EPIC2016

Papers 4 – Emerging Consumers

What Is a Sustainable Innovation? Cultural and Contextual Discoveries in the Social Ecology of Cooking in an African Slum

WILLIAM SCHINDHELM GEORG
Bridgeable

PETER HAYWARD JONES
OCAD University

This paper investigates how a close understanding of human activity can inform the design of culturally and contextually sustainable innovations for subsistence markets. Building on existing literature related to poverty alleviation initiatives and an ethnographic field study, this project attempted to understand the cultural and contextual challenges to the substitution of unhealthy and unsustainable biomass as cooking fuels by cleaner and competitive cooking alternatives in Kitintale, an urban slum in Kampala, Uganda. We share new research findings and experience from a recent ethnographic study that reveals the incompatibility of modern innovation theory with the realities of the deeply knitted everyday practices in the social ecology of slum life. As the findings of this project suggest, broad claims that disruptive innovation can shift existing practices, change demand and displace market leaders through the creation of new value networks might not fully apply in a context where the existence of cultural patterns have shaped the evolution of indigenous solutions over generations, and reactivity to daily circumstances is high.

THE LOCALIZED FACE OF POVERTY AND PRACTICES

More than one third of the world population—about 2.6 billion people—used traditional biomass as a source of energy for cooking in 2010 (IEA, 2012). In Sub-Saharan Africa, where about 79% of the population relies on this type of fuel, the most prevalent indigenous cooking fuel is charcoal, which in recent decades has proliferated as the main alternative to firewood as cooking fuel (IEA, 2012). Both have significant destructive consequences, including illegal deforestation and widespread health problems suffered from cooks and their families from the persistent use of charcoal in indoor cooking.

Numerous commercial and not-for-profit organizations advocate the substitution of cleaner cooking fuels, stoves and practices in these cultures as their focal innovation objective, supported by more affordable and accessible cooking systems that promise positive health and financial impacts to low-income households currently using charcoal in their everyday lives. In 2010, Hillary Clinton launched the Global Alliance for Clean Cookstoves in an attempt to create a global market for "clean and efficient household cooking solutions" that could "save lives, improve livelihoods, empower women and protect the environment."

No doubts the Alliance has achieved several accomplishments, the most important one in these authors' opinion being the increased awareness of the problem. However, the resolution of this challenge has not yet converged on a ready or simple solution. Improved cooking systems, regardless of their lower cost and potentially better accessibility, have not significantly replaced traditional stoves and biofuels in subsistence settlements where they are made available.

2016 Ethnographic Praxis in Industry Conference Proceedings, p. 235–248, ISSN 1559-8918,
https://www.epicpeople.org

This project attempted to understand the contextual and cultural challenges to the substitution of unhealthy and unsustainable biomass as cooking fuels by cleaner and competitive cooking fuel alternatives in Kitintale, an urban slum in Kampala, Uganda.

UGANDA: URBANIZATION AND THE BIRTH OF SLUMS

In pre-colonial times, societies in Uganda were organized around several tribal kingdoms. At that time, the Kibuga—moving capital of the Buganda kingdom - was structured based on rural modes of administration, and agriculture was a fundamental part of the urban fabric. As the ultimate centre of population, governance, and source of decisions, the Kibuga is considered a physical manifestation of the hierarchical, centralized system it sustained, as well as a cultural transmitter (Hull, 1976). The Kibuga remained the predominant social structure until 1894, when the British Crown announced a protectorate over Uganda, taking over the administration of the country. The city of Kampala became the headquarters of colonial administration, and started to develop next to the Kibuga, the indigenous capital. It wasn't until 1912 that Kampala saw its first modern planning scheme, forming the basis for what is today's central Kampala. Due to concerns over the transmission of tropical diseases, the plan for the city imposed order and social controls, transferring Africans to the outskirts of the city or to the Kibuga, thus planting the seeds of racial segregation (Gutschow, 2009). Several other planning interventions took place until in 1945, British authorities commissioned German architect and city planner Ernst May to create a plan for Kampala. His concept of a garden city emphasized the organic topography of the region, yet is also included large settlements for low- and middle-income Africans and Asians, setting aside entire neighborhoods for Europeans, and further reinforcing segregation (Gutschow, 2009).

Notably throughout this process, urban planners in the region protested that Africans seemed to resist permanent settlements and noticed that, when they did stay in the city, they could only afford crude mud huts with metal roofs (Gutschow, 2009), which closely resemble the simple round wattle-and-daub grass-thatched huts in which rural Ugandans still reside in modern days. Based on this perception, May's plans encompassed features that attempted to acculturate natives into European social norms, 'inducing the African laborer to become more stable, and to cease wandering back to his village after a few months' (Gutschow, 2009).

