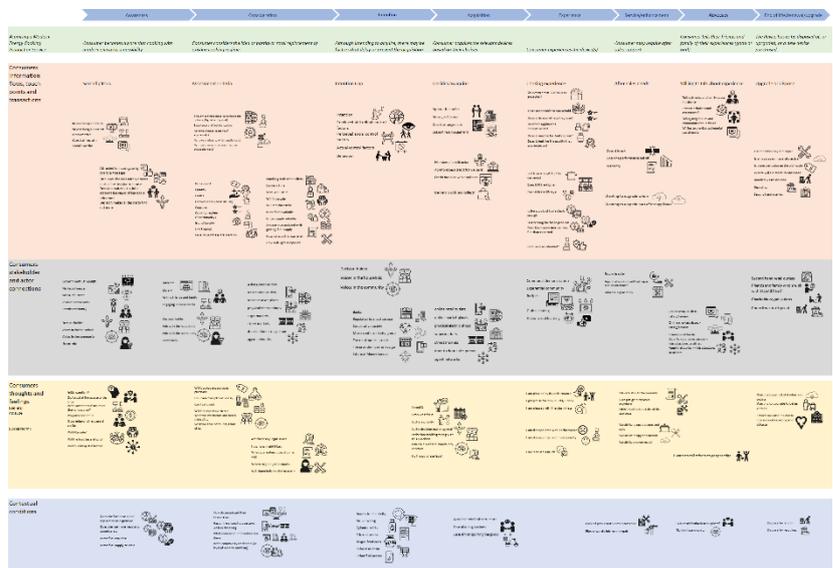


# Consumer Journey; Acquiring a Modern Energy Cooking Service

*Planning scaled uptake of MECS with a focus on the consumer/user.*

Working Paper 4/3/2022

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Working Paper for Comment

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# Consumer Journey; Acquiring a Modern Energy Cooking Service

## 1 Executive Summary

This paper describes a generic user or consumer journey for someone accessing modern energy cooking services. Consumer Journeys are often specific to a retailer of a product or provider of a service, and are used to ensure that the user can access the products or services with ‘minimal pain points’. They are a management tool that enables companies to determine where best to apply resources. They can describe everything from a journey through a website (and whether it leads easily to online purchase), to the experience entering a supermarket.

In this paper, we consider how households in Africa and developing Asia might consider changing from their existing cooking equipment (majority being wood and charcoal), to accessing a modern energy cooking service (either equipment, or a pay as you go service). Where possible we use national data in certain countries of interest to illustrate the proportion of the population any journey statement might apply to.

Although the paper was started to discuss how the consumer might purchase an energy efficient electrical appliance, we realised the journey also applied to other fuels and equipment. Throughout this description we have attempted to be neutral in fuel and device language around what the product or service actually is. When we say a ‘modern energy cooking service’, we can variously mean an electrical appliance working from a grid connection – in which case much of the journey is about acquiring a suitable energy efficient appliance. Or it could also mean a system set up to be ‘off-grid’ something like a solar home system, or the purchase and regular refuelling of a LPG or ethanol stove system. Solar home systems have tended to be sold on a pay as you go basis as a whole system and many of the consumer choices outlined would therefore be on the whole system, the whole package, including repayment rates and the lifetime of the equipment, indeed the repair and maintenance package that might come with it.

As a generic speculative journey, the pathway will need validation in specific contexts, but this framework is presented as a starter for where the joys and pains of that journey might be; as a management tool for those promoting modern energy cooking services either as a specific product or service, or as a shift in the policy environment that will enable the journey. The journey is populated with insights generated across the MECS research, including Discrete Choice Modelling, Cooking Diary evidence, focus groups, stakeholder workshops, among others, and from the wider literature on consumer journeys and from relevant national data<sup>1</sup>. Together they provide Insights as to how people set their criteria and make choices.

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<sup>1</sup> Data sources:- Discrete Choice Modelling surveys (MECS), Multi Tier Framework Data (ESMAP), National DHS and LSMS data (World Bank+) and various specific research materials.

For us we chose the following stages for the consumer journey:-

- **Awareness** - Consumer becomes aware that cooking with modern energy is a possibility
- **Consideration** - Consumer considers the idea of partial or total replacement of existing cooking regime.
- **Intention** – Consumer makes a decision to, (ie intends to) acquire.
- **Acquisition** - Consumer acquires the relevant devices or services based on their choices
- **Experience** - Consumer experiences the device(s)/service
- **Service/Enhancement** - Consumer may require after sales support
- **Advocacy** - Consumer tells their friends and family of their experiences (good or bad)
- **End of life** - The device has to be disposed of, or upgraded, or a new device purchased.

For each of these stages we consider

- the consumer information flows, touch points, and transactions
- the consumers connections (networks, the 'who' of the story),
- the consumers thought and feelings and
- the context (or control factors) within which the journey takes place.

Walking through the consumer journey illustrates and draws attention to the myriad of moments which may make or break an acquisition. It is presented as a linear journey but often it is more cyclical as one consumer gets a product or service and advocates with their friends family neighbours and strangers, which in turn may prompt a new consumer journey by a new consumer. Or indeed the original consumer may go through the journey again in upgrading their existing appliance or getting an auxiliary or associated appliance.

The overall journey can be found in figure 1. As a digital publication, the reader could zoom in and explore the figure, however, the pdf compression has variously 'pixelated' the diagram, and so each figure is linked to an A0 version at the end of the document (which is of a quality such that it can be explored).

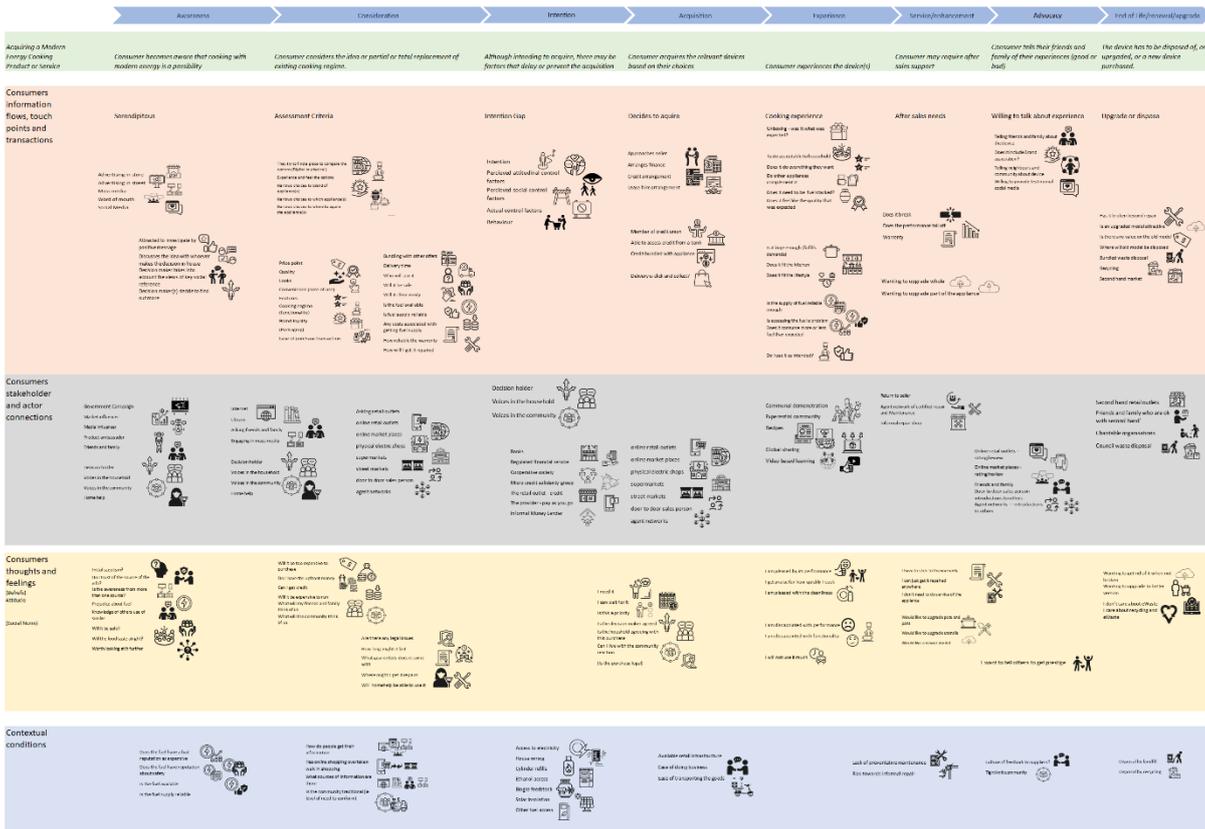


Figure 1 Overall consumer journey discussed in this paper ([Larger Version here](#))

The diagram reads left to right and top to bottom. Across the top the stages are approximated to columns, within which we explore the moments (the information flows, touch points and transactions), the connections to people, explore the thoughts and feelings of the consumer and finally make reference to the context and possible control factors

In the coloured bands across the diagram we have the moments, connections, thoughts and feelings, and the contextual factors. For each possibility we have created a short phrase which is unpacked in the text of this document, with a chosen icon for that item. The icons are there so that eventually the complexity of the overall diagram can be reduced as an aide memoire for planning processes.

While the stages may be common to most if not all consumers, the exact navigation across the diagram will likely vary according to the individual and their household. To complete the paper the five personas identified through discrete choice modelling across 6 countries, are used to show a typical path through map, the specific journey for that persona. These can be found in [Section 13](#).

[Section 15](#) walks through the stages and presents the beginnings of a check list that planners of a modern energy cooking service may want to consider (from the users point of view)

We welcome comment on this paper and hope it forms the basis for future discussion, research and planning of integrated modern energy programmes inclusive of clean cooking.

## 2 Introduction

The purpose of the paper is to explore the consumer journey, in such a way as those planning to implement scaled modern energy cooking programmes, can take into account as much as is possible, reasonable and cost effective, the complex needs of the consumer.

### 2.1 Why this approach?

The Modern Energy Cooking Services programme has worked towards building a new approach to the enduring problem of clean cooking. It has recognised that although significant progress had been made in the last decade on electrification, a '[mutual neglect](#)' in the political economy meant that those gains were not being leveraged for clean cooking. So MECS has focused on higher tier clean cooking, and developed research, data and evidence indicating that electricity access could be leveraged for cooking.

In a number of countries this has brought us to the edge of implementing scaled modern energy programmes. Nepal, India, Kenya, Uganda are just four of the countries that currently have significant plans for scaling modern energy cooking services. Electricity [isn't a silver bullet](#), but leveraging the new electrical infrastructure is an important strategy to reach [SDG7](#) and [Net Zero Carbon](#). In this paper while it mainly has in mind accessing an energy efficient appliance for use on an electrical grid, it also considers access to LPG, ethanol and biogas ([see section 2.3](#)).

As we move into a scaled response, it will be increasingly important to keep the consumer, or user, in view. What are their needs and wants. How might they access these developments? In this paper we take a customer journey approach to try to answer a number of specific research or market questions that anyone supplying a modern energy cooking service might include in their planning process.

**How will the consumer find out that the product or service is a possibility?** What media mechanisms might a government or private sector employ to reach a significant number of people.

**What could the campaign do to encourage their participation in the decision, and if anything strengthen societies progress towards equality?** The working paper presents data on gender decision making of large household purchases as a first step to answering this question.

**How might the campaign address the issue of trust in its source.** In some countries government branded messaging is trusted more than private sector, by the reverse can also be true.

**Should community discussions and demonstrations be a part of the campaign?** Consumers rarely make choices without taking into account the opinions of others.

**By what criteria might the choice be made?** The choice will likely go far beyond a simple cost effectiveness consideration.

**Who is going to make the decision and how can they be involved in considering the options?** Will someone other than the cook be doing the detail investigation?

**How will the consumer get more detailed information about the choices?** Can they see a demonstration, or go to a shop and handle the devices?

**How will the product or service be financed?** This is quite a significant part of the journey but the options are much more than are commonly discussed. Not only might people have access to credit through the seller, the PAYG scheme or from their savings, but formal finance organisations which offer loans secured by employment

are increasing, credit through cooperatives and solidarity groups are there, and there is a culture of borrowing from friends and family.

**What will be the impact of corruption and rent seeking on the purchase?** The report provides data on how most of the countries of interest score poorly in the global corruption database, and while this consumer journey is mainly constrained within the private sector, many salespeople, installer, fixers are used to some rent seeking as part of day to day transactions.

**How does the product or service get to the household?** Do they collect it or do they have to wait for delivery – this can be an important consideration for some households and may affect the acquisition.

**How does the product or service handle when its used?** Is the experience all that it was hoped for.

**Does it give an acceptable taste in a timely and cost effective way?**

**What could be done to encourage preventative maintenance?** Is there a culture of service and maintenance, or do people tend to wait until it is broken.

**How can performance tail off be mitigated, and at what point will components need replacing?** Some elements of the system may reduce in performance for example, energy storage in batteries, will likely tail off in performance depending on their use, (eg depth of discharge and ambient temperature).

**How can their good comments be magnified in future campaigns, and bad comments be mitigated** (if they are a result of early adoption teething troubles)? Good or bad, the consumer is likely to share their experience

**How can the end of life be anticipated?** Standards for waste disposal, encouraging upcycling, recycling, encouraging second hand markets.

The check list of scaling research questions is probably incomplete but is presented as a check list for more detailed investigations of the consumer journey in specific contexts and the guidance such journeys can have on scaled approaches.

## 2.2 A background to consumer journeys

Put the phrase ‘customer journey’, ‘consumer journey’ or ‘user journey’ in an internet search engine and it brings a multitude of responses, many of which are templates or software for managerial use. [As Wikipedia states](#), the term is usually but not exclusively associated with the use of software, and is intended to help software developers ensure that the user interface is optimised. There is however a body of literature that uses the term beyond software, for any experience that involves a purchase or acquiring a product or service.

[Hamilton and Price \(2019\)](#), draw out the journey aspect of pursuing large or small life goals. Not all journeys are about consumption, and hence their use of the terms consumers. They give as an example one from [Berry 2015](#), which describes the journey of a cancer patient and the family members who undertake a traumatic emotional journey that involves a complex network of health care brands, technologies, and services as they move from diagnosis, through treatment, to recovery, remission, or end-of-life care. Indeed as that journey indicates, most consumers are navigating a very complex system. The health system for example is a rapidly changing landscape where new ideas, and new possibilities are emerging all the time. This non linear change, with components interacting in a dynamic way is commonly called a complex system, and in [Varnali 2018](#), he likens the navigation of a customer journey as through a complex system. This brings out that journeys are unique and fuzzy, that over time one person experience will differ from another. He talks about value being co-created with the consumer, and of multiple realities.

As an anchor phrase for a particular way of thinking, the “consumer journey” has its own set of terminology – ‘touch points’ where the consumer interacts with the supplier or organisation, ‘pain points’ where the consumer experiences difficulties or challenges, and this leads into ‘consumer satisfaction’ measures [Giese and Cote 2002](#) and [Isac et al 2011](#) (including [specific survey approaches](#), and service and quality indexes eg [UKCSI](#) and [the net promotor score](#)), trust and effectiveness in advertising eg [Nielsen 2015](#), and Brand attributes and consumer loyalty (eg [PWC 2021](#)) (among others).

The language and ideas of a consumer journey have rarely been used in poverty orientated development work. This is partly because it is a relatively new term (which as said is more associated with software development), but partly because of the separation of disciplines and the term is more closely associated with private sector products or services.

As such it has been used by GSMA in the Mobile for Development programme ([GSMA 2019](#)). They produce a very useful guide with case studies (although interestingly with the changing nature of the internet we found that their hyperlinks no longer work – a ‘pain point’ in this consumers journey which illustrates why consumer journeys need to be smooth!). Their case examples can be found here - [ACRE Africa](#), [Nextdrop](#), and [Human Network International](#) (with correct links). The journey model was also used in the mNutrition evaluation ([GSMA 2018](#))

GSMA are of course working within the private sector with software developers (mobile networks). As such it makes sense for them to consider the consumer journey. In the field of energy, BBox have also approached it this way considering a Pay and You Go option for solar lighting [Kizilcec Parikh and Bisaga 2021](#). Very few other developmental customer journeys were identified but that’s not to say they are not out there.

Given the breadth of opinion about the journey models, we shall be using a mix of ‘consumer journey’ terminology and terminology from other development disciplines.

So how then can we identify a generic customer journey for MECS. Despite the journey being through a dynamic system, there are several key ideas that have become common to most customer/consumer journeys ([Folstad and Vale 2018](#) Systematic Review). As Folstad and Vale conclude, A rich and at times incoherent customer journey terminology gives two emerging customer journey approaches: customer journey mapping (analysis of a service process "as is") and customer journey proposition (generative activities leading towards a possible service "to be").

In this paper we also are not consistent but lean towards the customer journey proposition. As stated, the purpose of the paper is to explore the consumer journey, in such a way as those planning to implement scaled modern energy cooking programmes, can take into account as much as is possible, reasonable and cost effective, the complex needs of the consumer.

### 2.3 Stages of the consumer journey

Most customer journeys have now been reduced to five or six stages. Awareness, Consideration (or research), Acquisition (or purchase), Experience, Advocacy. This is easily understood in terms of single product, and in this background literature search [Figure 2 \(mageplaza 2022\)](#) described as Stephanie’s journey to get an electric pressure cooker (in a developed economy setting). In this description they have split consideration into research of the options, and then evaluation of choices, and they have bundled together her positive experience of the cooker, with her desire to recommend it on facebook.



Figure 2 Example of Mapping out your typical customer journey ([mageplaza 2022](#))

There is no single format for a consumer journey, and as described above it is a tool for assisting assessment of propositions and to help give a framework or guide for navigating a complex system. We have used the term '**consideration**' instead of research only because as a research programme, 'research' means something quite specific to us.

However, beyond that small change, we make two other changes.

First, we draw on the [Theory of Planned Behaviour](#) ToPB ([Ajzben 1991](#)) to change the stages from those presented on Stephanie's Journey ([Figure 2](#)). Between consideration and acquisition, we have added '**Intention**'. The ToPB states that someone may have an intention to change their behaviour, but whether that intention becomes a behaviour change depends on the strength of the intention and both the perception of the control factors and actual control factors. So after consideration, the consumer may have an intention to purchase (the behaviour in question) but may be prevented from doing so by control factors, or the intention is not strong enough to lead to action.

Second, In our concern for the environment we also anticipate the **end of life** of the product or service. Will it be recycled or will it be disposed on in landfill? This may or may not be of direct concern to the user when choosing the device, but we note that it is a part of the consumer journey (to finish with the product or service) and we use this journey map to prompt suppliers to consider that aspect of the equipment. Indeed there is increasing concern among consumers in developed economies about end of life of products and even their packaging such that a positive environmental disposal message about old equipment might actually be a selling point (stores in UK offer to remove and dispose of old mattress when a new one is bought). [PWC 2021](#) report

that 50% of all global consumers in our most recent Pulse survey say they've become more eco-friendly, and consumers in Southeast Asia and the Middle East are leading the way.

### 2.3.1 Information flows, touch points and transactions.

There are moments within each stages in the journey that can guide our thinking and planning.

There are to varying degrees moment or interaction that are about a flow of information from seller to consumer, either directly or indirectly, touch points, where the consumer is interacting with an institution or individual, and transactions, where those touch points are better conceived of as a action or transaction.

Given the view that **some moments are information flow**, the body of literature about information seeking behaviour is relevant, and we can draw on the research about how households in the countries of interest seek health and agricultural information.

Some of the moments are **specific interactions between the consumer and the seller** of the product or service and as such could be called 'touch points'. As [Persigehl and Vermeer 2019](#) comprehensively describe the use of the 'touch point' in consumer journeys is to attempt to model "How the customer purchasing decision is affected by the customer's interaction with touch points throughout the customer journey?" Since our description is a more generic journey trying to cover many possible aspects, not just the interaction with a single company, we can consider the interaction within each moment, touch point, the customer experience and cognition, and how the customer experience influences the customer journey stage.

Finally, some of these touch points are specifically **a transaction between seller and consumer**. In order not to get too tied up in the specific distinction and language of 'touch points' or transactions, we variously use all three depending on the moment.

### 2.3.2 An outline of the modern energy cooking services consumer journey

Keeping in mind this is a navigation through a complex system, and any one customer journey will be fuzzy and unique, nevertheless we have made an attempt to create a framework that might guide us to consider the 'moments' in the journey - information flows, touchpoints and transactions, and the stages the consumer may go through – as a tool for ensuring that when a modern energy cooking product or service is offered, the pain points are minimal.

For us we chose the following stages:-

- **Awareness** - Consumer becomes aware that cooking with modern energy is a possibility
- **Consideration** - Consumer considers the idea or partial or total replacement of existing cooking regime.
- **Intention** – Consumer makes a decision to, (ie intends to) acquire.
- **Acquisition** - Consumer acquires the relevant devices based on their choices
- **Experience** - Consumer experiences the device(s)
- **Service/Enhancement** - Consumer may require after sales support
- **Advocacy** - Consumer tells their friends and family of their experiences (good or bad)
- **End of life** - The device has to be disposed of, or upgraded, or a new device purchased.

For each of these stages we consider

- the consumer information flows, touch points and transactions,
- the consumers connections ( the 'who' of the journey),
- the consumers thought and feelings and
- the contextual conditions (or control factors) within which the journey takes place.

## 2.4 Product or service

The modern energy cooking services programme chose its name carefully. Pivoting from the use of polluting biomass fuels to modern energy can either be defined by the fuel that is being used or the business model or the combination of both. The fuels of interest are electricity, both grid and off-grid, natural gas, LPG, ethanol, solar thermal cookers and biogas. The choice of fuel that the consumer might consider is to a great extent dependent on the infrastructure available to them. Grid electricity delivered to their house may be strong enough to cook with or limited in levels of power, reliability and availability. The element of choice in the consumer journey for this case tends to be reduced to a connection fee (the choice of which may or may not be taken at the same time as the decision to pivot their cooking away from polluting fuels), and then the choice surrounding a product that can utilise the electricity to cook with, preferably with an energy efficient device. MECS research points to electric pressure cookers (EPC) for 'long cooking' of beans and food that takes more than a few minutes to cook, and notes that it can cook 90%+ of standard African cuisine (eg [Leary et al 2019](#) (Kenya), [Leary et al 2019](#) (Zambia), [Leary et al 2019](#), (Tanzania) . The consumer is then paying regularly for fuel through its utility bill.

So initially, this customer journey was sketched out for how a consumer might choose which EPC to buy. However, as the journey was developed it seemed that it could be applied to any of the modern energy fuels.

Off-grid electricity can be supplied by either mini grids (which are operated in the same way as a utility and so from a consumer point of view do not differ significantly from connecting to the grid other than the tariff rates are generally much higher) or by a 'solar home system' SHS (in theory it could also be a wind or micro hydro based home system). With a SHS, the consumer could pay for to install a whole solar home system, or more commonly SHS are installed on a pay as you go basis, with a small deposit followed regular payments until the system is paid for ([Kizilcec Parikh and Bisaga 2021](#), [IRENA 2020](#), [energypedia 2021](#)). This brings us to consider the possible business models – because for this to work there needs to be trust that the consumer will pay over the period of time ([energypedia 2021](#)). Such trust may be underwritten by the SHS asset but nevertheless there may be a 'credit check' before the deal is done. This has the same potential 'moments' on the journey as someone who cannot afford a cash purchase of an EPC and has to access credit finance. So the journey 'moments' may become quite similar.

This similarity of the moments for purchasing an energy efficient appliance such as an EPC, and the purchase of a Solar Home System suggests that the journey describes in the paper can be applied to either. It also suggests that it can be applied to other fuels since they each variously have 'appliances' or equipment that needs to be acquired and to do that may involve a credit facility (whether that be pay as you go or a lend from a formal or informal financial institution).

So we can discuss any of the modern energy cooking products or services. Natural gas for instance is very similar to grid electricity – either there has been significant investment in infrastructure for its transmission and distribution or there hasn't, and the household then has to choose to connect – its difficult for a household to

choose to do natural gas if the supply isn't available. Bangladesh is an example of a country of interest that is supplying natural gas to households ([Tilasto 2018](#))

LPG is said to be more flexible, although it still depends on there being industrial scale importation and refining of fossil fuels, and then a distribution network which may or may not piggyback on the transport network of petrol and diesel distribution (eg [Lucon et al 2004](#), [Abudu & Sai 2020](#), [Ramachandran 2021](#), [Khashimwo 2020](#), [Rao 2020](#), [Thoday et al 2018](#)). LPG cylinders need a basic distribution infrastructure, but in contrast to the electricity and natural gas, there isn't a need for household level connections – cylinders can be purchased from a local agent ([WLPGA 2021](#)). Nevertheless purchasing an LPG stove and signing up for a cylinder from a particular agent mimics the purchase of an electrical appliance and the arranging of a 'connection' (albeit slightly more flexible, and more dependent on the consumer going to get the cylinder refilled). Pay as you go LPG solutions can also now include delivery of cylinders to the household based on data from smart meters obviating the need for the consumer going to collect the new cylinder (eg [Perros et al 2021](#), [Paygoenergy.co 2021](#)).

Ethanol is also developing a similar model, where after purchase of the equipment (either upfront or by credit) the ethanol can be collected (or delivered) via automated dispenser machines or from local agents/shops (eg [kokofuel.com](#)). Biogas is more stand alone, but has a much higher capital expenditure at the start – so again many of these are now on a pay as you go basis mimicking the solar home system ([ATECbio](#)). Thermal cookers range from the very cheap to the more expensive, and tend to just need upfront capital expenditure – but again the consumer could consider them as an option on this consumer journey ([solar cookers](#)).

**So having begun the mapping of the journey solely with electric pressure cookers as a kitchen appliance in mind, the paper has been adapted to cover all modern energy cooking services.**

## 2.5 Consumer types (Personas)

Before moving on to the actual journey, we must acknowledge that different consumers may go through the same stages in their journeys but are likely to take different steps on the paths both as individuals and possibly as types. Some more educated may focus more on digital sources of information while those with less than primary school education may rely more on face to face advice.

MECS has conducted [some research on 'personas'](#) ([Scott et al 2021](#)). The traditional way to disaggregate potential users is by their key demographic characteristics – gender, age, education, size of household, poverty indicators. However, these statistics say nothing about cultural differences between different groups and geographies. Are the households conservative and religious, do they adhere tightly to traditions, or has their migration to urban settings with the associated exposure to global media made them cosmopolitan with aspirations to be 'modern'? We shall see below that social networks play a strong part in the decisions to acquire large household purchases, and that there is a difference between conservative traditional communities and the modern more individual life. There is then, a need to try to differentiate between different segments of consumers.

While demographic data can give a good start, there is a danger that it leads to a very two-dimensional portrait of users. Designers are increasingly using personas and archetypes to create a more three-dimensional picture of potential users (the exact differences between personas and archetypes is debateable - an archetype is said to be a real person who is a typical user of a service, while a persona is a detailed description of a fictitious person that is based on behaviours, attitudes and segmentation data of real people and users). We used personas drawn from discrete choice modelling data from Ghana • Kenya • Tanzania • Uganda • Zambia • Myanmar. The profiles are fictitious, albeit based on data gathered by the MECS programme.

The type of access to electricity appears to be a defining variable that is part of all of the categorisations proposed to date. The analysis has, therefore, been conducted exploring the following starting points for the personas, proposed on the basis of access to electricity: 1. Isolated (no electricity) 2. Communal supply (island grid) 3. Weak national grid 4. Strong national grid – small family 5. Strong national grid – large family. However, based on the data from the DCMs, we were able to nuance the personas into five types.

- The Isolated pioneer
- Communal energy pioneer
- Weakly connected pioneer.
- Connected and busy
- Connected but sceptical

Figure 3 presents the key characteristics of each persona, and Figure 4 illustrates their properties.

	THE ISOLATED PIONEER	COMMUNAL ENERGY PIONEER	WEAKLY CONNECTED PIONEER	CONNECTED AND BUSY	CONNECTED BUT SCEPTICAL
<b>LIVES WITH</b>	Parents, children, spouse sometimes	Parents, children, spouse	Children, spouse	Children, spouse	Children, spouse
<b>EDUCATION</b>	Primary	Primary	Secondary	University	Secondary
<b>WORK</b>	Market seller	Farm work	Electrician	insurance office	Police officer
<b>HOUSE</b>	Cement block with tin roof, dirt floor	Cement block with tin roof, cement floor	Cement block with tin roof, cement floor	Apartment in block	Cement block with tin roof, cement floor
<b>ELECTRICITY</b>	Solar torch	Minigrd, but not 24hrs a day	Grid but unreliable,	Grid, reliable, metered	Grid, reliable, metered
<b>TECHNOLOGY</b>	Basic phone, limited use of mobile money	Feature and smart phone, limited use of mobile money	Smart phone, uses mobile money	Smart phone, uses mobile money	Smart phone, uses mobile money
<b>SOCIAL MEDIA</b>	basic phone, limited use of mobile money	TV	Radio, tv and uses social media	Tv, social media	TV, social media
<b>MEALS</b>	3 a day	3 a day	3 a day, but buys lunch out	2 meals a day	4 meals a day
<b>CURRENT STOVE</b>	Basic charcoal burner, sometimes wood	Basic charcoal burner, regularly also wood	Basic charcoal burner	Lpg (single hob)	LPG (single hob) plus charcoal
<b>BELIEFS</b>	Parents, children, spouse sometimes Aware smoke from wood is bad, food tastes better with charcoal LPG expensive, electricity is expensive	Wood is expensive, charcoal difficult to source Aware smoke from wood is bad, charcoal is ok Lpg expensive, electricity is expensive	Charcoal convenient, food tastes better Chooses not to do wood because its unpleasant Lpg expensive and cylinders difficult to source	Lpg reasonably priced, safe Could use charcoal but not in flat Electricity too expensive to cook with even though neighbours use it	LPG reasonably priced, safe Aware smoke from wood is bad, charcoal is ok Believe electricy expensive

Figure 3 The key characteristics of each persona (derived from MECS data Scott et al 2019)



Figure 4 The key properties of each persona (derived from MECS data Scott et al 2019)

The likely location of each persona is across the top of Figure 4, and the priorities of each are on the right, although because some persona have similar priorities, the block on the right spans across several personas.

