

**EFFICIENCY
FOR
ACCESS**

60__decibels

USES & IMPACTS OF SOLAR WATER PUMPS

Insights from Kenya, Rwanda, Senegal, Tanzania,
Uganda, Zambia

JULY 2021

EFFICIENCY FOR ACCESS COALITION & 60 DECIBELS



IKEA Foundation



Photo: Sunculture

Executive Summary

This report presents the results of the research carried out by the 60 Decibels team through 1,851 phone interviews on the impact and experience of 1,193 solar water pump (SWP) customers in 2018-2021 who purchased their SWPs through companies participating in the [Global LEAP Results-Based Financing programme](#). The target countries for the program were Kenya, Rwanda, Senegal, Tanzania, Uganda, and Zambia.

As the market for SWPs that are appropriate for small-holder farmers is relatively nascent, our sample size was limited in some cases by customer numbers at the time of data collection.

This study aims to provide deeper insights into the impact of first-time appliance ownership. We conducted segmented analyses to look for trends by company, country, and gender, and have presented these where we saw differences.

Usage & Impact

- The majority of customers use their SWP for irrigation or agricultural purposes. 58% of customers said their quality of life had very much improved as a result of having the pump. The top outcomes were increased access to clean water and increased farming productivity. 87% reported an improvement in their way of farming, and there were also widespread reports of improvement in confidence, production, and money earned thanks to the SWP.

Satisfaction & Experience

- The Net Promoter Score® (NPS) for SWPs is 52 which is very good. Promoters value increased access to water and the ability to use the water for productive use. 65% of users interviewed rated the SWP as 'very good' or 'good' value for money and 73% could not easily find a good alternative to the SWP. However, 54% say they have to make unacceptable sacrifices to make repayments, with 38% cutting back on consumption to make repayments. Detractors complain about the pump durability and reliability. 34% of customers had experienced challenges with using their SWP. The most common challenge was unreliability of the product. You can find out more about the NPS on page 44.

Profile & Aspirations

- A typical customer was male, aged 46, living in a household with 5 other members. SWPs are being accessed by relatively wealthier customers with 77% living above the international relative poverty line. The majority of customers would like to purchase additional solar appliances in future; with 60% interested in an improved cookstove and 52% in a solar radio.

Performance Snapshot

Overall, SWPs are positively contributing to improvements in quality of life. Areas of focus are customer challenge rates, issue resolution and availability of alternatives.

Profile

23%

live in poverty



Impact

58%

quality of life 'very much improved'



What Impact

- 37% say they have easier access to water
- 20% talked about improved productivity
- 15% reported reduced farming costs

Contribution

91%

first time accessing product provided



Customer Voice

“Let me tell you, I even had to buy a solar water pump for the community. They were going far to fetch water from the river, while I was irrigating my farm easily and faster. I had to assist them.”

Data Summary

SWP Performance: 1,851 SWP customer phone interviews in Kenya, Rwanda, Senegal, Tanzania, Uganda, Zambia.

Quintile Assessment compares Company Performance with 60dB Energy Benchmark comprised of 80 companies, 20 countries, and 38,000 customers. Full details can be found in [Appendix](#).

Performance vs. 60dB Benchmark



Net Promoter Score®

52

on a -100 to 100 scale



Challenges

34%

report challenges: 42% not resolved



Customer Effort Score

3.8

out of a maximum score of 5



Alternatives

73%

don't have easy access to a good alternative



Contents

Here's what you can find in this report.

We hope you enjoy reading all about SWPs and their impact in Africa.

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“Today, I can say, I don't buy vegetables and I don't pay for electricity.”

Introduction

As part of an effort to scale markets for super-efficient appliances, the Efficiency for Access Coalition partnered with 60 Decibels to explore the benefits and potential challenges experienced by SWP customers.

Thanks to:

- > UK aid
- > EnDev
- > Power Africa
- > USAID through Powering Agriculture: An Energy Grand Challenge (PAEGC)

for generously supporting this program.

The Efficiency for Access Coalition, launched at COP 21 in Paris and co-chaired by UK aid and the IKEA Foundation, is a global coalition working to promote high performing appliances that enable access to clean energy for the world's poorest people. The Coalition has collectively invested over £200 million to support technology innovations for off-grid, solar-powered, appliances. It is a catalyst for change, accelerating the growth of off-grid appliance markets to boost incomes, reduce carbon emissions, improve quality of life and support sustainable development.

The Global LEAP Awards is an international competition that identifies and promotes the world's best, most energy-efficient off-and weak-grid appliances. The Global LEAP Awards pairs a competition with results-based financing, providing financial incentives to mitigate early risk for distributors and helping them buy and roll-out large volumes of best-in-class off-grid appliances. The incentives are also aimed at facilitating new business partnerships for appliance suppliers that have invested in the production of high-quality off-grid appliances.

Global LEAP Results-Based Financing facility is an initiative of the Efficiency for Access Coalition and is managed by CLASP, with support from Power Africa, UK aid, Energising Development, and USAID through the Powering Agriculture Energy Grand Challenge. More information is available on globalleapawards.org.

60 Decibels is a tech-enabled impact measurement company, working in over 55 countries. Our repeatable, rapid approach to gathering impact indicators and customer insights (primarily through phone-based surveys) provides our clients with genuine benchmarks of impact performance. These benchmarks enable a deeper understanding of impact and help to inform better decision making as well as data-led impact management. Our clients include over 450 of the world's leading impact investors, companies, foundations, corporations, NGOs, and public sector organisations.

We are proud to be a Climate Positive company.

60 Decibels has offices in London, Nairobi, New York, and Mumbai. To learn more, visit www.60decibels.com.

Data Collection

60 Decibels conducted phone interviews in Kenya, Rwanda, Senegal, Tanzania, Uganda, and Zambia between August 2018 and March 2021 with customers who purchased SWPs from companies participating in the Global LEAP Results-Based Financing programme. The interviews were conducted in local languages by 60 Decibels researchers.

1,193 baseline interviews were conducted between August 2018 and March 2021. 212 follow-up interviews in January 2020 and 446 interviews in December 2020. We have aggregated all the data collected on these customers to present the insights here. We used averages equally weighted by company in the report. For core indicators, we extracted the differences pre-and post-2020 to showcase any changes with the growth and development of the market.

To begin with, this is who we spoke to and who the data presents insights on.



Participating Companies

Bonergie	Simusolar
Davis & Shirtliff	SolarNow
Epicentre	Solutions Height
Future Pump	Sunculture
Greenserve	Sunny Irrigation
Ignite Power	Vitalite



Breakdown By Country

Kenya	84%
Uganda	8%
Tanzania	6%
Senegal	1%
Rwanda	1%
Zambia	1%

Solar Water Pumps

Approximately 95% of farmland in Sub-Saharan Africa and 60% in South Asia relies on unpredictable seasonal rain to meet water needs. SWPs—a clean, modern irrigation solution—have the potential to increase yields and crop diversity, build farmer resilience, and reduce greenhouse gas emissions from diesel pumps.

Situated at the heart of the water-food-energy nexus, the SWP has the potential to play a critical role in improving the incomes and resilience of rural households while unlocking environmental benefits.

Energy-efficient and affordable SWPs have the potential to be a critical enabler of economic growth and security for more than 500 million smallholder farmers worldwide. However, SWPs present significant technical challenges as their performance is highly dependent on the use case, intended application, size of the associated energy system, and other environmental factors. [The 2019 Global LEAP Awards](#) included the first-ever SWP competition, recognizing products that offer a strong balance across price, energy efficiency, performance and reliability.

The commercial ecosystem for SWPs is, however, still nascent. Winners and Finalists of the competition were also eligible to participate in the [Global LEAP Results-Based Financing](#) programme, which provides financial incentives to appliance manufacturers and off-grid solar distributors that partner to distribute large quantities of Global LEAP Awards winning and finalist [products](#).

Between 2019 and 2020, the Global LEAP Results-Based Financing programme facilitated the procurement and distribution of over 8,021 Global LEAP Awards Winning and Finalist SWPs in East Africa, Senegal and Zambia, sold to smallholder farmers by 21 participating distributors. This represents a significant portion of this market (60%) as GOGLA sales data records 13,376 SWP sold in East Africa in 2019 and 2020 cumulatively. 60 Decibels conducted thousands of interviews with these end consumers to verify the purchase of eligible products and collect additional consumer insights.

Second Iteration

We published the [first iteration of this report](#) in May 2019. Since then, we followed up with the majority of the initial 375 respondents. We have also collected data from an additional 818 customers during both baseline and follow up interviews.

We have aggregated all the data collected on these customers in this report. For some key indicators, we looked at the differences between the data collected before 2020 for the first report and the data collected since January 2020 to provide more insight into any changes.

You can find the main differences on the right and throughout the report.

Challenge rates, though high, have reduced and, customer service has improved. Customer satisfaction, income level, and quality of life improvements have remained reasonably consistent. Competition has increased, as shown by an increase in access to alternatives.

	2018/19 Data	2020/21 Data
Sample Size	n = 375	n = 818
Poverty Reach	25% (47% national rate)	23% (47% national rate)
Access to Alternatives	9%	25%
Challenge Rate	45% (48% unresolved)	32% (43% unresolved)
Customer Effort Score	2.5	3.2
Net Promoter Score	55	46
Value for Money (‘Very good’ or ‘good’)	82%	65%
Quality of Life Improved	82%	89%

Customer Profile & Aspirations

- Demographics
- Farming profile
- Income profile
- Future aspirations

“There is no more fetching of water; people can focus on other activities now.”



Customer Profile: Demographics

A typical customer was male, aged 46, and was accessing the SWP for the first time.

There was a wide degree of variability in demographics, suggesting that SWP value propositions are appealing to a broad demographic by age, but not gender.

Education levels may affect financial literacy and access to information. They may also be an indicator of income status, further illuminating why SWPs remain elusive to those below the poverty line. The customer profile by these indicators on the right remained consistent since the first study in 2018.

About the Customers We Spoke With

Data relating to customer characteristics (2018/19 n = 375, 2020/21 n = 817, Total n = 1,192)

	Total	2018/19	2020/21
Average household size	5.7	6.0	5.7
Gender	Male: 89% Female: 11%	Male: 84% Female: 16%	Male: 89% Female: 11%
Average age	46	47	46
Highest education level attained by a person in the household	<ul style="list-style-type: none"> • Tertiary - 74% • Upper secondary - 11% • Lower secondary - 4% • Primary - 11% • None - 0% 	[insufficient data]	<ul style="list-style-type: none"> • Tertiary - 74% • Upper secondary - 11% • Lower secondary - 3% • Primary - 11% • None - 0%

Usage of the Solar Water Pump

The majority of customers use their SWP for irrigation or agricultural purposes.

