



Cookstoves in Tanzania

User Insights and Opportunities

We used a human-centered design approach to examine the habits, motivations, and aspirations of cookstove users in Tanzania.

We developed a consumer-based understanding of cookstove adoption and actionable opportunity areas for Global Alliance for Clean Cookstoves and its stakeholders to explore.

Although focused on the Tanzanian market, many of the insights and opportunities are relevant globally.

Human-centered design (HCD) is a generative and iterative process through which we gain deep empathy for people, question assumptions, and explore directions in order to identify new opportunities.

We shape our context, and thereafter,
it shapes us.

Human centered design helps us
understand not only people and their
needs but also their broader context
that shapes their daily lives.

We tell human stories.

Stories are idea containers. Through them it is possible to remember, transmit and spread ideas.

We tell human stories because it enables us connect with people and reminds us who we are working for in the first place.

Quantitative + qualitative.

Quantitative data provides useful information, but it's unable to uncover human behavior identifying on its own.

Qualitative on the other hand doesn't reveal the broader picture.

Weaving nuance with numbers allows us to truly understand the landscape that we want work in.

Fundamental Behaviours.

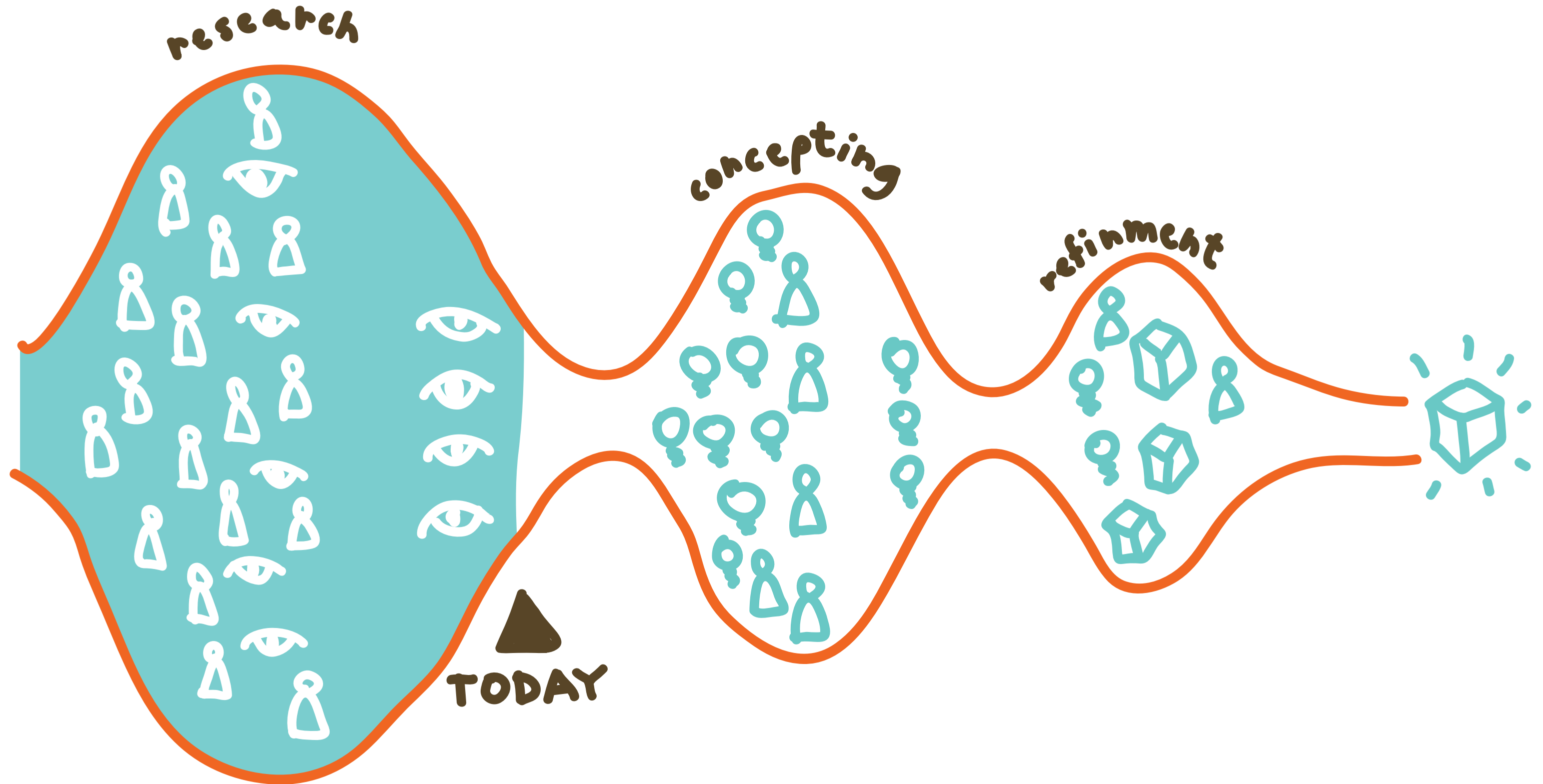
Human-centered design identifies the fundamental elements to human behavior. Although advanced stoves are rare in Tanzania, we believe that our approach allowed us to identify behavior patterns that still apply to the future adoption of such stoves.

Our Approach

Human-centered design



Our process



Our field work

8 weeks, 68 interviews: 45 users, 10 experts, 6 entrepreneurs, 3 charcoal sellers, and 4 NGOs.



Where we went

3 weeks in Tanzania, 3 different cities: urban, peri-urban, and rural areas.





Our Approach

User Interview

Our 1 hour **in-depth user interviews** in people's homes enabled us to gain deeper insight about who they were and the reality of their life beyond discreet topics. We asked questions about their life such as their **family, income and spending habits, and hobbies and chores**. Only after understanding their lives, did we explore how the cookstove fit in.



Our Approach

Extreme User

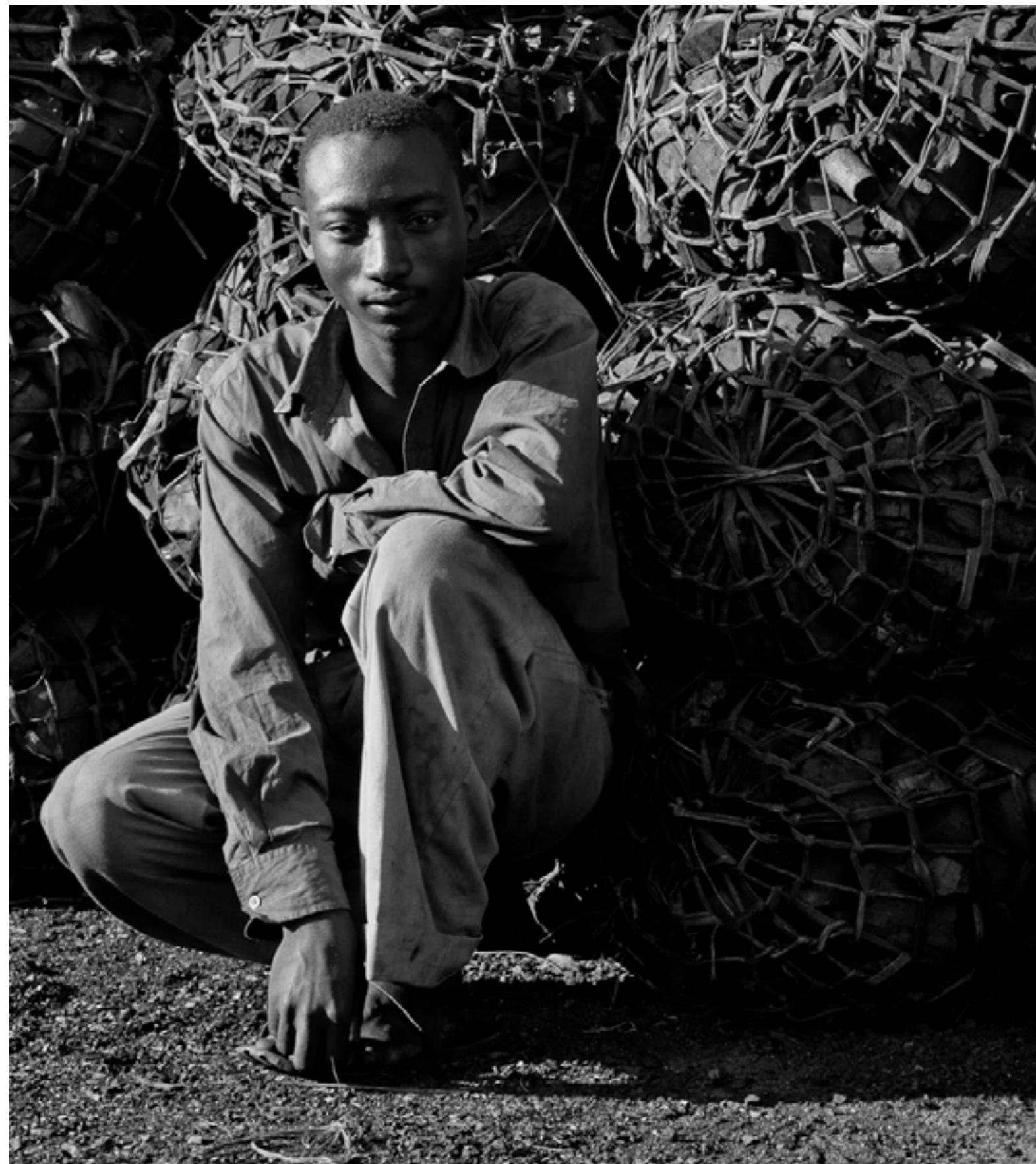
Because it's important to gain understanding across the **spectrum of users**, we looked for a variety of user types, from young **single men to elderly women**, very poor to lower middle class. Interviewing **professional chefs** helped us test assumptions about Tanzanian cooking traditions.



Our Approach

Expert Interview

Interviewing expert stakeholders involved in the cookstove challenge helped us identify key assets and attitudes, and set our **baseline of knowledge** that informed our design process.



Our Approach

Entrepreneur Interview

Understanding consumer behavior doesn't mean focusing only on the end users. We also interviewed **charcoal sellers**, cookstove **manufacturers**, and cookstove **vendors**. Understanding the ways in which **people interact with these players** strengthened our research, yielded valuable insights, and uncovered innovative opportunities.



Our Approach

Extended Observation

While in-depth interviews increased our understanding, adding in-context observation brought even deeper insights. With a few users, we **followed them through the entire cooking process**, from shopping in the market to cooking the meal to washing the dishes. We were able to **establish real relationships** with people, understand their daily routine, interact with other people in their household, and **pick-up tangible cues** about their needs and values.



Our Approach

Analogous Experience

Sometimes **inspiration** is found in situations **outside our research focus**, but with similar characteristics. To further understand consumer behavior, we had a **variety of different shopping experiences** from high-end **appliances to mattresses**. Our experience helped us see which consumer attitudes applied to all products and which were specific to cookstoves.



Our Approach

Flash Cards

Sometimes it's easier to talk about something rather than yourself. To help people articulate and express thoughts that may be **harder to talk about**, we created flash cards with **images** of the most common expenses for Tanzanians, different fuel and stove types, and different adjectives often associated with cooking. Having this **interactive tool provided clarity** around more abstract topics, kept people more **engaged**, and added a level of **humor**.



