

Impact Assessment for “Rainwater Harvesting through Borewell Recharge Project”



Supported By	Implemented By
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Acronyms

SLIC	SCORElive Impact Crew
SRDS	Sankalpa Rural Development Society
FGD	Focused Group Discussion
KII	Key Individual Interview
TDS	Total Dissolved Solids
PRI	Panchayati Raj Institutions
SDMC	School Development Management Committee
PIA	Project Implementation Agency
CGWB	Central Ground Water Board

Executive Summary

The Rainwater Harvesting through Bore Well Recharge Project, initiated by **Fincare Small Finance Bank** and **Sankalpa Rural Development Society (SRDS)** in selected villages of **Koppal District, Karnataka**, represents a commendable effort to address **water scarcity and promote sustainable groundwater management**. The project's methodology, involving the collection and filtration of rainwater for recharging bore wells, is tailored to the specific challenges faced by the region, characterized by uneven rainfall patterns and subsequent water scarcity.

The impact assessment, conducted with a comprehensive scope, has provided valuable insights into the project's achievements and areas for improvement. The **findings indicate a substantial increase in groundwater levels, showcasing the effectiveness of bore well recharge systems in replenishing underground aquifers. Improved water availability, particularly for agricultural and domestic purposes**, has positively impacted the livelihoods of the local population, fostering economic growth and poverty alleviation.

Community participation and awareness have emerged as critical factors in the project's success. The positive correlation between effective community engagement and the long-term sustainability of bore well recharge systems underscores the importance of local empowerment and ownership. The impact assessment highlights the need to continue and expand community capacity-building on the taking care of this process and mechanism as well as importance of rainwater harvesting initiatives to ensure the continued success and sustainability of the project.

Socio-economic impacts, including enhanced agricultural productivity and improved living standards, demonstrate the project's positive contribution to the well-being of the communities. Additionally, the project has shown a **positive environmental impact, aligning with conservation goals and minimizing adverse effects on local ecosystems.**

In light of these findings, the recommendations and suggestions are formulated to enhance the project's impact and sustainability. **Continuous monitoring and maintenance, coupled with water quality monitoring, are crucial for ensuring the longevity and safety of the bore well recharge systems. Further efforts in climate-resilient practices, diversification of water sources, and partnerships with local institutions can contribute to a more robust and adaptable water supply system.**

The importance of community health and hygiene programs is emphasized, reinforcing the integral connection between improved water availability and public health. Income diversification initiatives and scale-up strategies are recommended to broaden the project's impact beyond its current geographic scope.

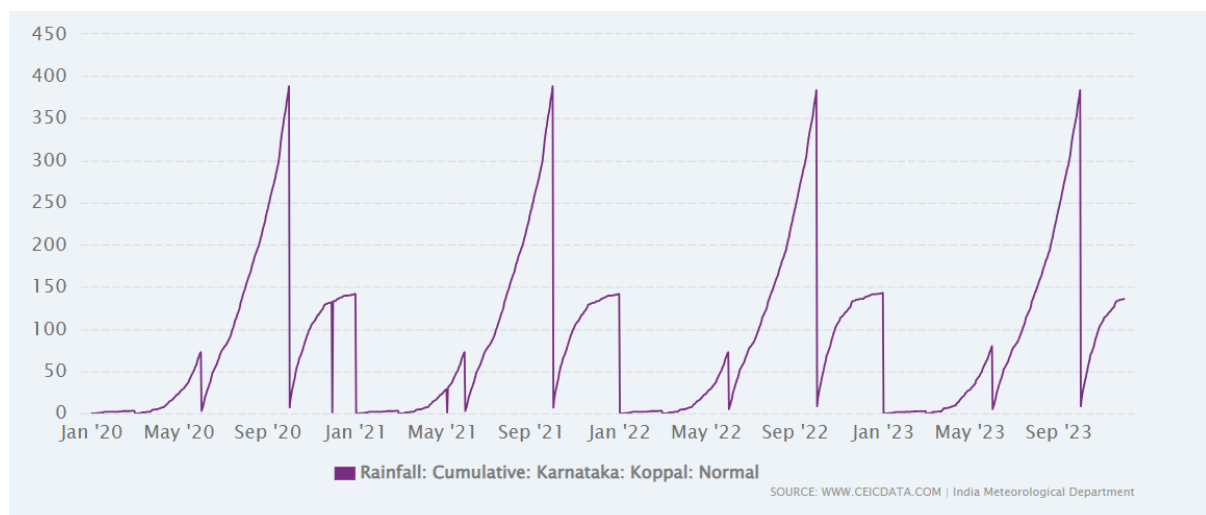
Establishing a feedback mechanism is crucial for maintaining open communication channels between stakeholders, allowing for ongoing improvements and adaptations based on community needs. While the financial review was excluded from the study scope, it is

recommended that future assessments include a financial component to provide a comprehensive understanding of the project's economic efficiency.

In conclusion, the Rainwater Harvesting through Bore Well Recharge Project has demonstrated substantial positive impacts on water availability, community well-being, and environmental sustainability. The recommendations provided aim to further enhance the project's effectiveness, ensuring its continued success and serving as a valuable model for future water management initiatives in similar contexts.

Context & Background:

In 2021, Fincare Small Finance Bank, in collaboration with SRDS, initiated a significant project addressing water scarcity through rainwater harvesting in selected villages of Koppal District, Karnataka. The project officially commenced in 2022, aiming to establish 30 Borewell Recharge Systems, strategically distributing 25 in schools and 5 with farmers in Koppal Taluka. The primary objectives were to ensure a sustainable water supply for agricultural irrigation in farmers' fields and to provide schools with reliable water sources for drinking, hygiene, and sanitation.



