



POLLINATE ENERGY

Impact Assessment Report
June 2016

Acknowledgments



This Pollinate Energy Impact Assessment was conducted by Phoebe Hardefeldt and Hamish Alexander in 2016. Data was collected by enumerators consisting of Indian and International as part of internships, fellowships and Young Professional Programs, who were trained and managed by staff from Pollinate Energy. Program participant assessments were gathered via online surveys, administered by Pollinate Energy Australian national managers.

Commissioned by: Pollinate Energy, 2016.

Executive Summary

Pollinate Energy is a **social enterprise** with a mission to improve the **lives of India's urban poor**. It was established in Bangalore in 2013 and expanded to Hyderabad and Kolkata in 2015. Pollinate Energy employs a **network of local 'Pollinators' to distribute solar lights** and other sustainable technologies to households in urban slum communities. This is the second Impact Assessment conducted on Pollinate Energy's operations in urban poor communities in India. Since the first Impact Assessment was conducted in April 2014 the social enterprise has scaled up operations and expanded to Hyderabad and Kolkata.

This Impact Assessment assesses the **impacts of Pollinate Energy's work in** four main areas. Firstly it assesses the **financial and social impacts** of products sold by Pollinate Energy on customers' lives, as well as the extent to which their pro-poor sales model and post-sale service are meeting customers' needs. It finds that Pollinate Energy is delivering financial savings as well as improvements to the quality of life of its customers, including increasing the time children spend studying, improving the safety and ease of women cooking, and reducing the frequency of rats and snakes in customers' tents. It also finds that customers are overwhelmingly satisfied with Pollinate Energy's services and that their repayment system generally meets customers' needs.

Secondly, it assesses the **environmental impacts of reduced kerosene** use which are achieved by enabling customers to switch to solar energy products. It finds that the proportion of customers using kerosene has reduced from 89% to 7%, and that of those households still using kerosene, the average volume used has reduced from over 1.9 litres to less than 0.3 litres per week. This has resulted in a CO2 saving of 2.71 million kilograms.

Executive Summary

Thirdly this Impact Assessment assesses Pollinate Energy's **impact on its 'Pollinators'** – micro-entrepreneurs who build skills and experience through the training and support they receive. It finds that overall Pollinators feel they have built skills through the training and support provided, with some areas remaining more challenging for Pollinators. We recommend reviewing training in these areas, and also collecting baseline data on Pollinators' skills and experience to enable better assessment of training and support in the future.

Finally it assesses **the impact of Pollinate Energy's Young Professional Programs and Fellowships** on program participants. Participants come from India as well as internationally and typically spend 2-4 weeks with Pollinate Energy supporting operations and learning about global social entrepreneurship and pro-poor social business through workshops and guest speakers. We find that participants were highly positive about Pollinate Energy's programs and felt they had benefited professionally and personally from the experience. Most participants indicated that their career, personal outlook or life plans had been influenced by the experience gained through the program.

In each of these areas we provide recommendations for improvements to Pollinate Energy's work based on recommendations and feedback from customers, Pollinators and program participants. We commend Pollinate Energy on the positive impact of their work and hope these recommendations can help to increase this impact in the future.



Summary of recommendations

1. When selecting future **products**, maintain Pollinate Energy's strong focus on through **testing, and sourcing high quality and durable products**.
2. Consider offering **longer repayment periods** to enable customers with lower incomes to access products.
3. Ensure that **repayment options** are consistently provided to all prospective customers.
4. **Collect systematic data on problems and servicing** times to monitor and establish benchmarks for post-sales service.
5. **Review Pollinator training** on financial management, time management, business management and sales to look for approaches that would build Pollinators' skills in these areas.
6. Collect baseline data on **Pollinators' skills and experience** prior to joining Pollinate so that impact can better be assessed in the future.
7. Increase **pre-program planning for Fellowship Professional Programs** and consider ways to diversity to the composition of program participants.
8. **Prioritize products that meet customers key issues**: mosquitoes, water quality, issues with rats/snakes, lack of TV/radio/communication, and household smoke.

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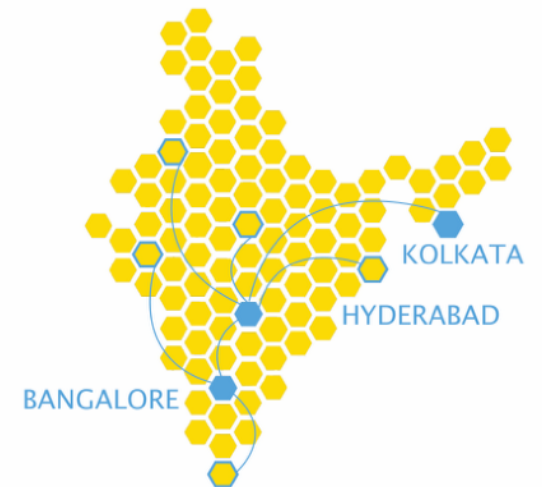


About Pollinate Energy

Pollinate Energy is a **social enterprise with a mission to improve the lives of India's urban poor**. It was established in **Bangalore in 2013** and expanded to **Hyderabad and Kolkata in 2015**. Pollinate Energy employs a network of local **'Pollinators'** to distribute solar lights and other sustainable technologies to households in urban slum communities.

THE PROBLEM

Indian families are **migrating rapidly to urban centers in search of economic opportunities and a better life for their families**. They settle in temporary city slums with living conditions unfit for humans. **They lack access to products that would improve their quality of life**, instead relying on harmful kerosene for their lighting needs, drinking unclean water, and cooking with dirty cookstoves. **They are not educated about how alternative products could work for them and serve to improve their lives**, and they have no access to finance to enable them to purchase the products they need.



THE SOLUTION

Pollinate Energy brings life-changing products - like solar lights, water filters and improved cookstoves - **to people who need them most**. For families living in India's urban slums, **Pollinate is the missing link in the chain that allows them to access, understand, and afford household products that make daily life easier**. Pollinate Energy does all this whilst creating job and skill development opportunities for local men and women from disadvantaged backgrounds - Pollinators. Pollinators offer payment plans to make products affordable for customers, as well as post-sale servicing and support to ensure that the product solutions are sustainable.



Operations, vision and mission

Pollinate Energy impacts on all those involved across its operations – from Young Professionals and Fellows who gain skills and experience in social entrepreneurship, to influencing the development of products which meet poor communities’ needs, all the way to customers who purchase products.