Our Approach

Prototyping

Making rapid prototypes allowed us to **test assumptions** around differentiation and functionality and explore new possibilities. We “**build to think.**” Prototyping ideas in the midst of research helps us continually think of **new ideas and learn from failure.** With the help of a local entrepreneur, we developed a prototype of a clay liner insert that we brought to interviews. It enabled us to have **different conversations.**



Our Approach

Cook off

Because little importance is attached to culinary tradition in Tanzania, it was challenging for people to describe the **nuances of cooking**. We held a **cook off using three different types of cooking technology**: improved charcoal cookstove, improved wood cookstove, and 3-stone fire. Three women cooked ugali, the national dish, simultaneously. Three local men were the testers. The experiment helped us understand better what people valued in cooking.



Our Approach

Cooking Class

It was important for us to **gain firsthand knowledge** in what it was like to cook in Tanzania. So we took a local cooking class. Guided by a food vendor and a local chef, we had to chop the food, light and stoke the stoves and fire, stir the pots, and test the flavor. Instead of observing the act of cooking, **we experienced it**. It added to our depth of understanding of the user experience.

Our Approach

Synthesis and Storytelling

Every few days in the field and immediately following our return, we engaged in a process of synthesis and storytelling. More than just a simple download, we use this process to **capture compelling stories** and quotes, observations, and thoughts. We organized them **thematically into key insights** and begin to identify the **biggest opportunities**.





Our Approach

Opportunities and Concepting

Human-centered design not only yields insights, but also uncovers **untapped opportunities**. This is its **biggest value**. Inspired by the insights and stories emerging from our synthesis process, we brainstormed several **innovative ideas and concepts** that the Alliance can pursue. Some are easily implemented. Others require some prototyping and refinement. All are actionable areas of change and impact.

Tanzania in Context

Culture, people, market





Context

Tanzania is a country of community, neighbors and big families. They enjoy a *pole pole* pace of life and take pride in their welcoming and friendly nature.

Pole pole means slowly or easy going



Context

There are cultural differences between the coast and inland, Muslim and Christian, but the nationalist notion of *Ujamaa* prevails and they are united by language, shared history, and a peaceful state.

Ujamaa is the Swahili word for community, unity or togetherness



Context

For the average family in Tanzania, paying for food, rent, and fuel are burdensome expenses that take up the majority their monthly income. Unemployment is high and most people do casual work or small entrepreneurial activities.



Context

When people have large sums of money, which happens at certain times of year in fairly predictable patterns, they invest in fixed assets such as a television or bricks (for their future house). These items represent stability. This also frees people from the cash demands of extended family and friends.



Context

Tanzanian women are queens of their domains. There are many female-headed households, but even in households run by men, women are strong leaders. They are the ones who make most household purchases, using their daily allowances. Bigger purchase decisions are made together with their husbands.



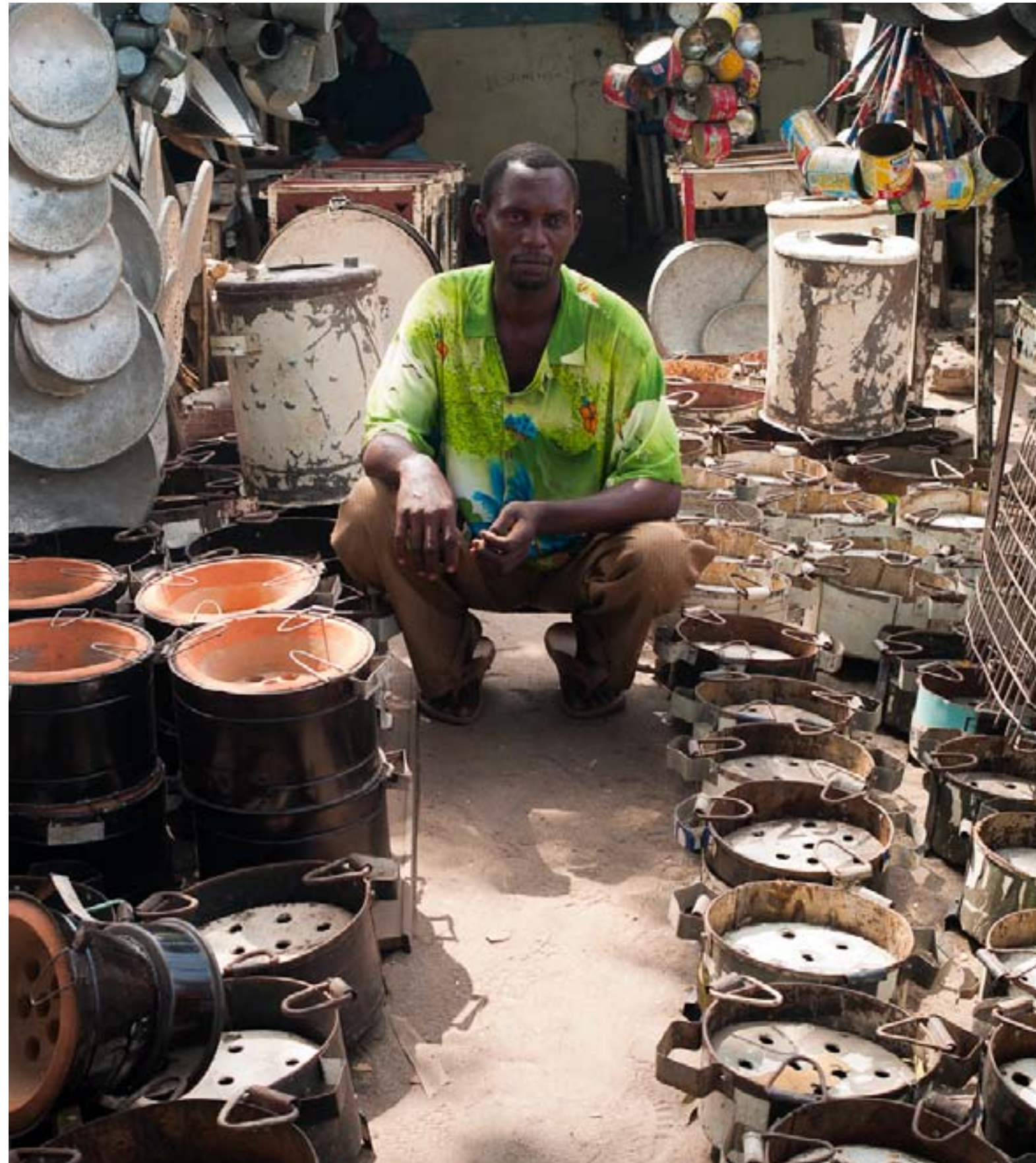
Context

There is little importance attached to culinary tradition. Food is considered sustenance and consumed for energy and strength. Tanzanians prefer heavy starches like ugali and rice with cooked vegetables for daily meals and when they can afford it, they love meat.



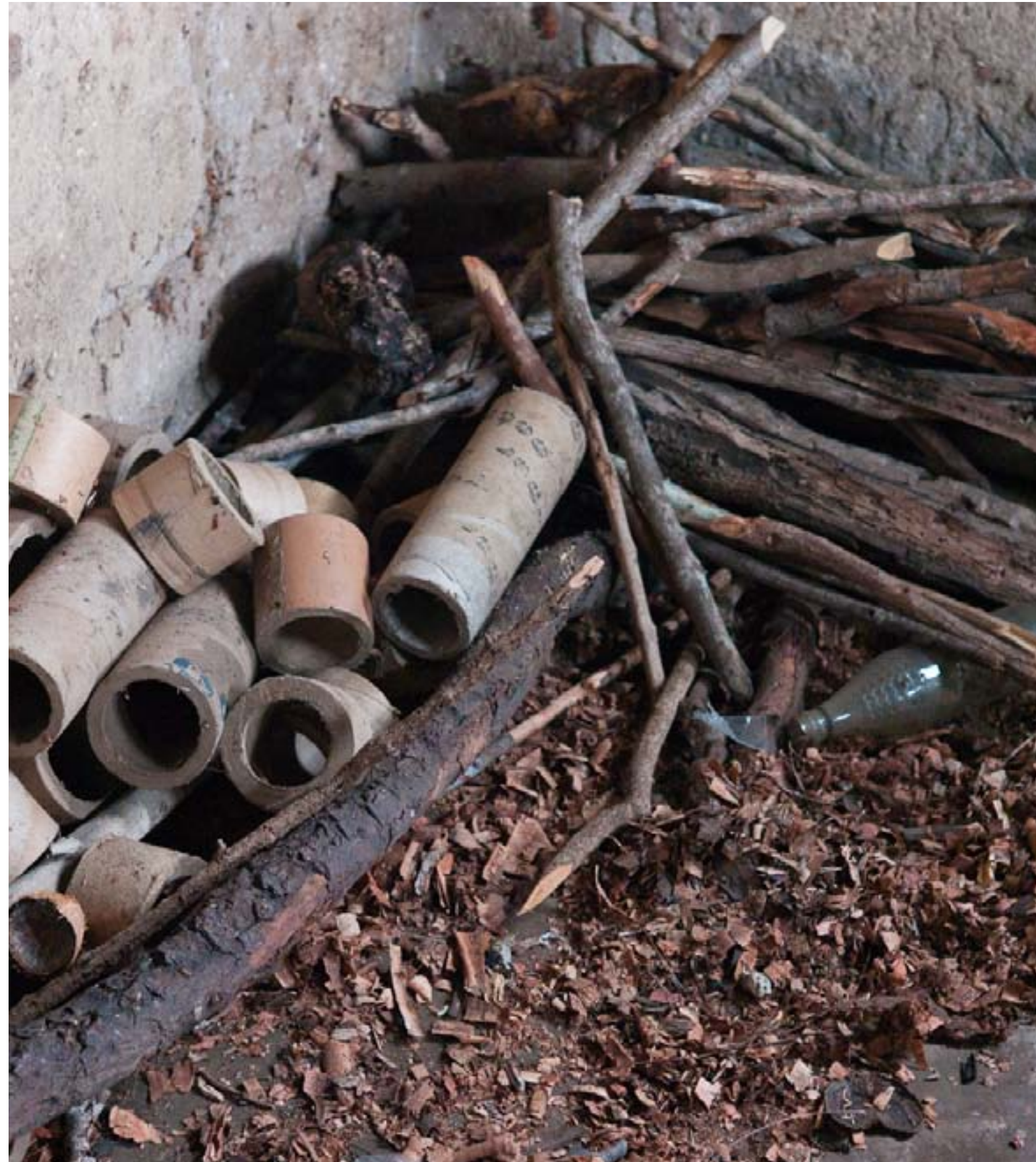
Context

Because there is little variety or nuance associated with the Tanzanian culinary tradition, most people are open to different fuel types and cooking technologies.



