-16	Nari Phase – 2	
12	2017-18	Nari Phase – 3	15
13	2018-19	Nari Phase – 4	15
14	2018-19	Kathouli – 2	10
15	2018-19	Goji – 2	9
Total			148

A snapshot of the works sanctioned amount in project Gram Panchayat and scaled up Gram Panchayat is shown in table below:



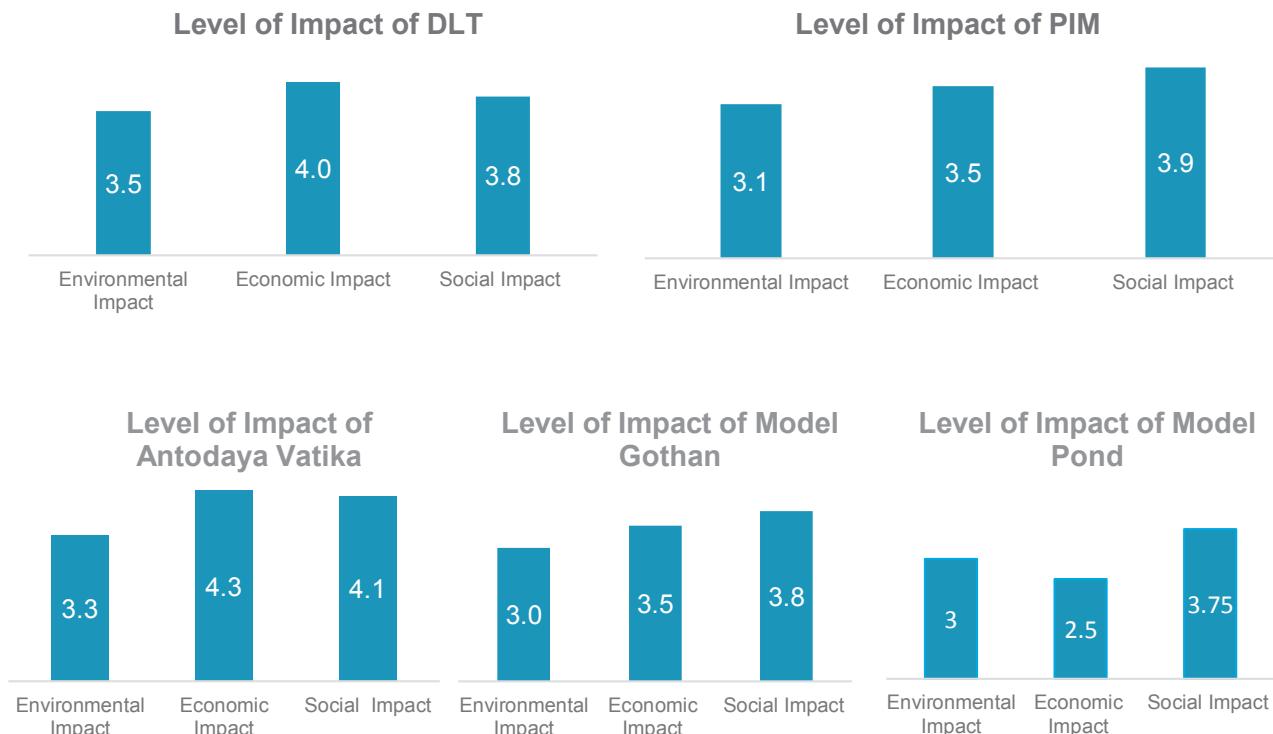
Under this model 438 women members of SHG were selected to whom usufruct rights were given and a Memorandum of Understanding (MOU) was signed with GP. Standard Operating Procedure was also developed on MIS module of maintenance of plantations works. The growth of plants in plantations sites was found good and SHG members are growing vegetables on the sites as intercrops and receiving additional incomes from the plantations along with the maintenance of the plants.

Figure 8: Antyodaya Vatika Plantations in a GP



The training programme was organised for scaling up the Antyodaya Vatika model in other panchayats and blocks and RURBAN cluster in the state. The training programme focused on Block Plantation on common and waste lands. The topics covered under the training are Species Selection, Layout of Different Plants, Pit Digging, Pit Filling and Plantation, Intercropping, Work Monitoring, and Work Schedule. The trainings helped the participants to develop capacity and confidence to take-up the horticulture activities in their areas. The one day training was organised on 30th June and 2nd July 2018 and total 48 participants trained in these trainings.

