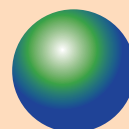

WATER COMMONS

- Influencing Practice and Policy

SOCIAL RETURN ON INVESTMENT (SROI) REPORT
2015-16



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FES

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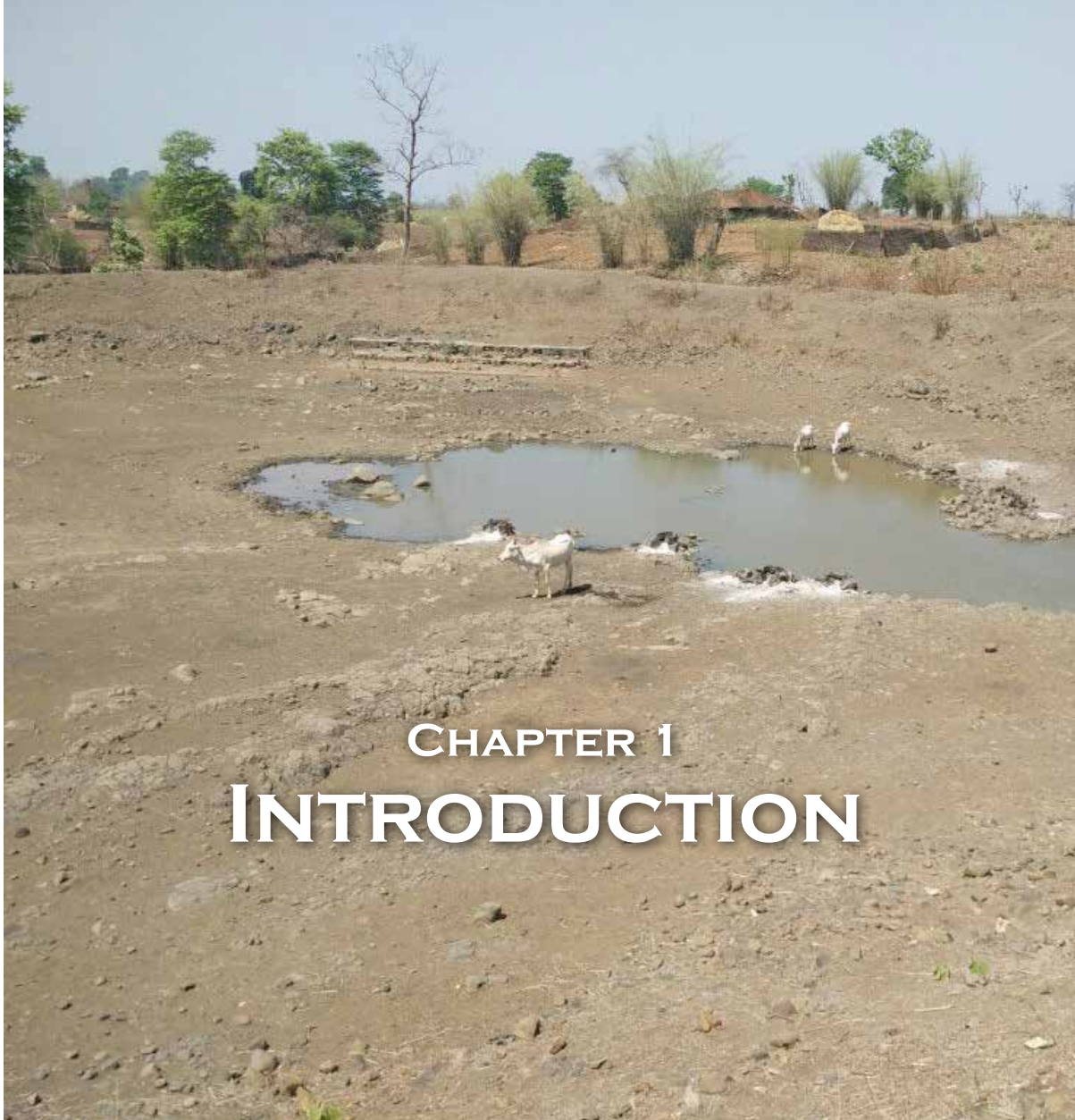
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CHAPTER 1

INTRODUCTION

1.1. The Growing Water Crisis in India

India is a 'water stressed' country with per capita water availability of 1588m³ (CWC, 2010) that is likely to be reduced to 1401 m³ by the year 2025 and 1191 m³ by 2050. Over the past two decades, there has been a steep increase in the utilization of groundwater; as epitomized by the 70% increase in the area being irrigated by tube wells, in the period between 1995-96 and 2012-13. India is the largest groundwater user in the world, with an estimated usage of around 230 km³ per year, i.e. more than a quarter of the global total. This increase has coincided with the decline in the area under irrigation by tanks and canals (44% and 7% respectively). In addition to increasing the pressure on groundwater, what this has done is to take water governance out of the realm of commons and has placed it firmly in the private realm. The role of local communities has been minimized to that of 'water users' from that of 'water stewards'. Given that nearly 85% of the drinking water needs are also met by groundwater, the decline in groundwater is deeply concerning, both from the standpoint of rural livelihoods and from that of quality of life. The increasing competition for scarce freshwater also raises serious issues of water security, particularly for the poorer, socially and politically marginalized sections of the population.

1.2. The Water Commons Initiative – Approach and Actions

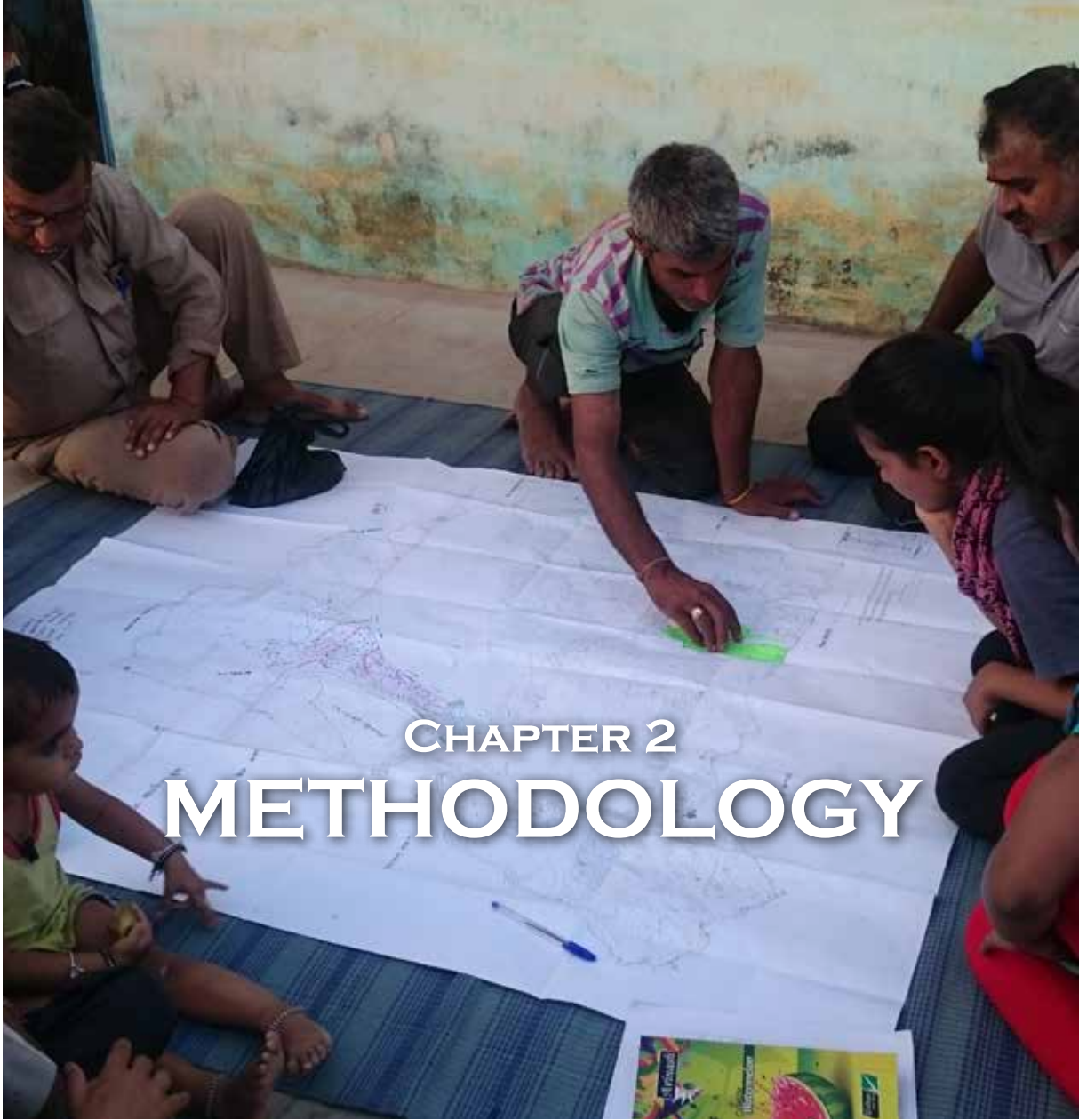
Foundation for Ecological Security (FES) in collaboration with Hindustan Unilever Foundation (HUF) has initiated a programme on Water Commons to improve the management and governance of land and water resources by strengthening community stewardship in more than 800 habitations across eight districts in the States of Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra and Rajasthan. The Initiative believes that water is a Commons that is finite and therefore subtractable and involves large costs of exclusion unlike a public good that is non-subtractable and non-excludable. All water bodies such as ponds, tanks, canals, and groundwater are common pool resources and need to be managed and governed as common property regimes. Building on FES' experiences from work on Land Commons, the core of the initiative on Water Commons is to carve out a space for community management between the extremes of centralised or individualised management of water resources. Major components of the initiative on Water Commons include formalising community institutions and strengthening collective action for restoration and management of common lands and water resources (which result in improvement in local livelihoods), promoting debates on judicious use of water resources in agriculture, and joining wider networks and policy dialogues.

The Water Commons initiative focuses on:

- a) **Commoning water**, i.e. establishing minor water bodies and groundwater as common pool resources and strengthening community stewardship at village and landscape levels for better governance of land and water resources;
- b) Establishing practices for **enhancing water conservation and water demand management**;
- c) Ensuring **more purposeful use of public investments** made under flagship programmes such as the **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)** by supplementing the financial investments with institutional investments and aligning the right to employment with right to resources; and
- d) **Strengthening rural livelihoods** through improved agricultural productivity and better adaptive capacities.

1.3. Social Return on Investment (SROI) Assessment

The Social Return on Investment (SROI) framework was used to assess the changes while the Initiative is in its third year of implementation. Moving beyond a simple cost-benefit analysis, the Social Return on Investment (SROI) framework helps in assessing the social, environmental and economic changes from a stakeholder's perspective. The SROI assessments have tried to understand how the various initiatives under the Water Commons programme is influencing practices towards commoning water – what are the various triggers and motivators for getting people to collectively engage to improve water conservation and water demand management. Key indicators for assessing the changes were identified and monetary values (where possible) were used to create financial equivalents of the social and environmental returns such that the value of benefits could be measured against the value of the investment. The SROI ratio at the end of three years is 1.43:1 while that of 2015-16 alone is 3.25:1.



CHAPTER 2

METHODOLOGY

The Social Return on Investment (SROI) assessment involved interactions with the local communities who are the primary stakeholders of the Initiative, to identify the ‘barriers’ or key issues and challenges, the interventions being undertaken and the various changes (positive and negative) that they see or hope to see subsequent to the interventions. Mind mapping and perception assessment exercises were undertaken with the various stakeholders in a sample of 37 habitations where the Initiative is being undertaken. The names of the habitations are given in Table 1:

Table 1: Habitations where mind mapping and perception assessment exercises were undertaken			
State	District	Block/Taluka/Mandal	Village/Habitation
Andhra Pradesh	Anantapur	Gandlapenta NP Kunta	Pothulavandlapalle Jowkala, Papannagaripalle, Somarajukunta, Yadlavandlapalle
	Chittoor	Peddamandyam Thamballapalle	Bathannagaripalle Gummadikaayalavaripalle Mekalavaripalle, Vepulapalle, Kanakantivaripalle

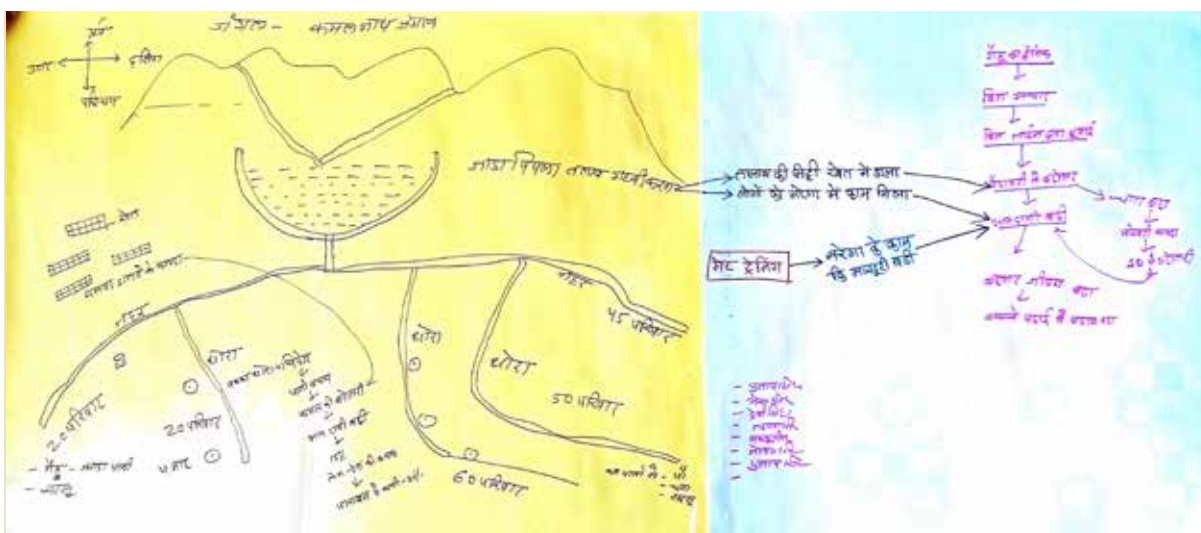


Table 1: Habitations where mind mapping and perception assessment exercises were undertaken

State	District	Block/Taluka/Mandal	Village/Habitation
Karnataka	Chikballapur	Bagepalle	Devarajapalle, Kothoor, Thollapalle, Thollapalle AK Colony
Madhya Pradesh	Mandla	Bichiya	Bhanpur, Changariya, Kherotola, Khuksar
Maharashtra	Yavatmal	Ghatanji	Chandapur, Hiwadara, Jarur, Manushdari, Mejeda
Rajasthan	Bhilwara	Mandalgarh	Gulgaon, Jalam ki Jhopadiya, Thana, Dhuwala
	Pratapgarh	Pratapgarh	Anchalpur, Joda Mahuda, Kadwamoda, Surajpura, Undakhora
	Udaipur	Gogunda Jhadol	Jemali, Kanji Ka Guda, Dhimdi, Luniyara, Rope

Simultaneously, data on various social, economic and environmental aspects such as water saved, water storage potential created, changes in agricultural production, wage days generated under MGNREGA, common land and water bodies brought under community governance that have been collected across the 820 habitations were analyzed for valuation of the benefits accrued. The SROI process has the following steps:

2.1. Mind mapping and perception assessment

The SROI team interacted with the FES implementation teams and various stakeholders to identify the ‘barriers’ (what are the things that stop people from adopting a new behavior towards bringing the desired change and the initiatives being undertaken to overcome these), the ‘triggers’ (what are the initiatives that is being undertaken to get people to start a new behavior towards the desired change), and the ‘motivators’ (what are the initiatives that are being undertaken to reinforce or sustain the desired change). An interview schedule was administered to better synthesize the responses.

Focused group discussions were held with different stakeholders to measure the extent to which the interventions have been able (or have the potential) to influence practice along the focus areas of the Water Commons Initiative in terms of overcoming the barriers, triggering actions and motivating them to reinforce and sustain the initiative.

A mind map was developed with active engagement of the community to understand their perceptions on the immediate and long term outcomes of the initiatives being undertaken towards environmental restoration, improving land and water governance, energizing MGNREGA and strengthening rural livelihoods.

Discussions were held with farmers whose farmlands are in the command area of the water harvesting structures that were constructed / renovated / deepened to assess the changes in water column in wells, cropping area, crop yield, agricultural income etc. Similar discussions were held with the farmers who were supported in constructing farm ponds or *boribands*. Farmers who were supported in undertaking various agricultural interventions to improve water use efficiency and crop productivity were also consulted to estimate the changes in water usage for agriculture, the costs of cultivation and income from agriculture.

