IMPACT ASSESSMENT

of Focused Development Program (FDP) P0500

of HDFC Bank CSR

NGO Partner: Professional Assistance for Development Action (PRADAN)

Project Location: Bastar and Raigarh region, Chhattisgarh

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EXECUTIVE SUMMARY

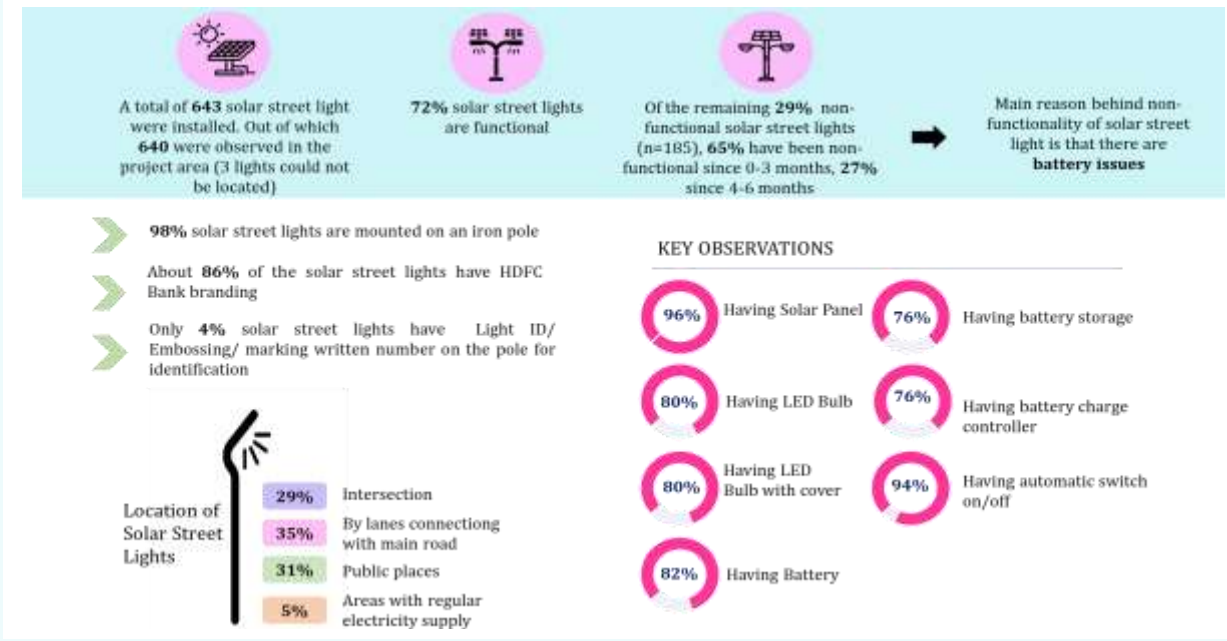
About the FDP: This FDP project of HDFC Bank CSR was focused on 'promotion of renewal energy' with the specific objective of improving the living condition of the rural communities through solar light availability and promoting clean and renewable energy solution. The project was implemented between December 2021 and June 2022 in Bastar and Raigarh regions of Chhattisgarh by PRADAN, the NGO supported by HDFC Bank.

About the Impact Assessment: The present study was commissioned to conduct an Impact Assessment of the FDP project P0500 in Chhattisgarh to assess the positive changes the installation of solar street lights has brought about in the quality of life in rural communities in terms of safety, security and socio-economic well- being by increasing access to solar lighting and advocating for sustainable, clean energy alternatives. The Assessment also sought to evaluate the efficacy, effectiveness of the project interventions and sustainability of the project's outcomes. A *cross-sectional mixed-method approach* was followed for this study. The coverage of the project was across Bastar and Raigarh regions (4 districts) with installation of 1500 solar street lights in 150 villages. For the purpose of data collection for the Impact Assessment, a sample of one-third of the villages, that is, 50 villages were covered. The selection of sample villages followed a descending order of number of solar lights installed. Data collection methods included a quantitative component of Village Observation Checklist for all sampled 50 villages, and qualitative component of Key Informant Interview (KIIs) spread in 20 villages (within the overall 50 sample villages), while Focus Group Discussions in the rest 30 villages. Fieldwork for the study was conducted between 3rd to 10th February, 2024. The study used the OECD DAC criteria as an analytical framework for assessing the overall impact of the FDP.

Key Study Findings:

Physical verification and Observation checklist of solar street lights:

The assessment has revealed pivotal insights into the impact of the intervention program. An observational checklist was administered to carry out on-site inspections of the solar street lights in the 50 sample villages to validate their current operational status and functionality. A total of 643 solar street lights were installed in the 50 sample villages, of which 640 were verified. Among the 640 solar lights observed, 71 percent of them were reported as functional, while issues such as battery malfunctions or bulb unavailability accounted for the remainder. Notably, 86 percent of these installations prominently featured branding from HDFC Bank.

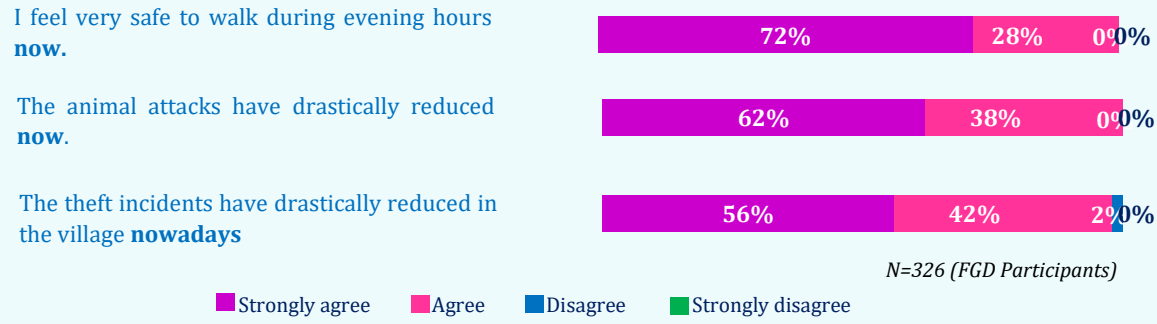


Relevance:

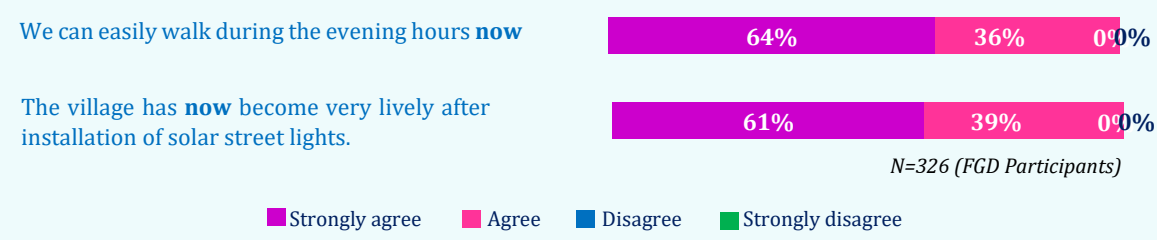
The relevance of these installations was underscored by the pressing needs within the community, including concerns about animal threats, robbery incidents, alcohol-related issues leading to antisocial behaviour, and limited mobility, particularly affecting women. Prior to installation, community engagement was prioritized through village-level meetings, resulting in 90 percent of villages reporting strategic placement of lights in areas difficult to access at night. These findings highlight the critical role of the intervention in addressing community safety concerns and enhancing overall well-being in the targeted areas.

Impact:

***Enhanced safety and security*:** The intervention successfully achieved its goal of improving mobility and enhancing security for beneficiaries. Community members expressed increased confidence in navigating the village, with qualitative insights confirming heightened feelings of safety. Solar light installations facilitated easier movement within and outside the village, as evidenced by 100 percent of respondents reporting feeling safe walking during evening hours. Particularly noteworthy is the significant percentage of women, at 84 percent, expressing strong agreement with feeling secure walking in the streets at night, reflecting an improved sense of safety among them. Adolescent girls also reported increased freedom to study or move around without fear. The high mean score of 9.17 out of 10 reported by beneficiaries indicates a robust perception of their safety and security associated with solar street lights and their likelihood to thereby recommend neighbouring villages to consider adopting similar renewable energy solutions. Women have experienced enhanced access to water structures such as taps for domestic use, facilitated by the installation of lights near these facilities. Insights from focus group discussions underscored women's improved mobility both within and outside the villages. They noted increased visits to Anganwadi centres and markets. Moreover, instances of crime against women have decreased, and the threat posed by intoxicated individuals in the village has been mitigated since the installation of lights.



Enhanced well-being: The installation has significantly improved overall well-being, evident as 98 percent of respondents reported increased mobility during rainy conditions, particularly noted by 75 percent of women. Additionally, all respondents reported a rise in social gatherings. With a mean score of 9.17, individuals strongly endorse solar street lights for their well-being, advocating neighbouring villages to adopt renewable energy. Furthermore, 100 percent of respondents noted enhanced relaxation through walking, especially highlighted by 77 percent of women, showcasing increased leisure opportunities. Qualitative insights from FGDs highlighted improvements in children's lives, including enhanced study opportunities under solar lights, access to evening tuitions, group study sessions, and safe evening playtime, free from the risks of accidents in the dark.



Enhanced sense of pride: The findings highlight a notable sense of pride among respondents, with 100 percent reporting a perceived development in their village and 97 percent noting increased visitation from neighbouring villages. Feedback from community members, including *Urja Sakhi* and Gram Panchayat representatives, emphasized the aesthetic enhancement brought by solar lights, contrasting them favourably with conventional electric poles. Solar lights were praised for their brightness and aesthetic appeal, contributing to an overall beautiful village ambiance. With a high mean score of 9.21, individuals strongly endorse solar street lights, motivated by a sense of pride, urging neighbouring villages to adopt renewable energy sources.

Increased socialization: The installation of solar lights has significantly boosted community socialization. With lights available, members can now organize festivals, meetings, and religious events in the evening. Children engage in recreational activities like playing cards and Ludo, while women actively participate in organizing prayers and *bhajans*. This increased social interaction has facilitated open discussions on community issues, including social and political challenges. Additionally, cultural activities such as evening prayers, festivals, and social gatherings are now regularly held, with greater participation from women.