Based on primary inputs and ratings from stakeholders on scale of 1-5 for Environmental, Economic and Social impacts were quantified to understand the importance of such initiatives among the beneficiaries and project facilitators associated with MGNREGA in the pilot GPs. The impression was higher on economic and social impact, indicating higher involvement and sense of social responsibility in community members to conserve natural resources.



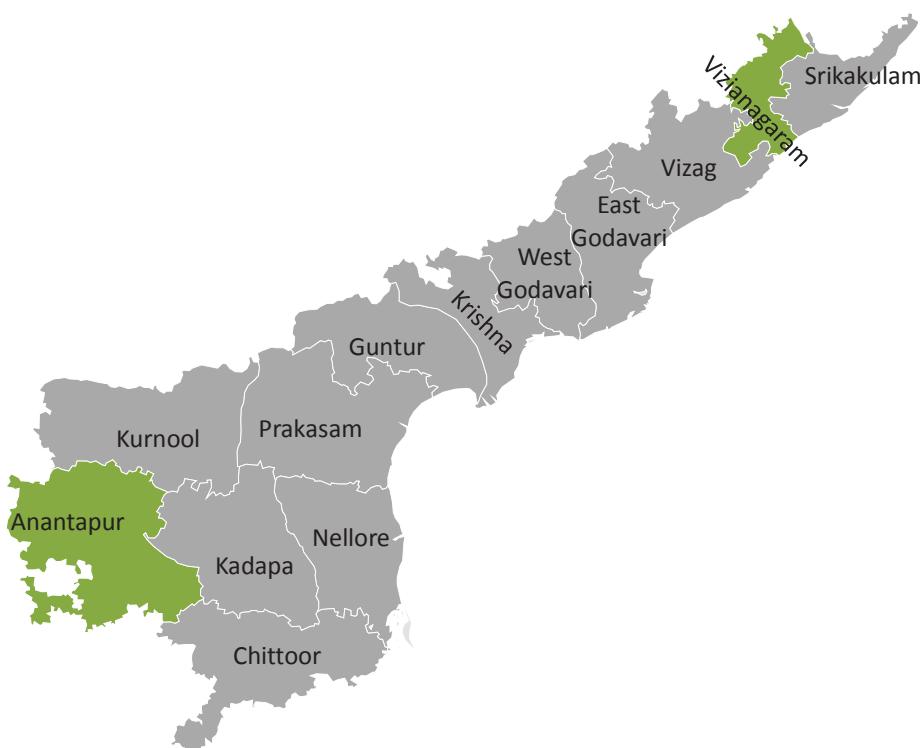
OTHER MILESTONES

- Capacity building training of Panchayati Raj Institutions (PRIs) and technical experts of other blocks on basics of MGNREGA and INRM Works, Concept of Watershed (Ridge to Valley) and GIS Based Planning, DLT and Livelihood, Technical Measurement and Site Selection, Sustainability and Maintenance of assets. Total 411 Participants from different districts including Rajnandgaon, Sarguja, Bastar, Dantewada and Kanker attended the training.
- Exposure visit of 252 farmers of the project area on 'innovative agriculture', 200 trained persons on Nari Horticulture Livelihood Model to facilitate scale up of the model in other 4 Districts.

Andhra Pradesh Impressions

Andhra Pradesh is the eighth largest state in India with a geographical area of 1,60,205 square kilometres. The state comprises 13 districts, 661 blocks, and 12,933 GPs. It has 6 agro-climatic zones. The MGNREGA - EB project was piloted in Bukkapatnam GP and Agraharam GP of Bukkapatnam block in Anantapur district and Tettangi GP and Garida GP of Gurla block in Vizianagaram district.

Figure 1: Project Location



The project was implemented in partnership with MGNREGA divisions of the state, respective district and block rural development departments of the government and technical partners Accion Fraterna Ecology Centre (AFEC), The Centre for Environment Concerns (CEC), DHAN Foundation, Andhra Pradesh Space Applications Centre (APSAC), CGARD-NIRD, Code & Pixel, and individual experts.