Context

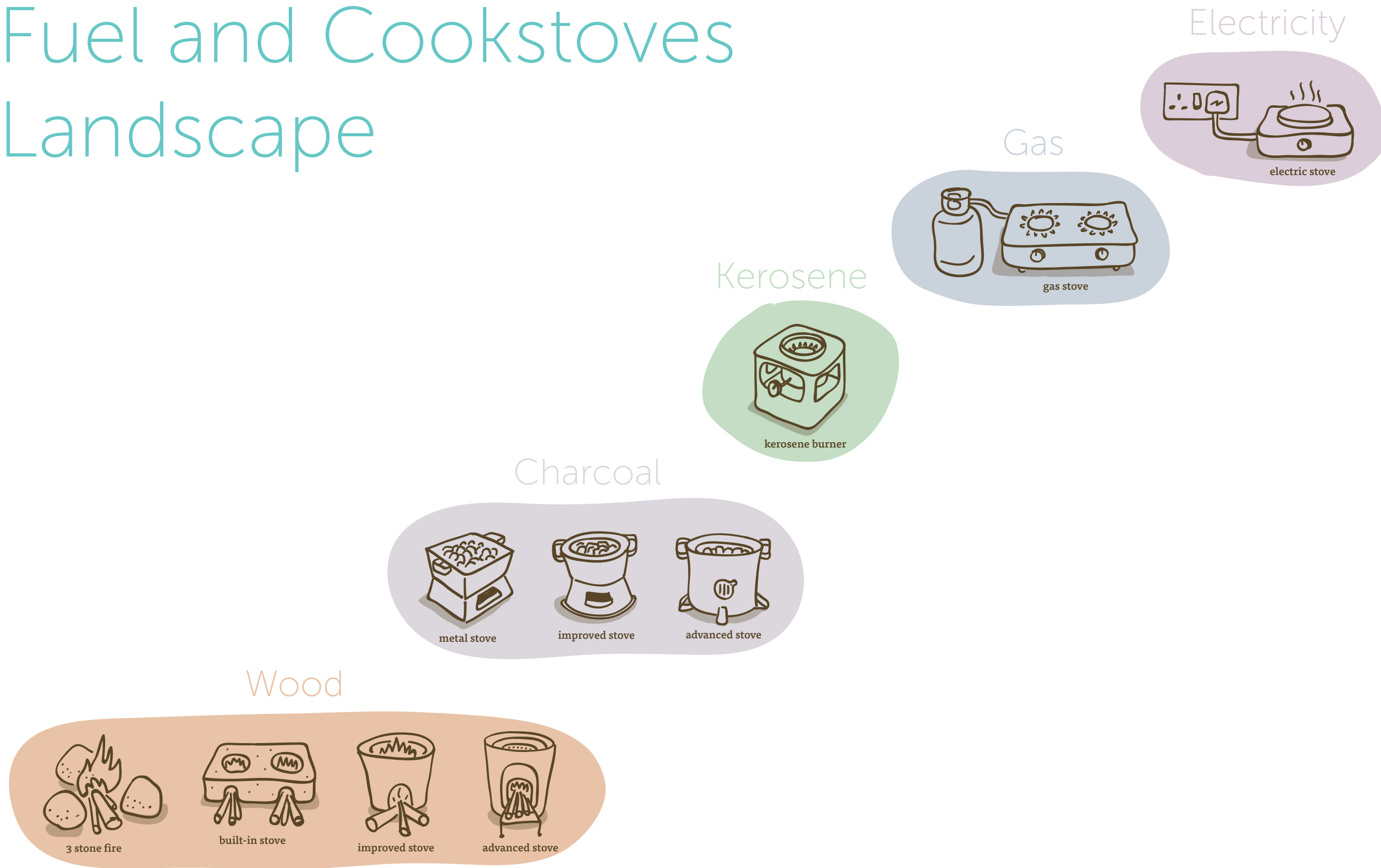
Tanzanian urban markets are dominated by cheap cookstoves of both the metal and clay-lined variety. Most people have the latter, which are usually made and sold by small entrepreneurs at every small market. These cookstoves, even of poor quality, are considered “improved.”



Context

Advanced cookstoves are rare. Most women have some combination of charcoal stoves, a kerosene stove, and a 3-stone fire. Fuels used include wood, charcoal, kerosene, gas, and electricity.

Fuel and Cookstoves Landscape



5 Shifts

Old problems, reframed from a customer perspective



1. From Acquisition to Use
2. From Stove to Fuel
3. From Status to Utility
4. From Saving Fuel to Cooking with Ease
5. From Health to Comfort

1. From Acquisition to Use

Tanzanians find little is certain in their daily lives. Hedging bets is second nature, even when cooking.



1. From Acquisition to Use

5 Shifts

Tanzanians find little is certain in their daily lives. Hedging bets is second nature, even when cooking.

They purchase new cookstoves but this doesn't mean they're always used. Daily challenges and circumstances often cause them to revert to inferior technologies.

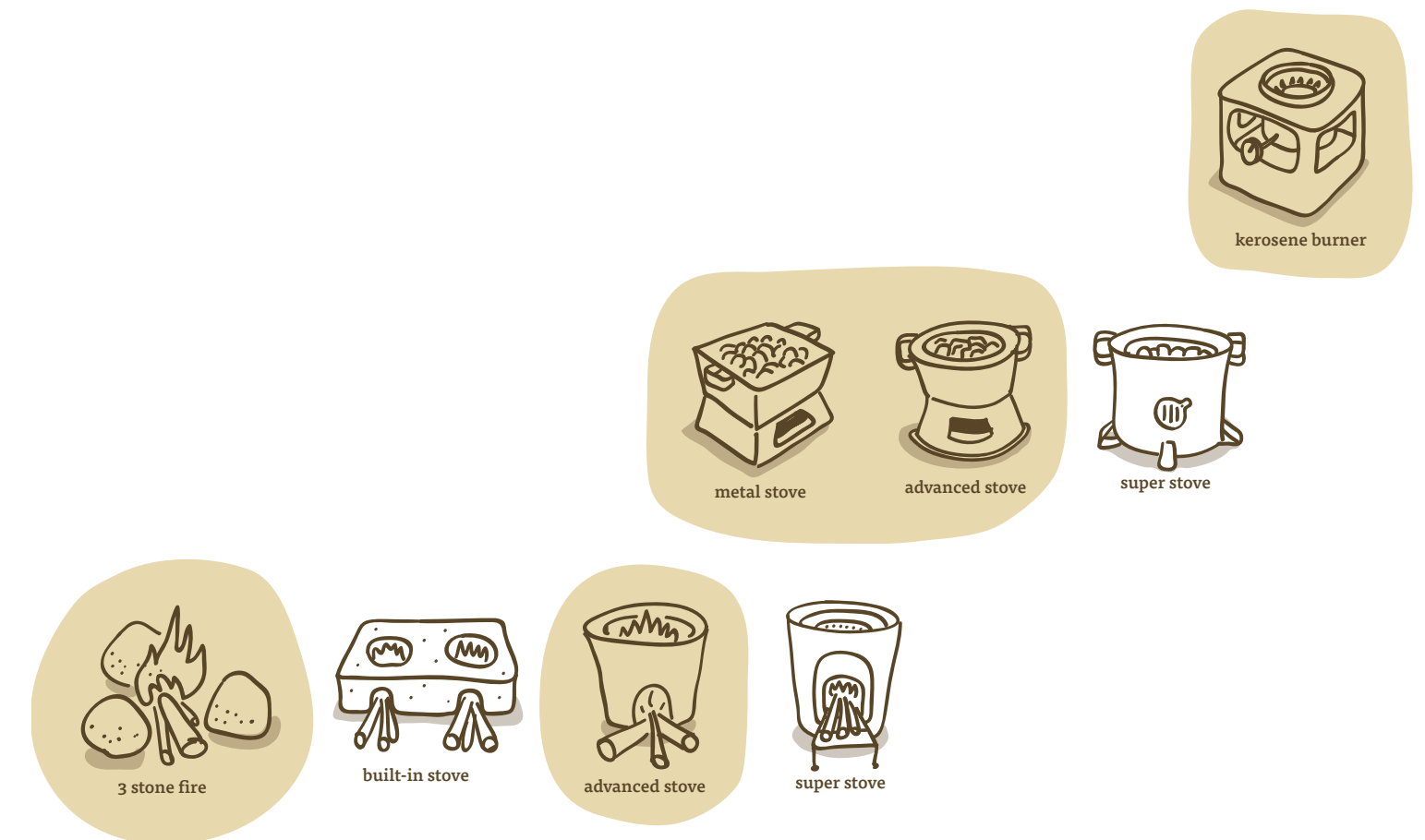




5 Shifts / From Acquisition to Use

Mama Salma, Zanzibar

Mama Salma's "kitchen" contains a host of cooking technologies and fuel types. From wood, coconut husk and charcoal to a 3-stone fire, multiple cookstoves and a kerosene stove, she is prepared for any situation. She uses the kerosene stove in the morning to cook her tea quickly, her charcoal cookstove when she's cooking beans, her 3-stone fire when she can't afford the charcoal, and multiple cooking technologies when her extended family comes to eat.