As we now continue on to the consumer journey, we acknowledge as stated above, these persona are likely to take different paths through the journey. The 'isolated pioneer' will probably not source an electrical appliance in the capitals' supermarkets, and might need a complete solar home system. The 'connected and busy' probably lives in a major urban area and might have access to the internet, and their consideration may include online sources.

**With these comments on persona, modern energy cooking services and the theory of customer journeys in mind, let us begin to explore the journey.**





## 4 Awareness

*Consumer becomes aware that cooking with modern energy is a possibility*

In this section we look at :-

- **How does the prospective consumer** become aware of the possibility of modern energy cooking services?
- **Who is providing information** about the product or service – is it a public campaign to improve the health, environment, and economy of the community, or is it advertising by a product or service?
- **What messaging** might be persuasive to consumers?
- **What channels** might people hear through – traditional media, digital media or word of mouth?
- Do people **trust the sources** of the information?
- And before considering whether to obtain a product or service, **who does the consumer have to consult with** within their household and community – **how is the decision made** to continue through the consumer journey, and is there a particular gatekeeper.

### 4.1 Consumer Awareness Moments (Information flows)

**How does the consumer become aware that modern energy cooking might be a possibility?**

A key question here is who might be promoting the product or service. The obvious answer is the private sector selling the product or service, but in reality, the transition from polluting biomass is a major health, environmental and gender issue that governments are increasingly concerned about. Ministries across public health, environment and deforestation or social wellbeing, might be willing to put public finance into an awareness campaign.

Awareness and Behaviour change campaigns are a skill or profession almost in their own right with multiple theories of how people change. We ourselves use the Theory of Planned Behaviour and mention it below on the journey, but there are overviews of the different theories [such as this](#). In developed economies there have been many significant campaigns that have seen real impact – from stopping smoking, cancer tests, organ transplants, mental health, firework safety, picking up dog faeces, plastic bags, fast fashion and of course most recently the social distancing required for COVID mitigation. Resulting from that, there is of course a [wealth of advice](#) (2021) on how a behavioural change campaign might be planned and implemented (and the slightly older summary can be found here [U4 expert answer 2011](#)). In LMICs the more notable campaigns have been on [health related choices](#), [HIV](#), [Water and Sanitation](#), and [agriculture and nutrition](#) among others. With mixed results, and not all with high impact.

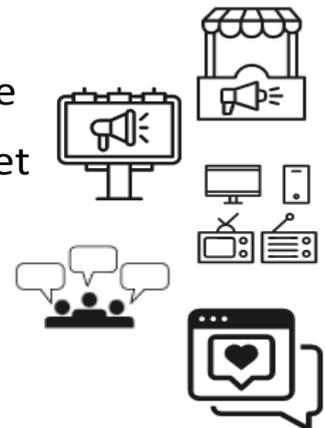
Advertising in store

Advertising in street

Mass media

Word of mouth

Social Media



## What messaging might be persuasive to consumers?

So if government policy was implemented to encourage consumers to shift from polluting environmentally unfriendly fuels for cooking, to modern energy cooking services, what messaging might be appropriate and what methods might be used? In many of our studies consumers seem unaware of the health impact of biomass smoke, and so messaging on improving health might not find a ready reception. It may be necessary to raise awareness of the impact. It is unlikely that raising awareness of the impact on deforestation will trigger people to pivot their fuels, but it may be that a focus on time saved and of course money saved, might be the better focus. Messaging needs to be underpinned by studies on what people are concerned about and how aware they are of the issues of their existing fuel. A short study in Cambodia showed that people were aware of the health risks, and that what they really wanted in a product of service was safety for their children ([Moung et al 2021](#)). However, it is not for us here to design an overarching messaging campaign but to recognise that it is good practice to undertake some basic research is required to find the triggering messages before a campaign is implemented..

The same remains true for simple 'advertising'. 'Public health' awareness raising may be the domain of government or Non-government organisations but promotion by the private sector of its goods and services could have the same effect. And indeed some advertising for a product or service may wish to leverage the improve health, environment and economy messages. Again it is important for market surveys to reveal the key messages before promoting too strongly – there have been examples of the wrong message being inadvertently communicated by the wrong image.

In general campaigns work well with a short slick hook line, and a personality or a culturally memorable image. So how then might the consumer access these campaigns or become aware of them?

## Through what channels might people become aware – traditional media, digital media or word of mouth?

### 4.1.1 Traditional media

There are traditional routes to awareness raising. Mass media such as television, radio and even newspapers might have articles or adverts extolling the virtues of a device or combination of devices, and even posters or billboards on the road may hold some awareness generating properties.

The MECS programme has sponsored TV shows in Kenya to raise awareness for consumers – '[Shamba Shape Up](#)', creates awareness of modern energy cooking services and solutions (*Figure 6*). The show is a make-over show about farms and agriculture, but includes segments on clean cooking. It uses multiple media outlets – TV, Radio, , printed materials, advertising, interaction by phone, and a helpline for enquiries.

**The Electric Pressure Cooker**  
So you would like to cook in a faster, cheaper, cleaner way?

Many farmers still cook using firewood or charcoal. This is not only quite expensive, but smoke from the fire damages your lungs.

The Electric Pressure Cooker is a very safe way of cooking using electricity. It's a cleaner, faster and cheaper way of cooking.

**Benefits of EPCs**

- It's cheap as the pot is fully sealed so no heat can escape.
- Cooks fast. Cooking heavy foods is done in less than half the time compared to firewood.
- It's time saving, once you start cooking, you can leave it alone and do other activities.

**DID YOU KNOW**  
Over 17,000 women die from indoor air pollution in Kenya every year! This is mostly from cooking on open fires.

For more information  
Subscribe to Shamba Shape Up  
Send the word "JOIN" to 21606.

Produced by:  
THE MEDIA COMPANY

Watch us on:  
**CITIZEN** RADIO

Series 11 was supported by:

**A brand new Shamba Shape Up!**

**ON RADIO!**

Make sure you tune in to **Citizen Radio** Monday - Friday at 9.30pm to hear the show!

**Financing**  
The upfront cost of a good Electric Pressure Cooker is about 7,000 KES in Kenya. This is a big upfront cost, but pays off quickly, when you look at how little it costs to run.

Electric Pressure Cooker		Using Firewood	
Cost of EPC	KES 7,000	Cost of cooking appliance	KES -
Monthly cost EPC	KES 280	Monthly cost appliance	KES -
Monthly cost for energy	KES 20	Monthly cost for charcoal	KES 6,000
Monthly Cooking Cost	KES 3,000	Monthly Cooking Cost	KES 6,000

**Are you part of a chama?**  
One way of financing this EPC is getting a monthly allowance from your savings group, which goes straight in to buying the EPC.

**Pros & Cons of EPCs**

**Pros**

- Can cook "heavy foods" in half the time and a fraction of the cost
- Can fry, boil, steam and even bake or roast
- Safer than ordinary stoves - it has no open flame
- It's automatic, so you can do other things
- Insulated - keeps food warm after cooking

**Cons**

- Not ideal for some dishes such as chapatis or deep frying
- Appliance costs about twice as much as an electric hotplate
- Looks complicated at first, but once you get used to it, cooking becomes much easier

**Tips for even more energy efficient cooking**

- Use the right amount of water to start - one cup of water should do
- Avoid opening during pressure cooking - hearing is automatically controlled and the steam can escape, so stirring is not necessary as food is very unlikely to burn
- Spend little time trying as little as possible - best to cut ingredients small so they cook quickly

**Shamba Shape Up**

**Transform your kitchen with our help**

Cookstoves | Nutrition | Recipes | Kitchen Garden

**Show times Kenya**  
Citizen TV Kenya  
Sunday 1:30 pm (Swahili)  
Thursday 1:30 pm (English)

Figure 6 Pamphlet and screenshots of Shamba Shape Up engagement with modern energy cooking. ([Shamba Shake Up 2021](#))

One can imagine the consumer watching or hearing these programmes and becoming aware that there are new possibilities for their cooking.

And of course, products are themselves are being advertised by their makers on traditional media (Figure 7), and recently in a few countries the utilities themselves are promoting that electric cooking is a possibility (eg Figure 8).

**Ease the Pressure of Cooking!**

**FAST, SAFE & EFFICIENT!**

**Von**  
MADE FOR YOU

Figure 7 Advert from Kenya for a [Von Hotpoint](#) electric pressure cooker (2021)

**Pika na Power**

*Add some Spark to your Cooking!*

Kenya Power invites you to the 'Pika na Power' Cookery classes at the newly revamped Demo Centre at Electricity House, Nairobi on Tuesdays and Thursdays from 12:30pm to 1:45pm

**FREE CLASSES**

Kenya Power

**Power Speak #90**

**Did you Know?**

**Cooking with an Electric Pressure Cooker (EPC) is Cheaper, Faster and Safer than Charcoal, Kerosene and Gas (LPG).**

Cost of Cooking kWh

Energy Source	Relative Cost (kWh)
CHARCOAL	100
KEROSENE	~65
LPG	~75
HOTPLATE	~85
EPC	~25

Save energy and time by using smarter cooking techniques.

**AVAILABLE AT:**

- Hot Point Outlets
- Electricity Free Nairobi at Demo centre (on Discount while stock lasts)

Kenya Power

Figure 8 Adverts by [KPLC utility](http://www.kplc.co.ke) to encourage electric cooking (2021)

Modern energy cooking services encompasses more than just electric, and as discussed above, the journey map below started as focusing on electric cooking appliances but has been adapted to encompass a wider range of modern energy cooking services.



Figure 9 Range of advertising and campaigning for alternative modern energy fuels ( [Seagas Kenya](#), [PMUY India](#) [Koko Kenya](#), [Biotech India](#) 2021)

Do such campaigns raise awareness? Global studies on advertising and trust suggest that trust in traditional advertising is still strong ([Nielsen 2015](#)). Globally 63% trust TV advertising, 60% newspaper adverts, 56% billboards, 54% ads on radio (percent of global respondents who completely or somewhat trust advertising). And such trust turns into action. In the Nielsen study (2015), taking action associated with the advert always exceeded the percentage who said they trusted the advert. These are global figures and there are slight variations between regions Africa/ Middle East shows the highest reported levels for seven of 19 advertising formats, with a mix of both online and offline formats. Studies on health orientated Behavioural Change Communication such as [Elrod 2019](#) and [Barik et al 2019](#) suggests billboards are still an effective way to reach the disadvantaged.

When we consider rural communities, word of mouth and face to face narratives still hold strong. Neighbours tell each other about the experiences they have, or indeed whether they have seen a TV programme or heard it on radio. They may also say whether they or a known person has had a good or bad experience with a product or service. There may be agents that offer the product or service, and they may create awareness by demonstration days or by just informing the household with a simple sales pitch. We shall see below that social networks become very important particularly with traditional communities, and that they have a mechanism of 'demonstration' and 'risk alleviation'. At this stage of awareness gaining, the demonstration factor can be persuasive, particularly where a known person can give a personal testimony of use. In a recent study on the quality of electrical appliance sin Kenya, survey data suggested that 60% of purchases were made because they had seen friends and family using such a device (Strathmore University Energy Research Centre 2022)

#### 4.1.2 Digital access

Shamba shape up use both traditional media and digital resources to strengthen their messaging. They use phone apps, [facebook](#) and [youtube](#) (among other channels) to strengthen their campaign.

In an age of digital services, it might seem that the consumer finding it 'online' is the most prevalent possibility, certainly the case for developed economies. However, Low and Middle Income countries tend to not only be lacking in clean cooking but also in digital connectivity.

**So how realistic is it that digital routes of awareness might actually touch the consumer?**

The urban dweller, 'connected and busy', probably has a phone and looks at it much like the average person in developed economies. However, it may be true that to some degree all personas may be exposed to digital social media. It is the case that even low and middle income countries have greatly improved access to the mobile phone in the last 10 years (Figure 10). And of course they have also enabled their internet access (Figure 11).

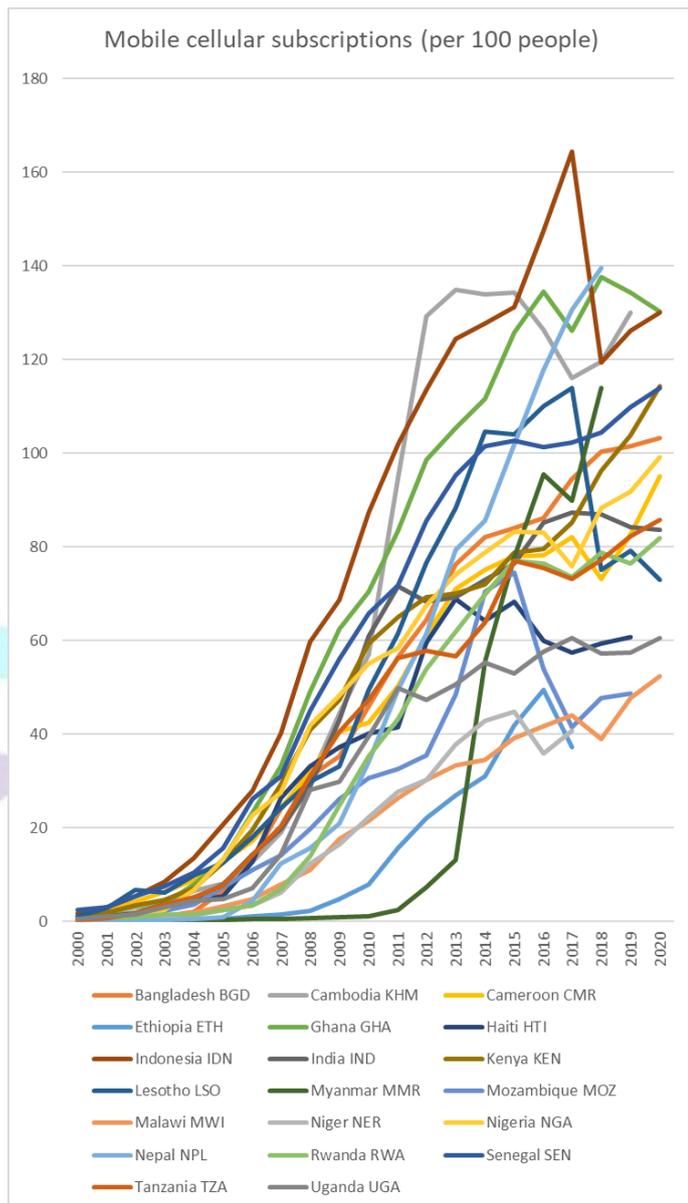


Figure 10 Mobile cellular subscriptions (per 100 people) for selected countries Authors own from WB data.

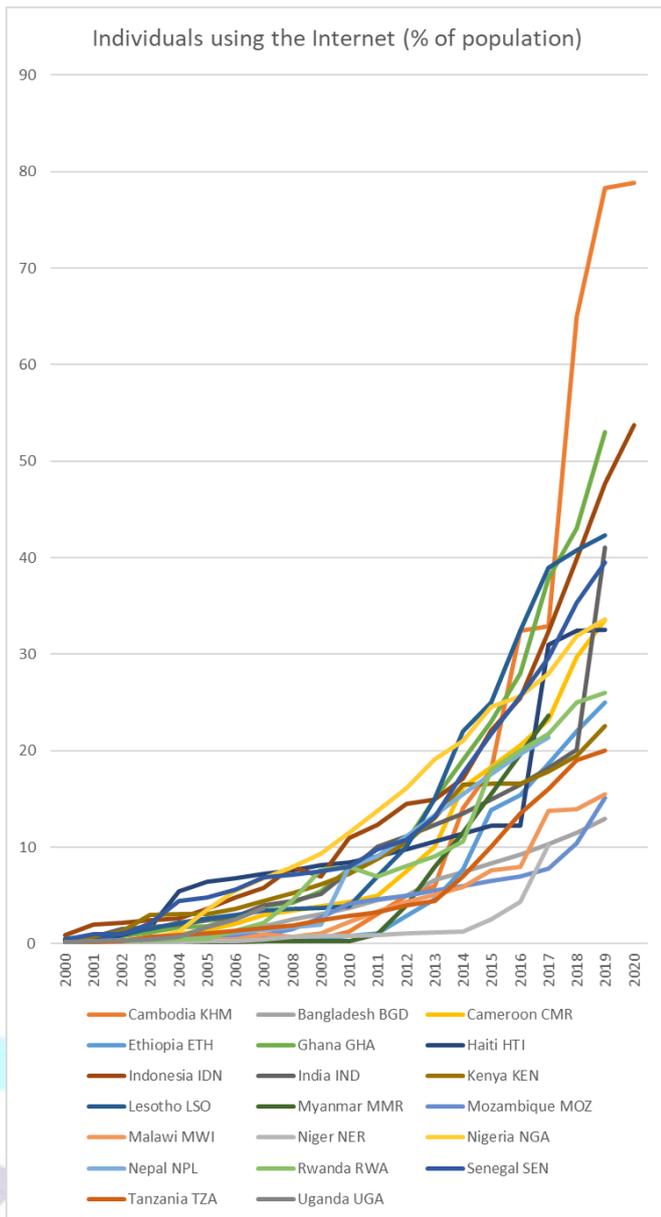


Figure 11 Individuals using the Internet (% of population) for selected countries Authors own from WB data.

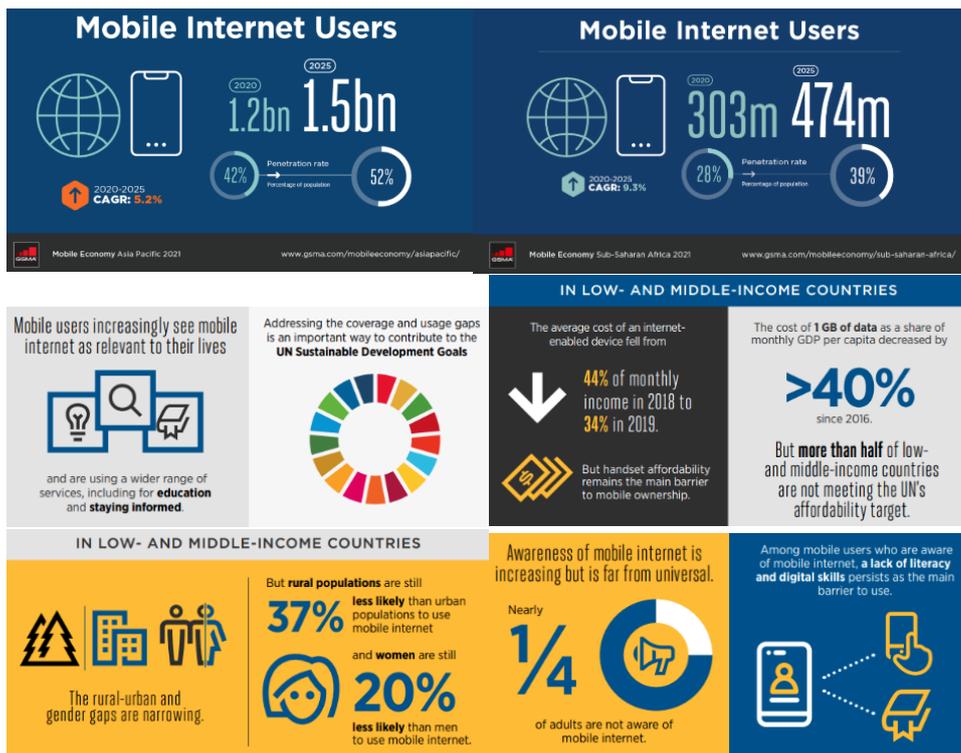


Figure 12 Headlines and statistics on ICTs in LMICs [GSMA 2021](#), [GSMA 2021](#), [GSMA 2021](#) and [GSMA 2021](#)

However, not all cultures are well connected. Even if a mobile phone is available, it may sometimes be a basic or feature phone, and householders may not have money for airtime to ‘surf’. Internet cafes are available in many urban locations and community centres for some rural communities, but all come at a cost to the user. Basic telecentre, library, internet cafe use is evolving all the time and even studies such as [Gomez et al 2019](#), (published 2019 but drawing on data from 2007 to 2010) can be out of date very quickly. Nevertheless such reports draw our attention to the issues of trust, credibility, ‘coolness’ and infomediaries.

**Do people trust ‘adverts’?** Within such channels the consumer may experience different messaging. This could include the trusted source of information saying how good the product or service is, it could just be an attraction to the core positive message.

While adverts on TV and radio tend to be trusted by more than 55% of people ([Nielsen 2015](#)), adverts on the internet were trusted less by about 10%. However, both traditional and internet advertising sees action following the trust people have in the advert. Trust and action from social networks is high at 83% ie they take action on opinions from friends and family at least some of the time (83% each). Branding is convincing. 70% say they trust and take action on adverts that are from branded websites.

So while suspicion of social media and online bombardment of advertising may be off putting to some, actually the majority appreciated the information, and eventually take action on it. Trust levels for each type of advertising format are highest in developing markets. Africa/ Middle East report levels of trust for seven of 19 formats presented by the Nielsen survey, with both online and offline formats. Asia-Pacific reported the highest levels of trust for 3 formats, including both ads on mobile devices and mobile text ads.

Keeping in mind the Nielsen data was from 2015, and the consumption of online media has dramatically increased since then, even then it was young people who led the way in trust of online advertising and information. Young adults have the highest levels of trust in 18 of 19 advertising formats/channels, including

TV, newspapers and magazines, and they're also the most willing to take action on 16 of 19 formats. What also is interesting is that the studies show that Adverts that drive emotions have impact. We will talk below about the role of demonstrating the modern energy cooking service might have in the consideration, and even at this stage an emotive good looking meal in an ad can attract the attention of the consumer. Ads depicting real-life situations resonate most powerfully, depiction of familiar scenes is extremely useful in driving memorability. Ads focusing on family have strong appeal in Africa and the Middle East.

## 4.2 Consumer connections

The social referents mentioned above as influential on the consumers thinking, who are they? In this awareness stage a number of people, media and institutions might be seeking to raise awareness.

The initial awareness might have come through public campaign, media or market advertising, and behind the announcements and adverts there may be influencers. The sales representative for a product used to be closely associated with the supplier, the company selling the product or service. However increasingly in this age of open content creation, a market influencer or media influencer may or may not be being paid by the producers of the product or service. (The 'influencer' landscape is complex and it is not always easy to see if someone is being paid to say positive things about a product, or whether they are just building a following and relying on general (i.e. not specific) advertising revenue.

Instant Pot, makers of a high end electric pressure cooker, have done well in this regard in developed economies.

They have created a sense of community among food bloggers and chefs, among the enthusiastic, who have been evangelistic in their outreach to friends, neighbours and strangers. In 2018 Thomson sang the praises of the instant pot facebook page ([here](#)) and while [this](#) was the official page of the company, the article describes the sense of community instant pot users have. The reddit community is active ([here](#)) and as far as I can see, this Wondermom wannabe food blogger specialising in Instant Pot recipes is not paid by the company but by advertising on their site ([here](#)). This idea of 'demonstration', now commonly found in digital videos, has always been a strong influence on purchases, and its role in the purchase decision is discussed in [Chapter 4 below](#).

The point is that while traditionally, awareness creation depended on the advertising budget of the core manufacturer or retailer, it no longer does. Indeed beyond the social media critical mass that could grow, as said above, there may also be public campaigns by the government to encourage clean cooking and mention the health and environment benefits of modern energy cooking. There may be fuel suppliers such as utilities wanting to increase the uptake of electricity in energy efficient ways, and they may offer advice through their offices as has been successfully undertaken for [energy efficient fridges in Ghana](#), [solar home systems across Africa and Asia](#), and [energy efficient light bulbs](#) (india) the world over.

These public campaigns are perhaps captured in the terms of being market influencers and media influencers.

Government Campaign

Market influencer

Media influencer

Product ambassador

Friends and family

Decision holder

Voices in the household

Voices in the community

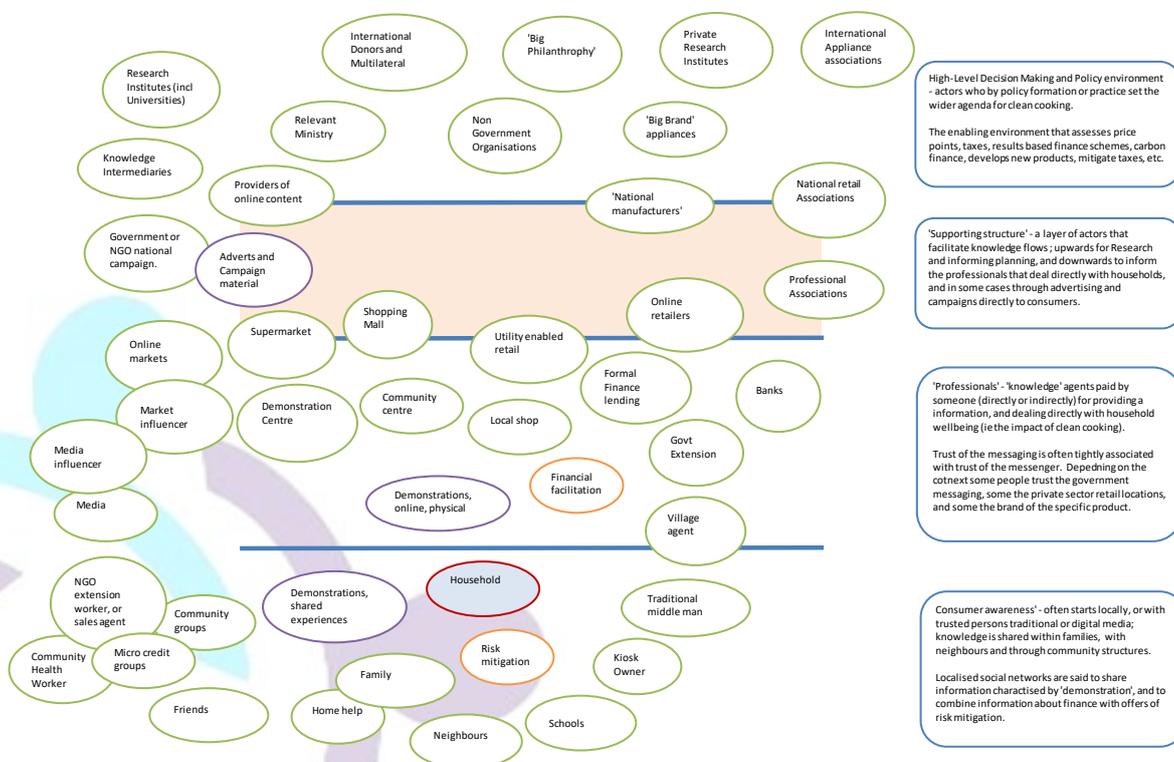
Home help



### 4.2.1 Actor networks for information flow

So how then might promoters of the product or service conceive of influencing the consumer or creating awareness without a heavy reliance on media? *Figure 13* is adapted from [Batchelor et al](#) and was based on a series of surveys and interviews mainly in Bangladesh about health information seeking. Such tracking and tracking of information flows documented how many community level personnel types there were that might give information to a household. Households have many connections throughout an actor network, by which they may gain information and knowledge. We have adapted their findings for this documented journey, but ideally more information on consumer actor networks may be required. In the diagram, the proximity of the actor to the household varies, although through the use of media, or perhaps something like demonstration days, even the big brand corporates can make a temporary but direct connection to the household.

Information and knowledge flows tend to also be dependent on trust, and some community level professionals such as the local health worker may have significant levels of trust. If they are co-opted to talk about the benefits of clean cooking, and the options of modern energy cooking services, that may in turn create awareness in the consumer.



*Figure 13* Authors construct based on previous work in Bangladesh on health information seeking. [Batchelor 2015](#)

Within the household, one explicit connection may be 'the home help'. Many urban households use the services of friends, relatives or employees to do domestic work around the house while the house owner is at work. In discussing future possibilities we have heard people say – 'Oh but I wouldn't let my maid use it'. The maid or

home help therefore has been identified on the journey map to provoke early discussion of who would actually use the appliance.

The actor network also comes into the decision to acquire, and we discuss this further [in section 4](#).

### 4.3 Consumer thinking and feelings

During this process of becoming aware, and determining whether it is worthwhile to share the information gained with the decision maker, to move on to a more structured consideration, the consumer is going through a number of thoughts and feelings. In our version of the consumer journey, these thoughts are worth noting. If we can correctly identify common barrier thoughts or beliefs, we may be able to unlock the awareness raising, turning general awareness into intention to acquire. In [Ajzen's Theory of Planned Behaviour](#), an action is influenced to varying degrees by the belief and the value the thinker attributes to that belief, which informs an attitude, and social referents and the value the thinker attributes to each referent. As an evolution on the Theory of Reasoned Action, the ToPB assigns an external control factor, and the perceived power of that factor. These come together as an intention to behave in a different or same way, and the intention informs the behaviour.