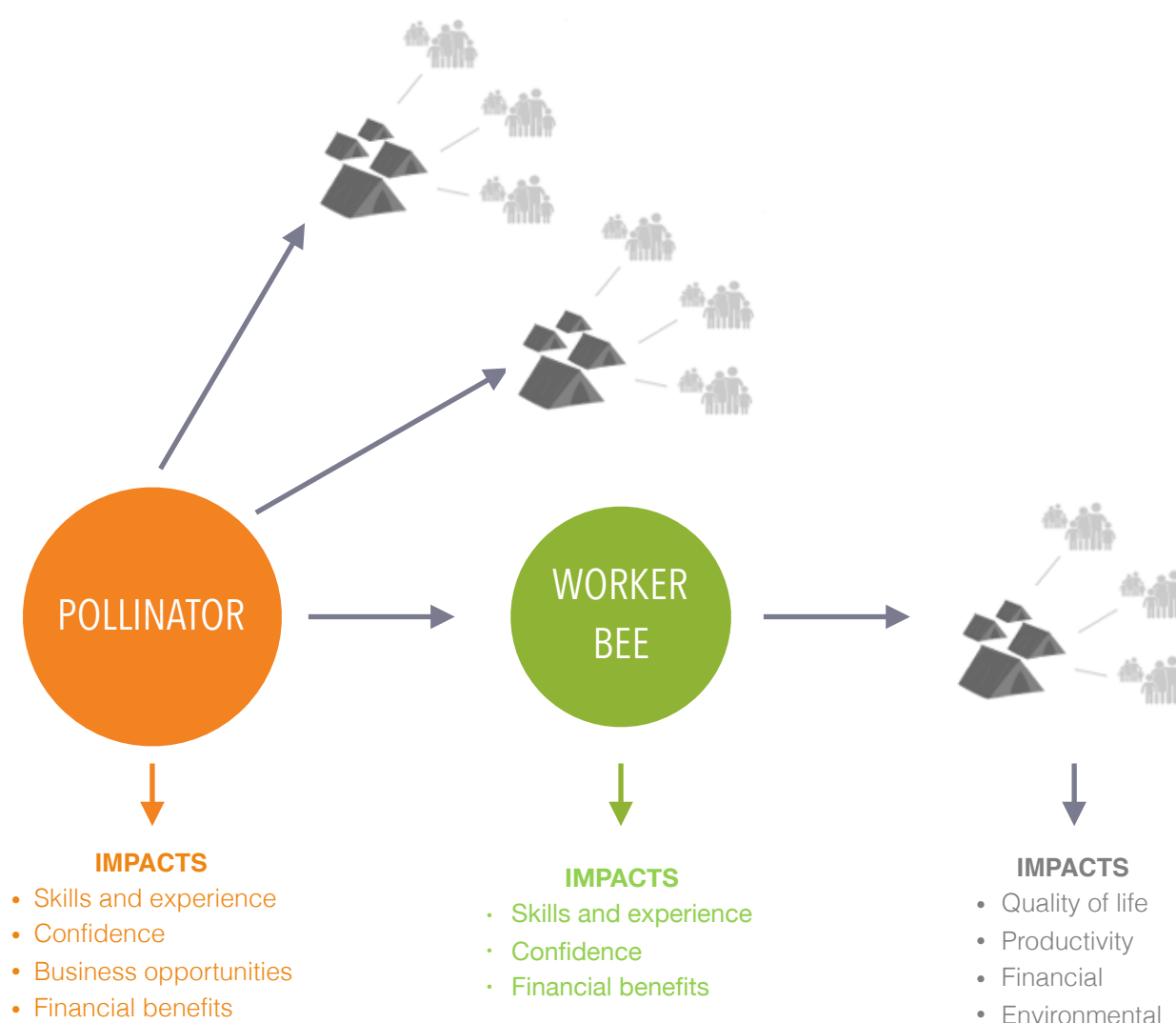
This **Impact Assessment** assesses the impacts of Pollinate Energy’s work for Pollinators, Worker Bees, communities, program participants and the environment.

VISION

Pollinate Energy’s vision is a world where **all communities have equal access to sustainable technologies** to improve their quality of life.

MISSION

- **Improve the lives of the urban poor** by giving them access to sustainable products that make their lives better.
- **Empower local entrepreneurs** to be a positive force for change in urban poor communities.
- **Make social business mainstream** by raising awareness about the communities we work with and supporting the next generation of social entrepreneurs.



The products

Pollinate Energy supplies **a range of solar light products** to meet the varying needs and budgets of its customers. Payment by installment is available to most customers.

Product	Specifications
Sun King Pro 2	2x Mobile chargers; 15x brighter than kerosene; 36 hours single charge
Sun King Pro	Mobile charger; 10x brighter than kerosene; 30 hours single charge

TOTAL PRODUCTS SOLD TO DECEMBER 2015

Data Source: Salesforce, January 2016

Product	# sold (minus returns)
Individual solar light	12,216
Solar home system	34
Water filter	57
Electronic tablet	52
Cookstove	25



Sun King Pro 2

Water Filter



Home 60

The methodology

Data was collected through the following methods:



Baseline and impact **surveys collected qualitative and quantitative information** on customers and non-customers across a sample of communities where Pollinate works. Surveys were conducted in-person by international and local volunteers, to ensure independence.



Operations spot checks conducted by Operations Managers to monitor the quality of service delivery and products



Evaluative stories were conducted by an international volunteer



Pollinator surveys were conducted by the Pollinate Energy headquarters human resources manager and staff



Program participant surveys were conducted (online) by Pollinate Energy's Australian national managers

In addition data from Salesforce, Pollinate Energy's sales management system, on sales, returns and payments was used in the Impact Assessment.

Sampling for this Impact Assessment was on the basis of proportionate representative sampling across the three cities where Pollinate works. Sampling factors were: sex, length of time the customer had owned the product, geographic location, whether communities were electrified and the size of the community.

