Stiftung Solarenergie (StS) & Hybrid Social Solutions (HSSi)

SOCIAL IMPACT ASSESSMENT

FINAL REPORT
I – Background

1. Planète d’Entrepreneurs
2. Social Impact Assessment
3. StS/HSSi
4. An Overview of the Philippines
Planète d’Entrepreneurs

Student organization funded by HEC Paris business school and French corporate firms

Created in 2009 by three HEC students

3 teams and 14 active members

10 missions completed

A database of 600 social entrepreneurs

Planète d’Entrepreneurs main objectives:

• To help social entrepreneurs assess their impact

• To promote social entrepreneurship:
  • Articles on website: www.planetedentrepreneurs.com
  • Business Cases for HEC Paris

• To carry out applied research work
Summary

I. Background
II. Methodology and process of the mission
III. Results of the study on end-customers
IV. Insights on Account Managers
1. Carried-out missions

Missions carried out in 2010-2011

Cambodge Agriculture
Inde Water
Philippines Social Responsibility
Argentine Social insertion
Brazil Craftsmanship
Ethiopia Nutrition

Missions carried out in 2011-2012

Inde Solar energy
Bangladesh Water Treatment

Social impact assessment mission

<table>
<thead>
<tr>
<th>End customers</th>
<th>Impact on revenue</th>
<th>Impact on health</th>
<th>Impact on Education</th>
<th>Impact on livelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Account Managers</td>
<td>Profile Training &amp; After-sales service</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Social impact assessment
What is Social impact assessment?

Definitions

‘Social Impact Assessment (SIA) includes the processes of analyzing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions. Its primary purpose is to bring about a more sustainable and equitable human environment.’

International Principles for Social Impact Assessment

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• External and internal communication</td>
<td>• Risk of over-monetization</td>
</tr>
<tr>
<td>• Clarity on Governance</td>
<td>• Interpretation</td>
</tr>
<tr>
<td>• More effective and focused decisions</td>
<td>• Exhaustiveness versus feasibility</td>
</tr>
<tr>
<td>• Investment mentality</td>
<td>• External accreditation</td>
</tr>
</tbody>
</table>

=> Planète d’Entrepreneurs’ report is a first step for further and regular evaluation
2. Social impact assessment
Why assess social impact?

Main objectives

1. **TO ASSESS**
   To evidence your social impacts and see how you meet your social mission and how you could maximize it

2. **TO MONITOR**
   To set up practical social metrics to follow, monitor and scale-up your social impacts in the future

3. **TO COMMUNICATE**
   To design some communication tools for investors and local partners, providing them with concrete and positive outcomes

**Reminder**
Planète d’Entrepreneurs chose to work on the SROI methodology as a working baseline. However, SROI is an academic and scientific framework that needs to be more flexible for social entrepreneurs. Our methodology tries to be adapted to each social project and its specificities.
2. Social impact assessment
How to assess social impact?

The SROI Framework

Definition
The Social Return on Investment is a principle-based method for measuring social and environmental value (not currently reflected in conventional financial accounts) and compare it to resources invested. The SROI framework incorporates social, environmental and economic costs and benefits, providing a bigger picture of how value is created or destroyed.

Guideline
At the end of the process, SROI is able to assign a monetary figure ("the ratio") to the value created ("how much social value created for 1$ invested"). But more than credible numbers, SROI provides a framework that captures the main components and benefits of a project.

What we kept
• The stakeholders’ approach
• The theory of change
• The Impact Map framework
• The quantitative approach

What we changed
• An internal tool rather than a scientific study
• More qualitative results
• A focus on the direct stakeholders
• Figures but no monetization
HSSi is a for-profit social business launched in 2010 in the Philippines. It is specialized in **distributing solar lamps in rural areas**. The product is manufactured by Sun Transfer, funded by Stiftung Solar Foundation and imported by HSSi.

“The Mission of Stiftung Solarenergie is to FIGHT POVERTY in the Philippines by providing all OFF-GRID villages with SUSTAINABLE access to solar energy through an empowerment oriented approach that leverages both market and philanthropic forces.”
• The final product includes a lamp, a battery, a cable and a solar panel.

• There are three different modes of lighting, the highest reaching 100 Lumen

• The retail price is 3500 PHP ($81)

The social objectives are:

- To bring light in remote areas
- To offer an alternative to existing lighting systems (kerosene lamps, batteries)
- To develop new activities within the communities (homework, economic activities, social meetings, ...)

Planète d'Entrepreneurs - Social Impact Assessment for HSSi – December 2011
3. Hybrid Social Solutions Inc.

A focus on the distribution model:

- HSSi relies on existing distribution networks
- It has more than 35 partners mainly in the Luzon and Palawan islands
- Most partners are MFIs (CARD, NWTF,...) which sell the lamps to their members during the weekly meetings hold by their account managers
- Most customers buy the lamp thanks to a loan
- Each island is supervised by an area manager who is an HSSi employee. He ensures the well-functioning of the partnerships and prospects for new ones
4. A quick overview of the Philippines

The Philippines has an estimated population of **94 million people**, mostly Christians, and it has a total land area of **300,000 km²**.

The Philippines is an archipelago comprising **7,107 islands**. The main islands are Palawan, the Visayas, Mindanao and Luzon where Manila is located.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GDP 2010</strong></td>
<td>$ 200 billion</td>
</tr>
<tr>
<td><strong>GDP/capita 2010</strong></td>
<td>$ 2,123</td>
</tr>
<tr>
<td><strong>HDI ranking 2011</strong></td>
<td>112nd</td>
</tr>
<tr>
<td><strong>Currency (for $1)</strong></td>
<td>43 Pesos (PHP)</td>
</tr>
<tr>
<td><strong>Population below the poverty line (2006)</strong></td>
<td>32%</td>
</tr>
<tr>
<td><strong>Population with less than 1$ per day (2009)</strong></td>
<td>26%</td>
</tr>
</tbody>
</table>

**Today, the unelectrification rate is 22%***

*Source: NEA & NSO*

One liter of kerosene costs approximately **60 PHP**.

