This report presents the process and findings of the Impact Assessment conducted for the Light for Education (LFE) programme for the year 2015 being implemented by SELCO in schools and hostels across Karnataka.
Introduction to Light for Education programme

The Light for Education (LFE) programme was started by SELCO in partnership with Menda Foundation in 2010 with an objective of providing safe and bright study light for rural students who otherwise had to rely on kerosene lamps for studying.

Besides providing insufficient lighting, kerosene lamps and candles have a number of health related impacts such as an increased risk of burns and an increase in harmful indoor air pollution. Through the LFE programme there has been a marked reduction in the use of kerosene and candles for lighting, as indicated in the report. The effectiveness of the distribution programme of lamps through schools and the provision of lights in hostels were surveyed during this impact assessment.

**LFE lamps in schools**: This solution has three important components, a centralized solar charging system, pocket size battery and LED study lamp.

- Each student is provided with a pocket size, light weight battery and a LED study lamp. The lamp is placed at home where students study at night.

- The battery (size of a soap) is carried to the school every day for charging.

- At school the batteries are charged by the centralized solar charging system. In the evening when it is time to go back home, kids carry the charged battery to home.

- A completely charged battery will provide light for 4 hours a day for 2 days.

**Hostel lighting**: The Solar lighting system contains Solar panels that are installed on the rooftop of the schools/hostels. The Panels convert the solar energy and store it in a central battery system which in turn powers DC lights installed in the study halls where students study in the evenings.

The Light for Education programme has reached 50,000 beneficiaries in 500 schools and 265 hostels in the last 5 years.
Objective and Methodology of LFE Impact Assessment

The LFE Impact Assessment 2015 is intended to gather and document data and impact statements to gauge the impact of the lamps and lights provided in the schools and hostels. The assessment will be used to improve the programme and allow for replication through the identification of best practices and lessons learned.

The Impact Assessment was conducted through surveys by the assessment team during October 2015 in approximately 15 schools and hostels across Karnataka. The survey recorded the response of 203 beneficiaries (students, teachers, parents and hostel wardens) of the above-mentioned programmes. The team consisted of members from SELCO India and SELCO Foundation’s Education Lab.

The questionnaire for the Impact assessment was designed to capture what was observed after the intervention, the benefits that were ascribed to the usage of the solar lights, the future potential, the issues faced during usage, etc. An important part of the assessment were observations made by the survey team to understand the impact of solar light, especially in cases where respondents were unable to explicitly articulate their views.

Process for LFE Impact Assessment

- **Stage 1:** Pre survey development
- **Stage 2:** Identification of respondents
- **Stage 3:** Selection and training of the survey team
- **Stage 4:** Impact assessment process
- **Stage 5:** Results of impact assessment
- **Stage 6:** Action plan development
Stage 1: Pre survey development

Two questionnaires were created for the Impact assessment – one for the hostels and one for the schools. The questions of the impact survey were framed to test the following broad parameters:

- Part 1 and 2 are for student & parent beneficiaries. The questions are on the impact of the LFE programme, its advantages and issues faced.
- Part 2 is for teacher beneficiaries. This is to gather information on the functioning of the LFE project in the school and changes noticed in student behavior (quality of homework, attendance rate, etc.)

Please see Annex for sample questionnaires used

Stage 2: Identification of the Schools and Hostels for impact assessment

The schools and hostels where solar lamps and lights were provided/deployed under the LFE implementation were listed and the ones for the survey were selected through cluster sampling technique.

The clusters consisted of the six districts of Belthangady, Chitradurga, Gadag, Hassan, Hosanagara and Tumkur. The schools and hostels were chosen such that the impact assessment covered some districts where LFE programme was implemented over a period of time, ensuring a mix of old and new schools and hostels (in terms of duration of LFE implementation), a mix of Government and Private schools and also a mix of Boys’ and Girls’ schools and hostels.
Given below are the Hostels and Schools where the LFE Impact Assessment was conducted.

