



USAID
FROM THE AMERICAN PEOPLE



CAN ZAMBIAN HOUSEHOLDS AFFORD SHS? INSIGHTS FROM A LOCAL SURVEY

PRESENTATION | SEPTEMBER 2019

How can we **improve affordability**
for the **65-82%** Zambians that
can't afford SHS?



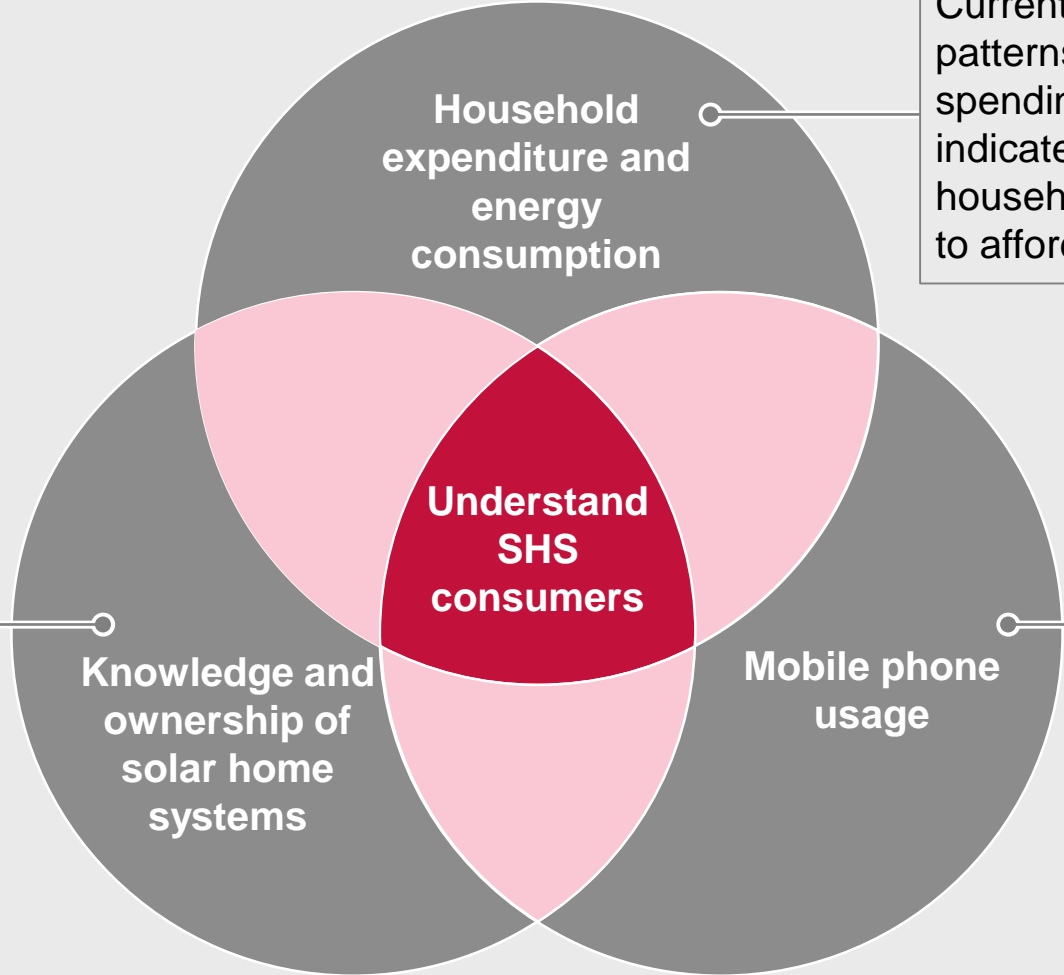
USAID
FROM THE AMERICAN PEOPLE



USAID SAEP CONDUCTED A NATIONWIDE SURVEY TO BETTER UNDERSTAND CURRENT AND FUTURE SHS CONSUMERS

N = 1,486 households (full surveyed sample)

Awareness of SHS, current purchasing patterns and barriers to SHS take-up provide an understanding of the current reach and appeal of the market, where varying levels of market development will require a different sales approach by SHS players



Current expenditure patterns, particularly spending on energy, indicate whether households would be able to afford a SHS product

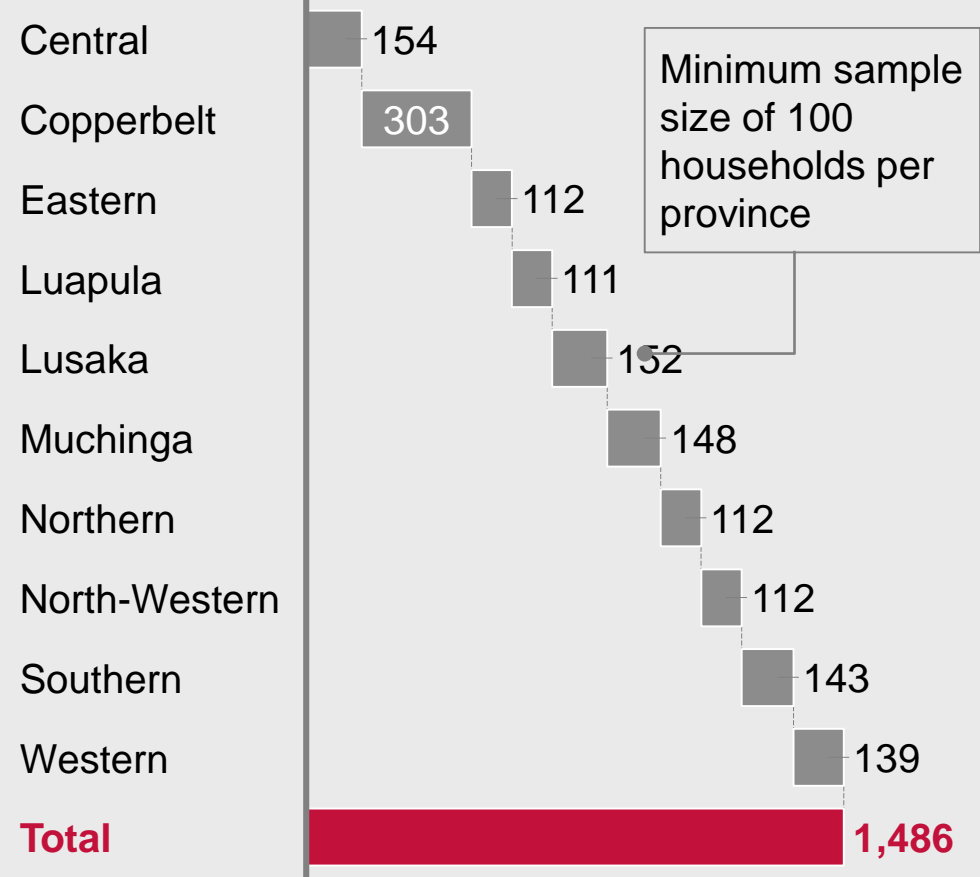
Mobile phone penetration and digital financial services uptake are key indicators of market potential for SHS companies given the ease of payment via mobile platforms

SOURCE: Internal analysis, SHS company interviews

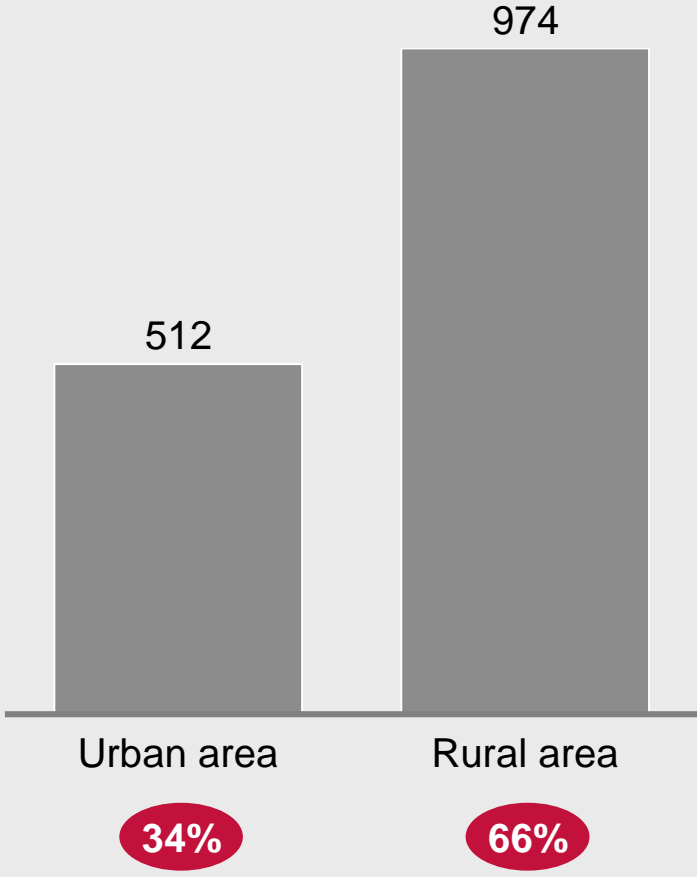
THE SURVEY HAS NATIONWIDE COVERAGE WITH OVER 100 RESPONDENTS PER PROVINCE AND 66% FALLING IN RURAL AREAS