The context for this project is rooted in the irregular rainfall patterns observed in Koppal Taluka, leading to water scarcity throughout the year. The data indicates that although there is substantial rainfall during the wet season, it often results in soil erosion and inadequate percolation of water into the ground, exacerbating the challenge of maintaining water sources. Recognizing this issue, the rainwater harvesting method employed by the project involves the collection of rainwater from roofs during the rainy season. This water is channeled through a pipeline and then naturally filtered using a system composed of large and small stones and gravel. The filtered water is gradually directed into bore wells through specially cut slits in the casing pipe, facilitating its percolation into the aquifer and thereby recharging the underground water table. This innovative approach has the potential to revive even fully dried-up bore wells, transforming them into reliable sources of flowing water. The project

represents a critical intervention in addressing water scarcity and promoting sustainable water management practices in the targeted geography.

Objective and scope of the study

Objective of the Study

To conduct a comprehensive Impact Assessment of the "Rainwater Harvesting through Bore Well Recharge Project" implemented by SCORE Livelihood Foundation, with the aim of

- Evaluating the project's effectiveness in enhancing water availability and contributing to socio-economic and environmental well-being in the target communities.
- To evaluate and analyze the impact of programme as well as extent of achievement of the intended outcomes such as – social, community awareness aspects
- Identify potential areas of improvement wider impact & scale

Exclusion of the Study

- Financial review of the project is not covered in this study as it was not part of the scope of the study
- Comparison of Impacts before and after the project because there was no baseline of this project
- As the project nature was beneficiary oriented hence the FGD has not been conducted for the assessment.

Scope of the Study

The Impact Assessment for the "Rainwater Harvesting through Borewell Recharge" project in Koppal Taluka, Koppal District, Karnataka aims to comprehensively evaluate the effects of the initiative on both agricultural practices and educational facilities. This assessment had employed Key Informant Interviews (KII) with **three selected farmers and three school representatives** (listed in following table) from the project area in consultation with Fincare CSR Team. And the assessment team has tried to capture non-farmer and secondary respondents' perspective also to compare the impact from the project. The scope encompassed an examination of the agricultural impact, focusing on changes in crop yield, quality, and economic outcomes for farmers through reduced water expenses. Additionally, the assessment has explored the educational impact due to enhanced water availability. Social and environmental impacts will be assessed by gauging community engagement and environmental benefits, such as groundwater replenishment. Challenges and opportunities faced during implementation was also identified, to be aided in future project planning.

Target Group

Primary Respondent: Beneficiaries of this project, Project Coordinator and Donor Agency Representative

Secondary Respondent: PRI Members and SDMC Representative

The list of conducted interviews are depicted in the following table

Sl. No.	Interviewee Name	Designation	Village Name/ Location	Date of interview
1	Mr. S. Parameshwarappa Ji,	Division Manager (CSR Projects)	Fincare Small Finance Bank, Koppal District.	8 th January, 2024
2	Mr. Zashavender Singh Ji	Farmer	Vana Ballary Village, Koppal Taluk, Koppal District	8 th January, 2024
3	Mr. Vinayakumar Ji	Farmer	Koppal Taluk, Koppal District, Karnataka	8 th January, 2024
4	Mr. Hanumanthu	Gardener	Vana Bellary Village, Koppal Koppal District, Karnataka	8 th January, 2024
5	Mr. Veerayya.G.S	Vice Principal.	Govt. Girls PU College, Koppal, Karnataka	9 th January, 2024
6	Mr.Shri. T. Hanumanthappa Ji	Head Master	Kuvempu Nagar, Govt. High Primary School, Astreya Colony, Koppal Taluk, Koppal District	9 th January, 2024
7	Mr. Veera Basappa Pattan Shetty	SDMC Chairman	Govt. First Grade College, Irakallagada, Koppal, Karnataka.	9 th January, 2024
8	Mr. Nagaraj Gonegar Ji,	Village Head	Kodadal Village, Koppal Taluka, Koppal District	8 th January, 2024
9	Mr. Akbar Ji	Farmer (Non-Project Beneficiary)	Kodadal Village, Koppal Taluk, Koppal District	8 th January, 2024