**Sources:** Wikipedia, International Energy Agency
II – Methodology and process of the mission

1. Process of a Planète d’Entrepreneurs mission
2. Step 1: Preliminary studies
3. Step 2: Mapping the impacts
4. Step 3: The choice of the indicators
5. Step 4: Designing the tools
6. Step 5: Field studies
7. Step 6: Deliverables
Process of a Planète d’Entrepreneurs mission

Before the mission
• To prospect both through our database and on the field
• To agree with the social entrepreneur on the terms of the mission
• Preliminary work: to analyze the environment, read studies and draft the tools

During the mission
• To meet with the managers and define the scope and objectives of the study
• To design the impact map, the indicators and the questionnaires
• Field work: interviews, focus groups, data collection and design of the tool

What’s next?
• To write down an impact report and make a presentation for the entrepreneur
• To deliver a SIA tool with guidelines and recommendations
• Follow-up work
Step 1: preliminary studies

To better understand the market and the environment of the social business, Planète d’Entrepreneurs analyzes baseline studies as well as similar solar initiatives. The objective of this preliminary work is to define the main categories of impact and their relevance for the organization.

Therefore, in appendix there are some quotations, facts and figures taken from studies on solar energy and solar lanterns market concerning:

• The impact of kerosene lamps on health and safety
• The impact of kerosene lamps on education
• The impact of kerosene lamps on environment
• The impact of kerosene lamps on activity
• The potential limitations of solar energy program and solar lanterns.
Step 2: mapping the impacts

The Impact map
To isolate changes, SROI specialists recommend to develop an outcome map that depicts relationships between initiatives strategy and intended results. The impact map helps the entrepreneur to understand how he creates social, environmental or economic change by linking his mission, his objectives and his activities with the outcomes.

How to complete it?
1. Identification of the stakeholders (any people/organization impacted by the social business)
2. Analysis of the way they are related to the social business: identification of their contributions
3. Definition of the outcomes: the potential and measurable benefits related to each activity
4. Listing of the indicators to collect and analyze the data able to assess each impact.

Impact Value Chain
Here is a simple but efficient way to understand the process.
## II. Methodology

### Step 2: mapping the impacts

**Customers impact map (abstract: focus on economic situation improvement)**

<table>
<thead>
<tr>
<th>IMPACTS</th>
<th>NATURE</th>
<th>INDICATORS</th>
<th>Questions</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>How would you describe the change?</td>
<td>What kind of impact is it?</td>
<td>How would you measure it?</td>
<td>How would you ask beneficiaries?</td>
<td>Where did you get the information from?</td>
</tr>
<tr>
<td><strong>ENERGY SAVINGS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kerosene consumption</td>
<td>Direct / Quantitative</td>
<td>Amount of consumption decrease/month</td>
<td>How much Kerosene did you buy before buying the solar lantern? How much kerosene do you buy today? What is the price of 1L of Kerosene?</td>
<td></td>
</tr>
<tr>
<td>Battery consumption</td>
<td>Direct / Quantitative</td>
<td>Amount of consumption decrease/month</td>
<td>How many batteries did you buy? How many batteries do you buy today? What is the price of a battery?</td>
<td>Indirect calculations</td>
</tr>
<tr>
<td>Generator</td>
<td>Direct / Quantitative</td>
<td>Amount of consumption decrease/month</td>
<td>How many liters of fuel did you use before solar lantern? How many liters do you use today? What is the price of one liter?</td>
<td></td>
</tr>
<tr>
<td><strong>ADDITIONAL INCOME</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional revenue</td>
<td>Direct / Quantitative</td>
<td>Additionnal income per month thanks to the solar lantern</td>
<td>How many paid additional hours per today? What is the revenue linked to those hours?</td>
<td>Customers questionnaires</td>
</tr>
<tr>
<td>Mobile charging station</td>
<td>Direct / Quantitative</td>
<td>Additionnal income thanks to mobile charging</td>
<td>Do you sell mobile charging to you neighbors? How often and how much do you charge?</td>
<td>Customers questionnaires</td>
</tr>
<tr>
<td><strong>OTHER SAVINGS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crops loss</td>
<td>Direct / Qualitative</td>
<td>Amount of crops saved?</td>
<td>Do you feel you have less crops loss since you have a solar lantern? If yes, how much money do you think you saved?</td>
<td>Customers questionnaires</td>
</tr>
<tr>
<td>Mobile charging</td>
<td>Direct / Quantitative</td>
<td>Savings per week</td>
<td>Frequence of mobile charging B/T Price of mobile charging? Transport costs B/T?</td>
<td></td>
</tr>
</tbody>
</table>
Step 3: the choice of the indicators

How to choose the indicators?
Each impact has to be measured with relevant indicators. The study has to be confined to 2-3 indicators max. per impact:
• To get more precise results during the given evaluation period
• Because some indicators would require a long scientific approach
• To highlight qualitative data instead of focusing only on figures and quantitative information

Indicators nature and sources:
• The indicators selected will be both quantitative and qualitative
• They could be either direct (e.g. extra revenue) or indirect (e.g. savings allocation)
• They can be measured by different methods: questionnaires, interviews, focus groups, reports etc.