% % of total respondents

Geographic distribution of the households,
Number of households



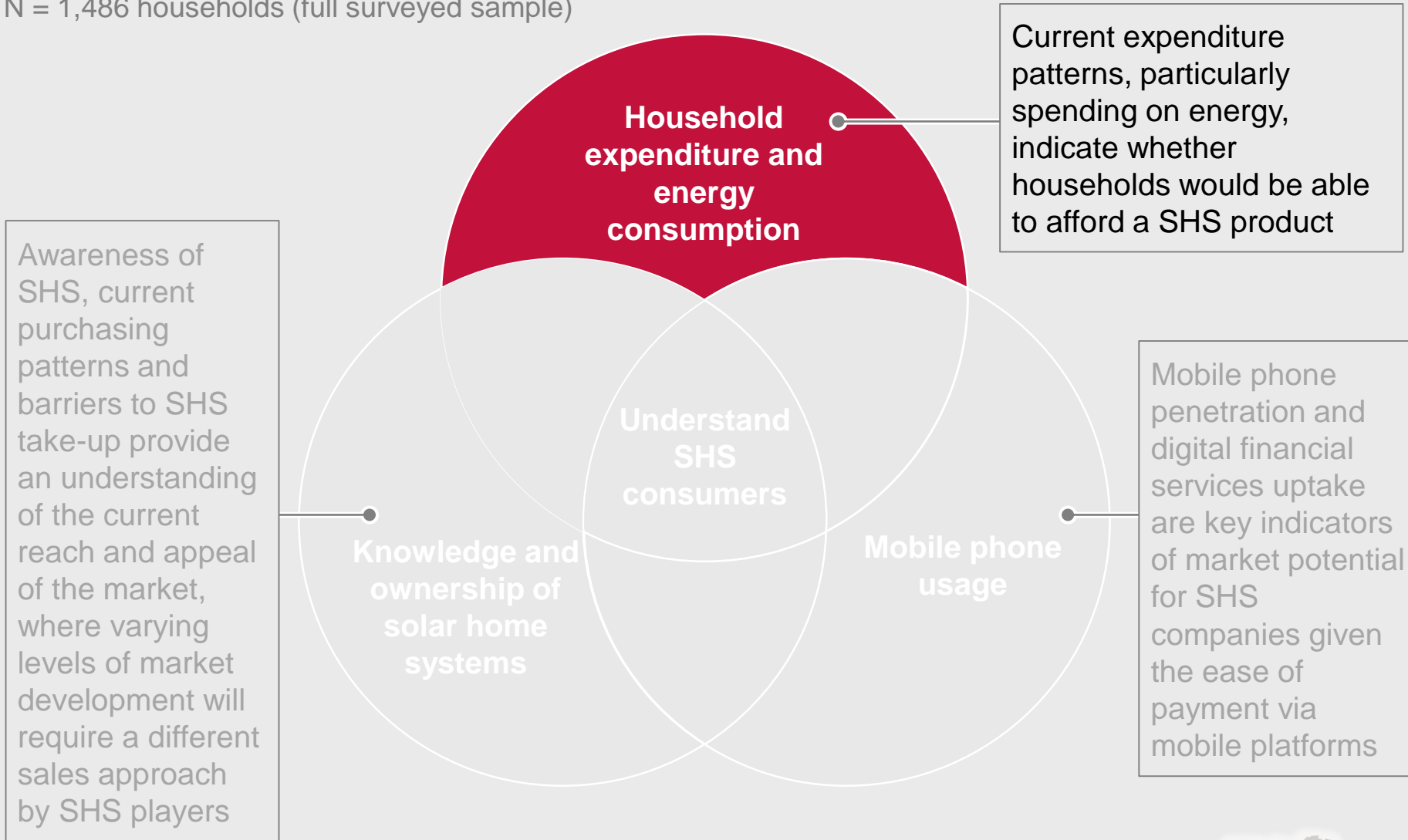
Split of households by area of residence, Number of households



SOURCE: USAID SAEP Household Survey (2018)

USAID SAEP CONDUCTED A NATIONWIDE SURVEY TO BETTER UNDERSTAND CURRENT AND FUTURE SHS CONSUMERS

N = 1,486 households (full surveyed sample)

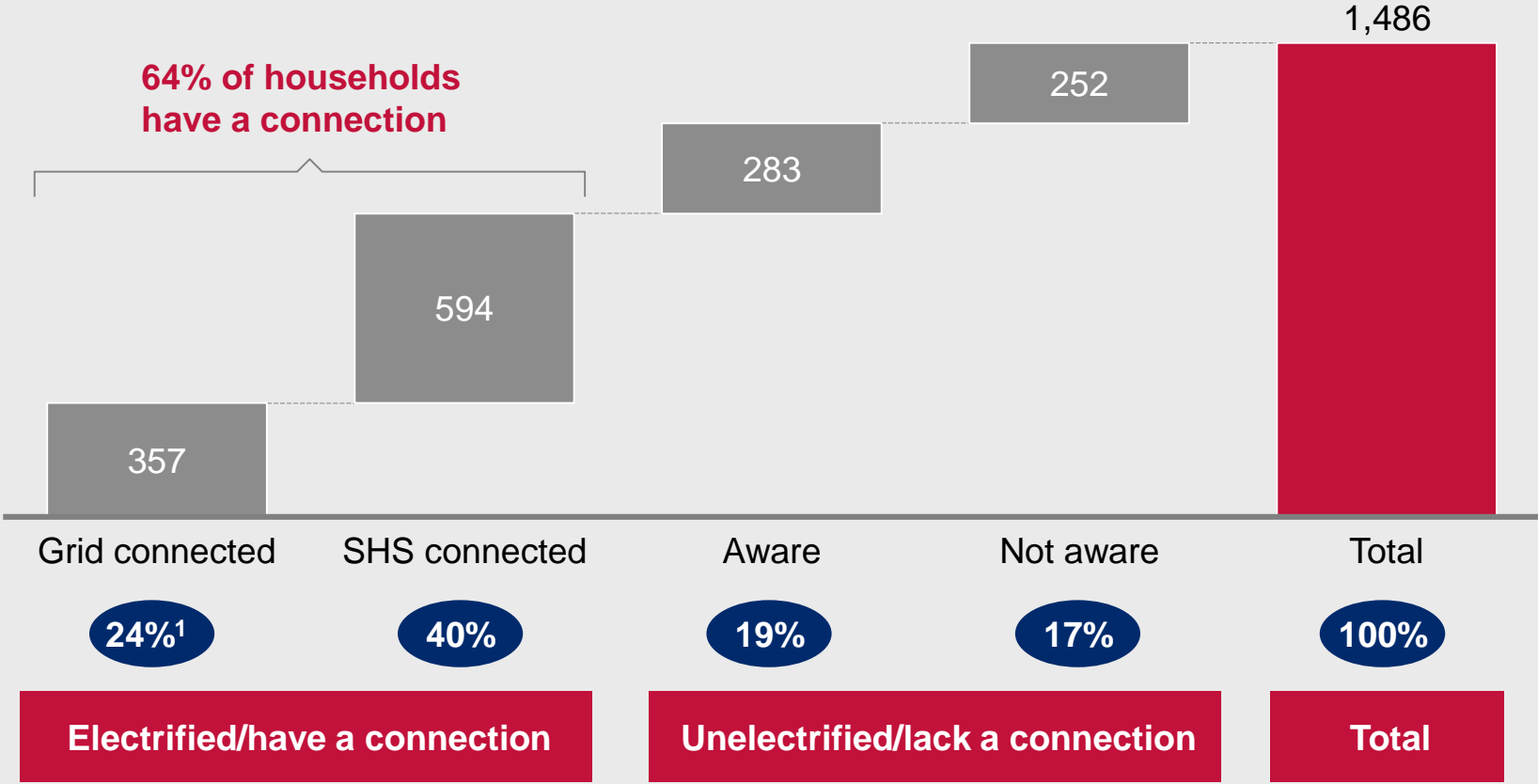


SOURCE: Internal analysis, SHS company interviews

64% OF SURVEYED HOUSEHOLDS HAVE ACCESS TO A CONNECTION AND OF THOSE 40% ALREADY OWNED A SHS PRODUCT

% % of total households

Level of electrification across surveyed households,
Number of households (full surveyed sample)