Increased education and health avenues: The installation of lights has brought notable improvements in education and healthcare within the project area. Previously, children faced study challenges due to unreliable electricity, but now they can study under solar lights and attend tuitions, benefiting especially young girls who can now study outdoors. Parents feel more comfortable with their children studying outside. Additionally, access to healthcare facilities has improved, with easier transportation and the ability to call doctors to the villages in emergencies.

Enhanced livelihood opportunities: The installation of solar lights has ensured an increase in livelihood opportunities in the community. With lights available in the evening, community members can work longer hours, leading to increased productivity. Individuals have also been able to set up shops for selling items such as peanuts and *pani puri*, which remain open later into the evening, resulting in higher profits. This positive impact is particularly evident among women, who engage in various activities such as collecting and processing leaves, bamboo work, and food processing. Post-harvest tasks, such as cleaning and sorting paddy, can now be done at night thanks to the availability of light, further enhancing economic activities in the community.

Increased awareness of renewable energy and sustainable development: The intervention has significantly increased awareness among beneficiaries about the environmentally friendly aspects of solar lights. Participants understand that solar energy is renewable and does not require electricity consumption. They recognize solar power as a cleaner alternative to coal, with no smoke generation or harmful gas emissions. The installation of solar lights has led to reduced usage of kerosene lamps, thus contributing to decreased air pollution. Beneficiaries believe that promoting solar energy is crucial for environmental balance, especially amidst concerns about fuel use, deforestation, and global warming. Solar energy not only saves money compared to conventional systems but also reduces the risk of short circuits and fires, minimizing pollution. Additionally, some community members have begun using solar pumps for irrigation, indicating a growing acceptance of solar energy usage in the future.

Effectiveness:

The intervention effectively addressed community challenges by installing solar lights, by mitigating challenges of erratic electricity supply and various socio-economic difficulties such as limited mobility, security, well-being, and overall economic enhancement. Decision-making was community-led, fostering ownership and participation. Positive impacts include enhanced mobility, security, and livelihoods, particularly benefiting women. However, while the program has brought tangible improvements, there are also some gaps in the effective functioning of the program; such as challenges in maintenance due to limited

skilled technicians and continued reliance on NGO support for major repairs. Despite satisfaction among beneficiaries, additional installations are needed for wider coverage. Overall, the project demonstrates commendable progress in enhancing community well-being but highlights the importance of long-term sustainability and capacity-building efforts for lasting impact.

Coherence:

The global shift towards sustainable energy practices is becoming increasingly urgent, particularly as energy consumption remains a primary contributor to climate change. With billions still reliant on non-renewable energy sources like wood and coal, initiatives are underway to curb their usage and promote cleaner alternatives. The 7th SDG goal emphasizes universal access to affordable and modern energy services, aligning with efforts such as India's Atal Jyoti Yojana and HDFC Bank CSR interventions. These programs, including the HDFC Bank *Parivartan* initiative, prioritize community-based renewable energy projects to enhance livelihoods and mitigate environmental impact. In this context, the installation of solar lighting systems under these initiatives not only improves safety and quality of life but also fosters a deeper understanding of renewable energy benefits within the community. Qualitative insights from focus group discussions highlight the community's growing recognition of solar energy as a sustainable alternative, with notable reductions in air pollution attributed to decreased kerosene lamp usage. Moreover, the community's adept understanding of solar light functionality underscores the success of these interventions in promoting clean energy adoption and fostering environmental stewardship.

Sustainability:

Maintenance of the solar light installations is envisioned as a community effort, with funds collected at the village level for minor repairs while major renovations are mainly handled by PRADAN. A pool of *Urja* volunteers, including *Urja Sakhi* or *Urja Mitra*, is designated across villages for maintenance tasks, with most selections made jointly at community meetings. They ensure proper functioning of structures, including battery replacement and cleaning, while community members participate in panel and light cleaning. *Urja* volunteers serve as contact points for repairs, coordinating with technicians for minor issues and informing PRADAN for major ones. While PRADAN largely bears the responsibility for repair and maintenance expenses, some community members advocate for managing their own funds. Challenges reported include the need for designated technicians, technical training for villagers, and addressing complaints about non-functional lights. Additionally, both community members and *Urja Sakhis* express a need for more installations to adequately illuminate the entire village area.

Towards a conclusion:

The installation of solar lights at the village level has proven to be a transformative endeavour, significantly enhancing the quality of life for residents. Through a community-centered approach, the initiative has effectively addressed the specific needs and preferences of the community. Active community involvement has facilitated tangible improvements, including enhanced safety, increased mobility—particularly among women and adolescent girls—improved socialization, and heightened awareness of renewable energy and sustainable development. Additionally, this initiative contributes to economic development by reducing reliance on costly and environmentally harmful alternatives like kerosene lamps. Overall, solar lights serve as a catalyst for socio-economic development, environmental conservation, and community empowerment, aligning closely with sustainable development goals.

Based on the findings of the study, here are a few recommendations –

- Increase installations of solar lights to enhance the coverage of the benefits from solar lights
- As the findings have indicated gaps in the maintenance of the installations, training of technicians can be done for effective knowledge transfer for up-keep
- For ensuring maintenance of solar street lights, collection of village funds to be done efficiently and optimally at the community level
- Initiating collectivised initiatives for upkeep for sustainability
- Mechanisms for accountability for the up-keep of the installations at the community level

INTRODUCTION

Chapter 1

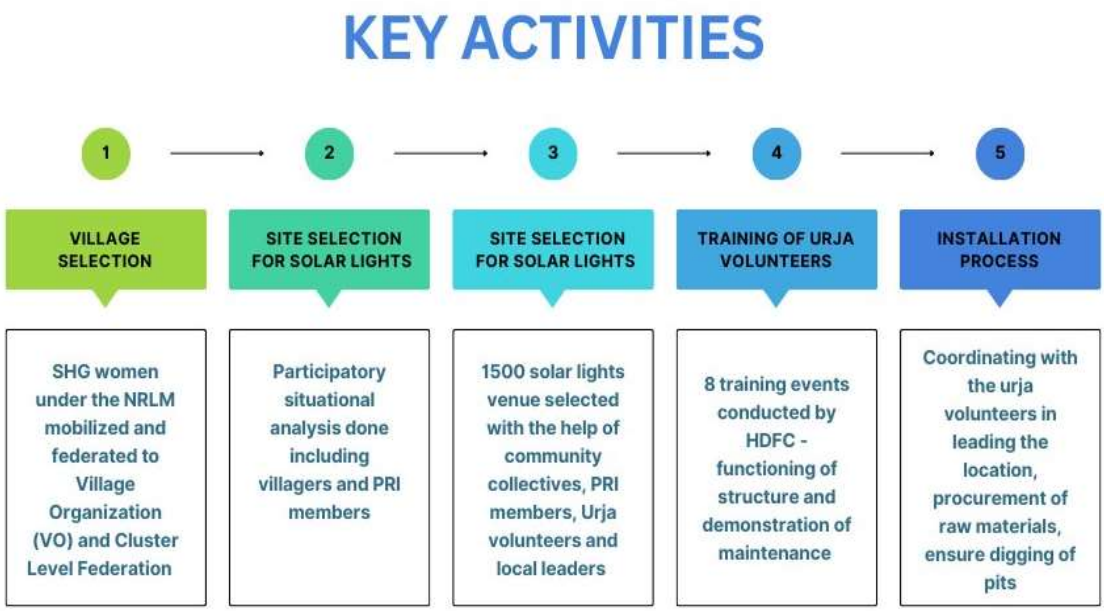
HDFC bank carries out its CSR activities under the umbrella of 'Parivartan', through which it tries to reach out to communities and enable them to shift from poverty to growth. Through interventions in the areas of *rural development, education, skill development and livelihood enhancement, healthcare & hygiene, and financial literacy,* Parivartan aims to contribute towards the economic and social development of the country by sustainably empowering its communities.

The Focused Development Program (FDP) of HDFC Bank CSR is one among its many important programs, where the Bank chooses an implementing partner with expertise in one of the focus areas and tries to improve the lives of the target beneficiaries around that particular focus area. Systematic routine monitoring and independent evaluations are regularly undertaken to assess the effectiveness of projects under their programs.

The proposed research was hence commissioned to conduct an Impact Assessment of the FDP project P0500 which was implemented in Bastar and Raigarh regions of Chhattisgarh between December 2021 and June 2022.

The project focused on 'promotion of renewal energy' with the specific objective of improving the living condition of the rural communities through solar light availability and promoting clean and renewable energy solution. The research objectives of this study encompass evaluating the impact of solar light availability on diverse stakeholders such as the community, students, and women groups. It also entails examining how interventions promote the adoption of clean and renewable energy solutions. Moreover, the research intended to understand the sustainable development outcomes in rural areas resulting from the installation of solar street lights. Additionally, the study was aimed to facilitate capacity building and empowerment initiatives specifically tailored for women, fostering their engagement in environmental and social responsibility endeavours.

The key activities undertaken as part of the project intervention are shown in Figure 1.1 below



STUDY METHODOLOGY

Chapter 2

This chapter describes the research methodology adopted for conducting the said Impact Assessment.

2.1. RESEARCH DESIGN

The research design for this study followed a cross-sectional **mixed method approach**.

The ***objective of the Assessment*** was:

- ***To assess the impact on community, students and women groups through solar light availability.***
- ***To understand the promotion of clean and renewable energy solutions through the intervention.***
- ***To understand the sustainable development in rural areas by solar street light installation***
- ***Capacity building and empowerment of women towards environmental social responsibility***

The assessment focussed on conducting physical verification and observation of the installed solar street lights in all sampled villages. Qualitative techniques of data collection involving Key Informant Interviews (KIIs) with Gram Panchayat Member/ Maintenance Volunteer and Focus Group Discussion (FGDs) with community members were used to gain descriptive insights along with certain quantifiable estimates gathered during the conduct of the latter to assess the impact. In the absence of baseline information, data from respondents was collected through a retrospective recall approach.

2.2. SAMPLE SIZE AND SAMPLING APPROACH

The coverage of the project was across 4 districts of Chhattisgarh in Bastar and Raigarh regions, these being, **Baster, Kondagaon, Raigarh,** and **Uttar Baster Kanker**. A total of 1500 solar street lights were installed in 150 villages across these four districts. For the purpose of data collection for the Impact Assessment, a sample of one-third of the villages was sought to be covered, that is, 50 villages.