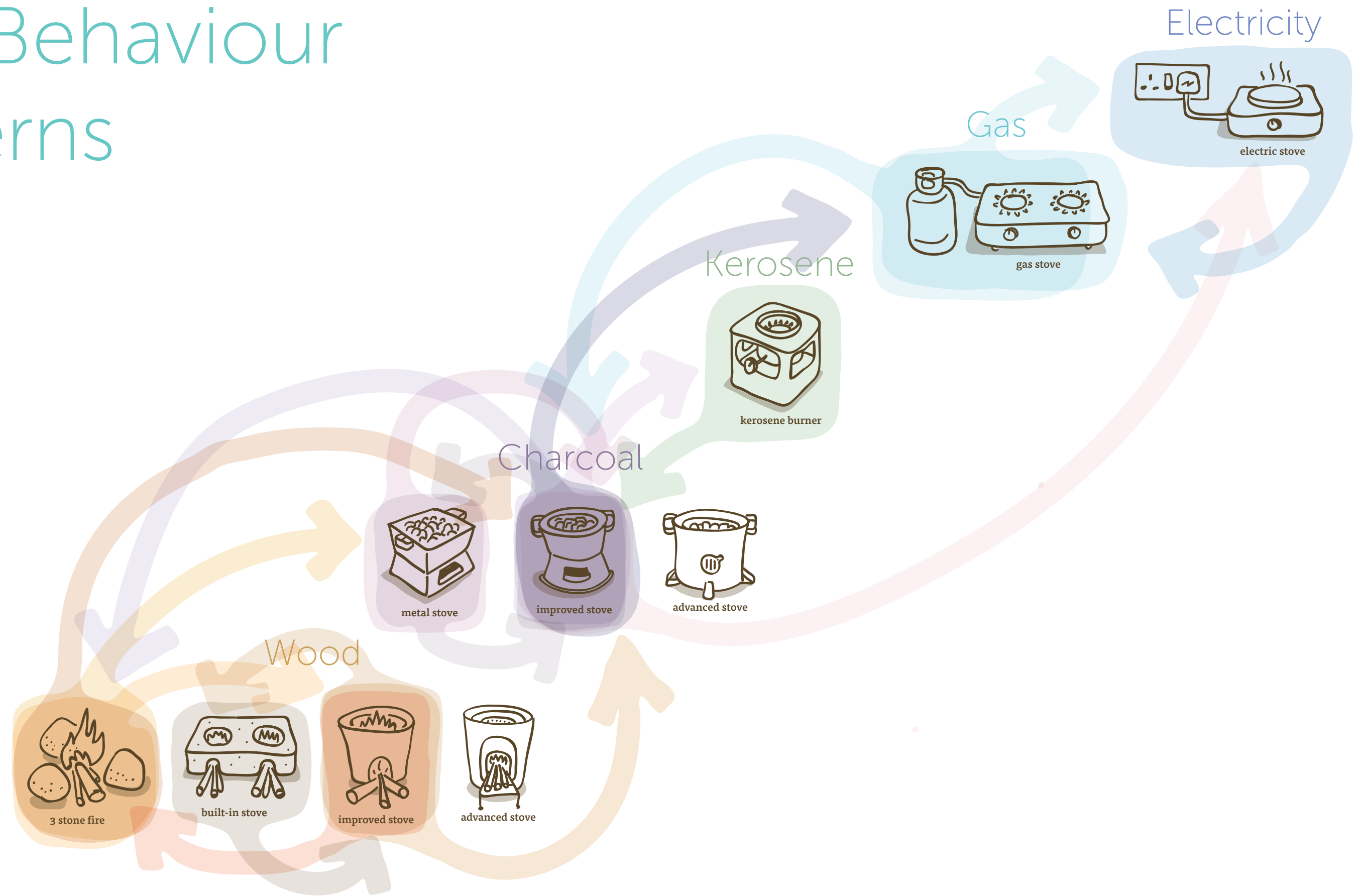
**Anna, Dar es Salaam**

Anna doesn't work. Her husband works nearly 200 km away. The variability of his employment means that she knows how much money he'll send. She makes decisions about her purchases based on how much money she has on a given day. Her daughter recently bought her a sack of charcoal, but she continues to buy charcoal everyday. She saves the sack for when - not if - the money doesn't come.

5 Shifts / From Acquisition to Use**Half gas, half electric**

In high-end appliance stores, the most popular stove top is half gas/half electric. Because even for middle and upper class Tanzanians, the electricity "doesn't always come." People like to have gas just in case.

Use Behaviour Patterns



1. From Acquisition to Use

People are purchasing cookstoves, but not always using them. Shift the focus from the point of purchase encouraging people to use more frequently the best technology available to them.

2. From Stove to Fuel

Fuel is one of a family's top three household expenses: a month's supply of charcoal is 10 times the cost of a cookstove. People struggle daily to afford fuel.



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5 Shifts

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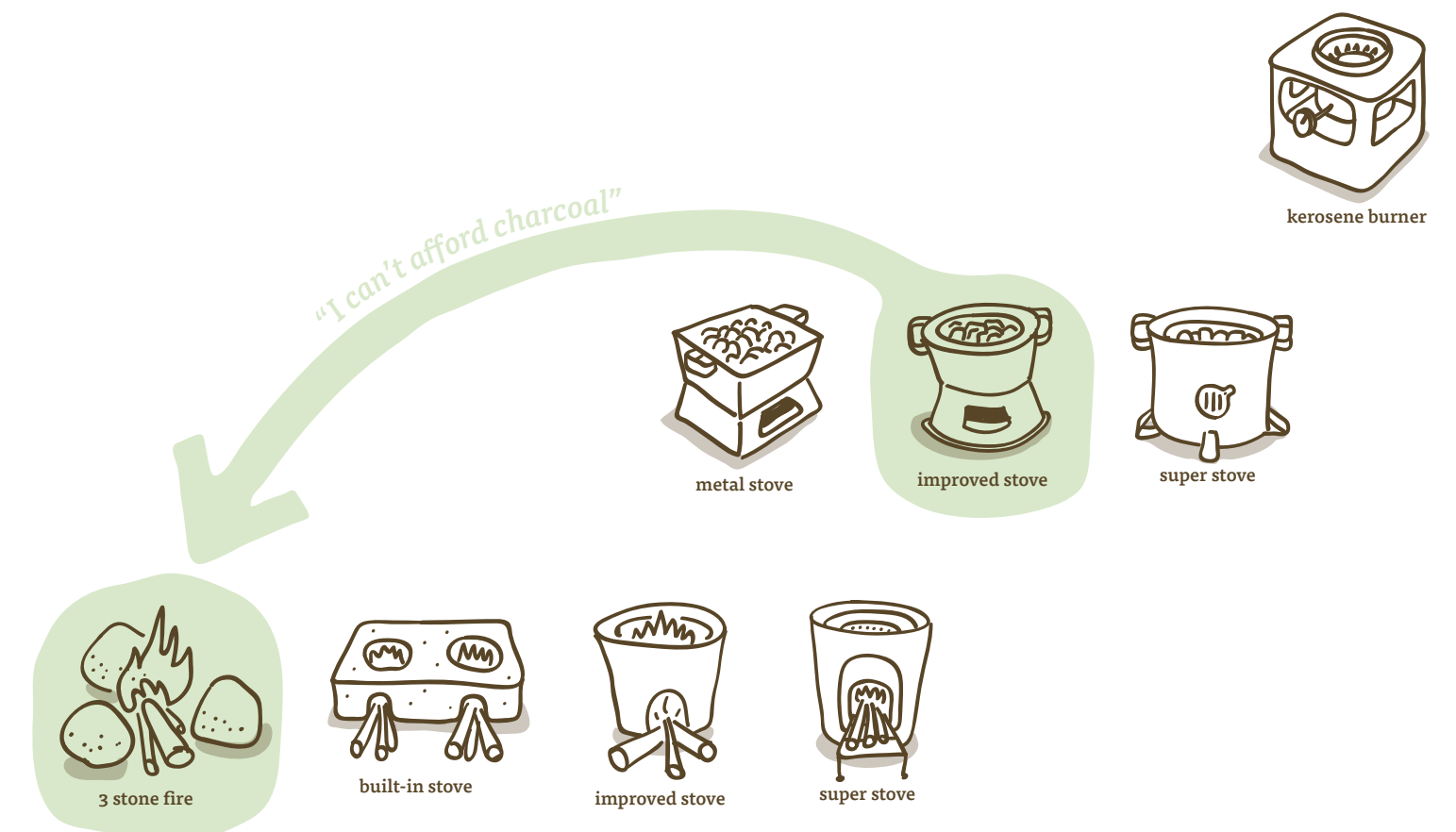
When cooking, the first decision a woman has to make is about the fuel, only then can she choose the stove. And when she can't afford charcoal, the decision is made for her, and she backslides to a 3-stone fire.



5 Shifts / From Stove to Fuel

Kabula, Mwanza

Kabula has acquired several charcoal cookstoves and used to cook with them often. Her husband is a casual laborer. He has not had work in the last 6 months so they can no longer afford the charcoal. But, "wood for a 3-stone fire is always available; I just have to walk far away to gather it."

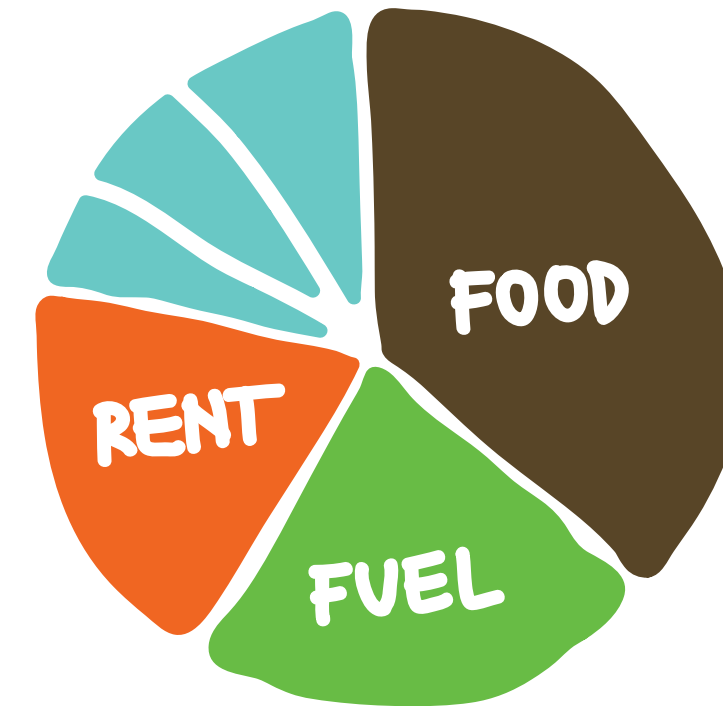




5 Shifts / From Stove to Fuel

Bibi Abdallah, Dar es Salaam

Bibi Abdallah's family has a monthly income of TSH 200,000 - 400,000. They spend TSH 150,000 on food, 40,000 on rent and 40,000 on fuel. Sometimes this is all they can afford to buy in a month, leaving other expenses unpaid.



2. From Stove to Fuel

Fuel drives the decision making process. In order to release people from the burden of fuel expenses, shift the focus from a single stove to integrated stove plus fuel solutions.

Let's Explore

- > Enabling bulk buying of fuel
- > Engaging fuel sellers in the cookstove business
- > Scaling distribution of lower cost and more efficient fuels
- > Making fuel savings of efficient cookstoves more tangible

5 Shifts / From Stove to Fuel / Concepts

Community Fuel Purchases

Using already existing community networks, facilitate community purchases of bulk fuel. Many women already belong to Savings and Credit Cooperatives (SACCOs) and are used to group savings and lending. Use this mechanism as a means to buy and distribute charcoal to members.





5 Shifts / From Stove to Fuel / Concepts

Fuel Subscription Model

The buyer would pay a fixed amount for a months supply of charcoal delivered every few days to their home. The seller would guarantee the months supply and provide an fuel efficient cookstove to the consumer. The more efficient the cookstove, the less charcoal used, the less the seller has to top up, and the more profit he is able to capture. This gives him incentive to provide an efficient cookstove and market its use to his customers.



5 Shifts / From Stove to Fuel / Concepts

Alternative Fuels

Design and promote low cost efficient fuel manufacturing, sales, and distribution. Briquettes and pellets are efficient and low cost fuels that are not widely available. Ramp up production and distribution and consider marketing techniques such as comparisons in cooking times or cost with charcoal. Focus efforts on the benefits of the alternative fuel and use and equivalent measurement system. It's important to help people distinguish between charcoal and alternative fuels.

3. From Status to Utility

In Tanzania, all expensive purchases that represent status reside in the living room, not the kitchen.