The methodology

The actual sample achieved for data collection was:

- 247 quantitative customer surveys, 32 qualitative customer surveys, 6 evaluative stories, 21 program participant surveys and 21 Pollinator surveys
- 35% Female, 65% Male respondents for customer surveys
- 69% from Bangalore, 27% from Hyderabad, 4% from Kolkata (sample sizes reflect the relative number of customers in each city)
- 98 communities were surveyed in total

Strengths, limitations and mitigation strategies for maximizing data quality:

Strength	Limitation	Mitigation strategy
Use of two data collection methods to verify results	Possible inaccuracy of responses	Systematic sampling across communities to capture trends
Multi-cultural teams brought diverse skills and experiences to the assessment	Language barriers and possible inconsistency of translation	Native speakers of local languages were included in every team, and all members understood data needs
Pollinate's links with communities helped the team to build trust with respondents	Bias arising from data collectors' affiliation with Pollinate Energy	Ensuring respondents understood the value of providing objective answers; Visiting communities when Pollinators were not present
Diverse insights captured through different approaches to data collection	Variation in the execution of data collection methods	Training all teams on data collection methods
Use of online tool aided consistency of responses	Inaccuracy in data recorded by interviewers	Ongoing checking and feedback on data accuracy
Gained broad community views and experiences	Multiple people contributing to answers within communities	Sitting in private spaces where possible, focusing in on the respondent's opinion
Removal of selection bias or convenience sampling by taking a random approach	Difficulty in find customers listed in the random sample	Randomising customer lists to identify a group of possible respondents

The customer profile

Pollinate Energy customers **live in the urban slums of Bangalore, Kolkata and Hyderabad**. These communities are populated by individuals and families who have **relocated from rural areas** in search of employment and higher incomes.

Most people are employed to do **manual labour**, including construction, rag picking, street and public facility sweeping, domestic work and waste collection. Most people lack access to savings or credit.

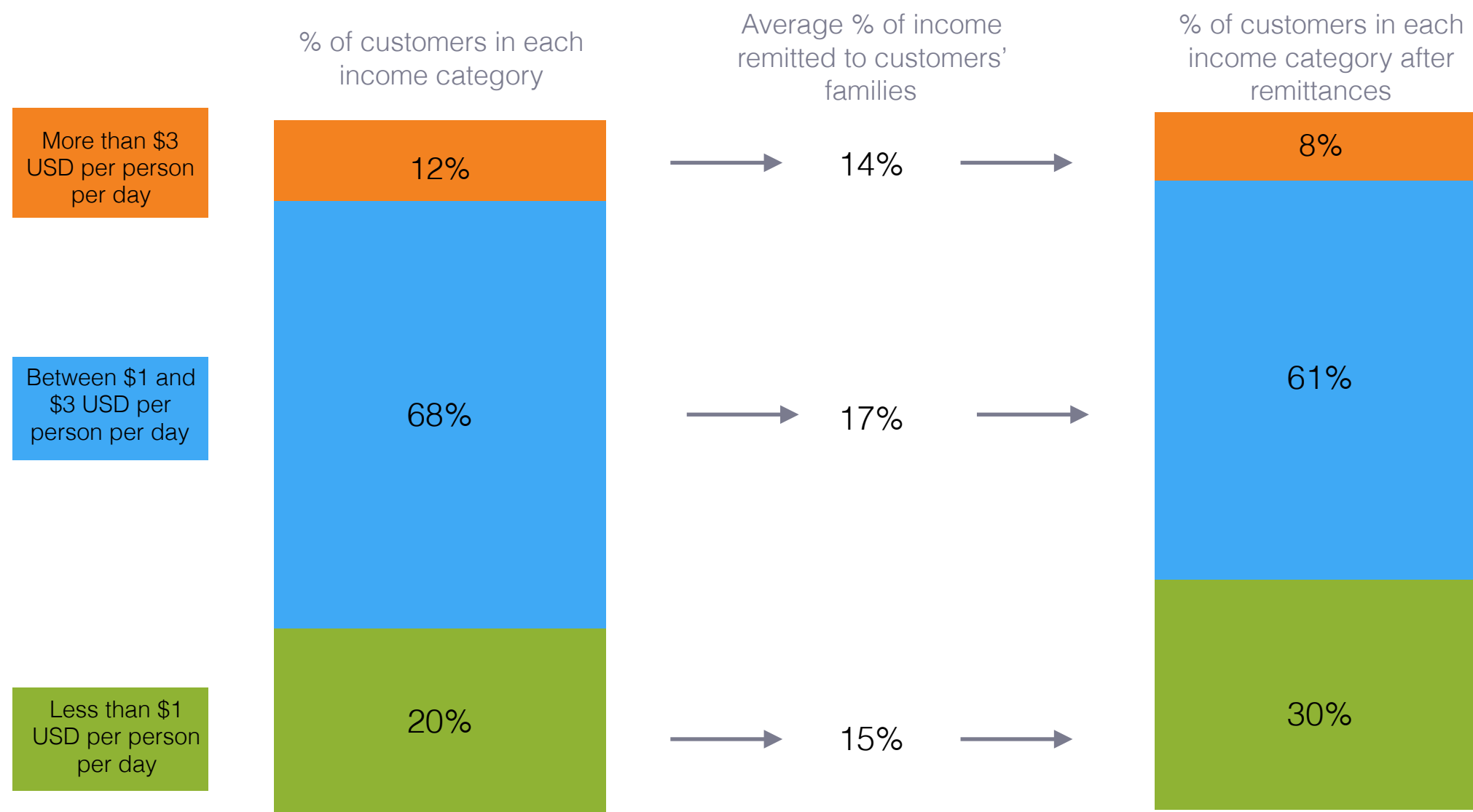
People live in tents, typically made of tarpaulins and organized into rows or clusters. They have a door at the front and no windows. **In Kolkata** they tend to live in semi-permanent or permanent structures. Slums generally **lack basic facilities** including electricity, clean water, sanitation and waste management systems.



Average people living in household	Median income per person per day	Average length of time in community	Average weekly kerosene use before solar light
4.3 (44% female, 56% male) (37% children, 63% adults) 5% reported having a disability	USD1.64 per person per day	30% 1 to 5 years 50% over 5 years	1.9 litres

Data source: Customer surveys, 154 respondents.
Note: US exchange rate used is RP66.7 to USD1