Two different comparative approaches to design indicators:
1. Samples approach: Beneficiaries (“control group”) and non-beneficiaries (“target group”);
2. Timeline approach: Situation before and after buying the product/working for company.
>> Method chosen by Planète d’Entrepreneurs for the mission
Regarding the impact reports on solar energy (see appendix), the study will only focus on the indicators below:

- Kerosene Savings
- Additional Revenue
- Living Conditions
- Impact on Economic Situation
- Air Quality Improvement
- Safety
- Time saved
- Day-to-day activities
- Impact on day-to-day life
- Studying Time
- Academic Level
- Convenience and Motivation
- Impact on Education

Planète d'Entrepreneurs - Social Impact Assessment for HSSi – December 2011
Step 4: tools design

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Planète d'Entrepreneurs - Social Impact Assessment for HSSi – December 2011
Building a Questionnaire

- Build an impact map to bring out the main impacts of HSSi on stakeholders;
- Develop indicators to assess those impacts;
- Build questionnaires which will allow us to measure effectively the indicators.

Administrating a Questionnaire

- Depending on the stakeholder and on the way it is administrated, a questionnaire interview should last between 20min to 45min;
- There should be very few intermediaries between the surveyor and the interviewee (only 1 translator) in order to collect objective information;
- According to the culture, sex, age of the interviewee some questions can differ.

Changing a Questionnaire

A questionnaire needs to be changed according to on-field observations:
- Some questions are not relevant/clear/useful enough;
- Some questions/indicators need to be changed to better measure an impact;
- Questions must be added to collect unpredicted valuable information.
Scope of the study

Who?
The study focused on two major stakeholders* of HSSI:
• the end-customers who buy the solar lanterns for their personal use
• the MFI members who sell the solar lanterns: CARD & NWTF

What?
For the first group, the study focused on the impacts the use of the solar lamp has on savings, education and day-to-day life.
For the MFI members, it focused on the impacts on revenue and social position.

Where?
The study took place in Mindoro and Palawan in about 30 barangays. HSSi entered this market about a year ago so the before/after study makes sense.

When?
The study took place in December 2011. The goal is to pursue the study on the long run to monitor the indicators chosen in the social impact assessment tool created during the mission.

• A complete social impact assessment would take all the stakeholders into account but due to limited time and resources, the study focused on those who seem the most important.
Step 5: field studies

Sample & Resources

The villages were chosen in the islands of Mindoro and Palawan. Both on-grid and off-grid villages were on the agenda and no preselection was made in terms of age, sex, activity so as to guarantee a random sample.

- 134 customers and 16 account managers were interviewed in about 30 barangays
- 697 people under study (in the households of the interviewees)

End-Customers:

- **Mindoro:**
  - 2 PDE members
  - 20 villages
  - 38 customers
  - 2 translators

- **Palawan:**
  - 2 PDE members
  - 20 villages
  - 96 customers
  - 2 translators

Account managers:

- **Mindoro**
  - 2 PDE members
  - 8 interviews
  - 2 translators

- **Palawan**
  - 2 PDE members
  - 8 interviews
  - 2 translators

21% of customers were CARD members, 78% were NWTF members

Planète d'Entrepreneurs - Social Impact Assessment for HSSi – December 2011
Planète d’Entrepreneurs provides its partners with:

- **The final impact report, including:**
  1. An impact evaluation based on the indicators selected
  2. Data, facts and figures enabling the partner to better understand its environment
  3. Recommendations based on field observations

- **A follow-up tool including:**
  1. A data collection and calculation tool
  2. A Penetration tool
  3. Questionnaire templates
  4. An impact map
  5. Tool tutorials to run new SIA
## Step 6: final report & deliverables

### Disclaimer

<table>
<thead>
<tr>
<th>What can be taken for granted:</th>
<th>What can not be taken for granted:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All data was collected through the questionnaires administration</td>
<td>• Scientific and statistical evidence of impact</td>
</tr>
<tr>
<td>• All qualitative information relies on interviewees’ statements</td>
<td>• Systematical impact attribution</td>
</tr>
<tr>
<td>• Facts and figures were observed on the field</td>
<td>• Causality links (mainly for health)</td>
</tr>
<tr>
<td></td>
<td>• Account managers data as the sample is too limited</td>
</tr>
</tbody>
</table>
III – Results of the study on end-customers

1. Customer profile and sample analysis
2. Learnings about the solar lamp
3. Learnings about micro-credit
4. Learnings about other lighting systems
5. Learnings about mobile charging
6. Impact on customers
   1. Impact on economic situation
   2. Impact on education
   3. Impact on day-to-day convenience
1. Customer profile

- **94% of interviewed end-customers are women**

- A typical household is composed of **5.2 people**, amongst whom **1.9 children**

- **43%** of interviewed customers villages have electricity but **only 25% of households have electricity at home**

**End-customers and electricity**

**Off-grid villages**
- 43% Villages with electricity
- 57% Villages without electricity

**Off-grid customers**
- 25% Customers having electricity
- 75% Off-grid customers
1. Customer profile

- The majority of interviewed end-customers are **farmers (40%)**. Fishermen, who primarily use the solar lantern to work, represent **18%** of the interviewed end-customers.

- The average income of interviewed customers is **9640 PHP per month**. The **median income is 7000 PHP per month**.

- **18%** of end-customers earn **less than 3000 PHP per month**. **7%** of end-customers earn **more than 20 000 PHP per month**.

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### Housekeeper's job

- Farmer: 40%
- Owns a business (e.g. grocery shop): 14%
- Fisherman: 18%
- Miner: 5%
- Employee: 19%
- Other: 4%

### Repartition of the households per income brackets

- **<3000 PHP**: 18%
- **3000 PHP - 5000 PHP**: 21%
- **5000 PHP - 10 000 PHP**: 32%
- **10 000 PHP - 20 000 PHP**: 7%
- **>20 000 PHP**: 7%
2. Learnings about the solar lamp

Why did you buy a solar lantern?