Table 2.1: Target and Achieved sample size for Physical Verification of installed solar street light

	Project villages	No of Solar Lights	No. of villages to be sampled *(1/3rd of project villages)*	No. of solar street lights physically verified	
				Target	Achieved
Bastar	20	230	7	102	102
Kondagaon	11	175	3	71	71
Raigarh	89	801	30	323	320
Uttar Bastar Kanker	30	294	10	147	147
Total	**150**	**1500**	**50**	**643**	**640**

The selection process for the 50 sample villages followed a descending order based on the number of installed solar lights. For instance, in Bastar district, seven villages were sampled (as shown in Table 2.1), that is, one-third of the 20 project villages in this district. These seven villages were the top seven in terms of the number of solar lights installed. Based on this method of sampling, the 50 sampled villages were

found to have a total of 643 solar street lights as per the project related list provided by HDFC Bank CSR. During data collection, all 50 sample villages were visited and solar street lights observed – of the 643 originally installed lights, observation could be made for 640 lights. Three of them, from 3 villages of Raigarh district, could not be found/located on the ground for verification.

For the qualitative component, amongst the 50 sample villages, Key Informant Interviews (KIIs) were done in 20 villages, while Focus Group Discussion (FGDs) in the rest 30 villages, as planned under the sampling design. Selection of respondents for the qualitative component was purposive. The total number of KIIs/ FGDs across different respondent categories is given in Table 2.2 below. For the FGDs, the discussion was organized with approximately 10 members per group so as to be able to get the opinion and information of a sizeable number of community members – men, women, adolescent girls and adolescent boys. By the end of the fieldwork, data could be collected from *326 community members* who participated in the FGD (women – 98; men – 98; adolescent girls – 67; adolescent boys – 63).

Table 2.2: Distribution of achieved Qualitative Sample Size

Respondent category	Sample size (KII/ FGD)	Community members covered through KII/ FGD
Key Informant Interviews (KII)	**20**	**20**
• Gram Panchayat Member	12	12
• Volunteer looking after solar light maintenance/ post-installation issues	8	8
Focused group discussion (FGD)	**30**	**326**
• Women	9	98
• Men	9	98
• Student – adolescent girl	6	67
• Student – adolescent boy	6	63

2.3. STUDY TOOLS

The research tool developed was in alignment with the intervention done under the FDP, with the aim to arrive at quantifiable impact indicators and assessing the project's efficacy, effectiveness and sustainability of outcome. Project related documents as obtained for HDFC Bank CSR were studied to get detailed understanding of the project and hence develop the tools. The tools developed as part of this Assessment included the following:

- Quantitative questionnaire
  - Village Observation checklist
- Key Informant Interviews (KII) Guide
  - Gram Panchayat Member
  - Volunteer looking after solar light maintenance/ post-installation issues
- Focused group discussion (FGD) Guide
  - Women
  - Men
  - Student – adolescent girl
  - Student – adolescent boy

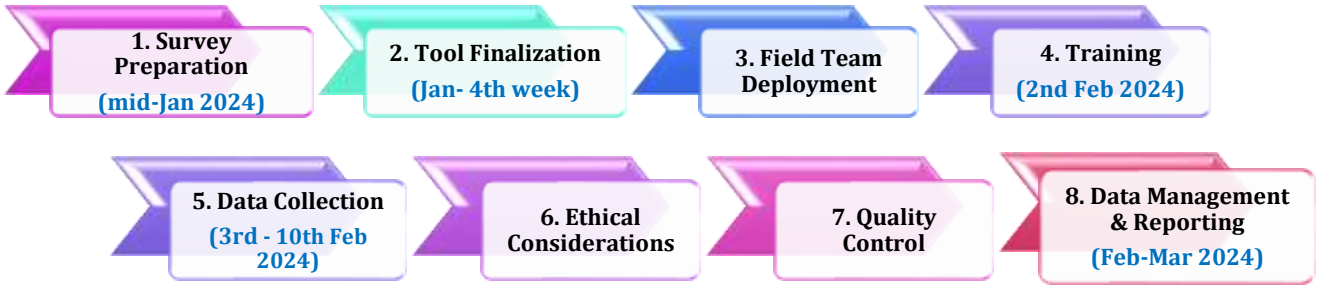
The Village Observation Checklist was a structured checklist which included physical verification of the solar street lights in terms of installation status, functionality, functionality of battery, area in which it was located etc. It also included a small portion to collect certain quantitative data from the Village Pradhan around the installation process and maintenance of the lights.

The qualitative FGD/ KII Guide had questions to help draw qualitative insights in keeping with the scope of the Assessment, with special attention to assessing the project's efficacy, effectiveness and sustainability of

outcome. In addition, the FGD Guide also contained certain close-ended questions to help arrive at impact related quantifiable estimates from the participants. The quantitative questions were self-administered before the qualitative discussion to be able to get unbiased responses. Once these had been filled-in by the participants, the moderator facilitated and continued with the discussion/ interview.

2.4. STUDY IMPLEMENTATION

The preparation for the Impact Assessment after commissioning from HDFC Bank CSR began in mid-January 2024. One of the important initial tasks was to study the project documents shared by HDFC Bank CSR, for developing an understanding of the project. The study tools were then developed and shared with HDFC team for approval. The CAPI digital scripting was also undertaken in preparation for the field launch in addition to other field level preparation. Field Team Training was held on 2nd February, 2024 at Raipur for orienting and training the teams on the study protocols and tools. Soon after, data collection was launched from 3rd February to 10th February. This was followed by data processing, management, analysis and preparation of Report which was undertaken in the month of February-March.



Solar light installed

IDI being conducted with Sarpanch at Lehuga, Raigarh

FGD being conducted with women at Kanker village

FGD conducted at Kilkila village with adolescent boys

IDI conducted with Urja volunteer

2.5. DATA MANAGEMENT, ANALYSIS AND REPORTING

After completion of data collection, final data collation, checking and cleaning of the completed quantitative interviews were done. The self-administered quantitative portion of the FGDs were also entered digitally. Like-wise, transcription and further content analysis was undertaken for the qualitative capsule. Once the

data was cleaned, it was analysed and Draft Findings Report prepared on its basis. Descriptive statistical analysis using SPSS was conducted. For the qualitative data, thematic analysis was done to collate the findings of the intervention.

2.5.1. ANALYTICAL FRAMEWORK

This Report on the Impact Assessment of FDP P0500 has made use of the OECD DAC[1] criteria as an analytical framework. This framework defines six evaluation criteria – relevance, coherence, effectiveness, efficiency, impact and sustainability – and two principles for their use. These criteria provide a normative framework used to determine the merit or worth of an intervention (policy, strategy, programme, project or activity). They serve as the basis upon which evaluative judgements are made. This framework recommends adapting this framework, wherever feasible and applicable.

The OECD DAC Framework

2.6. FIELDWORK CHALLENGES

A few challenges were encountered during the fieldwork, primarily around gathering the group for focus group discussions (FGDs) at a common time convenient for all prospective participants. For instance, challenges were faced in conducting Adolescent boys group sessions given their days' schedule of morning tuition, school commitments during daytime, and afternoon cricket matches. Additionally, the upcoming exams further reduced their availability for participation. Organizing Adolescent girls' groups also posed some hurdles as family members often expressed reluctance in allowing their daughters to participate, particularly in smaller villages were assembling a group of ten Adolescent girls proved challenging. Lastly, conducting male group sessions presented difficulties primarily attributed to their engagement in agricultural and other work activities. Through concerted efforts and adjustments from participants, the teams were ultimately able to hold the sessions as required.

[1] https://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm

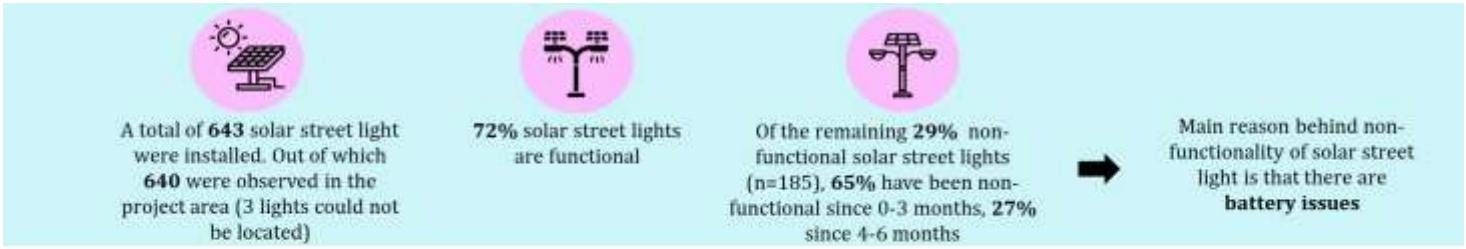
STUDY FINDINGS

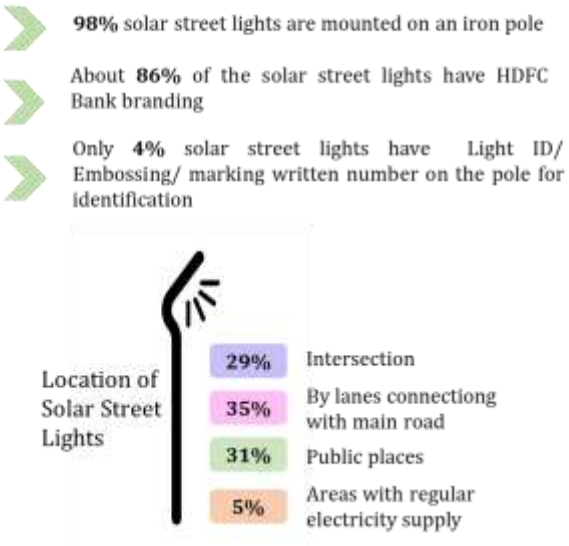
Chapter 3

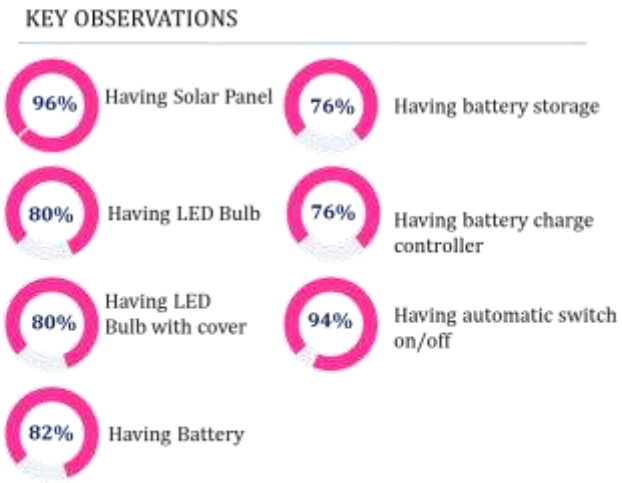
This chapter presents the key findings of the study beginning with data collected through physical verification of the solar street lights. The subsequent sections in the chapter are categorized on the basis of the OECD DAC framework – encompassing the various parameters of assessment. The findings of the inquiry have been categorized into Relevance, Coherence, Effectiveness, Impact and Sustainability, drawing from data collected from all categories of respondents across quantitative and qualitative data collection methods.