[Batchelor and Scott 1999](#) applied the ToPB predecessor the TORA, to improved cookstoves in Northern Ghana two decades ago and were able to identify three key beliefs. As the very dated briefing note states, the validity of the construct and its application in this situation was further proved in the demonstration phase of the project (DFID R7483), This project took the recommendations of R6849 and worked with extension services across Northern Ghana to apply them. The key point of that research was that there were core beliefs that people valued that influenced their attitude to obtaining a new stove, and these attitudinal beliefs were also strongly influenced by the key social referents (which in this case was the male of the household). By addressing the core beliefs (one of which was that God would protect the trees) and turning it into a key message (God expects you to work with him to protect the trees), and by including men as an audience for the messaging (to date in that area improved cookstoves had been targeted and discussed mainly with women), then the programme saw a change in uptake of improved cookstoves over 4 years from 5% to 40%, and the implementation of a wild wood management scheme.

That was a rural area with strong traditional social structure. Many of the personas potentially taking up modern energy cooking services are urban and influenced by modern media. So what then might some of the thoughts and feelings such a consumer have in response to becoming aware of the new possibilities?

In terms of beliefs they will likely have certain questions about the opportunity. Will it be safe is a common question among LPGs users and likely to be here. Rumours abound that the question of smoke and taste is prevalent in consumers minds, although some research work using Discrete Choice modelling and with focus groups suggests that it is not as prevalent as thought by many international stakeholders. Nevertheless we

- Initial scepticism?
- Do I trust of the source of the info?
- Is the awareness from more than one source?
- Prejudice about fuel
- Knowledge of others use of similar
- Will it be safe?
- Will the food taste alright?
- Worth looking at it further



might speculate that the taste of the food is very important. There may be a belief that the fuel<sup>2</sup> is expensive or unreliable. These are beliefs that will form the attitudinal intention to find out more about the possibilities. We shall return to these in the consideration stage.

Some of the public funded behavioural campaigns may have emphasised the health benefits from switching away from biomass fuels to clean cooking modern energy. In general it seems that the public health messaging that smoke is harmful to your health, and that there is a need to switch, has limited impact on the consumer. There may also be messaging about environment and deforestation. Again, the impact on consumer thinking can be limited unless a clear alternative is presented. Charcoal in urban situations is a particular concern for deforestation, and yet in the day to day lives of the consumer the macro picture of a country moving forested to deforested probably has little impact on their consideration and journey.

**Potential impacts of scaled uptake in most viable market segment**

- if 40% of Uganda's grid-connected charcoal users (7.8m ppl, 1.7m HHs) switched to eCooking, the WHO's [BAR\\_HAP](#) tool suggests that:
  - **6,115 DALYs/yr** avoided
  - **9.4m tonnes/yr CO<sub>2</sub>eq** emissions reduced
  - **1.7m tonnes/yr** reduction in unsustainable wood harvest
  - **1,041m hrs/yr** of women's time saved (593hrs/HH/yr)
  - **11 months payback** for eCooking appliances (\$70/HH upfront cost, \$77/HH/yr savings on fuel energy costs)
  - **5,527 GWh** demand for electricity stimulated

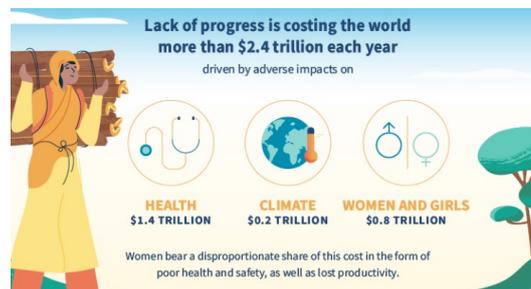


Figure 14 Insights on the health, environment and economy from the [MECS programme](#) Price et al 2022 and [ESMAP 2020](#)

The more commercial messaging will likely be about cost effectiveness, aspirations, convenience and timeliness. Modern energy cooking means that people start with a clean clothing and end the process with clean clothing – and it is this cleanliness that focus groups in [Tanzania spoke about](#) (Leary et al 2019). Those who are connected and busy often have jobs that mean going out the house early in the morning and returning late in the afternoon, so if lighting a fire and slow cooking a meal could be replaced with instant heat and shorter cooking times, then this is attractive. Messaging about how much cheaper cooking a meal with modern energy can be than biomass alternatives is probably more persuasive to the consumer.

<sup>2</sup> As discussed in the introduction, the construct of this consumer journey started as the possibilities of getting an electrical appliance for use with the grid electricity. However, we have sought to use the language carefully and hope that it can also be applied to off-grid (including acquiring a solar home system), and also other modern energy fuels such as LPG, Ethanol, Biogas, etc.



Figure 15 Pamphlet from Shamba Shape Up engagement with modern energy cooking focusing on time and cost savings. ([Shamba Shake Up 2021](#))

However, the consumer will also put value onto the source of the information and their social referents. The source of the information – is it to be trusted? As touched on above, many on the internet have hidden agendas and what may seem unbiased information could be paid for advertising. Similarly, government information in a public campaign may be tainted with a sceptical view of the governments intentions.

And then closer to home - Do others, who are influential on the consumer, have experience of the possibilities, or even an informed opinion of them. There are many stories where older people have formed an opinion based on their childhood and early adult life, which have erroneous conclusions. Indeed, for instance the opinion that ‘electricity is too expensive to cook with’ has been shown by controlled tests, new energy efficient appliances and rising biomass and fossil fuel prices to be incorrect in some (many) contexts. Similarly the opinion that ‘electricity is too unreliable to cook with’ may have been overtaken by the enormous gains made in just the last 10 years in many grids in our countries of interest.

However, the thinking, feelings, conversations with friends families and others, might all come together at this awareness stage to influence whether to move on to the next stage...‘Consideration’. Is it worth acquiring?

#### 4.4 Contextual backdrop

In the ToPB, Ajzen realised that the contextual conditions were a key to the last step of in their framework of changed behaviour, turning an intention to behaviour. No matter how well formed the intention to change is, if there are perceived control factors, or indeed the actual control factors, then the beliefs and the social norms cannot, except in rare cases, overcome the control factors in such a context. The awareness, consideration, intention acquisition is all on the path to behavioural change, and we can variously take each step as having its own contextual factors, or treat them as a whole at the end. For this paper, we draw attention to the ones that seem relevant to the stage.

These contextual conditions may well affect the consumers response to their increased awareness, whether they intend (and action) seriously considering the new possibility. At a basic level – is the underlying fuel required for the product or service available and reliable? If it's not then even if the product is available, it cannot be used. With slightly more nuance, if it is there only part of the time, a choice will have to be made in the coming consideration stage.

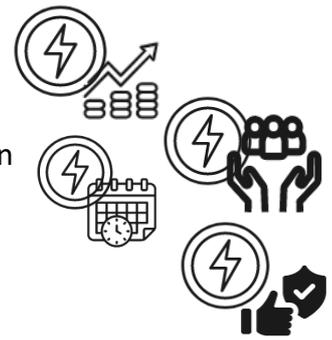
And in addition to the actual reality of the context, there are sometimes perceptions that feel like controlling conditions. For instance as an example of contextual myths – does the fuel have a bad reputation as expensive? That may or may not be the case, but perhaps if the consumer is bombarded with statements that the fuel is 'too expensive' they may never do the calculation themselves and the awareness may be cut off even before it has settled into the mind of the consumer. We will consider this further below.

Does the fuel have a bad reputation as expensive

Does the fuel have reputation about safety

Is the fuel available

Is the fuel supply reliable



## 5 From awareness to consideration to acquisition – who makes the decision?

**What is the next step for the customer if they have become aware and are attracted?**

They as an individual may or may not have the power and agency to make a decision to find out more, and then to decide to acquire. To date, research tends to suggest that different genders have differing abilities within a household to make decisions. There is a trend toward joint decision making, with many urban dwellers in say Cambodia or Kenya reporting that it would be a joint decision, on the other hand there are other more traditional cultures where the woman may have to submit to a decision made by an other. This of course need not be the stereotypical gender direction, and it could be that the man has become aware, and need to discuss with his wife ‘who handles the cooking’.

So a likely step if awareness has attracted the cook to consider a change, is to discuss the idea with the decision maker. If the decision maker is favourable, they would likely consult with others in the house. On domestic appliances, the husbands mother is sometimes of strong influence, but it could also be the elders of the village, or the landlord. The decision maker will take into account the views, real or perceived, of key social referents. And following that cluster of consultations, the decision maker may decide to find out more (independently or alongside the original consumer).

The DHS data has data on 4 key decisions to enquire whether women participate solely or jointly in the decision. The latest cross [country comparative report dates from 2008](#), and so is a little old. At that time it noted that

*“There is no country where the majority of women make decisions alone about women’s health care, large household purchases, household purchases for daily needs, or visits to family or friends. Among the four decisions, those most often made alone by women are either about making daily purchases for household needs (14 countries) or about women’s own health care (8 countries). Joint decision making is not as common as might have been expected: in only 13 countries do women most commonly make one or more of the decisions jointly; these jointly-made decisions tend to be decisions about large household purchases or visits to family or friends.”*

[DHS 2008](#)

DHS surveys are not conducted every year, and so data on this question can be sparse. In the table below, we extract the data for some countries of interest. Of interest is the growth in women’s participation in large household purchases in most countries, levelling off in the more established economies such as Indonesia. Countries who have more traditional cultures and low economic growth, tend to maintain the male dominated decision making (eg Senegal)

Attracted to investigate by positive message

Discusses the idea with whoever makes the decision in house

Decision maker takes into account the views of key social reference

Decision maker(s) decide to find out more



Table 1 Extract of *DHS data (presented by World Bank Data)* from last 20 years for some countries of interest on the response to “Women participating in making major household purchase decisions (% of women age 15-49)”

Country Name	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	2020
Bangladesh		48			56				59			61				71		48
Ethiopia			57						66					78				
Ghana	51					62						74						
Indonesia	80				79					81					76			
India				53										73				
Kenya	36						67					72						
Cambodia			79					94				94						
Myanmar														74				
Mozambique	37								59				76					
Malawi		18						30						55				
Nigeria	19					38					38					40		
Rwanda			58					71					73					
Senegal			16						26		20	19	17	15	21	16	18	
Tanzania			34					39						46				
Uganda				50					57					64				
Zambia					56							66				68		

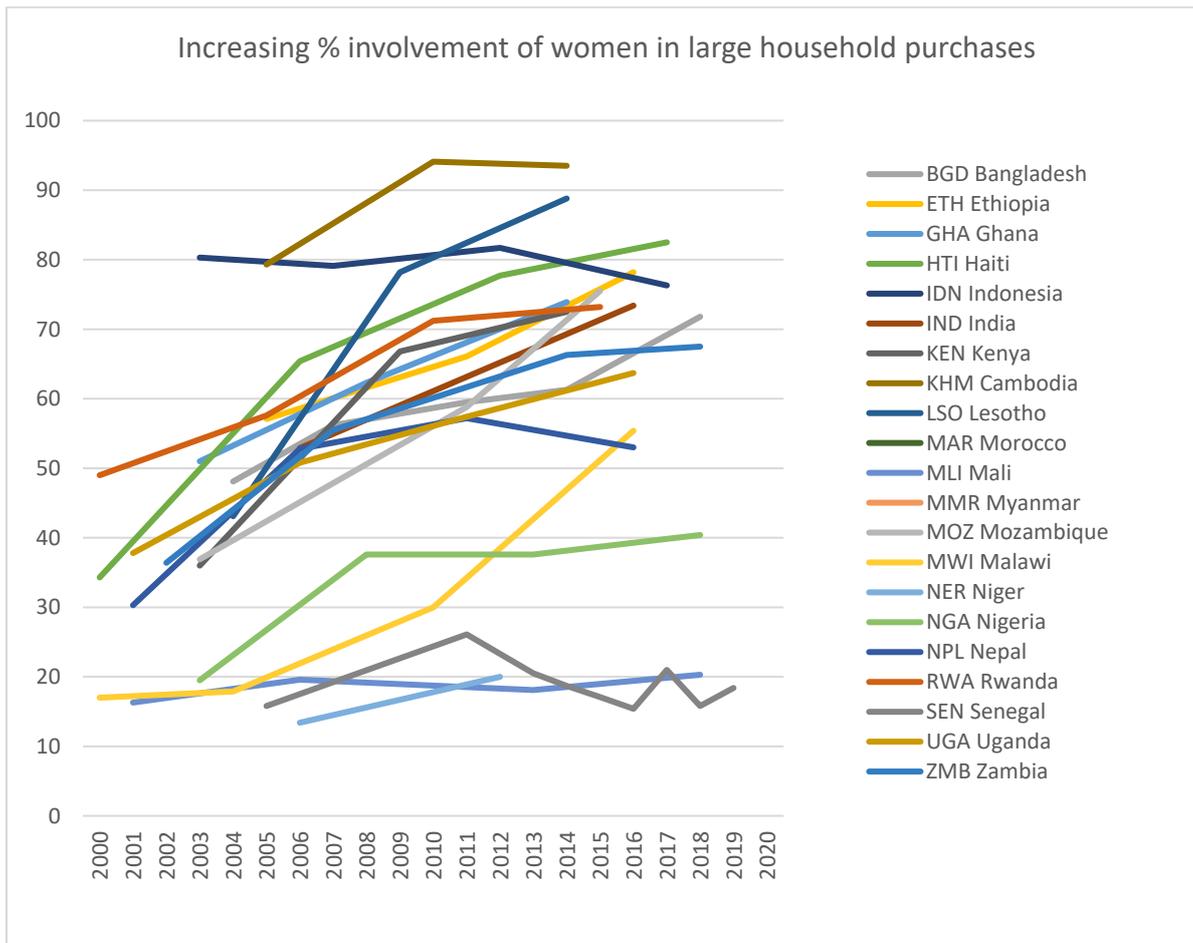


Figure 16 Extract of *DHS data (presented by World Bank Data)* data from last 20 years for some countries of interest on the response to “Women participating in making major household purchase decisions (% of women age 15-49)”

Given the above data, it seems safe to speculate that if the woman becomes aware of modern energy cooking services, about 50 to 70% of them will likely share the info with the other household members, and either solely or jointly make a decision. It is not clear from this data whether the balance of women have the right to draw the male’s attention to the new product or service, and from that point of view, it would be good for awareness raising campaigns to ensure they target both men and women.

However, as well as the decision making between two spouse, there is also the influence of the wider household and the community. [Kang 2019](#), studied the impact of the family social network on household consumption, in China. The analysis relied on panel data of 16,000 households in China. While most of our countries of interest have breadths of culture, it is reasonably safe to say that they are more communal than a developed economy like the UK. The link between traditional cultures and communal decision making comes out in Kangs analysis, across the different traditions of China itself. Traditional relationship-based societies pay more attention to interpersonal relationships.

*“Consumption can not only bring people material enjoyment, but also enhance the exchange and transmission of information. For families with a wider social network, it also carries social significance and status attributes. Therefore, social networks can make consumption decisions for families through the communication and demonstration effects produced by residents in the process of social interaction. On the other hand, social*

*networks can give people such as job opportunities, financing channels and access to information to help, as an informal system to provide security for families, reduce the sensitivity of families to risk, and risk attitudes are important factors affecting household consumption decisions, so families can share risk through social networks, so as to mitigate the inhibitory effect of risk on Residents' consumption."* [Kang 2019](#)

Zhang analysed for total expenditure, that which they designated as survival expenditure and expenditure for enjoyment and development. In the various different circumstances our countries of interest might contain, considering a modern energy cooking acquisition could be 'enjoyment', but perhaps most commonly 'development', with the monthly fuel expenditure being considered 'survival'. Perhaps surprisingly Kang found a weaker link between social networks and survival consumption, than enjoyment or developmental. Perhaps this is understandable, as the wider social network (of friends and family, who have the good of the other at heart) encourages the consumer to spend on things that improve their life. The mechanism of influence of the social networks on the consumption is by both demonstration (perhaps the idea that 'I have one of these, why not get one') and risk alleviation (providing financial support, or taking a part of the risk)

The picture Kang paints is one of complexity, since many of the control factors such as household income, age, education, play a stronger role in the consumption than the social network per se. For the consumer journey though, Kangs data reinforces the idea that the consumer does not make a rational choice based purely on the information (even the asymmetric information, [see Section 5.2 below](#)), but is constrained and encouraged by the influence opinions and decisions of others within their social network, and that in traditional societies these influences are stronger than in urbanised modern communities.

With these points in mind let us move in the journey from a rising awareness of the possibility to an explicit consideration of the choices available.



## 6 Consideration

Consumer considers the idea or partial or total replacement of existing cooking regime.

In this section we look at :-

- **What might the prospective consumer** set as their criteria for choosing whether to proceed or not with acquiring modern energy cooking services?
- **Who might provide more detailed information** about the product or service – do their social network have experience of the product or service, are there local agents or shops that sell such systems, do they have access to the internet for online information gathering?
- **How might they access the finance for the acquisition** – do they have access to savings, to credit through formal or informal means?
- **How might the payments be spread** - so there isn't a large upfront cost?
- **How can the suppliers get the consumer to consider the long term fuel cost?**
- And before considering whether to obtain a product or service, **who does the consumer have to consult with** within their household and community – **how is the decision made** to continue through the consumer journey, and is there a particular gatekeeper.

Having become aware, the household (or the person delegated to move the idea forward) likely then tries to find more information about the specific products or services. In a digital age, this might be online comparison of options and reading reviews, but it could also be going to supermarket and looking, touching even having a demonstration. In this process they may also be influenced by branding – does such and such brand have a reputation for quality. They may also seek to decide between similar appliances, and finally they may narrow down the choices of where to get the appliance (complete with implications for its return if it fails).

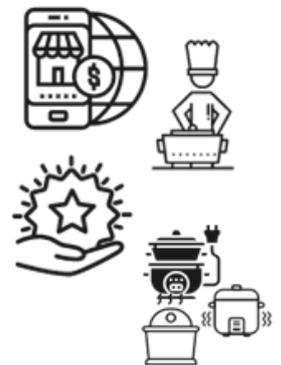
They try to find a place to compare the options (Digital or physical)

Experience and feel the options

Narrows choices to brand of appliance(s)

Narrows choices to which appliance(s)

Narrows choices to where to acquire the appliance(s)



### 6.1 Consumer Consideration Criteria

The complexity increases now as the consumer considers whether to purchase or acquire the product or service they have heard about. While awareness raising was perhaps to some degree passive with the consumer receiving information serendipitously (from media, friends family etc), in the consideration stage, the consumer is actively seeking information. The core moments for this stage are perhaps a long list of criteria that the household may use to determine whether to make the acquisition, and who they might ask to answer these questions.

Many stakeholders discussing the issue of clean cooking focus on the price point, and assume that that is the key issue for the consumer. Much research among the consumption obsessed developed economies does indeed focus on the price of the product. However this is nuanced with that price being a signal for the quality. [Yang et al 2019](#) show how price is a signal that suggests quality and how higher priced goods are perceived. Within developed economy studies, the look of the product seems very important, and is associated with the brand. The consumer may have brand loyalty (ask any apple computer user), and of course this is often associated with functionality and ease of use, which are in themselves one of the possible criteria a consumer may be using.

A definitive list of choice based criteria varies from consumer to consumer, and indeed it may be similar or quite different from those in developed economies. There perhaps need to be more studies on what consumers in Africa and Asia look for when choosing a large household purchase. The [PWC global consumer insights survey](#), does not contain many of our countries of interest. However, we could take Vietnam, Egypt, Indonesia, and South Africa as younger economies that are mildly representative of some of our countries of interest. The global survey shows that consumers are growing in their concern for health. In Southeast Asia and the Middle East respondents state that they've become more healthy (since 2018). Globally, 49% of survey respondents say they're healthier while Egypt 68%, Indonesia 83% Vietnam, 80%; and South Africa 62%. Similarly, our four countries have consumers with a higher than global interest in the environment. Globally, 50% of survey respondents say they're healthier while Egypt 68%, Indonesia 86% Vietnam, 74%; and South Africa 60%.

Globally, less than half respondents say they are loyal to a brand, and for the various reasons; Exceptional customer service (26%), Products that are widely available (31%), Reliability (the brand always delivers what I expect) (46%), Loyalty programs (26%), Ethical practices (e.g. Fairtrade, cruelty-free testing, workforce equity, best in practice production etc.) (24%), Engaging content (e.g. social media, influencers, advertising) (24%), Sustainable practices (e.g. commitment to net zero) (19%), among other reasons. The four young economies show more or less similar levels of brand loyalty, although Egypt respondents seemed to doubt that reliability came as part of the Brand package.

It should be noted that the surveys are conducted in predominately urban areas, but nevertheless whether people use stores or go online to make their purchases in our four young economies, is again very similar to

- Price point 
- Quality 
- Looks 
- Convenience (ease of use) 
- Features 
- Cooking regime (functionality) 
- Brand loyalty (Packaging)  
- Ease of purchase transaction 
- Bundling with other offers 
- Delivery time 
- Who will use it 
- Will it be safe 
- Will it clean easily 
- Is the fuel available 
- Is fuel supply reliable 
- Any costs associated with getting fuel supply 
- How reliable the warranty 
- How will I get it repaired 

global trends (Figure 17). While South Africa lags a little in online purchasing it is not by much, and the Asian economies show a higher than global use of the online systems.

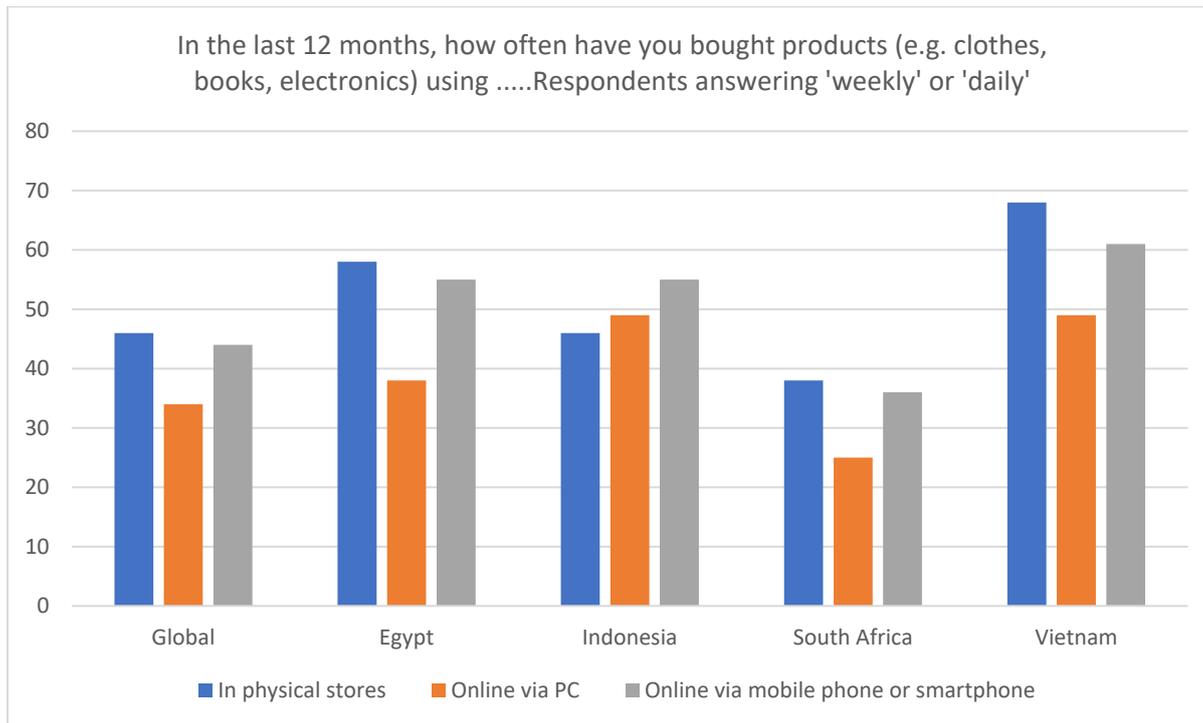


Figure 17 Where purchase of products occurs data from [PWC global consumer insights survey 2021](#)

In addition to the features of the actual product such as price, quality, ease of use, etc, the consumer may consider other systemic factors. There is a growing phenomenon of ‘unboxing’ where social media is used to show what you get when you purchase an item – how securely it was boxed and what accessories it came with. Indeed the ease of the purchase transaction may be a factor. Amazon have grown by delivering to the door, and by accepting no quibble returns.

Considering the online purchase, then delivery time may be a factor – I have purchased a different product from the one at the top of my list because the delivery time for the alternative was better than the original choice.

And then after or alongside the features of the product or service, and the features of the acquiring transaction, the consumer will likely consider who will use it and how will they get on with it. Will it be easy to clean, will it be safe? As touched on during the awareness narrative, the role of the fuel in any modern energy cooking service will be key, and so the choice of product or service may be strongly influenced by that external context – will the fuel be available, reliable? Are there any costs to obtaining the fuel beyond the fuel price (eg connection fees, or wiring upgrades)?

And the consumer may also consider the warranty and how they may get it repaired. [Harrington & Wambugu 2021](#) states that “end users rely on local sales agents, technicians, and electricians for guidance on purchases, repairs, and e-waste, as these actors are better positioned to help end users interpret the technical information required by standards” (for solar products and services).

This is by no means a definitive list, and each consumer will likely put a different weighting on each variable, including adding new variables. For those promoting modern energy cooking services a key step will be to discuss with a cluster or representative consumers how they might consider their choices. This can be undertaken through a discrete choice modelling exercise.

MECS has undertaken Discrete Choice Modelling in six countries of interest (GH, KE, TZ, ZM, MM, UG), but on a product agnostic view of modern energy cooking. It is perhaps worth noting that DCM as a methodology avoids the common problems of ‘stated preference’. When complimented with a willingness to pay experiment, the combination of DCM and WTP can be quite insightful to how consumers choose their product or service.

In this case, as a new product or service, most respondents did not have experience modern energy cooking services (whatever that may include). The DCM featured ‘cooking processes’ criteria, ie how it will do the actual cooking, design criteria, i.e. what the ‘stove’ may look like and its features, and some functionality and purchase options. Table XX outlines the criteria covered by the existing DCMs.

Table 2 Parameters and levels

Parameter	No. levels	Level 1	Level 2	Level 3	Level 4
Cooking processes					
Type of cooking	2	Boil only	Boil & fry		
Power (speed of cooking)	3	slow	normal	Fast	
Use of lid	3	No lid	Pot with lid	Sealed pot	
Number of hobs	3	Single hob	2 hobs	4 hobs	
Stove					
Capacity (people)	3	Cooks for 4 people	Cooks for 6 people	Cooks for 8 people	
Capacity (devices)	3	always need to use with another stove	sometimes need to use with another stove	you can do all your cooking on it	
smoke emissions	3	No smoke	gives same smoke as charcoal fire	gives same smoke as wood fire	
Portability	2	cannot be moved (too heavy)	can be carried in/out of the house		
looks	2	Looks plain	Looks good		

Functionality					
Devices	4	2 hobs	2 hobs + 3 LED lights	2 hobs + charge mobile phone	2 hobs + television
Availability	2	only works on sunny days	works on sunny and rainy days		
Financing	3	pay each month (utility)	lease over 6 years	lease over 3 years	
Cleaning	2	awkward to clean	Easy to clean		

Given the many different context resulting design feature scores are complex and vary according to the country and culture (as expected). [Scott, Batchelor and Jones](#) 2019 present some initial findings from the DCMs. While the report contains the specifics of each context, it is interesting to note that there is a universal preference for a device that can both boil and fry. This is consistent with the finding that large numbers of people (roughly one third) cook on only a single device (see Table 6). In most countries people had a preference for a lid (rather than an open pot), but not for a sealed pot. This highlights a potential challenge if designing or trying to sell a sealed vessel such as a rice cooker or pressure cooker. It was interesting to find that in most countries, choices revealed a clear preference for a device that did not impart a smoky flavour to the food. This is contrasted to stated preferences evident from lengthy and animated discussions that we have experienced in focus groups.

Regarding some of the stove design features: There is universal preference for a high capacity device that can cook for larger numbers of people. Only in Myanmar was there an apparent preference for a device that could cook all of the foods prepared. This does not appear to be a design requirement because people are accustomed to cooking with multiple devices, with the notable exception of Uganda. Indeed in Ghana there was even a preference for a device that would always need to be used in conjunction with another device. There was almost universal preference for a portable device, which is consistent with the finding that a substantial proportion of respondents cooked both indoors and outdoors (except Myanmar). In all countries except Tanzania, having a device that is easy to clean appears to be important.

The availability and reliability of fuel, and the prospect that we are here discussing a solar home system package that includes cooking, the DCM found that there was a preference for a device that can cook all days (regardless of weather) evident across all countries except Uganda (which may reflect a poverty status issue).

And in terms of finance, in all countries except Tanzania, people preferred a lease financing arrangement (PAYG) to a utility style rental model where they would pay a monthly fee forever.

## 6.2 Economic theory and consumer choices

Economic models on consumer consumption tend to draw on either Keynes absolute income hypothesis (1936), Friedman's permanent income hypothesis (1957) and the Modigliani life cycle hypothesis (1949), or a combination of them. As one can see from the dates, these are now half a century old, and the world has changed quite considerably. Have consumer choices changed?

Oremerod (2016) explains that these theories rely on certain assumptions. They assume that the consumer has already fixed preferences, and that those preferences are independent of the decisions of other agents and influencers. The consumer therefore considers the alternatives knowing all the information that the other agents possess (i.e. that they have perfect information on the products and services and all the alternatives), and then they make the best possible decision (the optimal one). Anyone who has made a decision can immediately see that these assumptions are flawed, and in developing this working paper, we cant quite understand how economists could think this way.