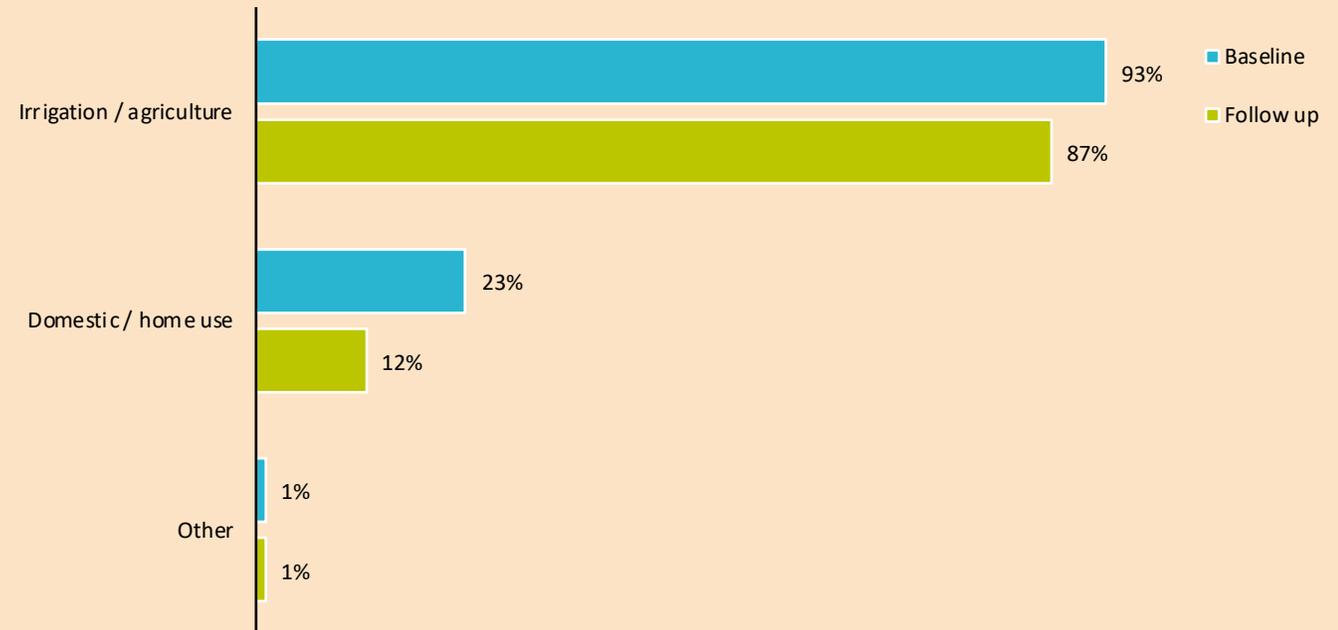
We asked customers how they planned to use their SWP at baseline. During follow up, we asked how the SWPs were being used to see if there were differences.

The actual usage for domestic activities was lower than customers planned for at purchase. This may be because the functionality didn't work for these purposes, or it could be that the product was actively engaged in agricultural activities for longer time periods than initially expected.

Usage of SWPs

Q: How do you plan on using your SWP? Select all that apply (Baseline; n = 392)*

Q: What is the primary way you are using your SWP? (Follow up; n = 392)



*Note: Respondents were allowed to select multiple usage options at baseline and only the primary usage at follow-up.

Farming Profile

78% of respondents used the SWP for agricultural activities and 22% for domestic uses. We asked questions to those using their SWP for agricultural activities to understand their farming practices.

The majority of these users had already been irrigating their crops (76%) before purchasing a SWP, indicating a shift from manual or diesel irrigation.

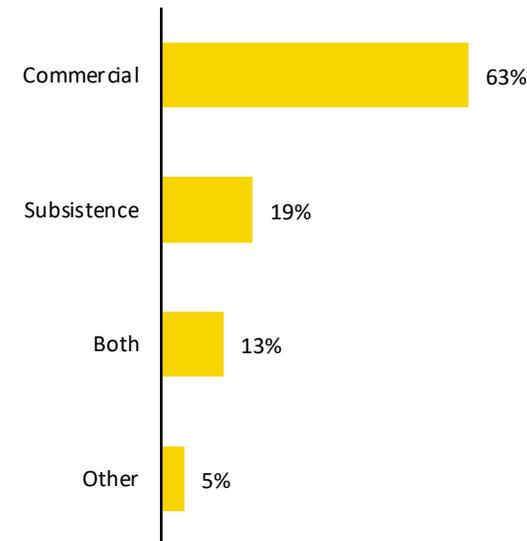
Farmers are mostly irrigating horticultural crops. Being high value, they complement the commercial nature of most of the farming operations. Grain irrigation is significant, with maize at 13%. Maize is a staple crop in the region with steady demand both for subsistence and commercial purposes. The other crops irrigated were onions, potatoes, spinach, hot pepper, avocados, bananas, mangos and watermelons.

On average, customers who used the pump for agricultural purposes cultivated 3.7 acres of land in the last 12 months. The majority of customers used the pump for commercial farming.

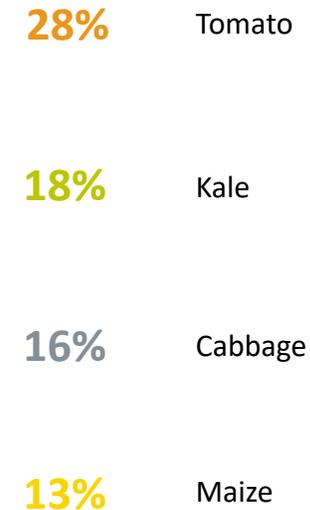
About The Customers We Spoke With

Data relating to customer characteristics (n = 930)

Type of Farming



Top Crops Irrigated



3.7

Acres were cultivated by customers last year, on average

24%

Didn't irrigate before purchasing the SWP.

Water Sources and Incumbent Irrigation Methods

On average, customers spent 8.8 hours per week collecting water.

Customers previously using generators may shift to SWP use and reduce spending on fuel and associated carbon emissions. Those using manual irrigation mentioned saving money from hiring casual labour, so there may be unexpected negative livelihood implications in the community. These need to be considered in the context of broader community level economic gains.

SWP access represents a step up the energy access ladder for 64% of customers. This progress means moving on to more modern energy services, in this case, moving from manual labour to solar technology.

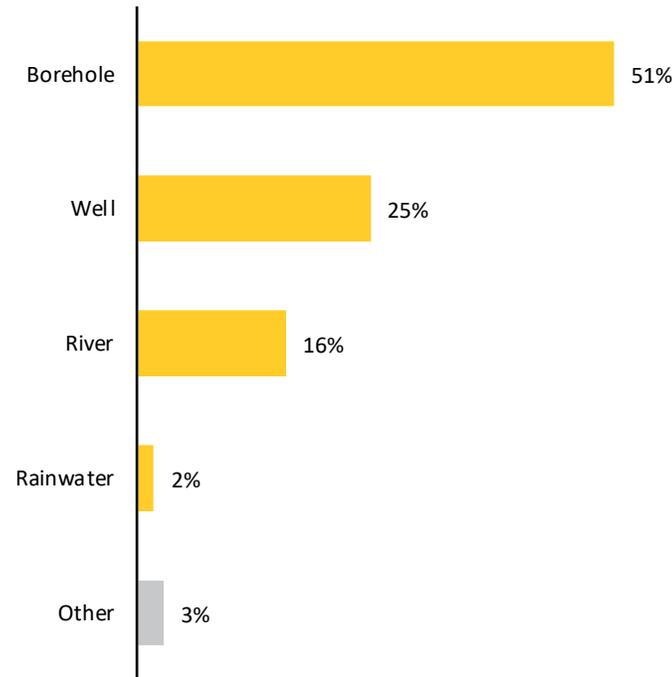
33% mentioned that water availability and quantity was a problem in the area they live in. Upcoming Efficiency for Access research shows that for this region, even with an optimistically modelled scenario in SWP usage, over-extraction is not a near-term concern. However, Efficiency for Access is also conducting research on longitudinal impacts that will help track if these issues are persistent and/or worsening.

Additional insights on changes in volume and availability of water can be found on slide 33.

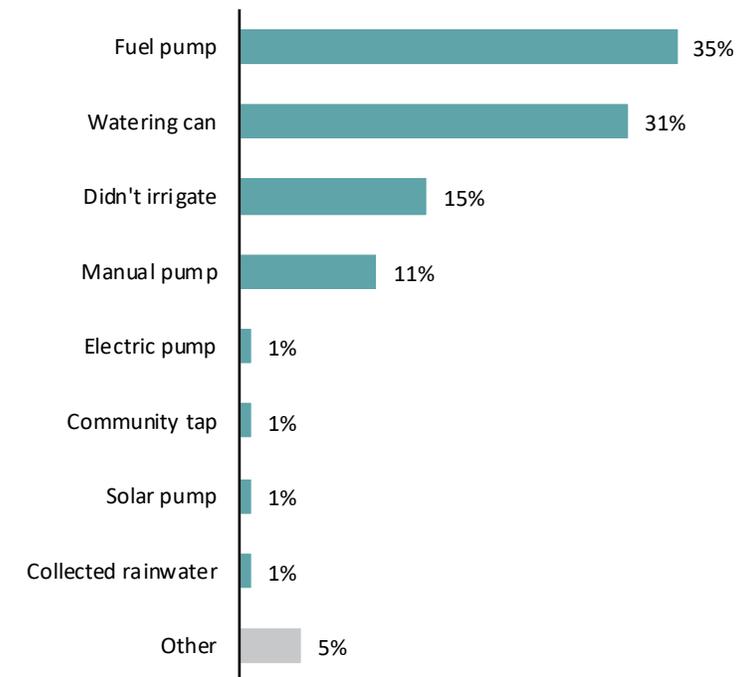
Most customers rely on boreholes as their primary water source and a significant proportion have displaced their use of fuel pumps for irrigation.

In 2019, 47% of customers used a watering can prior to purchasing their SWP, compared to 31% now.

Primary water sources



Top former irrigating methods



Customer Profile: Availability of Alternatives

Although it is improving, awareness of the various SWPs that are available remains low. Nearly two-thirds of customers say they could not easily find a good alternative to the SWP they had purchased.

Availability of alternatives provides insight into the competitive landscape and the degree to which the companies are providing a unique product.

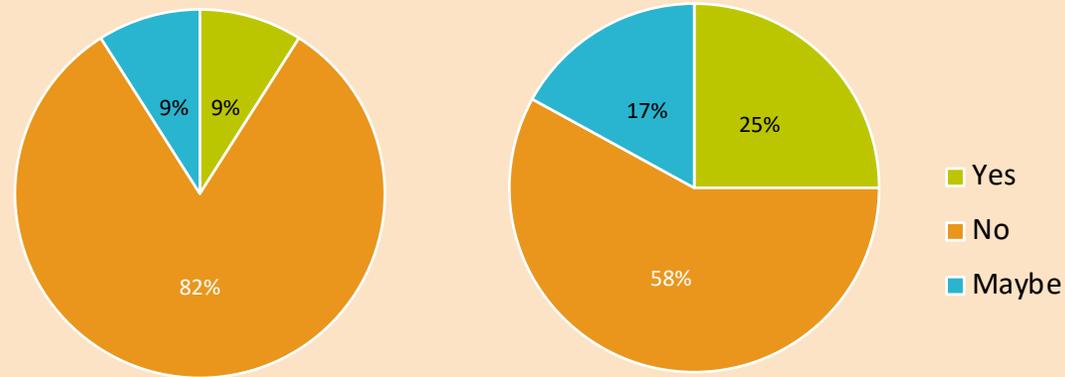
In total, 73% said they could not easily find a good alternative which suggests the companies are serving a less developed market.