¹ This is within range of the national electrification rate of 27%



18% – 35% OF HOUSEHOLDS ARE ABLE TO AFFORD A BASIC SHS PRODUCT (USD 7 PER MONTH)

%

Estimates on ability to pay

%

Sense-checks used to validate analysis

i **Current lighting expenditure**

ii **Self-stated willingness to pay**

iii **Sense-checks**

One-time

One-time

PayGo

Current SHS premium

REMP analysis

Peri-urban

18%

35%

27%

47%

Rural

18%

35%

32%

33%

15%¹

Overall

18% 35% 31%

34%

¹ The 2009 analysis established that 15% of households in rural Zambia are willing to pay USD 5 per month for SHS

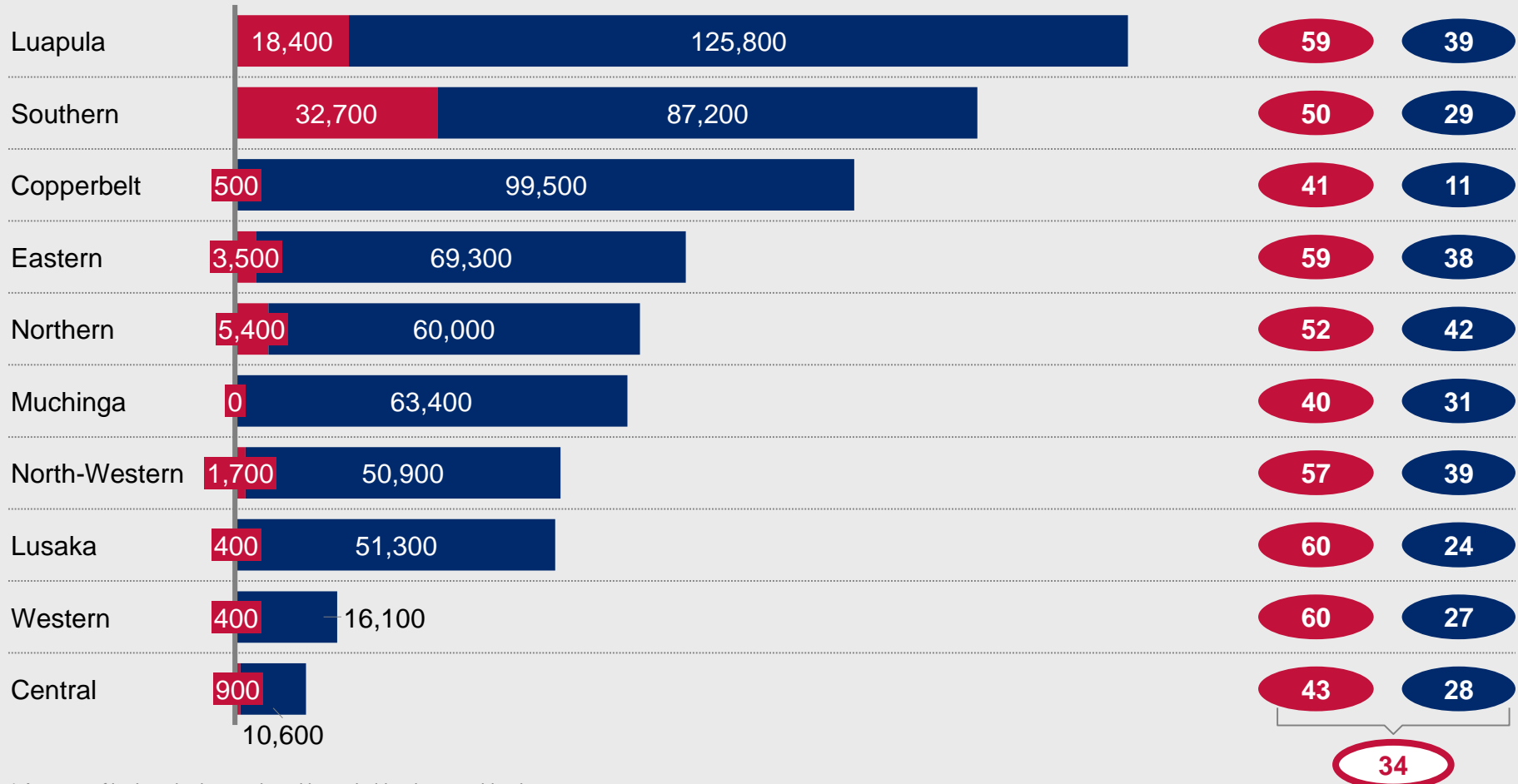




THIS CORRELATES WITH THE HOUSEHOLD SURVEY, WHICH SHOWS 34% HH CAN AFFORD SHS; MOST IN RURAL AREAS

■ Peri-urban ■ Rural (# Average % of peri-urban and rural HH (# % of peri-urban HH that can afford (# % of rural HH that can afford

Distribution of unelectrified households by affordability based on current lighting expenditure,
unelectrified households (2017)²



1 Average of both peri-urban and rural households when combined

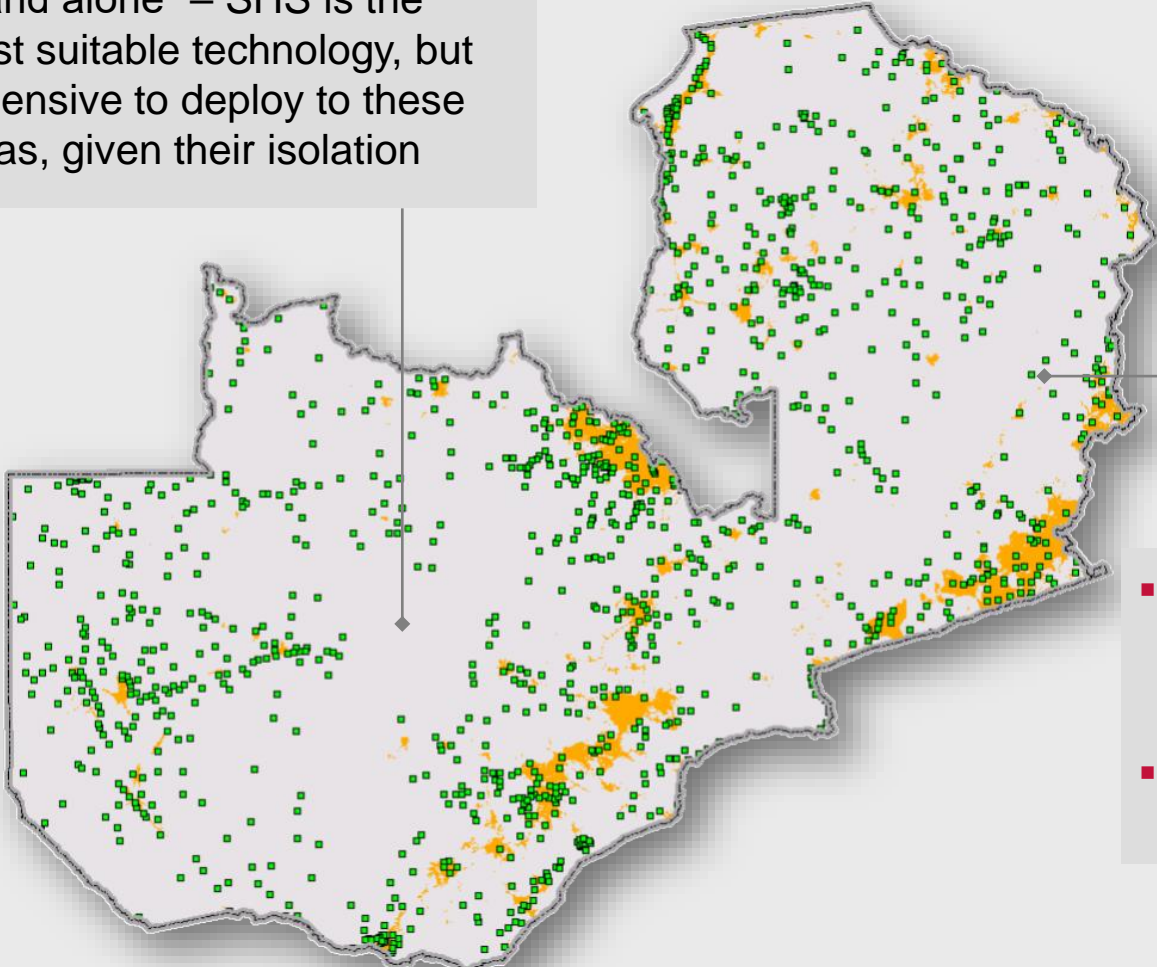
2 Proportion able to afford applied to the provincial rural and peri-urban unelectrified population from the USAID SAEP geospatial model