In more recent economic literature the simplifications above have been relaxed or weakened by acknowledging that consumers have incomplete information (Akerlof and Stigliz). Noble prize winning economists suggested that most transactions were affected by asymmetric information. An example of this would be that one party to a transaction has greater material knowledge than the other party. For example, if a homeowner wanted to sell their house, they would have more information about the house than the buyer. The transaction is said to be affected by ‘adverse selection’ when the asymmetric information is exploited. They argued that this changed the more traditional analysis of economic and consumer behaviour. They also argued that there was a considerable cost to obtaining and processing information and therefore many people limit how much information they seek out. Indeed the number of choices in the digital enhanced modern society is staggering, and the concept of optimal choosing is effectively eliminated since it often is just not possible to gather and process information in the way implied by rational choice theory. It is also important to acknowledge that ‘man is not an island’. The assumption that the consumer is free to make their own choice, is particularly challenging in the communal societies of our countries so interest and has been explored in the above sections.

### 6.3 Consumer connections

The mapping of the journey can be complex and repetitive. Many of the connections will appear again and again throughout the journey. Having set criteria, there is perhaps a need to bring together the connections and people they need to assess the criteria and settle their thoughts. These have been touched on by our description of the consumer journey so far, but for completeness they are repeated here.



While the diagram attempts to cover the myriad of possibilities, for the consumer journey we can reduce the information consideration moments to those engaged in retail of the product or service, and those engaged in supporting the purchase.

In terms of the retail touch points, where are they going to get all this information and opportunity to experience (touch and feel) the devices? While awareness was stimulated by general exposure to media and friends and family, the next stage of acquisition will depend on a specific retail outlet. In considering whether to purchase, the access to and perceived reliability, of each retail outlet is likely to influence the consumer.

Analysing data again from the [PWC global consumer insights survey](#), globally, less than half respondents say they are loyal to a brand (of goods or seller), and that loyalty is generated by various reasons; Exceptional customer service (26%), Products that are widely available (31%), Reliability (the brand always delivers what I expect) (46%), Loyalty programs (26%), Ethical practices (e.g. Fairtrade, cruelty-free testing, workforce equity, best in practice production etc.) (24%), Engaging content (e.g. social media, influencers, advertising) (24%), Sustainable practices (e.g. commitment to net zero) (19%), among other reasons. The four young economies we looked at above (Egypt, Indonesia, South Africa and Vietnam) show more or less similar levels of brand loyalty, although Egypt respondents seemed to doubt that reliability came as part of the Brand package.

It should be noted that the surveys are conducted in predominately urban areas, but nevertheless whether people use stores or go online to make their purchases in our four young economies, is again very similar to global trends (*Figure 18*). While South Africa lags a little in online purchasing it is not by much, and the Asian economies show a higher than global use of the online systems.

Asking retail outlets

online retail outlets

online market places

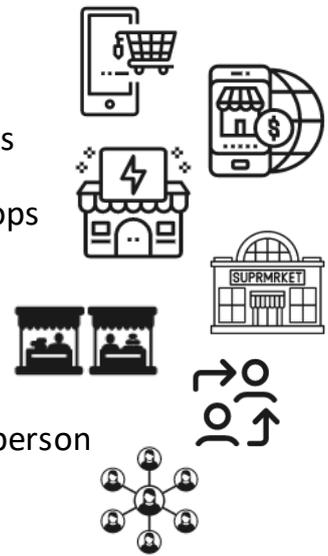
physical electric shops

supermarkets

street markets

door to door sales person

agent networks



Banks

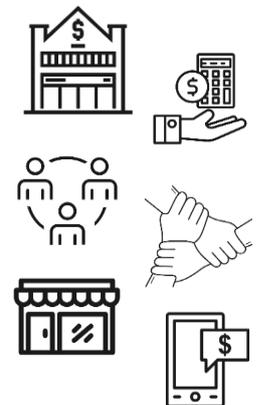
Regulated financial service

Cooperative society

Micro credit solidarity group

The retail outlet - credit

The provider - pay as you go



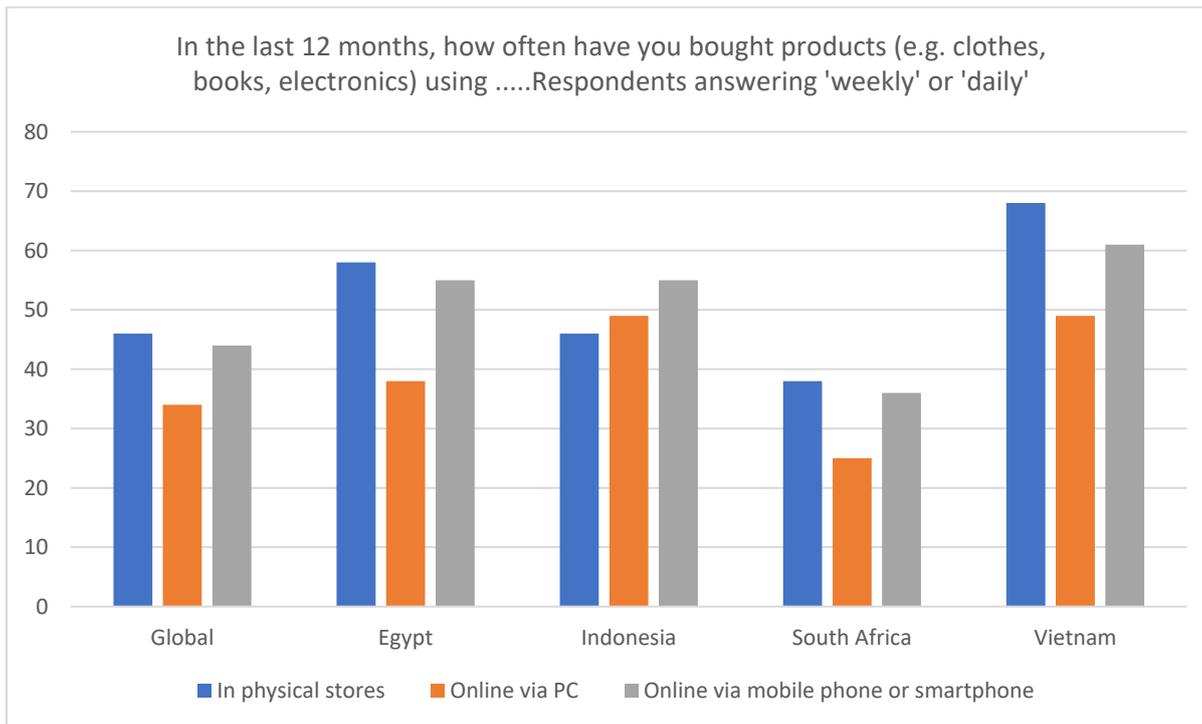


Figure 18 Purchase of products data from [PWC global consumer insights survey 2021](#)

Developed economies are accessing more and more on online retail. This may be a direct online contact with a single company, or through a market place such as Amazon. In Africa, [Jumia](#) is growing, and urban populations are increasingly using it to purchase goods, groceries and even borrow money (eg [Nigeria](#)).

Returning for the moment to retail centres, traditionally, there may be a single or parade of shops which may or may not be specialising in the kitchen ware and/or the renewable technology systems. Some of these will be clustered in ‘american style’ malls, shopping centres where the consumer experience is almost entertainment, but others may be just a single shop where one has to know ‘where to go’ to get to it. Supermarkets are increasingly common in African countries in the main city, and across Asia, but there is also often an informal street market which may include sales of kitchen products, especially second hand goods.

While door to door salesmen have almost ceased in developed economies the prevalence of micro credit, the need for agricultural and health extension, and the formation of community solidarity groups give opportunity for both salesmen from say an agricultural equipment provider, and for agent networks that support the groups. A good example of the latter is [Bidhaa Saha](#), which works to help women’s group get products and services that are relevant and beneficial to their lives.

In terms of the finance required for the product or service, the consumer may have to access their savings, approach friends and family to mitigate the risk, approach a credit facility, which may be offered as part of the sale by the retail outlet, or through a separate financial institution. The financing of the product or service is complex, and for that reason [Section 5.5 discusses it more fully](#).

## 6.4 Consumer thinking

In addition to the criteria the consumer may have set to judge whether to acquire the product or service, the consumer may think about the choices from a more personal point of view. The product may be priced reasonably, cost effectively, but the consumer may wonder whether it is too expensive for them as a household to purchase? What is their personal situation – do they have the upfront money to make such a purchase, and if not can they get credit.

Other thoughts may overlap with some of the criteria – will it have any legal issues, how long might it last, where do I get repairs. While these have an overlap with the criteria for considering the acquisition, they may be wrapped up with feelings and previous personal experiences. Has the consumer tried a hotplate before – only to have it fail very soon, or be too expensive to run. Have they tried a change in the household only to have pushback from their relatives or community leaders?

These thoughts might also include an opinion about the person who might use it. Many households have homehelps for some domestic chores, and working families recruit from friends, family and by job placement for such a position. (We acknowledge that the majority of domestic helps are female, and they, where present, are the ones mostly doing the cooking, but there are a substantial number of males for the more heavy work of gardening. The icon used is female – but need not be).

Returning to the financial considerations and thoughts, the next section looks at finance and financial inclusion.

## 6.5 A focus on the finance

This consideration criteria and thinking perhaps point to a key cluster of moments, persons or institutions, that **might be required to help finance the purchase**.

While \$50 to \$100 for an electric pressure cooker is substantially more than consumers are used to paying for their stove (\$10 to \$30 for a biomass stove), it is not unreasonable to find that some consumers may have that money. If all the other criteria are persuasive then there may be both a willingness to pay and resources to pay. If purchasing this device saves \$5 a month, and lasts 5 years, then it may seem worthwhile to pay for it. Similarly, if the idea that it doesn't cause health problems and will save on seeking medical care on a respiratory illness

Will it be too expensive to purchase



Do I have the upfront money



Can I get credit



Will it be expensive to run

What will my friends and family think of us



What will the community think of us



Are there any legal issues



How long might it last



What guarantees does it come with



Where might I get it repairs



Will homehelp be able to use it

(which could easily be several hundred dollars) finds favour, then the consumer may want to find the upfront money.

However, having a willingness to pay (and intention to pay in ToPB terms) it may be that perceived and actual control factors such as not having the \$50 may prevent intention becoming behaviour. So financial institutions and financial instruments are a deep part of the equation as to whether and how to make this 'large household purchase'.

In developed economies a device such as an electric pressure cooker or an induction stove, would generally be purchased with cash, debit or credit card. Most consumers have a bank account and this enables various instruments such as credit and debit cards, or what is rapidly evolving now, an app on their phone connected to their bank account. The consumers of developed economies sometimes take for granted the credit card that is effectively a loan that enables them to make a \$100 purchase and then consider whether to pay it off in one month or several months. For the Low and Middle income consumers in our countries of interest, access to credit is more of an issue, and financing the purchase may have more complexity.

### 6.5.1 Financial Inclusion

**So how many of the 3 to 4 billion biomass users, could access financial services in one of the forms cited above?** Financial inclusion broadens the discussion slightly from just debit and credit, to include the act of transactions or payments, and services such as insurance. This muddies the water a little of whether the consumer could pay upfront by using credit, by including how the consumer might pay.

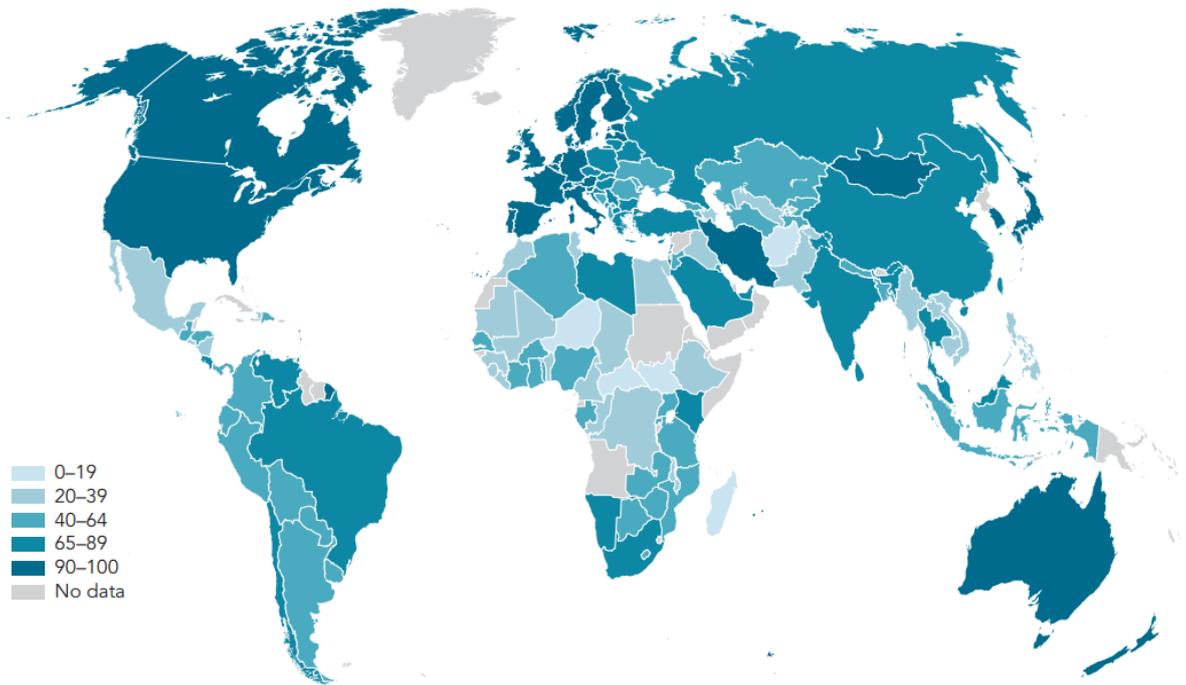
The advent of mobile money has enabled many to have a transaction account, and these accounts have often been a gateway to longer term credit and savings services. It may be important to note that a mobile money account is often limited in its daily spend (part of the security) and often does not have provide for interest on any stored money, and therefore has limited utility as a savings account, thus making it difficult as a means to make large household purchases.

Nevertheless considering the financial inclusion since 2011, 1.2 billion people have additional access to financial instruments. There are still 1.7 billion who don't have access to financial services (as at 2017, latest available), and the majority of these 1.7 overlap with the 3 to 4 billion who utilise biomass for cooking. Given the 20% growth of financial service access in developing economies between 2011 and 2017, it is not unreasonable to assume that the 1.7 has become 1.4 billion in 2021.

Therefore in the same way that at a headline level 2 to 3 billion have access to electricity and could cook with it if they so desired, so too these figures of financial inclusion suggest that 2 to 3 billion of biomass users have access to financial services and at a headline level could perhaps leverage that to obtain upfront finance for the purchase (on their customer journey).

## Account ownership varies widely around the world

Adults with an account (%), 2017



Source: Global Findex database.

Figure 19 Adults with financial accounts, [2017 World Bank](#)

Some of the key countries of interest, such as India and Kenya, have seen a growth of financial inclusion from 40% to 80% from 2011 to 2017. Therefore if the consumer in the consumer journey above is in these stable developing economies, their potential to access savings and credit is considerable (IF after their consideration of the product or service they wish to acquire and take the risk of purchase). We will use Uganda below as an example of regulated financial loan services – Uganda has moved from 20% in 2011, to 60% in 2017 (adults with a financial account).

So of the MECS countries of interest, how many consumers could utilise financial services in their purchase journey if they wanted to?

Banks

Regulated financial service

Cooperative society

Micro credit solidarity group

The retail outlet - credit

The provider - pay as you go



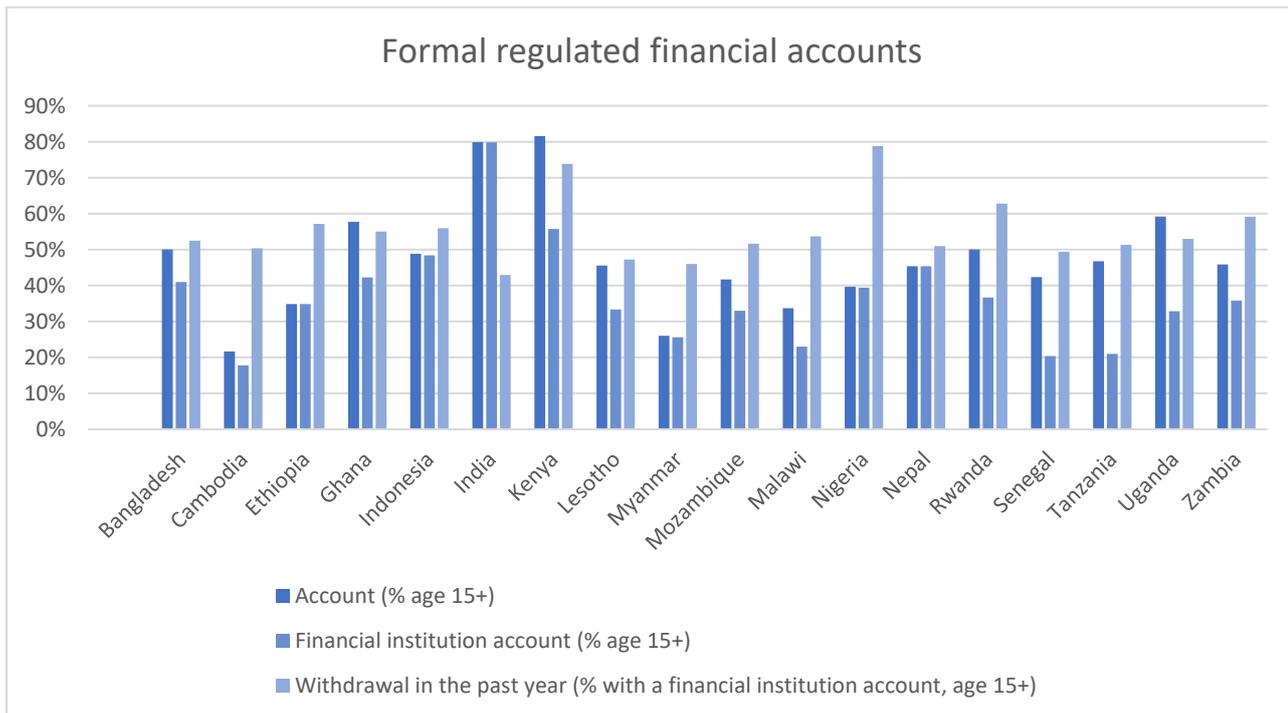


Figure 20 Formal accounts data for countries of interest (derived from [Global Findex Database World Bank 2017](#))

It is worth keeping in mind that this data is from 2017. While that is only 4 years ago, over the previous 4 years the access to financial services increased on average by 15 to 20% in most of these countries. The advent of digital services enabled many who had previously been excluded for various ‘Know Your Customer’ reasons, to be added by utilising two stage authentication of accounts. This is illustrated in the Kenya data, where formal financial services accounts are just below 60% while all accounts (including mobile money) are over 80%. It is reasonable to acknowledge that all figures in this section are therefore probably under estimates of the state as of 2022.

Having an account offers two prospects for the customer journey. It could enable access to the consumers own saving, ie debit money, or it could offer access to credit. For debit finances to be accessed, the consumer would need to have savings.

### 6.5.2 Savings and Debit options

The consumer may have enough savings to make an outright purchase. We often hear in international meetings that the poor do not have that upfront capital. However, our experience is that there are sometimes hidden sources of finance not disclosed on household surveys. In Cambodia in 1992, while a low level civil war persisted, most village surveys suggested that no one had any savings. However, when a borehole and pump combination (\$70) illustrated that for that outlay (upfront capital expenditure) the consumer could recover such expense in one season of irrigating vegetables, several hundred pumps were installed within a short space of time. It came to light that many village households had gold hidden and not declared in surveys – they kept gold so they could flee the civil war. When a profitable use for their money was became an option, they were willing to use the gold.

Another example of ‘unseen wealth’ comes from Northern Kenya. A Turkana pastoralist lives without apparent income and at the edge of poverty, and yet his 140 goats at \$50 each represent savings of \$7000. The sale of two goats would fund the most expensive EPC.

However, these examples are drawn from the rural poor (where the (\$50-100) EPC example is not actually relevant as it would have to be combined with a PV solar home system (\$300-500)). Appliances connected to the grid are more applicable to urban contexts, and urban poverty can sometimes be deeper than rural poverty. Many urban poor are renting property and have few land rights. Without rights they often pay for utilities through the landlord and are sometimes paying at a higher tariff than the official rate. They do not have a spare goat living in their shack. Nevertheless, some of the middle class and lower middle class may have savings they can draw on IF the purchase of the product is important enough.

So what does the data say about how many people have savings (keeping in mind it probably doesn’t take into account goats and hidden gold)?

Of those who operate an account – how many have been able to save some money either for a specific business purpose or generally?

It is worth noting that in a stable economy like Kenya, over 70% of all adults say they have been able to save something over the last 12 months (*Figure 21*). In the more challenging economies of say Bangladesh this reduces to 30%, but nevertheless it is note worthy that a third have been able to save something.

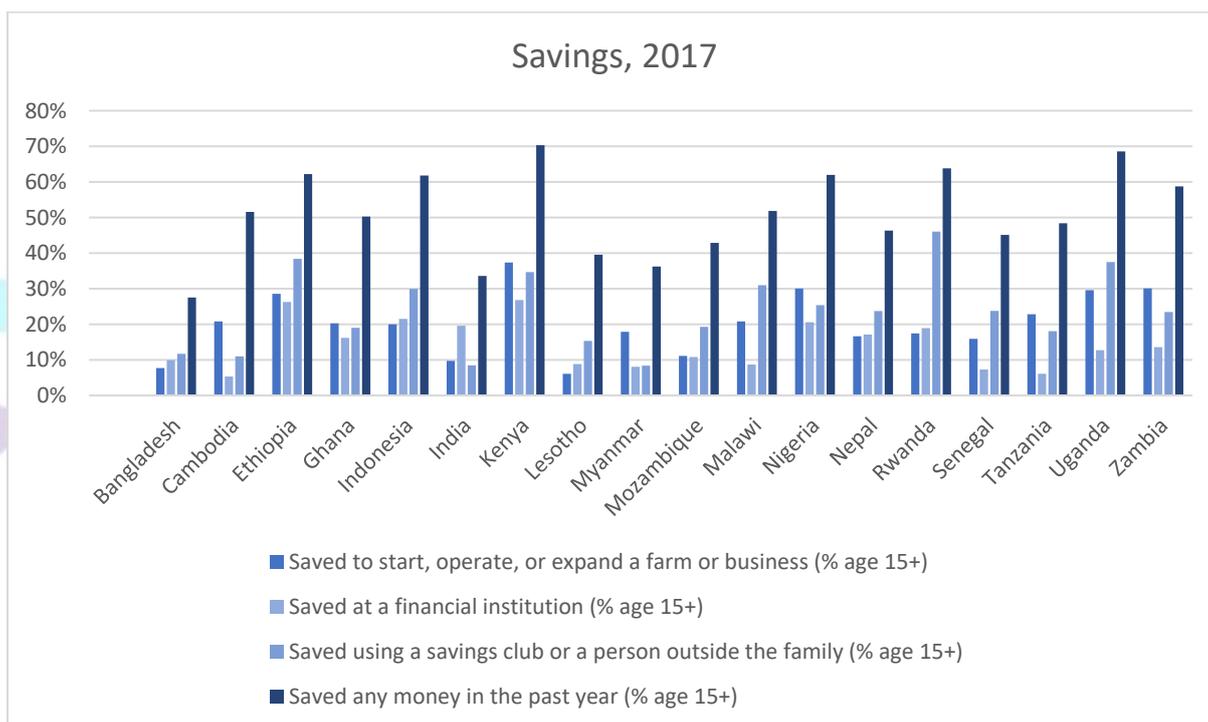


Figure 21 Savings data for countries of interest (derived from [Global Findex Database World Bank 2017](#))

To date in this paper we have tried to call it a product or a service. There is a line of thinking that households may not own the equipment but pay for a service. We shall explore that further below – but at this point we acknowledge that even then there may need to be an upfront connection fee or deposit, which may need to be covered before entering into a service arrangement.

### 6.5.3 Credit options

Of course if the savings are not there, available for the large household purchase that we are discussing in the user journey, then the consumer may have to borrow money to acquire the product or service. This borrowing could be variously formal credit through a bank or formal regulated financial institution, informal money lenders (who tend to charge significant interest and is not recommended!), or perhaps to peer group cooperative community model.

We will discuss typical options below, both formal and cooperative, but what the data suggests is that friends and family dominate the lending, with approximately 30 to 50% of adults borrowing during the last 12 months (*Figure 22*). The data includes an attempt to record borrowing from a store to purchase appliances, but so few people do that in 2017, that no records are available.

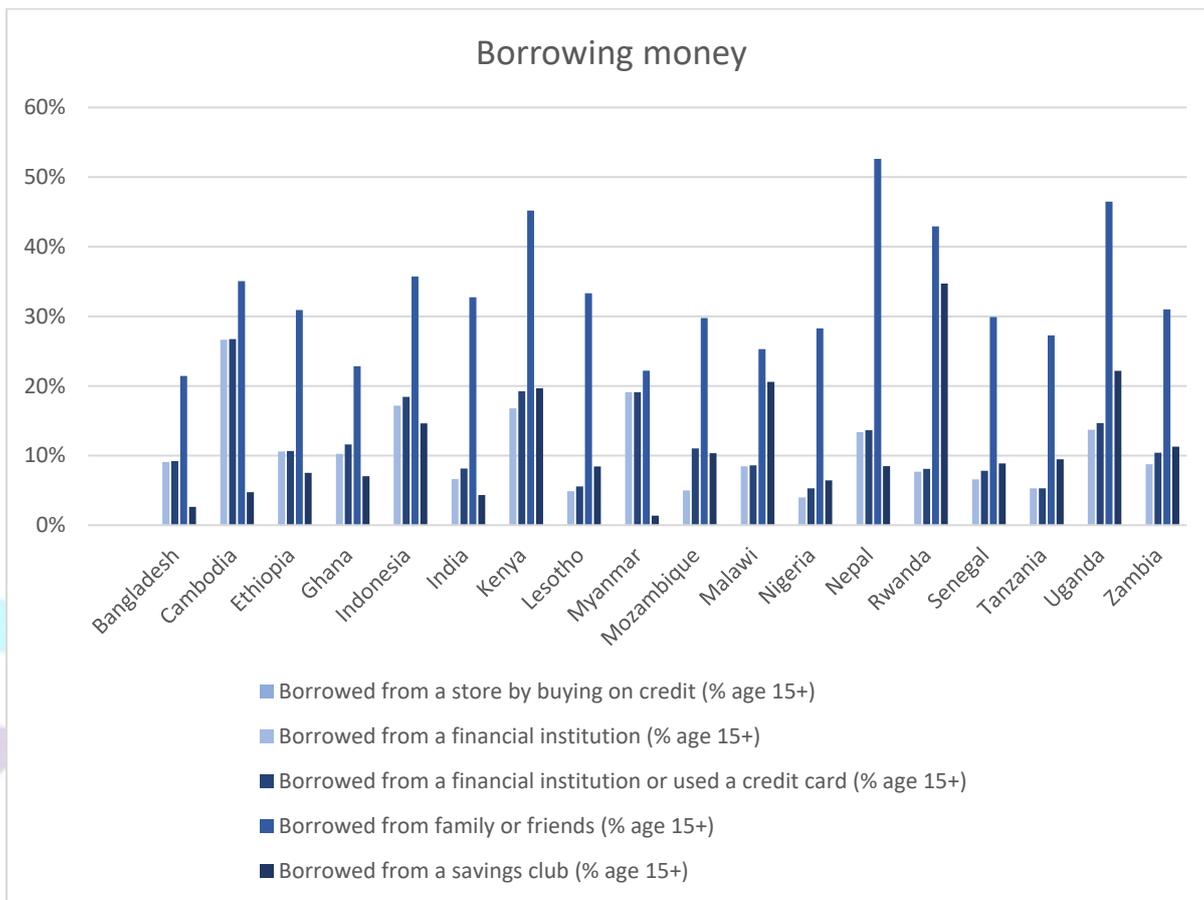


Figure 22 Borrowing data for countries of interest (derived from [Global Findex Database World Bank 2017](#))

In terms of borrowing from friends and family, there is a culture of remittances within the countries of interest, where school fees or emergencies are paid for by members of the family who are working elsewhere (*Figure 23*).