Table 2: Stakeholders consulted

Stakeholder	Rationale
Farmers (across landholding sizes)	As the interventions focused on grazing land, agricultural land, and water resource development, farmers and livestock owners are the primary constituencies of this study.
Livestock owners	
Women	As most of the people working on MGNREGA work sites are women in the project locations, this stakeholder group was determined to be central.
MGNREGA wage earners	
Marginalised Caste Groups/ Vulnerable Groups	It was felt that it was necessary to engage with potentially excluded social groups. Care was taken to ensure that these discussions took place away from presence of dominant social groups
Village Institution (VI) Representatives/ Rural volunteers/Community Resource Persons (CRP), MGNREGA Mates	Form the executive of the VI and are the most engaged in project activities.
Panchayat & MGNREGA Officials	Given the emphasis on MGNREGA, we sought to speak to this stakeholder group whenever possible.
Panchayat Representatives	
Farmers who made seed varietal replacement, seed treatment, and kitchen garden/vegetable cultivation interventions	Improving agricultural productivity and water savings through demand management is a prime focus area under the project. Thus, focused group discussions were held specifically with this stakeholder group to understand their perceptions and assess the behavioural changes.
Participants in training programmes	Capacity building being another major component of the project, discussions were held with the participants in the various training programmes viz., claiming and securing Commons, work allocation and measurement under MGNREGA, agricultural training programmes.
FES Staff	Discussions were held with FES staff to determine the activities undertaken within the habitations, identifying key personnel etc

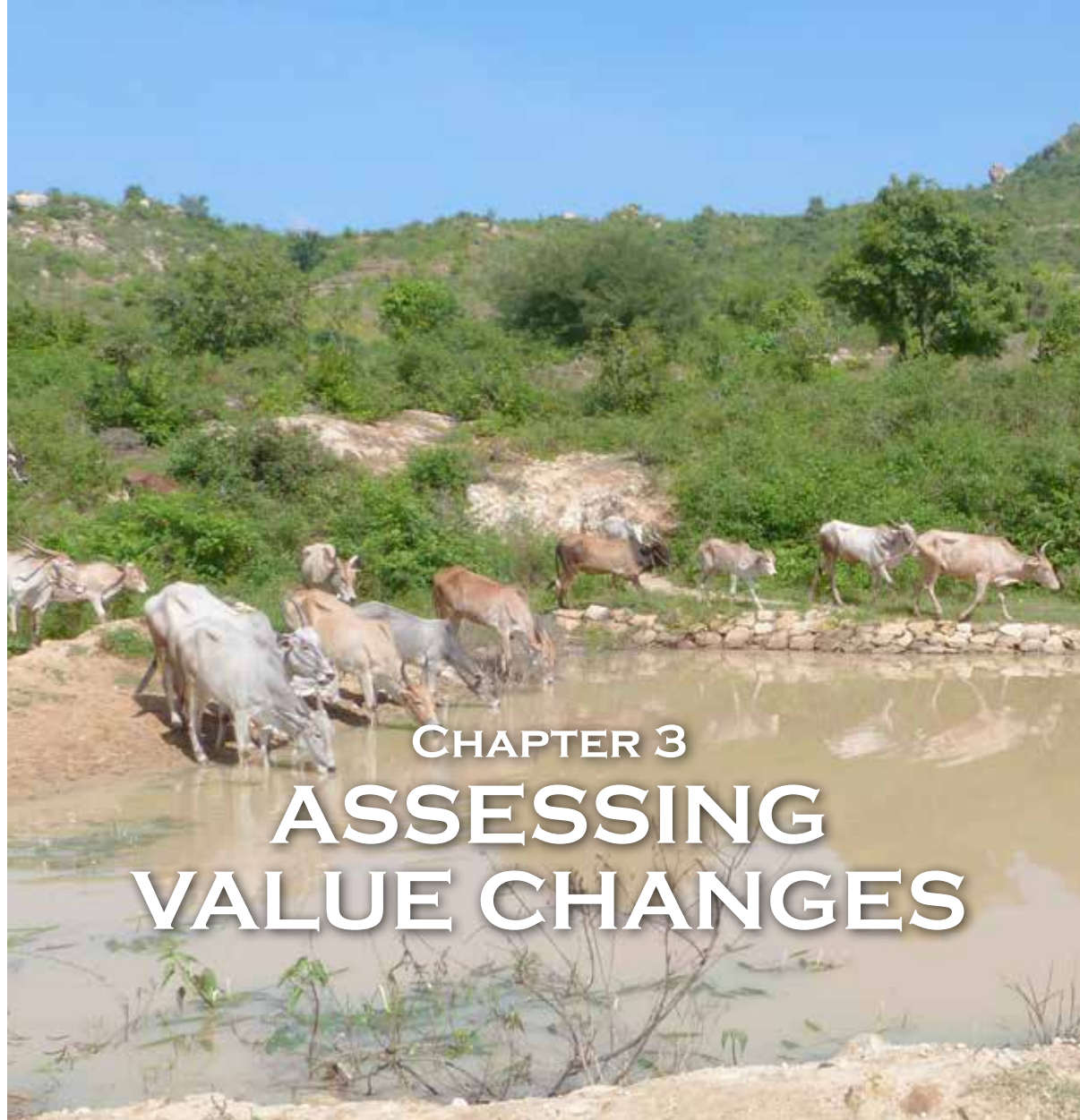
2.2. Valuation of benefits accrued

A broad set of quantitative indicators were identified to valuate and estimate the changes along each of the focus areas of the Initiative – ecological restoration, environmental governance, energizing MGNREGA and strengthening livelihoods.

Table 3: Key indicators measured and methodology			
Focus area	Indicators being measured	Methodology	Rationale/ Key Assumptions
Ecological restoration	Area treated	The different area treatment activities that were undertaken and the extent of area treated by each of these activities was calculated	To understand the different area treatment activities undertaken, and their resultant water potential created or water savings achieved.
	Water saved	Calculation of water saved due to improved agricultural practices, availability of surface water for domestic purposes and water conservation efforts. Replacement Cost method was used. The value of water saved has been taken at a notional price of Re 0.005 per liter.	Improved agricultural techniques were promoted with an aim to reduce water consumption and move towards a more sustainable model of agriculture which is based on less water consumption. It is therefore important to understand the extent to which water savings have been achieved.
	Additional water available for domestic consumption	The number of households who were accessing the additional water storage created was accounted. The state-wise value of water was derived from Pricing Water in Public Systems by the Central Water Commission. We have assumed that the water would be available for a period of 7 months or 210 days post intervention (based on the discussions with local communities in some of the villages). The value thus derived from this calculation is assumed to be the water actually consumed by households for domestic use; viz bathing, washing, cooking, etc.	Alongside saving water through improved agricultural practices, FES has been able to create water potential through various water harvesting and soil moisture conservation measures. These interventions include boriband, replacing gates to existing WHS and so on. The water potential thus being ACTUALLY used for domestic purposes has been taken into account. The key assumption here is that 350 liters of water is consumed each day by a rural household in semi-arid regions. This is based on past studies conducted in collaboration with International Food Policy Research Institute (IFPRI).
	Biomass and Carbon Stock	Biomass assessment of protected and control plot were undertaken in sample villages in each block and the values were compared to estimate the net change in biomass and carbon stock. Grass biomass - Standard rate of fodder at the rate of Rs.5/- per kg has been used to estimate the added value of grass biomass. Standing biomass - For valuation of standing biomass, proportion of biomass used for fuelwood only is taken into consideration. Standard rate of fuelwood at the rate of Rs.3/- per kg has been used to estimate the value of mean annual increment in fuelwood due to improved standing biomass. Please note that this does not taken into account the timber value of the Standing biomass. Carbon credit price as calculated as per the method prescribed in the 'Landowners Guide to Carbon Sequestration Credits' was taken to estimate the added value of carbon stock. The carbon credit price as per this method is Rs.272/- per metric ton of carbon stock.	To estimate the changes in biomass (standing biomass, carbon stock, fodder) availability due to community governance and common land restoration efforts. Assumption: 2.8% of the standing biomass is used as fuelwood (Source: Ravindranath et al., 1997)
	Pumping Hours Saved	A significant reduction was achieved in pumping hours, due to improved agricultural practices. In calculating this, the pumping hours were converted into diesel consumption saved (@ average diesel consumption of 1.5 liters per hour, as per Ministry of Agriculture figures). Diesel was priced at Rs.55/- as per the prevailing prices.	The efforts to promote improved agricultural practices have resulted in a reduction in the number of hours for which pump sets are used to supply water to the fields. This is therefore a significant saving of energy consumption and needs to be quantified and monetized. The key assumption here is that all pumpsets use diesel. Although in many places electric pump sets are prevalent, it is easier to quantify when things are seen in terms of diesel.

Table 3: Key indicators measured and methodology			
Focus area	Indicators being measured	Methodology	Rationale/ Key Assumptions
Environmental governance	Cost of Management of Water Resources	Number of Tanks being managed by the communities have been taken into consideration. It has been assumed that each tank is managed by one Tank Manager who gets paid @ the MGNREGA wage rate prevailing in the district. The total duration for which such a payment has been assumed is 3 months or 90 days of Rabi season when the tank water is actually used by the communities	Community driven tank management is an age old practice, especially in villages of AP and Karnataka. While the actual payment made to such tank managers is usually in kind, we have assigned the daily MGNREGA wage rate in each block in order to derive the value of the governance of water bodies
	Cost of Management of Land Resources	There are a total of 1142 patches of forest/common land in as many panchayats. Each patch of forest has one manager who is paid @ 3000 per month for 4 months.	It is assumed that in the absence of community management, the government agencies (Forest Department, et.al) would have to deploy adequate manpower in order to achieve that governance. The cost of such deployment is take as the value of community governance which amounts to Rs.3,000/- per month for period of 4 months (during monsoon)
Energizing MGNREGA	Additional income due to better MGNREGA wages	Wages generated in works supported by FES vis-à-vis the district average wage rate	FES has striven to improve the quality of MGNREGA in its work areas. In doing so, we have been able to improve the average wage rate per person per day in some of the locations in comparison to the rest of the district where we are working.
Livelihoods and well being	Agricultural income	Additional crop production due to the intervention was valued as per the price of the crop as per Minimum Support Price (MSP). To estimate the changes in crop yield due to improved practices a sample of 20% of the farmers who adopted these practices was taken and the crop yield in demonstration plots were compared with that of control plots where the traditional practice was used. To estimate the changes in agricultural income due to soil and water conservation efforts and water harvesting structures, a sample survey of 10% of the farmers was done for collecting information on cropping area and crop yield before and after the intervention.	To estimate the changes in agricultural income due to: (a) improved practices such as SRI, seed treatment, varietal replacement, line sowing, application of organic manure and pesticides; (b) improved water availability
	Savings on cost of cultivation	With the adoption of better agricultural practices, the number of rounds of irrigation has reduced that has helped in saving the costs incurred in pumping water. In calculating this, the pumping hours were converted into diesel consumption saved (@ average diesel consumption of 1.5 liters per hour, as per Ministry of Agriculture figures). Diesel was priced at Rs.55/- as per the prevailing prices. Number of rounds of irrigation saved was multiplied	To estimate the savings in diesel / electricity costs due to better agricultural practices





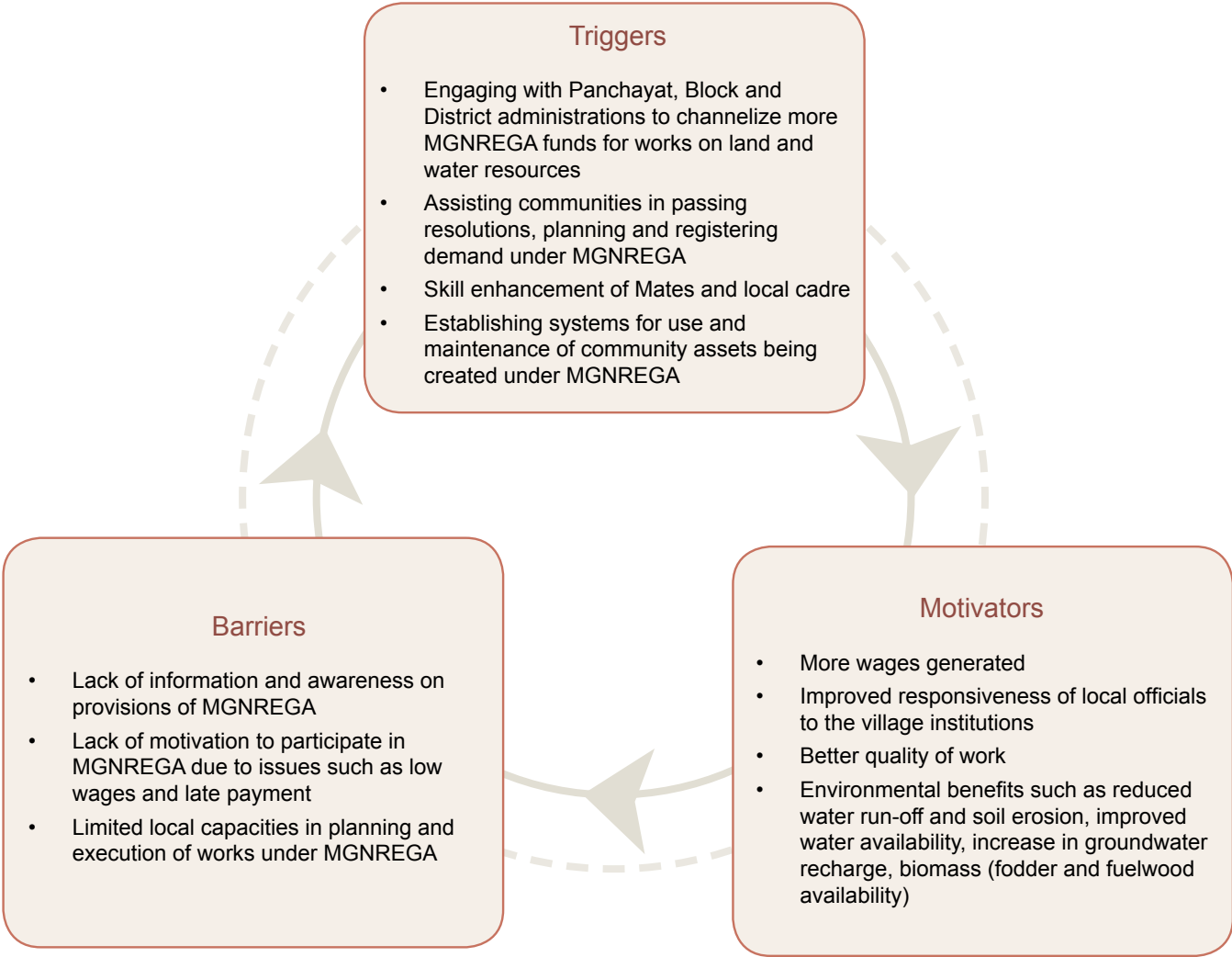
The immediate and long term impacts of the interventions were mapped with the local community along the four focus areas of ecological restoration (in terms of land development, augmenting water supply and water savings through demand side management), environmental governance (commoning water), energizing MGNREGA, and livelihood enhancement. As is evident from the Mind Map in Figure 1 (in the Annexure), each of these components are closely intertwined and supplement and complement each other. (The red boxes indicate the interventions while the green boxes indicate the outcomes perceived. Continuous lines indicate the benefits already perceived while dotted lines indicate benefits that the stakeholders expect in the long run. A plus sign along the line indicates a positive correlation between the two variables while a minus sign indicates that the variables are negatively correlated).

As has been mentioned above, the consumption of groundwater is both for irrigation and for domestic consumption. Coupled with the fact that common water sources like tanks and ponds are in decline, one can safely conclude that the pressure on groundwater is enormous. Therefore, in dry land areas, effective governance of groundwater is imperative. At the same time, in places like eastern Madhya Pradesh which are marked by undulating terrain, deciduous forests and high rainfall, the problem is of deforestation and land degradation, which in turn causes high soil and water run-off, thereby rendering agriculture vulnerable. The looming prospect of climate change only

promises to exacerbate the water crisis; with a fall in the number of rainy days dry spells threaten to be for a longer duration in the arid and semi-arid belts of India. At the same time, a lot of rainfall in a short duration means that in places experiencing increasing deforestation, soil and water run-off will be high. It is these disparate challenges that the Water Commons initiative of FES is trying to address.

3.1. Energizing MGNREGA

As has been mentioned above, MGNREGA is the preeminent employment generation program in India; attracting thousands of crores worth of investment by the government with an aim to improve rural infrastructure and at the same time generate wage employment for rural households. FES has been striving to ensure that the works selected under MGNREGA are geared towards the restoration of land and water resources and that the community is equipped to play a more active role in the identification of works that would lend themselves to the twin goals of ecological restoration and livelihood creation.



With increasing variabilities in rainfall, instances of crop failure have increased, particularly in the rainfed areas. Severe droughts in the last couple of years in the states of Andhra Pradesh and Karnataka for instance have caused acute distress to the rural communities. With agriculture still employing a large number of people either directly or indirectly through labor, crop failures resulted in untold miseries for the rural households.