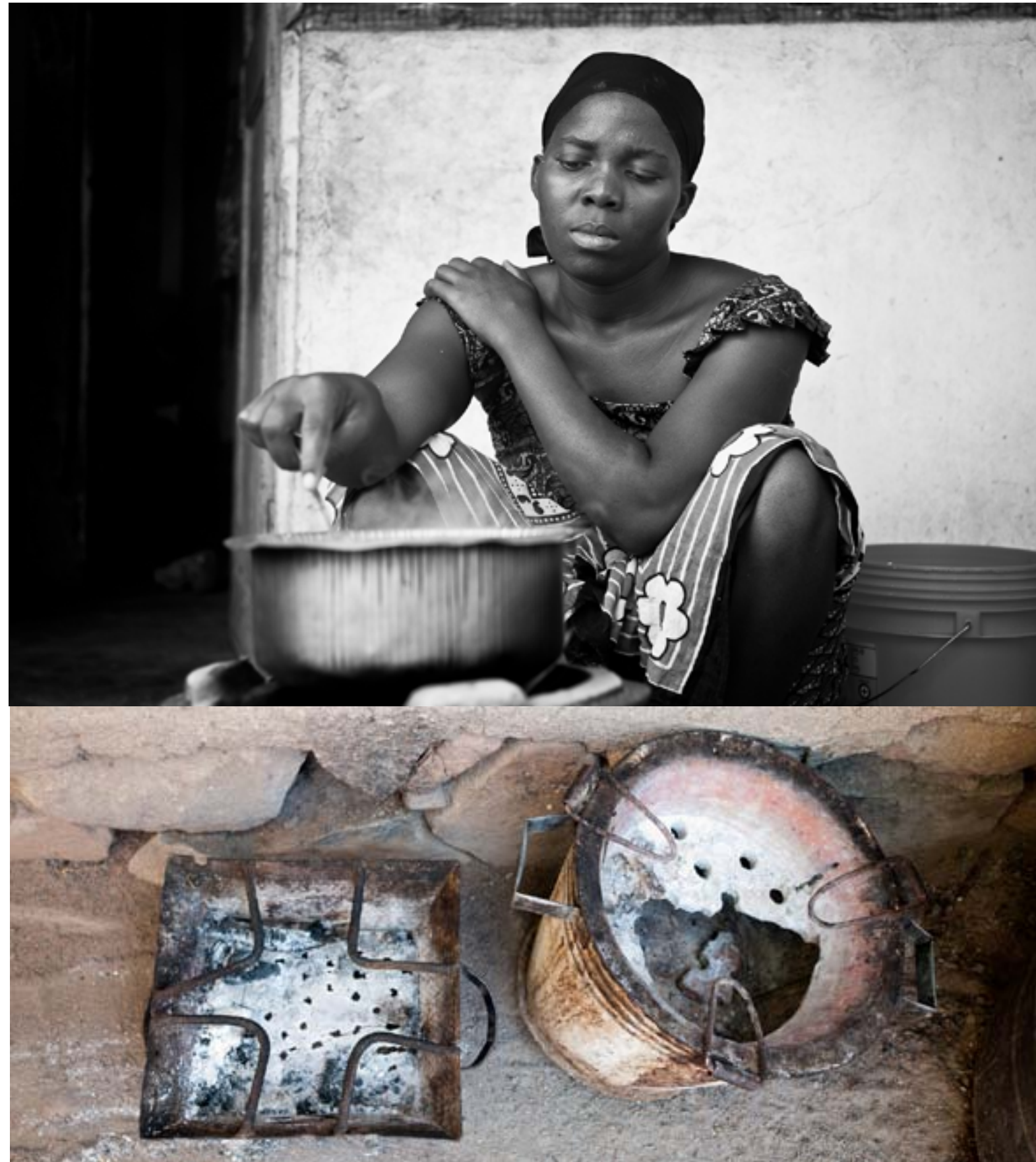
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5 Shifts

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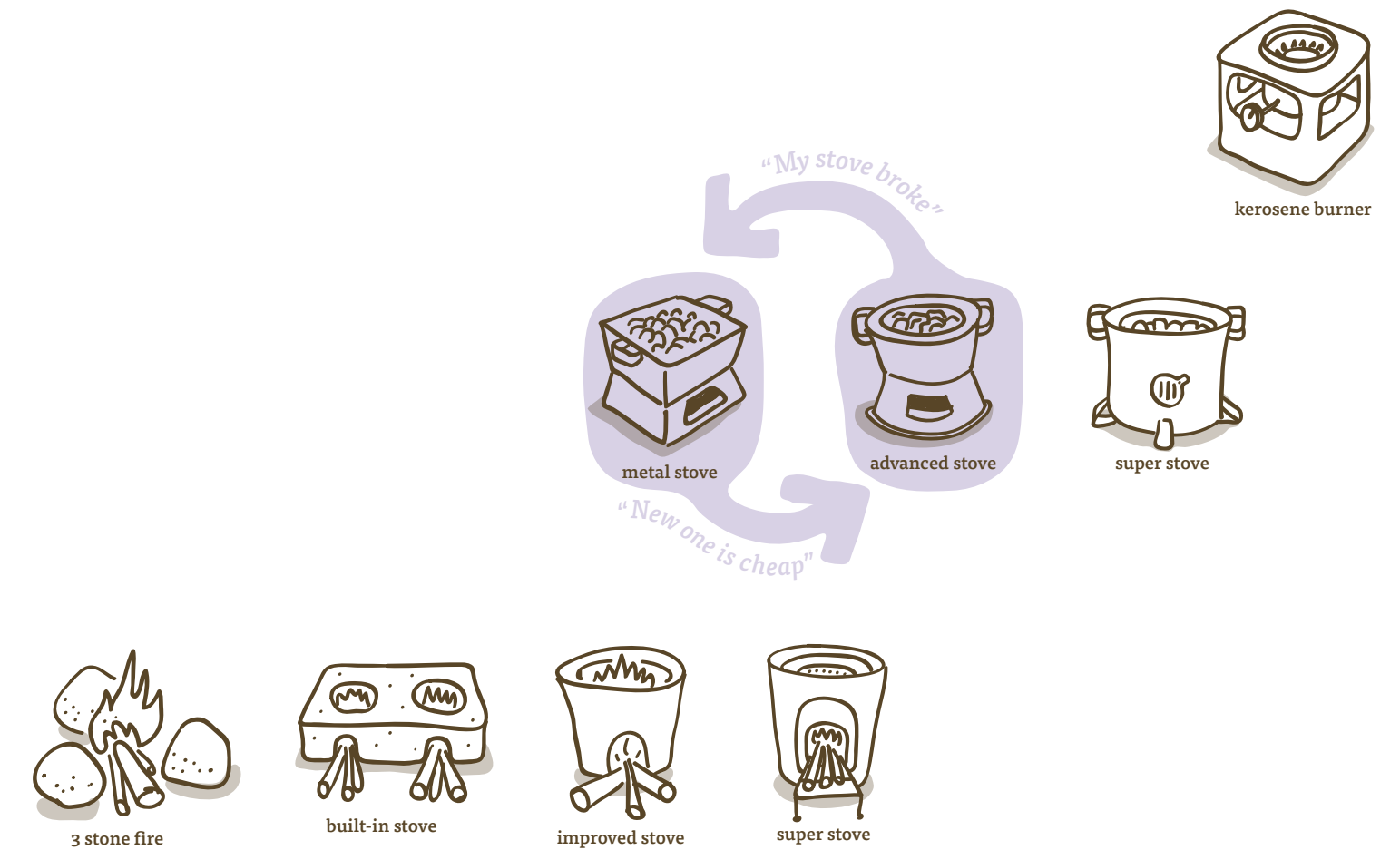
Cooking is a chore and cookstoves are utilitarian items that people are not willing pay much for. As a result, they are cheap and disposable.



5 Shifts / From Status to Utility

Jacklyn, Mwanza

Jacklyn has owned several improved cookstoves. Her improved stoves never lasts for long, but she keeps buying them because she understands the value of them. They are also cheap and available everywhere. For the times when needs to cook before she can buy a new cookstove, she has a heavy duty metal back up.





Asha, Dar es Salaam

Asha's living room is nicely decorated with her valued possessions, including her new stereo. She saved up TSH 100,000 by giving a small amount every time she had some extra to the electronics dealer. She has no formal kitchen, storing pots and pans in the corner of her living room and keeping her jiko in the hallway outside her door. .

5 Shifts / From Status to Utility



Pontis, ARTI

"When we sell LED lights we can really emphasize the 'snob value.' When you have solar powered lights, your neighbor can see when your house is lit up bright and everyone else's has gone dark. Cookstoves don't have that."

3. From Status to Utility

Embrace the low margin, high volume nature of the product and create innovative business models to increase innovation. Re-define the product category and value proposition by radically shifting the functionality and performance of the cookstove.

Let's Explore

- > Leveraging the cookstove as a high volume, low margin, disposable product
- > Taking advantage of “copy cat” low quality, high distribution producers
- > Finding new channels to market and distribute advanced stoves
- > Presenting a new way of cooking to women

**Replacement Liner Business Models**

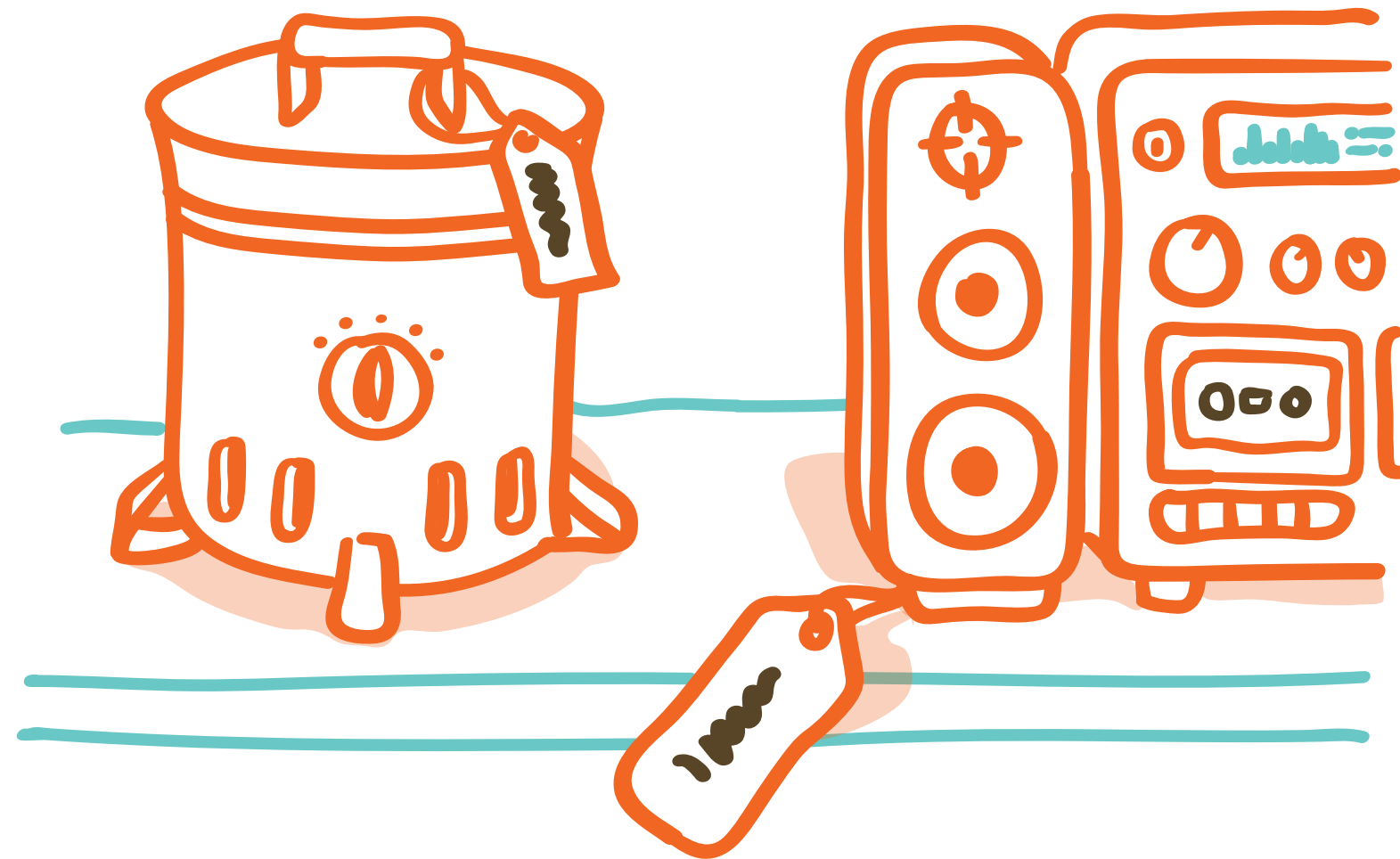
Promote replacement business models such as selling each cookstove with several replacement liners already attached, offering discounts on repairs and replacement liners, or selling only replacement liners. Maintenance and care education could also be combined.