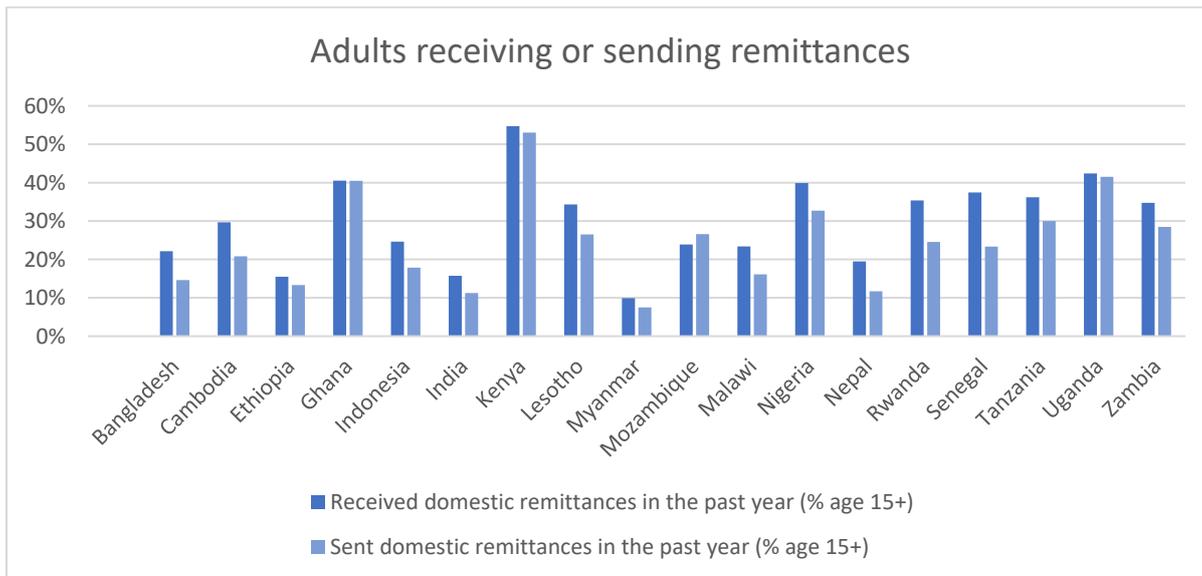


Figure 23 Remittance data for countries of interest (derived from [Global Findex Database World Bank 2017](#))

So what do the formal regulated institutions look like? In the following we took Uganda as an example to explore what might be available to the consumer.

#### 6.5.4 Formal regulated financial institution - an example from Uganda

The range of formal loans is perhaps best illustrated by considering Uganda. Other than banks per se, which often required collateral against a loan or overdraft, there are a generation of lenders such as [Platinum Credit Limited](#), a licensed Micro Finance Company providing Emergency Loans to all Civil Servants and employees of selected private sector companies and business people. Their sales literature says ‘50+ branches, 100K+ happy customers’. Whether an modern energy appliance for the kitchen would qualify for a loan remains to be tested but if it is secured by a government salary it probably would?

Again, tagged as being for emergencies [Smart Loan Uganda Ltd](#) offers an instant loan from 100,000/= to 50 million. “We understand that high street banks aren’t for everyone, and that sometimes they may not be able to offer you the short term finance product you are looking for. Life throws us many curve-balls and we understand that financial emergencies do happen and can leave you with unforeseen urgent payments to be made such as vehicle repairs, medical bills and the like. Here at Smart Loan Uganda Ltd, we treat you as an individual.” It is not clear what collateral these loans require.

Staying for the moment in Uganda, we find [Bayport financial services](#) provides primarily government-employed men and women with credit and access to financial services, as does [People Finance](#). Going beyond being a government employee, [Shaka Credit](#) opens the possibility of a ‘salary loan’.

[Freedom Lender Ltd](#), does not seem to have a website, seems to work through facebook, is located at Makerere University, and provides “quick emergency loans to enable you attend to your immediate financial needs. Simple items like Laptops, TV screens, cars, iPhone and Samsung phones can act as security.” It is not clear whether it is financially regulated.

The above are examples of private sector commercial lending agencies that seek to fill a gap between the strict and often tedious criteria of bank based lending and the need for flexible finance. There are lending agencies that started more as Non Governmental Organisations seeking to undertake development work. There are

NGOs that specialise in lending. [Vision Fund](#) is an offshoot of the global NGO World Vision, and offers targeted loans to improve the life of the poor, and has adjusted its collateral requirements accordingly. Their Uganda page focuses on the possibilities of a business loan, and agricultural loan, but also a boda boda loan, school fees, WASH, and asset financing. It is currently an untested possibility as to whether they would loan for purchase of a kitchen appliance? It is likely that the arguments about health and environment may sit well with such agencies if they could be made by either the suppliers or the consumers.

A cooperative model involving peer to peer lending has both been a staple of the finance landscape, and is currently experiencing a revival due to the possibilities opened up by the digital landscape. (Again we shall return to the digital possibilities in a moment). Savings and Credit Cooperative Organisations (SACCO) are popular and dominant in Africa. Some are open for anyone, for example the [Uganda Cooperative and Savings Union](#), while others are more specific for example have been used to run the 'public' transport operating mini buses (eg Manjiya Taxi Operators Sacco), and they may also present in institutions such as the [Ugandan parliament SACCO](#). They operate as the name suggests taking in savings and making credit available to their members.

### 6.5.5 Peer to peer lending and cooperative solidarity groups.

In addition to the above regulated lending agencies that mirror the procedures of financial institutions the world over, Low and Middle Income societies have been host to a myriad of micro credit schemes, that are arguably slightly different from regulated micro finance schemes. According to [Qudrat-I Elahi & Rahman 2006](#), micro credit schemes are best characterised by one or more of the following:- a standardised and limited set of products and services . group lending social collateral . forced savings . small initial loan size . loan size tied to savings . standardised loan repayment and disbursement schedules . frequent repayments. They suggest that the first wave of micro credit actions, famously championed by Grameen Self Help Groups in Bangladesh ([Harper 2002](#)) were “focused on overcoming the structural barriers to providing savings and credit services to the poor. These barriers include information asymmetries, lack of collateral, high cost, high risk, and systematic market bias.” They suggest that the ‘second revolution’ in micro finance has a primary purpose to satisfy organisational and donor demands, not the demands of their customers or clients. The loan programmes above are ‘product centred’ services, as they find customers to match the demands of their product (small loans), rather than developing products to match the demands of their customers.

This is not to say that the cooperative micro credit approach doesn't exist alongside the more global forms of small scale lending. Micro-credit can be based on traditional informal groups. The key characteristic of microcredit mechanisms such as [Tontin, su su](#), or [ROSCA](#) is that a common pool is to variously lend to or fund individuals in the group for specific possibilities.

### 6.5.6 Informal money lenders.

Finally the consumer could get their credit from “predatory loan sharks with exorbitant rates”, but this is not to be recommended and probably counts as a painful touch point on the journey.

### 6.5.7 Pay as You Go

As mentioned above, off-grid solar products and increasingly other devices such as LPG gas stoves, have been sold on a Pay as You go basis. The consumer pays a deposit and then signs up to make regular payments until the capex for the device and in the case of LPG, the opex of the fuels are covered. Is a Solar Home System sold on this basis a product or a service? Most would characterise this as a lease hire product. – i.e. credit under a different name. This is now very common with mobile phones in developed economies – a contract that spreads the capex of the phone over the time of the contract, and covers the operating expenditure on of the voice and

data flows. [Ockwell et al 2019](#), discuss how Pay as You Go was key to unlocking the growth of solar home systems across the world.

So the consumer could find a company that was offering either the kitchen appliance, or a whole off-grid system on a pay as you go basis. We have also talked above about product or service. While PAYGO could be seen as a lease hire purchase with the consumer eventually owning the product, it could also be seen as a service, with the commitment to maintain a working system held by the selling company. The Service Delivery Approach has been seen as important in the WASH sector, and one is seeing it in the mobile phone and transport sectors, where phones and vehicles are replaced after a given time as part of an ongoing service contract. While utilities traditionally offer a wire with energy coming out of it for any use feasible, there is a move towards utilities offering more of a service model, where efficient appliances can be hired as part of the utility package. This echoes the [roll out of television in the UK](#) where appliances were obtained on the ‘never never’ and rented from the service provider.

### 6.5.8 Reducing the cost of the appliance and price signals.

The consumer will likely be presented with a wide range of costs for what on the surface look like similar products and services. A general rule of thumb for consumers might be that the cheaper a product the lower the quality, but there are two factors that may disrupt this market norm.

The first is the second hand market. Energy efficient appliances such as electric pressure cookers and rice cookers have become common in kitchens throughout developed economies, and it is likely that affluent consumers will begin to treat such items as ‘disposable’. When a new model comes onto the market such as the currently emerging EPCs with wifi so one can trigger it as one is leaving the office, there is the possibility that viable secondhand appliances may be collected and shipped to LMICs. The market for clothes in Africa is dominated by recycling European and US pre worn clothing. Again using Kenya as an example Kenya is one of Africa’s biggest importers of second hand clothing, in 2019 importing some 185,000 tonnes. These clothes — called mitumba in Kenya after the Swahili word for “bundles” — form the bulk of Kenyans’ fashion choices: an estimated 91.5 per cent of households buy second hand clothing priced at Ksh 1000 (around \$9) and below.

Will therefore second hand electrical appliances distort the consumer price signals? Will a second hand instant pot (considered high quality but expensive by the [Global Leap survey](#)), actually be better value than one that is lower quality and cheaper when new?

The second is the possibility of lowering the cost of the appliance or service through Results Based Finance, ([Stritzke et al 2021](#)) which may be through the use of carbon finance schemes or drawing on the co-benefits in health, environment and gender.

Regarding carbon finance, a new protocol has been introduced by [Gold Standard on accessing carbon credits by smart metering](#) on modern energy appliances. This is theory increases the potential that those promoting and selling appliances may sell them in a package whereby with the cooperation of the consumer meter reading data is used by the supplier to obtain carbon finance. This in turn could reduce the cost of the appliance and/or reduce the cost of the monthly energy consumption.

There are also more ‘traditional’ carbon finance schemes (eg [Gold Standard 2016](#), [VERRA 2021](#), [energypedia 2021](#)) which measure the baseline emissions from the biomass fuel, and then measure the reduction from a sample of users, and make payments accordingly. There is no reason why this method cannot be applied to modern energy cooking appliances, but it needs to cooperation of the consumer for the baseline and post

appliances surveys. However, if the consumer is told that this extra effort on their part could result in a cheaper product or service, then cooperation is likely.

Building on this, there are also more generalisable health, environment and gender co-benefits from converting households from biomass fuels to modern energy. These are acknowledged and recognised by agencies such as the [World Bank and their Clean Cooking Fund](#). It is therefore possible that the consumer might be eligible to sign up for these impact based subsidies. For the consumer this may variously mean lower product, service and energy costs. [Section 5.8](#) will discuss the fuel element of this. To get the price reduction, the consumer may have to enter into an agreement with the provider and that may involve some level of bureaucracy – which may be influenced by the level of background corruption and rent seeking by government officials who may or may not influence these schemes (this is discussed further below in acquisitions, [Section 7.5](#)).

What may become important though from a consumer point of view is that they are aware of what they are signing up to (their obligations) and that they realise the cheaper product or service is based on a subsidy – without that realisation they may take the low cost as a price signal that the product or service is of low quality.

### 6.5.9 How to pay

Having acquired the finance, how then do people pay for things. As discussed briefly above, in High income OECD countries purchases are often made by debit card (84% ownership) or credit card (made purchase during last 12 months 51%). We can see in *Figure 24*, that the use of such cards is not yet common in the countries of interest, but again attention is drawn to the use of digital payment devices. Where mobile money is prevalent even in 2017, 75% had used digital payment when making purchases.

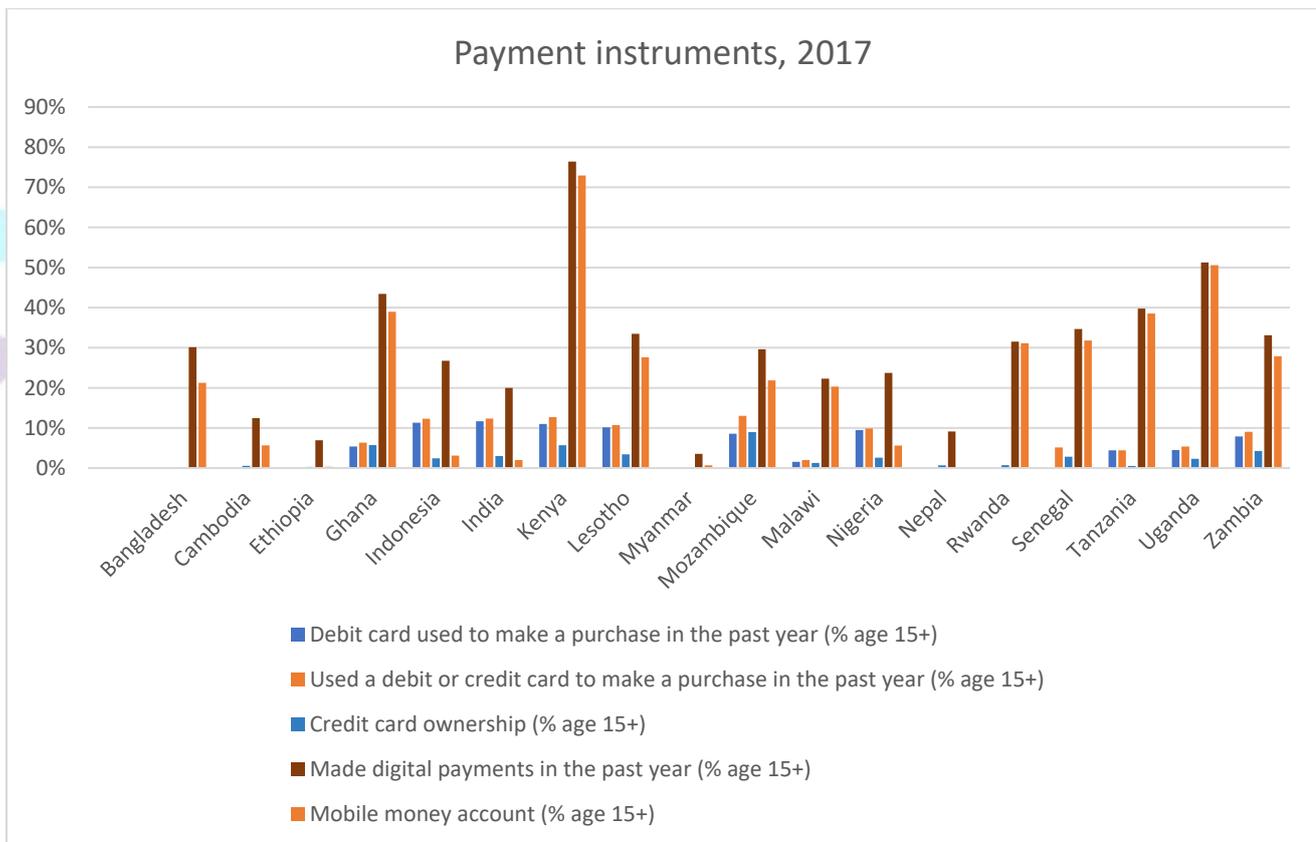
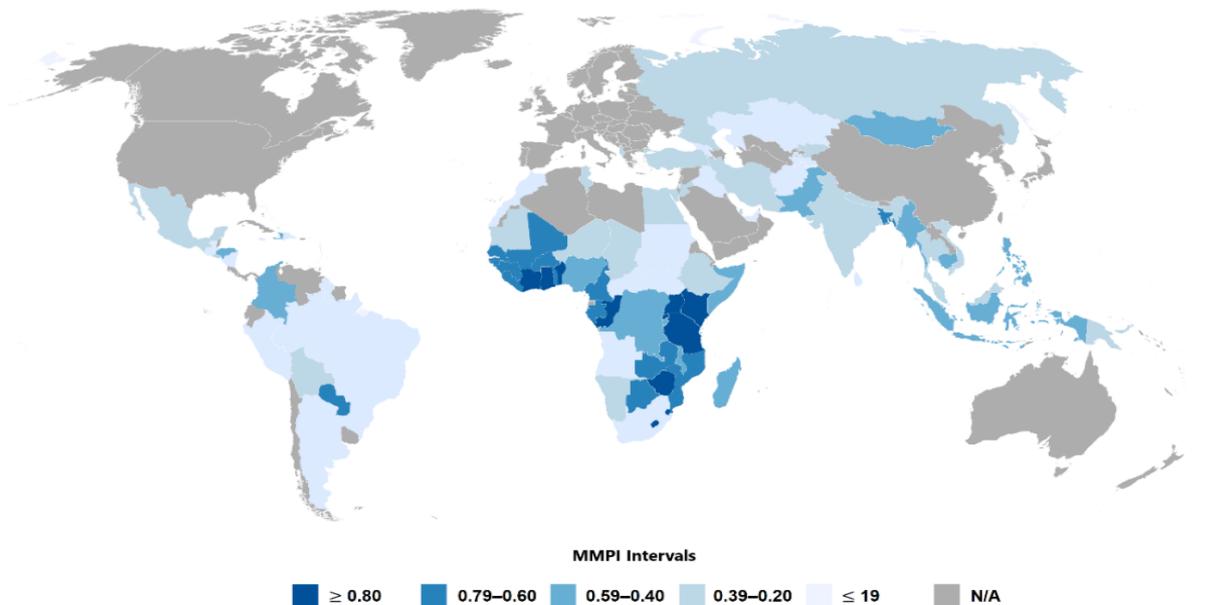


Figure 24 Payment instruments for countries of interest (derived from [Global Findex Database World Bank 2017](#))

The use of mobile money is a subject in its own right, and tracking the growth of mobile money is challenging as it grows so quickly if the right enabling environment is created ([GSMA 2021](#)). The [GSMA \(2021\)](#) also announced a protocol for assessing the Adoption, Activity and Accessibility of Mobile Money. The Mobile Money Prevalence Index (MMPI) considers the agent networks, the registrations and the actual use. The output from this work is the 2020 Mobile Money Prevalence Index. *Figure 25* clearly shows that the majority of countries with higher MMPI, are countries of interest which have large proportions of their population using biomass for cooking.



*Figure 25 : Mobile Money Prevalence Index 2020 (from [GSMA 2021](#))*

So will the presence of mobile money, and the increasing use of (second hand) smart phones lead to online searching for products and online purchase? The use of the internet on mobiles is expanding rapidly. In internet terms, 2017 is quite old, and yet nevertheless the data from 2017 shows the beginnings of online purchasing in the countries of interest. It also illustrates the difference in use between young adults and the general adult population – which also indicates the direction of travel for the consumer journey in their consideration and acquisition. What is interesting in the online purchase data is of course the gender disparity, where men are more likely to have purchased something online (with the exception of Indonesia). This reflects gender inequities in society and technology access, and is an important consideration in mapping the touch point of the consumer journey.

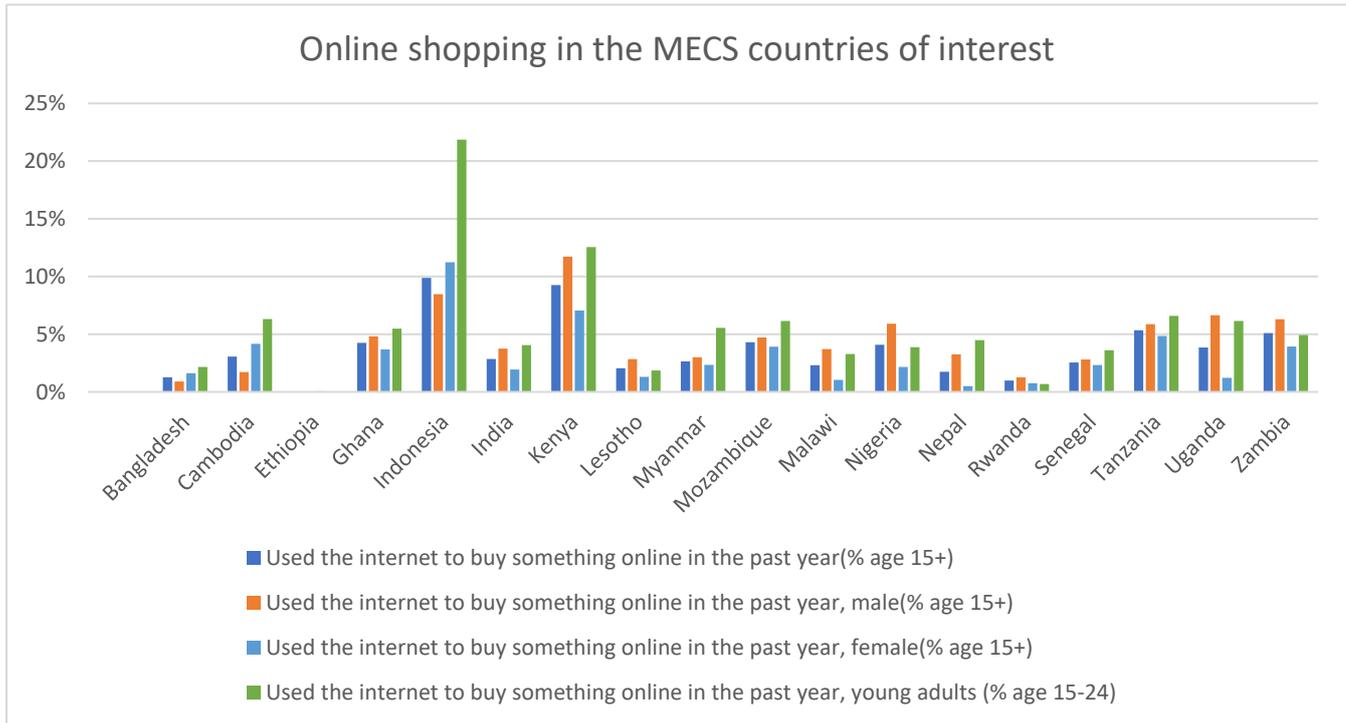


Figure 26 Online shopping data for countries of interest (derived from [Global Findex Database World Bank 2017](#))



## 6.6 Contextual conditions

At each stage of our journey map, we consider the contextual situation of likely perceived and actual control factors for the consumer.

The prevalence of how people get their information, and whether online shopping is overtaking retail walk in, is a part of that context. Are they able to walk into a shop and ask for details? Are the shops within reach or is the cost of travel to them a significant proportion of the possible total spend?

The other element we have considered for this consideration stage, is the tradition of the community. When considering their options for product and services, the consumer may feel that not just the social norms of their immediate social circle, but the social norms of society may prevent their intention becoming a behaviour. On the other hand the social norm can reinforce the desire to transition for instance where charcoals smoke disturbs your apartment neighbours ([Singh et al 2022](#)).

There are perhaps two key aspects to these potential control factors within consideration. One links back to who makes the decisions, already discussed above.

We noted that joint decision making is improving in many of the key countries, however in very conservative societies, change is not so welcome, and particularly change initiated by women. Until recently women were not allowed to drive in Saudi Arabia – i.e. there was a direct law preventing them from accessing a particular technology. While we may feel that this is unlikely to apply to household goods such as kitchen appliances, nevertheless the gender gaps for the use of digital equipment are well documented, as is the gap in education on science, technology, engineering and math (STEM). These may well have an impact on the consumers consideration of the possibilities.

The second is the role of ‘fire’ or hearth in societal meaning. [Campbell \(2022\)](#) draws attention to how the fire required for warming the house in colder climates is a place of social interaction, and the transition to modern energy cooking, which seeks to avoid heat going into the general kitchen/cooking space, does not have that ‘gather around the fire’ feel. In addition to the social construct when new efficient cooking processes do not give out ambient heat the household sometimes has to light a traditional fire to provide warmth. It has been found that efficient improved cookstoves in rural Rwanda (which didn’t radiate heat) were stacked with three stone fires in order to give warmth during night.

Heating of the home is a consideration that the consumer may apply, and while they may not speak of the fire as a focal point for social interaction, they may intuitively know that that is a part of the households daily routine, and as such it becomes a perceived control factor ([see section 6](#)).

How do people get their information



Has online shopping overtaken walk in shopping



What sources of information are there



Is the community traditional (ie level of need to conform)



While this may be an important consideration, we are mindful that modern urban life may well overtake such lifestyle features. The reality of urban life is that the cook returns from work, tired, and wants to get the meal cooked and ready for the household. They often sit in a separate kitchen or outside to ‘get the meal prepared’. The consumer may prioritise convenience over social interaction as so many in developed economies do.

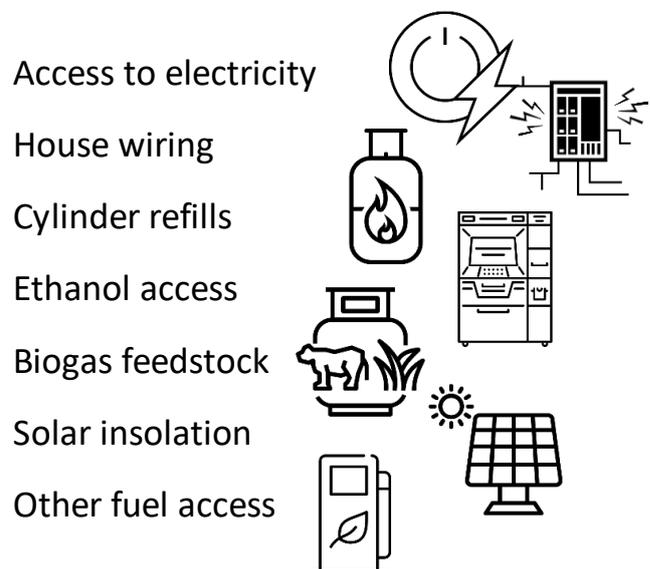
Somewhere here in the journey, the consideration may be strongly constrained by the external fuel infrastructure. Is the electricity available and reliable? Does the household have a connection that can take higher electrical loads? Is there a LPG cylinder seller within reach. Is Ethanol being promoted, and are refills within reach. And indeed if we are talking the isolated persona, have they gone for biogas or solar home system, and then is there enough feedstock for the biogas and enough solar insolation for all year round cooking.

Before moving on the consumer would be wise to consider what might happen to the fuel price and how they may be affected by pricing and availability which is beyond their control.

### 6.6.1 Fuel costs, fuel futures and fuel subsidies

In the finance [section 5.5.8](#), we considered how the consumer might reduce the upfront cost of the appliance or system. For the consumer as they consider whether to acquire they are likely to balance the capital cost of the appliances with a view on the **ongoing expenditure on fuel**. A more expensive energy efficient device is much cheaper in the long term than a cheap but energy inefficient device<sup>3</sup>. A part of this calculation is the price of the fuel and (a calculated guess at) the future price of the fuel.

There is now convincing evidence that cooking with an energy efficient electrical device can be significantly cheaper in urban areas than alternative polluting fuels ([World Bank 2020](#), [Leach et al 2021](#)). However, even in cases where the cost comparison between fuels is persuasive, other factors come into play.



**One of those may be the expected change in fuel price.** Deforestation in many areas is pushing the price of wood and charcoal up. So even if charcoal is cost comparative today with LPG and electricity, it is unlikely to be so in the future. Population growth in the countries of interest is high, with urbanisation due to inward migration meaning that urban areas are becoming more dense, and the supply of charcoal is increasingly stretched.

**LPG is a fossil fuel and is likely to also go up.** The fluctuations in the baseline cost of LPG are often dampened by government policies, but if we consider the longer term trend then as a fossil fuel the predictions are that it will at least triple in price by 2050 ([Knoema 2022](#)). Recently the COP26 statement stated the political ambition regarding climate change to remove ‘inefficient subsidies’ from fossil fuel (globally). The IMF calculates that subsidies for things like exploration and extraction, and along the value chain, amount to over 500 billion, and if

<sup>3</sup> We know that a straight for costing exercise is not an overriding factor in consumer choices – there are many other criteria. So even though most improved cookstoves will use less wood than a three stone fire (and is therefore cheaper in the long term), there are still challenges to getting scaled uptake of such devices.

externalities and indirect subsidies is taken into account, it is more like 5 trillion ([IMF 2022](#)). As these are removed the basic cost will go up!

In the meantime, the direct cost of LPG is sometimes subsidised in some countries such as India and Indonesia, but this has been costing each country \$3 to 6 billion ([IISD 2014](#)) and \$3 Billion per year ([iisd 2021](#)) respectively, and is said to be unsustainable. (India has taken steps to quietly reduce this subsidy). Again once this subsidy is removed the consumer will experience a price increase in LPG.

**In contrast electricity costs tend to be stabilised by government regulations.** The regulator sets the national tariffs in consultation with the primary supplier. The public and economic growth are often very sensitive to electricity tariff change, and so much is done to keep it bounded. The consumer is also offered a lifeline tariff, or tariff strata. These lifelines or strata are often cross funded by the more intensive energy users, and the 'subsidy' rarely comes from the government central budget. This makes such lifelines more sustainable financially ([Scott & Archer 2021](#), [Siyambalapitiya 2018](#), [Trémolet & Binder 2009](#), [Guatama 2021](#) ).

So in brief, the consumer in their cost calculation would be wise to consider not just the present price of the fuel but the likely changes. Given population growth, they should expect charcoal to rise in price even in the short term. Any fossil fuel such as LPG and Kerosene, will likely go up over the longer term, beyond inflation as subsidies are removed. Electricity is likely to keep pace with economic growth and inflation, and there may be emerging opportunities for very cost effective actions (eg Uganda has recently introduced a 'cooking tariff' which is said by [the press release](#) to offer consumers:- *"The introduction of the Cooking Tariff is a deliberate strategy by the Government of Uganda to displace charcoal and other biomass sources of cooking fuel by making the cost of electric cooking lower than the cost of cooking using charcoal in homes."*

We have acknowledged that the consumer is unlikely to base their decision solely on a rationale price point, but as said above, if the consumer is wise in their consideration, they will not only consider the price of the fuel today, but take a view on how that price may change over the coming 5 to 10 years.

## 7 Intention

In this section we consider

- **how an intention to acquire a modern energy cooking service might get stalled or derailed by control factors** – both perceived and actual.

In most customer journeys, after consideration (or ‘research’), the consumer makes a decision to acquire and makes the purchase or signs up for the service. However, something may stop their intention (based on their consideration) turning into a behaviour. In the ToPB a behaviour, seen here as purchasing a large household item, is dependent on the attitudes, social referents and contextual factors all of which form an intention to behave. However, ToPB recognises that unless the intention is strong enough, it may never become an actual behaviour.