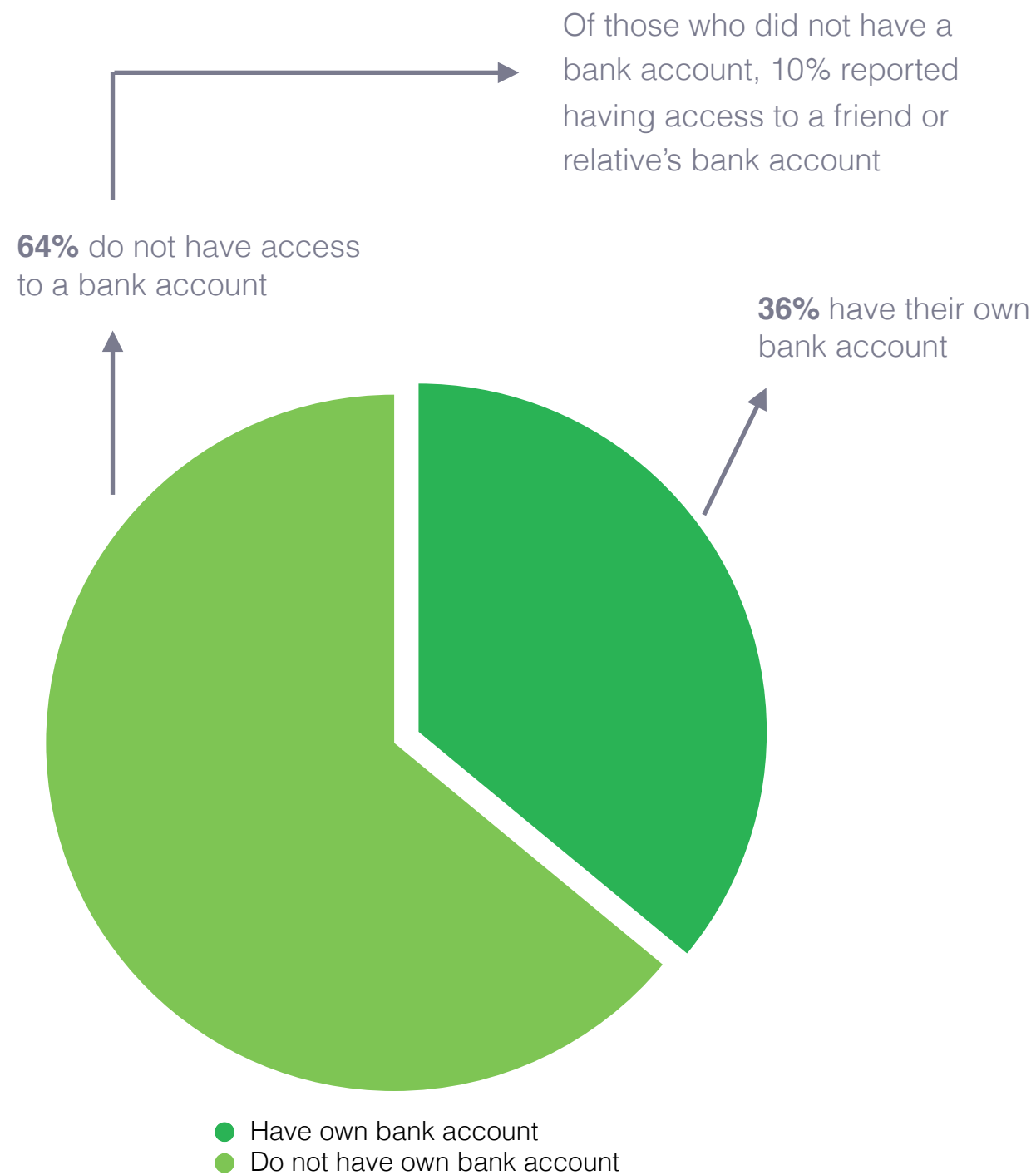
The customer income



Data source: Customer surveys, 154 respondents.

Customer - access to banking

Proportion of individuals who have access to a bank account



Summary of impacts



12,216 lights sold



Over 52,500 people reached



in over 670 communities

KEY STATISTICS

- **USD1.52** saved per household per week
- Proportion of customers' households using kerosene has reduced from **89% to 7%**
- Children spend **12 minutes** more doing **homework every day**, which is a 17% increase in the time spent doing homework.
- **2.71 million** kilograms of Co2 saved
- **21 micro-entrepreneurs** supported to build skills and businesses
- **170 students** and young professionals gain experience in social business between April 2014 - February 2015

Financial impacts

SAVING FROM A SOLAR LIGHT

100% of customers had reduced expenditure on lighting due to purchasing the solar lights, **with an average saving of USD1.58 per week.**

Average weekly savings on kerosene/candles per household	Average annual savings kerosene/candles	Average savings over lifespan of solar light (assuming lifespan of 5 years)
USD1.52	USD79	USD394

Data source: Customer surveys, 142 respondents.

This represents a saving of **6% of income for households** with members earning less than one dollar per person per day and a saving of 3% of income for households with members earning between USD1-3 per day

CUSTOMER'S RETURN ON INVESTMENT

Sun King Pro 2	Sun King Home
24 weeks	49 weeks

Data source: Customer surveys, 142 respondents.

Customers' return on investment is **24 weeks for the Sun King Pro2** and **49 weeks for the Sun King Home system.** Based on an lifespan of 5 years for the solar lights, this represents a net saving for over **4.5 years for Sun King Pro 2** customers and for over **4 years for Sun King House** customers.

Stories of customers

ADDITIONAL INCOME GENERATION BY CUSTOMERS

In addition to financial savings, evaluative stories conducted with some customers demonstrated that in some situations solar lights are creating opportunities for customers to earn additional income.



Maheshwari

comes from Tamil Nadu and she runs a **rubbish recycling business** with her husband. Without solar power it was hard to accurately weigh the rubbish and do the accounts after dark. Now her husband can continue **working late into the evening while she cooks**, and their two children do their home work by the light. Maheshwari and her husband have two children, one hopes to be an engineer one day and the other a teacher.



Subhu

is a **drum player from Andhra Pradesh**, he brings joy to people's most memorable occasions, their birthdays, weddings any festival. He milks cows to feed his family, and sells the rest of the milk to earn cash. In the past Subhu would **wake up early every morning to milk his cows with only a small candle for light**. The candles were very unreliable – they blew out easily, and the light was so dim that he couldn't see if dirt or insects fell into the milk, which makes the milk unsellable. **Now that he has a solar light all those worries are gone**. He can successfully milk his four cows without wasting any milk and use the money he makes to help the family.