* Multiple choice question / Open question

- The main reason for buying is by far *Better lighting*
- 17% of customers told they bought the lamp to start or develop a new activity such as sari-sari stores, fishing or farming
- *Savings*, 34% of answers, is also one of the main reasons for buying

The average customer has had the lantern for **8 months** and paid an average price of **3590 PHP** to buy it. He uses it about **5 hours per night** in average.
III. Results

3. Learnings about micro-credit

Average cost of the lantern

- **Paid Cash**: 3590 PHP
- **4-month loan**: 4140 PHP (Cost of the lamp: 3590 PHP, Interests of the loan: 550 PHP)
- **6-month loan**: 4514 PHP (Cost of the lamp: 3590 PHP, Interests of the loan: 924 PHP)
- **9-month loan**: 4800 PHP (Cost of the lamp: 3590 PHP, Interests of the loan: 1210 PHP)
- **12-month loan**: 4835 PHP (Cost of the lamp: 3590 PHP, Interests of the loan: 1246 PHP)

Repartition of the customers depending on the loan

- **Most of the customers apply for a 12 months loan (59%)**
- **The longer the loan the more expensive the lantern**: **4835 PHP for a 12 month loan**, (50 weeks) 3590 PHP when paid in cash
- **97% of customers** said that wasn’t difficult to pay back the loan every week
4. Learnings about alternative lighting systems

General information

Among these customers using alternative lighting systems today:
• 33% use kerosene
• 29% use flash lights (batteries)
• 25% of customers have access to electricity at home
• Few of them still use candles and generators

Do you still use other lighting systems than the Solar lamp?

* 134 respondents

No 27%
Yes 73%
4. Learnings about alternative lighting systems

Before the solar lamp, what kind of lighting system did you use?

* 134 respondents – Multiple answers allowed

- KS. lamps: 84%
- Candles: 19%
- Flash lights: 69%
- Generator: 8%
- Electricity: 25%

Today, what kind of lighting system do you use?

* 134 respondents – Multiple answers allowed

- KS. lamps: 33%
- Candles: 5%
- Flash lights: 29%
- Generator: 6%
- Electricity: 25%
4. Learnings about alternative lighting systems

a. Kerosene consumption

Today, only 1/3 of the customers still use kerosene lamps

• Today, among the customers still using kerosene, the monthly consumption has decreased by 4.4L

• The average monthly consumption per month is now 1L

*134 respondents

* Among the 112 kerosene buyers

Planète d'Entrepreneurs - Social Impact Assessment for HSSi – December 2011
4. Learnings about alternative lighting systems

a. Kerosene consumption

- Only 4% of customers use the same quantity of kerosene than before
- 13% of customers have decreased their consumption by 50%
- 12% of customers use 3 times as less kerosene as before
- Today, 76% of the respondents do not use kerosene

*134 respondents
b. Candles consumption

Today, the number of customers using candles has decreased by over 75%

- Today only 5% of the customers use candles compared to the 19% before.
- Before the solar lamp, the average consumption per month was about 20 candles.
- The monthly consumption is dramatically high for people living in remote areas, where the average cost for kerosene amounts more than 100 PHP/L.

⇒ Today, people only buy candles in case of emergency. This is no longer an alternative lighting system.

Use of Candles

<table>
<thead>
<tr>
<th></th>
<th>Before Sun Transfer 2</th>
<th>Today</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of Candles</td>
<td>19%</td>
<td>5%</td>
</tr>
</tbody>
</table>

*134 respondents

Planète d'Entrepreneurs - Social Impact Assessment for HSSi – December 2011
4. Learnings about alternative lighting systems

c. Flashlights consumption

Most of the customers using flashlights have stopped using it since they have the Sun Transfer 2

• **Highlights**: Among the 69% of the customers using flashlights before the Sun Transfer 2, **half of them use batteries** (43 customers out of 92) and **half of them use rechargeable flashlights** (49 customers out of 92)

• Today, **only 29% of the customers still use flashlights** (both batteries and rechargeable) compared to 69% before

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Use of flashlights

- Before Sun Transfer 2: 69%
- Today: 29%

*134 respondents*
4. Learnings about alternative lighting systems

d. Batteries consumption (for flashlights)

The average consumption of batteries has decreased by over 50%.

The customers only use 1 battery per week compared to 2 batteries before.

Average consumption of batteries (Number per week)

<table>
<thead>
<tr>
<th></th>
<th>Before Sun Transfer 2</th>
<th>Today</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

*45 respondents
4. Learnings about alternative lighting systems

e. Rechargeable flashlights

Today, the number of customers using rechargeable flashlights was cut by half.

• Today, among the 29% of the customers still using flashlights, **65% use rechargeable flashlights** (25 customers out of 39, compared to 49 before)
• Among them, 24% still pay to charge their flashlights (electricity outside)

How do you charge your flashlight?