To reiterate, for the quantitative component, physical verification of the installed solar street lights was conducted after seeking permission from the Village Pradhan and in the presence of either the Pradhan or *Urja* Volunteers of each village. A brief questionnaire asking certain structured questions around the installation process and maintenance of the lights was also administered to the Village Pradhan. The qualitative component, comprising of the KIIs and FGDs was conducted across various categories. The KIIs was conducted with Gram Panchayat members and *Urja* volunteers responsible for maintenance of the solar street lights. The 4 components of the FGD were conducted across the women, men, adolescent boys and adolescent girls.

3.1. FINDINGS FROM PHYSICAL VERIFICATION AND OBSERVATION OF SOLAR STREET LIGHTS







An important aspect of the Impact Assessment was to conduct physical verification of the solar street lights across the 50 sample villages to confirm their current use and functionality. Of the 643 solar lights installed in these villages as per the village-wise list provided by HDFC Bank CSR, 640 lights were located and verified/ observed. Three solar lights could not be observed as they could not be located, belonging to 3

villages in Raigarh district (Nawagaon E, Pandaripani W, Sambalpuri). Among the 640 solar street lights so observed, 72 percent of the lights installed were found to be functional. Among the remaining 28 percent non-functional solar street lights (n=182), 65 percent had been non-functional since 0-3 months, 27 percent since 4-6 months, 3 percent since 7-9 months and 10-12 months each and 2 percent over 2 months. These lights were non-functional primarily due to battery issues (76%) or non-availability of LED bulb (12%). Among the total solar lights, 86 percent solar lights had HDFC Bank branding.

Further, through a district wise analysis of the observation checklist, the proportion of the installed lights and currently functional lights has been evaluated. In districts Bastar and Kondagaon, the proportion of solar lights functional are 98 percent and 100 percent, respectively. However, as seen in Raigarh and Uttar Bastar Kanker, the proportion of functional solar lights are lesser, amounting up to 54 percent and 77 percent.

	No. of solar street lights installed in 50 sampled villages as per project list	**No. of solar street lights available/ found during data collection**	**Functional solar lights**
Bastar	102	102	100 (98%)
Kondagaon	71	71	71 (100%)
Raigarh	323	320	174 (54%)
Uttar Bastar Kanker	147	147	113 (77%)
Total	**643**	**640**	**458 (72%)**

Note: Figure in brackets in the last column reflect proportion of functional lights.

3.2. RELEVANCE - *Is the Intervention doing the right things?*

Need for Intervention:

The intervention area comprises majorly of poor households from scheduled tribes and Dalit communities. Availability of light is an essential prerequisite towards the goal of enhancing the quality of life and promotion of safety and security. Additionally, usage of solar light help advances the cause of environmental sustainability within the villages.

Qualitative insights collated from across respondents, brings out that the solar lights were required to be installed, as the area faced challenges compromising mobility and security. Further, this impacted their over-all socio-economic development. Owing to many challenges posed due to the erratic unavailability of electricity, the area had a crucial necessity for a reliable source of light.

The project area was faced with frequent issues of attacks from animals – such as elephants and wild bears. In the rainy season, there was increased threat of snakes, scorpions and insects. They were destroying the fields and houses. Moreover, this would make it difficult to move around outside. Additionally, issues of alcoholism and drunk miscreants causing trouble was also a persistent problem. Prior to the installation of solar lights, the shops would close in the evening as there was no source of light for the people to continue their shops. Instances of theft were reported as a prominent issue in the area. Robbers were stealing grains and livestock such as goats, chicken etc. In the FGD conducted with women, it was also reported that they were unable to fetch water in the dark. Elderly persons at night were unable to go out in the night as their eyesight was weak, making it difficult for them to commute outside. In cases of health emergency, it was difficult to access healthcare services. Load shedding was also reported to be a common issue in the area further exasperated by storm and rainfall which caused frequent power outage. Children were also unable to play in the evening, as they would get hurt with stones and pebbles.

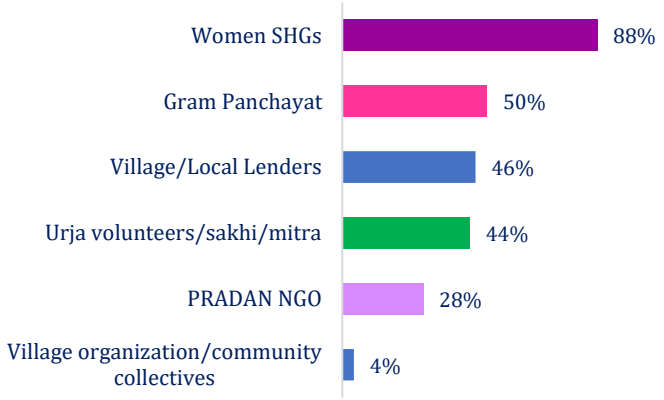
> *"Earlier there used to be incidents of theft such as that of paddy. It was stolen by boys in the area. Now, after the installation, they can be identified through the lights. This has helped in reducing such incidents of theft."*
>
> - *Women FGD, Golwand*

Ensuring Community Involvement:

The intervention done was intended to ensure a sustainable model through an all-encompassing support of the community. At the inception of the intervention, the community was mobilized for the identification of the locations for the installation. The decision for the location of the solar lights must be a community initiative to ensure that the benefits of the installation is equally distributed within the community.

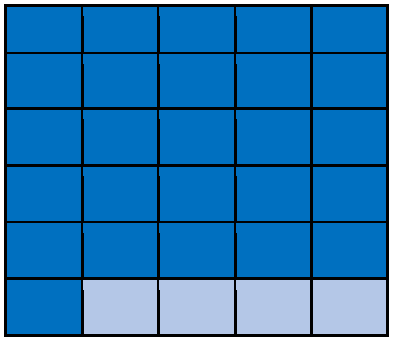
Findings from the assessment suggest that the decision making for the location of the installation was done in a democratic manner. On being asked who all were instrumental in taking the decision about the location of placing street lights within the village, 88 percent of the surveyed villages reported that the decision was taken by the women self-help groups; 50 percent by the Gram Panchayat; 46 percent by the village/local lender; and 44 percent by the *Urja* volunteers/*sakhi/mitra*.

Decision maker on the location of the street light



N=50 [All villages]

Meetings held before installation



N=30 FGDs

This community-based decision making of the location of the solar lights resonated through the 30 FGDs conducted among different community members. The adjacent chart shows that among the 30 villages, the meeting was held in majority (n=26) of the villages. However, from 4 FGDs conducted with adolescent girls, they reported being unaware of any meeting held at the village level to discuss the location of the solar lights.

Further to this, insights from the village heads highlighted the challenges they faced at the community level to ensure that the installation of the solar lights does not serve the vested interests of some individuals. Village heads played an active role in addressing to these objections or motives of few individuals. They mobilized the people for application of lights for public interest rather than individual interest. They also facilitated the process of community involvement in the planning and collective decision.

"There were many people and of many thoughts. Everyone wants their personal benefits also. Members from PRADAN made a map and planted lights according to our necessity. Now we have benefitted."

- FGD with women, Golwand

Factors determining the location of solar lights

N=50 (All villages)

The above infographic presents the findings of the factors that were taken into consideration while deciding the location of the solar lights. In 90 percent of the villages, the decision was taken on the basis of the areas that were difficult to be accessed to villagers at night. Moreover, 74 percent villages the location was decided on the basis of important public places such as handpumps, *rangmanch*/health centres. It can largely be seen that the location was decided on the basis what would prove to be most beneficial to the larger community.

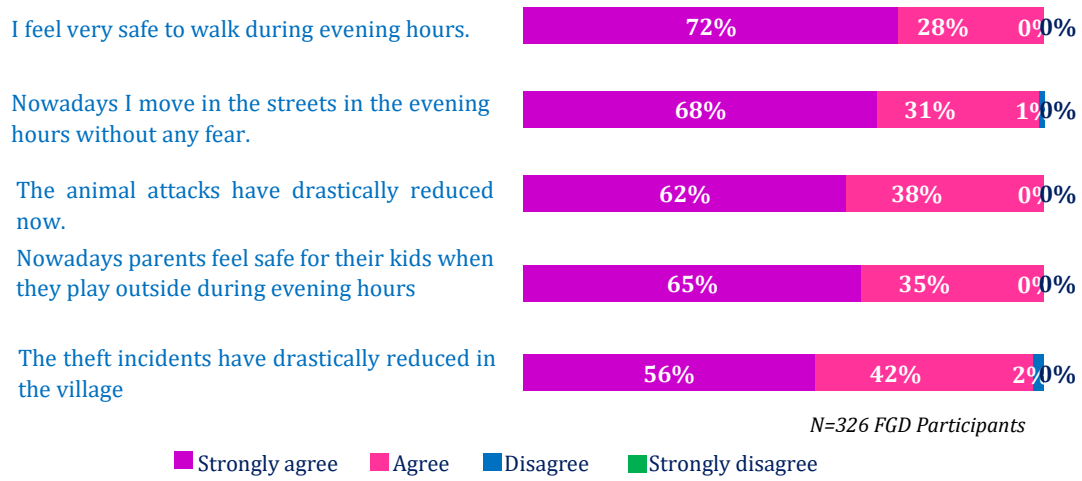
As the installation of the solar lights has been a community effort, the members of the community have highlighted their significant role during the installation. The community contributed in the form of labour through digging pits and installation. They also provided food and water to the workers. Moreover, men and adolescent boys reported their involvement in the installation. They helped in the construction through clearing of the area for installation. Moreover, they also worked on mixing the cement and installing the pole.