Productivity and quality of life

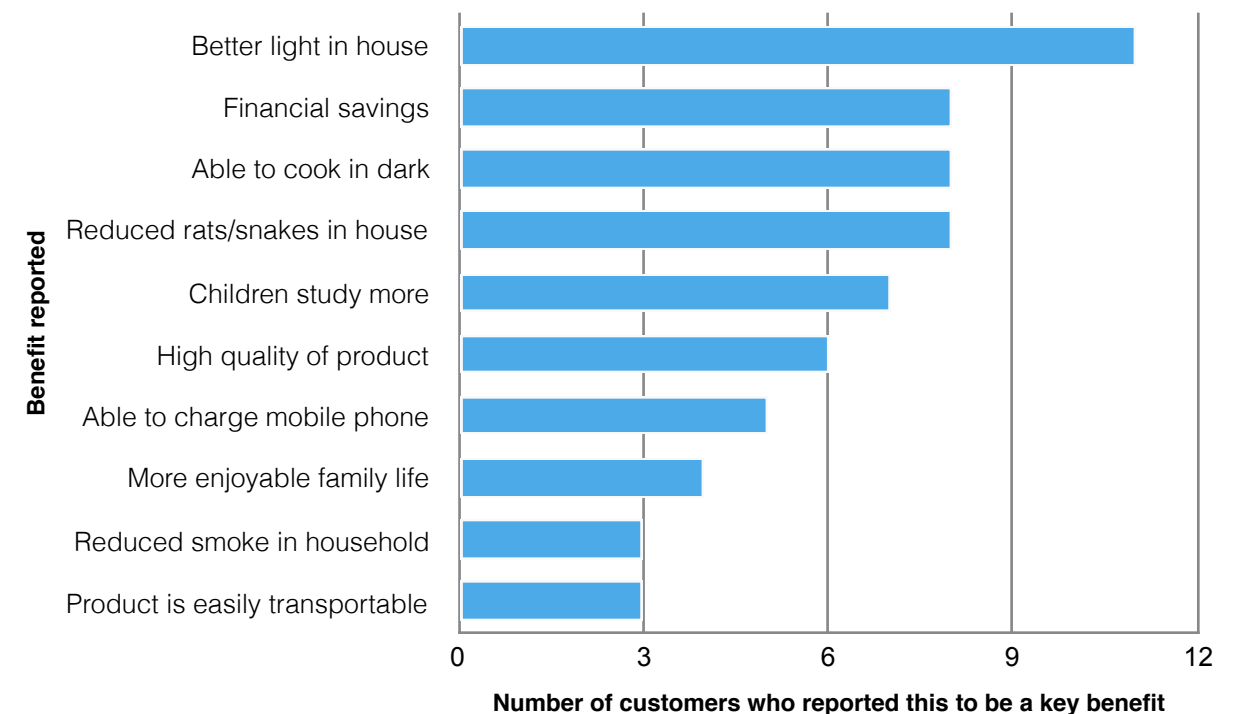
When asked what the impact of the light was on their lives, all customers **reported positive impacts**.

The most common positive benefits reported by customers (in order of the frequency with which the benefits was reported by customers) were:

- **Brighter** light in the home
- **Financial** benefits
- Women can more easily **cook after dark**
- **Reduced rats/snakes** in the home
- Children **study** more

Other benefits reported by customers were: the high quality of the product meant it was reliable, more enjoyable family life; free mobile phone charging; and reduced smoke in the home, and the transferability of the light (to take it to their village).

Benefits of lights reported by customers



Data source: Qualitative surveys, 32 respondents



Productivity and quality of life

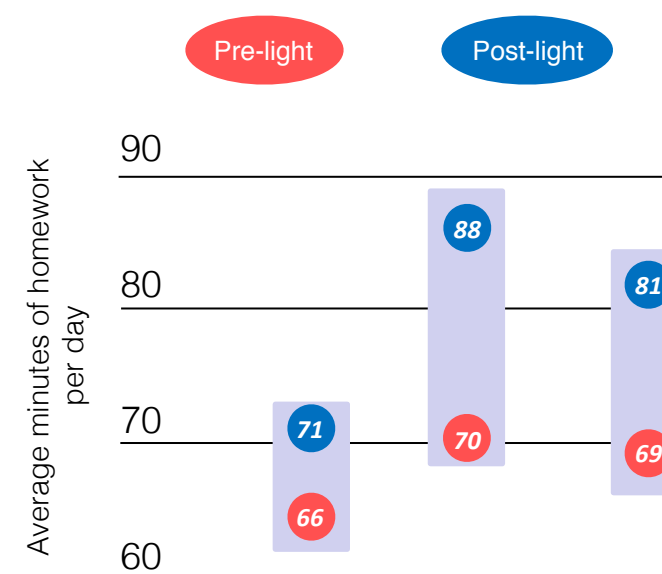
BRIGHTER LIGHT AT HOME

Prior to using solar lights, customers used kerosene lamps or candles to light their homes. Using solar lights provided far brighter lights at home which customers felt made life far easier and improved their quality of life at home.



TIME STUDENTS SPEND STUDYING

After buying a light students who were enrolled in school increased the amount of time they spent doing homework 69 to 81 minutes per day on average. Of these, boys increased from 70 to 88 minutes per day, and girls increased from 66 to 71 minutes per day. The overall study time increases by 17% overall.



Data source: Customer baseline and impact surveys, 55 respondents

Productivity and quality of life

KEROSENE USE IN HOUSEHOLDS

- Use of kerosene by customers has reduced from 89% to 7%.
- Of those households still using kerosene, the average volume used has reduced from over 1.9 litres to less than 0.3 litres per week.

* Data source: Customer baseline and impact surveys, 142 respondents

Without solar lights, customers typically use kerosene lamps and candles to provide light in their homes. This exposes them to **dangerous particles** carry high risks of respiratory and cardiovascular disease and cancer.

Reducing the use of kerosene lamps is particularly important for women and children, who are typically in very close proximity to the lamps for long periods of time while cooking and studying.

ISHAMA

and her husband have six children. As they leave for work at 6am, Ishamma wakes at 4am every day to prepare breakfast and lunches for the whole family and to wash their clothes. She purchased her first solar light two years back and then quickly bought a second one it proved so helpful to her. She no longer uses kerosene, which is toxic but also expensive and difficult to buy. It's also easier to charge mobile phones, which they need to find out about work that is available, and even just to avoid stepping on insects in their tent. Not too long later Ishamma purchased a third and fourth and finally a fifth light which she gave to other family members to help with their own households. Now every family and every house has at least one solar light. Ishamma is proud that she allowed other lives to become easier by introducing solar lights to her community.



Productivity and quality of life

SAFETY AND EASE OF COOKING

Women cook for several hours per day in communities – typically rising well before dawn to prepare breakfast in the dark, and cooking dinner after dark in the evenings when they return from work.

Solar lights provide lighting for them to prepare and cook food. This reduces the risk of burns and also makes cooking easier and more efficient for women.