MAJOR INTERVENTIONS

1. Pilot demonstrations of
 - a. Greening of hillocks (afforestation)
 - b. Raising tall seedlings,
 - c. Rejuvenation of traditional cascade tanks,

- d. Injection ground water recharge well,
 - e. System of Water for Agriculture Rejuvenation (SWAR) root zone water system for horticulture plantations,
 - f. Micro model for dry land farming.
2. Capacity building for GIS based convergent planning process of MGNREGA officials in the state.

KEY ENVIRONMENTAL IMPACTS

Rejuvenation of traditional tank cascades: The tank renovation works started in two pilot tank cascades in Gurla Mandal, Vizianagaram district. As on May 2018, 1,67,794 person days were generated with different works of approx. INR 33.4 million value on 54 tanks in these two cascades. A combination of various approaches was used on the traditional tanks for rejuvenation of Champavathi river basin:

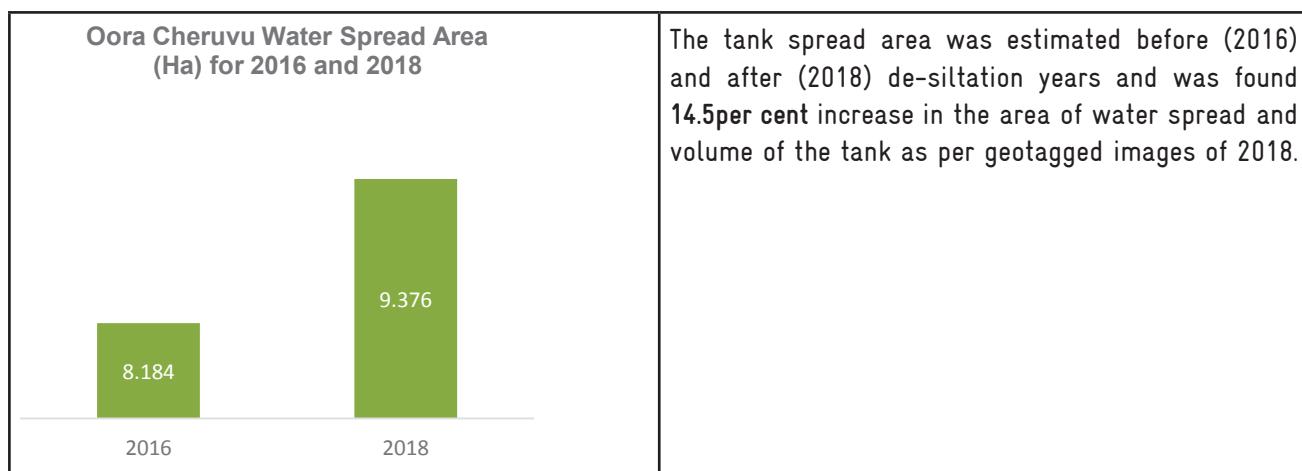
- Promotion of tankbased people institution or users' associations for planning, implementation, future maintenance and management of tanks
- Bund strengthening using manual labour and provision of rough stone revetment for the bund
- Promotion of grass turfing on tank bund using Stylo hamata or local grass
- Renovation of all the link channels (feeder, supply or surplus course)
- De-siltation of tanks to its original shape; bund strengthening; linking of upper tank to lower tank
- Repairs to sluice and surplus weir
- Development of catchment area development
- Foreshore area development for control of encroachment of land

These activities resulted in increase in water holding capacity of tanks, proper flow of water across tanks and run-off of excess water into Champawati river to contribute to rejuvenation of the Champawati river itself.

The project provided technical support to scale-up of the revitalisation of Champavathi River Basin through the revival of 124 tank cascades on-site training was also offered to 64,000+ wage seekers and mates on works related to cascade tanks. The project activities included approx. INR 2,42.5 million worth of works (labour and material) under the convergence of MGNREGA and Pradhan Mantri Krishi Sinchayee Yojana (PMKSY). Rejuvenation of tank cascade has resulted in increase in storage capacity of tanks; green cover in the command areas; additional income of ~INR. 12,000 - 15,000/acre from second/third crop and control of encroachment of community lands.

Figure 2: Rejuvenated Traditional Cascade Tank





Technical Orientation Training workshop for improving the quality of tank works existed in Champavathi River Basin, Vizianagaram. A total 105 participants trained which included Technical Assistants, Engineering Consultants (EC)/Junior Engineers (JE) and APOs of 14 mandals which are part of Champavathi River Basin.