Under these circumstances MGNREGA has played a crucial role in not only providing wage employment to these households but also in undertaking works for restoring land and water resources that can help in improving the adaptive capacities of these communities to frequent droughts. As much as 60 to 75% of the annual budget of INR 40,000 crore of MGNREGA is invested for restoration of degraded common and private land and water resources. The financial investments however, need to be supplemented with institutional arrangements such that the local communities take a long term interest in safeguarding and managing the assets created.

The Water Commons initiative emphasizes on aligning the Right to Employment with Right to Resources by establishing robust institutional arrangements that can help in ensuring more purposeful use of the public investments made under MGNREGA. The initiative focuses on assisting local communities in developing integrated plans for regeneration of natural resources, liaison with Panchayat, Block and District administrations to prioritize works on land and water restoration, mobilizing communities to participate in the execution and monitoring of works being undertaken through MGNREGA and assisting them in securing collective tenurial rights over community assets such as forests, pastures, and water bodies and establishing rules for management of these resources in the long run.

Better wages

FES has been facilitating a number of training programs for the communities at large, and for leaders and MGNREGA Mates (known by different names in different states; for instance in Karnataka they are called Kayakabandhus), who in turn are expected to steward their respective communities towards NR-oriented MGNREGA planning. Such trainings are also geared toward helping the mates be more precise in their measurements and in ensuring that they understand the various provisions and rights as laid down under Act better. Further, it has been observed that while most of the people working on MGNREGA work-sites are women, the supervisors (Mates) are usually the men. Therefore, skill enhancement programmes specifically for women were carried out in places like Bhilwara to increase the number and performance of women Mates. On-site meetings and improving information on MGNREGA provisions and work measurement techniques has also equipped the people working on MGNREGA work-sites to do the measurements themselves in some of the locations.

Table 4:Valuation of Key Indicators	
Person days generated (nos)	761881
Total wages earned (Rs)	93619896
Wage Rate in FES Locations (Rs/Day)	122.88
Wage Rate At District Level (Rs/Day)	121.43
Total Wages as per District Wage Rate (Rs)	92513120.61
Additional Wages Generated (Rs)	1106775.39

These efforts have resulted in an overall improvement in the wage rate in the sites where we are working, as compared to the wage rates prevailing at the block level. Table 5 furnished here gives a snapshot of the wage bills generated in the areas where FES has tried to leverage the program; as it indicates, communities in FES locations have successfully leveraged a total of INR 931 lakhs which is INR 11.06 lakhs more than what would have been leveraged had the district level wage rates been applied. The wage rates prevailing at the district level and the wage rates that have been leveraged in the FES locations in these districts is given in Table 5. As is evident, while in some of the districts like Bhilwara and Udaipur where FES has been recognized as a PIA the wage rates are slightly more than the district average wage rate, in others the district average wage rates are more.

Table 5: Comparative analysis of wages in FES supported works vis-à-vis average wage rates at District level			
District	Total wages earned (in Rs)	Wages earned (at district average wage rates) (in Rs)	Additional wage earned (in Rs)
Udaipur	13000000	12842168	157832
Bhilwara	21572000	20440106	1131894
Pratapgarh	23961000	24676726	-715726
Mandla	7432000	7774488	-342488
Yavatmal	1795000	1821164	-26164
Chikkaballapur	6013896	6053808	-39912
Chittoor	10498000	9448125	1049875
Anantapur	9348000	9456536	-108536
Total	93619896	92513121	1106775

While the increases in wages may not be entirely attributable to the interventions undertaken by FES, there are several community testimonies which point to the fact that the trainings imparted by FES to community stewards have had a salutary effect on their ability to monitor the work being undertaken and demand for wages as per the quantum of work done.

“Pehle mate kab napti karta tha, kaise karta tha humein malum nai hota tha. Ab hum roz kaam kar k apna napti karte hai. Aur jitna kaam karte hai, utna paisa banta hai us din ka” (Earlier we did not know when and how did the Mate used to take measurements of the work we did. Now we measure our works every day. And the wages that we get is as per the quantum of work that we have done that day)

- **Women at MGNREGA worksite in Thana, Bhilwara, Rajasthan**

Reduced migration

Anecdotal evidence suggests that MGNREGA, particularly with interventions by FES, seems to have made some dent on migration; community testimonials especially from AP and Karnataka indicates that MGNREGA has helped people stay in the village for a little longer than they would have, a few years ago under similar circumstances.

There is similar evidence from Mandla; in Khuksar village of Bichiya block, the number of households migrating came down from 170 in 2013-14 to about 40 in 2015-16. The change, as articulated by the community, was due to the work on *med bandhan* work



“Mundhu Bangalore ki poyi akkada cement pani cheskunnam. Kashtam kaani oka naalugu yellu akkade vunnam. Ippudu kondalalo gunthalu thavvinchinaru kadha. Neeti shaatham perigindhi ani telisi malli vacchinam ooriki. Polam lo bore lo kooda neellu vasthunnayi. Memu poyinappudu oka chukka neeru raale. Panta kooda pandindhi. Ippudu Gujarat samstha vaallu vacchinaka panulu perigi, karuvu pani ki dabbulu baane andhuthunnayi chethiki. Malli Bangalore thirigi ponavasaram le”.

Earlier, we used to stay in Bangalore and work as laborers; it was tough but we stayed there for four years. When we left, there wasn't a drop of water in the village. Now with NREGA work coming in, and with more work coming into the village, we are able to make some money while staying in the village itself. Thanks to the activities being undertaken under NREGA, we have also been able to resume agriculture. This has been made possible, among other things, by the initiative of the *konda panollu*, or FES.

- Papulamma, at NREGS work site, Papannagaripalle, Anantapur, AP

that has been commissioned under MGNREGA, and that FES has striven to ground in the village. In addition to providing wage work, this activity has also been successful in improving water availability in the village, thereby enabling communities to undertake double cropping; now communities also undertake cultivation during the Rabi season.

Improving agricultural returns

Farm bunding and farm ponds were important activities that were undertaken by communities across the country, through MGNREGA. These activities not only helped in improving the soil moisture regimes of their lands; but also created additional water storage capacity, thereby providing critical irrigation to the farmers. For instance, in Chandapur, Yavatmal, Maharashtra, farm bunds are being built on the lands of 15 farmers. In the immediate term, it generated wage employment for hard-pressed farmers; and in the long-term created avenues for improving agricultural production. This activity alone generated about 251 person-days of work, amounting to INR 45431.

“Yanda jevdha utpanna shetitun zala nahi tyapeksya jast MGNREGA tun dhalichya bandhacya kamamule zali. Mothya pramanavar rojgar bhetlyane utpannache sadhan gaavatach upalabdha. Yacha shetkari aani maju doghanna fayda hot aahe.”

People received more income than agriculture through wage employment in MGNREGA farm bunding work. Large number of wage employment becomes additional source of income in the village. It benefited to wage seeker and farmer as well

- Sunil Nagorao Pendor, Chandapur, Ghatanji, Yavatmal

Similarly, in Udaipur, Rajasthan farm bunding has helped in checking soil erosion and improved the productivity of the farmlands of 66 farmers.

A number of farm ponds too have been supported through MGNREGA. These structures too promise to improve agricultural production by providing critical irrigation; in addition to providing substantial wage employment to rural households.



Farm pond helps in improving agricultural production: A Case Study

Shravan Motiram Surpam, 52 years old is living with his wife, son, daughter-in-law and a 2 year old grandson. He owns 2.5 hectares of farm land. His agriculture is totally rain fed and he was able to grow only one crop in kharif season. He has a well but the water therein was not sufficient for irrigation. Digging of the Farm Pond in his farmland through MGNREGA last year has helped in recharging the groundwater and increasing the water column in his well. With increased water availability, his agricultural production increased and was able to earn additional Rs.21,300/- . Besides this, digging the farm pond also generated wage employment of Rs 39,699/-.

Shet talyamule yanda pausman kami asunahi unhalyat vihirit pani shillak aahe. Mashagatiche kaam kartana bailanna pinyasathi paani milat ahe je magchya varshi ya mahinyat aatat hote."

Water remained in well, even in summer and despite less rainfall. This water is available both for irrigation and for livestock.

Regeneration of common lands and water resources

The various capacity building programs that FES has been organizing, in the realms of MGNREGA and Commons is, according to community testimonies, helping them pick work that is geared towards strengthening of common land and water resources. The result of this is that of the wide array of activities that were undertaken as part of MGNREGA in 2015-16, activities like tank de-siltation (24%), pasture land development (11%), maintenance of existing water harvesting structures like earthen dams, etc and afforestation (7%) constitute a very significant proportion. Another important activity that has tended to dominate in the areas where FES is working are the construction of water harvesting structures like farm ponds, construction or de-siltation of check dams and so on; all of which were geared towards improving soil moisture regime and water availability in commons and on private lands. As the subsequent chapter on livelihoods would show, there has been a significant improvement in water availability and in agricultural production.



IMPROVED LIVELIHOODS DUE TO NREGS: A CASE STUDY

Ravindra Reddy is migrant to Marrikommadinne Panchayati from T.N.Palle near Kotthapalle, Chittoor; where they had ancestral land of around 6 acres. The burgeoning debt on agricultural inputs and personal loans forced his father to commit suicide and the land was cordoned off by the moneylenders. The same year the remaining family members migrated to the current place. The family consists of 4 people, he and his siblings viz., Raghunath Reddy, Bharathi and Bhaskar Reddy. He is the only person who does the entire work for NREGS from the household. He solely depends upon NREGS works for around 1/3rd of the days in a year i.e., around 150 days (in 2015) and earns roughly around Rs.140-150 per day which come to around Rs.21,000 to Rs.22,500, if worked completely.

He quips “*Andaram kalisunnam kabatti illu edhola gadustondhi. Lekapotha parishithi vereyla undedhemo*”(we are all together; so we are able to manage things at home. Else it would have been very difficult). Through the statement, he stresses the importance of family support system in sustaining their collective livelihoods. Over the years, his family worked extremely hard and bought few goats and sheep, with the savings made, for rearing. He sold the entire lot for Rs.2.50 lakhs and used the entire money to marry his daughter and reinvest in livestock as he saw it an appreciating asset.

During the drought season, earlier, the family used to suffer even to get a good meal in a day. Later, the increase in the number of works due to the involvement of FES and Government officials sustained the cash flow to his household.

Thus the interventions indirectly contributed in turning a landless labourer into a livestock herder. He is planning to further increase the number of livestock and later on buy a small piece of land and expand his livelihood options.

Community Perceptions regarding changes in MGNREGA due to the interventions

Community perceptions about different aspects of MGNREGA have largely been favorable. 36 out of the 37 habitations that were surveyed, using a habitation level survey, opined that there had been an increase in awareness about MGNREGA; with about 87% (32 habitations) feeling that the improvement has been moderate to high.

Table 6: Community perceptions regarding changes in MGNREGA due to interventions

Indicators	Decrease	Increase	No Change	Grand Total
Awareness about MGNREGA Provisions		36	1	37
Peoples' Participation in MGNREGA		33	4	37
Peoples' Participation in Work Execution		33	4	37
People Participation in Monitoring and Supervision		32	5	37
Wage Rate		25	12	37
Quality of Work		32	5	37
Quality of Supervision		29	8	37
On-Site facilities	3	8	26	37
Responsiveness of officials		23	14	37
Works Planned for Land and Water Restoration		34	3	37
Access to MGNREGA Information		27	10	37
Works Implemented for Land and Water Restoration	1	31	5	37

Table 7: Community perceptions regarding the extent of change due to interventions

Indicators	1-No Change	2- Low Change	3-Moderate Change	4-High Change	5-very High	Grand Total
Awareness about MGNREGA Provisions	1	4	18	14		37
Peoples' Participation in MGNREGA	4	5	17	8	3	37
Peoples' Participation in Work Execution	5	5	16	11		37
Peoples' Participation in Monitoring and Supervision	7	9	16	4	1	37
Wage Rate	11	8	13	4	1	37
Quality of Work	6	6	20	5		37
Quality of Supervision	5	11	15	6		37
On-Site facilities	25	4	8			37
Responsiveness of Officials	14	10	9	4		37
Works Planned for Land and Water Restoration	3	6	16	12		37
Works Implemented for Land and Water Restoration	7	9	16	5		37
Access to MGNREGA Information	8	6	13	9	1	37

In 90% of the habitations surveyed (33 habitations), the view was that there had been an increase in the peoples' participation in planning and monitoring the various activities under MGNREGA. About 68% (25 habitations) of the habitations felt that there had

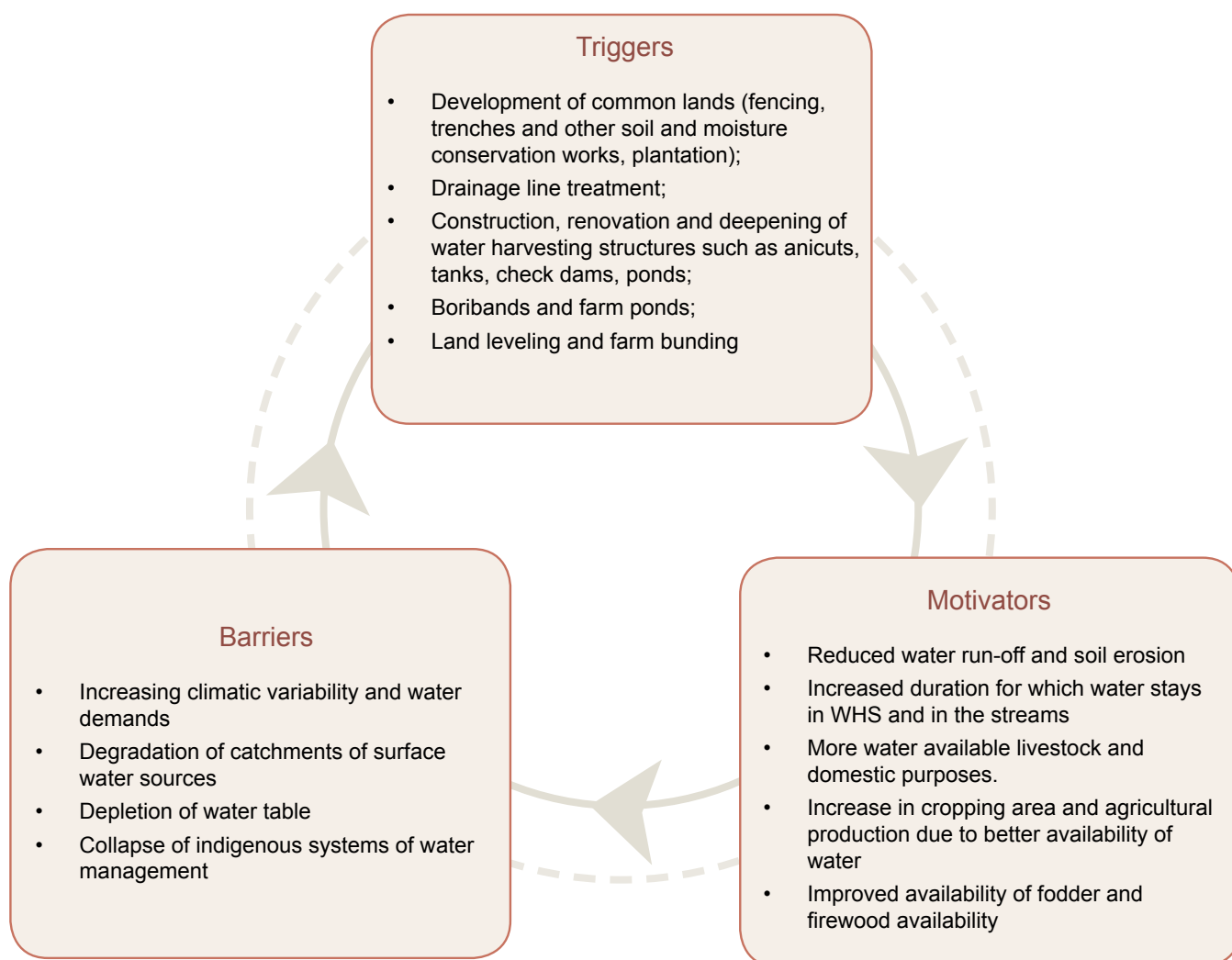
been an improvement in the wage rate; about 48% of the habitations feel that the improvement in wage rates has been moderate to very high. 23 habitations (67%) felt that there has been an improvement in the responsiveness of the MGNREGA officials; with 44% of the habitations opining that the increase in the officials' responsiveness has been moderate to high.

There were some important factors that helped the rural households in earning more from MGNREGA; one of them was the fact that the MGNREGA wage rates were increased by the various state governments. Secondly, in states like Andhra Pradesh, the government decided to increase the number of minimum person days per household from 100 to 150. As has been mentioned above, the role of FES has been to improve the delivery of MGNREGA; and this is reflected in the slightly higher wage rates prevailing in the Panchayats and blocks where FES is working than those in others. With the central government recognizing MGNREGA as an important rural wage employment program, and aiming to use the funds allotted in the said program in a sharper way, it opens numerous opportunities for FES and the communities with whom we are working, to leverage it in order to restore land and water commons, even while generating substantial livelihoods for these communities. At a time when agriculture is becoming more and more uncertain owing to climatic factors and with most rural communities becoming increasingly dependent on scarce groundwater resources, MGNREGA is the ideal program with which to undertake activities that can help in undertaking activities that can help in creating water storage capacity, improving soil moisture regimes and in restoring important land and water commons like tanks and grazing lands.