Since 2019, the proportion of respondents who believe they could easily find a good alternative to the SWP they have has tripled. Much of this data is from Kenya, demonstrating growth in that market. Consumer awareness campaigns, like the one that will soon be run by Efficiency for Access in Machakos, Kenya, will further increase customers familiarity with this growing market and thus choice.

91% were accessing a SWP for the first time; across all data.

Access to Alternatives

Q: Could you easily find a good alternative to [company] SWP? (n = 855)



2018/19 Data (n = 112)

2020/21 Data (n = 743)

Customer Profile: Sources of Income

Unsurprisingly, the majority of customers' primary income source was farming, but one-third did not rely on farming at all. On average, respondents talked about 1.5 sources of income, suggesting that many customers are not exclusively focused on agriculture.

36% of customers had variable incomes; nearly all of these said it was seasonal. This number has doubled since the last report, and may have been affected by numerous factors, including the COVID-19 pandemic.

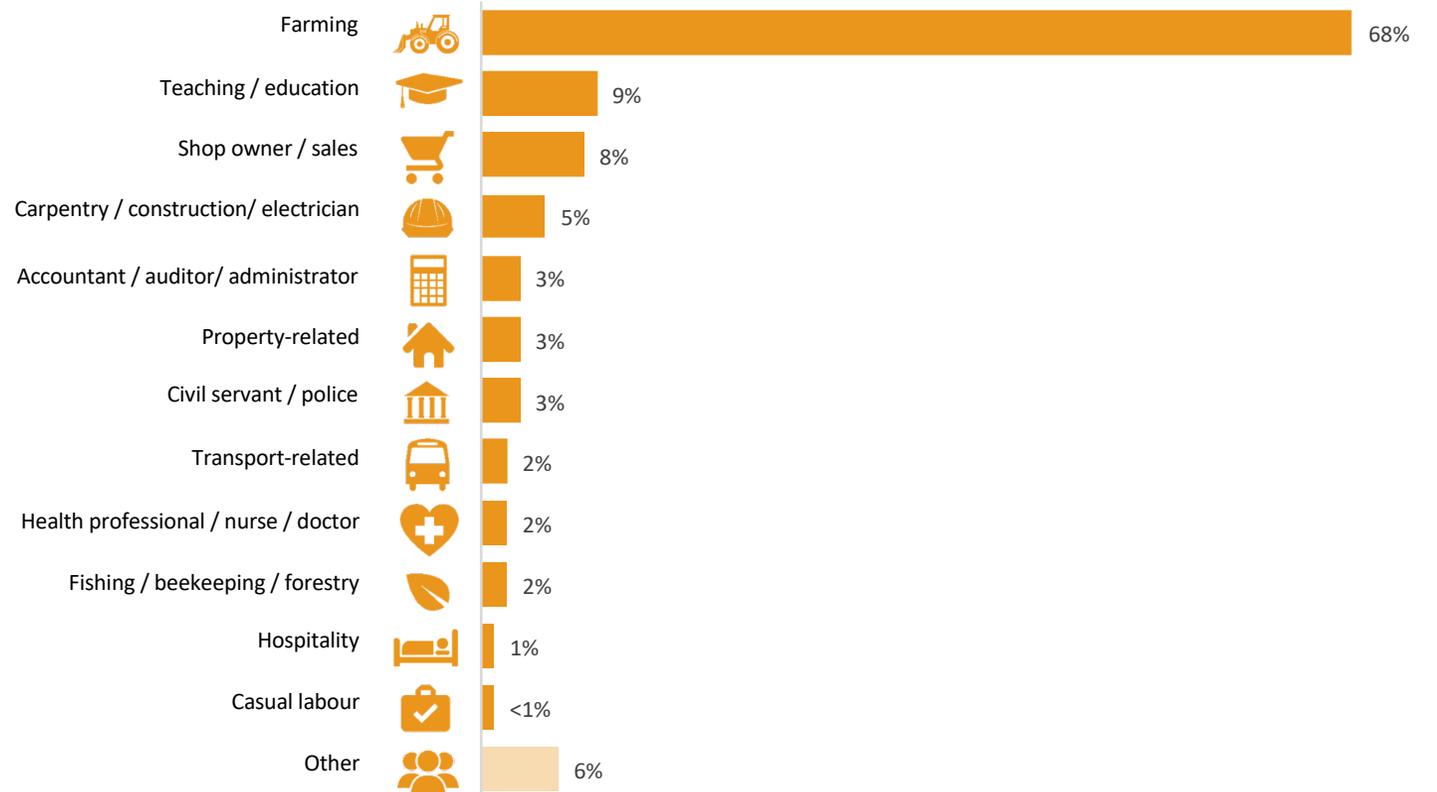
On average, customers say that 43% of their household's total income comes from the farm.

We also asked questions around access to credit and prior loans to get an understanding of pump affordability. 51% of customers purchased their product on credit. 86% of these paid the deposit for their SWP using their income or savings. This is a reflection of the higher income customers who are currently accessing the majority of SWPs being sold.

Farming was the primary income source for the majority of SWP users.

In 2019, 18% of customers had variable incomes compared to 36% now.

Primary income sources for a SWP user's family in the last 12 months:



Customer Profile: Inclusivity

Compared to the Kenya national population, companies in the SWP RBF are serving a relatively wealthier customer base.

In 2019, 25% of customers were living below \$3.30 per person per day, compared to 23% in 2020/21.

Using the Poverty Probability Index®, we measured how the income profile of SWP customers from Kenya compares to the national average. This comparison reveals whether SWPs are under- or over-penetrating certain income segments and is a way of gauging inclusivity.

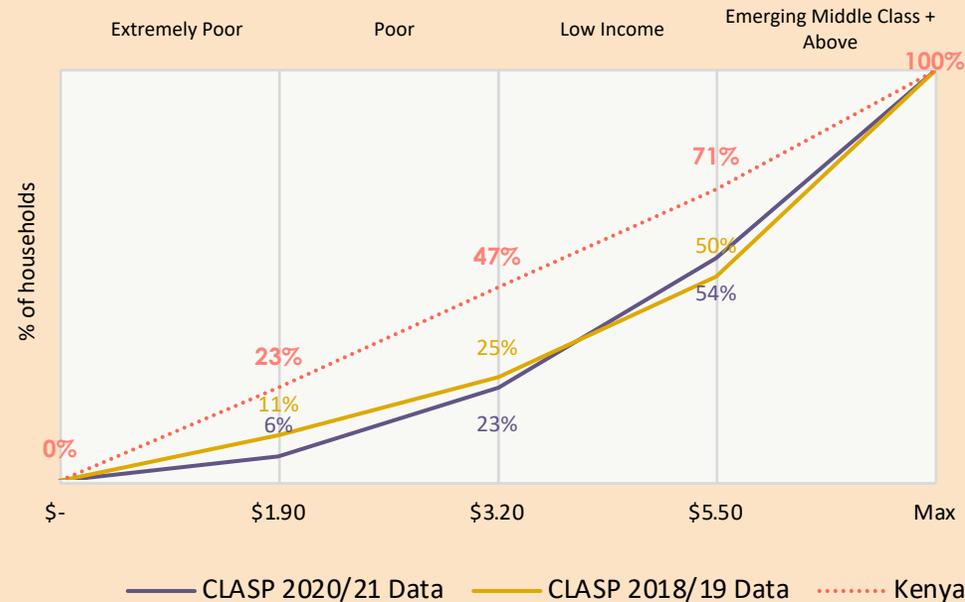
Companies participating in Global LEAP Results-Based Financing programme are serving wealthier customers than the Kenya national average, resulting in an Inclusivity Ratio of 0.50.

In countries other than Kenya, the sample sizes were not large enough to calculate Inclusivity Ratios.

The income profile of customers hasn't changed much over the years.

Income Distribution of Global LEAP Results-Based Financing Company Customers Relative to Kenya Average

% living below \$xx per person / per day (2011 PPP) (n = 1001)



Inclusivity Ratio

Degree that RBF participating companies are reaching low-income customers in Kenya

0.50x

● ● ● ● ● - BOTTOM 40%

We calculate the degree to which CLASP RBF companies are serving low-income customers compared to the general population. 1 = parity with national population ; > 1 = over-serving; < 1 = under-serving.

See Appendix for calculation.

Future Aspirations

We asked questions to find out what aspirations customers had for accessing new and different appliances or devices. This may provide insight for companies when thinking about offerings, cross-product marketing, and selling.

88% of customers said they would like to purchase another solar product in the future. Interestingly, 38% of users are also looking to move further up the energy ladder by upgrading their solar home systems. These insights suggest that companies are doing a good job of demonstrating the benefits of solar-powered technology and the value proposition is seemingly beneficial to customers.

The majority of customers would like to purchase additional appliances in the future; particularly improved cookstoves and solar radios.

Interest In Purchasing Other Solar Products

Multiple choice (n = 393)



63% wanted to buy an improved cookstove, 4% already owned



61% are looking to buy a solar radio; 4% already owned



43% would like to buy a solar fan; 1% already owned



40% would like to purchase an upgraded or additional SWP



38% would like to purchase a solar TV, 35% already owned



38% say they'd like an additional or upgraded solar home system.

Usage, Satisfaction & Experience

- Acquisition channels
- Motivation to purchase
- Choice of company
- Usage of SWP
- Net Promoter Score & drivers
- Customer challenges
- Value for money
- Over-Indebtedness

“My poultry is getting fresh water. The community around can use the water easily. They used to get water from the borehole, but I have now set up a tap.”



Acquisition Channel

The top sales channel was through word of mouth but social media influence is growing.

In 2019, only 7% of customers heard about the SWP through social media compared to 17% now.