One of the key constraints on the step [from intention to behaviour](#) is the consumers perception of whether that behaviour is within their control. We have discussed above how the consumer who becomes aware might then have to negotiate with a decision maker, or even a whole community of decision makers, before taking even the step of a systematic consideration of the possibilities. The decision maker also then has their own attitudes, their own influences and obligations from other social referents, and their own perception of how much control they actually have.

The greatest influence on the step between intention and behaviour, is the perceived control beliefs. This has variously been described as [perceived control beliefs](#) and **actual** control factors. For instance, one may have the intention to purchase a solar home system to cook with, but if there are no suppliers of such systems and/or the household doesn’t have the means to acquire such systems from outside their country, then even a strong intention cannot be implemented into a behaviour. The difference between perceived control beliefs and actual is a point of debate. By keeping the consumers view on the control factor as the decider, it allows the ToPB to explain why someone with strong intent still fails to undertake the acquisition behaviour even if there is actually a SHS seller in the next town that they are not aware of. By marking it as a perception, it allows the construct to include erroneous facts such as thinking no supplier exists when in fact they do, they are just not within another town or an unfamiliar location.

However, to us, we prefer to look at control factors as real items. If there is not SHS seller, then a really strong intention cannot be fulfilled – until a SHS seller starts up. This view enables us to see the journey as stalled because of the background infrastructure, and to acknowledge that the user may have a very strong intention which can be ‘released’ into behaviour if outside agencies focus on the infrastructure. Intentions represent a person's motivation. The construct is conceptualised as an individual's conscious plan or decision to exert effort in order to engage in a particular behaviour.

Indeed Ajzen and Schmidt (2020) discuss this dilemma in their recent reworking and discussion of the practicalities of the ToPB. The resulting representation of the ToPB is shown in *Figure 27*

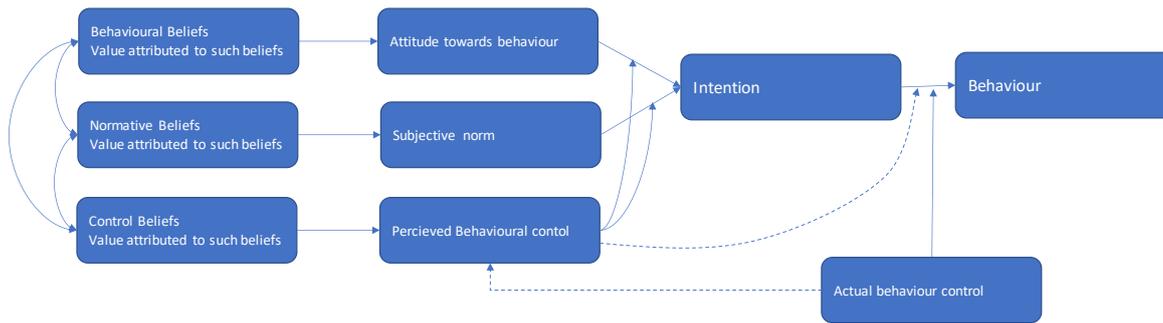


Figure 27 Conceptual framework of the Theory of Planned Behaviour with Perceived and actual control (based on Ajzen and Schmidt 2020)

The intention to purchase a modern energy cooking product or service within say the next 12 months can actually be measured. The global survey of consumer behaviour suggests that intentions and actions are fairly well aligned.

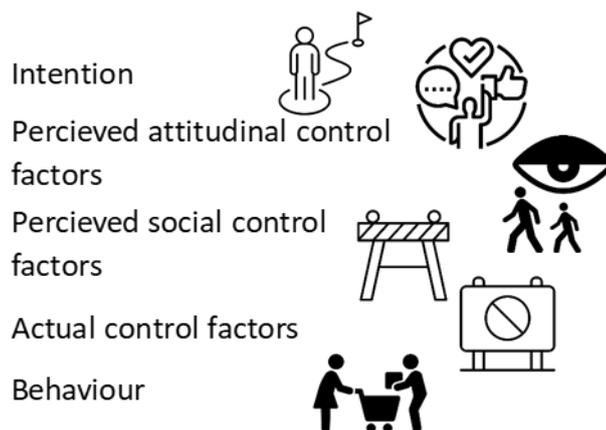
However, unanticipated events; insufficient time, money, or resources; lack of social connections, shortfalls in the supply chain; and a multitude of other factors may prevent people from acting on their intentions. Ajzen and Schmidt note that the degree to which people have control over the behaviour depends on their ability to overcome barriers of this kind and on the presence of such facilitating factors as past experience and assistance provided by others.

The difference between perceived control beliefs and actual behaviour control can be subtle. A person may believe they do not have the finance for the purchase, and yet as in the example of the pastoralist and their goats, finance and how much money people think they have can be complex. Fishbein and Ajzen describe this as predominantly guided by what they see as their capacity and autonomy. Autonomy (how much the decision is up to the consumer) has been discussed above, and their capacity depends on that intersect with autonomy (can they access the finance often is constrained by their autonomy).

However, there are many other factors which affect the intention and its path to actual behaviours which can be said to be more ‘actual controls’. Demographic characteristics such as gender, race, income, all affect the choices available to the consumer. These affect their life values and political ideologies, and at an extreme, maybe a disgust with global capitalism prevents the consumer from purchasing imported goods (a true life example). These kind of variables are considered background factors.

So how might this apply to the consumer journey?

It forces us to recognise the possible disconnect between having an awareness campaign, and or doing a marketing or advertising campaign, without sufficient balanced attention to the enabling environment. If



people become interested in electric pressure cookers but cannot acquire them in their country then the intention to behaviour cannot be realised. If they consider that LPG is viable, but there are no suppliers in their area – once again they cannot turn intention into behaviour.

Perceived control behaviours might also come into play through their situation. If they are renting housing from a landlord and the landlord has said the electric supply cannot be used for cooking, then unless they change that edict, they will perceive that they shouldn't acquire an electrical cooking device.

**So on the assumption that actual control factors are not limiting, and that the consumer has considered what is possible, their next step is to acquire.**



## 8 Acquisition

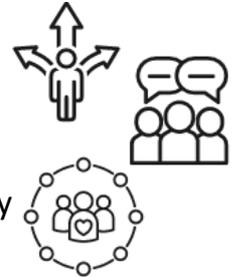
Consumer acquires the relevant devices based on their choices

In this section we look at :-

- **How does the consumer acquire** the modern energy cooking services?
- **Who might provide finance and risk mitigation** for the product or service?
- **Who does the consumer have to consult with** within their household and community – **how is the decision made** to continue through the consumer journey, and is there a particular gatekeeper?
- **Does the endemic presence of corruption affect this stage of the journey?**

Having gone through the criteria and discussed with the decision maker, decided there is a way to raise the finance, and decided on which product or service to get from which supplier, perceives that together with the decision maker that the control factors are not a constraint and that they have the agency, the consumer moves on to the next stage of acquiring.

Decision holder



Voices in the household



Voices in the community



### 8.1 Consumer Acquisition Touch Points

The key touch point is the negotiation of the acquisition.

This is likely to involve approaching the seller and those arranging the finance. The finance could be payment of the full upfront cost by cash or debit instrument, or it could involve a credit or a pay as you go arrangement. The lease hire could end with ownership of the assets transferring to the consumer or be a perpetual lease, either could be possible.

As discussed above, the debit may be a payment from a formally held savings, or any credit may be through a bank, a regulated financial institution, cooperative lending society, microcredit solidarity group or indeed from the seller of the product or service. Is the credit bundled with the appliance?

And finally for this set of touch points, how does the consumer get the product or service, do they have to go to the store, or does it get delivered to their home?

### 8.2 Consumer connections

There are multiple connections the consumer needs for the acquisition stage, most of which have been discussed above in the consideration.

Approaches seller



Arranges finance



Credit arrangement



Lease hire arrangement



member of credit union



able to access credit from a bank



credit bundled with appliance



Delivery is click and collect?



We have discussed ‘brand loyalty’ and price signals of quality above and shown that the global surveys suggest this is if anything even more important in some of our countries of interest. To many in developed economies the brand makes a difference, and it remains the case to some degrees in stable developing economies.



The brand can be both the appliance or equipment, but also the place of sale. Studies such as [Kinyanjui et al 2018](#) and [Peter & Oundo 2017](#) illustrate how retail outlets in places like Kenya can command a store loyalty. This is often associated with the shopping environment such as the atmosphere of the store, and the uniqueness of the store, the familiarity of the consumer with the store, customer service and of course the merchandise value. What these studies show though is that the ‘wanachi’ (the ordinary people) in Kenya still value a similar shopping experience to those in developed economies, and as Peter & Oundo 2017 points out this is not a function of age or wealth. It is therefore a likely important part of the consumer journey that the acquisition stage is marked by easy touch points of getting what they want from a source they trust (or like). We might also speculate that the consumer is looking for a place of sale without the hassle of a ‘corruption’ mindset from the seller – is the opening offer legitimate and fixed?.

We have noted the role the social networks of the consumer play in giving agency to the acquisition and mitigating the risk of purchase. Such connections utilised may well be driven by social networks and relationships. We have also noted that there may be some loyalty to certain retailers, or indeed there may be extended family members of personal contacts who wish to broker the acquisition. Several people and institutions may need to get involved, the retailer, the finance institution, and of course the household and local community.

### 8.3 Consumer thoughts and feelings

This stage is probably driven by desires. Having seen what they want, the consumer may now be in an ‘I need it as soon as possible’ frame of mind. Are they prepared to wait for the right moment or might they compromise their criteria to get it sooner? How much is this a priority for them and their household finances – particularly in rural setting it may be better acquired in a different season after sales of the harvest?

As said throughout this journey, the acquisition probably needs checking with the decision maker who may well have approved in the consideration stage when it was a hypothetical purchase, but now the consumer need to know everyone is on board – the decision maker, the household and the community.

I need it

I can wait for it

Is this a priority

Is the decision maker agreed

Is the household agreeing with this purchase

Can I live with the community reaction

(Is the purchase legal)



### 8.4 Contextual conditions

In terms of the context for the acquisition, we have already discussed perceived and actual control factors that may affect the intention turning into action. However, one of the ones we barely touched on was ease of doing business as it connects to corruption and the rule of law. While corruption is commonly associated with the public sector, government and government processes, in a society where payments are ‘flexible’ there can be some slack in knowing what the actual price might be and whether there are hidden costs. We discuss this further in [section 7.5 below](#).

The consumer may intend to purchase the product or service from a retail outlet. However, how many outlets are selling the product or service the consumer wants? There are for instance 43 supermarkets in the Nairobi district of Kenya, and an increasing number of branches in the other major towns. We picture in our icon graphic, supermarkets and electrical shops – how many shops selling electrical appliances are there?

Available retail infrastructure

Ease of doing business

Ease of transporting the goods



And a simple logistical question - how will the product be got home – by taxi? If one was purchasing in Uganda, the likelihood is that the home journey might be on a boda boda – a motorcycle taxi. Can the box be carried on a motorcycle or is it too bulky?

#### 8.4.1 A reflection on the moment of purchase and the influence of the corruption context

In the consideration phase we suggested that the consumer might consider whether the transaction was legal and look at the brand of the product but maybe also the brand of the seller.

Corruption and integrity, may raise its head again when the purchase is made – does everything seem legitimate or have certain fees crept in or the deal is done outside the back door rather than at the till in the shop? This may seem a factor that shouldn’t be an everyday occurrence but in our countries of interest, the integrity of a sales transaction could be important. Legal recourse if the warranty is not in place or voided by an absent sales receipt is likely to be a factor in the consumers assessment of the product or services reliability.

Corruption is endemic in our countries of interest (*Figure 28*), and data gathering such as that done by [Transparency international](https://www.transparency.org) seeks to rank countries on a corruption perception index. The index focuses on the public sector as opposed to our consumer journey that we suppose is mainly private sector. But endemic public sector corruption is perhaps a proxy for private sector ‘underhandedness’? If a warranty is issued, will it be honoured, and if it isn’t, if the legal system and courts are corrupt, then where would the consumer go? If the supply chain has experienced corruption all along its path, then the price to the consumer possibly reflects the additional monies that had to be paid along the way. If there is corruption in the standards agency, then the consumer cannot be sure the products quality assurance mark is valid.<sup>4</sup>

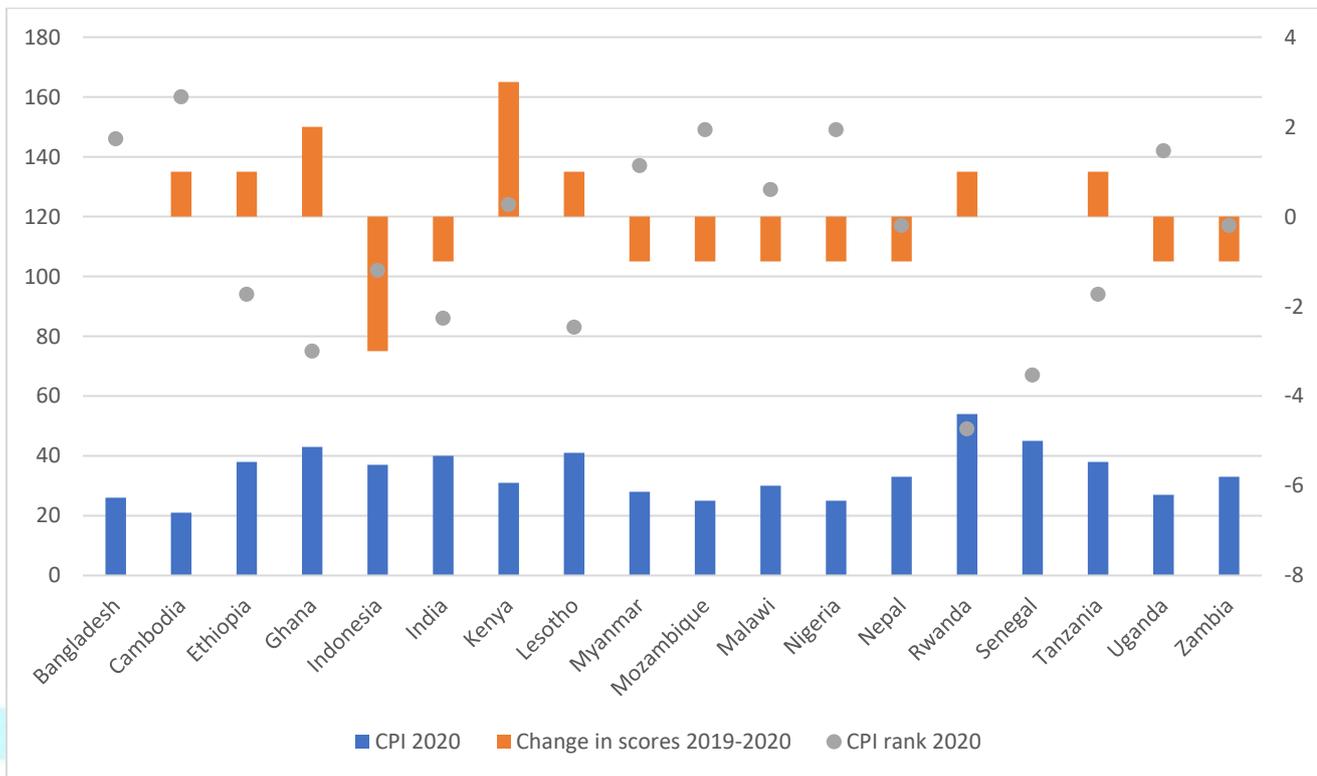
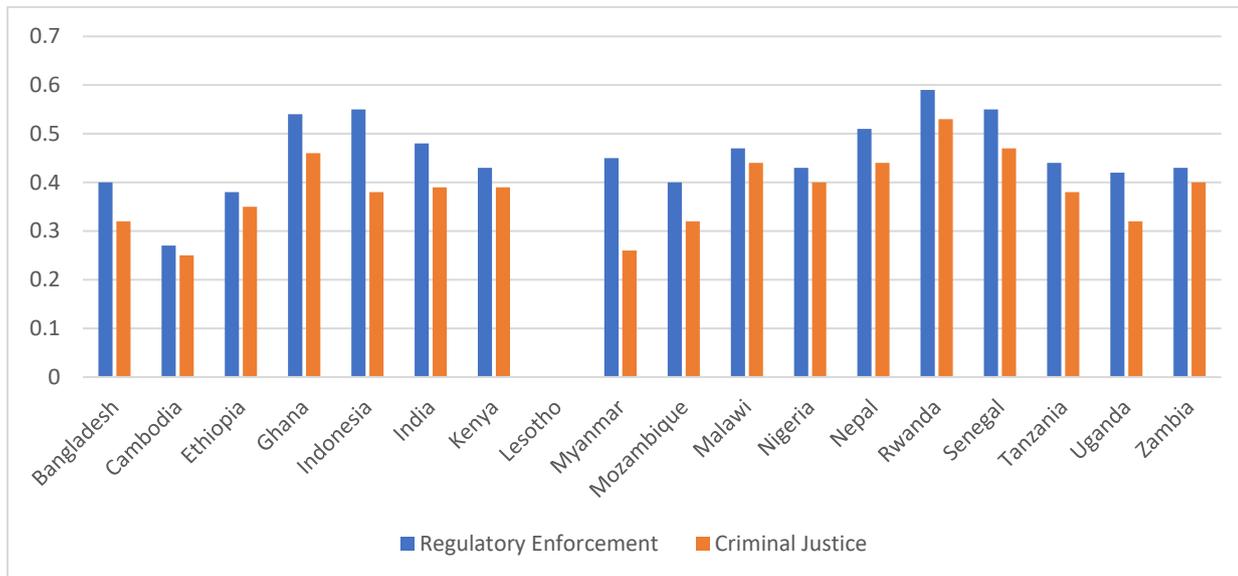


Figure 28 Corruption Perception Index score, changes in scores and ranking in countries of interest; [Transparency international](https://www.transparency.org)

The Corruption Perceptions Index (CPI) is of course an aggregate score, and tells us little about the consumer experience of purchasing a private sector product. Most of the countries of interest have an average or low score. What this means in practice is those who are economically challenged are the most affected by the effects of corruption and related fraud. In general life, those who live in a lower CPI country experience an overabundance of regulation and a thriving black market.

<sup>4</sup> The term Corruption Perceptions Index (CPI) refers to an index that scores countries on the perceived levels of government corruption by country. Scores range from zero to 100, with zero indicating high levels of corruption and 100 indicating low levels. As of 2020, the index ranks 180 countries and territories, where the average score is 42 out of 100.

So for instance, if the consumer is duped into buying a low quality product, how might they find redress? In most countries of interest, the regulatory enforcement<sup>5</sup> and criminal justice<sup>6</sup> scores taken from the [WJP Rule of Law of Index](#) are average or low.



Figure

29 Regulatory enforcement and criminal justice scores in countries of interest; [WJP Rule of Law of Index](#)

So far we have been talking about a product. When a service is considered, other stakeholders may come into play who are each rent seeking. The following was constructed within [Rahman 2020](#), and quoted by [Sovacool 2021](#). We have not defined whether the consumer might be getting a kitchen appliance that connects to the grid or as a pay as you go appliance, or whether they are purchasing a connection to a modern energy cooking service such as pay as you go LPG or solar home system. If it is effectively a new ‘connection’, they may well experience the rent seeking that [Cavihill and Sohail 2007](#) describe, and knowing that this is a possibility may affect their consideration and acquisition stages (unexpected expense or delays).

<sup>5</sup> Regulations, both legal and administrative, structure behaviors within and outside of the government. This factor does not assess which activities a government chooses to regulate, nor does it consider how much regulation of a particular activity is appropriate. Rather, it examines how regulations are implemented and enforced. ADHERENCE TO THE RULE OF LAW = 1

<sup>6</sup> An effective criminal justice system is a key aspect of the rule of law, as it constitutes the conventional mechanism to redress grievances and bring action against individuals for offenses against society. An assessment of the delivery of criminal justice should take into consideration the entire system, including the police, lawyers, prosecutors, judges, and prison officers. ADHERENCE TO THE RULE OF LAW = 1

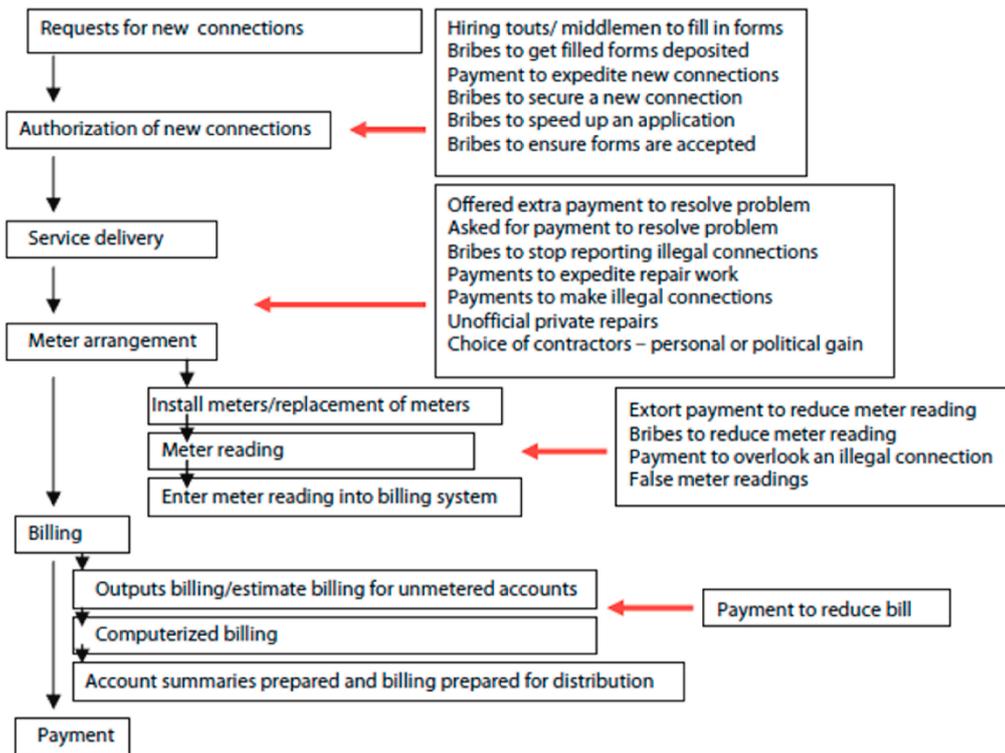


Figure 30 Corruption risks in the energy sector at the service delivery level. Source Cavill and Sohail (n.d.) quoted in Rahman 2020 and referred to in Sovacool 2021.

The issue of changing meter readings might be a key consideration – if they believe their new device is going to ramp up their electricity consumption, is it possible they will lose relationship with their meter reader? And illegal connections – many poor rent from landlords who extend their own connections. As such they state that the tenants shouldn't use electricity for cooking even though the tenant might be willing to pay. Tanesco in Tanzania recently verbally acknowledged that the key issue for them and their consumers was not new connections, nor the cost of connection, but the wiring, where poor quality wiring prevents higher power loads.

The 'legality' of the acquisition is therefore likely to impact on the choices made.

## 9 Experience

*Consumer experiences the device(s)*

In this section we look at :-

- **What are the first experiences of getting their new product or services?**
- **Are they satisfied with that experience?**
- **How might they learn how better to use the product or service?** – a community of experiential knowledge.
- **Has it worked out at the monthly cost they were expecting?**
- And within their household and community – **has it been a positive experience for all?**

### 9.1 Consumer Satisfaction

So what then is the cooking experience of the new product or service.

The process starts even on arrival of the package and there is on social media a phenomena called ‘unboxing’. Consumers can be immediately impressed or unimpressed by how the item is packaged. Are there instructions. Do you get a recipe book? Are there extra utensils? Most rice cookers and electric pressure cookers now come with plastic spoons.

How easy was it to set up. Out the box, plug in and use, or one needed to make connections, do registrations, remove transportation restraints?

Once it is in use then the cooking experience really begins. That first meal – was the taste acceptable to the family? What is the learning curve for the product.

Does it do everything the consideration thought it would, or does it do a lot but needs to be matched with other appliances that complement it.

In [section 2.1](#) we referred to customer satisfaction as a discipline almost in itself. There are approaches, surveys and measures that have been developed to ensure that the consumer is satisfied with their experience of the product or service. In [Cleave 2019](#), they outline what sort of experiences the seller might look for to achieve their key performance indicator of a satisfied consumer. They note the effect of even one bad review, citing the [Hubspot survey](#) that declares 80% will not choose the same product or service again if they have one bad

Unboxing - was it what was expected?



Taste acceptable to household



Does it do everything they want

Do other appliances complement it



Does it need to be fuel stacked?

Does it feel like the quality that was expected



customer experience. By experience they mean more than just the performance of the product, they include the longer term experience of any service, and the acquisition experience.

In terms of follow up, it is not deep rocket science. Customer Satisfaction Scores can be found by just asking the consumer to score question such as using a scale from 1 to 10, how pleased are you with your purchase, and then perhaps a follow up question for low scores. MECS research attempts to capture this in exit surveys for those participating in the cooking diaries or piloting work (GIVE EXAMPLES)

In the private sector, a key measure which stands as a proxy for satisfaction are 'net promoter scores'. Net Promoter Score measures the willingness of customers to recommend a company's product or services to third parties (e.g. friends). We have allocated a stage on the journey to this effect, advocacy, and will consider it below as this deeply affects the reach of modern energy cooking services to beyond being a niche action and becoming a scaled norm for a society. [Energia 2021](#) used NPS to assess how their pilot cooking programme had been received. Of course the timing of the survey is important. If an NPS survey is conducted immediately after purchase, it tends to be tracking the consumers initial excitement and the acquisition experience. On the other hand, if they are surveyed after some weeks after the purchase the survey will capture how satisfied their customers are with their products and services over time.

So apart from the satisfaction with the purchasing experience, what is more important to the long term uptake of modern energy cooking services will be the long term satisfaction with the cooking experience.

A key influence will likely be whether the ongoing costs for fuel are as expected, and can it cook everything the cook wants to cook. The [ESMAP cost effective report \(2020\)](#) suggests that one of the cheapest ways of undertaking clean cooking that does everything a household might want to do is stack an electrical appliance (an electrical pressure cooker to be precise), with LPG gas. The gas gives the instant high heat for frying items, while the EPC can do the long simmering of heavy foods such as beans very cost effectively. Indeed the EPC can do frying – but its shape doesn't really enable cooking of foods like chapatis.

Other reports suggest that the EPC combined with an induction stove can make for a comprehensive clean cooking solution. (India cookbook 2022). Similarly, the electrical appliances could be paired with biogas, or with ethanol, both of which give an open flame for high heat cooking.

## 9.2 Consumer connections

### 9.2.1 Some experiential observations

**Electric Pressure Cookers.** The EPC is a very energy efficient device, but it cannot cook everything although the vast global community of electric pressure cooker enthusiasts have shown that it is a very flexible device. Studies suggest it can cook 80 to 90% of meals that are everyday meals in East Africa. Fresh chapati is a challenge due to the depth of the pot (the frying can be done but its difficult to flip), although reheating chapati is easily possible (and urban communities increasingly rely on food bought on the street to eat at home).

EPCs also have a small learning curve – if the cook is not used to pressure cooking per se, then they tend to add too much water in the first few meals. Since the EPC switches of, it doesn't reduce the fluid content like an open pan or even an simmering manual pressure cooker does.

Not only can it cook the majority of the food the consumer wanted it to cook, but can it do it in sufficient quantity. Many EPCs are sold with exaggerated sizes – a 8 litre EPC, has an 8 litre pot to the brim, but can only practically accommodate cooking 6.8 litres. And it has only one pot and some feedback has been given that people don't like to cook 'sequentially' (ie one dish, clean the pot, then the next dish) and prefer two heating

elements in order to have both dishes ready at the same time. On the other hand EPCs can be left alone as they self regulate, and this releases time of the cook for other activities.

Pilots have been undertaken on Solar home systems with cooking, and a Direct Current electric pressure cooker is now on the market. (There have been DC EPCs for a few years, but their electrical and pressure safety was in question – the new ones are confirmed as high quality and electrically and pressure safe).

**Induction stoves.** Induction stoves give good heat transfer from stove to pot, but require a iron based pot. Since aluminium pots are the norm in Africa and developing Asia, this often means that induction stoves have to be sold with a package of pots. While induction stoves themselves are cheaper than an EPC, with a suitable range of pots the capital expenditure is very similar.

They are more versatile than an EPC in that they can deliver higher temperatures to shallower pans (thus making the cooking of chapati easy), but they also can be less energy efficient depending on the meal. For quick frying meals then the induction and EPC (and indeed even a well fitting hotplate (resistive heater) or infrared stove are very energy similar. However, when a pot is simmering for a long cook meal (dried beans being cooked for 3 hours), then the EPC is more energy efficient. The induction stove loses heat from the side of the pot. There is no reason why insulated pots could not be a part of the steel pot package for induction stoves.

**LPG stove or burner.** LPG is versatile in cooking and is a favourite for professional chefs – very controllable, high heat, can make very fancy meals. But its important to keep in mind that in our countries of interest our focus is on the 'regular consumer', the personas that come in from a hard days work and just need to deliver a meal for the household (or indeed have a househelp who will do this for them – but again basic tasty meals not necessarily fancy ones. There is considerable experience with LPG, and it is a proven winner in the kitchen.

If the consumer has chosen an LPG stove product, then the satisfaction may hinge on how easy it is to refill the cylinder. There are reports from India that people are not refilling, particularly the poor, but this is likely an intersect of availability near the household, availability of transport, and availability of finance. Signing up for a Pay as you go may have overcome some of these conditions and some PAYG deliver the new cylinder to the house.