MOST OF ZAMBIA IS COVERED BY “STAND ALONE” HOUSEHOLDS; AN IMPORTANT MARKET FOR SHS, BUT COSTLY TO REACH

Rural growth centre locations (2017)

- 1.5 million HH are classified as “stand alone” – SHS is the most suitable technology, but expensive to deploy to these areas, given their isolation

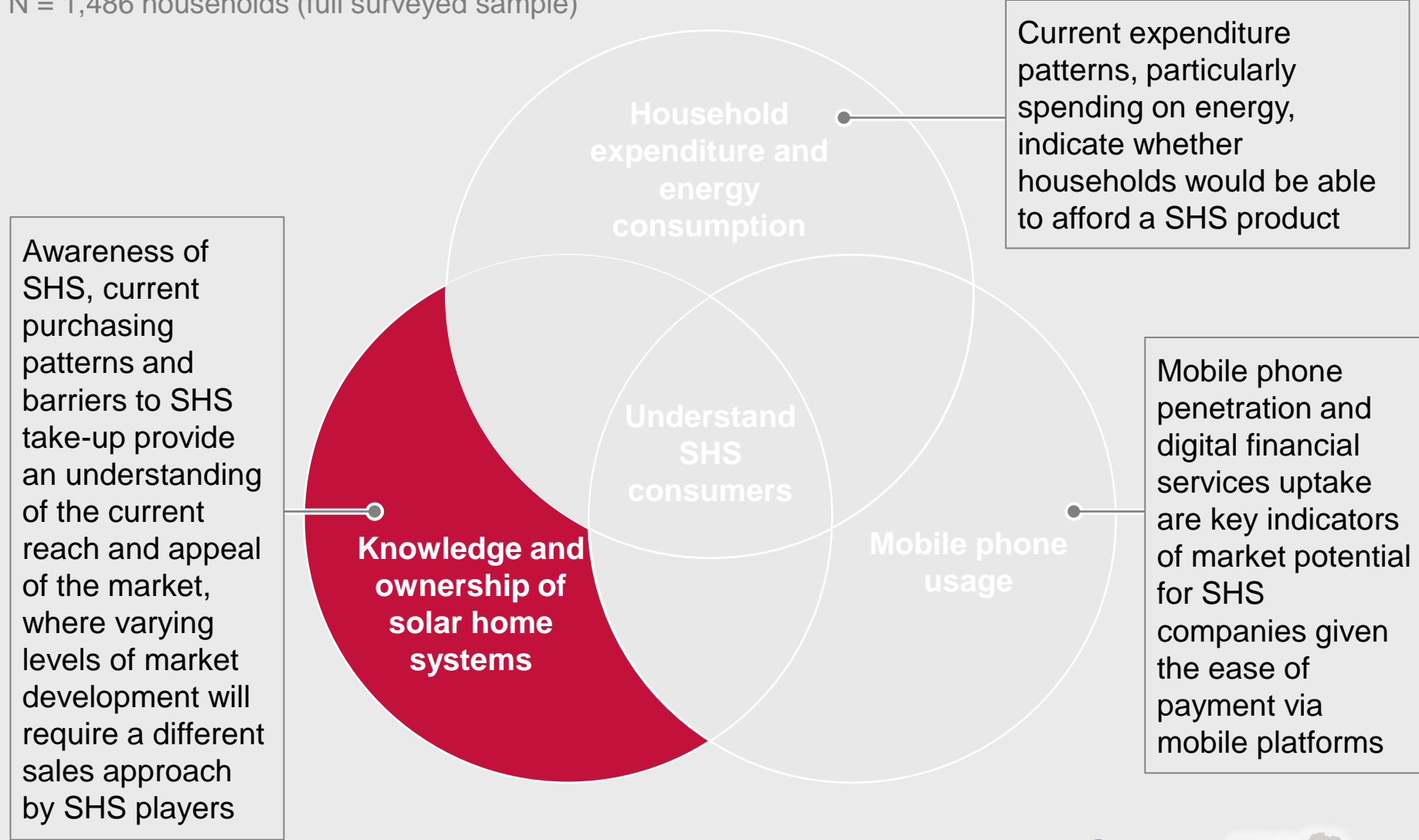


- Settlement areas
- Rural growth center
- Stand-alone households

- There are 1,216 rural growth centers in total that need to be electrified
- 275 rural growth centers fall within settlements

USAID SAEP HAS UNDERTAKEN A NATIONWIDE SURVEY TO BETTER UNDERSTAND CURRENT AND FUTURE SHS CONSUMERS

N = 1,486 households (full surveyed sample)



SOURCE: Internal analysis, SHS company interviews

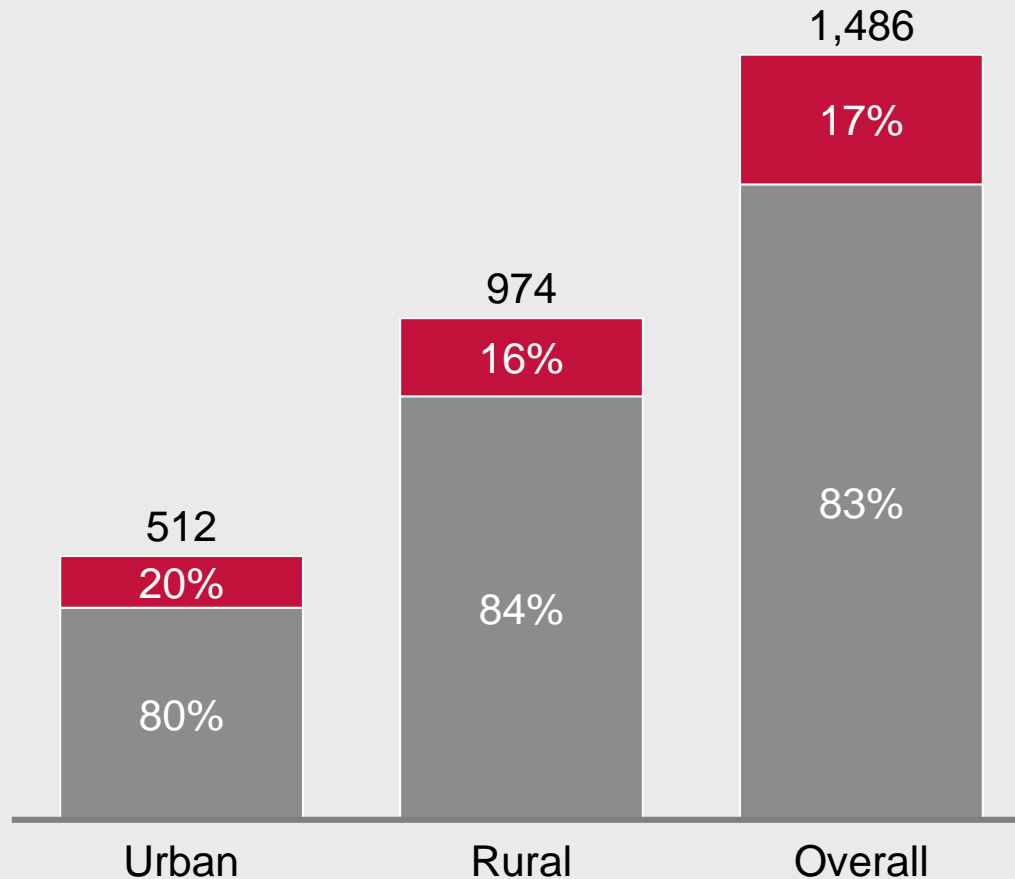


AWARENESS OF SOLAR PRODUCTS IS VERY HIGH WITH 83% OF SURVEYED HOUSEHOLDS KNOWING ABOUT SOLAR ENERGY

■ Not aware ■ Aware

Awareness of solar products, % of households

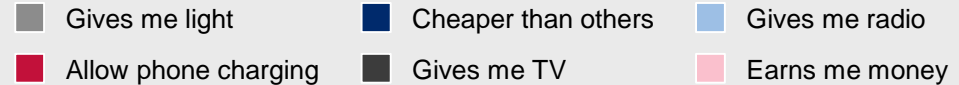
N = 1,486 households (full surveyed sample)