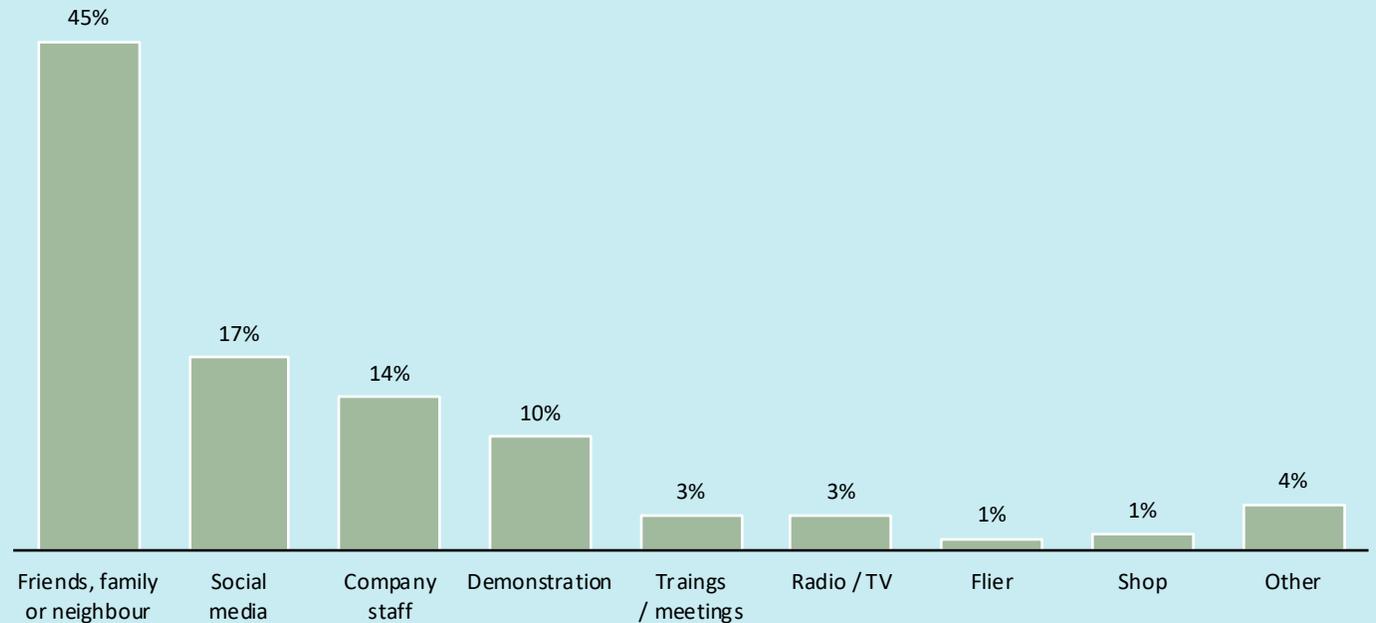
To gauge customer access and familiarity with solar technology, we inquired about prior ownership of solar lighting as this may reduce the perceived risk of trying a new technology.

In 64% of households, customers had owned a solar lighting product prior to purchasing their water pump. Yet, 57% of customers had not heard of solar technology for water pumps before. 91% were accessing a SWP for the first time.

In 81% of households, it was the male adult alone who made the decision to purchase the SWP. In 15% of households, it was the female adult alone. In 4% of households it was the male and female adults together.

Acquisition Channel

Q: How did you or your household hear about the SWP? (n = 952)



Motivation To Purchase

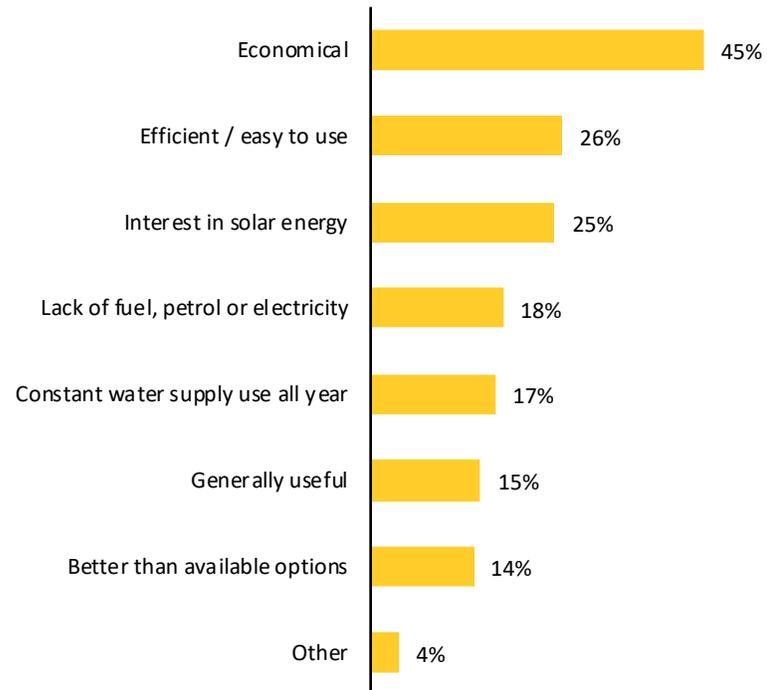
Ensuring that motivations for purchase are met is important, particularly in markets where word-of-mouth referrals are key. Negative messaging from dissatisfied customers could prove damaging to future demand and uptake. Similarly if marketing messages are perceived as misleading, they can erode trust in the brand.

In general, we found that customers who previously used fuel-powered pumps were more likely to purchase for economic reasons, whereas customers who irrigated manually were likely to purchase due to the solar pumps' ease of use and time savings. The provision of constant water all year around was a more common purchasing motivator for female customers (26%) than male customers (15%).

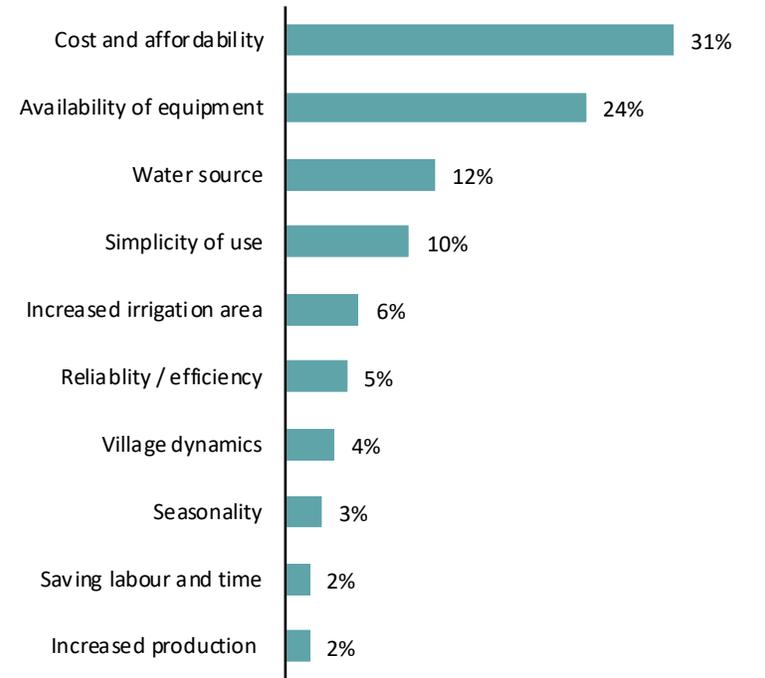
The top motivation for purchasing a SWP was to save money and have an option that was cheaper than their previous solution.

This is data from 2019. We didn't ask this question in more recent interviews.

Motivation to Purchase



Factors Affecting Purchase of Current Irrigation Technology



Choice of Company

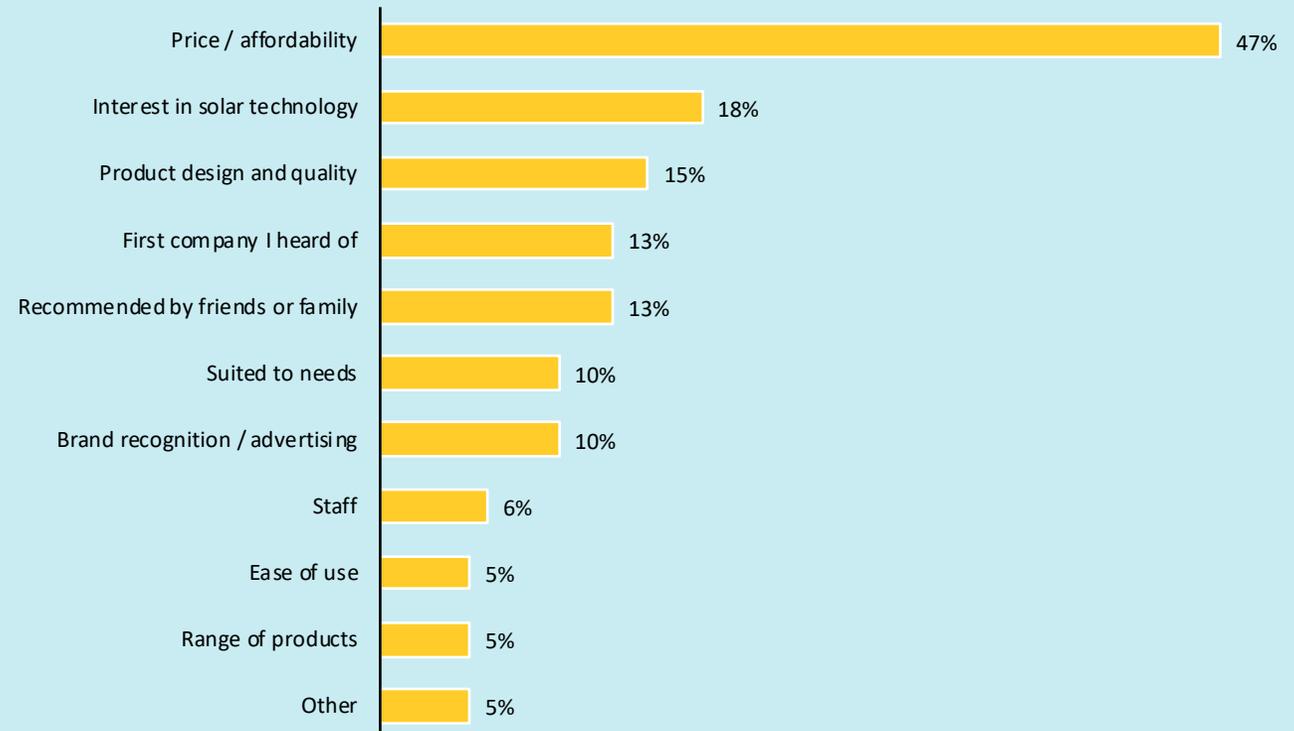
A company's product pricing and affordability is the top reason attracting SWP customers when making a purchase.

This is data from 2019. We didn't ask this question in more recent interviews.

When considering which company to purchase their pump from, male customers were more likely to consider pricing and affordability (51%) than female customers (25%). On the other hand, female customers were more likely to consider a word of mouth recommendation (25% of female customers vs. 9% of male) and their interest in solar technology (25% of female customers vs. 17% of male).

Given that pricing is the key driver for choice of company, companies should pay more attention to tailoring their pricing and financing models to customers. The Low Energy Inclusive Appliances Program (LEIA) is piloting the use of a productivity model that couples satellite imaging with large data sets of weather, soil, farming practises and other variables. This tool can help determine a farmers productivity profile, allowing for customised financing packages.

Reasons for Company Choice



Customer Satisfaction: Net Promoter Score

SWPs have a Net Promoter Score[®] of 52, which is very good.

The Net Promoter Score[®] is a gauge of customer satisfaction and loyalty. Anything above 50 is considered very good. A negative score is considered poor.