3.2. Ecological Restoration

Ecological Restoration is one of the cornerstones of the interventions by FES; here once again the objective is not to arrive in a village with a bag of solutions. Rather, it is to work closely with the communities to understand the different connections and feedbacks between human and natural resource systems and identify a set of interventions that can address the ecological and livelihood concerns of these communities. The interventions on this front focused on water savings through improved agricultural practices, creating water storage structures in order to assist with improving critical irrigation and soil moisture regime on private and common lands alike; and on restoring commons through soil moisture conservation interventions and strengthening institutions.





Water Saved; Water Earned

Table 8: Water saved due to area treatment interventions

Treatment Undertaken	Area Benefitted (ha)	No of Farmers	Increase in Income (Rs)	Total Water Harvested (TCM)	Total Money Saved due to water harvesting (INR)
Area Treatment	2710.85	1573	1,27,49,506	34,664	17,33,20,000
Water Harvesting Structures	3413.08	4176	7,55,79,791		
Bori Bund	112.07	415	22,43,296		
Total SWC Works	4874.363	6164	9,05,72,593		

In arid and semi-arid regions where FES has been implementing the Water Commons project, saving water through measures like area treatment, water harvesting structures and soil moisture conservation measures are important ingredients in water governance. FES has focused on a number of measures geared towards the objective of increasing water savings. As Table 8 given below shows, we have been successful in treating 6236 hectares of common and private land; benefitted more than 6100 farmers and created additional income of INR 9.05 crores. The total water thus harvested is 34,664 TCM, valued at over INR 17.33 crores.

Another important approach that we have adopted in order to improve water savings is to promote improved agricultural practices. These include the use of gypsum, undertaking seed treatment and a variety of other measures. The total water saved through such initiatives is 2603.55 TCMs valued at over INR 1.30 crores.

Water for Domestic Use

An important intervention undertaken by the communities who were supported by FES, was to repair or create water storage structures on common lands. In doing so, the communities were able to access some additional water for domestic consumption, viz washing, cleaning, livestock etc. In all, 1545 households were able to access water for duration of 7 months; the value of water thus made available is in excess of INR 55 lacs.

Table 9: Additional water available for domestic use

Location	No of HHs	Average water required for domestic purposes in semi-arid rural areas (Its)	Total Water Consumed (Its)	Value of Water	No of Days	Total Value of water consumed
Bichhiya	336	350	117600	23.96688	210	5033.045
Gogunda	140	350	49000	1.75	210	367.5
Jhadol	620	350	217000	7.75	210	1627.5
Pratapgarh	259	350	90650	3.2375	210	679.875
Rekkamanu	190	350	66500	26388.89	210	5541667
Grand Total	1545	350	540750	26425.59	210	5549375

Source: Pricing Water in Public Systems in India, Central Water Commission, 2010

Supporting the communities in placing boribands in the streams areas where the base flows are good not only improved availability of water for irrigation and the residual soil moisture, but also helped in retaining the stream flow for longer duration thereby

“Boribund valla na beedu bhoomiki neeru vastondhi. Asalu pantey pandadhu anukunna na bhoomi lo vari saagu chesthunna. Digubadi chaala baaga vacchindhi. Malli varshaalu padithey rendo panta kooda vesukovochu”.

My fallow land turned productive due the water from boribund. I'm cultivating paddy in the same land parcel which I thought was useless. The yield is very good. If the rainfall is adequate this monsoon, I can try cultivating the second crop as well

- Sivayya, Somarajukunta

providing water for domestic purposes and for livestock. A case in point is Changariya village in Bichiya block, Mandla. Two boribands have been constructed by the community, with support from FES. Before this, the members of this village would have to walk long distances in order to fetch water, both for their domestic purposes and for their livestock. However, with the two structures coming up, it has become a lot easier for the communities to support their livestock. Now, there is water in the village even in the hot months of April and May, which is being used for critical irrigation. Another positive spin-off is that some green fodder is available in the vicinity of the boribands. This, according to the communities, is an added benefit of the said activity.

Biomass and Carbon Stock Improvement

Another major focus of our interventions has been to improve biomass availability, especially on the commons. Through activities like plantations the communities have been striving to improve the green cover; thereby enhancing the availability of fodder and fuel wood. In addition to physical interventions, FES has also focused on reviving and strengthening existing systems of governance; in doing so we have been engaging with communities to evolve rules, regulations and norms for protection and management of these common lands. Strengthening institutional arrangements not only ensure the regeneration and survival of the newly planted saplings but also aid in natural regeneration. As a result of these efforts, 16,369 tons of additional biomass have been produced last year; taken at the prevailing market rate of dry fodder, in each state, the total value of the additional fodder is nearly INR 8.18 crores. Simultaneously, rules such as ban on tree felling and permission for collection of only dry wood for fuelwood purposes has led to an increase in the standing biomass by more than 7 lakh tonnes. The incremental changes in standing biomass and carbon stock are shown in Table 10 below. The value of additional fuelwood and carbon stock is estimated at INR 6.01 crores and INR 8.61 crores respectively.

Location	Additional grass biomass production (tonnes)	Value of additional grass biomass (in Rs. Lakhs)	Mean annual incremental (MAI) fuelwood production (tons)	Value of MAI (in Rs. Lakhs)	Additional carbon stock production (in tonnes)	Value of additional carbon stock (in Rs. Lakhs)	Net change in the value of fodder, fuelwood and carbon stock (in Rs. Lakhs)
Anantpur	3967	198.35	8436.72	253.10	133679.30	363.61	815.06
Bhilwara	2252	112.6	1434.55	43.04	22385.64	60.89	216.53
Chikballapur	198	9.9	166.51	5.00	2636.63	7.17	22.07
Mandla	188	9.4	1046.43	31.39	16580.77	45.10	85.89
Pratapgarh	519	25.95	679.31	20.38	10762.74	29.27	75.60
Udaipur	5283	264.15	5896.80	176.90	92562.64	251.77	692.82
Chittoor	3962	198.1	2381.09	71.43	38132.80	103.72	373.25
Total	16369	818.45	20041.42	601.24	316740.53	861.53	2281.23

Note: Value dry fodder is taken for valuation of grass biomass (value of dry fodder is taken @ Rs. 5 /- per kg)

Value of fuelwood is taken @ Rs.3/- per kg for valuation of mean annual increment in fuelwood production. The MAI is calculated as 2.84% of the additional standing biomass.

Carbon credit price @ Rs.272/- per tonne (based on the landuser guide) is taken for valuation of carbon stock

There is also some anecdotal evidence of the fact that communities have evolved some rules to regulate collection of fire wood; and this promises to improve the biomass availability further, in the years ahead.

According to some community testimonies, wild animals have reappeared in places where none had been seen for years. This is a sure sign of not only improved water availability but also of improved biomass; of course this is a result of efforts over many years and not just that of the previous year.

“Okappudu okka janthuvu pakshi kaanocchevi kaadhu ikkada. Ippudu samstha chesina panula valla neeti shaatham baa perigindhi inka chetlu kooda bhaariga periginaayi. Deenitho jinkalu, nemallu, kottha pakshula raaka baaga periginayi. Atta adavi loki velthey meeku jinkalu kacchithamga kanipisthayi. Okappudu paristhithi verey”.

There was no sign of animal and birdlife here, earlier. Due to the physical interventions taken place in the common lands, it led to a drastic increase in surface water levels and greenery around it. Due to this, the number of deers, peacocks and new kind of birds which we haven't seen earlier has increased. Once you enter the forest land, now, you will witness deers for sure. The situation was quite on the opposite earlier.

- Ramanjullu, Somarajukunta. Anantapur, AP

The other major intervention on the eco-restoration front, which also has significant implication for the livelihoods of rural households, is the promotion of improved agricultural practices so that water savings can be effected. In various locations, FES has promoted practices like seed treatment, line sowing, use of drip and sprinkler irrigation and gypsum application among others; so that water consumed for irrigation could be saved. As the chapter on livelihoods will highlight, in addition to helping save water, these improved agricultural practices have also helped in reducing the energy consumption for pumping water; which is also an important gain. As the table given herewith indicates, the total water saved due to adoption of improved agricultural practices is 2603.55 TCMs valued at over INR 1.30 crores. The average water savings per farmer is 0.202 TCM or about 2.02 lac liters. This amounts to INR 1,014 worth of water saved per farmer

Table 11: Water saved due to improved agricultural practices

Water Saved (TCM)	2603.55
Total Number of Farmers Benefitted	12843
Water Price per liter (Rs)	Rs.5/1000 liters
Value of Water Saved	Rs.1.30 crores
Water Saved per Farmer (TCM)	0.202
Value of water saved per farmer (Rs)	Rs.1014
Value of water saved per hectare (Rs)	Rs.4687
TCM=10,00,000 liters	

Activities like staggered contour trenches, tank de-siltation and percolation pits, check dams and water harvesting structures has increased the water storage capacity that has also helped in recharging the groundwater and increasing the water column in wells. In particular the SCTs have resulted in a decrease in water run-off, resulting in an improvement in the availability of grazing areas, by improving organic leafy matter.

In Jowkala village of NP Kunta Mandal, the various water harvesting structures have, as per community narratives, resulting in an improvement in the water column in the bore wells; which in turn has encouraged more people to try and drill bore wells. While this is an encouraging development, it is an indication that perhaps we might have to work on water governance in the months and years ahead.

Similarly, in Undakhora village of Pratapgarh district, Rajasthan, soil and water conservation measures and construction of Anicut has helped in checking soil erosion. The communities share that this has helped them in bringing more farmland under cultivation and improved the land productivity. *“Mitti ka katav kam hone se ab hamara khet ek se dedh guna zada badh gaya hai. Isse humara upaj bhi prati bigha teen se chaar bori badh gaya”* (Our farmland has increased by one to one and a half feet due to reduced soil erosion. This has also led to an increase in the crop yield by three to four quintal per *bigha*), shared the farmers in the village whose farmlands used to be severely affected by the soil erosion.

Maauri cheruvu Nayana kere ku repair cheyakamundu okkapantaku kuda neeru saripoyedi kadu. Kaani FES vallu repair chesina tharuvatha pantamotham ku neeru saripoindi..deeni tho 40 mandi raithulaku panta saagu authundi.

Water of Nayana kere (Tank) was not even sufficient for one time irrigation but after its outlet repairing water is more than enough for one time irrigation. About 40 household are using this tank water.

- Anjappa, Thollapalle AK Colony

Another case in point is the tank repair activities that have been undertaken by the communities in Bagepalle, Karnataka; anecdotal evidence suggests that these repairs have proven to be very useful for communities, not only in sustaining agriculture but also in providing them with an improved water source for domestic consumption. A case in point would be the repair of Nayanappakere in Thollapalle AK Colony; the outlet of this tank was repaired and is today catering to about 40 households and meeting both their irrigation and their domestic needs.

Community Perceptions about the Changes

A field survey was undertaken across 37 habitations where FES has been grounding the Water Commons Project. As part of this survey, we enquired about the nature and the extent of changes that have been witnessed due to the various eco-restoration activities undertaken therein. 75% of the habitations (28 habitations) felt that there had been a decline in water run-off; about 64% of all the habitations felt that there had been a moderate to very high decline in the water run-off. Similarly in 32 habitations, the participants felt that there had been an increase in the water column in the wells, with about 64% of the total habitations feeling that the improvement has been moderate to very high. Talking about the activities aimed at improving the water storage capacity in the habitations/villages, nearly 73% of the habitations (27 out of 37 habitations) claimed to have witnessed an increase in the availability of surface water; with about 51% of the habitations feeling that there has been a moderate to high improvement in the availability of surface water. This is clearly an area that has been a target of interventions, by the communities and FES alike. Similarly, there seems to have been some improvement in the soil moisture regime in most of these habitations; as indicated by the fact that 25 of them (about 68%) feel that there has been a decline in soil erosion. Nearly 76% of the habitations feel that there has been an improvement in soil fertility and in the overall soil-moisture regime. Finally, a significant proportion of habitations opined that there has been some decline in the occurrence of forest fires. These responses show that, at the very least, the communities see the benefits of undertaking activities that aim to strengthen the commons; by corollary they see the value of land and water commons. Even today, with rapidly shifting livelihood priorities, rural households depend significantly on commons and believe that there is worth in striving to restore them.

Table 12: Community perceptions regarding changes due to eco-restoration activities				
Change	Decreased	Increased	No Change	Total Habitations
Water Run-off	28		9	37
Water Column in Wells	2	32	3	37
Duration of Stream Flows	3	23	11	37
Availability of Surface Water	1	27	9	37
Quality of Drinking Water	4	15	18	37
Soil Erosion	25	7	5	37
Soil Moisture Regime	1	28	8	37
Soil Fertility	4	28	5	37
Pest Attacks	14		23	37
Forest Fires	17	2	18	37

Table 13: Community perceptions regarding extent of changes due to eco-restoration activities						
Change	No Change	Low Change	Moderate Change	High Change	Very High Change	Grand Total
Water RunOff	9	8	12	6	2	37
Water Column in Wells	3	4	21	9		37
Duration of Stream Flows	11	6	17	3		37
Availability of Surface Water	9	9	14	5		37
Quality of Drinking Water	18	4	10	5		37
Soil Erosion	5	3	17	9	3	37
Soil fertility	5	5	22	3	1	37
Forest Fires	18	4	8	4	3	37
Pest Attacks	23		10	4		37
Soil Moisture Regime	8	5	18	4	2	37

3.3. Environmental governance (Commoning water)

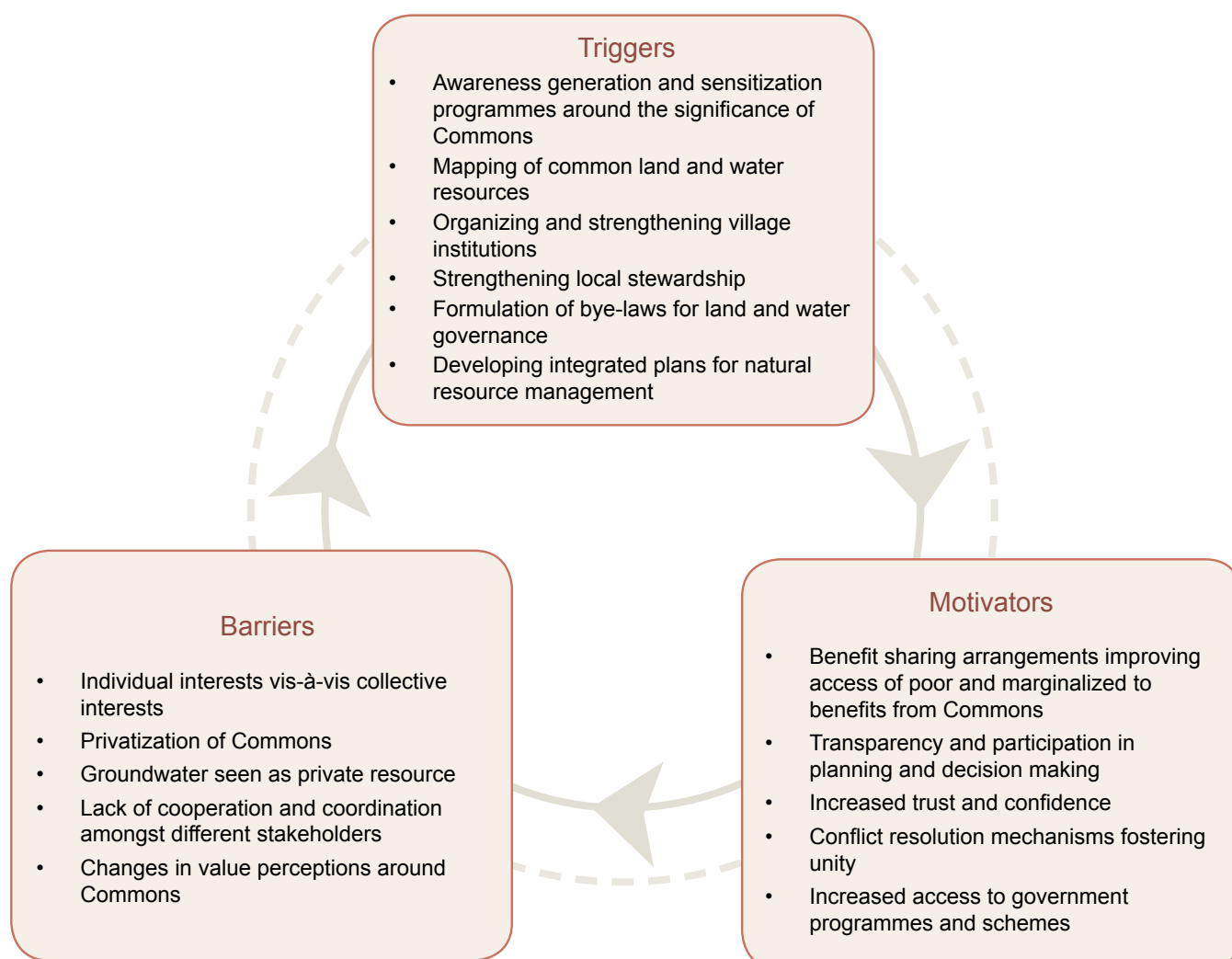
Natural resources such as forests, pastures and water are common pool resources that are not owned or used by an individual, but shared amongst multiple actors. The mainstream discussions most often focus either on ‘centralized’ or ‘privatized’



institutional solutions for governance of such shared resources. While there are numerous evidences that demonstrate the capability of local communities to self-regulate and collectively manage these resources, the role of local communities in management of natural resources is undermined in the dominant discourses. Local communities who are the primary stakeholders of natural resources, in many instances lack the legal and institutional spaces to manage these resources as common property regimes. This has resulted in sea changes in the way people value these resources. Further, the local institutional arrangements that had evolved over generations for managing these resources as common resources have been eroding in many cases.