### Schools- Lamps

<table>
<thead>
<tr>
<th>Region</th>
<th>School details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belthangady</td>
<td>1. Government High school</td>
</tr>
<tr>
<td></td>
<td>2. Sree Vishnumurthy Anudanitha, Hiriya prathamika Shale, Pattur, Kokkada post, Patrame grama, Belthangady tq</td>
</tr>
<tr>
<td>Gadag</td>
<td>3. Totadarya High School, Dambal</td>
</tr>
<tr>
<td></td>
<td>4. Government Higher Primary School, Haralapur</td>
</tr>
<tr>
<td></td>
<td>5. Government Lower Primary School, Haralapur</td>
</tr>
<tr>
<td></td>
<td>6. K.K.Nandikol High School, Hirevaddatti</td>
</tr>
<tr>
<td></td>
<td>7. S A V High School, Abbigere</td>
</tr>
<tr>
<td>Hosanagara</td>
<td>8. National High School, Teerthahalli</td>
</tr>
<tr>
<td>Tumkur</td>
<td>9. Govt girl high school, chelur, gubbi tq, tumkur dist</td>
</tr>
<tr>
<td></td>
<td>10. Sri Maradi Ranganatha Swamy Rural High School, Kallambella</td>
</tr>
</tbody>
</table>

For School-lamp study students, parents and teachers were surveyed.

### Hostel Lighting

<table>
<thead>
<tr>
<th>Region</th>
<th>Hostel details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chitradurga</td>
<td>1. MDRS backward class Holalkere, Chitradurga</td>
</tr>
<tr>
<td></td>
<td>2. Pre matric boys hostel At Nayakanhatti Tq Challakere Dist</td>
</tr>
<tr>
<td></td>
<td>3. Pre matric boys hostel At Thiyyapanhalli Tq Challakere Dist</td>
</tr>
<tr>
<td></td>
<td>4. Girls Matric hostel Chitradurga</td>
</tr>
<tr>
<td></td>
<td>5. Post Metric Girls Hostel, JMET, Chitradurga</td>
</tr>
<tr>
<td></td>
<td>6. Post Metric Hostel, Rangayyana Bagilu, Chitradurga</td>
</tr>
<tr>
<td></td>
<td>7. Post Metric Boys Hostel, Behind Petrol Bunk, Hosadurga</td>
</tr>
<tr>
<td></td>
<td>Chitradurga</td>
</tr>
<tr>
<td>Hassan</td>
<td>8. Pre matric Boys hostel, Mudalaippe (v) Holanarasipura (tq)</td>
</tr>
<tr>
<td></td>
<td>9. Pre matric Boys hostel, Somenahalli (v) Holanarasipura (TQ)</td>
</tr>
<tr>
<td></td>
<td>10. Pre matric Boys hostel, Koushika Hirahalli (v) Hassan (TQ), Hassan</td>
</tr>
<tr>
<td></td>
<td>11. Pre matric Girls hostel, Koushika Hirahalli (v) Hassan (TQ), Hassan</td>
</tr>
<tr>
<td></td>
<td>12. Pre matric boys hostel, Yasalura (v) Sakaleshpura (TQ), Hassan</td>
</tr>
<tr>
<td></td>
<td>13. Pre matric Boys hostel, Sakaleshpura (v) (TQ), Hassan</td>
</tr>
<tr>
<td></td>
<td>14. Pre matric Girls Hostel, Yalagundha (v), Hassan</td>
</tr>
<tr>
<td></td>
<td>15. Pre matric Girls Hostel, Karle (v), Hassan</td>
</tr>
</tbody>
</table>

For hostel lighting students and wardens were surveyed.
The sample size of the respondents is decided on the following rationale:

<table>
<thead>
<tr>
<th>Hostels</th>
<th>5 students (of different grade levels/ages) + 1 warden per hostel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>10% of the total class strength (classes in which the lamps were given) or minimum of 5 students (in case 10% of the total is less than 5), the corresponding number of parents and the respective class teacher(s).</td>
</tr>
</tbody>
</table>

Hence following are the number of respondents:

<table>
<thead>
<tr>
<th></th>
<th>Schools</th>
<th>Hostels</th>
<th>Students</th>
<th>Teachers</th>
<th>Parents</th>
<th>Wardens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hostels</td>
<td>Chitradurga</td>
<td>--</td>
<td>7</td>
<td>35</td>
<td>--</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Hassan</td>
<td>--</td>
<td>8</td>
<td>40</td>
<td>--</td>
<td>8</td>
</tr>
<tr>
<td>Schools</td>
<td>Belthangady</td>
<td>2</td>
<td>--</td>
<td>10</td>
<td>2</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Gadag</td>
<td>5</td>
<td>--</td>
<td>35</td>
<td>5</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Hosanagara</td>
<td>1</td>
<td>--</td>
<td>05</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Tumkur</td>
<td>2</td>
<td>--</td>
<td>10</td>
<td>2</td>
<td>--</td>
</tr>
<tr>
<td>Total</td>
<td>203</td>
<td>10</td>
<td>15</td>
<td>135</td>
<td>10</td>
<td>43</td>
</tr>
</tbody>
</table>

**Stage 3: Selection and training of the Survey team**

The survey team consisted of team members from Education Lab of SELCO Foundation who were fluent in English and Kannada. They were given an Orientation training (duration: 3 hours) on the objectives, questionnaire, methodology - paper based/android based device usage, communication approaches or dos and don’ts while conducting the questionnaire, recording the responses, logistics, FAQs etc.