Asking respondents to explain their rating provides insight into what they value and what creates dissatisfaction. These details are on the next page.

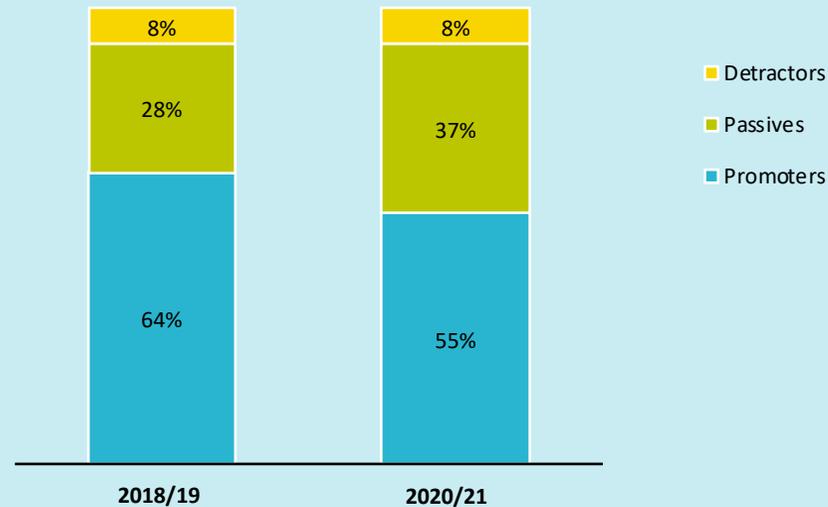
Customers who reported that their quality of life had ‘very much improved’ had the highest NPS (55).

The NPS for customers who had not experienced challenges was higher (38) than those who reported challenges (12). The range here was large with the lowest and highest NPS per company at 0 and 100.

The NPS has remained stable overall, showing a pretty consistent market, a good sign in a growing sector.

Net Promoter Score[®] (NPS)

Q: On a scale of 0 to 10, how likely are you to recommend the [company] SWP to a friend or family member, where 0 is least likely and 10 is most likely? (n = 828)



NPS	55	46
n =	324	503

NPS Benchmarks

Selected 60 Decibels Benchmarks

60 Decibels Global average 384+ companies	43
East Africa average 118+ companies	44
Energy average 80+ companies	46

“It is very convenient to use especially during dry seasons. It helps since I can pump water for irrigation, in the garden and even home use.”

NPS Drivers

Promoters value the increased access to water brought about by the pump. Detractors complain about the pump's unreliability.

59% are Promoters :-)

They love:

1. Increased access to water
(37% of Promoters / 17% of all respondents)
2. Productive water use
(20% of Promoters / 9% of all respondents)
3. Decreased farming costs
(15% of Promoters / 7% of all respondents)

"I don't spend money purchasing water or sending my children to go and fetch water since it is now at my doorstep and my house."

34% are Passives :-/

They like:

1. Increased access to water
(21% of Passives / 9% of all respondents)
2. Decreased farming costs
(10% of Passives / 4% of all respondents)

But complain about:

1. Faulty/unreliable product
(41% of Passives / 3% of all respondents)

"It is easy to use, though what is needed is a tank so that it can pump water from the river."

7% are Detractors :-(


They want to see:

1. Improved pump durability
(100% of Detractors / 7% of all respondents)
2. Improved reliability of product
(33% of Detractors / 3% of all respondents)

The 2019 Global LEAP Awards SWP Competition identified durability as a key performance issue. However, there are limitations to quickly and inexpensively assess durability in a lab setting. Consequently, Efficiency for Access published a [SWP Durability Research Memo](#) that identifies common failure points and identifies measures manufacturers can take to improve pump system durability and recommendations to improve the test method to better assess durability. The memo has been a launching point for discussion with SWP companies. The research and discussion within the LEIA SWP Technology Working Group have led to a revision of the [Global LEAP Solar Water Pump Test Method](#).

Value for Money

Over half of customers consider their SWP ‘very good’ or ‘good’ value for money though this proportion has decreased over time.

Customers who rated their SWP to be ‘very good’ value for money had a higher NPS than those who rated it as ‘very poor’. Despite the high capital costs of SWPs, customers continue to see benefits and thus value for money. This indicates that any attempt to increase affordability will be met by higher acquisition numbers as customers are deriving value that they can appreciate and are willing to pay for.

Value for money rating has significantly decreased since the last report in 2019, with only 65% rating ‘very good’ or ‘good’, compared to 82% in 2019. This may be as later stage adopters start to purchase these products and have different expectations of value and usage. Further, the customers may be weighing their SWP purchase costs against the unfavourable economic situation brought on by the pandemic. Longitudinal data being gathered will illuminate this as either a trend or an instance brought on by the extenuating circumstances.

Value for Money

Q: How do you rate the value for money of your SWP? (n = 684)



Over-Indebtedness

Of the 83% of customers who bought their product on credit, we asked how they felt about their repayments and whether they ever struggle to make repayments for their SWP.

4% of customers have had to take out another loan to help with their repayments.

In 81% of households, the loan repayments are the responsibility of the male adult in the household.

Though the majority of users are able to service their repayments without concern, there is evidence of over-indebtedness impacting customers. Payment terms that are informed by farmer productivity profiles maybe one solution—such as the productivity model developed by Efficiency for Access. This model can be piloted as a tool to design bespoke financing plans for farmers, reducing the burden of servicing their repayments

Nearly half of customers have to make unacceptable sacrifices in order to make product repayments.

13% of customers say they have **other loans or credit**. This was lowest for customers in Tanzania, Rwanda, and Zambia and higher than average in Uganda (37%).

54% have had to make **unacceptable sacrifices** in order to make repayments; of these, 4% say it is 'regularly'.

Nearly half of customers **paid for the deposit using their income**. During follow up, **67%** were using their income to make payments for their SWP, 28% used their savings and 5% borrowed from a formal or informal lender.

87% of those who had made unacceptable sacrifices **had made them for other reasons** before purchasing their solar pump.

50% of customers said that their solar product repayments **were a burden**, with 12% saying it is a **'heavy burden'**. 49% of customers say the repayments are not a problem. Customers in Zambia were most likely to report feeling burdened.

38% of customers said they **sometimes have to cut back consumption** to make repayments, and 9% do regularly. However, for the majority (53%) they never have to.

Customer Challenges & Customer Service

Using all data, 34% of customers had experienced challenges. 42% had not had their challenge resolved. The proportion of unresolved challenges has remained relatively stable despite the reduction in the proportion of customers who experience challenges. Unresolved challenges can encourage negative word-of-mouth and detract from positive impact. Companies should prioritise resolving customer issues. The next page shows the most common issues experienced.

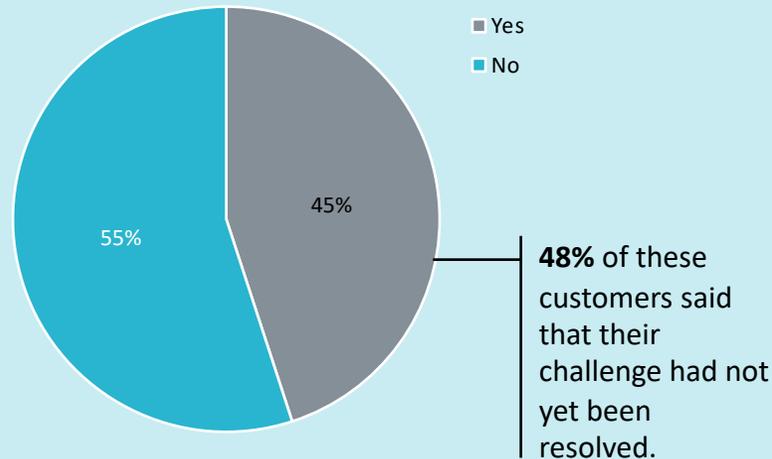
Customers who have experienced a challenge are asked how easy it was to get an issue handled. This is the Customer Effort Score (CES), and it is the average rating of all customers.

The CES is 3.8 out of 5 showing that customer service or after-sales care is good. The company with the highest CES score had a 5, while the lowest was a 1. There was also a large variation in the challenge rate among the companies; ranging from 8% to 100%.

32% of customers had experienced a challenge with using their SWP in 2020/21, this is an improvement from the 45% of customers who reported challenges in 2018/2019.

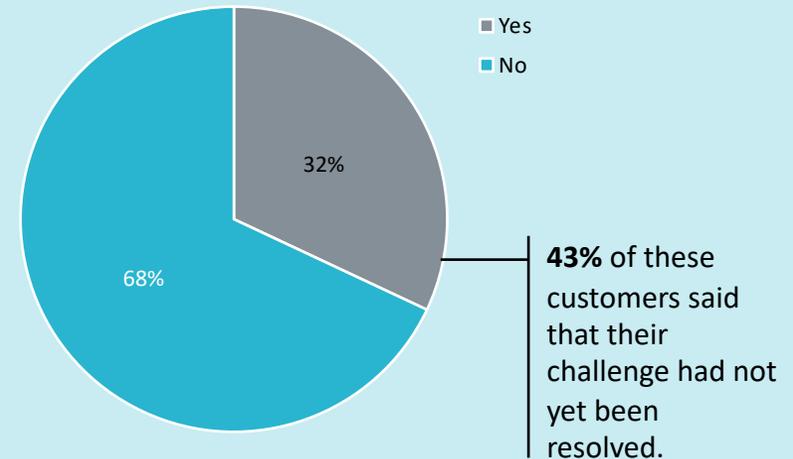
Proportion of Customers Reporting Challenges in 2018/19

Q: Have you experienced any challenges [working with/using] [company] SWP? (n = 375)



Proportion of Customers Reporting Challenges in 2020/21

Q: Have you experienced any challenges [working with/using] [company] SWP? (n = 1471)



Customer Challenges: Top Issues

We ask the challenges question as framed by customer experience rather than fault. Therefore, challenges can sit in three different themes and can be best addressed in different ways. Often the customer (and our Research Assistants) won't know which category the challenge fits into:

- > Faulty technology - there is something wrong with the product. This is best addressed through discussions with manufacturing.
- > Mismatched expectations - the customer says the product/service isn't working because they expected it to work differently but it is working as intended. A review of marketing materials or sales pitches may be useful here.
- > Misuse - the customer isn't using the product properly; often not deliberately. Installation guidance or training may help reduce these issues.

The most common issues were faulty valves and controllers, general unreliability of the SWP, and poor battery life.

Most Common Issues for 32% of Customers Who Say They've Experienced a Challenge

Q: Please briefly explain the challenge you have faced. (n = 356). Open-ended, coded by 60 Decibels.

33%

Unreliability
(8% of all respondents)

"The pump keeps breaking down. The valves keep disturbing me and repairing it is not easy."

25%

Poor/faulty valves and controllers
(6% of all respondents)

"The valves sometimes get issues so the pump stops working."

14%

Poor battery
(3% of all respondents)

"The battery is weak and also the pump is not powerful when pumping."