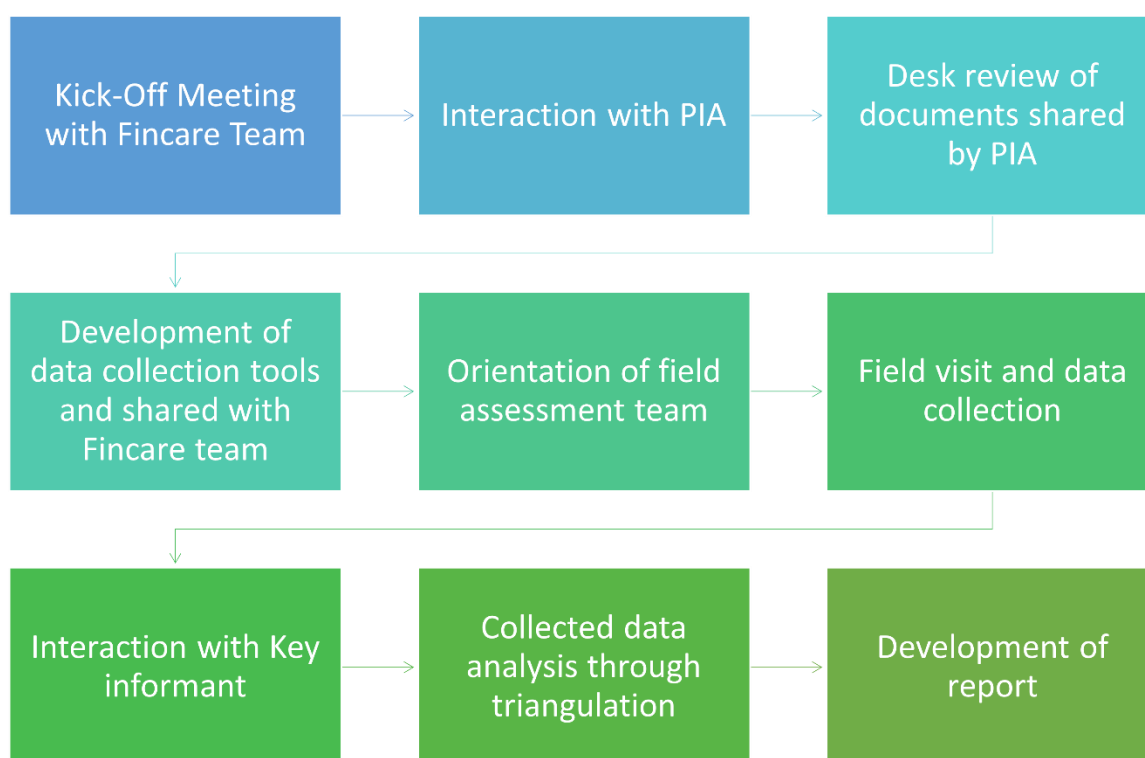
Assessment Methodology

To create an overall framework for the impact assessment, following activities were undertaken. We began by establishing the scope of the assessment in terms of type of stakeholders to be engaged and topics to be discussed with them. Based on this and the understanding of the project activities, we developed stakeholder-wise detailed questionnaires to ascertain factors including rationale for supporting the program, the implementation process, roadblocks in operations and beneficiary (community members) feedback about the efficacy of the program. The findings and recommendations arising out of this process are mentioned in the subsequent sections of the report.

- A qualitative analysis, investigation of varied perspective of key stakeholders such as beneficiaries, implementing agency and funding agency and PRI members etc. was adopted as key approach for the assessment.

- Qualitative research method offered the assessment team an opportunity to understand various aspects of this project in a better way and analyse multiple viewpoints. Experiences highlight that social dimension and intangible aspects may not be captured through desk review of proposals and reports. Varied experiences and insights provide understanding of a holistic picture and underlying dynamics effectively. Hence, it added enormous value in comprehending the reality and gaining holistic view. The assessment team adopted certain tools and mechanism for gaining insight
 - Key Informant Interview with beneficiaries i.e., Farmers, School Representatives, PRI Members and SDMC Representatives to generate qualitative data. The Key Informant Interview (KII), interaction with project implementation team and field observation created rich dataset which allowed the assessment team to understand the extent project initiatives. Protocol adopted for conducting KII is attached as annexure 1

The approach adopted for the assessment is



Kick-off Meeting with Fincare Team – To understand the project, its nature, implementation strategy and overall achievements. Identified project wise SPOC who will be responsible for providing necessary support to the team during the assessment.

Interaction with project implementation agency (PIA): Discussed the project execution strategy and achievements along with review of project progress reports shared by the implementation team. Identified nodal person from SRDS team responsible for sharing project details, mobilisation of beneficiaries and participation in the field visit.

Development of Data Collection Tools and Protocols: Development of assessment tools (Key Informant Interview KII) and protocols (for focus group discussion and interaction with key informants). The tools also shared with Fincare team.

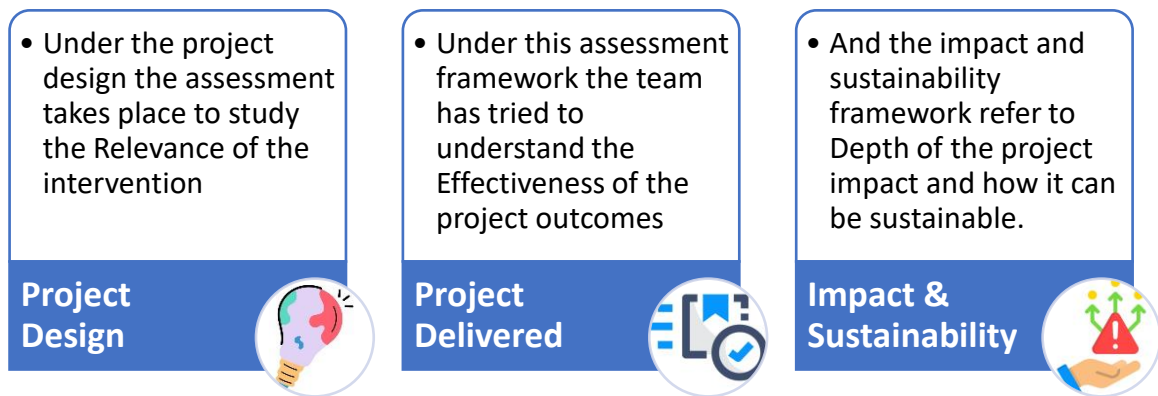
Orientation of Assessment Team: Daylong session with team members was conducted to orient them on data collection tools & protocols and its application at the ground.

Field Visit: Interaction with beneficiaries and key informants, collection of data and its triangulation with SRDS team etc. Documented beneficiaries voice, key informant's perceptions and micro movements initiated during the implementation processes.

Data compilation and its Analysis: Data compilations through using triangulation including its interpretation and preparation of report.

Analysis and Findings

The impact assessment findings are further anchored around Three-point Assessment Framework as illustrated here.



Project Rationale

Relevance of the project intervention

Throughout the evaluation of the project, engagements with diverse stakeholders, including farmers, and a supplementary examination for the study, unveiled crucial insights. It became evident that Koppal Taluka experiences erratic rainfall, contributing to groundwater deficits and elevated water salinity. This prevailing condition underscores the necessity of the project in the targeted region. The project aims to address the challenge of ensuring consistent water availability throughout the year for both agricultural irrigation and drinking purposes. The emphasis is on enhancing water quality, enabling its utilization for selected purposes such as drinking and irrigation. The intervention becomes imperative in mitigating the impact of uneven rainfall, aligning with the overarching goal of establishing sustainable water sources and improving water accessibility for the community in Koppal Taluka.