- 80% of surveyed households know about solar energy
- Awareness of solar in rural areas was marginally higher at 84% compared to 80% in peri-urban areas

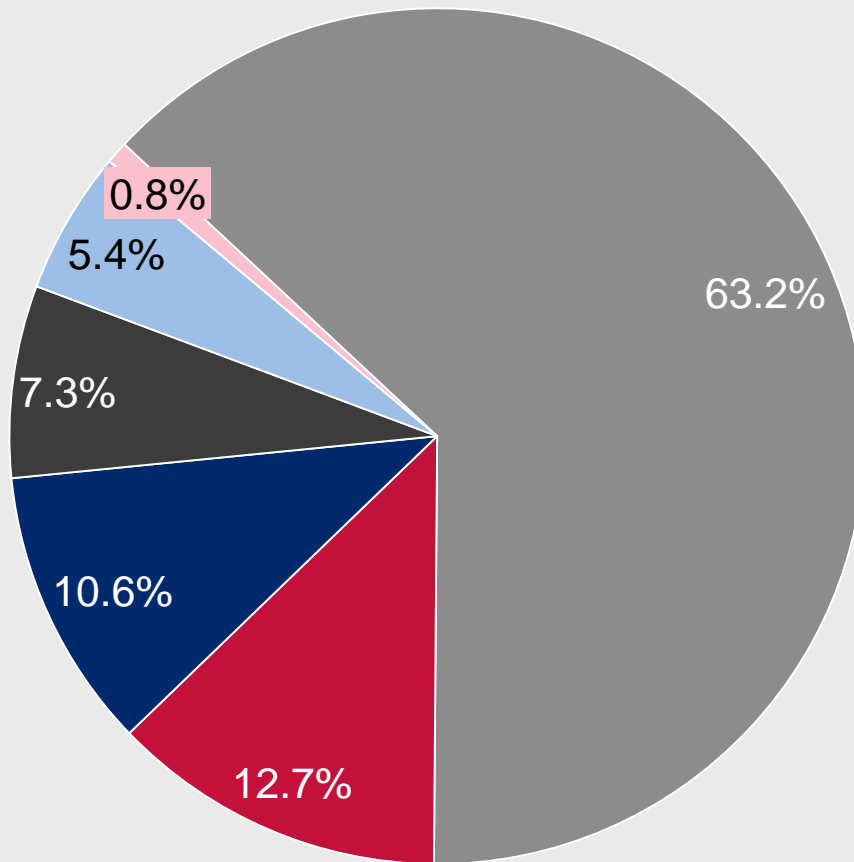


LIGHTING (63%) IS THE MOST VALUED FEATURE AMONG SOLAR PRODUCT OWNERS



Most valued feature by type of solar product, % households

N = 592 households (restricted to households that own solar products)



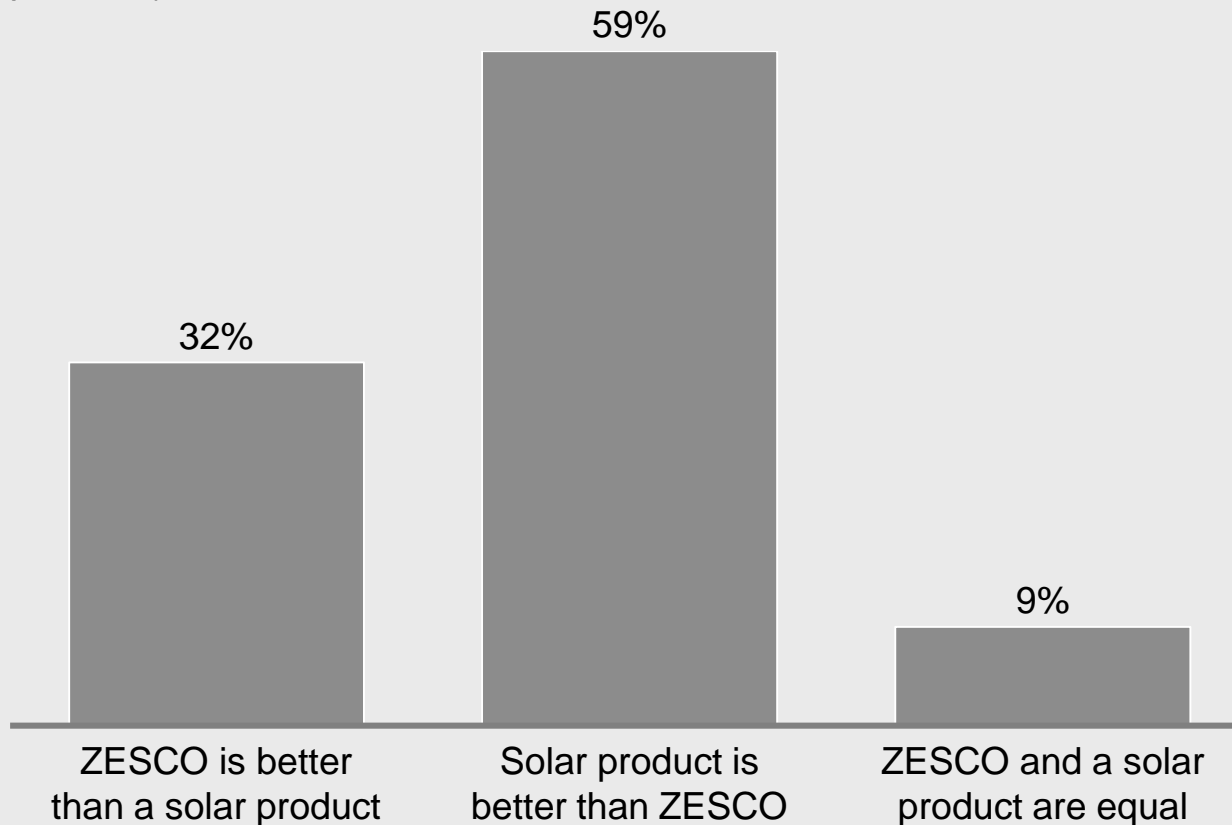
- Overall, 63% of households cite lighting as the most valued feature about their solar product
- Lighting may be seen as the 'essential' feature of solar products, whereas radio and TV are 'luxury' features that households value once they have become accustomed to the lighting component of their solar products



SOLAR HAS A POSITIVE PERCEPTION WITH 59% OF HOUSEHOLDS PREFERRING SOLAR TO ZESCO GIVEN ITS LOW COST AND RELIABILITY

Perception of solar as a source of electricity, % households

N = 1,220 households (restricted to households that are aware of solar products)



- 59% of respondents stated that they preferred solar to ZESCO
- The main reasons cited in interviews included:
 - Solar is relatively **cheaper** than ZESCO
 - Solar is **easier to acquire** i.e., has less cumbersome installation process when compared to ZESCO
 - Once paid off, **solar is free** to use
 - ZESCO communal¹, the most common form of grid electrification in rural areas, is perceived to be unfair as bills do not reflect actual consumption

¹ A ZESCO connection scheme where multiple households share a single meter and where the monthly bill is evenly split across the connected households - irrespective of varying degrees of usage across each household i.e., House A (high electricity consumer) and House B (low electricity consumer) evenly split the monthly ZESCO bill