*39 respondents*

**Before the Solar Lamp**
- Electricity at home: 47%
- Electricity outside: 53%

**Today**
- Electricity at home: 27%
- No flashlight anymore: 49%
- Electricity outside: 24%
5. Learnings about mobile charging

Today, 70% of customers use the solar lamp to charge their mobile phone

- 45% of customers do not use electricity outside anymore
- Household with electricity have also decreased their use of electricity using the solar lamp more often to charge their mobile phone
- A household owns 1,46 mobile phones on average

### Before the Solar lantern

<table>
<thead>
<tr>
<th></th>
<th>Electricity at home</th>
<th>Electricity outside</th>
<th>Solar lamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>37%</td>
<td>58%</td>
<td>5%</td>
</tr>
</tbody>
</table>

### Today

<table>
<thead>
<tr>
<th></th>
<th>Electricity at home</th>
<th>Electricity outside</th>
<th>Solar lamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>31%</td>
<td>13%</td>
<td>70%</td>
</tr>
</tbody>
</table>

Planète d'Entrepreneurs - Social Impact Assessment for HSSi – December 2011
6. Impact on end-customers

1. Impact on economic situation
   a) Savings on lighting system
   b) Savings on rechargeable items
   c) Savings on electricity
   d) Total savings summary
   e) Impact on additional revenue

2. Impact on education

3. Impact on day-to-day life
   a) Impact on indoor pollution
   b) Impact on safety
   c) Impact on time
   d) Impact on activity
1. Impact on Economic Situation

Methodology and main findings

To assess the impact of the solar lantern on the economic situation of the customers, Planète d’Entrepreneurs has focused on two main indicators:

The savings:

- On **kerosene** and **candles**, as the solar lantern may replace kerosene lamps and candles
- On **batteries** and **chargeable flashlights charging** (for off-grid-customers), as the solar lantern may replace flashlights
- On **mobile charging** (for off-grid customers), as the solar lantern may replace pay-per-charge model
- On **electricity** (for on-grid customers), as the solar lantern is used at home as an alternative lighting system

The additional income of the customers than can work later at night thanks to the solar lantern

**MAIN FINDINGS**

- A typical customer saves in average **4 060 PHP per year** thanks to the solar lantern. This is mainly due to savings on kerosene.

- The customers declaring additional working hours at night thanks to the solar lantern earn an additional **17 052 PHP per year** in average.
1. Impact on Economic Situation
Methodology to assess the impact on savings

Total savings thanks to the solar lantern

<table>
<thead>
<tr>
<th>Category</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEROSENE</td>
<td>(Number of liters of kerosene bought BEFORE - Number of liters of kerosene bought TODAY) * Price of a liter of kerosene</td>
</tr>
<tr>
<td>CANDLES</td>
<td>(Number of candles bought BEFORE - Number of candles bought TODAY) * Price of a candle</td>
</tr>
<tr>
<td>BATTERIES</td>
<td>(Number of batteries bought BEFORE - Number of batteries bought TODAY) * Price of a battery</td>
</tr>
<tr>
<td>MOBILE PHONES CHARGES</td>
<td>(Frequency of mobile phone charging outside home BEFORE - Frequency of mobile phone charging outside home TODAY) * Number of mobile phones * Price of a mobile phone charge</td>
</tr>
<tr>
<td>CHARGEABLES FLASHLIGHTS CHARGES</td>
<td>(Frequency of rechargeable flashlights charging outside home BEFORE - Frequency of RFL charging outside home TODAY) * Number of RFL * Price of a RFL charge</td>
</tr>
<tr>
<td>ELECTRICITY</td>
<td>Declared savings per month (based on monthly electricity bills)</td>
</tr>
</tbody>
</table>
Kerosene savings (for kerosene lamps) (1/2)

In average, customers save **268 PHP/month**, which amounts to **3094 PHP/year**.

- Today, customers have significantly reduced their kerosene consumption: in average, **4.4 liters are saved per month** thanks to the solar lamp.

- The average cost of a liter of kerosene is **61.09 PHP**.

- As a result, customers save in average **268 PHP/month**, which amounts to **3094 PHP/year**.

- 25% of the customers have reduced by more than twice their kerosene consumption.

*Among the 112 kerosene buyers*
# Kerosene savings (for kerosene lamps) (2/2)

## Consumption in absolute terms (# of liters)

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>Today</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td># of Liters of kerosene bought per week</td>
<td>1,2</td>
<td>0,2</td>
<td>1,0</td>
</tr>
<tr>
<td># of Liters of kerosene bought per month</td>
<td>5,4</td>
<td>1,0</td>
<td>4,4</td>
</tr>
<tr>
<td># of Liters of kerosene bought per year</td>
<td>62,4</td>
<td>11,8</td>
<td>50,6</td>
</tr>
</tbody>
</table>

## Savings (in PHP)

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>Today</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>cost of Liters of kerosene bought per week</td>
<td>73</td>
<td>14</td>
<td>59</td>
</tr>
<tr>
<td>cost of Liters of kerosene bought per month</td>
<td>330</td>
<td>62</td>
<td>268</td>
</tr>
<tr>
<td>cost of Liters of kerosene bought per year</td>
<td>3813</td>
<td>719</td>
<td>3094</td>
</tr>
</tbody>
</table>

*Among the 112 kerosene buyers*
1. Impact on Economic Situation
   a) Savings on lighting systems

Candles savings

- In average, about **20 candles** are saved per month thanks to the solar lamp
- The average price of a candle is 6.07 PHP
- As a result, customers save **119 PHP/month**, which amount to **1378 PHP/year**

Consumption in absolute terms (# of candles)

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>Today</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td># of candles bought per week</td>
<td>4,43</td>
<td>0,07</td>
<td>4,37</td>
</tr>
<tr>
<td># of candles bought per month</td>
<td>20,0</td>
<td>0,3</td>
<td>19,7</td>
</tr>
<tr>
<td># of candles bought per year</td>
<td>230,5</td>
<td>3,5</td>
<td>227,1</td>
</tr>
</tbody>
</table>

Savings (in PHP)

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>Today</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>cost of candles bought per week</td>
<td>27</td>
<td>0</td>
<td>26 PHP</td>
</tr>
<tr>
<td>cost of candles bought per month</td>
<td>121</td>
<td>2</td>
<td>119 PHP</td>
</tr>
<tr>
<td>cost of candles bought per year</td>
<td>1399</td>
<td>21</td>
<td>1378 PHP</td>
</tr>
</tbody>
</table>