3.2. IMPACT – What difference does the Intervention make?

This section analyses the larger impact on the community in lines of the objective as outlined in Section 2.1, as a result of the intervention done through the FDP.

3.2.1. IMPACT OF SSL ON COMMUNITY MEMBERS

❖ Safety and security



The intervention has been able to meet its objective of ensuring increased mobility and heightened sense of security among beneficiaries. Members of the community have reported to be confident in moving around the village. Through qualitative insights, it has been highlighted that the respondents reported enhanced safety and security. The installation of solar lights has ensured easy commute of persons within and outside the village. As seen in the infographic above, 100 percent respondents reported being able to feel safe to walk during evening hours after the installation of lights. Moreover, it can be notably seen that women have reported a higher percentage of strong agreement to feeling safe to walk during the evening hours; indicating an enhanced sense of security among them after the installation. High percentage of 84 women have reported being able to move in the street in the evening hours without any fears. This resonates through the qualitative findings where women have highlighted that there is an increased sense if safety among them. Adolescent girls through have reported being able to go out to study, in tuitions or be able to roam without any fear.

Strongly Agree *- I feel very safe to walk during evening hours*	
WOMEN 88%	MEN 61%
GIRLS 62%	BOYS 74%
Strongly Agree - Nowadays I move in the streets in the evening hours without any fear	
WOMEN 84%	MEN 66%
GIRLS 53%	BOYS 63%
N=326 (FGD Participants)	

From the qualitative insights through the FGD, it was highlighted that instances of theft were a prevalent issue, prior to the installation of the solar lights. People would steal crops, utensils etc. The findings indicate reduced instances of theft as 98 percent of respondents have reported that incidents of theft have reduced drastically after the installation of lights. Respondents have also reported being able to identify the robbers, making it easy to hold accountability and reduce such instances.

> *"Earlier there were many places; many of houses faced the theft problem. Now stealing has reduced. Theft has now reduced as compared to what was happening before. Because of the lights it has become easier to identify."*
>
> *- Women FGD, Lailunga*

Women have also reported increased accessibility to the water structures such as taps, where they can fill water for their domestic usage. Through the meetings, members of the community had reached a consensus to install the lights near the water structures to ensure increased access. Women from their insights through the FGD have also highlighted their increased accessibility within and outside their villages. Owing to the installation, there is increased mobility among women to visit essential places such as the Anganwadi centre and markets. It was also highlighted that the instances of crime against women have also reduced after the installation of the lights. There was also a threat of drunk miscreants in the village, which has now become controlled after the installation of the lights.

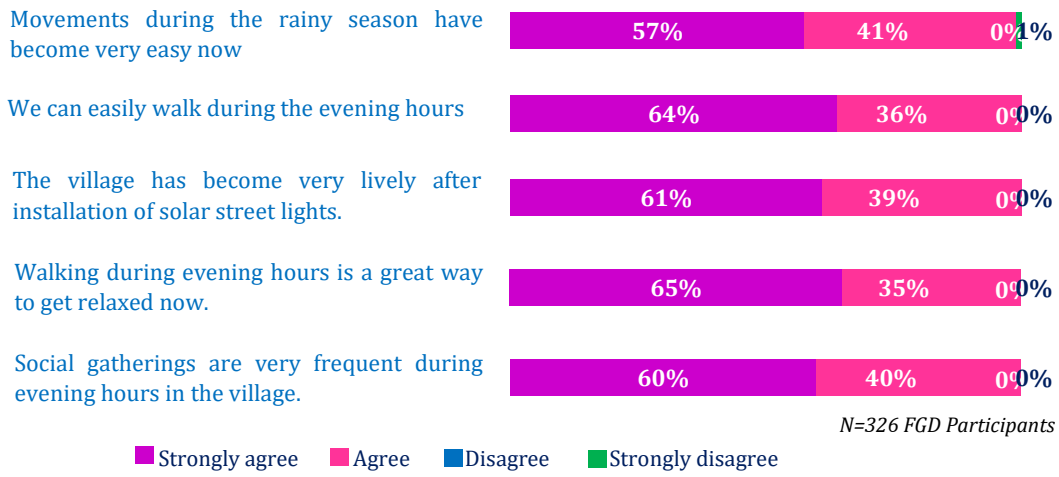
Mean score on likelihood of recommending solar light for enhanced safety and security

9.17

(Out of 10)

The high mean score of 9.17 (out of 10) indicates a strong sense of safety and security associated with the use of solar street lights, suggesting a high likelihood of recommending neighbouring villages to adopt solar or other renewable energy sources.

❖ Well-being



In terms of overall wellbeing, the installation has ensured increased enhanced quality of life. This can be seen through the above infographic which displays that the respondents are now able to more freely during the rain, as reported by 98 percent. This feeling of heightened mobility during the rain have been reported to have increased for women, as 75 percent women resonated. Moreover, 100 percent of respondents reported that the social gatherings have frequented and increased.

Strongly Agree *- Movements during the rainy season have become very easy now*	
WOMEN 75%	MEN 51%
GIRLS 46%	BOYS 53%
N=326 (FGD Participants)	

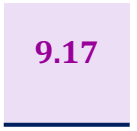
As 100 percent respondents have reported that owing to the installation of solar lights, they are now able to go for evening walks which is a great way for them to relax. This has been reported higher among the women, as 77 percent women have resonated the same. This is a testament to the increased agency of leisure among women, through relaxation from walking.

Strongly Agree - Walking during evening hours is a great way to get relaxed now	
WOMEN 77%	MEN 57%
GIRLS 53%	BOYS 69%

N=326 (FGD Participants)

From the qualitative insights received from the FGD, respondents have reported betterment of children. It was reported that the children are now able to study under the solar lights. After the installation of solar lights, they are also able to visit tuitions in the evening and get together with their peers in group studies. Moreover, children are also able to play in the evening without the threat of being harmed or hurt through any accidents in the dark.

Mean score on likelihood of recommending solar light for well-being



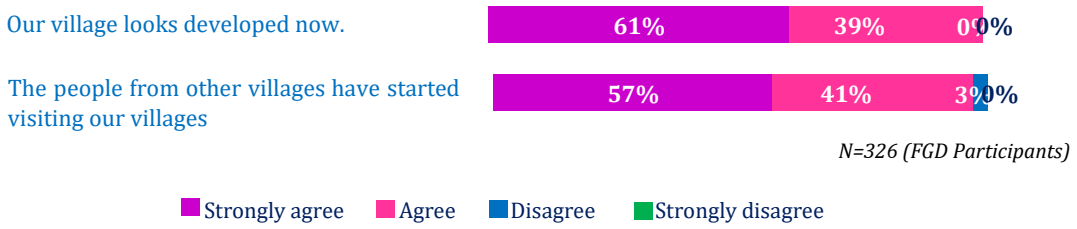
(Out of 10)

With a mean score of 9.17, individuals, considering their sense of well-being associated with solar street lights, would strongly recommend neighbouring villages to transition to solar or other renewable energy sources.

> *"Girls were finding it difficult to get out especially during the night time, when it is completely dark. Now it is easier for them and safe."*
>
> *- Boys FGD, Lailunga*

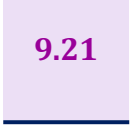
❖ Sense of pride

The findings indicate an enhanced sense of pride among the respondents. It has been reported by 100 percent respondents that their village looks developed now. Moreover, 97 percent respondents reported that people from other villages have started visiting their villages.



The members of the community interacted with, through the FGD, highlighted that the solar lights added aesthetic value to their village. This was also resonated by the Urja Sakhi and the Gram Panchayat members, as they highlighted the importance of the aesthetic beauties attached with this kind of lighting facility, with sharp contrast with electric poles which have wires attached to it. They compared solar lights with conventional ones and commented that solar lights not only emit more brightness but they also look beautiful with no attached wires and cables. The entire set-up has made the village look beautiful Also, as pointed out, solar light was much brighter than conventional electric light. The findings reveal a high mean score of 9.21, suggesting that individuals, driven

Mean score on likelihood of recommending solar energy considering sense of pride



(Out of 10)

by a strong sense of pride associated with solar street lights, are highly inclined to advocate for neighbouring villages to embrace solar or other renewable energy sources.

> *"It gets charge by the sun light and we do not have to pay any electricity bill. In electric connection we require cables, wires, plugs etc. whereas we do not need anything in solar street lights. They look nice also."*
>
> *– Urja Sakhi, Bhagora, Raigarh*

> *"I am very much happy that people here are really praising me and saying that at least one girl from our community is doing such a great work which is really helping a lot of people"*
>
> *– Urja Sakhi, Tedaikondal, Bhanupratappur*

❖ Socialization

The installation of solar lights has increased socialization of the community members. With the availability of lights, community members are able to organize festivals and events in the evening. To discuss important issues in the community, the members are able to conduct meetings in the evening after their work hours. Religious events such as *bhajan* and *kirtans* are being able to be organized. Young children engage in playing cards and ludo in the evening. This has increased the socialization of women as well, as they engage in organizing prayers and *bhajans.*

They share their problems and are also involved in recreational activities like playing cards or any board game like Ludo. The increase in the socialization process has resulted in people sharing their opinions and discussing about the social and political challenges they face as a community. Apart from this, cultural activities like evening prayer, festivals, rituals and social gatherings are being regularly conducted by the villagers. The participation of women members on social and cultural activities have increased.