The project has completed concept seeding about Tank Associations (Vayalagam) by conducting various activities in Panchayats. Till September 2018, the project created 10 Tank Associations consisting 381 members. The project has also promoted 30 Agriculture Finance Groups (AFGs) consisting 450 members under 8 tank associations. Each member of the AFG is saving INR 100 per month and internal loaning is being practiced amongst members. The AFGs of Gurla Location have a saving of INR 2,45,665 as on end of September 2018.

The Farmer Field School (FFS) for Paddy crop was organised in Tettangi village for around 26 farmers with the help of Agriculture Department, Vizianagaram. The Paddy field of farmers of Tettangi village were visited by the agriculture officer during the cropping period. The farmers got good clarity on package of practices of Paddy crop by reducing the cost of cultivation of the crop and the farmers got increased yields due to the intervention.

Raising of Tall Seedling Nursery: Large scale plantation works are being taken up by Forest Department and Andhra Pradesh Rural Development Department, to enhance the vegetative cover in the State. Forest Department is raising nursery seedlings to meet the requirements of the plantation programme being taken up under MGNREGA. The tall seedlings when planted establish quickly with early rains and withstand drought conditions, with increased survival rate of more than 60 per cent.

Figure 3: Tall Seed Nursery



The Forest department has raised 15 Lakh tall seedlings for plantation, which has been achieved due to technical trainings of forest officials of all cadres at district level and field level in all 13 districts of Andhra Pradesh. Technical support for module development and training was imparted to 580 Forest Officials on raising tall seedlings.

Figure 4: Training to A.P. Forest Department Officials



Injection wells: Based on 3 different types of Injection wells intervention piloted in the project sites of Anantapur, Vizianagaram and additionally in Prakasam districts in the state contributed to recharge of groundwater through tapping of excess run-off and hence increased availability of water to the communities during the critical period.

Figure 5: "Bhungroo" Injection Well



The injection well at Prakasham is done by IWMP improvising the model of Bhungroo done at Bukkapatnam.

Records taken and month on month comparison of water table status over a year indicated improvement in water table at one of the pilot sites of Bukkapatnam, as depicted in the table below.

Date of piezometer reading	Water table in feet	Date of piezometer reading	Water table in feet
13.02.2017	48	13.02.2018	23
28.03.2017	54	21.03.2018	29
22.04.2017	63	09.04.2018	36
03.05.2017	79	30.05.2018	43
08.06.2017	106	29.06.2018	64

System of Water for Agriculture Rejuvenation (SWAR): The model of root zone watering through System of Water for Agricultural Rejuvenation (SWAR)" introduced by project in partnership state MGNREGA cell to reach 35,000 farmers in 5 states in public and private mode. In 2018, under the Andhra Pradesh Water Conservation Mission, SWAR was taken for installation on 4000 fruit trees in two watersheds of Prakasham district. SWAR has contributed in saving of moisture by 30-40 per cent if compared with conventional drip irrigation system and reduces drudgery through automated gravity-based water flow control.

Figure 6: System of Water for Agriculture Rejuvenation (SWAR)



Micro model for dryland farming was demonstrated for a group of farmers as per framework of MGNREGS, utilising the planning and resources from MGNREGA, IWMP and APDMP (AP Disaster Mitigation Project). 70-80 per cent farmers in the pilot area are small and marginal, where an area of 20 acres in a block is identified to make a micro model for sustainable dry land farming. The intervention has contributed to increase in water use efficiency and shift of cropping area from large cultivation of hash gram and groundnut to more remunerative red gram in the pilot area.