Exploring Impact

- Impact on quality of life
- Impact on way of farming
- Changes in farming outcomes
- Changes in volume and water availability



“I believe by using the pump, I will improve my finances through farming.”

Impact Performance: Quality of Life

To gauge the depth of impact, customers were asked to reflect on whether their quality of life has changed because of the SWP.

58% of customers saw significantly improved quality of life ('very much improved'). Customers in Senegal, Kenya, and Rwanda were more likely to talk of 'very much improved' quality of life than other countries. The sample sizes are small in the majority of the countries so these results aren't conclusive.

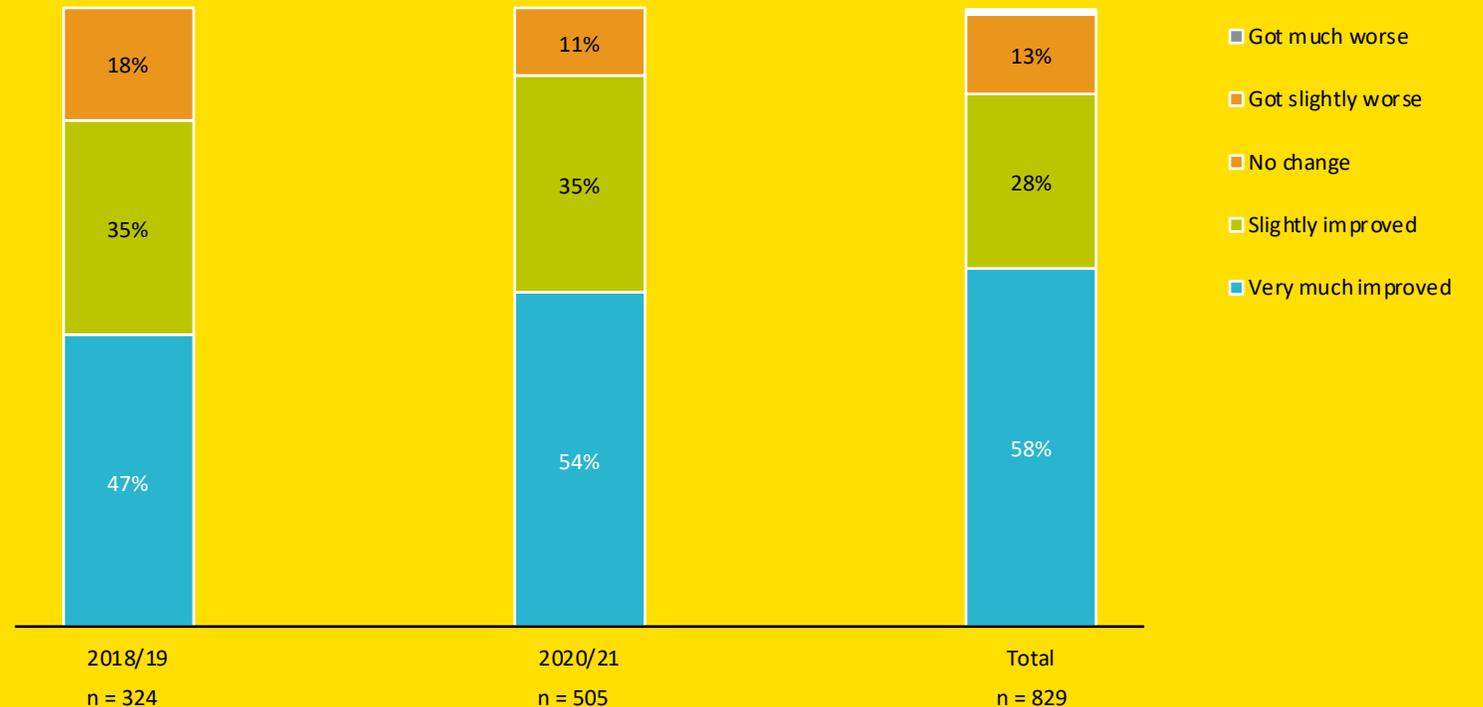
We also saw that customers who hadn't experienced challenges were more likely to say that their quality of life had improved (96%) than those who had reported challenges (82%).

We explore common themes on how quality of life had changed for users on the next page.

86% of customers say their quality of life has improved because of the SWP.

Perceived Quality of Life Change

Q: Has your quality of life changed because of the SWP? (n = 829)



Quality of Life: Top Outcomes

The most common outcomes are shown on the right. Others included:

- Ability to plant new crops (14%)
- Increased income (6%)

The ability to farm off season and to add in new crops are crucial to increase farm income. They give farmers a competitive edge when staple crop supplies are low thus potential for higher prices at market. Further crop diversity increases food resilience in the face of climate change.

Access to domestic water is crucial for hygiene, this data was collected during the pandemic where access to water for hand washing was a critical mitigation strategy.

For the 1% of customers who reported worse quality of life, issues with the product and increased farming costs were reasons given.

17% of customers who said they'd seen no change complained about faulty pumps which they were not able to use.

Customers talk about increased access to clean water and increased farming productivity.

Most Common Self-Reported Outcomes for 86% of Customers Who Say Quality of Life Improved

Q: Please explain how your quality of life has improved. (n = 720). Open-ended, coded by 60 Decibels.

37%

mentioned **easier access to clean water for farming and domestic use**

(30% of all respondents)

"I used to fetch water from the river for my cows and household use. My people can now do other things instead of going to the river. They've saved a lot of time and it has made things easier."

20%

talked about **increased farming productivity**

(16% of all respondents)

"I can now do irrigation even in the dry season, unlike before when I only depended on the farming season."

15%

reported **reduced farming costs**

(12% of all respondents)

"I spend less on labour, especially on costs for paying those who used to fetch water to be used for irrigation."

Way of Farming

We tried to gauge the effect of SWPs on users' management of their farm.

58% of customers who were using their pump for agricultural purposes said that their way of farming had 'very much improved' as a result of the pump.

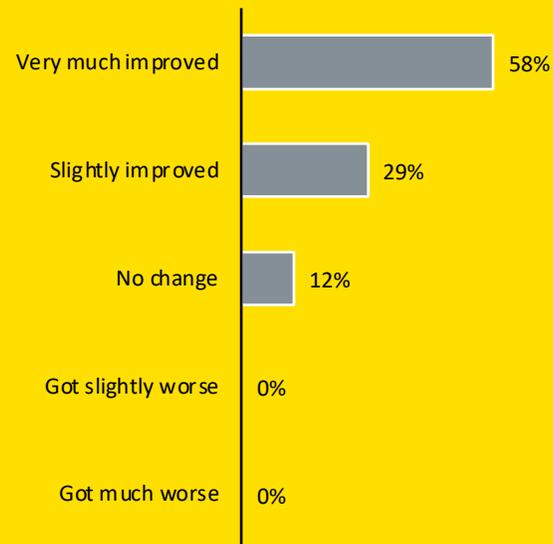
Users were asked to describe – in their own words – the ways in which their farming had changed because of the SWP. The most common outcomes are shown on the right.

The top outcomes from improvements in way of farming were similar to those reported in the quality of life question indicating that these were strong themes throughout.

87% of customers saw an improvement in the way they farm due to their SWP.

Changes In Way Of Farming

Q: Has your way of farming changed because of [company] SWP? (n = 238)



Top Outcomes

Q: How has it improved? (n = 138) Open ended coded by 60 Decibels

24% talked of increased access to water

"Now there is water. I can plant anything I want at any time. I'm not limited and don't have to wait for the rainy season."

23% cited improved health of crop or livestock

"Crops were wilting due to shortage of water but now I have access to water and can farm without caution. I also lacked money to buy fuel but now I use solar and don't have to pay for it."

18% mentioned increased farming production

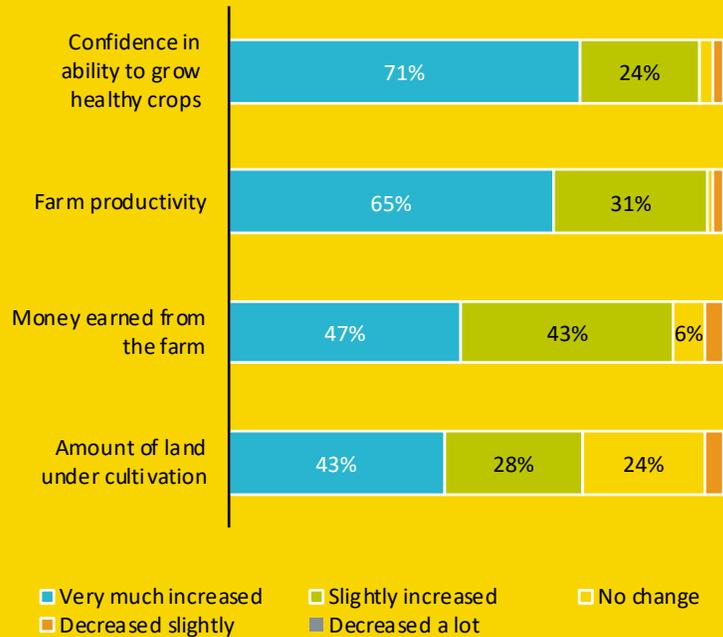
"I now cultivate a bigger portion of land and have more harvest."

Changes in Farming Outcomes

There were widespread reports of improvements in confidence, production, and money earned. However, farming income have not yet risen enough to account for the entire household income needs and must be supplemented with other income generating activity.