> *"Yes, there is increased socialization in the community. There are 6-8 boys of 15-16 years who sit in the village and play the drums in the evening. And later, they do the kirtan-bhajan for one-two hours. This is helping children in learning the culture."*
>
> - *Women FGD, Jharguda*

> *"Yes, socialization is happening now and people become get together in a particular place in the evening and discuss about different issues of the village and try solve them in the meeting. Now people are doing bhajan and kirtan near mandap and people are discussing about political issues in the discussion also."*
>
> - *Women FGD, Kotarliya*

❖ Health & Education:

There have been notable positive changes in education within the project area, owing to the installation of lights. Prior to the installation, children faced challenges in studies, owing to erratic supply of electricity. It has been highlighted that children are able to study under the solar lights. Moreover, children are also now able to study with their peers and attend tuitions. It is notable that this positive change has been seen among young girls who are now able to study outside. It was also highlighted that parents now feel more comfortable in their children going out for studying.

The installation of solar lights has also increased accessibility to health facilities, especially during an emergency. Transportation and access to medical facilities has become easier due to the facility of lights. It is also feasible to call doctors to the villages, in case of someone's health deterioration.

> *"If ever someone's health becomes bad, they call the doctor, when he comes, the light from the street light helps in giving medicine, it has helped in many things"*
>
> - *Women FGD, Rudukela*

> *"Yes, children's education has been affected. Now after the electricity failure, children are now able to study even under street lights. Children feel comfortable to read under this light because it provides far better light than conventional light."*
>
> - Women FGD, Lailunga

❖ **Livelihood opportunities:**

The installation of solar lights has ensured an increase in livelihood opportunities in the community. It has been highlighted that the members of the community are able to work more owing to the availability of solar lights functional in the evening. People are also able to set up shops for hawking and selling items such as peanuts, *pani puri.* Shops are open till later in the evening, ensuring more profit. This positive impact has been seen especially among women, as they work on collecting leaves by bundling them and processing them. Women also do food processing for bamboo work, *papads, badi* and pickles. Post harvest work is also being easily done, as suggested by participants. They are able to clean and sort paddy at night due to the availability of light.

❖ **Overall changes in the lives of people**

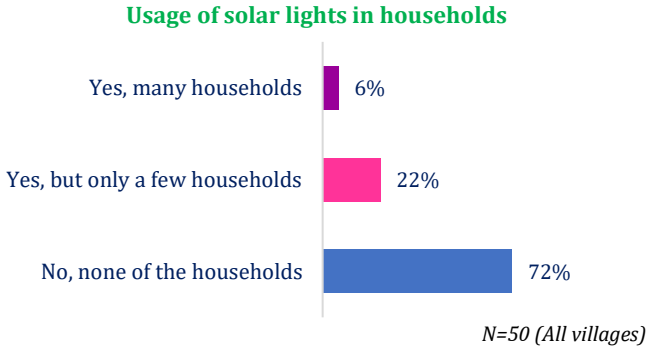
The intervention has caused various changes in the lives of the beneficiaries such as improved mobility and security for beneficiaries, with heightened confidence and feelings of safety reported among community members. Solar light installations facilitated safer movement, particularly at night, with a significant percentage of women expressing increased security. Adolescents also noted greater freedom and safety for studying and leisure activities. Moreover, the installation enhanced access to water structures and decreased instances of crime against women. Overall well-being improved, evidenced by increased mobility during rainy conditions and enhanced social gatherings. Solar lights also promoted leisure opportunities and improved children's lives through enhanced study opportunities and safe playtime. Community pride and aesthetic enhancement were noted, with strong endorsement for solar lights. Socialization increased, enabling evening events and discussions on community issues. Education and healthcare improved, especially for young girls, and livelihood opportunities expanded, leading to increased productivity and profits, particularly among women.

> *"We saved money because we conduct most of our work near solar street light in the evening time."*
>
> - *Boys FGD, Tokapal*

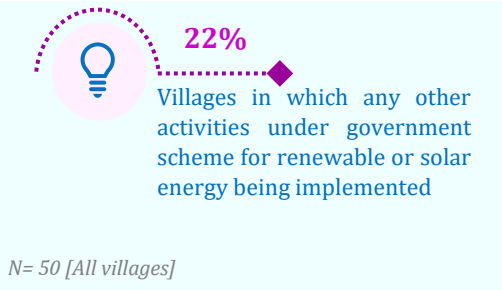
3.6.2. IMPACT ON UNDERSTANDING SUSTAINABLE DEVELOPMENT

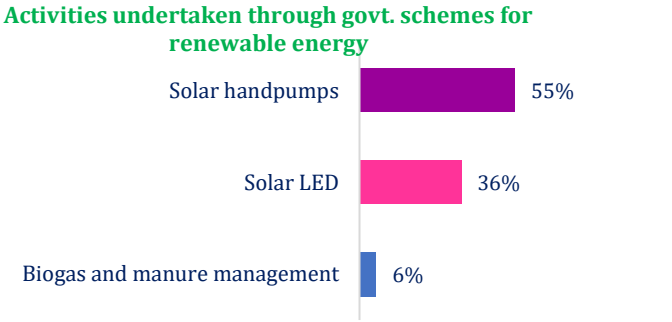
A beginning seems to have been made with regard to usage of solar based lights at the household level too. According to information shared by the Village Heads, 6 percent villages had many households making use of solar lights at home while 22 percent villages had such households too, but fewer in number. Remaining 72 percent villages were yet to make an initiation into having solar lights in the households; Of the 28 percent or 14 villages who did confirm usage of solar lights to lighten their houses, 43 percent have been

using the solar lights at home for >24 months. Usage of solar lights in homes in the past 0-12 months, reported being used by 36 percent villages and 21 percent villages in the last 13-24 months.

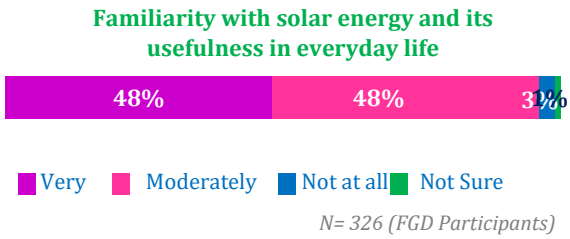


Further, activities under government schemes for renewable and solar energy were undertaken in 22 percent of the villages assessed. Among these, 55 percent were for solar handpumps, 36 percent for solar LEDs and 6 percent for biogas and manure management.





It has been reported by 96 percent respondents that they have familiarity with solar energy and its usefulness in day-to-day life. Moreover, through qualitative discussions, it can be seen that the members of the community possess ample knowledge of renewable energy. This knowledge was seen more among the category of adolescent boys and girls.



> *"Coals is limited but the solar energy is unlimited and thus it will be very user-friendly for future generations."*
>
> *- Adolescent girls FGD, Gerupani Lailuga*

> *"Solar plate become charged from sun rays in the day time and it automatically on at 6 pm in the evening and automatically become off in the morning."*
>
> *- Women FGD, Sambalpuri*

Through the intervention, there is an increased understanding among the beneficiaries on solar lights to be environmentally friendly. As reported, it does not require consumption of electricity. Participants have

reportedly recognized solar lights as renewable. In comparison to coal, participants have denoted that solar power can be regenerated. Unlike coal, there is no smoke generation in solar lights. There is no emission of harmful gases, in comparison to coal and wood.

In the locations where solar streetlights have been installed, beneficiaries understand the importance of promotion of solar energy. As solar energy does not emit harmful gas to the environment, unlike coal and kerosene, they feel that solar based light is good for environment. Earlier when there was no electricity villagers used to apply kerosene oil for lighting up of lamps, which caused air pollution. The installation of solar lights had ensured reduced usage of kerosene lamps, which may have contributed towards decreased pollution. In the current context of increasing use of fuel for transportation, cutting down of the forest and global warming, beneficiaries believe that the use of the solar energy is critical for keeping a balance in the environment. The use of solar energy is not only environment friendly, but it also saves money as compared to the wire and pole-based expenses in the conventional system. Also, the chances of short circuit and spread of fire and smoke causing pollution is less in solar streetlight system.

After realizing the importance of solar energy, some of the community members have also started using solar pumps for irrigation. It is believed among the beneficiaries that the use of solar energy will certainly increase in future. Households have been able to reduce the cost of torch and electricity after the installation of solar lights. Respondents from the FGD conducted with women has highlighted that they no longer have to purchase torch and batteries for usage during the night.

Out of 50 villages, 82 percent villages gave a score of 9 or 10 on a scale of 10 that they are very likely to recommend the adjacent villages to start using solar lights. The average score was 9.1 which signifies a very high mean score indicating that the villages are most likely to give recommendation to the adjacent villages to inculcate the usage of solar lights and other renewable sources of energy.

Mean score for recommendation of usage of solar lights and other renewable sources of energy to neighbouring village

9.10

> "This is environmentally friendly because it uses natural energy. Earlier we used to use some kerosene lamps, which used to cause lots of smoke which were harmful for our lungs and it also leads to the air pollution, and this light uses the solar energy which is not harmful for the environment."
>
> - Adolescent girl FGD, Gerupani Lailunga

3.3. EFFECTIVENESS – Is the Intervention achieving its objectives?

The project has been able to effectively address the objectives and vision of the intervention in many ways. Through the installation of the solar lights, there has been considerable betterment in the lives of the beneficiaries, in numerous ways. The area for intervention was chosen basis the requirement of the community. The intervention areas chosen were those facing challenges – on socio-economic fronts. These challenges were further exacerbated through the erratic supply of electricity. Through the installation of solar lights, the issue of electricity supply has been effectively tackled. Further, to ensure the benefits of the intervention are widespread and reaped by maximum individuals, the installation was done through democratic efforts. Particulars of the intervention such as the location of the solar lights installations was decided at the community level. As the intervention was intended to be communitarian in spirit, the activities were able to achieve it during the installation level. In many ways, the community has been able to contribute in kind and labour. This has also ensured that the community is actively involved, encouraging their investment in the intervention.

To address the difficulties of the community, the intervention has reportedly been effective in bringing changes in the lives of the beneficiaries. Through the installation, there has been positive effect in the overall lives of the community members. Addressing the challenges, the installation of solar lights has been able to ensure increased mobility and security. It is notable that this has been proven beneficial, more to women. As women have reported increased mobility, socialization and access to leisure; this has been proven more beneficial to women.