**Stage 4: Impact assessment process**

The survey team was divided into batches and were sent to the respective schools and hostels to carry out the surveys simultaneously. The survey questionnaire was in English and the questions were read out to the respondents and were simultaneously translated into Kannada (during the read aloud process) by the survey team members. The survey team members recorded the responses on Android devices with a custom designed application to capture the data.

**Stage 5: Results of the Impact Assessment**

Data collected during the assessment was collated and assessed. Key results are highlighted in the following chapter.
A. Impact Assessment of solar lighting system for hostels

- Hostels’ Location: Chitradurga and Hassan
- Total no: of hostels = 15

1. Students’ survey

- Respondents: Students staying in the hostel
- Total no: of respondents = 75

Grades that the students surveyed belong to:

VIII - 12% ; IX - 29% ; X - 32% ; XI - 6% ; XII - 21%

In the above respondents, 70% were residing in the hostels before the installation of Solar lights.

Bright CFL lights were installed in the Study rooms with studying being the intended purpose. Low power LED lights were installed in the common areas such as dining hall, corridors and toilets.

The response of the students helped us understand the differences before and after installation of Solar Lights.
The responses received indicate that the students perceive availability of light at all times (especially during power cuts & during the absence of day light) to be the greatest advantage of Solar light and would recommend the technology to others. However, they also pointed out that increasing the duration of working of the solar light would be helpful when they have to study more. Also, any option of adjustment of brightness can be useful at certain time.

Nearly all the respondents (99%) expressed that they would recommend solar to others.

**Summary of the findings: Students' survey at hostels**

A majority (61%) of the students residing in the hostels belonged to grades IX & X. On an average, the students were staying in the hostel since the last 4 years.

The students expressed that availability of light during power cuts and post sunset for doing various activities such as studying, eating and playing were the major changes in the hostel environment that they observed following the installation of the Solar lights.
2. In-charge/Wardens' survey

- Total no: of respondents = 15

Frequency of the power cuts and time of the day that the power cuts happen

<table>
<thead>
<tr>
<th>Duration of power cuts</th>
<th>Time of day of power cuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3 hours</td>
<td>Morning</td>
</tr>
<tr>
<td>More than 3 hours</td>
<td>Evening</td>
</tr>
<tr>
<td>Unpredictable</td>
<td>Night</td>
</tr>
</tbody>
</table>

Power cuts in the hostel are typically more than 2-3hrs in a day. Power cuts are largely unpredictable and most frequent at night. Prior to the provision of solar lights, gas lights, candles and generators were primarily used to meet lighting needs.

Changes noticed in hostel environment after installing SELCO lights

- Availability of light during darkness: 23%
- Availability of light during power cuts: 30%
- Availability of Solar light for doing various activities: 23%
- Increased safety & security: 17%
- More convenience to use facilities such as bathrooms: 3%
- No changes observed: 3%
The chart below shows the approximate monthly expenditure on electricity before and after the Solar Lights were installed. The following chart indicates the approximate annual savings post the intervention.

Note: Date collected was crosschecked with the electricity bills for the previous month.

This shows a saving of 35-50% in many cases. This data indicates that the hostels are using solar lights to the maximum even when grid electricity is available.
The wardens pointed out the benefits of cost saving and the positive aspects of renewable energy apart from the predictable availability of lights as pointed out by the students.

When asked about the promptness of the service provided, 77% were satisfied. Some of the factors identified for improvement were system related including insufficient brightness of the light especially when more number of children stay in one room, demand for more number of lights in the common areas and extension of the benefit of the programme to other nearby hoste. Some wardens also pointed out some reduction in the available usage hours for few days in peak monsoon time.

Suggestions for improvement:

- The system has to be maintained by a single person: 13%
- Service is not satisfactory. Please improve it: 7%
- Provide lights in more places in the hostels: 7%
- No suggestion: 39%
- Extend the programme to the hostels located in the interior regions: 27%
- Brightness of bulb/light has to be increased: 7%
Summary of the findings: Wardens' survey at hostels

A majority (67%) of SELCO Solar light installations were done in 2013 and the hostels have a power cut of more than 3 hours in a day. The timings are unpredictable and mostly happen during the nighttime. The usage of the solar lights varies according to the need and is mostly used for studying and cooking purposes. In all the hostels, on an average 1 Solar light per room is installed in 8 rooms (min-2 & max-33).