Figure 7: Micro Model for Dryland Farming



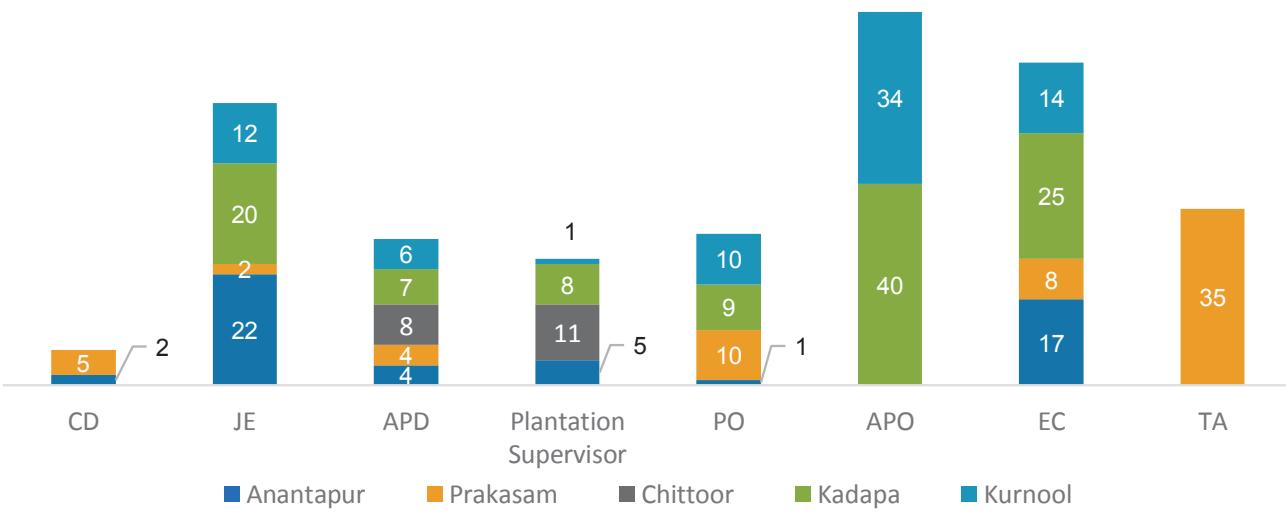
IMPACT OF BREAKTHROUGH INNOVATION OF GREENING OF HILLOCKS

The pilot of "Greening of Hillocks" was taken up in approx. 160 hectares, covering three habitations since 2014-15 in Anantapur district which is drought prone area with average rain fall less than 550 mm. The project has resulted in increase in green cover over the degraded hillocks, with more than 50 per cent survival of planted seedlings due to integrated approach of implementation. This included plantation of tall seedlings and seed dibbling on the mounds of dug staggered trenches along the line of the slope on the hillocks while practicing the watershed principle of ridge to valley. The planning was done to undertake works like Drainage Line Treatment and construction of Water Harvesting Structures on the hillock areas. Beside all these technical interventions, user groups were created among communities to provide maintenance of the plantation and other assets, thus providing a social fencing for protection of the natural resources revived. The state has taken up "Greening of Hillocks" its replication in a big way under MGNREGS-IWMP convergence

<p>Scaling up of Greening of Hillocks</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Area (Hectares)</th> </tr> </thead> <tbody> <tr> <td>2015-16</td> <td>160 Hectares</td> </tr> <tr> <td>2018-19</td> <td>10,150 Hectares</td> </tr> </tbody> </table>	Year	Area (Hectares)	2015-16	160 Hectares	2018-19	10,150 Hectares	<p>After gaining the experience of Greening of Hillocks under MGNRE-A project over three years, guidelines were prepared to scale up the programme in the entire state of Andhra Pradesh, with a focus on five districts viz., Anantapur, Chittoor, Kadapa, Prakasham, and Kurnool. Project has been providing capacity building support for scaling - up of "Greening of Hillocks" for 10,150 Hectares at state level, in convergence with Andhra Pradesh Forest Department and Integrated Watershed Management Programme (IWMP).</p>
Year	Area (Hectares)						
2015-16	160 Hectares						
2018-19	10,150 Hectares						

Training on Greening of Hillocks was imparted in June 2018 to **320 participants** from various cadres of mandal level staff of MGNREGS/IWMP in five districts. The trainees included APDs (Assistant Project Directors), APOs (Additional Project Officers), POs (Project Officers), TAs (Technical Assistants), ECs (Engineering Consultants), and Plantation supervisors among others.

Training on Greening of Hillocks, MGNREGA, and IWMP



Based on primary inputs and ratings from stakeholders on scale of 1-5 for Environmental, Economic and Social impacts were quantified to understand the importance of such initiatives among the beneficiaries and project facilitators associated with MGNREGA in the pilot GPs. The impression of was higher on environmental

impact indicating the higher perception for improved natural resource base followed up by economic impact, leading to increased opportunities for sustainable livelihoods and a sense of social responsibility to conserve the natural resources.