REDUCTION OF RATS AND SNAKES IN HOMES

Snakes and rats regularly come into the tents at night and cannot be seen as there is no light. Customers reported that solar lights help with this issue in two ways. Firstly, they allow customers to see snakes and rats and avoid getting bitten by them. Secondly, snakes and rats are less likely to come in their tents when they are lit up by a solar light. Customers typically leave the light on all night to deter snakes and rats from entering their tents.

Pro-poor service delivery

The quality of Pollinate Energy’s products and service delivery is monitored through its quality assurance process. **Operations managers visit a selection of communities where sales are ongoing.** They visit customers who have purchased a product less than a month ago and check that Pollinate Energy’s procedures have been followed, including the accuracy of pricing and receipts, installation and use, customers satisfaction with the product.

100% of customers would recommend Pollinate Energy products to others. The most common suggestions for improving Pollinate Energy’s services was to have longer repayment periods for products to make them more affordable to households with less income. *Data source: Qualitative customer surveys, 32 respondents



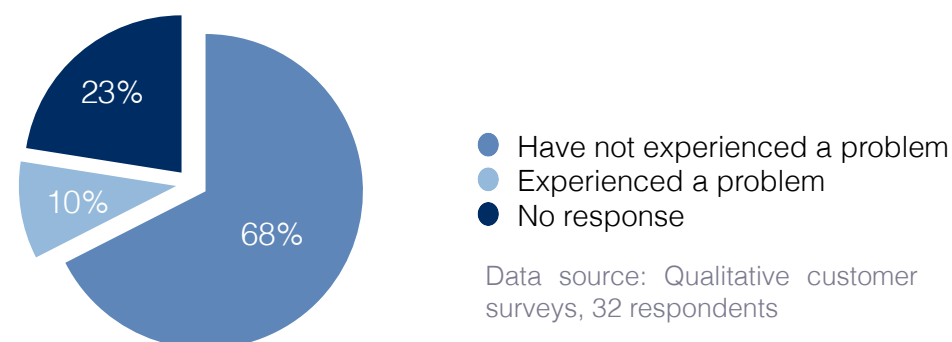
100% of customers were satisfied with the product they purchased

Data source: Operational spot checks, 320 respondents

Very few customers (0.5%) returned products. The most common problems reported with products were:

- Light is not charging incorrectly
- Light stopped functioning
- Wire was chewed through by rats

Percentage of customers who have had problems with the product



Pro-poor service delivery

EXPLANATION OF REPAYMENT SYSTEM - For most of Pollinate Energy's customers a solar light would cost an entire weekly salary so in most cases they are not able to save the entire amount needed to purchase products upfront. To solve this problem Pollinate Energy allows customers to repay products in installments, over 5-8 weeks depending on the product. Pollinators collect the repayments from customers during their weekly visit to the community and follow up on any product issues at the same time.

Table 1: Repayments, defaults and returns

% of customers who repaid in full	95%
% of customers who defaulted on payments	5%

Data source: Salesforce transactions data for 12,451 customers.

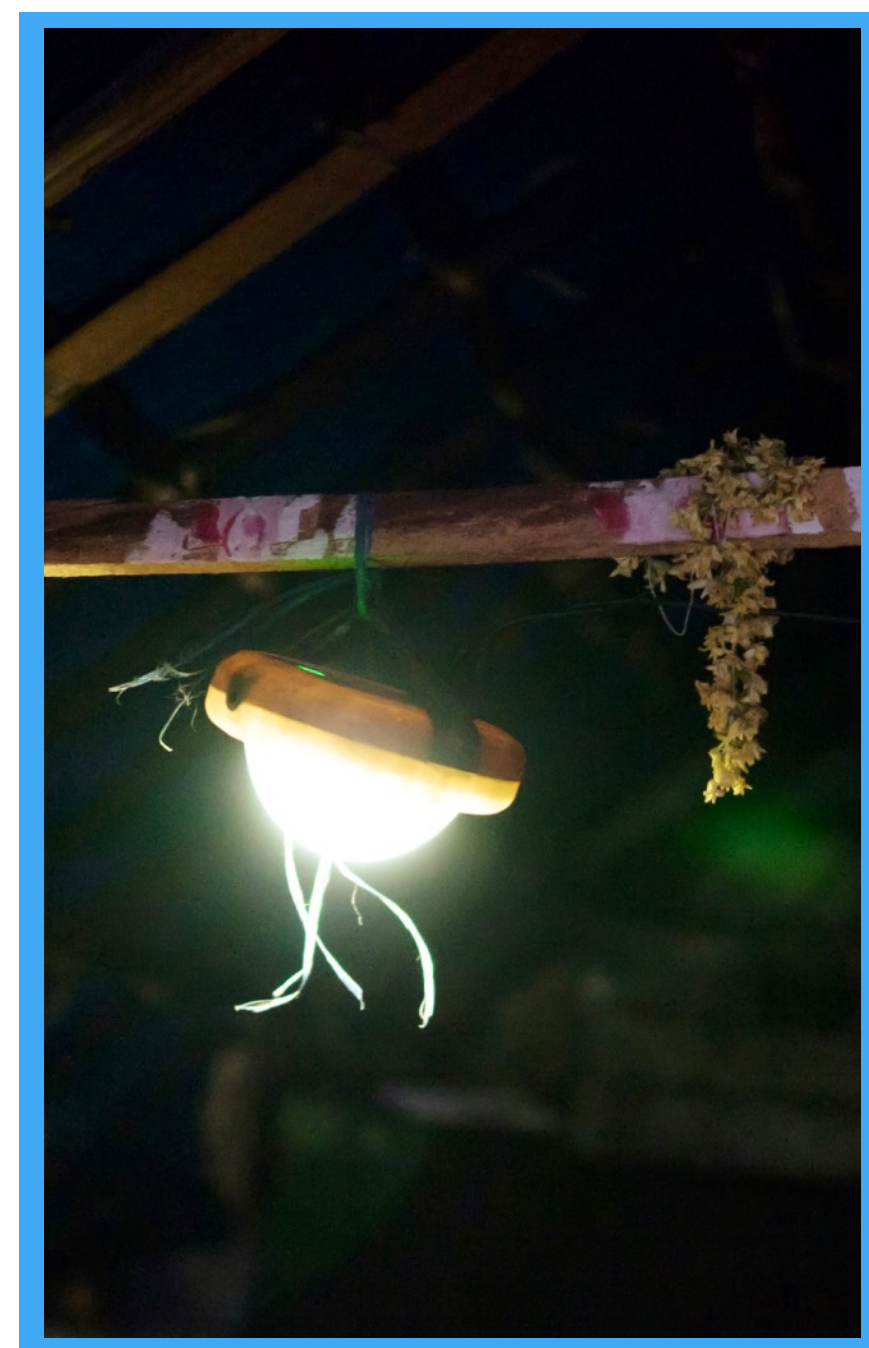
When providing feedback on the repayment system, customers reported that:

- 61% of customers said the repayment plan was very useful
- 19% of customers had opted to pay up-front for the product rather than pay in installments
 - The main reason for paying up-front was the discount provided
 - Also, a small number of customers reported that they were not offered installments and reported that it was difficult for them to pay upfront

Data source: Qualitative customer surveys, 32 respondents.