On similar lines to the students, the wardens informed that the major change in the environment after installing the Solar lights was the availability of lights at all times for doing various activities. Before solar lights, most of the hostels used to have alternate sources such as gaslights, generators, emergency lights and Kerosene lights to address the power outages. Three hostels (Pre matric Boys hostel at Hira Halli-Hassan, BCM Pre matric  Girls hostel at Koushika Hira Halli- Hassan and Pre-matric Girls Hostel at Yalagundha-Hassan) were using other solar lights before SELCO lights were installed and they informed that these lights were not working.

In terms of economics, the hostels on an average were spending around Rs.2,346 (min-250; max-26000) per month for electricity before the SELCO Solar lights were installed. This expenditure reduced to Rs.1,743 ( min-150; max-20000). On an average, the annual savings per hostel was Rs.7,230 (min-0,max-72000) or a reduction of 36% on expenditure majorly because of installation of solar lights.

In terms of advantages of Solar lights, the wardens echoed the same aspects as the students i.e. availability of light at all times and economics in addition to it being a Renewable energy & less prone to accidents. A majority of wardens (67%) do not see any disadvantages with the solar lights. They also informed that there were no major issues with the system. Battery overuse is the most common issue followed by brightness of the light not being sufficient. Around 87% of the wardens were satisfied with the services of SELCO. There were no suggestions from the wardens to improve the overall product and service. All the hostels informed that they would require additional Solar light installations in areas along with the installations in the study room and dining area. They also suggested that the hostel lighting programme by SELCO has to extended to other hostels in remote areas.

All the hostel wardens informed that the hostels do not avail the use of any Government Programme/scheme related to Energy (For example- Solar, Bio gas, ICT etc.). We could look for possible interventions.
B. Impact Assessment of solar study lamps at schools

1. Students’ survey

- Total no: of respondents = 60

The students surveyed belonged to the following grades V – 10%, VIII-2%, IX-2%, X-58%, XI-28%.

Out of the students surveyed, 48% of the students were using solar lamps since 2 years and 52% were using the lights since 1 year. The sources of light used in homes apart from solar lighting are primarily kerosene and candles.

The feedback from students indicates that the lack of a proper light source before solar lamps was impacting their study and health.

Though the intended usage of the solar lamp is for studying, we found that the lamp is being used for other activities like cooking, going out in the dark and other household work.

# Problems faced by the students before the intervention

- Could not study at home after school hours nor could complete: 68%
- Had to postpone the tasks for the daytime: 8%
- Inconvenience while using candles & kerosene lamps for: 4%
- Light from Kerosene/oil lamps/candles was not enough to study: 20%

# Usage of Solar light at home for various activities

- As a torch: 9%
- Cooking: 16%
- Household work: 59%
- Studying: 16%
Depending on the frequency and duration of power cuts solar lamps were used for roughly 2 hrs per day. Other members of the household and friends benefit from the light when the student is using it to study. When not being used by the student for studies, family members and friends use the light.

Due to availability of light at all times, especially after dark, 97% of the students expressed that they were able to complete their homework on time after the intervention of solar lamps.
Almost all (93%) expressed that they would recommend solar to others.

Summary of the findings: Students' survey at schools

A majority of students (66%) informed that they were unable to study and complete home work after school hours when there was no Solar light at home. They used Kerosene lights, oil lamps and candles but the light from these sources was not sufficient to study. Kerosene was the most preferred source as it was available in the market, could be purchased (in black) when required and the families use it for other purposes such as cooking. Some households also had access to electricity but there were frequent power cuts.

A majority of the students (47%) use the Solar lamp everyday for around 2-3 hours at home. The usage varied depending on power cut. The Solar lamps were used by the students mainly for studying. Their siblings shared the light for studying and the other members of the family, especially parents, used it for household activities.

Around 41% of the responses received indicate that there were no major issues with the lamp. The common issues were battery being lost by the students, connector problems, and no charging facility available during the holidays. A majority of the students (82%) expressed the need for availability of usage of Solar lamps during holidays.