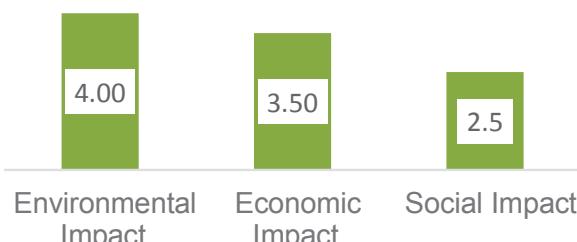
Level of Impact of Greening of Hillocks



Level of Impact of Injection Wells



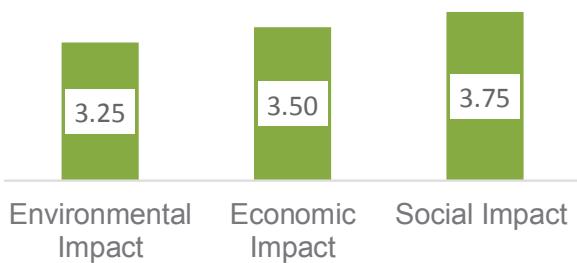
Level of Impact of SWAR



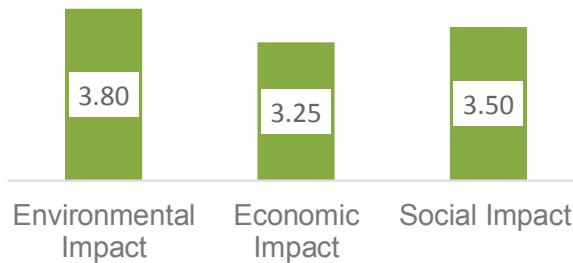
Level of Impact of Rejuvenation of Traditional Tank Cascades



Level of Impact of Micro Model for Dryland Farming



Level of Impact of Raising Tall Seedling Nursery



OTHER MILESTONES

- GIS Facility Centre After a proposal from project, 7 GIS Facility Centres were agreed upon to be supported by GIZ, one at state level, 5 at district level and 2 at block level.
- In association with Andhra Pradesh Space Applications Centre, Vijayawada, a GIS-Based Decision Support System (DSS) for "Greening of Hillocks" was developed and piloted for Bukkapatnam mandal of Anantapuram district.
- Institution building through formation of user groups and encouraging participation of women.

S. N	Name of the village	Name of the Intervention	No. of User Groups	Male	Female	Total
1	Buchayyagaripalli	Greening of Hillocks	10	66	139	205
2	Buchayyagaripalli	Percolation Tank	1	5	0	5
3	Rasimpalli	Greening of Hillocks	9	97	91	188
4	Chilakalagaddapalli	Greening of Hillocks	6	45	46	91
5	Rasimpalli Thanda	Greening of Hillocks	1	9	2	11

- **79,548 mates and labours in 371 villages in 14 Mandals were trained on the technical aspects to be maintained during tank works execution.**
- The **Farmer Field School (FFS)** for Paddy crop is organised in Tettangi village for around 26 farmers with the help of Agriculture Department, Vizianagaram. Similarly, two veterinary camps are organised in each of all the 13 Gram Panchayats of pilot project area. A **Digital Knowledge Centre (DKC)** for capacity development in INRM was established by Department of Rural Development, with specific input support from project. DKC aims to provide continuous updates online and quality technical support to the functionaries of MGNREGA. DKC has features of e-Content for technical information for MGNREGA works, Digital Web Studio accessible through a mobile application and a web-based portal, which can be used by the Master Trainers (DTRT/BTRT etc) as a handy and useful application for effective class room training with visual effects.

Ministry of Rural Development Impressions

MGNREGA – the world's largest programme on social security for poorest among poor is anchored in MoRD and has annual budget outlay of INR 60 billion for upcoming new financial year 2019-20 as per latest financial budget presented by Government of India. The budget has increased exponentially during last couple of years due intense focus of the government to build durable rural assets and improve the incomes from agriculture and allied sector.

MoRD being bilateral partner to GIZ for implementation of joint project of MGNREGA-EB has played a vital role in taking up the innovations derived from the project activities and issued advisories to other states for adoption of model interventions under MGNREGA to keep its mandate more translated on ground. MoRD has appreciated GIZ for intensive support on capacity building of the partner states and others as well especially for the GIS based planning process for GPs under MGNREGA.