5 Shifts / From Status to Utility / Concepts

Innovation and Copy Cats

Introduce easily copied innovations into the market in cookstove design, service deals, promotions, and marketing strategies. Use natural vectors for introduction and imitation such as low quality cookstove manufacturers, market and street vendors, annual fairs and exhibitions, churches, schools, and community groups.



5 Shifts / From Status to Utility / Concepts

Create new product category for mass produced advanced stoves

Create new channels and new cooking practices for the Tanzanian market. Seek out different retail outlets (e.g. electronics stores) and practical consumer financing (e.g., micro-leasing, formal layaway, money back guarantees). Advanced stoves must revolutionize the way people cook such as steaming food or cooking different kinds of food in order to be distinguished from the traditional cookstove market.

4. From Saving Fuel to Cooking with Ease

People understand the value of efficient cookstoves when they buy them, but when it comes to each individual day, the benefits are too small to matter.



4. From Saving Fuel to Cooking with Ease



5 Shifts

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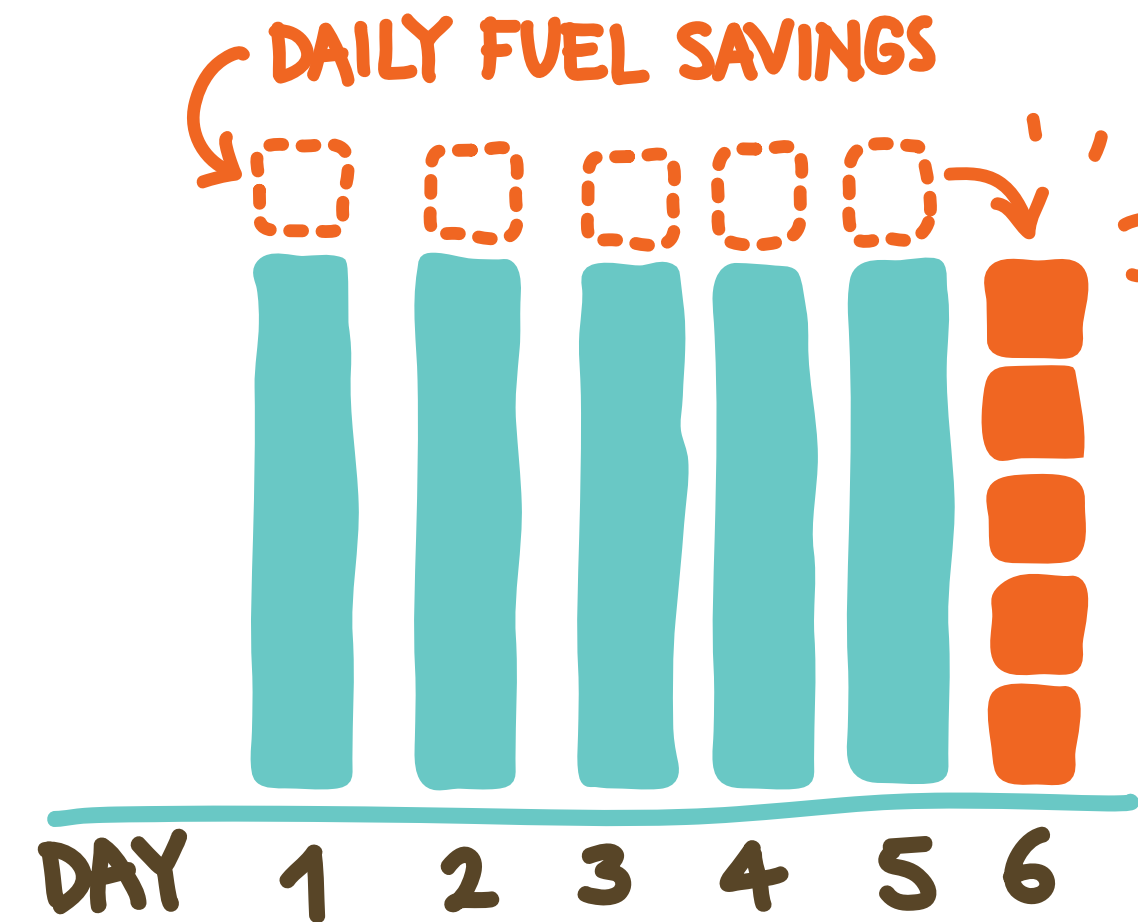
What does matter every day is how arduous it is to cook a meal. Women will always default to the easier choice, making them value things that help make cooking easier and faster.

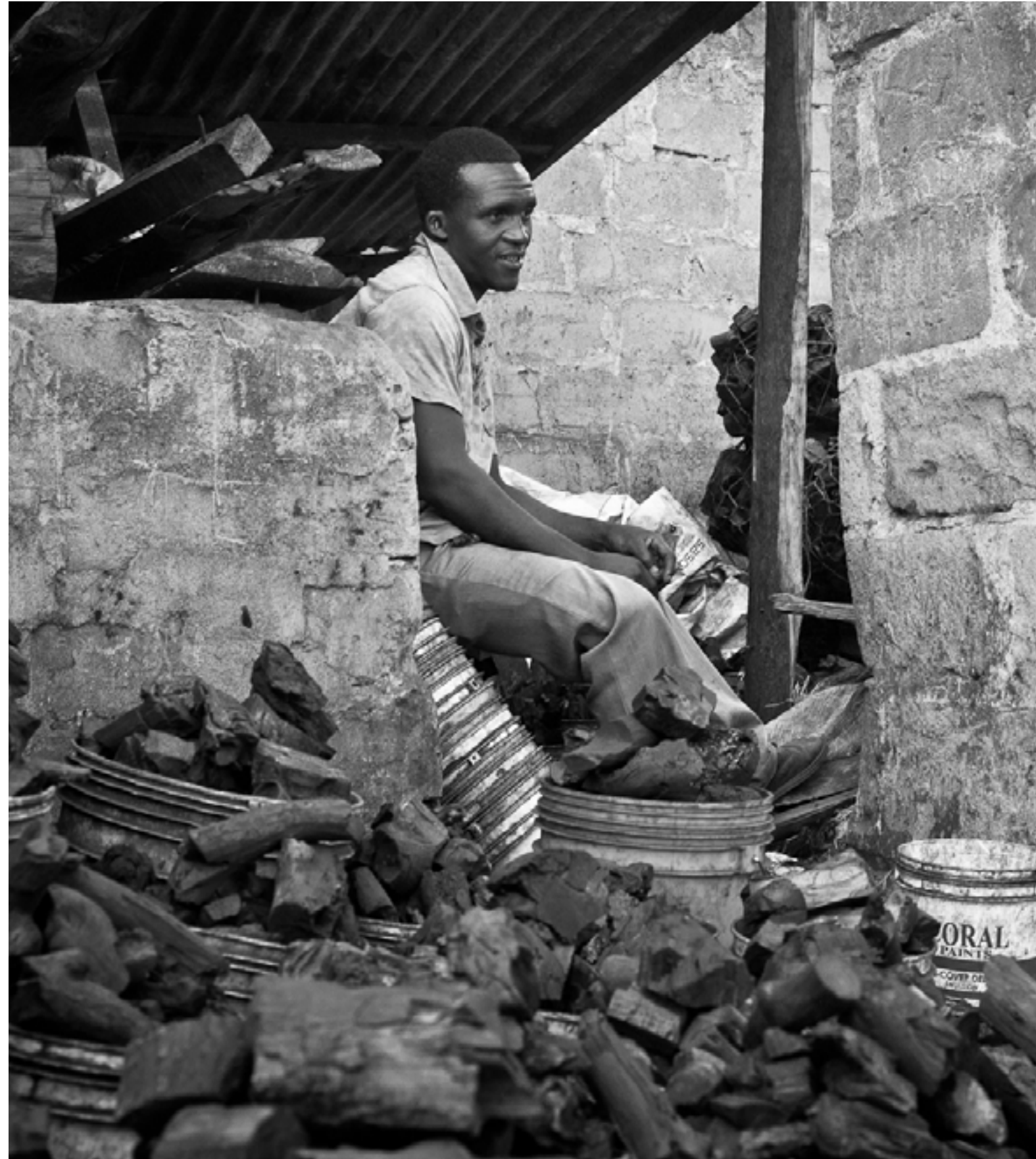


5 Shifts / From Saving Fuel to Cooking with Ease

A tin per day

Improved cookstoves cut fuel consumption significantly. But because people buy charcoal by the day rather than by the month, they don't feel the fuel savings. The savings from tin purchases are so small that it would take a week of purchases to save the equivalent of a tin, and eliminate the need to buy charcoal for a day.





5 Shifts / From Saving Fuel to Cooking with Ease

The fuel ladder

Currently, the only way to increase ease of cooking is to move up the fuel ladder and most women aspire to next level up of fuel. Most women understand that the greatest ease of cooking comes with using gas or electric as your primary fuel source.