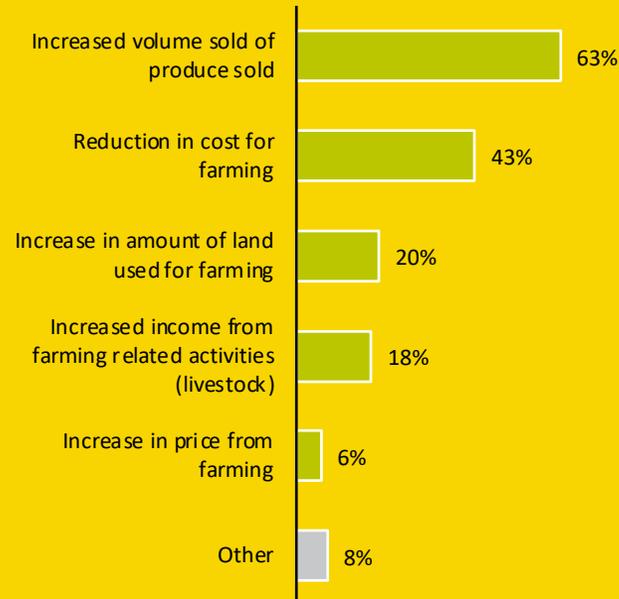
Changes in Farming Outcomes

Q: Since purchasing your SWP have any of the following changed? (n = 238)



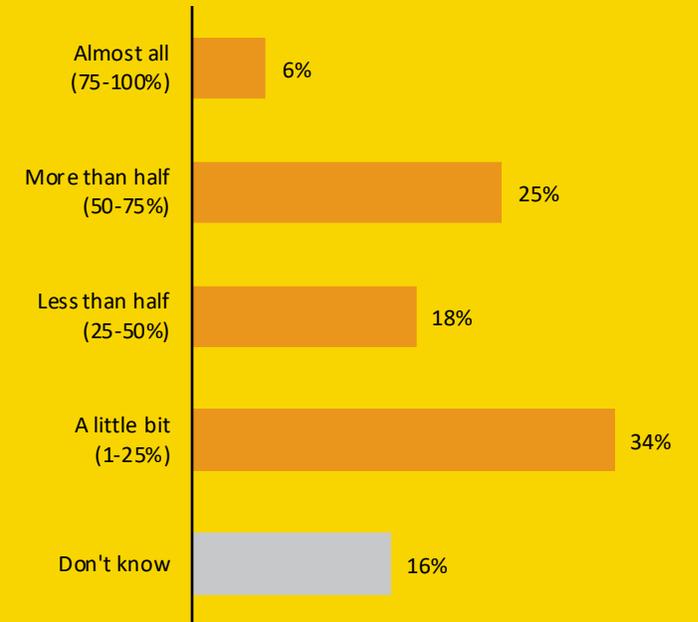
Reasons for Increased Returns

Q: What were the main reasons for the increase in money earned? (n = 226)



Household Income Impacted By Pump

Q: In the [time since last interview], what proportion (%) of your household's total income, came from your farm? (n = 238)

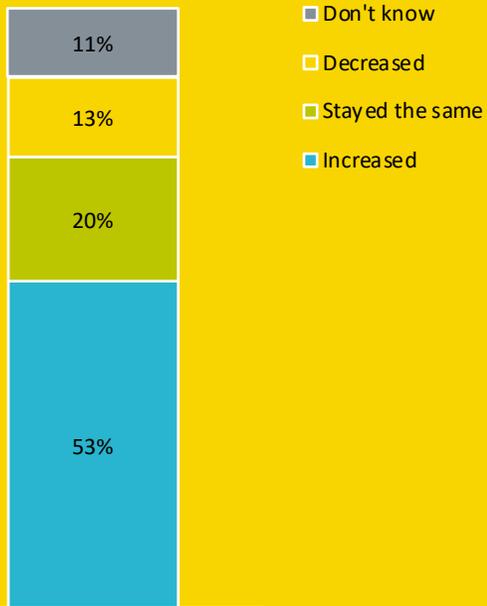


Changes in Volume & Availability of Water

Nearly half of respondents reported an increase in volume of water used for irrigation and availability of water wasn't largely seen as an issue.

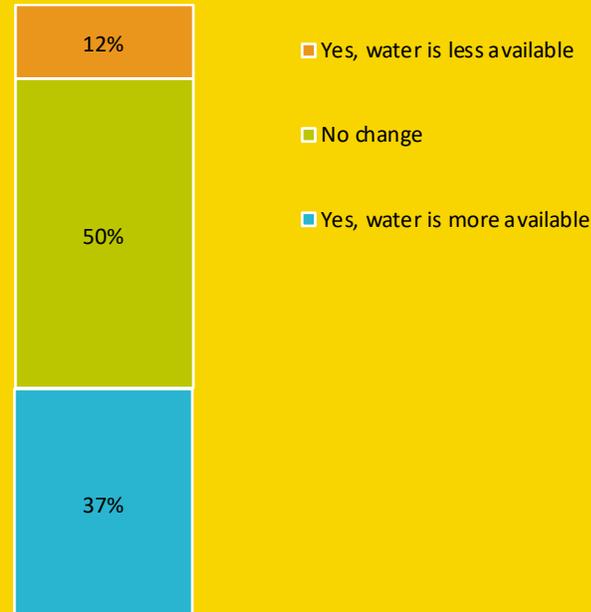
Change in Volume of Water Used for Irrigation

Q: Has the volume of water you use to irrigate your land changed? (n = 505)



Change in Availability of Water from Primary Sources

Q: Have you noticed any changes in the availability of water in your community in the past year? (n = 505)



Top Changes Reported

Q: Can you describe the specific changes you have noticed? (n = 505)

1. No change (50%)

"I don't see any changes in water availability because the rainfall patterns have not changed."

2. Increased access to water because of the pump (17%)

"For me, I have seen a change because the well I dug is now giving me a lot of water since I now have a pump to collect it. I do not know about other people around the area I live."

3. Fulfilment of water needs (10%)

"Now more water is available because it is enough to water the crops, and more is left for domestic use."

Additional Insights

- COVID-19 insights
- Customer voices
- By company: ranking core Lean Data indicators

“I think all features are available in this solar water pump so I don't think there is any feature extra I would want.”



Listening In The Time Of COVID-19

This is an unprecedented time, with people facing both a global pandemic and economic shutdown.



Results & Our Benchmarks

We know this is a difficult time for many. We included four COVID-19 related questions into our survey with SWP customers to give space for customers to talk about this. We also recognise that customer experience and impact performance more generally may be affected by the pandemic and how it is affecting families and companies' ability to operate. The 60dB benchmarks used in this insights report reflect all our work to date; we are also building COVID-19 specific benchmarks to reflect the environment we are all working in.



60 Decibels COVID-19 Insights Dashboard

To understand the impact of COVID-19, we are speaking to people around the globe to understand how this crisis affects them over time, and to identify their most urgent existing and future needs. To date, we've spoken to 50,000+ people in 32 countries about how COVID-19 has affected their lives.

You may find both the public [COVID insights dashboard](#) we've created useful to explore insights as well as our latest report, [Listening During COVID-19: A Year in Review](#).



External Factors

We know that certain outside factors will likely affect how SWP customers are feeling, and faring, at this time. We have seen some correlations related particularly to how stringent government measures are to control the spread of the disease. You may find the [Oxford University COVID19 Government Response Tracker](#) useful for providing context on the experiences of the customers.

Awareness & Concern About COVID-19

We asked customers questions related to COVID-19 to assess awareness and effects of the pandemic on them.

99% of all customers interviewed were aware of COVID-19 in December 2020.

60dB COVID-19 Dashboard

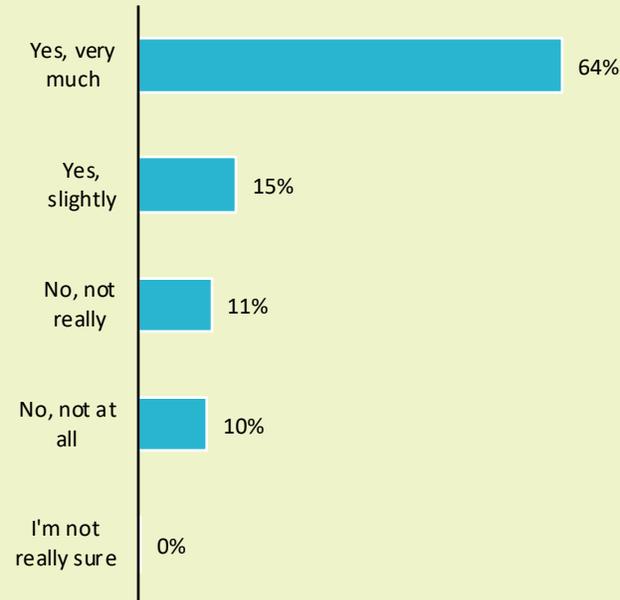
You can find out more about how families around the world are coping with the pandemic and see how SWP customers are doing relative to all on the 60 Decibels COVID-19 online insights dashboard:

<http://bit.ly/60dB-Covid>

99% of SWP customers interviewed were aware of COVID-19, and two-thirds were very concerned about it.

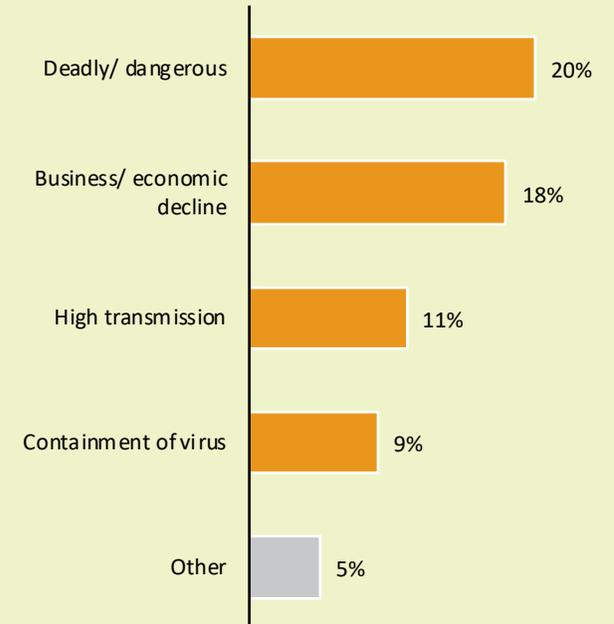
Level of Concern Over COVID-19 (Follow up):

Q: Are you concerned about COVID-19? (n = 705)



Concerns

Q: Could you explain your answer and let me know how you're feeling about COVID-19 right now? (n = 705)
Open-ended, coded by 60 Decibels



Support To Cope With COVID-19

We asked customers what actions being done by others were giving them hope and what one thing could improve their life at this time to support them to cope with the pandemic and associated measures.

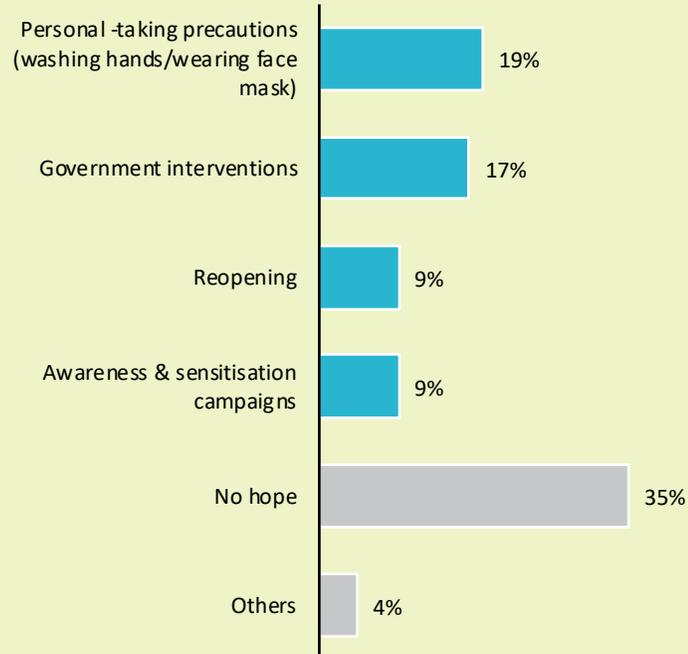
19% said personal initiative to take precautions against COVID-19, better access to clean water through a SWP hopefully gave more agency for such measures.

17% said government interventions such as food distribution and other resources were giving them hope.