Recommendation

- Maintain Pollinate's focus on high quality products, as this is contributing to high customer satisfaction and low returns
- Consider a longer repayment time and implement this if feasible
- Ensure repayment options are provided to all customers



Pro-poor service delivery

SALE AND POST-SALE SERVICE QUALITY

100% of customers were satisfied with the quality of service they received from Pollinators

SALE & INSTALLATION

Post-sale spot checks found that 100% of customers had their products installed correctly, and 319 out of 320 customers were using the product effectively.

4% of sales had discrepancies in financial records.

This demonstrates that Pollinate Energy's sales and installation systems are effective and appropriate for customers' needs.

Data source: Operational spot checks, 320 respondents

POST-SALES SERVICE

Of the 28 customers who provided feedback on post-sale service, 21 customers had not experienced any problems with their product.

3 reported problems which were not related to the product itself (for example, not being able to charge it on a rainy day).

3 reported problems with the product itself (not turning on correctly, rats having chewed through the wire), and one person did not specify the nature of the problem.

It took 23.6 days on average between customers reporting a product problem to Pollinate to the problem/product being fixed and the customer having full use of the product again.



Recommendation

Collect systematic data on problems and servicing times to monitor and establish benchmarks for post-sales service quality.

Environmental impacts

Environmental Impact Reduction	
Kerosene reduction per week	1.3 litres per customer
Total kerosene savings (12,216 customers)	1,127,262 litres
Kilograms of CO ₂ e avoided*	2.71 million

Data source: Pollinate Energy Salesforce data

*CO₂ emissions avoided is calculated by: The number of weeks since the purchase has been made, an average reduction of kerosene use of 1.3 litres per customer per week, and an assumption that 2.4kg of CO₂ is emitted from every 1 litre of kerosene burned.



Fostering micro-entrepreneurship

By joining Pollinate Energy, Pollinators get the **opportunity to start their own business** operating in urban slum communities all over the city, forming the backbone of our micro-distributor network. However, Pollinators are much more than just a conveyor of goods, often forming very **close relationships with their communities**.

In order to get a new Pollinator off a running, we provide them with a **Business in a Bag**. This is essentially a **tool kit** that the Pollinator always has access to, providing them with everything they need, from simple things like a transport allowance, to the more complex, like smart phones with a Salesforce cloud management system.

Number of Pollinators: 6 female and 15 male.



I was Pollinate Energy's second female Pollinate and the first Muslim Pollinator. I left school after tenth grade, married and started my family. I wanted to work at Pollinate to be financially independent and so my sons could get a good education. Most of my income goes to their education. My working hours are also flexible so I can help my sons with their homework.

When people ask me is it difficult being a Muslim woman working in city slums I say "we must never say that we cannot do this or that - especially if it is good work - if we wish to do it we can do it!" When I learnt about Pollinate Energy's work I said "Yes - I can do it!" I have been working for Pollinate Energy for 20 months and I hold the record for selling the most lights on one day – 42!

I like working at Pollinate Energy because I care about the people in the communities and they respect and care about me. First they are my friends, then they are my customers.

Fostering micro-entrepreneurship

SKILLS DEVELOPMENT FOR POLLINATORS - Pollinate provides intensive training and support in hard and soft skills from the local management team and from experienced Pollinators. The local management team will spend at least 3 days per week in the communities with every new Pollinator in their first month. Pollinate also partners with organizations to provide Pollinators with English language and financial literacy training.

Skills/capabilities that the greatest number of Pollinators felt most confident in were:

- Self-confidence
- Sales
- Relationship building
- Communications

Skills/capabilities that the greatest number of Pollinators felt least confident in were:

- Financial management
- Time management
- Business management
- Sales

Skill/capabilities	% of Pollinators who assess their capacity at each level			
	Confident	Significant improvement	Neutral	Not very confident
Sales	67%	19%	14%	0%
Marketing	38%	57%	5%	0%
Communications	62%	33%	5%	0%
Self-confidence	71%	19%	10%	0%
Time management	52%	29%	14%	5%
Business management	38%	48%	14%	0%
Financial management	48%	29%	19%	5%
Relationship building	67%	29%	5%	0%

Data source: Pollinator survey, 21 respondents

Recommendation

Review training provided on financial management, time management, business management and sales to look for approaches that would build Pollinators' skills in these areas. Collect baseline data on Pollinators' skills and experience prior to joining Pollinate so that impact can better be assessed in the future.

Building global entrepreneurship

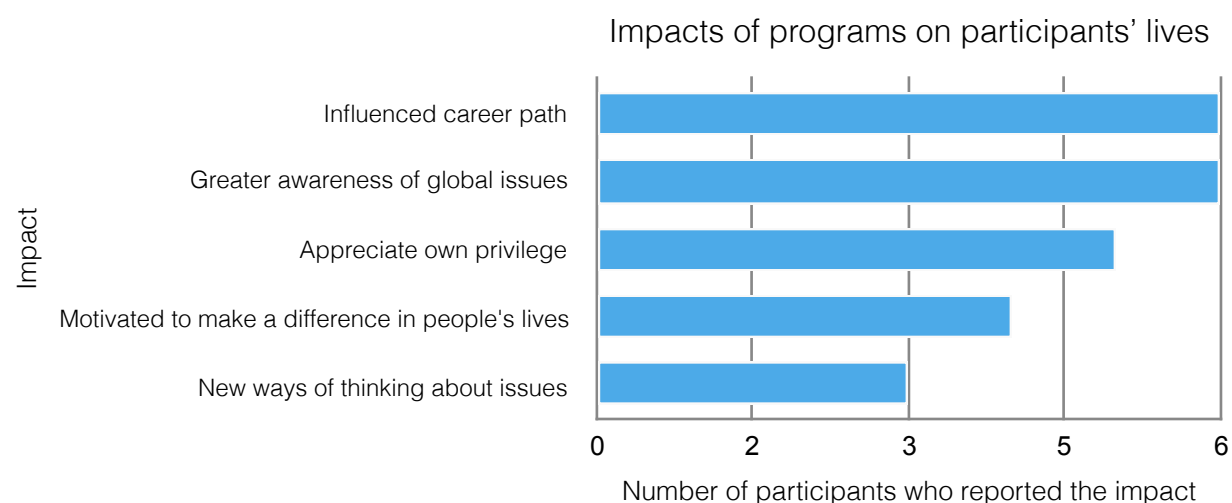
The participants spend 2-4 weeks on the ground in Pollinate Energy's local office with a team of **aspiring young changemakers and learn about the lives of families living in India's city slums**. They help Pollinate Energy grow by training and supporting a local entrepreneur (Pollinators) and develop new ways to improve the business as they work alongside the local team on a problem that interests and challenges them. **The fellowship is better suited to students** in their final 1-2 years of University, but that's more of a guideline than a rule. **The Young Professionals program is for the people who are already a part of the workforce** and are looking to switch careers or are looking for alternate ways to contribute to the society.