When asked about the benefits of the Solar Lights, the students informed that availability of light at all times, compactness of the light enabling it to be carried from one place to another (i.e. as a torch) were the major advantages.
2. Teachers’ Survey

- Total no: of respondents = 10

Given below is the data and the analysis of the aspects surveyed and the responses that were received.

Note: The 10 schools have been denoted by codes S1 – S10 to simplify representation. The key is as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>School name</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>Sri Maradi Ranganatha Swamy rural high school, Kallambella, Shira tq, Tumkur</td>
</tr>
<tr>
<td>S2</td>
<td>Govt girl high school, Chelur, Gubbi tq, Tumkur dist</td>
</tr>
<tr>
<td>S3</td>
<td>Government Lower Primary School, Haralapur, Gadag</td>
</tr>
<tr>
<td>S4</td>
<td>Shri Rama High School, Pattur/Sree Vishnumurthy Anudanitha, Hiriya prathamika Shale, Pattur, Kokkada post, Patrame grama, Belthangady tq</td>
</tr>
<tr>
<td>S5</td>
<td>Netaji subash chandra Bose High School/Government High school, Belthangady</td>
</tr>
<tr>
<td>S6</td>
<td>S A V High School, Abbigere, Gadag</td>
</tr>
<tr>
<td>S7</td>
<td>Totadarya High School, Dambal, Gadag</td>
</tr>
<tr>
<td>S8</td>
<td>K.K.Nandikol High School, Hirevaddatti, Gadag</td>
</tr>
<tr>
<td>S9</td>
<td>Government Higher Primary School, Haralapur, Gadag</td>
</tr>
<tr>
<td>S10</td>
<td>National High School, Teerthahalli, Hosanagara</td>
</tr>
</tbody>
</table>

The teachers surveyed taught the following grades:

IV-10%, VI-5%, VII-5%, VIII-25%, IX-25%, X-30%

**Effect of LFE programme on the students**

90% of teachers found an improvement in the attendance of students post the intervention. All of them expressed that there was a 100% improvement in the completion of homework on time, 80% noticed an improvement in overall student performance.

The teachers of Government Girls’ High Schools (Chelur, Gubbi Tq, Tumkur) and Sri Maradi Ranganatha Swamy Rural High school (Kallambella, Shira tq, Tumkur) informed that all the students in these schools require the Solar lamps because they belong to poor communities and experience major electricity supply problems. The teachers of Nethaji Subhash Chandra bose school, Belthangady informed that the students stay in the interior regions of Belthangady and there is no access to electricity at all. The teachers of Totadarya High School (Dambal, Gadag) also mentioned that lamps have to be provided to students belonging to the regions of Gadagin and Dambal.
70% of the teachers expressed that the students could not afford to pay the Annual Maintenance Contract. Another 80% expressed that they were satisfied with the promptness of SELCO’s service.

Around 99% of the teachers informed that the schools do have any other educational interventions apart from Light for Education programme. Only Government Higher Primary School (Haralapur, Gadag) has “e-shala” (Digital Education programme) being implemented. All respondents expressed that they would recommend solar technology to others.
Summary of the findings from teachers survey at schools

In the 10 schools surveyed, it was observed that the students of higher grades were given a priority over others while providing the lamps. This could be because they were older students who needed to spend more time on study to prepare for the Board exams. On an average in every school, 25% of the total numbers of students were given solar lamps. Necessity (students appearing for Board exams), time to be spent on study, ability to use, affordability and willingness to pay the AMC were some of the criteria use to choose the students for whom the lamps were provided.

The teachers feel that the solar study lamps have helped the students improve as they are able to allocate more time to study, complete the assignments on time and have been coming to school regularly. The teachers expressed that the other aspects that might have influenced the students’ improved performance were improved teaching, regular SDMC meetings, participation of the students in various competitions, improvement in attendance, students getting more time to study during the night.

Around 80% of the teachers expressed that other classes’ students and parents were interested in these study lamps. Around 80% of the teachers said that students charge their batteries once in 2-3 days (given that a fully charged battery can support the light for 4-5 hours). On the day of the survey and average of 30% of the batteries were kept for charging.

Most of the schools were satisfied with the maintenance services provided by SELCO.