District At A Glance-Koppal-Statistical Report - FY 2021-22

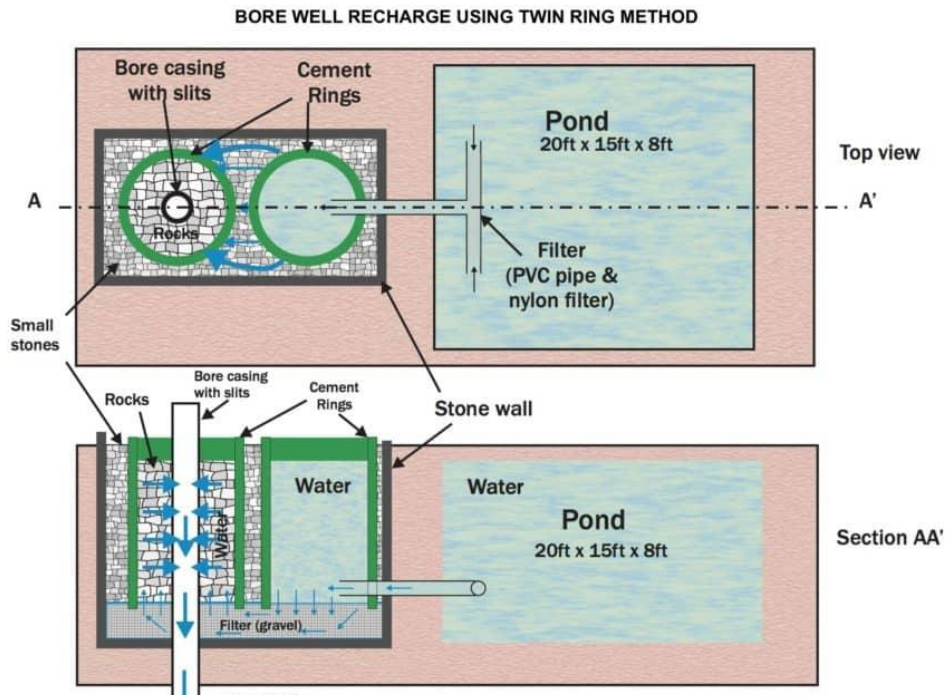
3. ವಾರ್ಷಿಕ ವಾಸ್ತವಿಕ ಮಳೆ / Actual Annual Rainfall

3.2 ಮಳೆ (ಮಿ.ಮೀ.)												
3.2 Rainfall (in mm)												
ಕ್ರಮ ಸಂಖ್ಯೆ SLNo.	ತಾಲ್ಲೂಕುಗಳು / Taluks	2011 ರಿಂದ 2021 ರವರೆಗೆ ವಾರ್ಷಿಕ ವಾಸ್ತವಿಕ ಮಳೆ (ಮಿ.ಮೀ.) Actual Annual Rainfall from 2011 to 2021 (mm)										
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	2	372	373	374	375	376	377	378	379	380	381	382
1	ಗಂಗಾವತಿ Gangavathi	361	400	536	581	349	294	539	297	544	726	589
2	ಕನಕಗಿರಿ Kanakagiri	0	0	0	0	0	0	0	0	707	800	589
3	ಕಾರಟಗಿ Karatagi	0	0	0	0	0	0	0	0	529	836	551
4	ಕೊಪ್ಪಳ Koppal	480	413	594	807	539	404	636	344	652	927	726
5	ಕುಕನೂರು Kukanuru	0	0	0	0	0	0	0	0	592	856	616
6	ಕುಷ್ಟಗಿ Kushtagi	396	379	611	779	553	372	559	395	679	846	647
7	ಯೆಲಬುರ್ಗಾ Yelburga	434	368	507	765	483	349	698	350	607	829	596
-	ಒಟ್ಟು Total	417	392	560	725	472	352	606	342	621	800	640

Source: WRIS Annual Reports

Project Delivered

After Interaction with project implementing agency (PIA) it came out as their method of rain water harvesting through bore well recharge – will bring water back to even your dried up bore wells. Due to difficulty and cost of obtaining sand as a filtration method, they have



Source: SRDS Reports

developed a new method called the Twin Ring Method. The use of locally procured natural materials enables us to deliver the bore well recharge service at an extremely low cost. By diverting naturally filtered rainwater into the groundwater tables' results in decrease in proportion of impurities in the water. The bore well's water thus loses its hardness with time and toxic minerals such as fluoride.

Using this process and mechanism they have implemented this project in schools as well as with farmers by selecting non-functional and semi-functional borewells as listed below

Roof top Rain Water Harvesting through Direct Borewell Recharge at Karnataka, Koppal distic