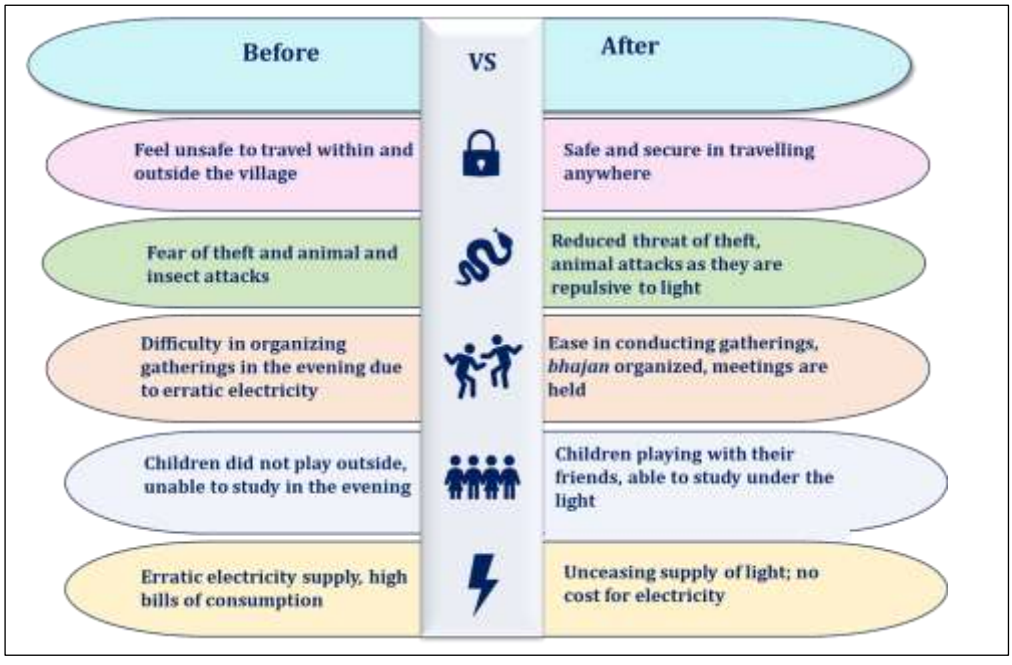
In addition to the positive impact on the beneficiaries, it has also ensured increased livelihood of the members of the community. This unintended outcome, was seen especially among the women as increase in their livelihood opportunities that have been exacerbated by the installation of solar lights. Moreover, in the effect towards community ownership and capacity building of women, *urja* volunteers have been recognized for maintenance. This has proven effective in helping maintain the upkeep of the installations and has also enhanced the role of women in the community.

As the *urja sakhis* have been primarily responsible for the maintenance of the solar lights, they have pointed out certain gaps in the maintenance of the installations. As they face challenges in accessing experienced technicians for the up-keep, *urja sakhis* have pointed this as a hindrance in the proper functioning of the structures. Moreover, gaps have also been noted in the functioning of the installations as a community endeavour, as the majority of the maintenance is done by the NGO partner, PRADAN. This points out a few gaps in the effective functioning of the system as a sustainable community effort, as envisaged as a primary objective of the intervention.

Respondents are largely satisfied by the installation of the solar lights; however, the need for additional installations to increase coverage was also suggested by beneficiaries.

To gauge the effectiveness of the intervention, the below infographic displays the situation and issues prior to the intervention of the program. In juxtaposition to that, it also displays the changes that have happened after the installation of the solar lights.

Transformational changes after installation of solar lights



> *"I am fully satisfied…women and children can go out during night safely, people sleep outside fearlessly, and able to conduct meeting outside"*
>
> *– Urja Sakhi, Bhagora, Raigarh*

"Now people from other village are so much excited that they want to install solar street light in their own village"

– Urja Sakhi, Ganjpur, Lailunga

3.4. COHERENCE – How well does the Intervention fit?

Energy production and emissions being the dominant contributor to climate change, the world is moving towards ensuring increased access to affordable and sustainable usage of clean and renewable energy. As 3 billion people in the world, rely on non-renewable sources of energy such as wood, coal, charcoal or animal waste for cooking and heating, concerted efforts are being made to mitigate their usage. It is being recognized that the lack of access to renewable energy supplies and mechanisms for change are proving to be a hurdle to human and economic development. At the global level, the 7th Sustainable Development Goals has been conceptualized towards ensuring the universal access to affordable, reliable and modern energy services. In addition to India's collective endeavours at the global level, implementation has also been done through various programmes such as the Atal Jyoti Yojana. This program was implemented in various parts of the country, with the primary goal of providing solar lighting systems at public spaces to enhance the quality of life and safety. Moreover, the purpose of achieving affordable and clean energy, has also been consciously incorporated within the framework of the intervention done through HDFC Bank CSR. Various efforts such as energy management and energy efficiency have been taken for reducing adverse environmental impact. Further, implementation of projects on renewable energy, through community interventions are central to the Parivartan initiative.

In addition to increasing the usage of solar energy in the community, it is also imperative to ensure the enhanced understanding of the importance of renewable energy. This intervention aimed to achieve heighted comprehension of benefits of solar lights among the members of the community. The installation and the mobilization of the community has induced an increased awareness on renewable energy among the community.

The efforts of educating the community on the importance of promoting renewable energy can be well seen among the community members. Through the qualitative insights from the FGDs, it is highlighted that the members of the village recognize solar lights as renewable forms of energy. Participants have opined that in comparison to coal and wood, solar power can be regenerated. This also aids to reduced smoke generation, which in turn reduces emission of the harmful gases. From the narratives of women, it is highlighted that solar lights are environmentally friendly. Insights from the interviewed village heads also reiterated the promotion of solar energy as a critical measure for maintaining a balance in the environment. Prior to the intervention, kerosene was used to light lamps, causing air pollution. The installation of solar lights has reduced the usage of kerosene lamps; village heads opined that this may have also resulted in reduced air pollution. The awareness has also ensured increased usage of solar energy in various forms such as solar pumps.

Understanding of Renewable energy through community

Firm understanding of the functioning of the solar lights could be seen among the members of the community. There was a shared comprehension within the community on the automatic functioning of the solar light structures. The light switches on at 6 P.M. and off at 6 A.M.

Participants also highlighted that the solar lights are functional even during the rain, as opposed to the conventional lights.

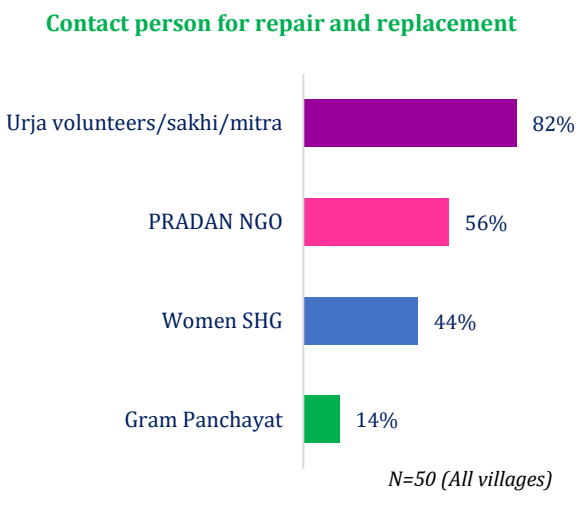
The above infographic displays the understanding of renewable energy and its usage among the members of the community, as gathered from the FGD and the IDIs with Gram Panchayat members and *Urja* Volunteers.

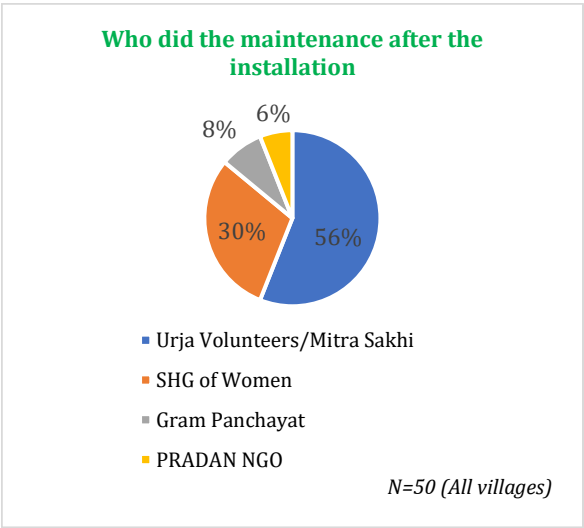
3.5. SUSTAINABILITY – Will the benefits last?

The maintenance of the installations was envisioned to be a community-based effort. There is a sense of community ownership of the maintenance and upkeep of the solar light structures. From the inception, focus was made on installing the spirit of equal ownership for use as well as maintenance of the system among all community members. For the repair and maintenance of the light, collection of funds is done at the village. This is for minor repairs and upkeep of the systems. However, for major renovations, it is done mostly by PRADAN.

Moreover, the community ensures that the upkeep of the structure is taken up by the community. To this effect, a pool of *Urja* volunteers was identified and selected across all the villages as part of the intervention for trouble shooting and maintenance of the solar street lights. In each location there are two to three designated and functional *Urja Sakhi or Urja Mitra.* In most of the locations, these individuals have been selected through joint decision at community meeting. They have also received orientation and training for fulfilment of their responsibilities. They work on ensuring that the all the structures are working well, replace their batteries and clean the structure. At the community level, members participate in cleaning the dust of the panels and the lights.

During the survey, 82 percent of the sample villages rightly indicated that the *Urja* volunteers/*sakhi/mitra* were the contact persons for repair and replacement. Next, 56 percent indicated PRADAN NGO and 44 percent indicated women SHG to be the contact point for repairs. Similarly, in more than half villages (56%) maintenance of solar lights post installation was reported to be done by the *Urja* volunteers followed by women SHG (30%).





> *"We have to make sure that the dust doesn't get in. So, it keeps getting in. If there is too much dust, it doesn't get enough light. So, we have to check where it will burn. Okay. So, we have selected Solar Sakhi for this."*
>
> *- Jharguda Raigarh*

Presently, in some of the locations *Urja Sakhi or Urja Mitra* is taking care of the minor repairs in the system. They are in contact with electricians / technicians, whose help are being taken in case of need. In most of the locations, however, the prime responsibility of *Urja Sakhi or Urja Mitra* is to take note of locations where solar streetlight are non-functional and need repairing. They then inform PRADAN officials about the requirement of repair in their respective location.