Pollinate Energy's programs received extremely positive feedback from participants, and made significant impacts on participants lives.

17 out of 18 respondents said they would change their life because of participating the program. The most common impacts reported by participants were:

- Influencing their career path
- Building their awareness and understanding of global issues
- Making them appreciate their own privilege
- Motivating them to make a difference to global issues through their lives and work
- Pushing them to develop new ways of thinking about issues and challenges

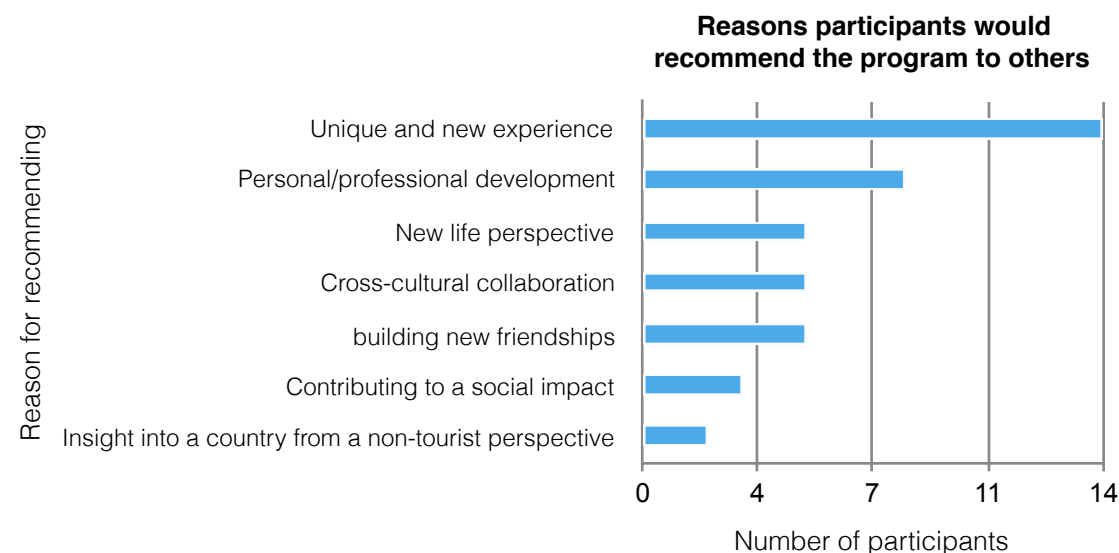
Of the 107 participants, 71% were international, 42% were female, 58% were on the Fellowships programs and 42% on the Young Professional.



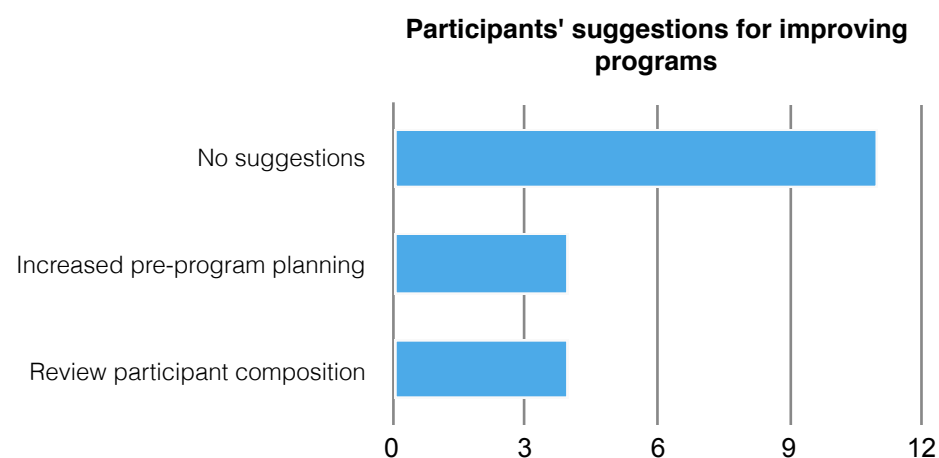
Global entrepreneurship and awareness

100% of respondents said they would recommend the program to others. Participants recommended it because they gained:

- A unique and eye-opening experience
- Extensive personal and professional development
- A new perspective on global issues
- Experience with cross-cultural collaboration
- New friendships with other program participants
- The opportunity to contribute to a valuable social impact
- Insight into life in India from a non-tourist perspective



Most participants did not have any suggested improvements for programs.



Of the 21 respondents 4 suggested increasing pre-program planning and 4 suggested reviewing the composition of participants. This included targeting recruitment to the skills required for that program and expanding the nationalities of those involved.

Recommendation

Increase pre-program planning and consider ways to change to the composition of program participants.

Demand for future products

In terms of changes recommended to existing products sold by Pollinate Energy:

- Brighter/longer lasting light (25% of respondents)
- Rat-proof wire for the light cord (6% of respondents)

In terms of Pollinate Energy's services, several respondents also requested **faster servicing times, more frequent pollinator visits to their community, and that all products sold are high quality.**

Customers reported the following **as key issues in their communities** which they would like Pollinate Energy to develop solutions to:

- Mosquitoes (40% of respondents)
- Water quality (25% of respondents)
- Rats/snakes (19% of respondents)
- Lack of TV/Radio (13% of respondents)
- Smoke in the household (13% of respondents)



Recommendation

Prioritize products that meet customers key issues: mosquitoes, water quality, issues with rats/snakes, lack of TV/radio/communication, and household smoke