Sl. No	School & College Name	Village	Taluk	District	Size (In Sq.Mtr)	Total Rainwater Harvest per Year In Ltr (Avg Rain Fall 571 mm)
1	Sarkari Kendra Madariya Hiriya Prathamika Shale (CPS)	Koppal	Koppala	Koppala	266.7	152285.7
2	Sarkari Hiriya Prathamika Shale	Dambaraahalli	Koppala	Koppala	182.88	104424.48
3	Sarkari Hiriya Prathamika Shale	Kidahal	Koppala	Koppala	228.6	130530.6
4	Balakiyara Sarkari Padavi purva College	Koppala	Koppala	Koppala	1463.04	835395.84
5	Sarkari Hiriya Prathamika Shale	VanaBallary	Koppala	Koppala	182.88	104424.48
6	Sarkari Hiriya Prathamika Shale	Hasagal	Koppala	Koppala	266.7	152285.7
7	Sarkari Hiriya Prathamika Shale	Chikkabommanal	Koppala	Koppala	266.7	152285.7
8	Sarkari Prouda Shale	Hirebommanal	Koppala	Koppala	266.7	152285.7
9	Sarkari Balakiyara Prouda Shale	Koppala	Koppala	Koppala	609.6	348081.6
10	Sarkari Prouda Shale	Betagri	Koppala	Koppala	304.8	174040.8
11	Sarkari Hiriya Prathamika Shale	Kodadal	Koppala	Koppala	231.648	132271.008
12	Sarkari Prathama Darje College	Koppala	Koppala	Koppala	975.36	556930.56
13	Sarkari Prathama Darje Mahila College	Koppala	Koppala	Koppala	457.2	261061.2
14	Sarkari Kiriya Prathamika Shale	Kuvempu Nagar Koppal	Koppala	Koppala	475.488	271503.648
15	Sarkari Hiriya Prathamika Shale	Budagumpa	Koppala	Koppala	487.68	278465.28
16	Sarkari Hiriya Prathamika Shale	Talakanakapur	Koppala	Koppala	731.52	417697.92
17	Sarkari Prathama Darje College	Iragalgada	Koppala	Koppala	731.52	417697.92
18	Sarkari Hiriya Prathamika Shale	Budihal	Koppala	Koppala	731.52	417697.92
19	Sarkari Hiriya Prathamika Shale	Chikkasindogi	Koppala	Koppala	914.4	522122.4
20	Sarkari Hiriya Prathamika Shale	Mynahalli	Koppala	Koppala	731.52	417697.92
21	Sarkari Prouda Shale	Hyati	Koppala	Koppala	266.7	152285.7
22	Sarkari Kiriya Prathamika Shale	Dambaraahalli	Koppala	Koppala	304.8	174040.8
23	Sarkari Hiriya Prathamika Shale	Budihal	Koppala	Koppala	213.36	121828.56
24	Governament Tool room and Training Center	Dadegal	Koppala	Koppala	731.52	417697.92
25	Sarkari Balakiyara Prouda Shale	Koppala	Koppala	Koppala	457.2	261061.2

Source: Project Completion Report

S.N.	Farmer's Name	Landholding (in acre)	Taluka Name
1	Nagabushan Shettar	5	Koppal
2	Basuraj Shettar	3.5	Koppal
3	Sohan Shetty	6	Koppal
4	Zashavendar Singh	5	Koppal
5	Vinayakumar Angadi	4.5	Koppal

Source: Project Completion Report

And in this impact assessment during the interaction with various stakeholders of this project some of key outcomes of this project shared by the interviewee as they felt after benefitted from this project are as

- Groundwater Replenishment:** As per more than 90% of beneficiaries with whom interview has conducted, they stated that, this process contributes to the replenishment of groundwater levels, helping to sustain water availability in their wells and boreholes.
- Reduced Dependence on External Water Sources:** By harnessing rainwater for borewell recharge, and interviewee named shared his personal experience that he felt

reduction in their dependence on external water sources for his irrigation purposes. This is particularly important in these villages where only groundwater is a primary source of water for agricultural, drinking and sanitation purposes.

3. **Increased Resilience to Drought:** As from this comprehensive assessment it has been observed that, Rainwater harvesting system helped communities to build resilience to drought conditions. During periods of low rainfall, having stored rainwater for borewell recharge helped to maintain groundwater levels and provide a buffer against water scarcity.
4. **Cost-Effective Solution:** Before this solution as some of borewells was taking much time for irrigation but the sufficient water availability ensures the less time of irrigation for the same agricultural field after this project has been implemented It also provides a reliable and continuous source of water, reducing the need for expensive water infrastructure development.
5. **Enhanced Crop Yield and cropping pattern:** Improved soil moisture levels contribute to better crop yield. Consistent and adequate water availability throughout the growing season supports optimal plant growth, leading to higher yields. And helped to start double cropping on the same agricultural land as before they were only having single crop.

Impact & Sustainability Findings

1. **Increased Groundwater Levels:** The primary impact has been observed after discussion with key informants and beneficiaries through KII almost 100% of the interviewee stated that this project has ensured the rise in groundwater level which leads to less time in irrigation through the non-functional and semi functional borewells which is indicating improved groundwater recharge through rainwater harvesting.
2. **Enhanced Water Availability:** From the interaction with multiple stakeholders, it is observed as accessibility and availability of water for domestic, agricultural, and community purposes. And this project has positively influenced the overall water supply situation, contributing to improved water security in the schools for their drinking and sanitation use as well as for the farmers for their agricultural needs.
3. **Community Participation and Awareness:** Discussion with Village head Mr. Nagraj it has been came out, after awareness session been conducted for community members the level of community engagement and awareness regarding this project has been improved. And the effectiveness of capacity-building initiatives and community involvement in the maintenance and sustainability of the bore well recharge systems can be ensured
4. **Socio-economic Impact:** From the key informant interviews and multiple interaction with secondary informants it has been observed as this project has impacted economically also to the primary and secondary beneficiaries both as before this project they were experiencing more time for filling the same tank and agricultural field irrigation because of which more electricity bill has to be paid by them but when ground water level increased for their borewell's pit it takes almost half time which reduces their expenses in

electricity bills and also due to water availability across the year they could take multi crops as some of farmers like Mahesh shared that he can cultivate his floriculture garden for across the year which shows a direct economic benefit for the farmers like Mahesh and socio-economic benefits experienced by the local population. This also includes improvements in agriculture productivity, livelihoods, and income generation resulting from increased water availability and reliability.

5. **Cost-Benefit Analysis:** As this method is cost effective also because this process and mechanism mostly using a traditional water harvesting method which is ensuring not only water availability but also water quality is also being improved through this process as in multiple cases

Reduction in timing of irrigation for the same agricultural field which was taking more before this system installed helps to increase the profit margin from agriculture. – Mahesh, Farmer

TDS¹ within water has been improved by implementation of this project and indirectly the medical expenses also been decreased as from our qualitative discussion its came out as the water borne diseases have been reduced among the beneficiary families and in school children.