*Among the 15 candles buyers*
1. Impact on Economic Situation

a) Savings on lighting systems

**Batteries savings (for flashlights)**

- In average, about 5 batteries are saved per month thanks to the solar lamp
- The average price of a battery is 21.62 PHP
- As a result, customers save 98 PHP/month, which amount to 1137 PHP/year

---

**Savings per month = 98 PHP**

*Among the 45 batteries buyers*

---

**Consumption in absolute terms (# of batteries)**

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>Today</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td># of batteries bought per week</td>
<td>1,7</td>
<td>0,7</td>
<td>1,0</td>
</tr>
<tr>
<td># of batteries bought per month</td>
<td>7,8</td>
<td>3,2</td>
<td>4,6</td>
</tr>
<tr>
<td># of batteries bought per year</td>
<td>89,8</td>
<td>37,3</td>
<td>52,6</td>
</tr>
</tbody>
</table>

**Savings (in PHP)**

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>Today</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>cost of batteries bought per week</td>
<td>37</td>
<td>15</td>
<td>22 PHP</td>
</tr>
<tr>
<td>cost of batteries bought per month</td>
<td>168</td>
<td>70</td>
<td>98 PHP</td>
</tr>
<tr>
<td>cost of batteries bought per year</td>
<td>1943</td>
<td>806</td>
<td>1137 PHP</td>
</tr>
</tbody>
</table>

Planète d'Entrepreneurs - Social Impact Assessment for HSSI – December 2011
1. Impact on Economic Situation
   b) Savings on rechargeable items
      (for off-grid customers only)

   **Rechargeable flashlights savings**
   
   *In average, customers save 53 PHP/month, which amount to 643 PHP/year*

   - In average, a customer has 1.12 flashlight at home
   - In average, an off-grid customer using rechargeable flashlights used to go and charge it twice a week before the solar lantern, and less than once per week today.
   - The cost of a rechargeable flashlight charge is 9 PHP in average
   - As a result, customers save 53 PHP/month, which amount to 643 PHP/year

   **Money savings on RFL charging**
   
   *If no electricity and using rechargeable flashlights*

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>Today</th>
<th>Money savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost per charge</td>
<td>9</td>
<td>9</td>
<td>PHP</td>
</tr>
<tr>
<td>Total money spent per week</td>
<td>20</td>
<td>8</td>
<td>12 PHP</td>
</tr>
<tr>
<td>Total money spent per month</td>
<td>87</td>
<td>34</td>
<td>53 PHP</td>
</tr>
<tr>
<td>Total money spent per year</td>
<td>1050</td>
<td>407</td>
<td>643 PHP</td>
</tr>
</tbody>
</table>

Planète d'Entrepreneurs - Social Impact Assessment for HSSi – December 2011
1. Impact on Economic Situation

b) Savings on rechargeable items

(for off-grid customers only)

Mobile charging savings

*If no electricity and having mobile phones

In average, customers save **125 PHP/month**, which amount to **1514 PHP/year**

- In average, a customer has 1.46 mobile phones at home
- In average, an off-grid customer used to go and charge them three times per week when he had no solar lantern, and only once every two weeks today
- The cost of a rechargeable flashlight charge is 8 PHP in average
- As a result, a customer save 125 PHP/month, which amount to 1514 PHP/year

Money savings on mobile charging

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>Today</th>
<th>Money savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost per mobiles charging</td>
<td>8</td>
<td>8</td>
<td>29 PHP</td>
</tr>
<tr>
<td>Total money spent per week</td>
<td>35</td>
<td>6</td>
<td>29 PHP</td>
</tr>
<tr>
<td>Total money spent per month</td>
<td>149</td>
<td>24</td>
<td>125 PHP</td>
</tr>
<tr>
<td>Total money spent per year</td>
<td>1801</td>
<td>287</td>
<td>1514 PHP</td>
</tr>
</tbody>
</table>

III. Results of the study
1. Impact on Economic Situation
   c) Savings on electricity

   Solar lamps have an economical impact on on-grid customers as it is an alternative lighting system.

   Electricity savings for on-grid customers

   If electricity at home: do you think you save electricity thanks to the lantern?

   - Yes: 58%
   - No: 42%

   *This question was asked to households who said they saved electricity to the lantern. Not all of them did answer.

   If electricity at home: How much do you think you save?

   - Per month: 136,67 PHP
   - Per year: 1640 PHP

Planète d'Entrepreneurs - Social Impact Assessment for HSSi – December 2011
1. Impact on Economic Situation

d) Savings summary

- In average, a typical customer saves 336 PHP/month which amount to 4060 PHP/year.
- More than 20% of the households save more than 6000 PHP per year thanks to the solar lamp.
- 7% of the households save more than 10000 PHP/year.

Savings per year: repartition of the households

- No savings
- Save < 2000 PHP per year
- Save 2000 < x < 4000 PHP per year
- Save 4000 < x < 6000 PHP per year
- Save 6000 < x < 10000 PHP per year
- Save > 10000 PHP per year
For a typical off-grid customer using the solar lantern, *kerosene represents 63% of his savings.*

Off-grid customers are the first to make savings thanks to the solar lamp. Their main sources of savings are kerosene (63%) then mobile phone charging (23%).
III. Results of the study
6. Impact on customers

1. Impact on Economic Situation
e) Additional Revenue

37% of customers claim they earn an additional income directly linked to the use of the solar lamp. On average, those 37% can earn an additional 1421 PHP per month, which represent 18% of their income.

- 37% of customers claim they can work more at night or develop new activities which enable them to earn an additional income.
- This figure does not take into account the customers who work more at night without earning more (ex: teachers).
- The majority are those who have developed mobile charging station, those who can open their sari-sari store at night, and finally those who cook food to resell it (ex: polvoron cooking).
- Mobile charging station usually represents a small additional income: up to 200 PHP per month.