According to the interviewed village heads, each and every community member using the streetlight facility have been oriented to take responsibility for safely and security of the unit. They have to ensure that no one is tampering the poles or breaking the panel or wire and the panels are being regularly dusted. Repair and maintenance are although a matter of concern. In few locations people try to repair the system on their own by climbing on the streetlight pole through ladder, but they fail to address issues which are mostly technical in nature. The major issue experienced in this regard was the discharge of battery leading to non-functionality of the system and the subsequent delay in repair. Approximately 10 to 15 days are being spent on repair of the battery and re-installation of the system. In some of the locations the delay ranges between 4 to 5 months.

The *Urja* Sakhis go around in the village to timely inspect the charge level of the system, condition of the panel and overall working condition of the light. In case of any requirement for repair and maintenance of the system, *Urja Sakhis* informs the local technician for looking into the issue and the required repair work. In case of any advanced technical issue, they try to resolve it with their own resources, and if the issue is still not resolved, they inform the concerned supervisor from PRADAN. Then, in case of minor issue the fault is immediately resolved by the visiting technician from PRADAN, and if the fault is something major then it taken few days for getting the light in working condition.

Presently, in most of the locations, community members have not experienced any major expense required for repair and maintenance of the solar based streetlight system. There are few minor expenses which are been taken care by the community. However, by and large the responsibility for repair and maintenance is borne by PRADAN. Village heads in few locations believe that community members should raise and manage their own fund meant for continuous running of the system. They also hope for having a government fund which can be utilized for taking care of the needs of repair and maintenance.

Urja Sakhis in few locations have set good examples of dedicated work. For instance, in one of the villages, some people objected the choice of location for installation of solar streetlight. They were not ready to give their land for installation work. These objections or communication gap was properly and timely tackled by the *Urja Sakhi*. Likewise, in one of the location the *Urja Sakhi* tried to collect money from the community for repair of the non-functional solar light, but unfortunately, she was unsuccessful in doing so because the community was not ready to contribute any money. One of the interviewed *Urja Sakhi* commented that during installation work more attention should have been given on strengthening the foundation of the pole with cement, so that it is secured from animals and people.

> *"If the light is damaged then I help in repairing it or replacing it."*
>
> *– Urja Sakhi, Choria, Narharpur*

> *"We check regularly if the bulb is active or fused. If fused, then by the help of a ladder we clean the bulb and check it up…we also check if the wire is cut or the problem is something else."*
>
> *– Urja Sakhi, Palva, Tokapal*

With regards to maintenance, *Urja Sakhis* have pointed out various challenges. They raised concern regarding requirement of a designated technician for taking care of the needs of repair and maintenance of the system. Payment to these technicians can also be provided for their services. This could also be a good

source of employment. Another suggestion was that of providing technical training to some of the individuals residing in the village itself, so that the person can take up repair work as and when required. Presently, the lack of trained technicians or personnels is a reason for the few numbers of non-functional solar streetlights. Some other challenges were also pointed out by the *Urja Sakhis*. In some cases, because of non-functionality of some of the lights, people continuously raise complain in front of them. They find difficulty in giving an exact reply to the queries of the people related to the days in which non-functional lights will become functional. In most of the locations community members expect *Urja Sakhi* to install more lights in the village. The *Urja Sakhis* themselves believe that the existing number of solar street light installed is insufficient to cater to the entire area, and that there are still areas in village under darkness.

> *"The places where there is very less communication or there is a lot of risk factor due to no lights, we can install lights. It is very much economical."*
>
> *– Urja Sakhi, Bangursiya, Raigarh*

> *"We need more lights for the places which are still in darkness. If there will be light it will be easier for people to commute"*
>
> *– Urja Sakhi, Badpali, Raigarh*

CONCLUSION & RECOMMENDATIONS

Chapter 4

Solar lights play a pivotal role in rural villages, offering a multitude of benefits that significantly improve the quality of life for beneficiaries. Firstly, solar lights provide a reliable source of illumination, particularly in areas where access to electricity is limited or non-existent. This ensures that villagers can engage in activities such as studying, working, or socializing even after sunset, thereby enhancing productivity and safety. Moreover, solar lights contribute to economic development by reducing reliance on costly and environmentally harmful alternatives such as kerosene lamps or diesel generators. Solar lights serve as a catalyst for socio-economic development, environmental conservation, and community empowerment, ultimately improving the overall quality of life for residents and contributing to sustainable development goals on both local and global scales.

Acknowledging the significance of solar lights, the initiative has effectively brought about change within the community. It aligns closely with the community's needs and preferences, employing a community-centered approach to ensure maximum impact. Through active community involvement, the initiative has successfully implemented crucial changes within the community, resulting in tangible improvements in the lives of its members.

The members of the community have been able to report various positive changes after the installation of the solar lights –

- Enhanced safety and security of residents owing to decreased threat of animal attacks and theft
- Increased mobility of beneficiaries, especially seen among women and adolescent girls
- Enhanced socialization, gatherings and meetings held within the community
- Increased involvement of children in playing and studying through availability of lights
- Community based maintenance and up-keep of the solar light installations
- Increased awareness of renewable energy and sustainable development among the community members

RECOMMENDATIONS

Based on the findings of the assessment, here are a few recommendations.

- Increase installations of solar lights to enhance the coverage of the benefits from solar lights
- As the findings have indicated gaps in the maintenance of the installations, training of technicians can be done for effective knowledge transfer for up-keep
- For ensuring maintenance of solar street lights, collection of village funds to be done efficiently and optimally at the community level
- Initiating collectivised initiatives for upkeep for sustainability
- Mechanisms for accountability for the up-keep of the installations at the community level

ANNEXURE

Data from village-level physical verification and observation of Solar Street Lights

	No. of SL	Installed	Checked	Currently functional	Light ID Given	Mounted on an iron pole	Have solar panel	Have LED Bulb	Have LED bulb with cover	Have battery	Have battery storage	Have a battery charge controller	Automatic switch on/off	Have HDFC Branding
Bastar														
Chidpal	19	19	19	19	0	19	19	19	19	19	19	19	19	19
Koynar	14	14	14	13	0	14	14	14	14	14	14	14	14	14
Lendra	13	13	13	12	0	13	13	12	12	12	13	12	13	13
Toper	15	15	15	15	1	14	15	15	15	15	15	15	15	15
Arracote	13	13	13	13	0	13	13	13	13	13	13	13	13	13
Kurenga	12	12	12	12	0	12	12	12	12	12	12	12	12	12
Palva	16	16	16	16	1	16	16	16	16	16	16	16	16	16
Kondagaon														
Badaloor	17	17	17	17	3	17	17	17	17	17	17	17	17	17
Golawand	19	19	19	19	1	19	19	19	19	19	19	19	19	19
Hasalnar	35	35	35	35	1	35	35	35	35	35	35	35	35	35
Raigarh														
Amapali	10	10	10	2	0	9	8	2	2	2	2	2	8	7
Dhouradand	16	16	16	8	0	16	15	11	10	12	3	5	14	6
Ganjpur	10	10	10	0	0	10	10	0	1	2	0	1	10	10
Gerupani	12	12	12	3	0	8	8	5	4	4	0	5	10	4
Katakliya	10	10	10	6	1	10	10	9	9	9	3	4	10	0
Kilkila	14	14	14	7	2	14	14	8	9	8	9	11	14	14
Lamdand	14	14	14	2	0	13	12	2	2	2	2	2	12	11
Lohadapani	10	10	10	8	0	10	10	10	10	10	10	10	10	10
Narayanpur	10	10	10	7	0	10	9	9	9	9	9	8	9	9
Phulikunda	10	10	10	0	0	10	9	0	0	0	0	0	9	1
Rudukela	10	10	10	10	0	10	10	10	10	10	10	10	10	10

Sonajori	11	11	11	6	0	11	11	6	6	6	0	2	11	11
Tolma	10	10	10	6	0	10	10	10	10	10	7	10	10	0
Turtura	12	12	12	8	0	12	12	12	12	11	9	9	12	12
Badpali	10	10	10	9	0	10	10	10	10	10	10	10	10	9
Bagursiya	10	10	10	8	0	10	10	9	9	10	10	0	10	9
Banora	10	10	10	8	1	10	8	8	8	8	9	9	9	7
Bhagora	10	10	10	8	0	10	10	9	7	9	9	9	10	10
Delari	10	10	10	8	1	10	10	10	10	10	10	10	10	7
Dhumabahal	10	10	10	7	0	9	9	8	8	8	3	2	8	9
Jharguda	10	10	10	7	0	10	10	10	10	10	10	10	10	10
Kachhar	11	11	11	5	0	10	11	6	6	6	4	4	6	9
Kotarliya	10	10	10	5	7	10	10	9	9	8	5	5	10	8
Koylanga	10	10	10	4	0	9	8	4	4	4	4	4	6	8
Lebda	10	10	10	0	2	9	6	0	1	0	0	0	9	4
Nawagaon E	10	10	9	3	0	9	9	8	8	7	8	9	9	7
Pandaripani W	13	13	12	7	0	13	13	8	8	8	8	9	12	10
Sambalpuri	10	10	9	7	0	9	9	9	8	9	9	9	9	8
Sarwani	10	10	10	9	0	10	10	10	10	10	10	10	10	9
Shankarboga	10	10	10	6	0	10	10	10	10	10	10	10	10	9
Uttar Bastar Kanker														
Chichgaon	14	14	14	1	0	14	14	1	1	14	13	13	13	14
Haranpuri	10	10	10	1	0	10	9	1	1	3	1	2	2	8
Ranidongari	10	10	10	1	0	10	10	9	9	10	10	10	10	10
Tedaikondal	9	9	9	6	0	9	9	6	6	6	6	6	6	9
Bhiraud	16	16	16	16	0	16	16	16	16	13	13	13	16	15
Choriya	17	17	17	17	0	16	17	17	17	17	17	17	17	17
Gawarsilli	13	13	13	13	1	13	13	13	13	13	13	13	13	13
Jhaliamari	21	21	21	21	4	21	20	21	21	20	21	21	21	21
Kapaspoti	11	11	11	11	0	11	11	11	11	11	11	11	11	10
Mandradarha	26	26	26	26	1	26	26	26	25	26	26	26	26	26
Total	**643**	**643**	**640**	**458**	**27**	**629**	**619**	**515**	**512**	**527**	**487**	**493**	**605**	**554**