Customers say companies can best support them by finding a way to improve their income streams and providing access to finance.

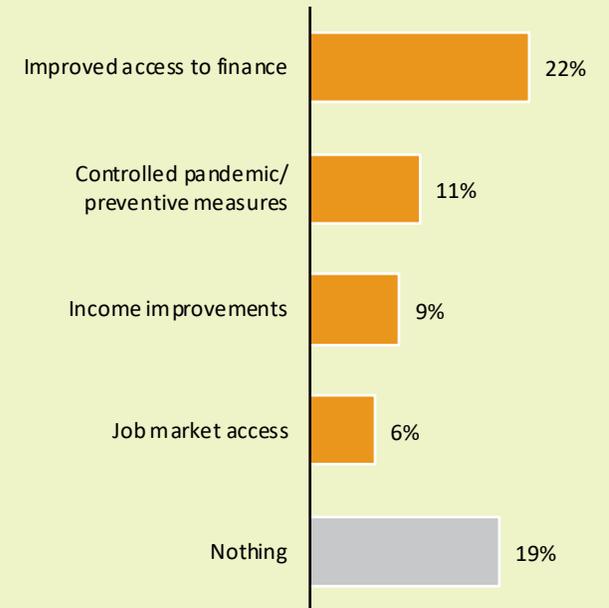
Sources of Hope

Q: Can you tell me, what actions, if any – by friends, community, government or others – are giving you hope right now? (n =705). Open-ended, coded by 60 Decibels



What One Thing Could Improve Life

Q: Related to this pandemic, what one thing could improve your life at this time? This could either be something that you currently do not have, or something that you currently do not have enough of. (n = 705). Open-ended, coded by 60 Decibels



Customer Voices

We love hearing customer voices.

Here are some that stood out.

Impact Stories

81% shared how the SWP had improved their quality of life

“The time I would take to get water has reduced. The water is cleaner and we're able to finish tasks around the compound faster.”

“I used to use an electric pump that was expensive. Now I get water for the farm, for cows, and for housework. It does all that and I do not spend money.”

“I'm eating vegetables, drinking water from the house, the toilet has water, and it has made work easier.”

“I've grown vegetables that I've sold, and they have given me revenue therefore motivating me.”

“My living standards have greatly improved because my income has also increased from farming.”

“After purchasing the solar water pump from SimuSolar, I have saved a lot of money because the pump uses renewable energy unlike fuel pumps.”

Opinions On Value Proposition

57% were Promoters and were highly likely to recommend

“It's efficient, time-saving, and cost-saving. It has made life easier on the farm.”

“The payment method was very comfortable. They didn't push me until I was able to finish.”

“The pump is efficient, cost effective and the monthly payments are friendly.”

Opportunities For Improvement

58% had a specific suggestion for improvement

“[We need] sensitisation of solar water pumps because people still believe electricity is better. This would go a long way to save them.”

“Make pumps with a battery so that it can be used at any time of the day when there is no sunshine.”

“Make pumps that can pump water for a longer distance like 200m and also that can pump larger volumes of water.”

Conclusions

SWPs lead to diverse and meaningful impact for users and are supporting income-generating activities.

Customers face challenges characteristic of a nascent market which provides insight into their experience.

“I used to use an electric pump which was expensive. Now I get light, water to plant, tending cows, and housework. It does all that and I do not spend money.”

SWPs are enabling economic growth and can improve the lives of consumers. However, some challenge remains including wider inclusivity, challenge rate and resolution and affordability.

Key conclusions and ongoing efforts

- **SWPs are positively impacting customer's lives.** Most water pump customers reported improved quality of life overall, and there were widespread reports of improvements in way of farming, confidence, production, and amount of land farmed.
- **SWPs are supporting income-generating activities.** The majority of customers we interviewed were using the SWP for agricultural purposes, particularly commercial farming. Nearly half of customers' household income comes from the farm. Users reported an increase in money earned since purchasing the SWP, primarily due to increase in volume of produce sold and reduced costs on the farm.
- **SWP customers report experiencing technical challenges,** which is characteristic of a nascent market. Further research is needed on how to best address these challenges to support continued growth of the sector. The majority of the reported challenges had not been resolved. Reducing and addressing customer challenges is critical for impact and growth.
- **There is an opportunity to improve accessibility of SWPs to low-income consumers.** Further innovation on cost-reduction strategies such as offering cheaper products and more favourable loan terms has the potential to deliver disproportionate benefits to these consumers.

Appendix

- / Efficiency for Access and Global LEAP
- / Who is in the 60 Decibels Energy Benchmark?
- / More info on sampling
- / Additional data collected not in this report
- / Indicator glossary

The 60dB Energy Benchmark

The 60dB Energy Benchmark is made up of the average performance of the energy company projects conducted since 2016. This includes 100+ off-grid energy companies across 270+ Lean Data projects.

We have completed Lean Data projects for some companies in multiple countries, for multiple services, or multiple timeframes; providing deeper learning over time or cross-geography.

Energy companies: mini-grid providers, solar home system, solar lantern, off-grid appliances, improved cooking solutions, and more.

Companies we've worked with

- Altech
- ARED
- Arnergy
- Auxano Solar
- Azuri
- Baobab+
- Bboxx
- Bidhaa Sasa
- BioLite
- Bonergie
- BrightLife FINCA Plus
- BURN
- d.light
- Davis & Shirtliff
- Deevabits
- Devergy
- Easy Solar
- Ecozen
- Emel Solar
- Energy+
- ENGIE Fenix
- ENGIE Mobisol
- ENGIE PowerCorner
- EnVenture
- Frontier Markets
- Futurepump
- Global Ice Tec
- Green Energy Biofuels
- Greenlight Planet
- Greenserve
- Greenway Grameen
- GVE Projects
- Harness Energy
- HelloSolar
- Husk Power Systems
- Ignite Power
- IMED
- Inspirafarms
- Jaza Energy
- Jumeme
- Kalangala Infrastructure Services (KIS)
- Kazang Solar
- KCKM
- KopaGas
- Lendable
- Lumir
- Lumos
- Mango Energy
- Mega Global Green
- M-KOPA
- Mobile Power
- MREF
- Mwezi
- NAL OffGrid
- Nizam Bijili
- NRSP
- OffGridBox
- OMC Power
- Ongeza
- Oolu Solar
- OPES Solutions
- Orb Energy
- PACOS Trust & Tonibung
- PACT
- Parami Energy
- Pawame
- PEG
- Pollinate Group
- PowerGen
- Powerhive
- Pro Engineering
- Promethean
- PSFI
- REDAVIA
- Rubitec
- RUH
- RVE.SOL
- SCODE
- SELCO
- Simusolar
- Solar Panda
- Solar Sister
- Solaris Offgrid
- SolarNow
- Solutions Height
- SparkMeter
- Standard Microgrid
- Sun Power
- SUNami Solar Kenya
- SunCulture
- Sunny Irrigation
- SunnyMoney
- SupaMoto
- Talent & Technology
- Tara Urja
- Techno-Hill
- Trend Solar
- Ultratec
- Umeme
- upOwa
- VITALITE
- WANA Energy
- Winock Solar
- Winsol
- Zhidao
- ZOLA Electric
- Zonful Energy
- Zuwa

Sampling Information

The sample size used in this report provides a 95% confidence level and 2% confidence interval that the data represented in this report is representative of the customer base.

60 Decibel's Lean Data approach focuses on collecting data in an efficient way.

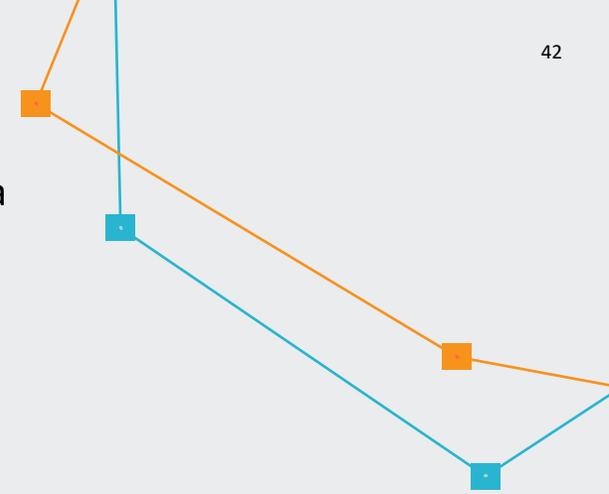
While we have taken time to consider the appropriate number of people to interview in order to generate insights that are representative of the RBF, this is still a sample of customers and won't represent all views and nuances.

In particular, as we used phones as our interview medium, any customers without phones are less likely to be represented – though due to the nature of the included companies' business models, this wasn't a major concern.

Recent changes to business model, product, or marketing may not be reflected in these customers' experiences. In addition, this project collected data from a certain point in time which may mean some answers are affected by seasonality, and/or reflective of any changes in product type and/or geographic locations depending on any sales campaigns, expansion, partnerships, or focus areas.

From a list of the 1,650 customers' information CLASP shared with the 60 Decibels team, the 60 Decibels team randomised the list for the baseline interviews. The 60dB research team then interviewed from this list, making a maximum of three attempted calls each time. The 60dB Researchers are all locals of the countries we work in so they are culture, and context aware, and conduct interviews in local language.

The 60 Decibels team also ran a check on the geographical distribution of respondents compared to the full company customer lists to check representation. We did not find any bias based on county or region.



Calculations & Definitions

For those who like to geek out, here's a summary of some of the calculations we used in this deck.

Metric	Calculation
Net Promoter Score[®]	The Net Promoter Score is a common gauge of customer loyalty. It is measured through asking customers to rate their likelihood to recommend your service to a friend on a scale of 0 to 10, where 0 is least likely and 10 is most likely. The NPS is the % of customers rating 9 or 10 out of 10 ('Promoters') minus the % of customers rating 0 to 6 out of 10 ('Detractors'). Those rating 7 or 8 are considered 'Passives'.
Inclusivity Ratio	The Inclusivity Ratio is a metric developed by 60 Decibels to estimate the degree to which an enterprise is reaching less well-off customers. It is calculated by taking the average of Company % / National %, at the \$1.90, \$3.20 & \$5.50 lines for low-middle income countries, or at the \$3.20, \$5.50 and \$11 lines for middle income countries. The formula is: $\sum_{x=1}^3 \frac{([Company] Poverty Line \$x)}{(Country Poverty Line \$x)} / 3$
Customer Effort Score	How easy do you make it for your customers to resolve their issues? This measure captures the aftersales care and customer service. Customers who have experienced a challenge are asked to what extent they agree with the statement: Do you agree or disagree with statement: Overall, [Company] made it easy for me to handle my issue : disagree (1), somewhat disagree (2), neither agree or disagree (3), somewhat agree (4), agree (5). The CES is the average score between 1 and 5. It is an important driver of uptake, adoption, and referrals, as well as of impact.

I have been able to save time.
I reduced my labour requirements.
I can now access water for my farm.

With the pump I can save

>time

>money

now.

Have questions? Get in touch:

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