MOST SOLAR PRODUCT OWNERS (68%) PURCHASED PICO-LANTERN OR OTHER TIER 1 PRODUCTS

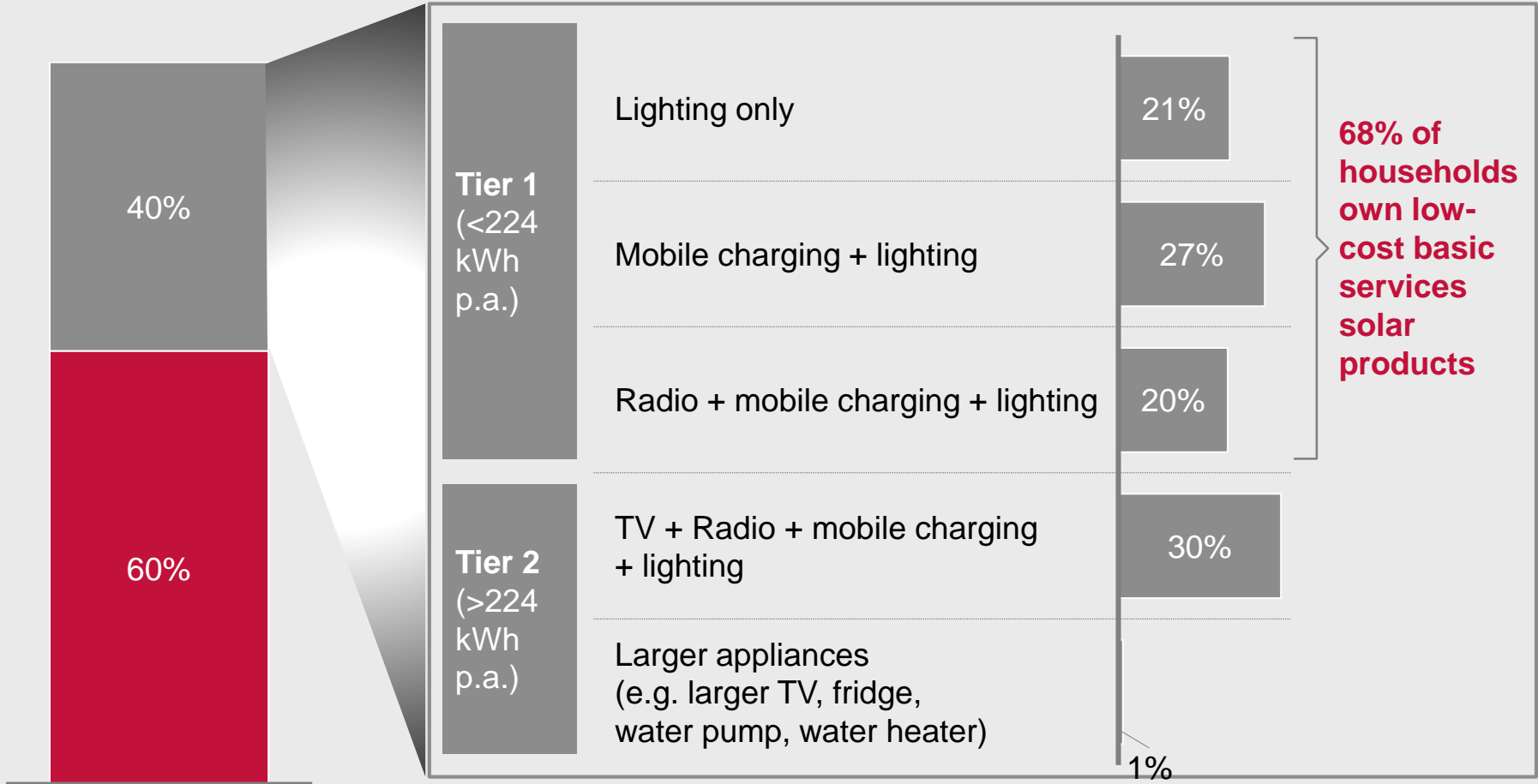
■ Has SHS ■ Does not have SHS

Ownership of SHS

% respondents

Type of solar product by tier¹ and appliances, % of households

N = 1,486 households (full surveyed sample)



¹ World Bank ESMAP tier definitions used

SOURCE: USAID SAEP Household Survey (2018)



USAID FROM THE AMERICAN PEOPLE

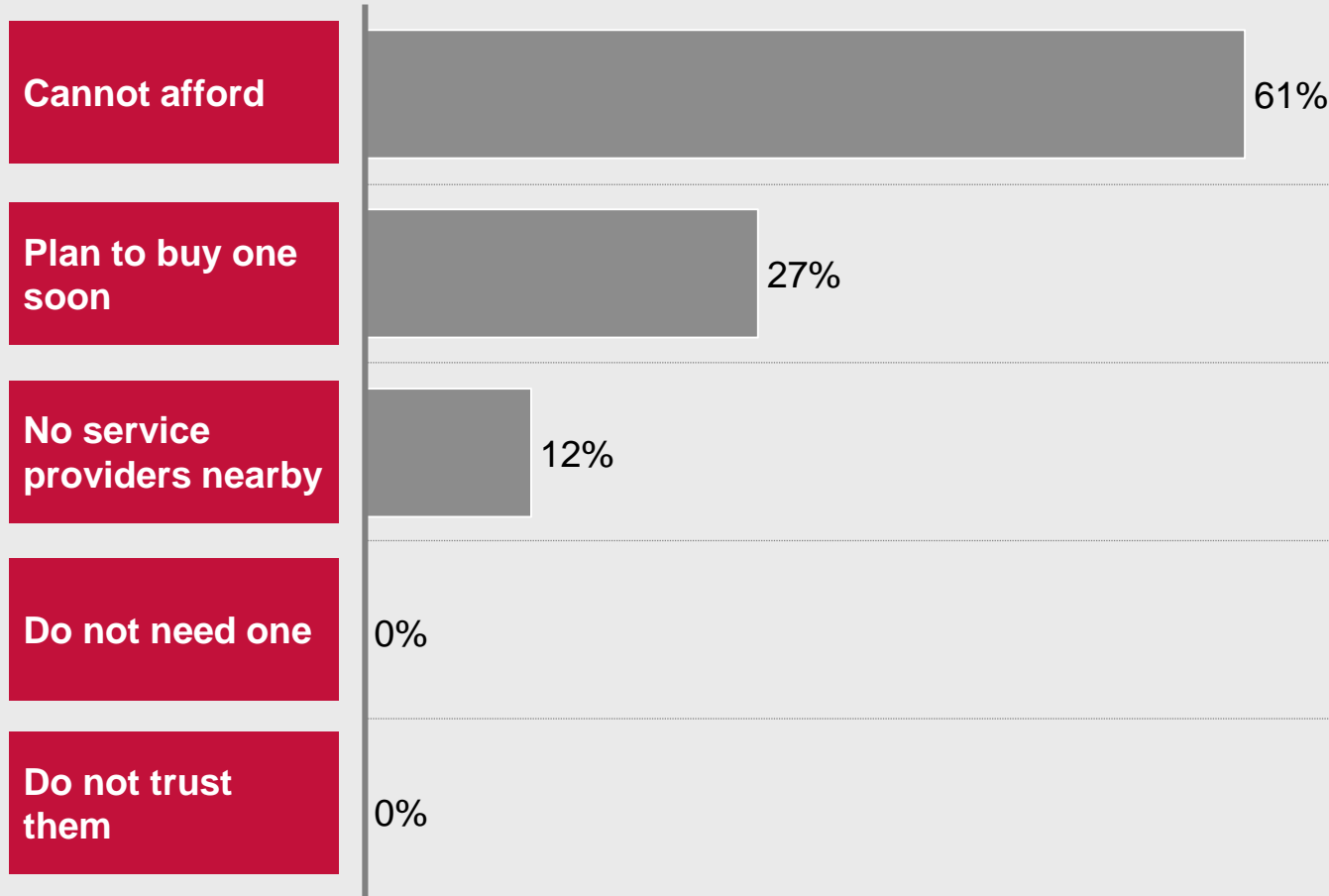




61% OF HOUSEHOLDS CITE AFFORDABILITY AS THE MAIN BARRIER TO PURCHASING A SHS PRODUCT

Reason for not owning a solar product, % households

N = 260 households (restricted to households that are aware of solar but do not own a solar product)



- 61% of unelectrified non-SHS owners who know about SHS cited affordability as the biggest barrier to ownership
- 12% of households stated that they are ready to acquire SHS but are unable to do so owing to lack of nearby sales agents
- No household cited trust (quality concern) as a barrier

1 Only includes unelectrified households currently aware of solar products

How can we **improve affordability**
for the **65-82%** Zambians that
can't afford SHS?