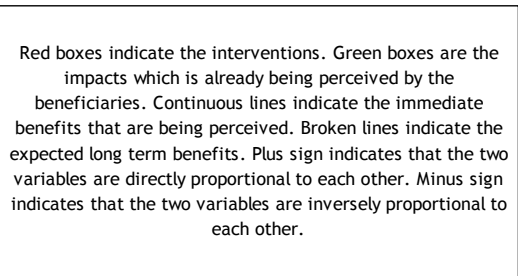
It is in this context, that one of the main focuses of the Water Commons Initiative is to change perceptions around the natural resources of forests, pastures, surface and ground water resources and to center stage common property regime as viable form of governance system for water and natural resource governance and legitimize the role of local communities in its management. Over the last three years, continued efforts have been made to engage with the local communities to map the various common pool resources, defining village specific bye-laws for their conservation and management, and strengthening local stewardship for better governance of these resources.

More than 800 village institutions have been organized in the last three years and are at different stages of formalizing rules for land and water management, developing



**- Venkat, Devrajpalle,
Chikballapur**

Community Mind Map



- Chandra Prakash, Jemli, Udaipur, Rajasthan

and executing plans for land and water rejuvenation, evolving strategies for improving water usage. Discussions with the local communities indicate that the institutional strengthening efforts are helping in improving management of land and water resources, improving the access of poor and marginalized to benefits such as fodder, firewood and water from Commons and fostering unity in the village. In many of the villages, the people shared that the village institution is also proving to be instrumental in resolving conflicts pertaining to wide range of issues such as encroachment of common lands, catchment of tanks, boundary conflicts, trespassing of rules collectively formed etc. Further, they now participate more actively in the planning and decision making processes. At the same time, with increasing confidence and unity, village institutions, Rural Volunteers and Para-workers have also started engaging with Panchayat and other external actors. In the long run, the communities see that a more robust village institution will also help them in improving their access to various programmes and schemes and to developmental funds for the village.

Collective Efforts To Address Water Crisis: A Case Study

Dhuwala is a village of about two hundred fifty households in Bhilwara district of Rajasthan. With an average annual rainfall of around 400-450 mm, the area faces severe water crisis situations, particularly during the summers. Water in the wells and in the anicut (that provides water to three villages in this region) is able to meet the water requirements only for five to six months. For the remaining time period they have to buy tankers even for meeting the domestic water requirements. One tanker costs around Rs. 250/- and lasts for about eight to ten days, depending on the size of the family and their water requirements. Although the Anicut present in the village has been significant in meeting the domestic water requirements, the water used to last for only three months due to leakage. The *Samiti* therefore, unanimously decided to repair the Anicut. At least one person from each of the households contributed five wage days for repairing the Anicut.

Repairing the Anicut has not only checked the leakage problem, but also improved the water availability in the structure by at least two months. This has also helped in recharging the nearby wells. Almost every household has kept a tank to store water for daily use. Water is supplied through a pipeline to all these tanks. One of the most significant impacts that can be seen because of the repair work done is in terms of reduced expenses on water tankers. Given that every household had to procure water through tankers for about five to six months, on an average the expenses on these tankers amount to Rs.2,500/- per household. With improved water availability they need to purchase water tankers only for three to four months, thereby saving an amount of Rs.1,000/- at the household level.

“Gaye saal hamein 3-4 mahine ke liye hi tanker kharidna pada tha. Is baar agar barish achi hui toh anicut me aur lambe samay tak paani rahega aur tanker ka kharcha aur bach jaega” (Last year we had to buy tanker only for 3-4 months. This year if it rains well then water would last for longer time in the Anicut and the expense on water tanker would further reduce), shared one of the men in the village.



Table 14: Valuation of key indicators

Village institutions organized (in no.)	826
Area of common land brought under community governance (in ha)	29,986
Number of water bodies brought under community governance (in no.)	507
Transaction costs saved due to management of common land by the village institution (in Rs)	23,16,000
Transaction costs saved due to management of water resources by the village institution (in Rs)	20,67,660

Community perceptions regarding changes due to interventions

Community perceptions with regards to governance have been favorable; but it needs to be mentioned here that water governance is still some way away. More than 81% (30) habitations felt that there had been an increase in the number of women who took part in planning the governance of natural resources; with 64% of the habitations feeling that the increase had been moderate to very high. Similarly, 67% (25) of the habitations felt that there had been an increase in the number of SC/STs taking part in the planning process. There has also been an increase in the number of poor and marginalized accessing commons, in 28 (76%) of the habitations with 64% of the habitations witnessing a moderate to very high increase.

Table 15: Community perceptions regarding changes in governance due to interventions

Indicators	Decrease	Increase	No Change	Grand Total
Participation in Planning		6	31	37
Participation of Women in Planning		30	7	37
Participation of SC/ST/Marginalized in Planning		25	12	37
Formulation/Enforcement of Rules		29	8	37
Number of Wells/Bores Shared	1	19	17	37
Issues of Conservation Discussed		35	2	37
Conflicts Resolved by Village Institution		18	19	37
Access of Poor and Marginalized to Benefits from Land and Water Resources		28	9	37
Access to Government Programs and Schemes		31	6	37

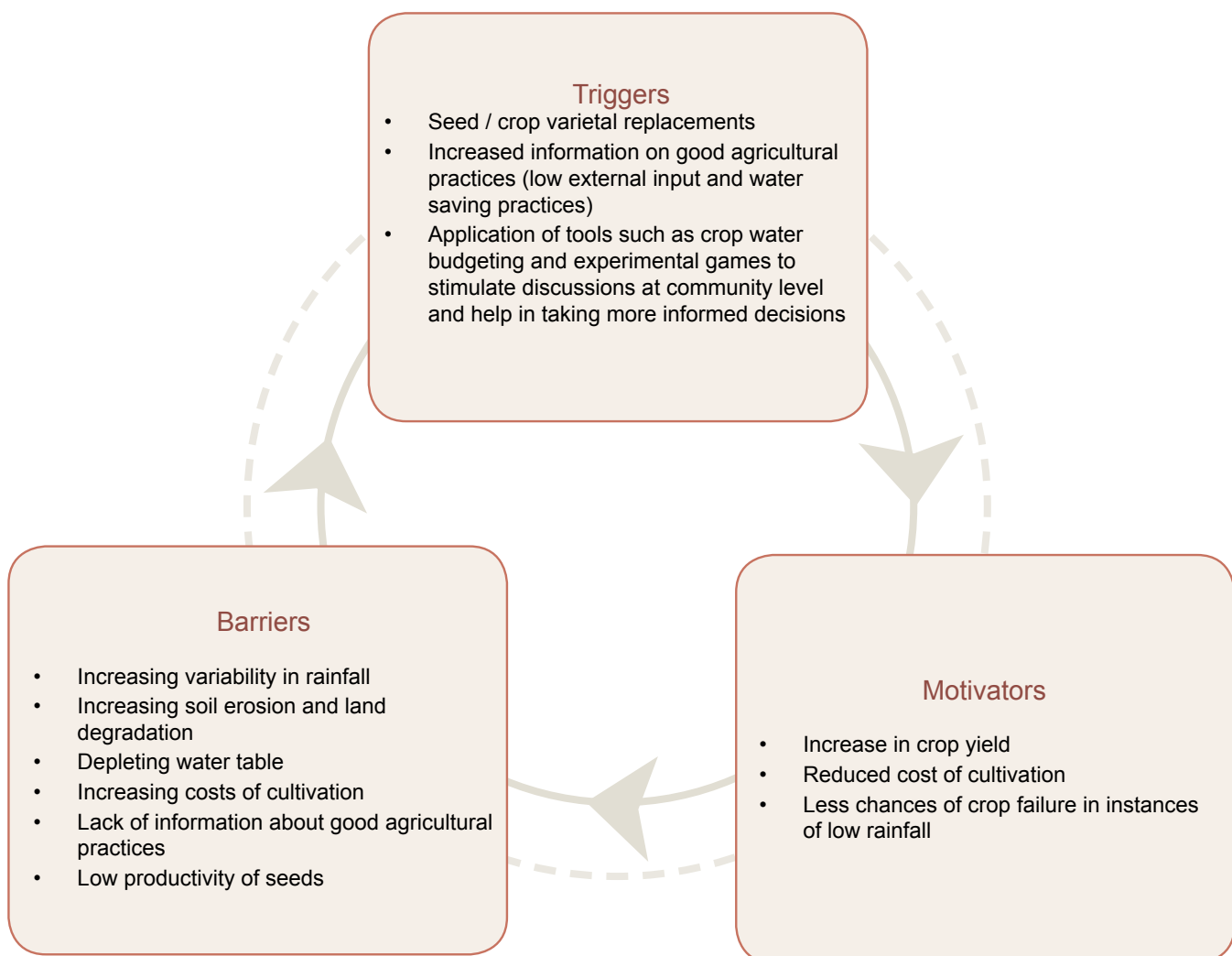
Table 16: Community perceptions regarding the extent of change						
	1-No Change	2-Low Change	3-Moderate Change	4-High Change	5-very High	Grand Total
Participation in Planning	31	2	3	1		37
Participation of Women in Planning	7	6	19	4	1	37
Participation of SC/ST/Marginalized in Planning	12	5	15	4	1	37
Formulation/Enforcement of Rules	8	6	17	5	1	37
Number of Wells/Bores Shared	17	9	10	1		37
Issues of Conservation Discussed	2	5	24	6		37
Conflicts Resolved by Village Institution	19	5	10	3		37
Access of Poor and Marginalized to Benefits from Land and Water Resources	9	4	17	6	1	37
Access to Government Programs and Schemes	4	10	18	5		37

The communities shared that the Initiative has helped in fostering more discussions at the community level on issues related to conservation. With communities discussing on land and water related issues, communities have also been moving towards establishing rules and regulations for improving governance of these resources. In 29 out of the 37 habitations surveyed, there has been some increase in the rules related to the governance of commons; with 71% of the habitations feeling that the increasing in the formulation of rules has been moderate to very high. In 19 habitations (51%) there has been an increase in instances of tube wells or wells being shared; with a moderate to high increase in 28% of the habitations.

3.4. Strengthening Livelihoods

The study villages are characterized by rainfed production systems wherein the local communities primarily depend on rainfall for practicing agriculture and livestock rearing - their main sources of livelihoods. Increasing variabilities in rainfall, low vegetative cover, high water run-off and soil erosion and frequent occurrences of drought have intensified the problems of land degradation and water depletion in these regions. Preliminary surveys undertaken across more than 400 households in Andhra Pradesh and 1200 households in Rajasthan indicated that 98% of the households in Andhra Pradesh perceived that the number of rainy days has reduced in the last ten years. More than 95% of the households reported increase in the number of droughts that they face and 82% households shared that crop failure has increased. Similarly, more than 43% of the households in Rajasthan perceive that there has been increasing instances of drought in the last ten years. Further, more than 50% of the households reported an increase in the crop failure in this time period. Some of the immediate repercussions of the challenges that the farmers are facing in this scenario can be seen in terms of increasing costs of cultivation due to higher expenses on external inputs such as fertilizers and pesticides or hybrid varieties of seeds with the hope of getting higher yields; and increasing dependence on groundwater for providing critical and assured irrigation to their crops.

In this context, the Water Commons initiative focuses on nurturing a 'systems perspective', aiming to establish and reinforce the inter-linkages between different resource systems (forest-farm-water) and production systems (commons-agriculture-livestock). As mentioned in the earlier sections, major focus of the Initiative has been towards restoring the land and water resources through soil and moisture conservation measures, regeneration of catchments and other common lands, reviving or constructing surface water harvesting structures, tapping the base flows through initiatives such as *boriband* etc. Further, specific interventions have been made to improve agricultural productivity by introducing practices that involve low costs and produce higher yields.



As indicated in the mind map prepared with the communities during the SROI exercises, the bio-physical initiatives have led to an increase in the cropping area and cropping intensity, resulting in more income (in terms of actual sales of these crops or in terms of savings on the expenses that they otherwise had to incur on purchase of food in the absence of the additional produce from their farmlands). These efforts have also improved the fodder and fuelwood availability from common lands that has contributed to saving the expenses of the households on these goods. Besides

savings on fodder expenses, improved fodder and water availability is also helping in improving the livestock productivity and milk yield and the people are now more confident of increasing the number of livestock that they keep. Improving information on good agricultural techniques such as line sowing, seed treatment, application of organic pesticides, irrigation scheduling etc. and provision of water frugal seed and crop varieties have helped in saving the costs incurred on fertilizers, pesticides and irrigation while also increased the yields. The farmers in Dheemri village of Udaipur district, Rajasthan shared that adoption of line sowing method not only reduced their expenses on seed by 50% but also provided them space for another crop (such as urad, vegetables or fodder crops) besides maize. Further, the weeding days decreased and the crop damage due to wind also reduced that increased the yield by 1.5 quintals per bigha.

Table 17: Valuation of key indicators		
Indicators	Number of house-holds	Increase in income per household
Increase in income per household subsequent to additional production due to improved agricultural practices, including SRI, seed treatment, varietal selection, line sowing etc.	12,843	2,205
Increase in income per household due to additional production subsequent to area treatment and water harvesting initiatives	5,749	15,364
Increase in income per household subsequent to construction of boribands	415	5,406
Increase in income per household due to vegetable cultivation	1,100	10,928
Potential savings per household in diesel motor / electricity costs due to irrigation scheduling/seed varietal replacement	4,439	615

As Table 17 given here indicates, nearly thirteen thousand farmers adopted improved agricultural practices that helped in increasing the average income per farmer by Rs.2,205. Similarly, the various area treatment and soil and water conservation initiatives helped in increasing the average income of the farmers by Rs.15,364/-. Promotion of kitchen garden and vegetable cultivation in selected locations has been an important initiative that has contributed in terms of either savings on the expenses that a household would have to incur if it had to purchase vegetables or in terms of direct income gains through sale of these vegetables.

An important initiative that has been undertaken in Madhya Pradesh and Karnataka is the promotion of fisheries; anecdotal evidence suggests that alongside providing some additional income, this initiative has also enhanced the rural households' access to cheap protein. A case in point is Kherotola village in Bichiya, Mandla. The village institution decided, in consultation with the community members, to release about 10 kgs of fish seeds into the two ponds that the village is blessed with. With an investment of Rs.6500, the village was able to produce 55 kilo grams of fish; this was then distributed to all the families at the rate of Rs.100 per kg, which is way less than the market price. As has been mentioned above, this ensured that the community had access to a cheap source of protein, alongside a potential source of revenue which the village institution can plough back for the development of the community as a whole.

Another noteworthy intervention, also emerging from Madhya Pradesh, was promoting the use of mustard seed cake in livestock rearing. Typically farmers would sell mustard seeds to the local traders who would then extract oil from it. However, in Kherotola and other villages of Bichiya, Mandla, the residual oil cake was usually retained by the traders. With some inputs from FES, and with the intervention from the village institutions, the local communities started taking the oil cake back from the traders and using it to feed their livestock. Anecdotal narratives suggest that this has resulted in some improvement in the milk production of the cows thus fed. The implication is that the households have an additional source of income and nutrition.

Another important intervention was the distribution of improved fodder varieties to farmers in Karnataka; farmers were provided with fodder seeds which they planted in their fields. This was done with an intention to provide the farmers with a cheap source of fodder that is readily available; thereby addressing acute fodder shortage which has come to mark the agri-scape of Chikballapur. Interacting with farmers has revealed that this initiative has resulted in a surplus of fodder for the farmers who received the seeds; which in turn they were able to sell to others and earn some additional income. In Andhra Pradesh, FES grounded several livelihood interventions, that were specially focused on agriculture. These included distribution of gypsum for improving soil moisture regime, distribution of trichoderma for improving germination rate of the seeds, distribution of neem oil and pheromone traps in order to control pests and the promotion of kitchen gardening, with an aim of improving household income and access to nutritious food. The table given below lists the major interventions and their benefits.