There have been some minor technical issues on an average of 3% of the lamps provided in all the schools. However, some schools (esp. Government Girls’ & Boys’ High schools, Chelur, Gubbi tq, Tumkur) expressed that there was no proper communication or grievance redressal system. They quoted several instances in which they called up the concerned service person(s) and requested him to come, but they received no response. Government High school, Belthangady informed that the service person came only once after the lights were distributed. The teachers of Sri Maradi Ranganatha Swamy Rural High school (Kallambella, Shira tq, Tumkur) informed that the components of the lamp were very loose. They had got them soldered with a local welder. The teachers of Government Higher Primary School (Haralapur, Gadag) informed that the lights stopped working from the second year onwards. On an average, the number of days between recording of a complaint and repair/replacement of a system has been between 7 and 8. The maximum number of days (60) has been for K.K. Nandikol High School, Hirevaddatti, Gadag.

Most of the teachers informed that the students belong to very poor families and are unable to afford to pay for school fees/school supplies and AMC charges as well. The principal of Sri Maradi Ranganatha Swamy Rural High school (Kallambella, Shira tq, Tumkur) requested the survey team to cancel the AMC charges and provide lamps to all the students in the school.
3. Parents’ Survey

- Total no: of respondents = 43

Most of the children come from a humble background. Majority of the parents are involved in agriculture and few others in local business and daily wage labour.

Quality of power – Most of the parents indicated that there is more than 2-3 hours of power cuts on a daily basis. The time of the power cut, through unpredictable, mostly happens in the evening hours affecting the valuable study time of the children. Majority of households use kerosene (59%) and candles (32%) for lighting during power cuts.
On average the monthly household income is Rs. 6,560, average monthly household expenditure on fuel for their children to study was around Rs. 325 (or an average of 5% of their monthly income). Following the LFE intervention this expenditure reduced to an average of Rs. 161 (or an average of 2.44% of their monthly income). Resulting in an average monthly saving of Rs. 164 per month.

No other Solar light apart from the SELCO Solar Lamp is being used in the households. 95% of the parents conveyed that there is a requirement of Solar home lighting system. Around 56% parents informed that they received enquiries from people outside the households on the SELCO Solar lamp. Almost all of them (98%) said that they would recommend solar to others.

79% of the parents conveyed the requirement of solar lamps during school holidays/vacations.

Perceived impact of the lamp -

In general the parents feel that the lamp has contributed in more engagement of the children in studies. The children feel like studying for longer hours and there is a marked improvement in regularity of completion of assigned tasks.
Summary of the findings: Parents’ survey at schools

A majority (65%) of the parents surveyed were farmers followed by labourers and housewives. Kerosene and oil were the major fuels used at home followed by candles.

The duration of power cuts at home were very unpredictable and were generally for more than 3 hours with the majority (37%) being at nighttime.

Around 84% of the parents informed that no modifications were required in the design of the solar lamp. However, some parents suggested the following modifications to be made:

- Increase the brightness of the light
- Increase the size of the lamp so that more light is obtained
- Decrease the weight of the lamp so that it can be carried around easily
- Provide more battery backup
- Change the shape of the light from a study lamp to a lantern so that it could be hung in the middle of the room and the light spreads everywhere.

Around 45% of the parents expressed that they were unable to pay the AMC charges due to the low household income. On average households saved roughly Rs.165 per month by using the SELCO solar lamps.
The Light for Education is a unique program for providing affordable and sustainable source of lighting to people suffering from poor quality grid supply. The overall impact of the program has been substantial as captured in the survey. There is an improvement in the quality of light in terms of brightness and absence of immediate health impact. This has led to more concentration in learning and regularity in studies. The teachers and parents have been able to see marked improvements in the children. The lamps project has contributed to better attendance and performance in the school. The solar lights in the hostel have contributed to savings in electricity bills, which also indicates the potential of such a project. The saving in kerosene in the houses using solar lamps has been quite significant. The lamps have also helped other members of the household to come together and do other activities.

There has been certain feedback on ideas of improvement. The most common improvement suggested is to increase the number of lights and also the backup of the battery for longer usage. This is a continuous process and many hostels have opted for more lights based on the size and number of children.

The suggestions for the solar lamps are in the line to make it more portable by making it a lantern model and reducing the weight further. But this has been a conscious decision of the project to continue the study lamps model so that the lamp in used for studying and not get diverted to other household chores.

Most of the respondents have indicated the need to expand the program and reach out to more hostels and schools, especially in remote areas. This is an important understanding and shows how acute the need is and potential to bring in more partners and expand the program to benefit more number of children.

Conclusion and way forward
Clockwise from top – (1) Parents’ survey at Pattur, Belthangady; (2) BCM hostel, Chitradurga; (3) Pre matric Girls Hostel, Yalagundha; (4) Teachers’ survey at Nethaji Subhash Chandra high school, Savanalu; (5) System at Pre matric Girls Hostel, Yalagundha