USAID
FROM THE AMERICAN PEOPLE



OVERVIEW OF THE SOLUTION SPACE

■ End-user credit/financing ■ Income intervention ■ Through SHS provider

Theme Description Successful case examples Country

Consumer credit

- In-kind lending / exchange platforms
- Extended payment terms for SHS without extending total cost of the product

- Sardex is a system in Sardinia that allows the **exchange goods and services** on a virtual platform without using money. There are 3000 business on the platform, making transactions of **USD \$100 million p.a.**



Social transfer programs

- Transfers to offer resources to poor families
- Multiple types exist (cash transfer, in-kind transfers, transfers under special conditions)

- **13 million households** in Brazil have received **USD \$ 11-98 per month** through a conditional cash transfer program based on fulfilling health and education conditions
- In Rwanda, **households** in the lowest income classification **receive SHS systems**



Increase primary source of income of end-users

- Reduce cash constraints by introducing initiatives to increase income from existing livelihood

- Kenya created a of Savings and Fertilizer Initiative program to encourage farmers to buy fertilizer input to **increase agricultural productivity**. In the second season, the program increased **fertilizer usage by 69%**



Decrease SHS cost

- Value chain interventions to reduce SHS manufacturing or distribution costs

- The CIZO program in Togo leveraged **post office facilities and services** to lower distribution costs, and designed a **national payment platform** for monthly SHS payments. It is expected **550,000 units** will be installed by end 2030



Provide financing via SHS companies

- Targeted results-based financing: SHS providers receive a cash incentive per sale in low-income areas at lowest price

- Through the K-OSAP program, USD \$12 million of results based funding was awarded to supply **250,000 households** over 6 years in underserved counties of Kenya



How do we close the identified funding gap to make SHS more affordable?

THERE ARE FIVE MAIN LEVERS TO BRIDGE THE AFFORDABILITY GAP

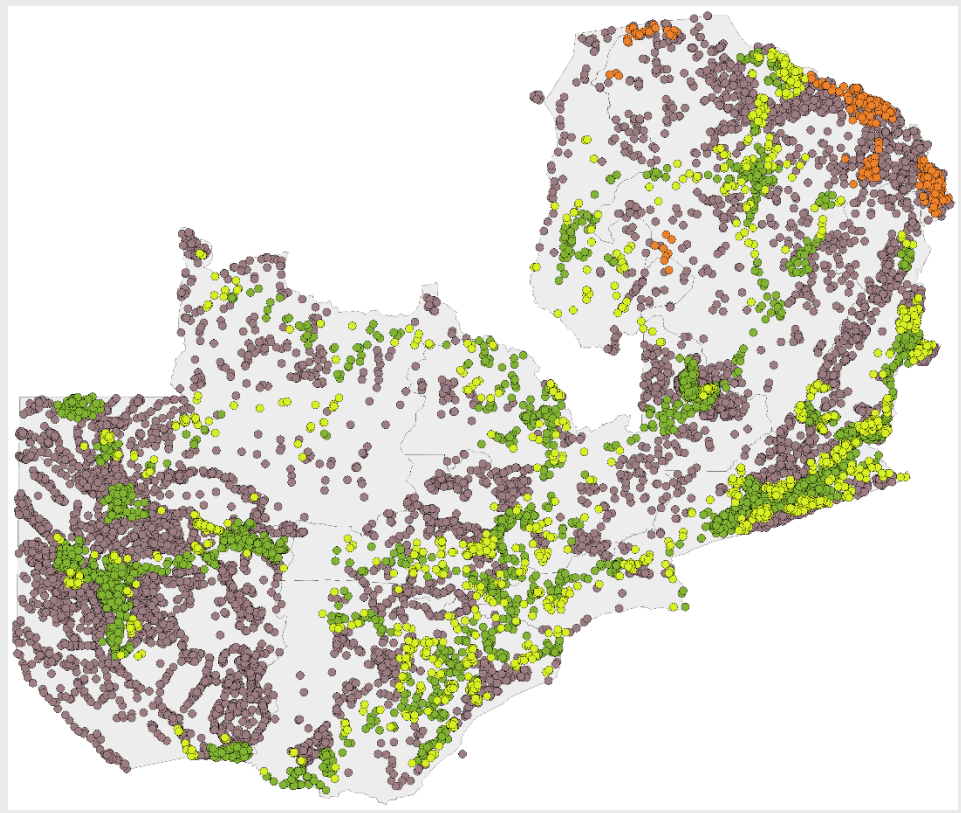
■ End-user credit/financing
 ■ Income intervention
 ■ Through SHS provider
 ■ Focus of discussion

	Description	Advantages	Challenges	Examples
Consumer credit	<ul style="list-style-type: none"> In-kind lending / exchange platforms Extended payment terms without increasing total cost 	<ul style="list-style-type: none"> Less upfront external funding Increases access to financial services with additional benefits 	<ul style="list-style-type: none"> Requires shift in consumer behavior (e.g., 73% of Zambians do not use banking services) Expensive microfinance interest rates (as high as 64% in some) 	<ul style="list-style-type: none"> Sardex Sardinia Malawi Kick-starter program
Social transfer programs	<ul style="list-style-type: none"> Transfers to poor families (e.g. cash, in-kind, with special conditions) 	<ul style="list-style-type: none"> Impacts affordability 	<ul style="list-style-type: none"> Negative connotations associated with 'free' or 'subsidized' goods Hard to roll back Difficult M&E 	<ul style="list-style-type: none"> Rwanda
Increase primary source of income of end-users	<ul style="list-style-type: none"> Reduce cash constraints by introducing initiatives to increase incomes 	<ul style="list-style-type: none"> Critical for long term sustainability High implementation potential through partnerships with governments & donors 	<ul style="list-style-type: none"> Long time frame to implement (>1 year) Impact difficult to monitor and attribute directly Most target end-users are farmers, so multiple interventions needed 	<ul style="list-style-type: none"> Kenya Savings & Fertilizer programme
Decrease SHS cost	<ul style="list-style-type: none"> Value chain interventions to reduce SHS manufacturing or distribution costs 	<ul style="list-style-type: none"> Many levers being addressed by companies Less upfront external funding to implement 	<ul style="list-style-type: none"> Lower connections impact Long lead time for savings to translate to price reduction 	<ul style="list-style-type: none"> CIZO, Togo
Provide financing via SHS companies	<ul style="list-style-type: none"> RBF: SHS providers receive a cash incentive per sale at lowest price 	<ul style="list-style-type: none"> Rapid connections impact Development partners' support 	<ul style="list-style-type: none"> Requires large amount of upfront funding 	<ul style="list-style-type: none"> Kenya's K-OSAP program Zambia BGFZ

PROGRAM SHOULD CONSIDER TARGETING EXISTING PLAYERS AS ~54% OF HOUSEHOLDS ARE IN CURRENTLY OR LIKELY TO SERVE AREAS

X% % total # # '000 least-cost SHS households

Distribution of localities based on ability to serve,
Unique locality



	<u>Driving time¹</u>	<u>Number of households²</u>	<u>% of total</u>
Currently Served	0-2 hours	548	30%
Likely to be served (existing SC³)	2-4 hours	379	21%
Likely to be served (new SC³)	2-4 hours	48	3%
Unlikely to Be served	>4 hours	826	46%

1 From nearest service center || 2 Households that have SHS systems as the least-cost electrification option || 3 Service center

SOURCE: Geospatial analysis

PROGRAM COULD BE DESIGNED AROUND THE PRODUCT THAT BEST FITS TARGET HOUSEHOLDS NEEDS

Choice ...



Proposed approach

1 Beneficiaries

2 Target products for entry-level electrification

3 Quality assurance

4 Sustainability

- **Households** that cannot afford a basic off-grid solution are the primary beneficiary
 - **Target the products that would meet these households' most basic needs**, as it is not possible to ascertain a households' income level on a case by case basis in Zambia, or target specific geographies
-
- **Tier 1, Lower Tier 2** (upper boundary of around **~\$170-200** unit price, at minimum 2 lights, a phone charger and with a 2-year warranty)
-
- **Strict company selection** criteria to ensure quality; **strict product selection** criteria to drive affordability for the lowest incomes, e.g.:
 - Boxed, off-the shelf units
 - Certified product warranties (e.g., Lighting Global)
 - PAYG
 - Local after sales service & footprint in low income / rural areas
 - Some metric of risk & collections management
-
- Must be easily **transferable to a REA** or other entity that manages grid based subsidies
 - Could be a **bridge**, until Zambia completes its National Electrification Plan and associated budget provisions

What is the **current landscape** in terms of **potential** for **productive use**?