While LPG is cost effective for quick meals, it can be expensive for long cooked meals such as simmering beans. It is well documented in our countries of interest that LPG is used for the quick meals, but the user reverts to charcoal or wood for the long cooks. This is one of the reasons an EPC compliments LPG use so well. There is recent research on pots and pans that are more energy efficient and can save the consumer money, but they have not yet been popularised.

**Ethanol burner.** There is an exploration of ethanol as a clean cooking fuel, and the consumer may have opted for an ethanol stove. Ethanol has become popular because of new ways of refilling or obtaining the ethanol. Instead of purchasing from a shop, the consumer may be able to access it from an Automated Teller Machine (ATM).

Ethanol gives a very clear flame, and it is not as hot as LPG. From this point of view, the consumer may need to learn the best ways of cooking on it.

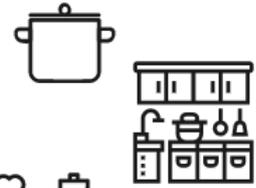
**Biogas system and burner.** Biogas requires a system approach. Neglecting the feedstock or not managing the generating plant can easily lead to the unit ceasing to work (crust on top or poor acidic balance), and so the consumer experience is very much going to be dependent on how well the household looks after the system. The gas itself is a low pressure flame, again not as hot as LPG, but about the same as ethanol.

These are very limited practical observations on what the consumer may experience once they get the system home.

There are also other practical considerations.....Does it fit in the kitchen? The consideration criteria probably calculated whether it would fit, but now it is home and out the box, does it fit the kitchen?

Does it fit the lifestyle? Does it require more or less attention than the previous means of cooking. The first electrical rice cookers sold in Japan after the war, did not find favour with households because they didn't turn themselves off. The cook had to keep a watchful eye on the cooker to ensure the rice didn't burn. This contrasted with cooking rice by charcoal, where the cook knew exactly how much charcoal to put so that it was consumed by the end of the processes and put itself out. That way they could start the process and walk away to do something else. Most modern rice cookers and EPCs have timers or sensors to switch themselves off and indeed one of the selling points of an EPC is the ability to load it up and leave it on its own to switch on and off, to maintain pressure for a required time.

Is it large enough (fulfills demands)



Does it fit the kitchen

Does it fit the lifestyle



Is the supply of fuel reliable enough



Is accessing the fuel a problem

Does it consume more or less fuel than expected



Do I use it as intended?



And after some experience, how reliable is the fuel supply?

Are there moments when blackouts occur half way through preparing a meal, or the gas cant be refilled because there is none in stock at the local agent. Is there a problem accessing the fuel – the local shop stops selling LPG and it has to be obtained from further away, or the battery on a solar home system doesn't store enough for the evening meal? Indeed does the product consume more or less fuel than expected?

A double edged touch point in the experience stage, is whether the device is used as expected. Does it perform as expected but also does the consumer use it as it is supposed to be used? Misuse can invalidate the warranty, and something as simple as using a metal spoon on a non stick surface can limit the performance of the product.

If we return for the moment to the overarching 'customer satisfaction' we have already noted that much of the literature focus on the experience of acquiring the product, and the perceived value of the product. In this section we believe that suppliers should undertake surveys to assess the actual experience of the consumer in using the equipment, as that will determine how much they advocate for its use [see section 10](#).

### 9.2.2 A sense of experiential community

Some energy efficient devices and/or a shift of the main fuel require an adaptation of behaviours. The experience of the consumer could be enhanced by a community of fellow users. If enough people in the area adopt similar devices then the consumer can learn alongside their neighbours, but more likely in today digital world, there are digital communities they might join in with.

Instant pot took this approach during their growth phase 2010 to 2015, and continue it to this day. They specifically encouraged a sense of community among people who were using the early instant pots. Their marketing strategy was to make the device a focal point for sharing recipes and experiences. The current official

facebook community now has 2.5 million followers, and there is a lively debates about recipes and experimentation. <https://www.facebook.com/groups/InstantPotCommunity/>

Youtube has seemingly endless tutorial on how to use appliances and how to undertake new recipes. In the USA, we find physical communities with an online presence helping their community consider energy efficient devices. For instance the East Bay Community Energy a public power agency launched in 2018 to provide greener energy, low rates, and local community benefits, has a page on [induction stoves](#), and advisory [youtubes](#) linked to [PDF recipes](#).

Of course, we are discussing Low and Middle Income country consumers, and have acknowledged that their connectivity is less than developed economies – but as discussed above it is substantial and growing. Indeed as acknowledged above it is the young people who ‘surf the internet’ and they are the ones who may prompt the consumer journey in the first place.

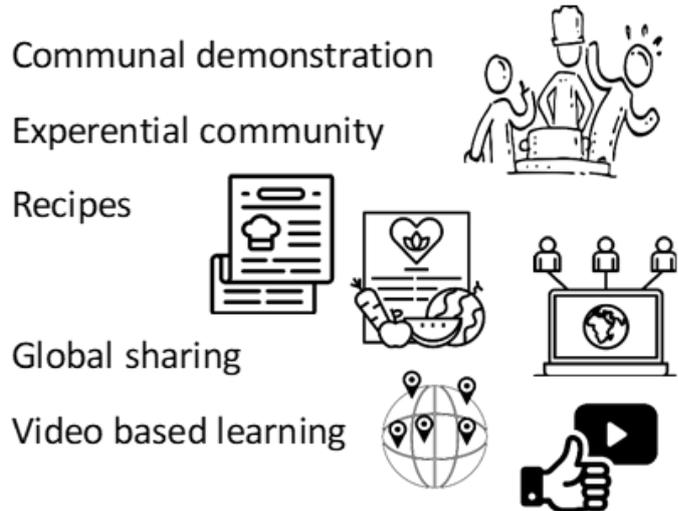
Specialist bloggers for LMICs can be found – Kenya for instance has [jikoni magic](#), [Kaluhi's Kitchen](#), [NairobiKitchen](#), among others, and facebook communities such as [Lets Cook Kenyan meals](#) with its 1.5 million users.

So will the consumer change their weekly menu to accommodate their new acquisition? There will inevitably be a sense of experimentation. Working an electric pressure cooker requires the cook to put a lot less water in any recipe compared to open pan simmering. Open pans boil off the water and one has to have enough water to accommodate that reduction. It feels counter intuitive to put only a little water into an EPC at first, because one feels one cant watch it and what if the base dries out and burns. Actually the EPC accommodates that, switching itself off and on and because of the sealed environment only requires a little water to cook.

What about the ‘weekly menu’? Will the consumer not just change how they cook but what they cook. EPCs retain more of the nutrients of vegetables than open pan cooking, and can therefore be better for the household. Will the better tasting vegetables elicit more requests from the family, or indeed will those who have grown up with overcooked tasteless vegetables reject the taste of vegetables that retain their nutrients (its subtle but one can taste the difference).

And given the time difference between lighting a charcoal stove and cooking for several hours, and the instantness of an EPC, will the weekly menu change?

MECS has a series of studies considering the question of menu change (alongside measuring the use of energy). The [cooking diary protocol can be found here](#). Reports from [Kenya](#), [Zambia](#) and [Myanmar](#) suggest that changes in recipes and the process of cooking are gradual, and that changes in weekly menu are minimal. The Kenya report for instance states “Although often seen as a barrier to the adoption of new cooking technologies, in this case, participants reported not having to change their behaviour or that if they did, the change (e.g. cooking faster) was positive. It seems the EPC & rice cooker are already well suited to user needs.” [Leary et al 2019](#)



...with buttons/timings for all local foods, even tea  
 Solar powered  
 ...that could deep fry  
 ...that can bake  
 Hybrid of rice cooker & EPC  
**Like an EPC...**  
 ...that can switch off completely  
 Hybrid of rice cooker, microwave & EPC  
 Like a rice cooker  
 ...but bigger

Figure 31 Word cloud responding to “If you could design your own completely new eCooker, what would it be like?” [Leary et al 2019](#)

Figure 29 “If you could design your own completely new eCooker, what would it be like?” Word cloud indicating user preferences for electric cooking appliances based upon participants’ responses on the exit survey. [Leary et al 2019](#)

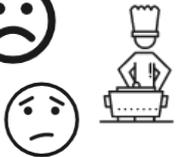
In the Zambian follow up survey ([Serenje and Price 2020](#)) more than three years after an initial piloting of EPCs and hotplates<sup>7</sup>, the conclusion was “The survey shows that a hotplate and EPC can cook a wide range of Zambian dishes, and that these appliances are valued to the extent that they are recommended to friends and family members. Social networks seem to be an important method of knowledge sharing, as these contacts showed interest in the appliances and one user received cooking tips from her church group.” Again this draws attention and shows the importance of the consumer experience being to contribute to and learn from a learning community of cooks.

### 9.3 Consumer thoughts and feelings

So how does the consumer feel now they are using it? Do they have internal pleasure using it. Do they receive validation from the rest of the household about how quickly they now cook, or how they can skilfully use it.

Something that is said a lot in focus groups with those who have transitioned from biomass to modern energy cooking is how easy is it to clean, and how clean it is compared with Charcoal. The cooks often contrast that they with modern energy they can ‘start with a clean dress and end preparing the meal with a clean dress’.

However, what happens if the performance is disappointing. What if it doesn’t do what the consumer wanted. Will they carry on using it or put it to one side? How do they learn the little tricks that make cooking with a new device easier?

- I am pleased by its performance 
- I get praise for how quickly I cook 
- I am pleased with the cleanliness 
- I am dissapointed with performance 
- I am dissapointed with functionality 
- I will not use it much. 

<sup>7</sup> Hotplates are not ‘energy efficient appliances’, and not really to be encouraged – however, this was an early trial that used both energy efficient devices and hotplates.

## 10 Service and enhancement

*Consumer may require after sales support*

In this section we look at :-

- **How can the product or service be serviced and maintained?**
- **If it does break – who do they go to for repair and replacement?**

### 10.1 Consumer pain points?

Having started using the product or service, the consumer may need some support. There is the moment during the initial first few times of using the product where consumers need to know which button to push. That is mainly covered by in box instructions, but could also perhaps be a referral to a telephone helpline, a company chat box, youtube instructional videos, and neighbours who already have one.

After a period of time, the product or items within the service provision may need some servicing or maintenance.

Does the product break, and if so where does the consumer go? Back to the retail outlet to invoke the warranty or to an independent repair service?

We assume the warranty and the ease of getting an early breakage repaired was a part of the consumers criteria in choosing the product or service, but it may not have been, and so an early breakage might be very disappointing to the consumer if it cannot be repaired.

Does the product performance tail off. Anything with batteries is likely to tail off in performance over a number of years. This is particularly the experience of solar home systems, but it could also apply to the new generation of electrical cooking appliances. Does the consumer know how to keep batteries at their peak, and what to do if they do start to tail off in their performance? Battery performance is affected by depth of discharge and temperature among other factors. It could be the difference between a product lasting 2 years or 15 years.

The awareness that something has broken (it may be something small that means the product still works but prompts a desire for a better version) or the performance tailing off, may stimulate a desire in the consumer to upgrade. That could be upgrading one component of the whole system like getting a better lid or adding a new timer, or it could be the whole system.

### 10.2 Consumer connections

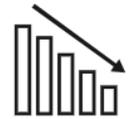
We talk above about whether the consumer has to return to the seller, or get it fixed elsewhere. That may depend on their viable choices.

Umeme in Uganda when promoting new TVs (in order to stimulate consumption of electricity), provided training to a network of certified TV repair technicians – the consumer could go to a qualified and trained technician.

Does it break



Does the performance tail off



Warrenty



Wanting to upgrade whole



Wanting to upgrade part of the appliance



The [IFC report \(2012\)](#) on how to scale up energy access emphasises the need for business models that include repair, maintenance and replacement. However, in many cases this provision has not been made, and the consumer may have to get the product repaired at informal shops might be the only possibility.

### 10.3 Consumer thoughts and feelings

So what beliefs and attitudes may affect the consumers service, maintenance, and upgrade moments?

Beliefs around whether they have to stick to the warranty (can I put in a new fuse myself or will that void the warranty?). Can I get it repaired anywhere, or does it have to be a registered certified repairer in order for the repair to be paid by the warranty?

And there is a common belief – if its not broken don't disturb it. Many modern energy appliances benefit from regular servicing, and yet servicing by a professional costs money. Many consumers reaction is to not do the service and wait for it to break – when regular servicing could prolong the life quite substantially.

We spoke above in the pain points about upgrades. In the consumers thinking they may regret the size of the appliance they obtained and want to upgrade to a larger version. Sometimes the 'upgrade' is about auxiliary equipment – having the right utensil to serve from the new product.

And of course there when new version come on to the market, does the consumer want to upgrade to the 'latest'.

### 10.4 Context conditions

This may well be considered a generalisable background context, and the presence of lack of viable repair and servicing may be a perceived or actual control factor on the behaviour of sustained use of the modern energy cooking service.

There may also be a culture to leave things until they break rather than undertake preventative maintenance, and to repair without approved parts and processes from the original factory.

[Singh et al 2022](#) considered the landscape of repair in Myanmar and concluded that “Myanmar people like to keep old and unused electronic items at home instead of disposing of them”. This works with a general lack of policies and companies on e-waste in our countries of interest, with Singh et al pointing out that 90% of Myanmar's e-waste is recycled; e-wastes are picked up by scavengers who sell them to aggregators or second-

Return to seller

Agent network of certified repair and Maintenance

Informal repair shop



I have to stick to the warranty

I can just get it repaired anywhere

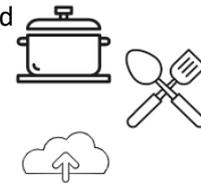
I don't need to do service of the appliance



Would like to upgrade pots and pans

Would like to upgrade utensils

Would like a newer model



Lack of preventative maintenance

Bias towards informal repair



hand dealers. Aggregators then sell useful e-waste to other small businesses/people.

## 11 Advocacy

*Consumer tells their friends and family of their experiences (good or bad)*

In this section we look at :-

- **Whether the consumer** will share their experience (good or bad) with their social network
- **Whether the consumer might give feedback to a wider audience about their experiences.**

After experiencing the product or service, the consumer is likely to tell their friends and family of their experiences. Will these be good or bad?

### 11.1 Consumer moments

The moments will likely be telling their social network about the device and what it can and cant do, but it may also include a commentary on the brand and the service the retailer provided.

Beyond their immediate friends and family, is the experience good enough or indeed bad enough that they become mildly evangelistic about the good (or the bad). According to Instant Brand, most early instant pot sales were made ‘at the school gates’. Parents collecting their kids from school spoke enthusiastically about their new acquisition, which in turn led the listener to embark on their own consumer journey. We have already noted that the demonstration effect among traditional or close knit communities is very important in the early stages of the journey ([See section 3.1.1](#)). At this stage in the journey, has the consumer become one of those who is willing to do demonstrations for the community

In the digital world, social media is also set up for feedback. The consumer if they obtained the product from a market place, will be invited by automated emails to share their experience of the sale and the product on the site. Online reviews are famously being gamed by some companies posting paid for fake reviews, but nevertheless there is a culture of posting experiences online, and a culture of taking such posts into account at the awareness and consideration stages.

What motivates people to tell their friends family, neighbours and even online strangers about their experiences? In a systematic review of customer to customer (C2C) interactions, [Heinonen et al 2018](#) in their

Telling friends and family about the device



Does it include Brand association?



Telling neighbours and community about device



Willing to provide testimonial social media



Online retail outlets - rating/review



Online market places - rating/review



Friends and family

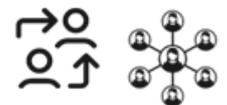


Door to door sales person -



introductions to others

Agent networks - - introductions to others



I want to tell others to get prestige

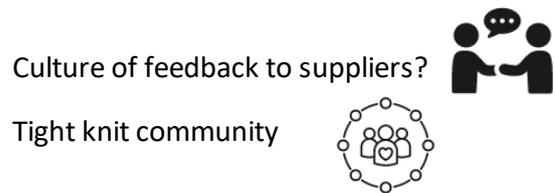


systematic review of C2C research, identified that C2C interactions are motivated by various functional emotional and social outcomes. They quote studies where the consumer gets social prestige from having knowledge that others may not have, although sometimes sharing of the knowledge is based purely on shared interests (the school gate effect). They of course also identify research that points to an unusual event such as a breakage prompting consumers to ‘vent their feelings and warn others’.

## 11.2 Consumer Connections and Context

So who might they tell? As discussed above, it may be friends and family but it may also be an online review. Online reviews might be to the retail outlet (eg the supermarket website) or to the market place (eg amazon or Alibaba sites). They may also be willing to feed back to the agent networks and perhaps make introductions to others.

The propensity to give feedback may depend on the cultural context (tight knit community that tells everyone everything?).



## 12 End of Life/Renewal/Upgrade

*The device has to be disposed of, or upgraded, or a new device purchased.*

In this section we look at :-

- **When the product or service comes to an end, how will the equipment be disposed of**
- **What might the consumer do next – replace or revert?**

### 12.1 Consumer moments

We touched on above, the moment of repair and maintenance, but at some point the product or perhaps the components of the service, come to the end of their working life. This may be because it is broken beyond repair and/or its performance has dropped significantly, but it could also be that the consumer just wants to ‘get rid of the old and in with the new’. Again we touched briefly above on the possibilities of upgrading – either partially or fully.

In this stage though we need to ask where might the old product be disposed of?

If it retains value and is being discarded because of the consumers desire to upgrade, then perhaps it can be sold second hand, or given away to friends and family.



However if it has no second hand value, where will it be disposed? If it is sent to landfill, the electronics in many modern energy appliances can pollute the water, and create an underlying toxicity for many years. Many components within appliances can be partly recycled, and it depends whether the consumer has within reach a tear down and recycle community either at public or private facilities. There is emerging evidence of recycling and upcycling in LMI countries (eg [Uganda](#), [Kenya](#), and [Bangladesh](#) ) although there is a [call for more regulation of e-waste](#). (electric cooking appliances often have a circuit board as part of the control system)

If we come to what the consumer may be thinking, we have noted that the global surveys suggest that consumers are as aware of the environment and the need for sustainability in our countries of interest as they are in developed economies. Globally, there is of course much discussion about the fashion industry and how consumers move on to another piece of clothing long before the existing piece is not useable, and do so because they want to be seen to have the latest fashion.

Motivations for retiring the modern energy product or service might vary considerably. On the one hand new energy efficient appliances may have come onto the market which make the switch a greater saving on ongoing fuel costs. On the other hand the consumer may be reluctant to get rid of the old in the belief that using it for a long time is better for the environment. [Leach et al](#) (2019) in their paper, explains how the overall environmental impact of modern energy that is not 100% renewable (ie LPG or electricity which is a mix of generation) far outweighs the environmental cost of an electrical appliance. It is therefore better to get rid of an old inefficient appliance and get one that is substantially more efficient.

The consumer could on the other hand not care about the environment at all and be driven by the personal prestige and reputation. It is not wrong per se to just want a better product but we are increasingly concerned about a consumer society that consumes for the fun of it.

## 12.2 Consumer Connections and Context

If they do dispose of the product or a part of the system that provides the modern energy cooking service, then the connecting persons and institutions may be second hand retail outlets, their friends and family, the disposal service or perhaps charitable organisations (as is common in developed economies).

Contextually it may be influenced by whether the society is concerned and raised awareness about landfill or is promoting recycling.

Wanting to get rid of it when not broken  
Wanting to upgrade to better version



I don't care about eWaste  
I care about recycling and eWaste



Second hand retail outlets



Friends and family who are ok with second hand'



Charitable organisations



Council waste disposal



It should be noted that the work of [J Lee found in Leach et al 2020](#) has shown that the impact of the fuel is far higher than the environmental impact of the appliance.

Disposal by landfill



Disposal by recycling.



## 13 Starting the Journey again

Of course, the end of life of one product or service, probably denotes the start of the journey again. The consumer has become aware of a new product or service, and after talking with the joint decision makers, they may have already considered it against their criteria. They may even acquire it before they dispose of the old product or service.

In brief, acquisition and the journey that accompanies it is a continual cycle, and where one journey ends another begins.



## 14 Revisiting the Personas

In section 2.3 we presented five persona that were derived from 6 discrete choice survey data across 6 countries. In this section, having discussed the 8 stages of the consumer journey, we revisit those persona, to gain insights as to how each might navigate the journey. The stages of the journey are likely to be common to all, but each persona will find their own steps through that journey based on their personality and their situation. Nevertheless as a persona, we can identify steps that are more likely for a particular persona than for another.

### 14.1 Connected and busy

#### Anne and Mark

Anne and Mark live in a flat near the downtown areas with their new daughter. Anne is a university graduate and now works in an office for an insurance company. Their flat has cement block walls, cement floors and ceiling, and piped running water, so it is classified as non-deprived. The flat has a good quality electricity supply, fed through a meter in their flat. Anne owns her own smartphone, which she uses intensively every day, mostly for keeping touch with friends and family (and advice on how to look after the baby). She makes extensive use of social media and the internet for personal communications, but also uses the internet at work. Although she has a bank account, she uses mobile money most days just because it is easier.



Figure 32 Picture credit Ngware Mburu of a couple used to represent Anne and Mark

**Cooking practice:** -She only cooks two meals a day, as she is able to leave the baby with a carer while she goes to work. Some of the other flats in her block are owned by men who will cook for themselves, mostly using gas. Her flat is a bit small with a tiny kitchen so she cooks on a single hob gas stove. **Beliefs on fuels** She uses LPG because it is reasonably priced, it is safe to use and, living in a more urban environment, it is reasonable easy to get hold of. She also feels that charcoal is just as easy to get hold of and is convenient to cook with. Her choice to cook with LPG is part of a modern lifestyle, but there are practical difficulties of using charcoal in a flat, and she does recognise that smoke is a health problem, even though she is not really convinced that charcoal (or firewood) is harmful to health. Although wood is the most readily available fuel, even in an urban environment, she chooses not to use it. Even though some of their neighbours cook with electricity, she strongly believes it is too expensive.

#### 14.1.1 Anne and Mark's Journey

Awareness	As someone who browses her smartphone, watches TV and travels to work, Anne becomes aware through a government campaign or through adverts of new energy efficient electrical devices which could compliment her use of LPG. She then sees one being displayed in her supermarket during a grocery shop. She discusses this with Mark and they decide to explore more detail.
Consideration	While price is their key criteria, Anne has a small kitchen and its attractive that an electric pressure cooker is a small appliance. They already have electricity, so the connection fee is not an issue, and therefore they just need the \$50 to \$100 for the appliance. Anne

	looks in her savings and doesn't quite have that amount available, but the bank are willing to give her an overdraft. Anne and Mark visit the local supermarkets to compare prices, and handle and feel the product.
Intention	They decide they would like to acquire one, but become busy at work. She knows that having an EPC might release time, but finding the time to go buy one never seems to be there. One day her mother in law visits and expects a traditional bean meal – getting out the charcoal stove and spending 4 hours cooking the beans reinforces Annes desire to get an EPC appliance.
Acquisition	Anne and Mark together visit the retail store, they pick up a box from the display and take it to checkout. They don't really look at the brand as they trust the supermarket to stock good products. They ask about warranty and the sales assistant says they should keep their receipt and can return it any time within the first 6 months. Together they carry it onto the shared minibus, and get it home safely.
Experience	Anne dare not try the EPC with her mother in law, but rather, goes onto the internet to find demonstration videos. The first two times she uses it she adds too much water, but soon realises the problem and adjusts her way of cooking. She finds that she can 'load' it with vegetables in the morning before work, and when she comes in she just switches it on, relaxes with a cup of tea (from the kettle), and the food is ready for Mark when he comes in. She gradually cooks more and more in it (80%), using the LPG only for quick frying. She finds that she used to spend \$12 a month <sup>8</sup> on LPG and charcoal and this has reduced to \$6 a month.
Service and Enhancement	Anne and Mark look after their appliance and five years later they are still using it. Anne cleans the pot after every meal, and the unit itself has a few spillages that she wipes off with a cloth.
Advocacy	Anne and Mark both love the EPC. They tell all their friends, and work colleagues. Anne has even gone onto a facebook group like 'Lets Cook Kenyan' which has 2m followers and shared her love of the product.
End of Life	We don't know the end of the story yet, as Anne and Mark are still using the appliance 10 years on.

<sup>8</sup> The data suggested 75% of people in this persona group of connected but small families spend at least \$12 a month.

## 14.2 Connected but sceptical

### Jonah and Eve

Jonah and his wife, Eve, live with their three children in a small house in suburbs of the capital. After secondary school, he left to join the army before becoming a police officer. Their house has cement block walls, cement floors, cement roof tiles, and a standpipe in the yard, which they share with a few other houses. The house has a good quality electricity supply, fed through their own meter. The house is classified as non-deprived. He owns a smartphone, which he uses intensively every day. Although he uses his phone to access social media quite a lot, he doesn't use it for the internet. He does use it to make mobile money payments, but only rarely when it is easier to do so.



Figure 33 Stock photo of a couple used to represent Jonah and Eve

**Cooking practice** They usually cook four times a day, only because his wife cooks lunch and tea for the children, and then prepares a second evening meal which she shares with Jonah later in the evening. They cook with both charcoal on a basic stove and a single hob LPG stove. Although the house has a small kitchen, his wife sometimes prefers to cook outside. **Beliefs on fuels** Even though they use LPG for some cooking tasks, they feel it is a bit expensive, and they feel that LPG is not safe, whereas they are confident that both charcoal and wood are safe. The main reason they like charcoal is because it is convenient, and it also makes food taste better. Even though they recognise that smoke is a health problem and they believe that firewood is harmful to health, they do not feel that charcoal is harmful to health. Although wood is the most readily available fuel, even in an urban environment, they choose not to use it. Although some of their neighbours cook with electricity, they believe electricity is expensive.

#### 14.2.1 Jonah and Eve's Journey

Awareness	Jonah doesn't browse his smartphone, but he does watch TV and travels to work, Jonah becomes aware through a government campaign or through adverts of new energy efficient electrical devices which are said to be able to save money on fuel. As an electrical device, he is sceptical, but he discusses with Eve and she talks about her nervousness on the safety of LPG. Is this an alternative?...they decide to find out more.
Consideration	Price is their key criteria. Eve likes to sometimes cook outside and she cant see how she could with an electrical device. Jonah decides they can run an extension cable through the kitchen window. Sales staff tell them the devices are clean and healthy, but they dismiss this as important since they sometimes use charcoal which doesn't give smoke. They already have electricity, so the connection fee is not an issue, and therefore they just need the \$50 to \$100 for the appliance. Jonah is reluctant to buy an expensive appliance, but Eve persuades him that they can get a cheap one from small informal shops next to the main market. They have the savings this month as Jonah was recently given a sizeable sum of 'Chai' money and the captain shared it equally among the three of them.
Intention	They decide they would like to acquire one, but worry it may draw attention to Jonah's income. After a while a colleague at work gets one for his wife, and that persuades Jonah that their family would look modern if they got one.

Acquisition	Jonah goes to get the EPC from the street shops. He goes into several, and the owner of the shop tries to persuade him that what he has in his hand is 'best quality'. Jonah sees that that one has Chinese writing on it, rejects it and finds one with English on the box. Jonah also buy an extension lead. Jonah bargains the price down by 10%, and carries it home as a passenger on a motorcycle taxi.
Experience	Together with the kids they open the box. They note that the seals were not very tight and realise the box looks a little old. Nevertheless they seem to have all they need, and they plug it in the lounge just to try it. They explore the buttons and realise they don't know what some of the foods are. Jonah sets up the extension cable, and Eve starts cooking. They notice the lights on the unit seem dimmer than when they had it in the lounge, but assume this is due to the sunlight. Eve adds too much water and the first stews are disappointing. She begins to lose interest in the device and reverts to LPG and charcoal. But she sees on TV a programme extolling them and demonstrating its use, and talking about how many people add too much water. Eve tries again, and after a few weeks, she is cooking about 50% of meals or parts of meals with it, supplementing dishes with LPG. She realises it makes no mess and doesn't need to be supervised, so she moves it to inside the house, and when Jonah comments on it, Eve says that this gives no smoke. She finds that she used to spend \$17 a month <sup>9</sup> on LPG and charcoal and this has reduced to \$12 a month.
Service and Enhancement	Jonah and Eve look after their appliance but after five years they accidentally drop it and it doesn't work. Jonah takes it back to the shop but the owner says it is too old and points to the electrician working on the other side of the street. The electrician opens it and declares it unrepairable. Jonah decides to buy another one without consulting Eve.
Advocacy	Jonah and Eve both love the EPC. They tell all their friends, and work colleagues. Jonah posts a picture of him with it (even though he never uses it!) on the municipal WhatsApp group. The mayor likes the picture.
End of Life	Jonah leaves the broken appliance with the electrician, who gives him \$2 for the 'parts'. The electrician tears it apart and uses the heating element to repair a kettle.

<sup>9</sup> The data suggested 75% of people in this persona group of connected but small families spend at least \$17 a month.

## 14.3 Weakly connected pioneer.

### George

George is a widower who lives in town with his three boys. After secondary school he went to technical college to train as an electrician and he now works for a small building company. They live in a cement block house with cement floors and a corrugate iron sheet roof. The house is connected to a national grid supply but it is frequently cut off. The landlord did a poor job of wiring the house, using sub-standard wiring, which restricts what can be plugged in safely. There is no standpipe nearby, so he sends one of the boys out to buy water sachets from the corner shop every other day. This means that the household is classified as deprived. Like most people in the neighbourhood he owns a smartphone which he uses intensively, mostly for work. He also uses both social media and the internet, mostly for buying materials and advertising himself for work. He also uses mobile money service most days for paying for materials and getting paid.