Naku savastharam kinda kashu meta vittanalu ivvaadam jerigindi. Intavaraku nenu gaddi karota karanaga baitanundi konokachanu. Dini dwara naku gaddi kone avasaram lekonda poindi. Na pashulaku meta na polam lo ne pandistunanu. Naku pala digu badi mundukante ipudu бага perigindi.

Last year I got fodder seeds from FES. I am growing them in my field for my cattle. Before that I used to buy fodder for my cows. But now I feed them with fresh grass due to which milk production raised. Now I am getting more profit as my fodder expense is saved and milk production also rose.

- Umesh, Thollapalle, Chikballapur

Table 18: Agricultural practices promoted and their outcomes

Interventions	Expected Output	Expected Outcome
1. Gypsum	<ul style="list-style-type: none"> • Soil loosens. • Moisture holding capacity of soil increased. • Outturn increased (groundnut). • Oil quantity increased (groundnut). • Weight of groundnut produce increased. 	<ul style="list-style-type: none"> • Eases the work of farmer • Time on one activity is saved • The same time is invested on another activity • The better quality gave better price in the market. • It increased the income levels to a certain extent. • The fertilizer costs had come down. • People buy it from the market even if the subsidized product falls short from FES.
2. Trichoderma	<ul style="list-style-type: none"> • Germination rate increased. • Number of living plants increased. • Quality of leaf is improved. 	<ul style="list-style-type: none"> • Better seed and cost management. • More yield. • More income. • Due to the smell, the crop loss due to wild boars decreased.
3. ZnSO ₄	<ul style="list-style-type: none"> • Prevents yellow colour to groundnut. • Quality of leaf improved. • Productivity increased. • Prevents yellow colour to the groundnut • Better root growth • Helps in cultivation in saline soils. 	<ul style="list-style-type: none"> • Quality cattle feed. • Milk productivity increased. • Agricultural yield increased. • Income increased. • Cultivation in alkaline soils.
4. Neem Oil	<ul style="list-style-type: none"> • Incidence of pests decreased. • Number of times to be sprayed increased unlike chemical pesticides. 	<ul style="list-style-type: none"> • Yield increased. • It increased work load for the farmer • Time invested on an activity increased.
5. P h e r o m o n e Traps	<ul style="list-style-type: none"> • Stopped pest breeding. • The number of pests decreased. • Incidence of pests decreased. 	<ul style="list-style-type: none"> • More yield. • More income.
6. Yellow Sticky Cards	<ul style="list-style-type: none"> • Decrease in the incidence of white mosquitoes ("thella domalu"). • Helps in pest targeting. 	<ul style="list-style-type: none"> • Reduces time and cost invested on pesticides. • Reduces quantity of pesticides. • Helps in better NPM. • Increased income.
7. Kitchen Garden	<ul style="list-style-type: none"> • Intake of a variety of vegetables increased. • Household availability of vegetables increased. 	<ul style="list-style-type: none"> • Nutrition levels might have improved as the incidence of paying a visit to doctor slightly decreased. • Decreased costs on weekly vegetable purchase. • Income increased by selling surplus in the market.

Table 18: Agricultural practices promoted and their outcomes		
Interventions	Expected Output	Expected Outcome
8. Germination Test	<ul style="list-style-type: none"> Ascertains the percent of seeds that germinate 	<ul style="list-style-type: none"> Better seed management Better expenditure management
9. Line sowing	<ul style="list-style-type: none"> Space for another crop (such as vegetables, fodder etc.) to grow Reduces crop damage due to wind Saves farmer's time during weeding 	<ul style="list-style-type: none"> Increased income due to higher production Savings on time of the farmer

The breeder seed is an experimental intervention in which quality groundnut seed is provided to one or two farmers. The farmer in this village had sowed the seed in his 1 acre farmland. The output had increased by 60% and commanded around Rs.3400 per bag of 44 kg groundnut. If we take on an average, the yield is around 25 bags per acre, the total income would be around Rs.85000/- whereas on a normal farm without breeder seed, the farmers commanded a price of Rs.2400 with a yield of 15 bags. This takes the revenue to Rs.36000. The difference of Rs.49000 accrued mainly due to the outturn achieved and the quality of output.The agricultural intervention over here are sustained i.e., farmers buy the inputs even if they are not supplied by the institutions.

Due to rainfall, agricultural and physical interventions, the economically marginalized people benefitted the most. The promotion of organic farming and sustainable agriculture has triggered a change in the perception of the people.

Promotion of better irrigation methods and techniques through interventions such as, exposure visits, training programmes and crop water budgeting exercises were undertaken with the communities, across the project locations. Farmers shared that they found such exercises very relevant to their livelihoods and adopted the suggested agricultural and irrigation techniques aiming at improving agriculture productivity Simultaneously, seed treatment and seed varietal replacements also helped in improving

“Krimulu, keetakaalu, cheemalu... ila anni baavuntene e vyaadhulu thagguthaayi. Ippudu ae okka jeevi ki chedu ayinaa, mana karanamga, samathulyam debbhathini vyaadhulu peruguthaayi. Rasaayinaka yeruvulu mariyu mandhula valle vyaadhulu periginayi. Challinappudu parledhu kaani tarvatha bhoomi inka pantalu endipothunnayi. Gujarat samstha vaallu vacchinaka ilaanti vishayalu baaga telisinayi. Mundhu tharaalaki manchi bhoomi andinchagalugutham. Nenu maarina, na polaanni marchina. Mellaga oorlo maarpu choostham”.

Ranging from microbes to small insects etc... every number has to be in balance. Then only the existing crop and livestock diseases can be checked. If any harm is done to even one species, the entire balance will be lost leading to an increase in diseases. All this happened only due to the extensive usage of chemical fertilizers and pesticides. It gives short term results but in the long term, it is leading to crop loss due to land degradation. The Gujarat Organization’s efforts has made us realise the same. We will be able to give product land parcels to the next generations. I’ve changed and transformed my farm. There’ll be change in the entire village, slowly

- By Nagamuni, Papannagaripalle

germination, crop yields, agricultural productivity, water savings and reducing the cost of cultivation.

Shankarlal, a small farmer in Undakhora village of Pratapgarh district, Rajasthan witnessed an increase in the production of lady finger from 16kg to 50kg due to improved agricultural practices. Thus, while earlier he earned around Rs.350/- by selling Okra, this year he was able to earn Rs.1200/-. Further, with the adoption of the line sowing method (instead of broadcasting method of sowing seed) the number of seeds required reduced by almost 40% that saved expenses on purchase of seed. “*Is saal mujhe*

chaar guna zada faida hua”, (This year I earned four times more), exclaimed Shankarlal.

Rasaynik khatamule jaminicha darja dhasalat aahe. jeevamrut mule jaminicha pot Sudharat aahe. Beejamrut mule ropanchi vaadh chagli zali. Yamule mala kami kharchat jast Utpadan gheta aale. Yanda ashach paddhatine sheti karnar aahe.”

Translation: (“Land is degrading by chemical fertilizer. But jeevamrut improves land fertility. Beejamrut benefited to improve germination of plants. Through such practices I got more production in Less input cost. I am continuing this practice in my farmland.”)

- Kisan Somaji Gedam, Hiwardhara, Ghatanji, Yavatmal

Community perceptions regarding changes in livelihoods due to the interventions

Community perceptions are taking cognizance of the initiatives being taken as part of the Water Commons project; a significant proportion (92%) feel that there has been some increase in the annual household income, with about 60% of the habitations saying

that the improvement in household income has been moderate to very high. Similarly, about 72% of the habitations felt that the cost of cultivation has decreased; with nearly 60% (22 habitations) feeling that the decline has been moderate to very high.

Table 19: Community perceptions regarding changes in livelihoods due to the interventions			
Indicators	Decrease	Increased	No Change
Annual Income of Households		34	3
Cost of Cultivation	27	6	4
Expenses on Fodder	25	3	9
Expenses on Fuelwood	22	3	12
Fodder Availability	1	29	7
Medical and Veterinary Expenses	14	5	18
Fuelwood Availability	2	26	9
Availability of Water for Livestock and Domestic Use		34	3
Manure Availability	2	29	6
Milk Yield	3	29	5
Livestock Productivity	3	25	9
Livestock Holding per HH	6	26	5
No of Earners in Family	2	26	9

Table 19: Community perceptions regarding changes in livelihoods due to the interventions

Indicators	Decrease	Increased	No Change
Migration	22	6	9
Women's Workload	15	14	8
Capacity to Cope with Threats	1	27	9
Alternative Livelihood Options		19	18
Income from Agriculture and Agriculture Labor	4	30	3
Crop Yield	5	27	5
Crop Diversity	1	25	11
External Input Costs	14	16	7
Water Saved Due to Better Agri Practices	3	28	6
Cropping Area	3	29	5
Water for Irrigation	5	28	4
Days of Moisture Retention	1	29	7
Agriculture Yield Rates	4	30	3
Fertilizer and Pesticide Use per Acre	20	10	7

Table 20: Community perceptions regarding extent of change

Indicators	1-No Change	2-Low Change	3-Moderate Change	4-High Change	5-Very High Change	Grand Total
Annual Income of Households	3	10	19	4	1	37
Cost of Cultivation	4	11	16	3	3	37
Expenses on Fodder	9	6	14	8		37
Expenses on Fuelwood	12	2	15	7	1	37
Medical and Veterinary Expenses	18	5	9	5		37
Fodder Availability	8	2	21	5	1	37
Fuelwood Availability	10	5	13	9		37
Availability of Water for Livestock and Domestic Use	4	1	23	9		37
Manure Availability	7	5	18	7		37
Milk Yield	8	6	17	6		37
Livestock Productivity	10	7	17	3		37
Livestock Holding per HH	8	7	14	8		37
No of Earners in Family	8	10	13	4	2	37
Migration	8	7	10	11	1	37
Women's Workload	9	8	17	3		37
Capacity to Cope with Threats	10	3	17	7		37
Alternative Livelihood Options	18	6	8	5		37
Income from Agriculture and Agriculture Labor	4	3	25	5		37
Crop Yield	5	2	19	9	2	37
Crop Diversity	11	6	14	6		37

Table 20: Community perceptions regarding extent of change						
Indicators	1-No Change	2-Low Change	3-Moderate Change	4-High Change	5-Very High Change	Grand Total
External Input Costs	7	11	13	4	2	37
Water Saved Due to Better Agri Practices	6	5	18	7	1	37
Cropping Area	5	8	20	4		37
Water for Irrigation	4	5	20	5	3	37
Days of Moisture Retention	7	8	13	9		37
Agriculture Yield Rates	3	8	19	6	1	37
Fertilizer and Pesticide Use per Acre	9	13	9	6		37

Nearly 60% of the habitations felt that there had been a decline in migration, with 58% of the households feeling that the decline had been moderate to very high. Nearly 73% (27) of the habitations felt that there had been an increase in their capacity to cope with livelihood threats; with 64% of the habitations feeling that the change had been moderate to very high. Coming specifically to interventions related to agriculture, 81% of the habitations (30) felt that there had been an increase in income from agriculture and agricultural labor; with 80% of them opining that the increase has been moderate to high. About 73% of the habitations felt that the crop yield had gone up; with 65% feeling that the increase had been moderate to very high. This apart, there have been significant positive trends with regards to days of moisture retention, cropping area and in the use of fertilizers and pesticides.

Perhaps the most important outcome of the livelihood interventions supported by FES, one that cannot intangible, is that the communities' interest in traditional agricultural practices and in age-old practices like the maintenance of tanks, using inputs like neem etc has been rekindled. Furthermore, communities in many areas are seeing the linkages between their livelihoods and the well-being of shared resources like common lands, tanks and groundwater. While this may not show immediate results in terms of reducing income costs or rising household incomes dramatically, or in terms of bringing about a behavioral change in the way communities approach scarce resources like groundwater; it is, in the, in the medium to long term, bound to bring about fundamental changes in the way communities practice livelihood activities like agriculture and livestock rearing. Alongside livelihood related interventions, the use of tools like crop water budgeting, experimental games and community based system modeling, is enabling communities to at least identify the bottlenecks that are hindering the better governance of shared resources; and is pushing them to explore ways that can help remove these bottlenecks. This is perhaps the most important outcome that will emerge as the project unfurls in the years ahead.



SROI Calculation

The total value of outcomes that have resulted from the interventions under water commons project stands over INR 6020 lacs; in 2015-16 alone, more than INR 4139 lacs worth of value was generated through these projects. Water savings has been the single value generator over the years, accounting for about 42% of the total value generated. The contribution of additional wages from MGNREGA stands at 15% of the total value generated; interestingly the contribution of biomass generated is much more than the MGNREGA wages; and that from improved agricultural practices almost matches the contribution of MGNREGA.

Table 21: Monetizing Benefits				
Variables	2013-14	2014-15	2015-16	Grand Total
Biomass Produced		39351100	228122672	267473772
Governance		27229000	4383660	31612660
Improved Agricultural Production		14764500	118892236	133656736
MGNREGA Wage	24250385.24	65161049.33	1106775.39	90518209.96
Opportunity Cost Avoided	1358640			1358640
Pumping Hours Saved		7053434.379	2731273	9784707.38

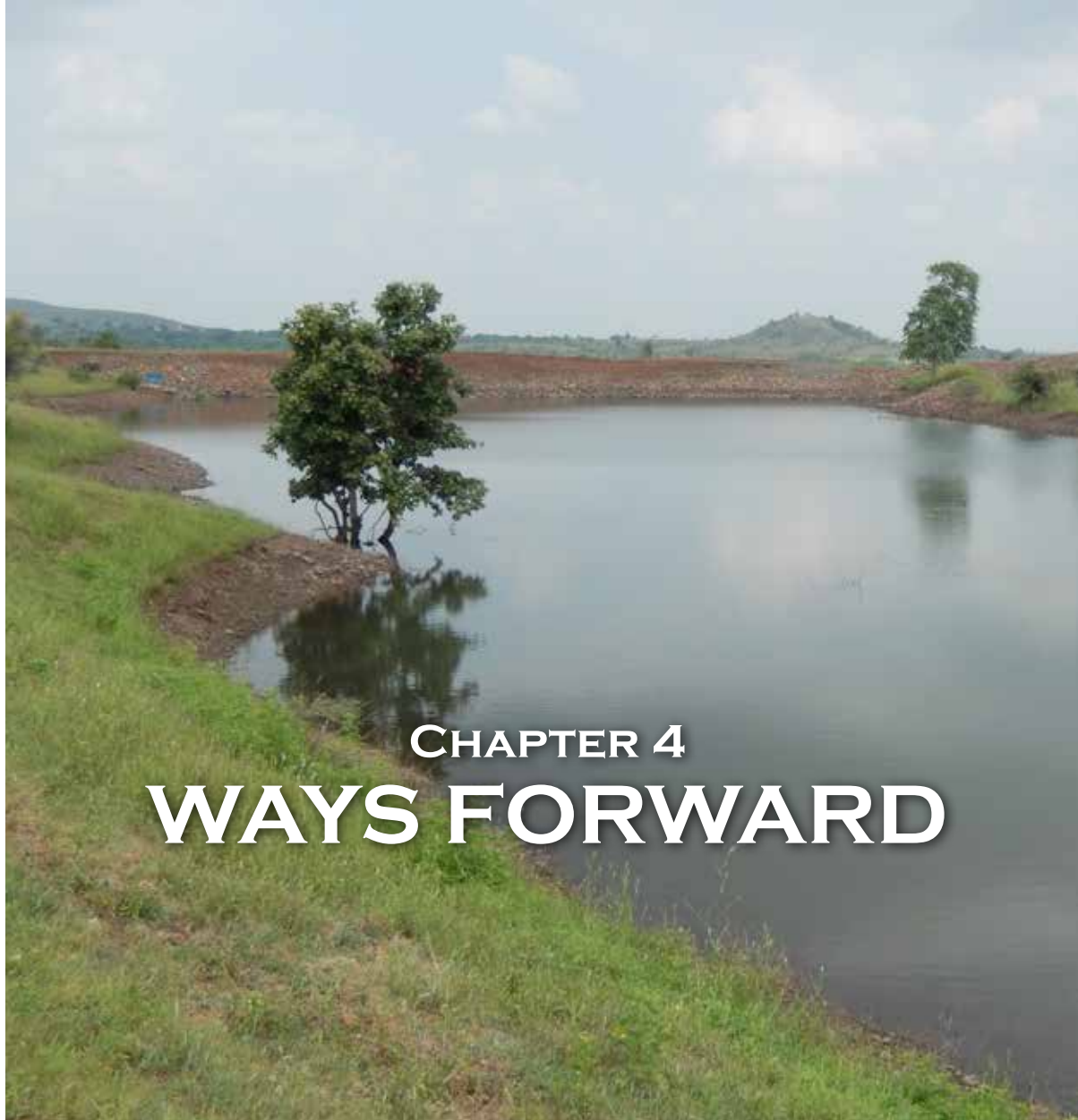
Table 21: Monetizing Benefits				
Vegetable Cultivation			12021060	12021060
Water Savings and water harvested		9451470	191887126	201338596
Grand Total	25609025.24	163010553.7	559144802	74,77,64,381
SROI Estimation				
SROI =			Net Social Value / Investment	
Net Social Value =			[Total Benefits Monetized – (Deadweight + Drop off + Displacement)]	
Net Social Value =			747764381	
Total investment across all the three years (2013-2016)			522336664	
SROI (ATP i.e. 1st year) =			1.43	

The total returns on investment for all the three years, put together stood at INR 7,477 lakhs; the returns on investment for the year 2015-16 stood at INR 5,591 lakhs. The SROI for all the three years stood at 1.43, while that of 2015-16 alone stood at 3.25.