KEY ROLE PLAYED BY MORD FOR THE PROJECT

- To review the progress and steer the implementation of activities through National Steering Committee meetings chaired by Joint Secretary MGNREGA and were held generally twice in year
- Director MGNREGA enacted as nodal officer for the project for day to day steering of operations of the project
- MoRD provided the opportunity to project team to show case its innovations at national and regional level workshop and events
- MoRD provided administrative support for facilitating the various studies and exposure visits conducted during the project duration
- MoRD approved the 5 technical models namely, Greening of Hillocks, Cascade of Tank Rejuvenation, Antodhya Vatika (horticulture model), Participatory Irrigation Management and Mate School and disseminated the advisories to all sates for its relevant replication
- MoRD included the project team as members for Joint Working Group for improving web GIS services of Bhuvan portal of National Remote Sensing Centre (NRSC)

MAJOR IMPACTS OF THE PROJECT

- MoRD acknowledged the publication of 5 simplified booklets based on "Samarthaya' the technical guide booklets published by project in 2016

GIS PROCESS OF PLANNING

This process includes the use of NRSC web GIS services through Bhuvan portal and other open source GIS services. The planning methodology involves two types of information viz; spatial and non-spatial. The former kind of information provides thematic layers of the GP while the later gives statistical information and lead to understanding the water budget and key thrust areas for interventions in the GP plan. The thematic information gives information about Land Use Land Cover, Watershed Boundaries, Drainage Pattern, Geo-Morphology, Soil Erosion, Lineaments, Slope & Contours etc. which help the planner to select right interventions and sites of its implementation to achieve the intended impacts

- MoRD adopted the process of GIS planning process through launch of Saksham – A series of trainings (14-15 batches) to build capacities of State Technical Resource Team (- 500 officials) from all 29 states of India in 2017
- MoRD launched the a handbook on "Preparation of GP INRM Plan for Mission Water Conservation GP under MGNREGA" developed by project in 2017 and hosted it in the library of official website of MGNREGA (https://rural.nic.in/sites/default/files/nrega/Library/Books/3_Handbook_for_INRM_Planning.pdf)
- MoRD also hosted the animated documentary on GIS based planning process in of the MGNREGA website as developed by the project (link given in the section for Rajasthan of this report)
- MoRD has also acknowledged the support provided by the project to roll out Software for Estimate Calculation Using Rural rates for Employment (SECURE) across the nation

BREAKTHROUGH IMPACTS

- **SDG Dashboard:** MoRD hosted the dashboard on contributions of MGNREGA towards SDGs into the home page of MGNREGA website and acknowledged project for highlighting the contributions to 1,5,6,8, 15 & 16 SDGs goals and meeting 11 targets under the existing data set available within the MIS of NREGASoft . Earlier reporting for only one SDG goal 1 for "No Poverty" was reported by Niti Ayog.

Fig.1 SDG Dashboard



- E-Saksham:** A massive open line course developed by project in consultation with MoRD for MGNREGA and all rural development practitioners for planning of interventions while using web GIS tools. It was launched by Honourable Additional Secretary, MoRD on June 17, 2018 and eventually now hosted at official website of MGNREGA. Recently it has been made mandatory by MoRD for all the block level technical officials accountable for preparation of GP plans to complete this course before April 15, 2019. Till the synthesis of this report more than 25000 subscribers from all the states have registered for this course.