“Before, I was selling nothing at night because I had to switch on the generator. Now I can switch on the light in one second at anytime of the night”
Sari-sari store owner in Sandoval, Palawan

The main impact is linked to the additional opening hours of the sari-sari stores that sometimes enable the owner to earn 200 PHP more per day.
To assess the impact of the solar lantern on education, Planète d’Entrepreneurs has focused on three main indicators:

**The motivation of the children going to school**
It may be easier to work with a better source of light, and more convenient to work with a cleaner one (contrary to kerosene lamps)

**The studying time at home of the children going to school**

**The level of the students having a solar lantern**
Based on interviews of teacher

**MAIN FINDINGS**

• 97% of the parents think their children are more motivated to read and learn since they work with a solar lantern

• The studying time per child going to school has increased by 45% in average
2. Impact on education

General data

- 70% of the parents interviews declared having children going to school
- In average, 1.86 children per households goes to school
- Out of all these households, 76% use the Sun Transfer 2 to study at night
- Customers admitted studying as a major change in their day-to-day life since they have the solar lamp

Do you think your children are more motivated to read and learn since you have the Solar Lamp?

97% of the parents think their children are more motivated to study with the Sun Transfer 2
2. Impact on education

Impact on studying time

Thanks to the Sun Transfer lamp, the studying time has increased by 45%

- The average studying time per child has increased since children work with the solar lamp: it is **1.5 times longer than before** (about 35 minutes)
- The increase in studying time partly reflects the impact of the solar lamp on education: there are other relevant indicators

Impact on studying time of scolarized children

<table>
<thead>
<tr>
<th>Hours</th>
<th>Average studying time before the solar lamp</th>
<th>Average studying time today</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>1h19</td>
<td>1h53</td>
</tr>
</tbody>
</table>

Convenience
- The solar lamp provides children with a brighter light and prevents them from eye-problems
- As the lamp is smokeless and very handy, children stopped inhaling toxic fumes and getting burned

Time
- When working, wind blowing is no longer a problem
- The solar lamp let children free to do other activities during the day

* Among children without access to electricity
2. Impact on education

Other conclusions

Even if children go to school, the solar lamp is not systematically used to study (24%). There might be different reasons:
• Children study with electricity; they only use the lamp at burn out times
• Children are too young to have homework at night
• The solar lamp was bought for other specific needs (working, walking in the mountains etc.)
• They may use safe alternative systems such as flashlights

Regarding social impact, the increase in studying time can hide other realities:
⇒ Given the benefits of the lamp, children can be more efficient at work and spend less time on studying

Out of 8 teachers interviewed, only one of them is able to notice differences between children studying with or without the lamp. Hence there is no incidence on the quantity of homework given at night. However, they all stated that the lamp really strengthens their aptitudes at studying.
To assess the impact of the solar lantern on customers day-to-day life, Planète d’Entrepreneurs has focused on four main indicators:

**Indoor pollution**
As the Sun Transfer replaces kerosene lamps which emits toxic fumes

**Safety**
As the Sun Transfer replaces kerosene lamps and candles, which may cause domestic accidents

**For off-grid customers, time saved to:**
- Go back and forth to charge mobile phones outside home
- Go back and forth to charge rechargeable flashlights outside home

**General activities**
Or in other words, how the Sun Transfer has changes the everyday life of its users

**MAIN FINDINGS**
- 95% of customers have the feeling that using kerosene has improved the quality of the air and 97% feel safer since they have the Sun Transfer
- A customer saves in average **1h42 per week** on mobile phones and/or chargeable flashlights charging
3. Impact on day-to-day life
   a) Indoor pollution

Among the 109 customers who answered this question, 95% admitted that reducing their kerosene consumption had curbed the indoor pollution of the household.

The main reasons they spontaneously mentioned to evidence this improvement are the fact that they cough less (56%), the reduction of the black particles in the nose (46%), and the decrease in the walls’ dirtiness (44%).

« I bought the Sun Transfer for my father who has had asthma for years. Since he has stopped using kerosene lamps, he does not cough anymore »

Babylen C. Basco, BANSUD, Mindoro

Do you have the feeling that using less kerosene has improved the quality of the air?

- Yes 95%
- No 5%

The problems that have improved thanks to the kerosene consumption reduction:

- Coughing 53%
- Black particles in the nose 46%
- Black walls 44%
- Watery eyes 5%
- Headaches 11%
- Other 11%

*Open Question*
3. Impact on day-to-day life
b) Safety

Before buying the solar lamp, 38% of the interviewees had experienced domestic fires and/or burnings due to kerosene accident in their household. Hence the safety feeling (97%) provided by the solar lamp.

If the safety feeling appears to be directly linked to the kerosene dangerous use and handling (49% for the fumes and 47% for fire hazard), customers sometimes mentioned the fact that solar lamps could be used in case of typhoon, and also the reduction of electric shock hazard.
3. Impact on day-to-day life
c) Time

Hypotheses:
• When a customer moves to an electrified place, he charges all his rechargeable items at the same time
• We consider one sample of customers using both rechargeable flashlights and mobile phones

To note: We only consider the time to go and come back. The charging time is not taken into account as customers seldom wait for their rechargeable items to charge.
3. Impact on day-to-day life

c) Time

- Off-grid customers using the solar lamp save around **2 hours per week** thanks to the mobile charging feature of the Sun Transfer.
- Off-grid customers using rechargeable flashlights save around **1 hour** per week as the Sun Transfer 2 replaces flashlights. (see saving methodology to see how we calculate time saving).