The perception index is given below:

Perception Index

Table 23: Perception Assessment										
Perceptions	Ananthapur	Bhilwara	Chikballapur	Chittoor	Mandal	Mandla	Pratapgarh	Udaipur	Yavatmal	Overall
Eco-Restoration	3.11	2.25	2.69	2.75	2.58	3.89	2.03	1.86	2.19	2.59
Governance	2.41	2.74	2.22	1.92	2.92	3.08	2.73	2.35	2.19	2.51
MGNREGA	3.29	2.50	2.02	2.57	2.79	3.16	2.67	2.29	2.29	2.62
Livelihoods and Well-Being	3.30	2.61	2.41	2.78	2.69	3.67	2.51	2.26	2.10	2.70
Agriculture Related	3.19	2.62	2.03	2.71	2.56	4.09	2.32	2.48	2.19	2.67



CHAPTER 4

WAYS FORWARD

Water is increasingly becoming a priced resource; with traditional water storage systems like cascading tanks going defunct, there is an increasing dependence on groundwater; especially in arid and semi-arid regions. As has been mentioned in the introductory chapter, with groundwater being increasingly over-exploited, agriculture—the livelihood most connected with it—is becoming increasingly difficult to pursue; thus contributing to rural distress and migration. In this context, governance of water in general and groundwater in particular becomes crucial. While the Water Commons initiative is working to strengthen livelihoods in rural areas, the larger goal is to reinvigorate traditional institutional mechanisms around water and help them gear up to the challenge of functioning in a water-stressed environment, and to that of governing complex and scarce resources like groundwater. We endeavor to pursue this goal by:

- 1. New Ways of Engaging with Communities**--One critical element is to explore and ground new and innovative ways of engaging with communities; tools like experimental games, community based system dynamics, crop water budgeting, etc are some such tools; they help in 'sharing' rather than 'giving' knowledge and make communities equal partners in the pursuit for water security. They also help us in challenging popular community narratives and thus nudge them towards identifying and addressing the water crisis in their midst. For instance,

the most commonly held notion among communities is that the groundwater depletion is only due to low rainfall. Experimental games help us in showing the community that while rainfall may have become erratic, the fact is that agricultural practices have also changed drastically over the years, and this too could have a bearing on the fast depleting groundwater.

- 2. Adopting Social-Ecological Systems Approach**--It is important to adopt a social-ecological-systems approach. We think it is important for us to refrain from taking a linear, reductive approach towards understanding human actions; the changes in water resources and the interactions and feedbacks between the two. In doing so, we are working with the communities to articulate the linkages between water resource conditions, livelihood outcomes and their inter-relationships. Once again, tools like community based system dynamics and experimental games are extremely useful.
- 3. Economic Valuation of Ecosystem Services**--While livelihood and agriculture related outcomes are the more obvious manifestations of the Water Commons initiative, the strengthening of ecosystem services and thereby ecological health as a whole are critical and need to be understood. For instance, improvements in prevalence of microbial species, as a result of the various soil-water conservation works would be important in improving soil health and thereby agricultural productivity. Thus, it is important to understand the extent to which the regeneration of microbial populations has taken place owing to the Water Commons initiative and value the contributions that these species have made to agriculture. We feel that as we move forward, it is important for us, and the communities, to understand the value of the services rendered by the various ecosystem functions and how the same can be strengthened through physical interventions, community actions and policy level work.
- 4. Valuing Community-Led Governance**--Community-led governance of natural resource seems to be the most effective way to restore and govern scarce natural resources. The more resources are privatized or centralized, the more divested communities are, from any stake in their governance. The challenge for us to work with communities to define what governance of natural resources would imply in today's time and age and to see how long-term eco-restoration concerns can be balanced with the more urgent, and equally legitimate, livelihood related imperatives. A corollary to this is to value, in economic terms, community contributions to the governance of natural resources. This is a way to surface the many hidden expenses, in the shape of time, expertise, etc that the communities bring to the table, in order to govern shared natural resources.
- 5. Importance of ICT**—one of the key paths forward seems to be to leverage information, communication and technology. Whether it is GIS and other mapping tools or the administration of complex studies or the in incorporating scientific concepts into the governance or restoration of natural resources, we feel that it is important to place these tools in the hands of the communities. We think that by doing so we make communities equal partners in this process; and

rather than making them dependent on us for 'solutions' we enable them to seek their own solutions that are more in tune with their ecological, social and economic contexts. We think that this is the way to the future.

- 6. Understanding Polycentricity**—It is important to appreciate that governance of water does not happen at just one level; different players from the farmer in the field to the Panchayat to the Mandal Revenue Officer to the state and central governments are playing a wide array of roles in influencing the condition of water resources. These roles could be that of information-providers or that of a funder or that of a water extractor or that of a policy maker. It is important to map and understand these roles better, and to explore avenues to bring these diverse players. In fact, what holds true for water also holds true for other shared natural resources.

Annexures

SROI Calculation Sheet—Detailed

Year	S.No.	Change/Impact Indicators	Amount (rs)
2014-15	1	Total MGNREGA Wage Rates Generated in Anantapur	7557085.65
2014-15	2	Additional income earned due to better wages under MGNREGA in supported interventions (E5-H5) in Anantapur	15,800
2014-15	3	Total MGNREGA Wage Rates Generated in Bagepalle	9,810,973
2014-15	4	Additional income earned due to better wages under MGNREGA in supported interventions (E5-H5) in Bagepalle	-588,013
2014-15	5	Total MGNREGA Wage Rates Generated in Bhilwara	12,775,694
2014-15	6	Additional income earned due to better wages under MGNREGA in supported interventions (E5-H5) in Bhilwara	3,645,659
2014-15	7	Total MGNREGA Wage Rates Generated in Chittoor	3,113,841
2014-15	8	Additional income earned due to better wages under MGNREGA in supported interventions (E5-H5) in Chittoor	406,213
2014-15	9	Total MGNREGA Wage Rates Generated in Mandla	5,164,646
2014-15	10	Additional income earned due to better wages under MGNREGA in supported interventions (E5-H5) in Mandla	-1,021,892
2014-15	11	Total MGNREGA Wage Rates Generated in Pratapgarh	10,869,598
2014-15	12	Additional income earned due to better wages under MGNREGA in supported interventions (E5-H5) in Pratapgarh	-254,956
2014-15	13	Total MGNREGA Wage Rates Generated in Udaipur	7,613,982
2014-15	14	Additional income earned due to better wages under MGNREGA in supported interventions (E5-H5) in Udaipur	837,230
2014-15	15	Total MGNREGA Wage Rates Generated in Yavatmal	778,771
2014-15	16	Additional income earned due to better wages under MGNREGA in supported interventions (E5-H5) in Yavatmal	4,436,417
2014-15	17	Increased agricultural production due to improved agricultural practices, including SRI, seed treatment, varietal selection, line sowing and so on	10,324,600
2014-15	18	Potential savings in diesel motor / electricity costs due to irrigation scheduling/seed varietal replacement	7,053,434
2014-15	19	Potential Savings in Water due to improved agricultural practices	919,090
2014-15	20	Additional biomass produced due to work on common and agricultural lands	39,351,100
2014-15	21	Additional agricultural production achieved by bringing additional area under cultivation; either bringing fallows under single crop or single crop under double crop.	4,439,900
2014-15	22	Water storage potential created through area treatment, including tank deepening, dug out ponds, drainage line treatment and so on	4,010,000
2014-15	23	Water conserved due to various area treatment activities	4,522,380
2014-15	24	Cost of management of tanks saved due to strengthened institutions	2,044,000

Year	S.No.	Change/Impact Indicators	Amount (rs)
2014-15	25	Cost of management of forests saved due to the strengthening of village level institutions	25,185,000
2013-14	26	Total Man-days income generated out of project-related works In Udaipur	811439
2013-14	27	Additional Income earned through increase in wages In Udaipur (E5-H5)	367470
2013-14	28	Total Man-days income generated out of project-related works In Bhilwara	5064528
2013-14	29	Additional Income earned through increase in wages In Bhilwara (E7-H7)	726692
2013-14	30	Total Man-days income generated out of project-related works In Pratapgarh	6770642
2013-14	31	Additional Income earned through increase in wages In Pratapgarh (E9-H9)	672573
2013-14	32	Total Man-days income generated out of project-related works In NP Kunta	4213535
2013-14	33	Additional Income earned through increase in wages In NP Kunta (E9-H9)	132160
2013-14	34	Total Man-days income generated out of project-related works In Thamballapally	611217
2013-14	35	Additional Income earned through increase in wages In Thamballapally (E9-H9)	2650
2013-14	36	Total Man-days income generated out of project-related works In Bagepalle	3951540
2013-14	37	Additional Income earned through increase in wages In Bagepalle (E9-H9)	-246852
2013-14	38	Total Man-days income generated out of project-related works In Mandla	1061328
2013-14	39	Additional Income earned through increase in wages In Mandla (E9-H9)	111463
2013-14	40	Overall opportunity cost avoided by reduction in travel time to fetch water, once the availability of water from near by harvesting structures increases.	548640
2013-14	41	Opportunity cost avoided from watering cattle from sources closer on hand	810000
2015-16	42	Additional wages generated in Udaipur	157831.80
2015-16	43	Additional wages generated in Bhilwara	1131894.44
2015-16	44	Additional wages generated in Pratapgarh	-715725.99
2015-16	45	Additional wages generated in Mandla	-342488.12
2015-16	46	Additional wages generated in Yavatmal	-26164.44
2015-16	47	Additional wages generated in Chikkaballapur	-39912.04
2015-16	48	Additional wages generated in Chittoor	1049874.97
2015-16	49	Additional wages generated in Anantapur	-108535.63
2015-16	50	Value of community governance of water resources	2067660
2015-16	51	Value of community governance of common lands	2316000

Year	S.No.	Change/Impact Indicators	Amount (rs)
2015-16	52	Total value of additional fodder, fuelwood and carbon stock produced	228122672
2015-16	53	Value of increased agricultural production due to improved agricultural practices, including SRI, seed treatment, varietal selection, line sowing and so on	28319643
2015-16	54	Value of increased agricultural production achieved by bringing additional area under cultivation; either bringing fallows under single crop or single crop under double crop through area treatment and soil and water conservation efforts	90572593
2015-16	55	Value of increased vegetable production	12021060
2015-16	56	Potential savings in diesel motor / electricity costs due to irrigation scheduling/seed varietal replacement	2731273
2015-16	57	Value of water saved due to improved agricultural practices	13017751
2015-16	58	Value of water harvested due to various area treatment and soil and moisture conservation initiatives	173320000
2015-16	59	Value of additional water available for domestic use	5549375
		Total Benefits Monetized	747764381

Index Detailed Table

Perceptions	Anan-thapur	Bhil-wara	Chik-bal-lapur	Chit-toor	Man-dal		Prata-pgarh		Ya-vat-mal	Aver-age
Eco-Restoration										
Water Run-Off Extent of Change	3.33	3.00	2.00	3.00	3.00	3.67	1.60	2.33	2.50	2.71
Water Column in Wells-Extent	3.67	3.00	3.00	2.50	3.00	4.00	2.80	2.40	3.00	3.04
Duration of Stream Flows- Extent	2.67	1.50	1.00	2.00	3.00	3.50	2.00	2.25	2.50	2.27
Availability of Surface Water- Extent	3.00	2.00	3.00	2.00	3.00	3.25	1.60	1.80	3.00	2.52
Quality of Drinking Water- Extent	1.67	1.00	2.75	2.50	1.50	3.75	1.80	1.00	2.00	2.00
Soil Erosion- Extent	3.33	3.00	3.25	3.50	3.50	4.25	2.40	2.60	2.00	3.09
Soil Moisture Regime-Extent	3.33	3.00	3.00	3.00	3.00	4.50	2.67	2.00	2.50	3.00
Soil fertility- Extent	3.00	3.00	2.75	3.00	3.00	4.25	2.60	2.00	2.25	2.87
Presence of Pollinators-Extent	3.67	2.00	2.50	3.00	2.00	3.50	1.60	1.50	1.25	2.34
Pest Attacks- Extent	2.67	1.50	2.75	2.50	2.00	3.75	1.40	1.40	1.50	2.16

Perceptions	Anan- thapur	Bhil- wara	Chik- bal- lapur	Chit- toor	Man- dal		Prata- pgarh		Ya- vat- mal	Aver- age
Forest Fires- Extent	3.33	1.00	3.25	3.00	1.00	4.50	1.40	1.00	1.75	2.25
Diversity of Microbial species in Soil-Extent	3.67	3.00	3.00	3.00	3.00	3.75	2.50	2.00	2.00	2.88
Governance										
Participation in Planning--Extent of Change;	2.67	3.00	3.25	3.00	3.50	4.00	3.00	3.00	2.80	3.14
Participation pf Women in Planning--Extent of Change;	1.33	3.00	3.00	1.50	3.00	4.25	3.00	2.40	2.75	2.69
Participation pf SC/ST/ Marginalized in Planning--Extent of Change;	1.33	3.00	2.75	2.00	3.00	4.25	2.60	3.00	2.80	2.75
Participation pf youth in Planning--Extent of Change;	3.00	2.00	3.25	2.00	2.00	4.50	3.00	1.80	2.60	2.68
Orders Obtained for Protection-- Extent;	3.00	2.50	2.25	1.00	3.00	3.75	2.40	2.25	2.20	2.48
Collective Tenurial Rights Over Water- -Extent of Change;	2.67	3.00	1.25	3.50	3.00	2.25	2.80	1.75	2.00	2.47
Formulation/ Enforcement of Rules--Extent of Change;	2.33	3.00	2.75	3.00	3.00	4.25	2.75	3.00	2.20	2.92
Collective tenurial rights over land resources--extent of change;	2.67	3.00	1.75	3.50	3.00	2.67	2.40	2.00	1.60	2.51
Issues of Conservation Discussed-- Extent;	3.67	2.50	3.25	3.00	3.00	3.25	3.25	2.60	2.80	3.04
Number of Wells/Bores shared--Extent;	1.00	3.00	1.75	1.00	3.00	1.00	2.00	1.80	2.20	1.86
Income from Conflict Resolution-- Extent;	1.00	2.50	1.00	1.00	2.50	1.67	2.40	2.00	1.60	1.74

Perceptions	Anan- thapur	Bhil- wara	Chik- bal- lapur	Chit- toor	Man- dal		Prata- pgarh		Ya- vat- mal	Aver- age
Conflicts Resolved by Village Institution--Extent;	2.33	3.00	1.00	1.00	3.50	2.50	2.80	2.25	1.60	2.22
Amount of Funds Being Channelized Through Various Programs--Extent;	3.50	1.50	2.75	2.50	3.00	3.75	2.75	3.00	1.40	2.68
Access to Water (Irrigation)--Extent;	3.33	3.00	1.50	1.00	3.00	4.00	3.00	3.00	2.20	2.67
Access of Poor and Marginalized to Benefits from Land and Water Resources--Extent;	3.33	3.00	3.00	1.00	3.00	4.00	2.60	3.00	2.00	2.77
Access to Government Programs and Schemes--Extent;	3.33	3.00	3.25	2.50	3.00	2.25	2.60	2.60	2.60	2.79
Sustaining Work on Land and Water Restoration--Extent;	3.33	3.00	2.50	2.00	3.00	3.50	3.67	2.20	2.40	2.84
Cost Saved Due to Conflict Resolution--Extent;	1.00	2.50	1.00	1.00	2.50	1.00	2.50	1.00	2.20	1.63
Income from Conflict Resolution--Extent;2	1.00	2.50	1.00	1.00	2.50	1.67	2.40	2.00	1.60	1.74
MGNREGA										
Awareness about MGNREGA Provisions--Extent; 1- No change, 2 - low change, 3 - moderate change, 4 - high and 5 - very high)	3.00	3.00	3.25	3.00	3.00	4.00	3.00	3.40	2.60	3.14