Fig.2 e- Saksham Modules

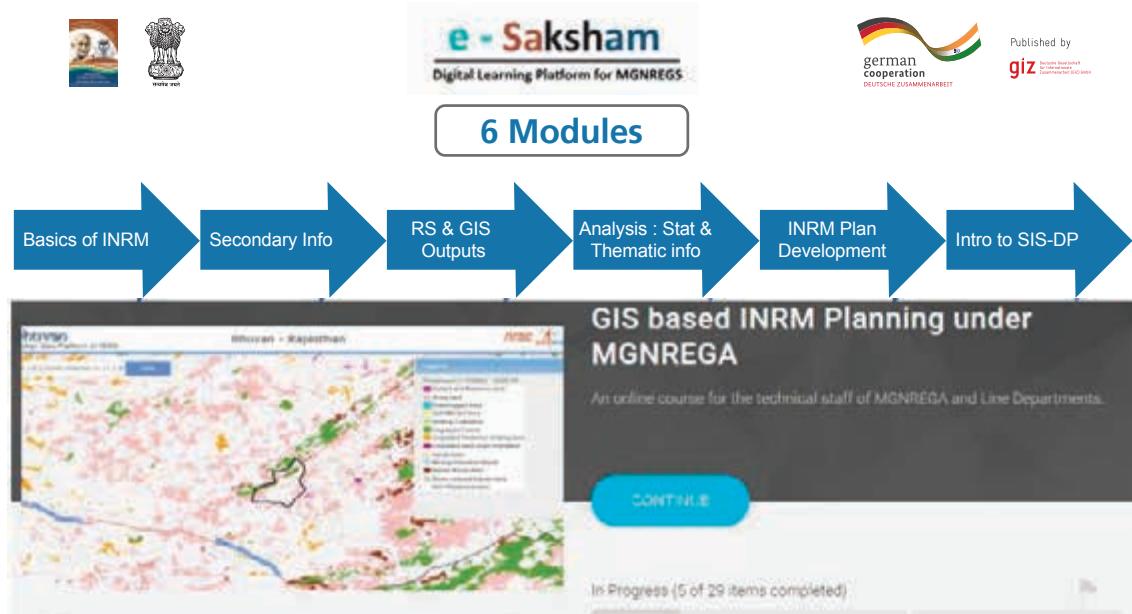
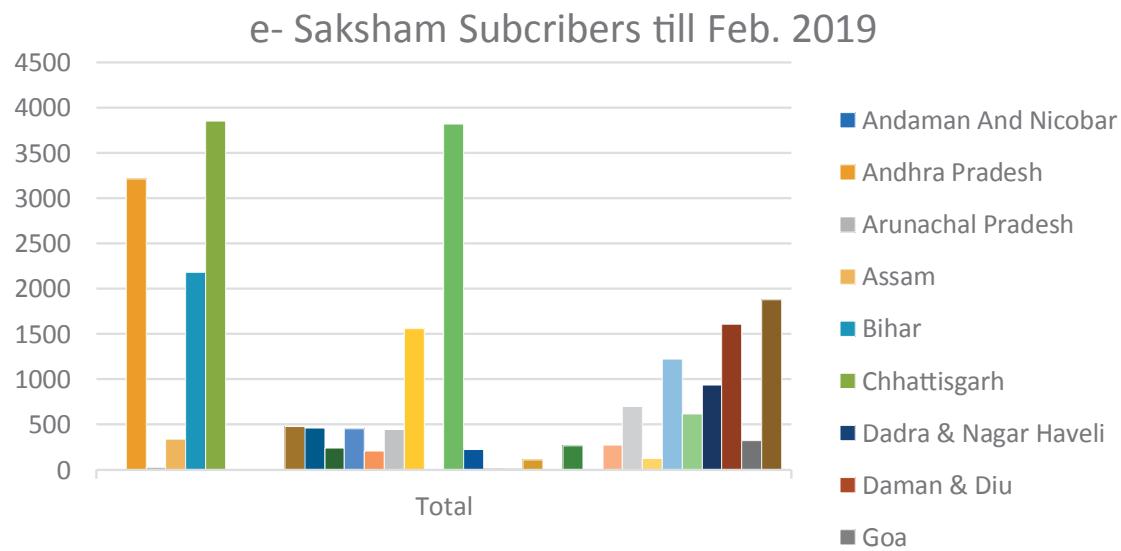


Fig.3 e- Saksham state wise Subscribers



- GIS Facility Centres:** 26 such centres have been established by project in 3 three states, MoRD has shown its intention to replicate this facility across all districts in all states in India in near future to further enhance the learning on GIS based applications for MGNREGA
- Concluding Remarks by MoRD:** A remarkable impact of the project intervention is a transformation in the process of planning of MGNREGA at national level through use of GIS methodology. The MoRD has issued a circular to states to develop 2 GPs plans for each of block (approx. 14000) plans based on GIS methodology for upcoming financial year 2019-20 labour budget.

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
A2/18, Safdarjung Enclave
New Delhi 110 029 India
T: +91 11 4949 5353
E: info@giz.de
www.giz.de/india