Figure 34 Stock photo of a couple used to represent George and family

**Cooking practice** Although George tends to buy lunches for himself on site, his sister, Mary, lives around the corner and comes in to cook lunch for the boys most weekdays. They cook using charcoal on a single basic stove. Many of his neighbours cook with LPG, but George feels he can't afford the cylinder. He shares a compound with a few other small houses, and this is where they cook. **Beliefs on fuels** He uses charcoal because it is relatively easy to buy, it is convenient to cook with, and makes food taste better, even though does recognise (weakly) that it is harmful to health. He doesn't use LPG because his friends' experience is that it is difficult to get hold of, and he believes it to be expensive. Although wood is the most readily available fuel, he chooses not to use it because it is unpleasant, he believes it is harmful to health and smoke is a health problem. Even though some of his neighbours use electricity for cooking, he strongly believes it is expensive.

### 14.3.1 George's Journey

<p>Awareness</p>	<p>Some of Georges' customers plan for electrical plugs when building their kitchens and say that new energy efficient electrical devices are able to save money on fuel. As an electrical device, he is sceptical, but he then sees some adverts on TV, and when he talks about it in the bar there are many who say their wives have got one or are thinking about getting one. George speaks with his sister and decides to find out more.</p>
<p>Consideration</p>	<p>Price is a key criteria. George goes to the local shops on his way home, but many of them haven't heard of such devices. He sees a bright orange advert on a billboard that shows the device but says you only have to pay \$5 upfront. George phones the number on the billboard and finds out they have an agent in his home area. The agent Peter visits and explains that George would pay \$5, get the device and then pay according to how much he used it. It has a meter that would measure his cooking<sup>10</sup>. Peter explains that George would save money each month, and he shows George a video of people saying how good it is. George is impressed by the smartness and knowledge of the agent Peter, and signs up there and then.</p>

<sup>10</sup> This is a PAYGO forever scheme – George never owns the equipment.

Intention	Having signed because the agent was persuasive, George realises he didn't discuss it with his sister, they have some arguments, but there is no easy way of going back!
Acquisition	The agent Peter comes on his motorbike within a week and brings the new box. He sits with George and his sister and half a dozen neighbours to unpack it. They plug it in and after a brief start it stops working. Peter then looks closely at the wiring, and he and George realise there is a 5 amp fuse in the line. They swap it for a 13 amp piece of wire and the appliance works. Peter shows George and the onlookers how to fry onions and cook some beans, and stays about two hours including eating the meal with George and neighbours.
Experience	After Peter leaves, that evening, they have a power cut and George just uses charcoal as usual. Over the next few days, Georges neighbours continually ask him about the appliance and so he likes to demonstrate to them how it works, but he rarely cooks on it. After two weeks Peter comes back and says that at the office they notice George is not using the device and shows George a picture of a graph which he understands to be his 'use data'. Peter explains again how to use it, and George and Mary agree they will make an extra effort. After another two weeks, Janet visits George and says she works with Peter and wants to show Mary some more ideas of how to use the device. Janet and Mary have two hours with several neighbours using the device and laughing and eating. George and Mary gradually use the device more and more although they are frustrated by power cuts. George finds that he used to spend \$18 a month <sup>11</sup> on charcoal and this has reduced to \$12 a month. He notices that charcoal prices have risen again, and he decides he will use the device more and more.
Service and Enhancement	George and Mary don't really look after their appliance and George wonders whether as an electrician he could cheat the system and avoid the meter on the device. He attempts to tamper with it and Peter turns up two days later because the device is no longer sending data. After a shameful argument in front of the neighbours, George apologises, and Peter agrees to leave the appliance with George. Five years later, Peters replacement at the company, Jeff, picks up the device and gives George a brand new one
Advocacy	George tells his community beyond his immediate neighbours about the device and deal, and Peter finds he has a slot of sign up within the community. It is this that makes him forgive Georges' attempt to cheat the system. Peter asks permission to take a picture of George, makes him sign a piece of paper, and tells him it will be used for advertising on the internet. George has never seen the photo.
End of Life	Peter's replacement takes the device back to their factory, where it is recycled, and some components are reused.

<sup>11</sup> The data suggested 75% of people in this persona group of connected but small families spend at least \$18 a month.

## 14.4 Communal energy pioneer

### Nang Cham

Nang Cham lives with her husband, their only daughter, and parents in a rural village. She completed only primary education before leaving school to work with her parents on the farm. They live in a house with a cement floor, and corrugate iron sheet walls and roof. They collect rainwater in a plastic barrel fed from the roof, which means her household is classified as deprived in terms of a poverty index. The mini-grid does not provide electricity 24 hours a day, but is reliable enough to charge her smartphone, which she owns herself and uses only once or twice a day. She uses social media on her smartphone, but does not otherwise use the internet. Nether does she use a mobile money service.



Figure 35 Stock photo of a couple used to represent Nang Cham

**Cooking practice** She cooks 3 meals a day and occasionally prepares a morning snack (tea). She does almost all of the cooking herself. She cooks on two basic stoves, using mainly wood, but sometimes she will use charcoal. Although most women in the village cook outdoors if they tend to use wood, her house has a small kitchen area, so she is able to cook indoors. **Beliefs on fuels** Even though she uses wood, she feels it is not safe and it is expensive, but it is the most readily available fuel. On the other hand, charcoal is difficult to get hold of. They feel that LPG is readily accessible but choose not to use it. Although she uses wood, she feels strongly that it is harmful, and even more strongly that smoke is a health problem. She has neutral views on whether charcoal is convenient or makes food taste better, but does recognise that it is harmful to health. She has friends who LPG so she doesn't really believe it is too expensive, but she does strongly believe that electricity is expensive.

#### 14.4.1 Nag Cham's Journey

Awareness	Recently the government decided it was spending too much money on importing LPG and was worried about it economy, so it introduced a public campaign on electric cooking. When Nang Cham first heard about it on the radio, and saw it on the TV, she was attracted to the idea of not having smoke although she thought electricity would be expensive. She attended a demonstration by an NGO using the minigrid she is connected to and she was willing to try the appliances.
Consideration	Her husband, Sross, was reluctant to try the device, and her parents positively against it “we have cooked with wood for all our lives, it wont taste the same”. Nevertheless, Nang has always been one to try new things, and the mini grid operators were offering a trial where they would pay the first two months of the electricity.
Intention	Nang Cham and her husband Sross, agreed with the mini grid operators to trial the devices and once agreed the mini grid agents pushed the process along.
Acquisition	The same person who collects their payments and supervised the wiring at their house, brought the device. It wasn't in a box, and Nang was slightly worried it was not new, but the agent Sroueng said that they had got them in a shipment so there were not retail

	boxes, they were packed in crates. He demonstrated it use with the mini grid electricity, briefly switching it on and off, and asking them to use it.
Experience	Nang felt nervous the first time she cooked with it, but she visited Neur a neighbour who also got one, and together they explored what it could do. Neurs daughter Cheata, who was visiting from the capital was the expert having seen them being used on social media, and she demonstrated how a meal could be cooked. Over the next few days Cheata cooked meals and Nang copied her. After two weeks, Nang’s confidence grew, and she loved the lack of smoke. She used it more and more. After two months, the mini grid operator said that they could keep the appliance but they would now need to pay for the electricity. Nang decided to keep it, and continued to cook with it until Sroueng came to collect the payment for the first month. Nang was shocked at how much it was, and she nearly gave the device back. Sroueng left it with them, and Nang used it more selectively. Sometimes she would light the fire, and only on occasion would she use the device. At the end of the next month the payment was reasonable, and so Nang carried on using it carefully. By month 6, the mini grid operator said that the tarif was being changed by the government and being reduced. They also changed the way the tariff was calculated, making it a daily minimum of 5kWh. Nang realised that having paid for 5kWh she could cook more of her food and not be paying extra, so she begun to use it more and more. She was frustrated that she couldn’t cook all the time with it as sometimes the minigrid didn’t deliver power, but she found she used to spend \$18 a month <sup>12</sup> on wood and this has reduced to \$12 a month. She is particularly pleased with how easy it is to make a cup of tea and morning snack.
Service and Enhancement	Nang doesn’t really look after the appliance and it now has many dents on the outside. At one point the mice ate a piece of the cable, and the local electrician replaced it with a wire he found and some rubber tape. Five years later, Sroueng is still their bill collector and she notices that the device needs replacing, she offers Nang a new one for \$10 saying that ‘carbon finance’ covers the balance of the cost (normally \$60).
Advocacy	Many people in the community have joined the scheme offered by the mini grid operator. Nang was an early adopted, and she used to talk to the neighbours to both share her learning and learn from them. Her network of friends and family all approve of the use of the device, and it has become the normal thing to use.
End of Life	Sroueng takes the old device back to the minigrid offices, where it sits for the next 5 years because no one know what they should do with it.

<sup>12</sup> The data suggested 75% of people in this persona group of connected but small families spend at least \$18 a month.

## 14.5 The Isolated pioneer

### Prisca

Prisca lives with her three daughters and her mother in a rural village with no electricity supply. This is a relatively large household size. She completed her primary education before leaving school to work in the local market. The family live in a small house built with cement block, with a corrugated iron sheet roof, but a dirt floor, which means her household is classified as deprived. One of the girls fetches water from a borehole every day. Like most people in the village, Prisca owns a mobile phone, but only a basic phone, she uses it sparingly and has to pay to get it charged from a local shop. She doesn't use mobile money and she has never used social media or the internet.



Figure 36 Stock photo of a family used to represent Prisca.

**Cooking practice** They cook 3 meals a day plus morning snack (tea), especially during the school holidays. Prisca does most of the cooking, although her mother will sometimes cook. They cook on a basic stove, which is their only cooking device, using only charcoal. Sometimes they use the stove outdoors, and sometime inside the kitchen, depending on what is being cooked and the weather. **Beliefs on fuels** She is not really aware of LPG, so has no opinion on whether it is safe or not, but she thinks that it is readily accessible although it is also expensive. She feels that Although wood is neither safe nor convenient, but it is the most readily available fuel. The down side of using charcoal is that it is often not available, but it is convenient, and she believes that it makes food taste better. However, she does understand that smoke is a health problem. She would be unwilling to use electricity for cooking as she believes it is too expensive.

### 14.5.1 Prisca's Journey

Awareness	Prisca first saw the device on the TV show Shamba Shake Up on a communal TV in the market. She liked to watch the show every Sunday with friends and neighbours because it showed her how to run a farm. She works in the local market but she also has a 'shamba' for her vegetables. Her mother and children help her in the fields. She also saw a company offering a solar home system that would give lights for her children to do their homework. She decided to find out more.
Consideration	<p>She asked about the solar thing in many places and it was eventually the market supervisor who was able to tell her where she could find out more in the district town. She delayed a month but eventually went out find out more when she had to go pay her taxes at the District offices. The company told her she would have to find \$20 and then pay \$10 a month for two years and then she would own the system – but it would only give light – it couldn't cook. Prisca went home disappointed.</p> <p>A month later, her friend Diana in the village invited her to a women's self help group meeting. She had previously heard of the group, but decided it wasn't for her. This time she went and was amazed to hear that the group was considering solar lights and cookers. The group leader explained that a member could buy a solar light for \$5 which would last a 'lifetime'. She said it normally cost \$15 but that foreigners would pay the other \$10. She explained that this should save members money on their torch batteries</p>

	<p>and kerosene and candles for light. Once the member had used the light for a while, they would be eligible for a cooking system that would cost \$10 a month, although they could pay after the seasons harvest. The \$10 system could only cook in the middle of the day which for Prisca was no very good since she was at the market. For \$15 a month she could have a system with batteries and cook in the evening. Again some of the cost was covered by foreigners. The group had a demonstration of the lights and cooking systems, and helped each other plan their acquisition, and cover some of the risk.</p>
Intention	<p>Prisca intended to get one of the systems after the meeting, but she had to wait until the harvest before she could get the first \$5 for the light, and then had to wait 3 months before the group would 'authorise' her to upgrade to the cooking.</p>
Acquisition	<p>Prisca acquired the lights, waited the three months and then upgraded to a cooking system. For the lights some women came with a small shiny panel which they put on the roof. Upgrading to the cooking system, the same women installed a very large panel that was the size of one of the corrugated sheets. Priscas house needed some extra wood to support the weight and she was surprised that it was women doing the work. At the next group meeting, Diana received the first payment from Prisca in front of the whole group, and the treasurer recorded the payment.</p>
Experience	<p>The light didn't look so nice, but it gave a bright light that everyone appreciated. The children were happier doing their homework in the evening. After the upgrade Prisca found she could have hot water on the go all the time, and even though she still used some wood in the evening, all the cooking was quicker and easier. During the day her mother could give the kids tea and snacks, and sometimes in the evening she would be able to make the whole meal from the system. On cloudy days she found that there wasn't enough in the battery, but by using the insulated pot sold with the system she found that if she had enough to start the meal and bring the water to boil, there was enough heat to finish the meal. After a few weeks, the group were given pressure cookers which took some learning but made it easier to cook dried beans.</p> <p>Prisca did find that her neighbours kept coming and asking to charge their phones on her system, and she realised that when this happened she didn't have enough battery for the evening cook. However she couldn't say no to her neighbours. Prisca and her children variously collect wood for cooking and purchase some to ensure there is enough. She used to spend \$7 a month<sup>13</sup> on wood and Prisca now finds that she doesn't need to spend this \$7. However, she is spending \$15 a month on the system, and the group has told her it will be hers in 8 months time.</p>
Service and Enhancement	<p>Prisca found that when it rained, there was very little power in the lights or batteries for cooking. She also found after the rain that the system seemed to be weaker than before. The group discussed this and asked the coordinators, only to hear that the rain was leaving a fine layer of mud/dust on the panels and Prisca heard that if she cleaned them</p>

<sup>13</sup> The data suggested 75% of people in this persona group of connected but small families spend at least \$7 a month.

	it would help. She did and it did, so now she cleans the panels after some of the rains. She
Advocacy	Many people in the community have joined the women’s group, and are variously buying solar products. One group member has bought a small electric vehicle for carrying things to market and another has bought an irrigation pump <sup>14</sup> . Prisca finds she doesn’t talk much about the solar cooking now as it has become the normal way of cooking among her social network.
End of Life	The group collects old devices and have made an arrangement with the lead NGO to send them to them for recycling. Since the systems are assembled by women in the district, reprocessing their components can be done locally and very little is thrown away.



<sup>14</sup> This fictional story about Prisca draws on some learnings and experiences in Malawi with our partners Kachione, who do indeed now offer a solar driven vehicle! This was their [experience by 2020](#), and [here is a blog post](#) 2021.

## 15 Conclusion and discussion

Walking through the consumer journey illustrates and draws attention to the myriad of moments which may make or break an acquisition. It is presented as a linear journey but often it is more cyclical as one consumer gets a product or service and advocates with their friends family neighbours and strangers, which in turn may prompt a new consumer journey by a new consumer. Or indeed the original consumer may go through the journey again in upgrading their existing appliance or getting an auxiliary or associated appliance.

Throughout this description we have attempted to be neutral in language around what the product or service actually is. When we say a modern energy cooking service, we can variously mean an electrical appliance working from a grid connection – in which case much of the journey is about acquiring a suitable energy efficient appliance. But it could also mean a system set up to be ‘off-grid’ something like a solar home system. Solar home systems have tended to be sold on a pay as you go basis as a whole system and many of the consumer choices outlined above would be on the whole system, the whole package, including repayment rates and the lifetime of the equipment, indeed the repair and maintenance package that might come with it.

But there is also LPG, in which case the journey may be about acquiring a burner, or it may be signing up to regular delivery and reticulation of the cylinder gas. It could be about getting a burner for a natural gas provision. There are new models for ethanol including the koko network of automatic dispensers, and there are new approaches on pay as you go biogas (or indeed the older approach of professional or self-made biogas units).

As we have commented on the moments in the journey we have attempted to keep all these options in mind, and we believe that the information flows, touch points, transactions, pain points, thoughts feelings, connections and context can be assigned and anticipated to any of the product or service journeys.

What the walk through has done is draw attention to a number of research and market questions that should be asked when considering scale up activities. Answering these points, before or during launching a product or services could enable the supplier to side step a mistake which then becomes a barrier.

In this last section we seek to draw these together into a check list for the baseline market surveys and research:-

### 15.1 Awareness

**How will the consumer find out that the product or service is a possibility?** What media mechanisms might a government or private sector employ to reach a significant number of people? Will the product be considered by the full range of personas? A poster with a beautiful smiling middle class mother may be overlooked by those who feel disenfranchised by society. On the other hand can it be presented as an aspirational product or service that positively attracts the poorer segments of society and gets over their initial scepticism?

Is there anything the marketing or awareness campaign (by government or private sector) can do to encourage joint decision making within the household. We have seen that women are increasingly having a say in large purchases for the household in most countries. **What could the campaign do to encourage their participation in the decision, and if anything strengthen societies progress towards equality?**

**How might the campaign address the issue of ‘trust in its source’.** In some countries government branded messaging is trusted more than private sector, but the reverse can also be true. Campaign designers might want to consider their own branding – do the consumers trust their brand (especially if their brand is ‘the government’)?

**Should community discussions and demonstrations be a part of the campaign?** Traditional communities will likely move through the journey because of demonstrations and risk taking within the social network. How can this be leveraged during an awareness campaign?

**Is there a growing use of social media in the country of interest,** particularly among the youth, that might be utilised, to promote products, but also to share how modern energy cooking services might increase the wellbeing of households. Are there food bloggers (instagrammers, tiktoks) who already have established followers – could they endorse the product or service?

## 15.2 Consideration

**By what criteria might the choice be made?** The choice will likely go far beyond a simple cost effectiveness consideration. There will be many features in the product or service that sit well or sit ill with the consumer. Different markets segments are likely to prioritise slightly different criteria. The personas give us some insight into what is important for each persona. (Figure 37)

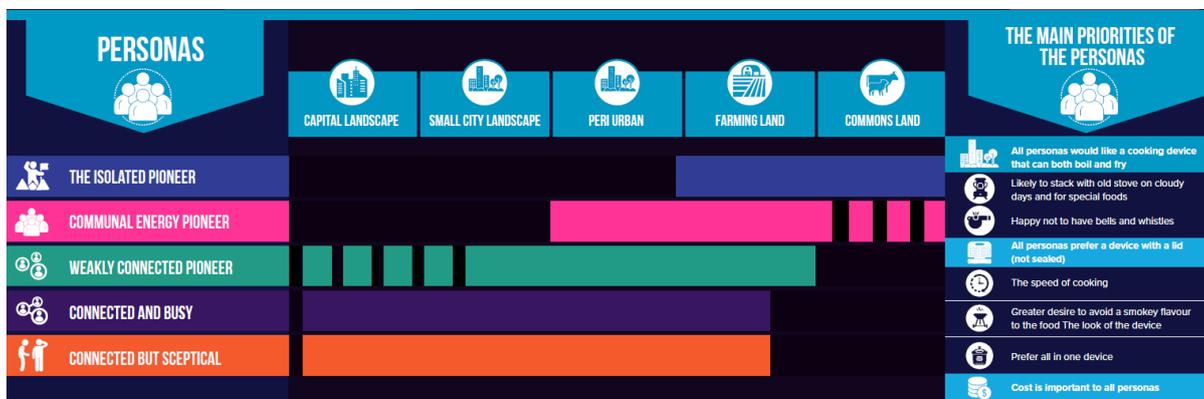


Figure 37 Infographic on personas Scott et al 2019

**Who is going to make the decision and how can they be involved in considering the options?** Will someone other than the cook be doing the detail investigation? How can the consumer make sure they take everyone’s ideas into account.

**How will the consumer get more detailed information about the choices?** Can they see a demonstration, or go to a shop and handle the devices?

**How will the product or service be financed?** This is quite a significant part of the journey but the options are much more than are commonly discussed. Not only might people have access to credit through the seller, the PAYG scheme or from their savings, but formal finance organisations which offer loans secured by employment are increasing, credit through cooperatives and solidarity groups are there, and there is a culture of borrowing from friends and family.

**How can the supplier mitigate the final price to the consumer?** Suppliers can sign up for Results Based Finance schemes or Carbon credits. Using these instruments they may be able to offer a lower price for the equipment to the consumer.

The ultimate cost is not the equipment but the cost of the fuel over the lifetime of cooking. **The supplier should demonstrate the long terms costs, and show how energy efficiency makes sense in the immediate monthly outgoings and in the medium and long term savings.** The supplier could perhaps show consumers what the

possible changes in fuel price might be – illustrating the rising process of wood and charcoal particularly in urban areas, but also the dangers of relying solely on LPG for the coming decade.

### 15.3 Intention

**What contextual factors might stop consumers for taking action on their intention?** Is there anything the suppliers could do to mitigate these barriers, for instance, if cash flow is a problem, can there be a seasonal offer just after harvest, if credit is not available could credit be facilitated. If there are no electrical connections, or LPG or ethanol supplies, could this be tackled through off-grid technologies or making suitable distribution arrangements?

### 15.4 Acquisition

**Will the acquisition mainly be 'online' or from a trusted physical source.** If online, are there delivery mechanisms that will deliver in a timely and reliable manner? If physical – does the supermarket or the shop have a supply chain in place for meeting demand, or do the agents promoting the product of service have enough supply.

**How does the product or service get to the household** – do they collect it or do they have to wait for delivery – this can be an important consideration for some households and may affect the acquisition.

**What will be the impact of corruption and rent seeking on the purchase?** Purchasing a large appliance or signing up to a Pay as You Go off-grid system is not always a simple fixed price proposition. Most of the countries of interest score poorly in the global corruption data base, and while this consumer journey is mainly constrained within the private sector, many salespeople, installer, fixers are used to some rent seeking as part of day to day transactions.

### 15.5 Experience

**How does the product or service handle when its used?** Is the experience all that it was hoped for, or is there a danger of a negative experience. Remember one negative experience counts more than 10 positive experiences in gossip and social media. Are there suitable physical or online demonstrations within the actual or virtual community (including TV and radio) that will help them learn how best to use their new product?

**Does it give an acceptable taste in a timely and cost effective way?** As market research, does everyone appreciate the taste of food cooked by the consumer. If feedback is negative, how might physical and online demos address that. What does the Net Promoter Score look like both immediately after purchase and 6 to 12 months later – are consumers and their households truly satisfied

### 15.6 Service and enhancement

Is there a culture of service and maintenance, or do people tend to wait until it is broken. **What could be done to encourage preventative maintenance?**

Some elements of the system may reduce in performance. Energy storage in batteries, will likely tail off in performance depending on their use. **How can performance tail off be mitigated, and at what point will components need replacing?**

### 15.7 Advocacy

Good or bad, the consumer is likely to share their experience. **How can their good comments be magnified in future campaigns, and bad comments be mitigated** (if they are a result of early adoption teething troubles)?

Has the acquisition process (online or physical) and the subsequent use of the product or service landed a good net promoter score both soon after purchase and 6 to 12 months later.

### **15.8 End of Life/Renewal.**

**How can the end of life be anticipated?** Standards for waste disposal, encouraging upcycling, recycling, encouraging second hand markets.

The check list of scaling research questions is probably incomplete but is presented as a starting point for more detailed investigations of the consumer journey and the guidance such journeys can have on scaled approaches.

We welcome comment on this paper and hope it forms the basis for future discussion and research.

## **16 References**

All references are within the text as hyperlinks. All were accessed during February 2022.

## **17 Larger Version of Consumer Journey for MECS**

See next page



Awareness

Consideration

Intention

Acquisition

Experience

Service/enhancement

Advocacy

End of Life/renewal/upgrade

Acquiring a Modern Energy Cooking Product or Service

Consumer becomes aware that cooking with modern energy is a possibility

Consumer considers the idea or partial or total replacement of existing cooking regime.

Although intending to acquire, there may be factors that delay or prevent the acquisition

Consumer acquires the relevant devices based on their choices

Consumer experiences the device(s)

Consumer may require after sales support

Consumer tells their friends and family of their experiences (good or bad)

The device has to be disposed of, or upgraded, or a new device purchased.

Consumers information flows, touch points and transactions

Serendipitous

Assessment Criteria

Intention Gap

Decides to acquire

Cooking experience

After sales needs

Willing to talk about experience

Upgrade or dispose

Advertising in store  
Advertising in street  
Mass media  
Word of mouth  
Social Media

Attracted to investigate by positive message  
Discusses the idea with whoever makes the decision in house  
Decision maker takes into account the views of key social reference  
Decision maker(s) decide to find out more

They try to find a place to compare the options (Digital or physical)  
Experience and feel the options  
Narrows choices to brand of appliance(s)  
Narrows choices to which appliance(s)  
Narrows choices to where to acquire the appliance(s)

Price point  
Quality  
Looks  
Convenience (ease of use)  
Features  
Cooking regime (functionality)  
Brand loyalty (Packaging)  
Ease of purchase transaction

Bundling with other offers  
Delivery time  
Who will use it  
Will it be safe  
Will it clean easily  
Is the fuel available  
Is fuel supply reliable  
Any costs associated with getting fuel supply  
How reliable the warranty  
How will I get it repaired

Intention  
Perceived attitudinal control factors  
Perceived social control factors  
Actual control factors  
Behaviour

Approaches seller  
Arranges finance  
Credit arrangement  
Lease hire arrangement

Member of credit union  
Able to access credit from a bank  
Credit bundled with appliance  
Delivery is click and collect?

Unboxing - was it what was expected?  
Taste acceptable to household  
Does it do everything they want  
Do other appliances complement it  
Does it need to be fuel stacked?  
Does it feel like the quality that was expected

Is it large enough (fulfills demands)  
Does it fit the kitchen  
Does it fit the lifestyle  
Is the supply of fuel reliable enough  
Is accessing the fuel a problem  
Does it consume more or less fuel than expected  
Do I use it as intended?

Does it break  
Does the performance tail off  
Warranty

Wanting to upgrade whole  
Wanting to upgrade part of the appliance

Telling friends and family about the device  
Does it include Brand association?  
Telling neighbours and community about device  
Willing to provide testimonial social media

Has it broken beyond repair  
Is an upgraded model attractive  
Is there any value on the old model  
Where will old model be disposed  
Bundled waste disposal  
Recycling  
Second hand market

Consumers stakeholder and actor connections

Government Campaign  
Market influencer  
Media influencer  
Product ambassador  
Friends and family

Decision holder  
Voices in the household  
Voices in the community  
Home help

Internet  
Library  
Asking friends and family  
Engaging in mass media  
Decision holder  
Voices in the household  
Voices in the community  
Home help

Asking retail outlets  
online retail outlets  
online market places  
physical electric shops  
supermarkets  
street markets  
door to door sales person  
agent networks

Decision holder  
Voices in the household  
Voices in the community

Banks  
Regulated financial service  
Cooperative society  
Micro credit solidarity group  
The retail outlet - credit  
The provider - pay as you go  
Informal Money Lender

online retail outlets  
online market places  
physical electric shops  
supermarkets  
street markets  
door to door sales person  
agent networks

Communal demonstration  
Experiential community  
Recipes  
Global sharing  
Video based learning

Return to seller  
Agent network of certified repair and Maintenance  
Informal repair shop

Online retail outlets - rating/review  
Online market places - rating/review  
Friends and family  
Door to door sales person - introductions to others  
Agent networks - introductions to others

Second hand retail outlets  
Friends and family who are ok with second hand  
Charitable organisations  
Council waste disposal

Consumers thoughts and feelings (Beliefs) Attitude (Social Norm)

Initial scepticism?  
Do I trust of the source of the info?  
Is the awareness from more than one source?  
Prejudice about fuel  
Knowledge of others use of similar  
Will it be safe?  
Will the food taste alright?  
Worth looking at it further

Will it be too expensive to purchase  
Do I have the upfront money  
Can I get credit  
Will it be expensive to run  
What will my friends and family think of us  
What will the community think of us

Are there any legal issues  
How long might it last  
What guarantees does it come with  
Where might I get it repairs  
Will homehelp be able to use it

I need it  
I can wait for it  
Is this a priority  
Is the decision maker agreed  
Is the household agreeing with this purchase  
Can I live with the community reaction  
(Is the purchase legal)

I am pleased by its performance  
I get praise for how quickly I cook  
I am pleased with the cleanliness

I am disappointed with performance  
I am disappointed with functionality  
I will not use it much.

I have to stick to the warranty  
I can just get it repaired anywhere  
I don't need to do service of the appliance

Would like to upgrade pots and pans  
Would like to upgrade utensils  
Would like a newer model

I want to tell others to get prestige

Wanting to get rid of it when not broken  
Wanting to upgrade to better version  
I don't care about eWaste  
I care about recycling and eWaste

Contextual conditions

Does the fuel have a bad reputation as expensive  
Does the fuel have reputation about safety  
Is the fuel available  
Is the fuel supply reliable

How do people get their information  
Has online shopping overtaken walk in shopping  
What sources of information are there  
Is the community traditional (ie level of need to conform)

Access to electricity  
House wiring  
Cylinder refills  
Ethanol access  
Biogas feedstock  
Solar insolation  
Other fuel access

Available retail infrastructure  
Ease of doing business  
Ease of transporting the goods

Lack of preventative maintenance  
Bias towards informal repair

Culture of feedback to suppliers?  
Tight knit community

Disposal by landfill  
Disposal by recycling.



**MECS**  
Modern Energy  
Cooking Services



Loughborough  
University



**ESMAP**  
Energy Sector Management Assistance Program