Perceptions	Anan- thapur	Bhil- wara	Chik- bal- lapur	Chit- toor	Man- dal		Prata- pgarh		Ya- vat- mal	Aver- age
Peoples' Participation in Work Execution--Extent; 1- No change, 2 - low change, 3 - moderate change, 4 - high and 5 - very high)	4.00	3.00	2.00	3.00	3.00	4.00	3.20	2.60	2.20	3.00
Peoples' Participation in MGNREGA--Extent; 1- No change, 2 - low change, 3 - moderate change, 4 - high and 5 - very high)	3.33	3.00	2.50	2.50	3.00	4.00	3.20	3.40	2.40	3.04
Wage Rate--Extent; 1- No change, 2 - low change, 3 - moderate change, 4 - high and 5 - very high)	4.00	2.00	2.25	3.00	2.50	1.50	2.80	1.40	2.20	2.41
Quality of Work--Extent; 1- No change, 2 - low change, 3 - moderate change, 4 - high and 5 - very high)	2.67	3.00	2.25	3.00	3.00	3.25	2.80	2.20	2.40	2.73
Quality of Supervision--Extent; 1- No change, 2 - low change, 3 - moderate change, 4 - high and 5 - very high)	3.33	3.00	1.75	2.50	3.00	3.25	2.80	2.40	2.40	2.71
On-Site facilities--Extent; 1- No change, 2 - low change, 3 - moderate change, 4 - high and 5 - very high)	1.00	1.00	1.00	1.00	1.00	1.50	1.80	1.20	2.00	1.28

Perceptions	Anan- thapur	Bhil- wara	Chik- bal- lapur	Chit- toor	Man- dal		Prata- pgarh		Ya- vat- mal	Aver- age
Responsiveness of Officials-- Extent; 1- No change, 2 - low change, 3 - moderate change, 4 - high and 5 - very high)	4.00	1.50	2.00	2.00	2.00	1.25	2.40	1.80	2.00	2.11
Works Planned for Land and Water Restoration-- Extent; 1- No change, 2 - low change, 3 - moderate change, 4 - high and 5 - very high)	4.00	2.50	2.50	3.50	3.00	3.75	2.20	3.00	2.80	3.03
Peoples' Participation in Monitoring and Supervision-- Extent; 1- No change, 2 - low change, 3 - moderate change, 4 - high and 5 - very high)	2.67	3.00	2.00	2.50	3.00	3.75	3.00	2.40	2.00	2.70
Works Sanctioned fo Land and Water Restoration-- Extent; 1- No change, 2 - low change, 3 - moderate change, 4 - high and 5 - very high)	4.00	2.50	1.50	3.00	3.00	3.50	2.60	2.40	2.40	2.77
Rules for Management and Maintenance of MGNREGA Assets--Extent; 1- No change, 2 - low change, 3 - moderate change, 4 - high and 5 - very high)	2.00	2.50	1.00	1.00	3.00	3.75	2.20	1.40	2.00	2.09

Perceptions	Anan- thapur	Bhil- wara	Chik- bal- lapur	Chit- toor	Man- dal		Prata- pgarh		Ya- vat- mal	Aver- age
Access to MGNREGA Information-- Extent; 1- No change, 2 - low change, 3 - moderate change, 4 - high and 5 - very high)	4.00	2.50	2.75	3.00	3.50	3.25	3.00	2.60	2.40	3.00
Works Implemented for Land and Water Restoration-- Extent; 1- No change, 2 - low change, 3 - moderate change, 4 - high and 5 - very high)	4.00	2.50	1.50	3.00	3.00	3.50	2.40	1.80	2.20	2.66
Livelihoods and Well-Being										
Annual Income of Households	3.33	3.00	2.25	3.00	3.00	4.00	2.40	2.40	2.40	2.86
Cost of Cultivation	3.67	2.50	2.50	3.00	3.00	4.75	2.40	2.20	2.00	2.89
Expenses on Fodder	3.33	3.50	2.25	3.00	3.00	3.25	3.00	2.40	1.60	2.81
Expenses on Fuelwood	3.67	3.50	2.33	3.00	3.00	3.50	2.20	2.20	1.80	2.80
Fodder Availability	3.33	3.50	2.67	3.00	3.00	3.25	2.40	2.60	2.20	2.88
Fuelwood Availability	3.67	3.50	2.00	3.00	3.00	3.75	2.00	2.00	2.00	2.77
Availability of Water for Livestock and Domestic Use	4.00	3.00	3.00	3.00	3.00	4.00	2.20	2.60	3.00	3.09
Manure Availability	3.67	2.50	2.75	2.50	2.00	4.00	2.20	2.60	1.75	2.66
Milk Yield	2.33	1.50	2.25	3.00	2.00	3.75	2.80	2.80	2.00	2.49
Livestock Productivity	2.33	2.00	2.00	3.00	2.00	3.75	2.80	1.60	2.20	2.41
Livestock Holding per HH	3.67	2.00	3.00	3.00	1.00	4.00	3.00	1.80	1.80	2.59

Perceptions	Anan- thapur	Bhil- wara	Chik- bal- lapur	Chit- toor	Man- dal		Prata- pgarh		Ya- vat- mal	Aver- age
No of Earners in Family	4.00	1.50	2.25	1.50	1.50	4.25	2.40	2.60	2.20	2.47
Migration	3.67	2.50	3.00	4.00	4.00	3.75	2.80	1.80	2.40	3.10
Women's Workload	2.00	2.50	1.50	2.00	3.00	3.25	2.80	2.20	2.20	2.38
Household Social Status	2.67	2.50	2.00	2.67	3.00	2.00	2.60	2.00	2.00	2.38
Education for Children	4.00	3.00	4.00	2.00	3.00	3.75	2.80	3.40	1.80	3.08
Capacity to Cope with Threats	3.00	2.50	2.67	3.33	3.00	3.75	2.00	1.80	2.40	2.72
Medical and Veterinary Expenses	3.00	2.00	1.00	2.00	3.00	3.25	2.40	1.60	2.00	2.25
Agriculture Related										
Income from Agriculture and Agriculture Labor	3.33	3.00	2.50	3.00	3.00	4.00	2.40	3.00	2.60	2.98
Person Days of Work for Farm Owners and Family	3.67	3.00	2.25	2.00	1.00	4.00	1.33	2.20	2.80	2.47
Alternative Livelihood Options	2.00	1.00	1.25	4.00	1.00	3.33	2.60	1.60	2.20	2.11
Person Days of Work for Agri Laborers	4.00	1.00	2.00	2.00	1.00	3.75	2.00	2.25	2.60	2.29
Yield from Crop Residue	3.00	3.00	2.25	3.50	3.00	4.25	2.20	2.50	2.00	2.86
Crop Diversity	3.00	3.00	2.00	1.00	3.00	4.00	1.80	2.60	2.20	2.51
External Input Costs	3.33	3.00	1.75	2.00	3.00	4.50	2.20	2.40	1.80	2.66
Adoption of SRI	1.00		1.00			4.25	1.50		1.80	1.91
Adoption of Irrigation Scheduling Etc	3.00	1.50	1.50	2.50	1.00	3.75	2.60	1.60	1.60	2.12
Adoption of Improved Agri Practices	3.67	3.50	2.25	3.00	4.00	4.25	3.20	2.40	2.40	3.19
Crop Yield	3.00	3.00	3.00	3.50	3.00	4.50	2.20	3.60	1.80	3.07
Water Saved Due to Better Agri Practices	3.00	3.00	1.75	3.00	3.50	4.25	2.80	3.20	2.20	2.97
Cropping Area	2.00	2.50	1.75	3.00	2.50	4.00	2.80	3.00	2.40	2.66

Perceptions	Anan- thapur	Bhil- wara	Chik- bal- lapur	Chit- toor	Man- dal		Prata- pgarh		Ya- vat- mal	Aver- age
Water for Irrigation	3.67	2.50	1.75	3.00	2.50	4.75	2.80	3.00	2.40	2.93
Days of Moisture Retention	4.00	2.50	2.25	3.50	3.00	4.00	2.25	2.50	2.40	2.93
Agriculture Yield Rates	3.67	3.00	2.50	3.00	3.00	4.25	2.60	2.80	2.20	3.00
Fertilizer and Pesticide Use per Acre	4.00	3.00	2.00	2.00	3.00	3.75	1.80	1.80	1.80	2.57
Crop/Seed Varietal Replacements	4.00	3.00	2.75	2.00	3.00	4.00	2.60	1.75	2.20	2.81

MGNREGA Additional Wages-Block Wise Table for 2015-16

Row Labels	Sum of Person days	Sum of Labor	Average of Wage Rate in FES	Average of Wage Rates at Block Level	Sum of Total wage as per FES wage rate	Sum of Total wage as per Block wage rate	
BAGEPALLI		7557598	245.45	200.76	7557598		
Bichhiya	38406	5219393	129.87	106.33	5219393		
Ghatanji	10013		180.76	180.22	1795855		-8687.86
Gogunda	26425	3384941	136.12	101	3335447		
Jhadol	25831	2548369	74.94	74.29	2548369		
Mandal	62117	8242026	151.86	96.14	8242026		
Mandalgarh	92507	8762299	99.49	96.83	8762299		
Nivas	17886	2214245	132.58	106.06	2214245		
NP Kunta	35830	5397171	149.09	147.333	5397171		
Pipalkhunt			99.79	106.22			
Pratapgarh	93537		118.90	100.6			
Rekkamanu	29437	3951337	136.15	140.47	3951337		
Thamballapalle	65781		161.36	161.12			
Grand Total			146.24				

Water Savings

Water Saved								
Crops	Season	Total water saved (tcm)	Water Saved in Its	Water saved per farmer (tcm)	No of	Water saved per farmer (Its)	Water value @ Rs 5/1000 liters	Value of Water Saved
	Kharif	147.22		0.31	475	310000	5	736100

Water Saved								
Maize	Kharif	251.33		1.05	239	1050000	5	1256650
Paddy	Kharif	615.89		0.23		230000	5	3079450
Pigeon pea	Kharif	83.92	83920000	1.17	72	1170000	5	419600
Kodo Millet	Kharif	78.48	78480000	0.6	131	600000	5	392400
Little Millet/ Kutki	Kharif	61.01	61010000	0.61	100	610000	5	305050
Crops	Season	Total water saved (tcm)	Water Saved in lts	Water saved per farmer (tcm)	No of	Water saved per farmer (lts)	Water value @ Rs 5/1000 liters	Value of Water Saved
Mustard	Kharif	0.93	930000	0.09	10	90000	5	4650
Sesame	Kharif	18.11	18110000	3.02	6	3020000	5	90550
Urad	Kharif	28.06	28060000	0.22	128	220000	5	140300
Soyabean	Kharif	1.75	1750000	0.01	175	10000	5	8750
Cotton	Kharif	110		0.32	344	320000	5	550000
Tomato	Kharif	157.99		0.83	190	830000	5	789950
	Rabi	326.7		1.27	257	1270000	5	1633500
Wheat	Rabi	783.07		0.64		640000	5	3915350
Gram	Rabi	1.19	1190000	0		0	5	5950
Paddy	Rabi	57.08	57080000	2.04	28	2040000	5	285400
Rhodes Fodder	Rabi	44.55	44550000	0.3	149	300000	5	222750
Mustard	Rabi	21.62	21620000	0.02		20000	5	108100
Chickpea	Rabi	5.73	5730000	0.03	191	30000	5	28650
Field peas	Rabi	19.97	19970000	0.04	499	40000	5	99850
Lentil	Rabi	12.59	12590000	0.04	315	40000	5	62950
		2827.19		0.341		341000	5	

Pumping Hours Savings

Pumping Hours Saved						
Crops	Total pumping hours saved (Hours)	Pumping hours saved per farmer (Hours)	Per Hour	Total Diesel	Cost of Diesel (Rs/ liter)	Value of Pumping Hours Saved
Groundnut	316	0.8	1.5	474	50	23700
Maize	32.74	0.06	1.5	49.11	50	2455.5
Paddy	0	0	1.5	0	50	0
Pigeon pea	0	0	1.5	0	50	0
Kodo Millet	0	0	1.5	0	50	0
Little Millet/ Kutki	0	0	1.5	0	50	0
Mustard	0	0	1.5	0	50	0

Pumping Hours Saved						
Sesame	0	0	1.5	0	50	0
Urad	0	0	1.5	0	50	0
Sama	0	0	1.5	0	50	0
Soyabean	0	0	1.5	0	50	0
Cotton	1188.79	3.45	1.5	1783.185	50	89159.25
Tomato	2181.2	11.42	1.5	3271.8	50	163590
Groundnut	7024.16	27.02	1.5	10536.24	50	526812
Wheat	18105.12	13.57	1.5	27157.68	50	1357884
Crops	Total pumping hours saved (Hours)	Pumping hours saved per farmer (Hours)	Per Hour	Total Diesel	Cost of Diesel (Rs/ liter)	Value of Pumping Hours Saved
Gram	0	0	1.5	0	50	0
Coriander	0	0	1.5	0	50	0
Paddy	1140.8	40.74	1.5	1711.2	50	85560
Rhodes Fodder	890.96	5.94	1.5	1336.44	50	66822
Mustard	0	0	1.5	0	50	0
Chickpea	0	0	1.5	0	50	0
Field peas	0	0	1.5	0	50	0
Lentil	0	0	1.5	0	50	0
Jowar	0	0	1.5	0	50	0
	30879.77					2315982.75

Additional Agricultural Production through Improved Practices-2015-16

Additional Agricultural Production							
Crops		No. of	Total incremental yield (Quintals)	Incremental yield per farmer (Quintals)	Price per	Income from Improved Yield per Farmer	Income from Additional Yield (Rs)
		1635	1093.8	2.26	4030	9107.80	4408014
Maize		2988	1637.4	2.43	1325	3219.75	2169555
Paddy		2688	1959.7	0.73	1410	1029.30	2763177
Pigeon pea		72	20.8	0.29	4425	1283.25	92040
Kodo Millet		131	77.2	0.59	1650	973.50	127380
Little Millet/ Kutki	37	100	47.9	0.48	1650	792.00	79035
	2	10	1.2	0.12	3800	456.00	4560
	0.93	6	3.3	0.55	4700	2585.00	15510
Urad	23.9	125	13.9	0.11	4425	486.75	61507.5
Sama	0.32	4	13.8	3.45	1650	5692.50	22770
		160	26.9	0.17	2500	425.00	67250
Cotton	209	345	430	1.25	3800	4750.00	1634000

Additional Agricultural Production							
Crops		No. of	Total incremental yield (Quintals)	Incremental yield per farmer (Quintals)	Price per	Income from Improved Yield per Farmer	Income from Additional Yield (Rs)
Tomato	65.6	191	2542	13.31	4600	61226.00	11693200
	258	453	440.1	1.95	4030	7858.50	1773603
Wheat		2322	1930.4	3.05	1525	4651.25	2943860
Gram		172	156	0.85	3425	2911.25	534300
		468	154.5	0.33	7450	2458.50	1151025
Paddy	12.4	28	237.7	8.49	1410	11970.90	335157
Rhodes Fodder		150	925.1	6.17	40000	246800.00	37004000
		1053	153.4	0.15	3800	570.00	582920
	32.1	166	26.3	0.16	3425	548.00	90077.5
Field peas		501	91.3	0.18	7000	1260.00	639100
Lentil		284	52.4	0.18	3325	598.50	174230
Jowar	3.2	8	5.3	0	1570	0.00	8321
			12040.4				68374592

Hindustan Unilever Foundation (HUF)

Future demand for water resources will increase significantly as the population, rate of economic development, and consumption grows. Estimates tell us that by 2030, the supply of water in India could be significantly lesser than the demand. The adverse impact of climate change on agriculture will further compound problems arising due to linkages between food, energy, and livelihoods in the country. To understand and partake in meeting this challenge, HUF was formed in 2010.

By 2020, the cumulative impacts of our collective action are expected to generate:

Water potential of 500 billion litres

Employment of more than seven million person days

Annual additional agricultural production of 0.1 million tonnes

HUF is a not-for-profit company that anchors various community development initiatives of Hindustan Unilever Limited. HUF supports national priorities for socio-economic development through its 'Water for Public Good' programme. Its projects also comply with the requirements of the Companies Act, 2013.

Foundation for Ecological Security (FES)

Registered under the Societies Registration Act XXI 1860, the Foundation for Ecological Security was set up in 2001. Spread across diverse ecological and social geographies, FES works towards conservation of nature and natural resources through collective action of local communities. In India, FES has played a pioneering role in furthering the concept of Commons as an effective instrument of local governance, as economic assets for the poor and for the viability of adjoining farmlands. Globally, FES hopes to see an increasing influence on two fundamental issues in governing shared natural resources – a 'socio-ecological systems' approach and a 'Commons paradigm', which together could have far-reaching impact on world views on 'development'. FES has initiated work on compiling, consolidating and making available accurate and comprehensive data to facilitate informed decision making on Forest, land and water resources and commons in particular. An effort with a vision to make available real time data on a scale and scope that systematically removes asymmetries in information for action on ecological and social concerns. This is an initiative to foster and enhance multi stakeholder efforts of cooperation, collaboration and management involving local communities and institutions with varied concerns and levels of decision making. By working on systemic issues that can bring about a multiplier change, FES strives for a future where the local communities determine and move towards desirable land-use that is based on principles of conservation and social justice.