### Time savings on mobile charging

<table>
<thead>
<tr>
<th></th>
<th>Before (# of hours)</th>
<th>Today (# of hours)</th>
<th>Time savings (# of hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total time spent per week</td>
<td>2,3</td>
<td>0,4</td>
<td>1,9</td>
</tr>
<tr>
<td>Total time spent per month</td>
<td>9,9</td>
<td>1,6</td>
<td>8,3</td>
</tr>
<tr>
<td>Total time spent per year</td>
<td>119,7</td>
<td>19,0</td>
<td>100,6</td>
</tr>
</tbody>
</table>

### Time savings on RFL charging

<table>
<thead>
<tr>
<th></th>
<th>Before (# of hours)</th>
<th>Today (# of hours)</th>
<th>Time savings (# of hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total time spent per week</td>
<td>1,5</td>
<td>0,6</td>
<td>0,9</td>
</tr>
<tr>
<td>Total time spent per month</td>
<td>6,3</td>
<td>2,4</td>
<td>3,8</td>
</tr>
<tr>
<td>Total time spent per year</td>
<td>75,8</td>
<td>29,4</td>
<td>46,4</td>
</tr>
</tbody>
</table>

- Today, off-grid customers spend about **25 minutes per week** to go back and forth recharge their mobile phone outside of home.
- Today, off-grid customers spend about **40 minutes per week to go back and forth** to recharge their flashlight.
3. Impact on day-to-day life

c) Time

Off-grid customers save in average **1h42 per week** by reducing the frequency of mobile phone/rechargeable flashlights charges outside home.

Considering the two strong hypotheses seen before, an off-grid customer saves in average 1h42 per week, which amounts to 7h30 per month.

This impact should be considered carefully as the time spent in town is not only dedicated to charging rechargeable flashlights and mobile phones.

We presume that an off-grid customer spend today about 40 minutes per week to go back and forth charge his rechargeable items.

---

**Presumed total time savings on mobile phones and rechargeable flashlights charging**

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>Today</th>
<th>Time savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total time spent per week (# of hours)</td>
<td>2,3</td>
<td>0,6</td>
<td>1,7</td>
</tr>
<tr>
<td>Total time spent per month (# of hours)</td>
<td>9,9</td>
<td>2,4</td>
<td>7,5</td>
</tr>
<tr>
<td>Total time spent per year (# of hours)</td>
<td>119,7</td>
<td>29,4</td>
<td>90,2</td>
</tr>
</tbody>
</table>
3. Impact on day-to-day life
d) Activity

When the customers are asked to spontaneously describe the changes in their lives that are related to the use of the solar lamp, they mention first:

- The decrease in their lighting expenses (49% of respondents)
- The convenience in the household day-to-day life (48% of respondents)
- The fact that it is easier to work at night (25% of respondents)

But when they are asked to mark five different categories from 1 to 4 depending on the amelioration attributable to the solar lamp in each category, the average marks appear to be quite similar. It evidences the multi-use aspect of the lamp.
3. Impact on day-to-day life

d) Activity

For each of the five activities, the marks of usefulness vary a lot from one customer to another. **Cooking comes first with 65%** of respondents seeing an impact on this activity, while **mobile charging only got 43%**.

Concerning the activity “working”, customers living on the seashores feel way more convenient with the lamp compared to kerosene lamps because of the windy weather when they fish.

Also, customers living in the remote mountains would use oil-tree candles they manufactured on their own. The impact of the lamp in terms of brightness and handiness is huge for them.

The oil-tree candles

The Sun Transfer 2
IV – Insights on Account Managers

1. Account Managers profile
2. Training and After-Sales service
1. Account Managers profile

50% of the account managers interviewed say that selling solar lantern is helpful to get new members.

- The market of off-grid MFIs’ members is about 34%
- MFIs find it hard to reach some very remote customers and to serve this off-grid population

**Average time of selling lamps**: 9.5 months

**Average number of lamps sold per AM**: 18.9 lamps

**%age of off-grid members**: 34%

### Are solar lamps useful to your members?

- Not at all: 20%
- Sometimes: 27%
- Often: 53%

### Is selling solar lamps helpful to get new members and new loans?

- Not at all: 13%
- Sometimes: 38%
- Often: 50%
- Always: 5%
2. Training and After-sales Service

How many times have you been trained on solar lamps?

- 13%: 0 times
- 50%: 1 time
- 13%: 2 times
- 13%: 3 times
- 6%: 4 times

Is it difficult to sell solar lamps?

- 56%: Very difficult
- 19%: Rather difficult
- 13%: Rather easy
- 14%: Very easy

How confident do you feel with your competences and knowledge concerning:

**The features**
- 25%: Not at all
- 19%: A little
- 31%: A lot
- 56%: Totally

**The use**
- 56%: Not at all
- 14%: A little
- 31%: A lot
- 19%: Totally

**The benefits**
- 75%: Not at all
- 14%: A little
- 13%: A lot
- 19%: Totally

**The AS service**
- 33%: Not at all
- 33%: A little
- 33%: A lot
- 7%: Totally

Average mark: 3.1

Average mark: 3.4

Average mark: 3.6

Average mark: 2.7

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2. Training and After-sales service

How often do you mention solar lamps to your members:

- Not at all: 6%
- Sometimes: 19%
- Often: 19%
- Always: 56%

75% of the account managers stated that they mention the lamp in most of their center meetings.

Do you feel you have enough support to maintain or repair the products?

- Not at all: 6%
- Sometimes: 7%
- Often: 53%
- Always: 33%

40% of the interviewees consider they lack support to maintain or repair the solar lamps.

When you have sent broken lamps for repair, did they come back quickly enough?

- Yes: 50%
- No: 50%

Transportations, availability of spare parts, competences of the technicians may have delayed 50% of the repair operations.