6. **Long-term Sustainability:** From this comprehensive assessment it is observed as if we will be in position to engage the community by capacitating them towards this process and mechanism by which they can own the maintenance of the process and mechanism is being used in this project the long-term sustainability of the project and the durability of the bore well recharge infrastructure and the community's ability to maintain and manage the systems independently can be ensured.

Successful implementation of this project in borewells often involves community participation. This fosters a sense of ownership, empowerment, and responsibility among community members. Which needs community awareness camps under this programme. – Mr. Prmeshwarappa Ji, Programme Manager, Fincare CSR

7. **Replicability and Scalability:** Looking at the satisfactory level among beneficiaries and secondary stakeholders of this projects and this cost-effective model itself it has high potential approx. 90 % interviewee suggests for replicating and scaling up the project in other similar regions and with other needy farmers among their own community. As from this assessment it clearly coming out that it has ensured the rise in water level at some extent the water quality is also being improved through this process and mechanism ensures the broader applicability of the rainwater harvesting through bore well recharge approach.

¹ Regarding Total Dissolved Solids (TDS), there is a lack of specific quantitative data for direct comparison before and after the project impact. However, insights gained from discussions and statements provide a qualitative understanding that suggests a reduction in TDS levels in water from the project intervention.

Case Studies

Case Study-1: Transforming Agriculture through Sustainable Water Solutions

Name: Mr. Hanumanthu, Gardener

Village: Vana Bellary, Koppal

Cultivation: Horticulture (650 Mango Trees Garden)

Mr. Hanumanthu, a 40-year-old gardener, residing with his family cultivating the total area of 3 acres 3 guntas land for the past three years. 650 total mango trees are there in entire land. He faced severe water scarcity due to irregular borewell water and diminishing pond levels caused by minimal rainfall over the past two years. The water crisis significantly impacted agricultural activities, put at risk the livelihoods of Mr. Hanumanthu and his



community. In light of the unpredictable future, they looked for a sustainable solution. By Recognizing the gravity of the situation, Fincare Small Finance Bank in collaboration with SRDS implemented a project aimed at resolving the water crisis. The intervention involved leveraging natural rock gravel filtration to enhance water quality and quantity.

The results were remarkable. Post-implementation, water supply became consistent, and the natural filtration process using rock gravel enhancing taste with a hint of sweetness by reducing Total Dissolved Solids (TDS) level in water, The natural filtration process not only alleviated the immediate water crisis but also inspired neighbouring farmers to adopt similar eco-friendly methods.

Interviews with Mr. Hanumanthu revealed a 100% satisfaction rate. The positive response showcased not only gratitude for resolving the crisis but also a newfound enthusiasm for sustainable agricultural practices. The community, including Mr. Hanumanthu, expressed heartfelt gratitude to Fincare Small Finance Bank for its transformative project. The unwavering support from SRDS staff.

Case Study-2: Nurturing Sustainable Practices in Education through Rainwater Harvesting

Name: Shri. T. Hanumanthappa Ji

Designation: Head Master, Kuvempu Nagar,

Location: Govt. High Primary School, Astreya Colony, Koppal Taluk, Koppal District.

Shri. Talawar Hanumanthappa, the Head Master of Govt. Hiriya Prathamika Shale (G.H.P.S) in Koppal, Karnataka, oversees a school with 116 students (64 boys, 52 girls). According to Hanumanthappa Ji, school faced a daunting water crisis due to insufficient rainfall over the past two years, resulting in an inadequate supply from



the school's bore well. Recognizing the gravity of the situation, Fincare Small Finance Bank, under the leadership of Mr. Parameshwarappa and support from Sankalpa Rural Development Society's CEO, Mr. Sikandar, initiated this wonderful project to address the water scarcity challenge within the school campus.

This joint effort aimed to pool resources and implement rainwater harvesting initiatives, fostering a sense of community and shared responsibility. According to Headmaster Hanumanthappa, the school experienced a remarkable transformation, receiving a continuous supply of approximately 1000 litres per day, meeting both drinking and sanitation needs after the implementation of project. Interviews with two students highlighted their positive understanding of the project, showcasing the initiative's educational impact.

Headmaster Hanumanthappa's visionary approach extended beyond immediate solutions. Recognizing the pivotal role of education, he proposed integrating rainwater harvesting topics into the school curriculum and awareness sessions and model exposure visits for students. This initiative not only provided formal education about the importance, methods, and benefits of rainwater harvesting but also empowered students to become advocates for sustainable practices in their communities.

The involvement of Fincare Small Finance Bank and its dedicated staff played a pivotal role in the project's success. The commitment to quality material and work, frequent visits, and ongoing support ensured the sustainable impact of the initiative. The school community expresses deep gratitude for this transformative collaboration, illustrating the powerful synergy between financial institutions like Fincare Small Finance Bank and local communities in overcoming water scarcity challenges and promoting environmental stewardship.

Conclusion and recommendation

Conclusion:

The impact assessment of the "Rainwater Harvesting through Bore Well Recharge Project" implemented by Sankalpa Rural Development Society (SRDS) has provided valuable insights into the multifaceted outcomes of this initiative. The project, designed to address water scarcity and promote sustainable groundwater management, has demonstrated commendable achievements across various dimensions, fostering positive changes in the targeted communities.

One of the most significant findings of the impact assessment is the substantial increase in groundwater levels in the project areas. The implementation of bore well recharge systems has proven to be an effective mechanism for replenishing underground aquifers. Monitoring data reveals a consistent rise in water levels post-implementation, indicating enhanced groundwater recharge and contributing to the overall resilience of the local water supply.