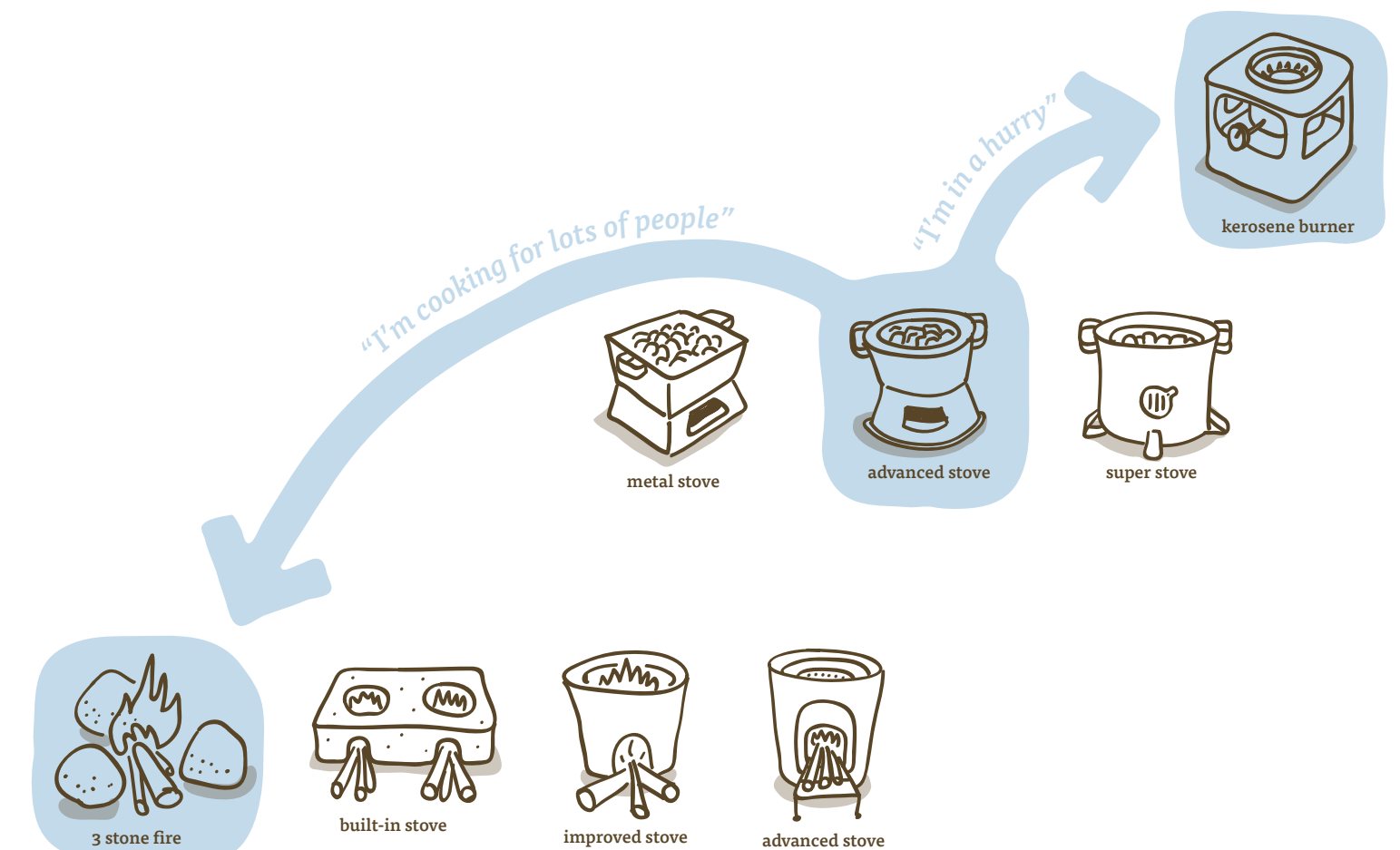




5 Shifts / From Saving Fuel to Cooking with Ease

Mama Sarah, Mwanza

Mama Sarah's default cooking option is a charcoal stove. In the morning, since she has little time to get the kids off to school, she uses her small kerosene stove to make tea. However, when she has guests over for a meal, she has no choice but to use her 3-stone fire. It is the only thing she has that will accommodate the amount of food she needs to cook.



5 Shifts / From Saving Fuel to Cooking with Ease

**Mama Salma, Zanzibar**

Mama Salma cooks on a wood jiko and has many discarded charcoal cookstoves in the corner. The cookstoves are all the same to her. Her favorite cooking possession, however, is her blender, which she bought to make the arduous task of making coconut milk easier. She saved up to buy it and it's a vast improvement over the traditional "mbuzi."

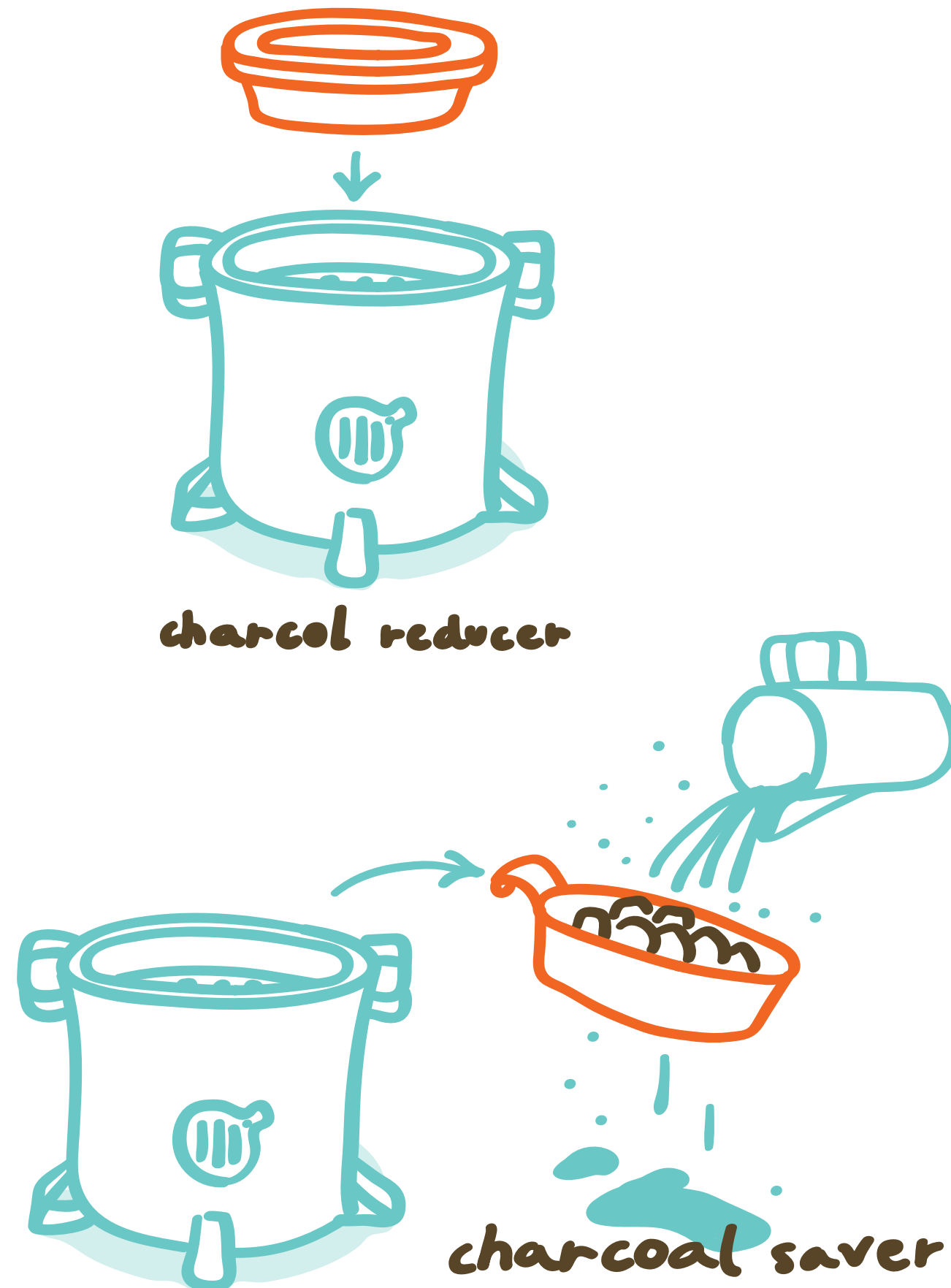
4. From Saving Fuel to Cooking with Ease

Ensure that, at a minimum, fuel efficiency doesn't undermine the ease of use of a cookstove.

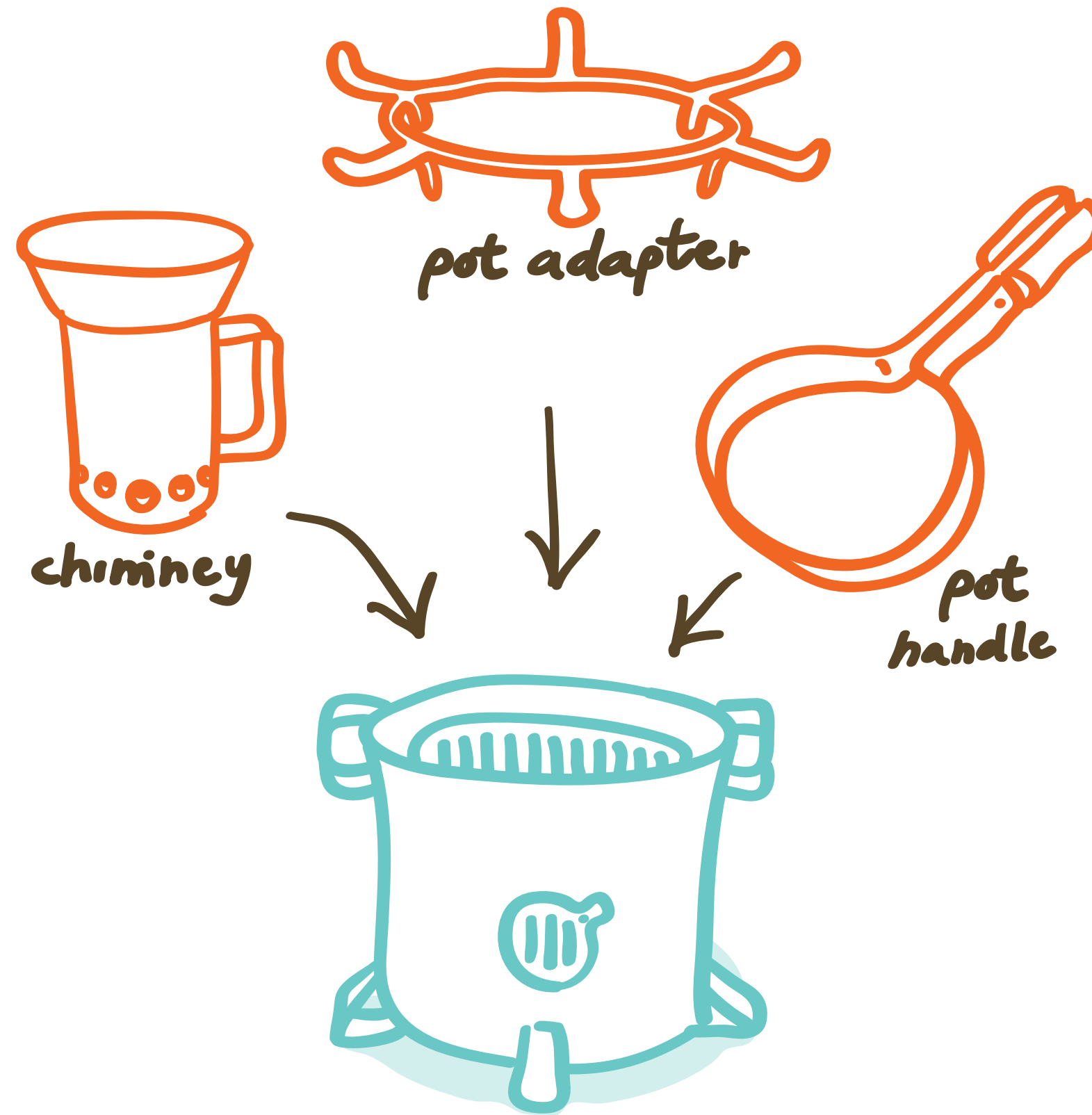
Furthermore, increase the functionality of efficient cookstoves to make them an easier choice.

Let's Explore

- > Introducing new features to make the cookstoves more desirable
- > Designing additional products to make cooking on cookstoves easier
- > Adding new industry standards around functionality as well as efficiency.