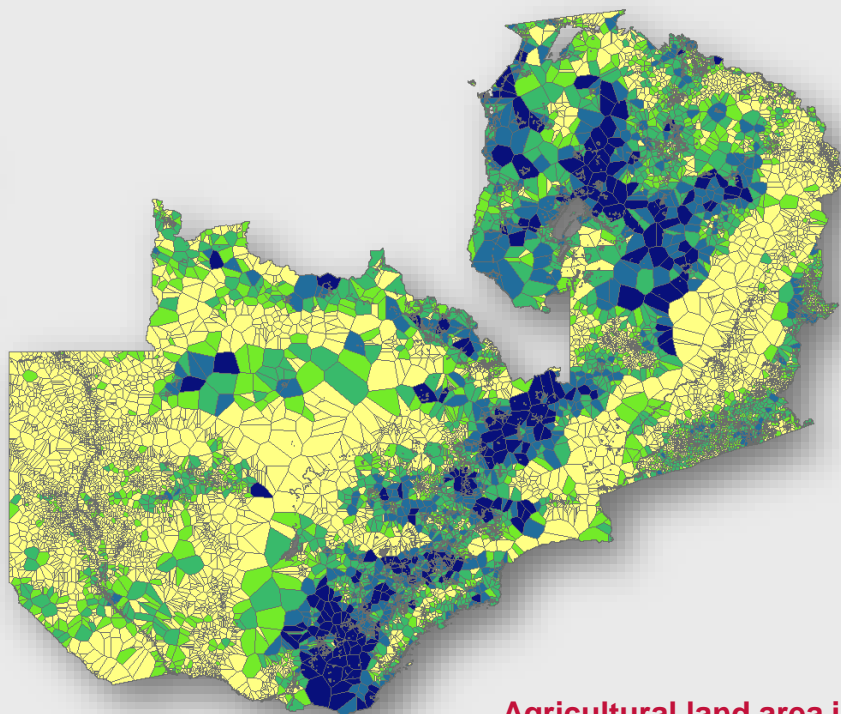
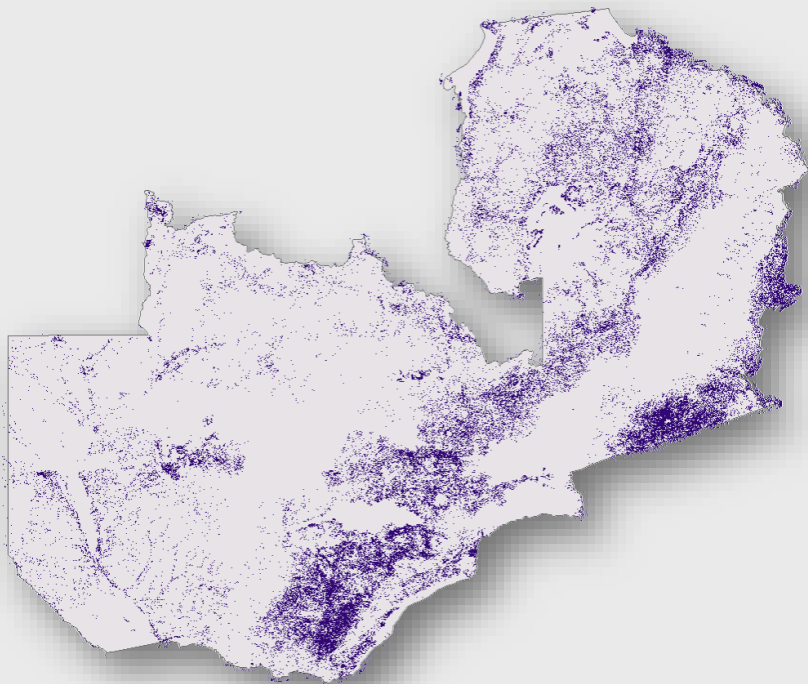
USAID
FROM THE AMERICAN PEOPLE



LAND USED FOR AGRICULTURE IS CONCENTRATED IN A FEW AREAS OF ZAMBIA

Land used for agriculture (2010)

Land used for agriculture by settlement (2010)



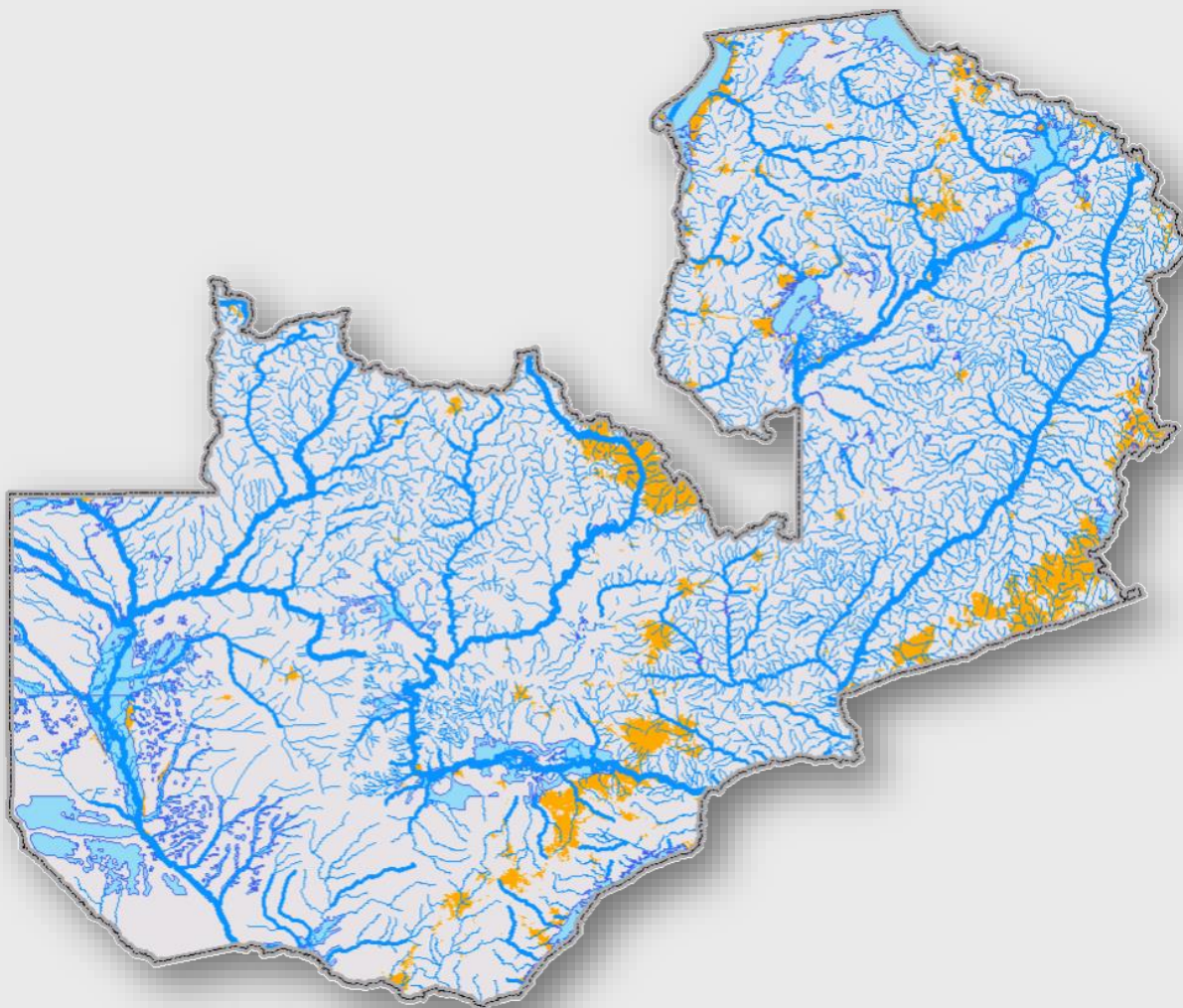
- 8,000 settlements overlap or are adjacent to cultivated land
- These areas range from 1 to 50,000 ha
- There is a large variance in size of the cultivated land sites:
 - Bottom 10%: 26 hectares or less
 - Median: 225 hectares
 - Top 10%: 1,800 hectares or more

Agricultural land area in settlement (ha)



SETTLEMENTS CLOSE TO RIVERS WITH SUFFICIENT DENSITY CAN SUPPORT IRRIGATION

■ Settlement areas



- Settlements require close access to water for irrigation
- In addition, settlements must be sufficiently dense for an irrigation system to be feasible
- Specific data on the cut-off points (proximity to river and settlement density) still need to be collected

What are the **opportunities** for **coordination** of the **public** and **private** sector?



USAID
FROM THE AMERICAN PEOPLE



COLLABORATION OF PRIVATE AND PUBLIC SECTOR MUST BE COORDINATED, WITH CLEAR OBJECTIVES AND MODE OF OPERATION



Objectives



- Align objectives
- Drive exemptions
- Generate awareness
- Maintain healthy competition
- Avoid duplication

Mode of operation



- Regular meeting cadence
- Transparency
- Collaborative approach
- Commitment to implement agreed actions