The project's success is also evident in the improved water availability for various purposes. Communities, which were once grappling with water scarcity issues, now enjoy increased access to water for domestic use, agriculture, and other livelihood activities. This has not only alleviated the burden of water scarcity but has also empowered individuals and households to pursue more sustainable and productive water-dependent activities.

Community participation and awareness have played a pivotal role in the success of the project. The impact assessment has highlighted the positive correlation between effective community engagement and the long-term sustainability of the bore well recharge systems. The development agency's efforts in raising awareness and building local capacity have empowered community members to actively participate in the maintenance and preservation of the water infrastructure, ensuring the continued benefits of the project.

Socio-economic impacts are evident in the flourishing agricultural activities and improved livelihoods observed in the project areas. Increased water availability has directly translated into enhanced agricultural productivity, leading to higher incomes for farmers. This economic upliftment has a cascading effect on the overall socio-economic fabric of the communities, contributing to poverty alleviation and improved living standards.

Furthermore, the project has demonstrated a positive environmental impact by aligning with conservation goals. The assessment has highlighted the compatibility of the bore well recharge systems with local ecosystems, minimizing adverse effects on flora, fauna, and biodiversity.

In conclusion, the "Rainwater Harvesting through Bore Well Recharge Project" stands as a beacon of success in addressing water scarcity and fostering sustainable development. The positive impact on groundwater levels, water availability, community engagement, socio-economic conditions, and environmental sustainability underscores the project's effectiveness. As we reflect on the outcomes of this initiative, it is evident that the lessons

learned and best practices identified can inform future water management strategies, emphasizing the importance of community involvement, environmental consciousness, and the sustainable utilization of water resources. The success of this project not only transforms the lives of those directly benefited but also sets a precedent for scalable and replicable solutions to water challenges in similar contexts.

Recommendations and Suggestions:

1. **Continuous Monitoring and Maintenance:** Implement a robust system for ongoing monitoring and maintenance of the bore well recharge infrastructure. Regular checks and timely repairs will ensure the longevity and effectiveness of the systems, preventing potential issues that may arise over time.
2. **Community Capacity Building:** Continue and expand community capacity-building initiatives (*Educate and raise awareness among the public about the benefits and techniques of rainwater harvesting and recharge systems*) to enhance local knowledge and skills in managing and maintaining the bore well recharge systems. This empowerment will contribute to the sustained success of the project by fostering a sense of ownership and responsibility among community members.
3. **Water Quality Monitoring:** Introduce a comprehensive water quality monitoring (TDS to be recorded periodically) program to ensure that the recharged groundwater remains safe and suitable for consumption. Regular testing will help identify and address any emerging water quality issues promptly.
4. **Data Management System Integration:** There should be a robust database management system to be integrated within the programme for
 - Gathering information about Water quality before and after the programme it will help to map the actual impact as far as data quality concern.
 - Baseline assessment from both perspective like qualitative and quantitative will help us to ESG reporting also from this project as this project is catering all the pillars of ESG.
5. **Climate-Resilient Practices:** Explore and integrate climate-resilient practices within the project design. This may include incorporating additional rainwater harvesting techniques, such as rooftop water harvesting, to further augment water availability during periods of erratic rainfall.
6. **Diversification of Water Sources:** Encourage diversification of water sources by integrating other sustainable water harvesting methods, such as surface water management and conservation practices. This approach will create a more resilient water supply system, reducing dependency on a single source (especially for the farmers).
7. **Community Health and Hygiene Programs:** Strengthen initiatives related to community health and hygiene by incorporating educational programs. Promote proper sanitation practices, hygiene awareness, and water conservation habits within the community to maximize the health benefits of improved water availability.

- 8. Partnerships with Local Institutions:** Foster collaborations with local educational institutions, research centers, and non-governmental organizations to leverage additional expertise, resources, and support for the project. Partnerships can enhance the project's impact and promote knowledge exchange.
- 9. Income Diversification:** Explore opportunities for diversifying income streams within the community through training programs in alternative livelihoods or by supporting small-scale enterprises that align with water sustainability and conservation goals.
- 10. Scale-Up Strategies:** Develop a strategy for scaling up the project to neighboring regions facing similar water challenges. Document and share best practices to facilitate the replication of successful models, ensuring a broader impact on water management and sustainability.
- 11. Feedback Mechanism:** Establish a feedback mechanism involving community members, stakeholders, and project implementers. Regularly solicit feedback on the project's performance, addressing concerns, and incorporating suggestions for continuous improvement. This feedback loop will enhance project adaptability and responsiveness to evolving community needs.

Annexure

1. Assessment Protocols

a. Key Individual Interview (School Teacher/Principal/Other Representative)

School Name		
Village Name		
Name of the Participant		
Designation		
School's Students Strength		
Distribution of Gender	Male	Female

1. Project Awareness and Integration

- a) How familiar were you with the concept of rainwater harvesting through bore well recharge before the implementation of this project in the school?

2. Implementation Experience in Schools

- b) Can you share the school's experience regarding the implementation of the bore well recharge system?
- c) Were there any challenges faced during the setup or maintenance of the system within the school premises?

3. Impact on Water Availability and Conservation Education

- a) Have you noticed any changes in the availability of water or water conservation practices within the school post-implementation of the project?
- b) How has this initiative influenced students' understanding and awareness of water conservation?

5. School Infrastructure and Maintenance

- a) How has the bore well recharge system affected the overall infrastructure and maintenance requirements within the school premises?
- b) What measures are in place to ensure the sustainability and upkeep of the system?
- c) How many ways this initiative is helping students in their education and operational experience?

7. Challenges and Recommendations

- a) What challenges, if any, have arisen in maintaining or optimizing the bore well recharge system within the school?
- b) Are there any suggestions or recommendations to enhance the effectiveness or utilization of the project?
- c) Have there been any student-led initiatives or actions inspired by the project?

b. Key Individual Interview (farmers)

Name of the Farmer	
Village	

1. Awareness and Understanding

- a) How familiar were you with the concept of rainwater harvesting through bore well recharge before the implementation of this project?