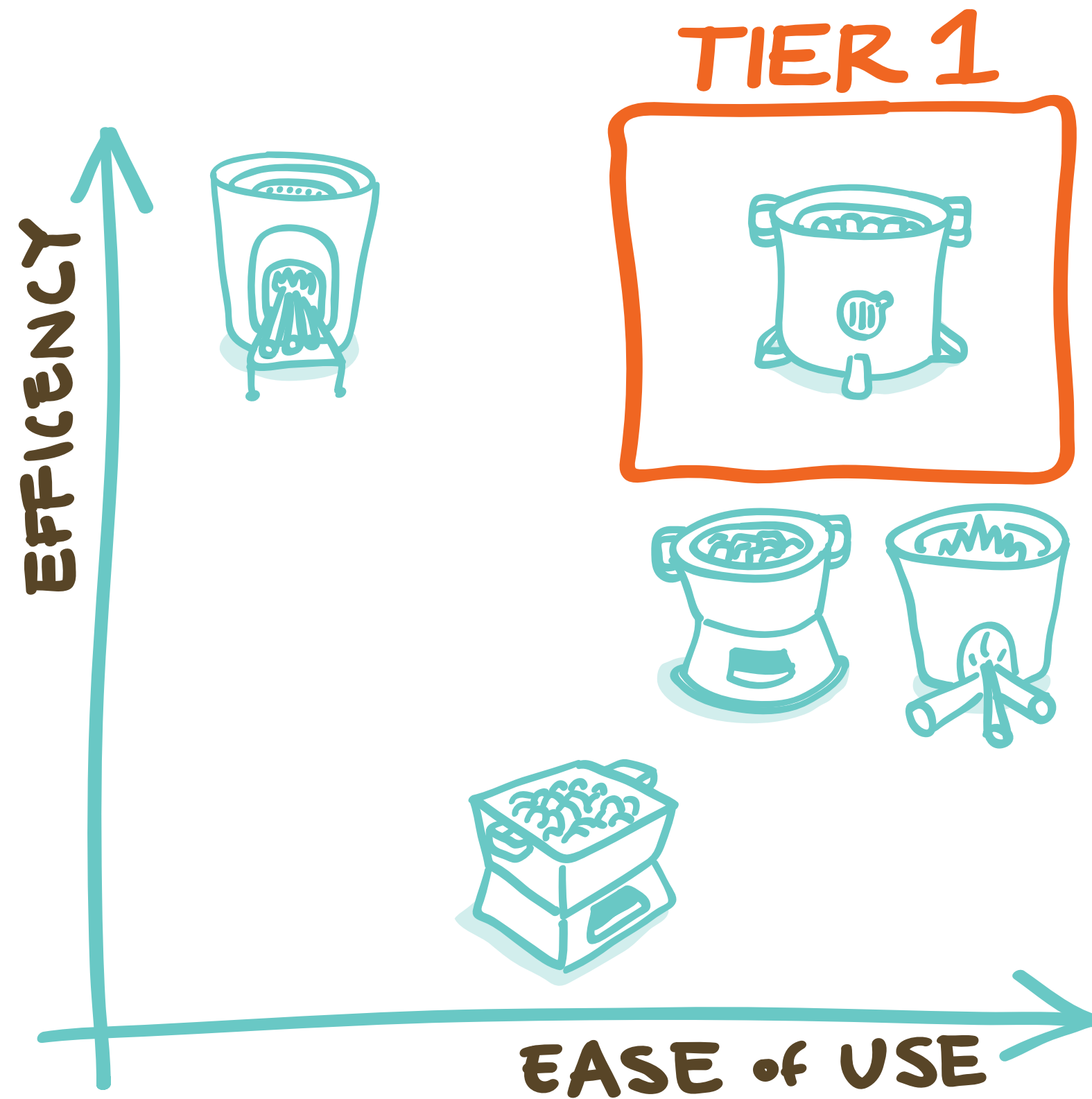
**Design improvements to existing cookstoves**

Design modifications could enable clean cookstoves to be marketed and sold with additional ease of use features. For example, you could make additional clay liners to reduce the charcoal used and give women options based on the amount of food she is cooking. You could also produce a thin metal liner with a handle that would enable women to save charcoal after they are finished cooking by pouring water over it without cracking the clay.

**"Easy cooking" accessories**

Develop a line of "easy cooking" accessories to package with clean cookstoves to incentivize sales and use. Design a suite of attachments like a quick light chimney, pot adapter, and pot handle.

5 Shifts / From Saving to Ease / Concepts



Create standards around ease of use as well as efficiency
The Alliance could spearhead a set of standards on ease of use. It would help members understand the balance of efficiency and ease of use that needs to be achieved for their products to be successful in the market.

5. From Health to Comfort

People understand the health impacts of open fires, but future health concerns don't outweigh present economic realities.



5. From Health to Comfort



5 Shifts

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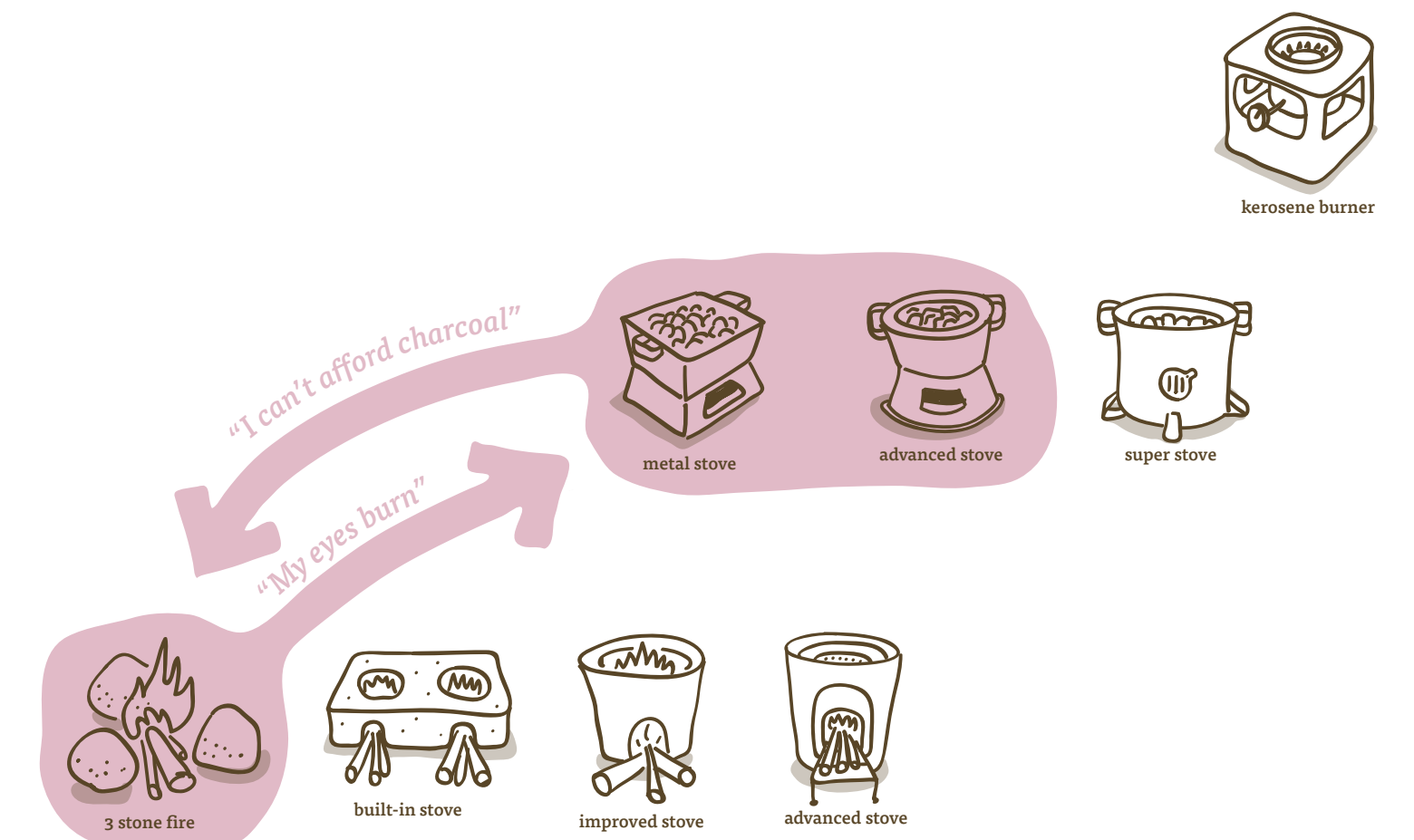
What matters to people is immediate personal comfort, like coughing and red-eyes. Bringing comfort in line with daily realities makes it easier to take it into consideration against economic pressures.



5 Shifts / From Health to Comfort

Maimuna, Kwala

Maimuna complains that her 3-stone fire causes coughing and “pain to the eyes.” She would prefer to use charcoal because it’s less smoky. Yet, because of its expense, she chooses to continue to use 3-stone fire, in spite of her discomfort.



**Nema, Mwanza**

Because her family doesn't have a lot of money, Nema almost always uses a 3-stone fire in her courtyard. But occasionally, when it rains heavily, the wood is wet and its uncomfortable to cook outside. "Its just much better to buy a little charcoal and cook inside." For these times, she has a small clay lined cookstove that she can easily move around.

5 Shifts / From Health to Comfort**Mama Fausta, Mwanza**

Mama Fausta believes that cooking on a cookstove is a major improvement over her 3-stone fire. Because the cookstove produces far less smoke than the fire, she can now "cook in her nice clothes."

5. From Health to Comfort

Because people care more about personal comfort and are focused on near term realities, reframe messaging in terms of immediate comfort rather than long-term health.

Let's Explore

- > Messaging around cookstoves to address comfort rather than health



5 Shifts / From Health to Comfort / Concepts

Marketing Campaign: Cookstoves for Comfort

Develop a marketing and awareness campaign that focuses on aspects of a woman's personal comfort or physical vanity while cooking rather than long-term health benefits. Market cookstoves as "clean stove, clean clothes" or as a way to reduce red-eyes or your cough: feel better, look better, and still get your cooking done.

1. From Acquisition to Use
2. From Stove to Fuel
3. From Status to Utility
4. From Saving Fuel to Cooking with Ease
5. From Health to Comfort

Next Steps



1. Introducing the Alliance's member's to the **HCD methodology** employed during this project could help the cookstoves industry get closer to the customers, ultimately resulting in increased adoption.

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2. Disseminate this research to the Alliance's partners, and use it to expand the conversation both about the HCD methodology and the insights and opportunities uncovered in this document.
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3. Many of the opportunities and initial ideas in this deck are easy wins. By identifying the right partners on the ground they could easily and cheaply be **prototyped, evaluated, and refined** giving us a unique opportunity to deepen our understanding of the cookstoves market.
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Thank you

For collaboration and support

GVEP International

Simon Collings, Laura Clough, Helmut Nyoni, Faustine Msangira

TaTEDO

Estomih Sawe, Everline Kihulla

Berkeley Air

David Pennise, Dana Charron

GTZ

Anna Ingwe

Aprovecho

Dean Still

Trees Water People

Sebastian Africano

Columbia University

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