2. Impact on Water Availability

- a) Have you noticed any changes in the water availability or groundwater levels on your farm since the implementation of the bore well recharge project?
- b) How has this affected your irrigation practices or water usage patterns?

3. Crop Yield and Soil Health

- a) Have you observed any changes in crop yield or quality after installation of the bore well recharge system?
- b) How do you perceive the impact of improved water availability on soil health and fertility?
- c) Have you observed change in cropping pattern (Mono to Bi/Multi) after this system installation?

4. Economic Benefits and Cost-effectiveness

- a) In what ways do you think the bore well recharge project has influenced your farming costs or overall economic situation?
- b) Have you seen any financial benefits as a result of this project?

5. Community Engagement and Sharing of Knowledge

- c) How has the project encouraged or facilitated knowledge sharing among farmers in the community regarding water conservation and recharge techniques?
- d) Have you collaborated or shared insights with other farmers regarding this project?

6. Challenges and Improvements

- e) What challenges, if any, do you foresee in maintaining or optimizing the bore well recharge system in the future?
- f) Are there any suggestions or improvements you would propose to enhance the effectiveness of the project?

7. Community Impact and Expansion

- g) How do you think the bore well recharge project has impacted the farming community as a whole?
- h) Do you see potential for expanding or replicating this initiative in other areas or among more farmers?

2. Geographic Location of the Study:

Koppal is a Taluk located in Koppal district of Karnataka. It is one of 4 Taluks of Koppal district. There are 151 villages and 2 towns in Koppal Taluk. As per the Census India 2011, Koppal Taluk has 73149 households, population of 377781 of which 190907 are males and 186874 are females.

The population of children between age 0-6 is 54547 which is 14.44% of total population. The sex-ratio of Koppal Taluk is around 979 compared to 973 which is average of Karnataka state.

The literacy rate of Koppal Taluk is 60.39% out of which 68.84% males are literate and 51.76% females are literate. The total area of Koppal is 1377 sq.km with population density of 274 per sq.km.

Out of total population, 78.99% of population lives in Urban area and 21.01% lives in Rural area. There are 19.2% Scheduled Caste (SC) and 8.4% Scheduled Tribe (ST) of total population in Koppal Taluk.

As far as rainfall in the assessment Taluka is concern the following tables are showing the uneven rainfall pattern since 2013 which is the most demanding situation for rainwater harvesting like projects in the region as out of 9 years 6 years showing that there is deficit in rainfall which lead to decrease the ground water level and availability of water across year.

And due to this uneven pattern of rainfall in some months of rainy season there is heavy rainfall occurs which again causes soil erosion and nutrient layer depletion of the agricultural lands.

Source: CGWB Annual Reports

Cumulative rainfall (mm) and %age departure during south-west monsoon period				
Year	Status			
	Normal	Actual	%Dep	Class
2013	383	236	-38	Deficit
2014	383	473	23	Excess
2015	385	372	-3	Deficit
2016	383	560	46	Excess
2017	383	537	40	Excess
2018	362	280.3	-23	Deficit
2019	423.5	388.2	-9	Deficit
2020	416	560	35	Normal
2021	367	363	-1	Deficit

Source: CGWB Annual Reports

Cumulative rainfall (mm) and %age departure during north-east monsoon period				
Year	Status			
	Normal	Actual	%Dep	Class
2013	119	171	44	Excess
2014	119	129	8	Normal
2015	138	46	-67	Deficit
2016	119	25	-79	Deficit
2017	119	134	13	Normal
2018	206	47.3	-77	Deficit
2019	132	122	-8	Deficit
2020	147	272	86	Normal
2021	149	158	6	Normal

Source: CGWB Annual Reports

Annual Rainfall Pattern for Koppal District		
Normal: 599.8		
Year	Actual	Situation
2006	284.6	Deficit
2007	661.2	Normal
2008	552.9	Deficit
2009	604.9	Normal
2010	708.2	Excess
2011	411.2	Deficit
2012	384	Deficit
2013	539.8	Deficit
2014	660.8	Excess
2015	512.5	Deficit
2016	395	Deficit
2017	686.3	Normal
2018	398	Deficit
2019	652	Normal
2020	543	Deficit
2021	411	Deficit
2022	744	Excess

3. Definitions

Rainwater Harvesting

Rainwater harvesting is the process of collecting and storing rainwater that falls on rooftops, surfaces, or catchment areas, for later use. This practice involves the collection of rainwater in tanks, cisterns, or other storage facilities, allowing it to be utilized for various purposes such as irrigation, watering plants, flushing toilets, and even for domestic use after appropriate treatment. Rainwater harvesting is an eco-friendly and sustainable method that helps conserve water resources, reduce reliance on traditional water sources, and mitigate

the impact of water scarcity in certain regions. It can be implemented on a small scale for individual homes or on a larger scale for communities and institutions.

Borewell Recharge

Borewell recharge refers to the process of replenishing or recharging underground aquifers by allowing rainwater or surface water to percolate into the ground and reach the water table through a borewell. In areas where borewells are commonly used as a source of groundwater, groundwater levels may deplete over time due to excessive extraction or other factors. Borewell recharge aims to restore and enhance the groundwater levels by directing rainwater runoff or other water sources into the borewell, facilitating the replenishment of the underground water reservoir.

This process is often implemented through the construction of structures such as recharge pits, trenches, or recharge wells that help in the efficient infiltration of water into the subsurface layers. Borewell recharge is a sustainable water management practice that helps in maintaining groundwater levels, improving water availability, and mitigating the adverse effects of over-extraction on local hydrological systems. It is particularly relevant in regions facing water scarcity and where borewells play a crucial role in meeting water demands.

4. Photographs