It is interesting to emphasize that Kampala essentially evolved as a modern center next to the traditional Kibuga. While the city was designed and built based on modern urban principles, the Kibuga was based on the traditional rural systems and this difference created a set of development tensions (Mugema, 2013). Under these circumstances, in 1968 nine villages surrounding Kampala became officially part of the city, marking the amalgamation of the traditional and the modern city (Musinguzi, 2013).

After a period of economic downturn, conflicts, and civil strife between the 70s and 80s, the restructuring of the national economy led to population shifts in Kampala, which reflected in changes in urban land uses. Most town settlements at that moment occurred without planning, were not recognized by urban authorities and therefore, declared illegal. Today, as existing urban plans for the main cities expired, most of the urbanization taking place in the country can be characterized as informal, organic or haphazard (Mukwaya, Sengendo, & Lwasa, 2010). As a result, housing in the capital is considered far from

satisfactory or substandard—about 80% of households in Kampala lack toilets. Rental accommodations account for 65% of households, even in informal settlements. In these areas, where 80% of households are in the low-income group, incomes are generally low, intermittent and uncertain, and small informal home-based enterprises have become an important element of livelihoods, predominantly contributing to household earnings (Mukiibi, 2012).

The Research Setting

The fieldwork described in this paper took place in Kitintale, a community in Kampala characterized by extreme poverty. The research was done in a period over three months between November 2014 and February 2015 and encompassed field observations, as well as in depth interviews and delicious meals with Kitintale's residents.

Even though there are no official estimates, rough calculations indicate that Kitintale encompasses about 4,000 households. Household size ranges from one person to entire 13 people families, but at an average household size of 3.6 people, one can claim that Kitintale is home to approximately 14,400 people.

Kampala has consistent water supply throughout the year, but even though the distribution network covers more than 70% of the city, access in poor communities is remarkably lower. Typically, Kitintale residents rely on free water from public springs, buy water from prepaid standpipes installed by the National Water and Sewerage Corporation or buy from the small minority with private connections, who make a profit by selling it. Regardless of the source of the water, it is a widespread habit in the community to boil it before drinking, which is done at home, in the same stove that's used for cooking the household meals.

When it comes to cooking, 87% of Kitintale households rely on charcoal as the main cooking fuel. Of all charcoal users in the community, eight out of ten are buying the fuel on a daily basis and nine out of ten do it from a supplier that's less than ten minutes walking distance from home, a sign of the pervasive availability of the fuel in the area. Charcoal is brought to Kampala and Kitintale by truck drivers who buy large volumes of sacks from the rural producers as far as several hundred kilometres away from the city. The fuel is then sold to the urban population by a huge network of retailers. Typically slum dwellers with very limited working capital who operate from small shops close to, or at home—retailers dismantle the bags, sort the charcoal chunks by size (large and small) and sometimes by quality (hard and soft) before selling it to the final users in used tins, the common unit of measure for the fuel. Because the price of a tin can't be adjusted by a single retailer without a general price adjustment in the area, to cope with the remarkably high competition, some retailers adopt retention strategies such as quality differentiation, giving away crushed charcoal at every purchase, as well as leveraging personal relationships with customers. The women, being responsible for all household-related activities like cooking, fetching water and buying food and fuel, tend to be fairly aware of charcoal quality differences. Kerosene, an alternative cooking fuel in Kampala's slums, is only available at gas stations along main roads.

It is important to highlight, at this point, that the charcoal system is complex, dynamic and many of its variables are highly context dependent. This project attempted to map the

contextual dynamics that might affect adoption and usage of charcoal and other cooking systems in Kitintale.

LIFE IN CONTEXTS OF POVERTY

Defining poverty in general terms can be controversial, especially when the definition is based on culturally insensitive quantitative indicators, such as household income. As a response, some authors attempted to portray poverty contexts qualitatively, rendering the living circumstances of poor people in frameworks that support their particular objectives.

Amartya Sen, for instance, described poverty as a set of interconnected "unfreedoms" in capability and opportunity, dimensionalizing it in terms of economic, physical, psychological and knowledge deprivations (Nakata & Weidner, 2012). Caroline Moser, on the other hand, focused her description on what the poor have, rather than what they do not have, categorizing their fundamental resources into an asset vulnerability framework comprised of labor, productive assets, human capital, household relations and social capital to assess urban poverty reduction strategies (Moser, 1998).

Others define poverty contexts as *loci* for transactions, eventually unfolding the main characteristics that could affect new product adoption. Prahalad, for instance, defined poverty contexts as markets characterized by illiterate consumers, poor in health and of meager resources, as well as inaccessible geographically and by the media, and therefore inexperienced with consumption (Moser, 1998). Viswanathan, in contrast, takes a more structured approach, proposing themes that characterize the marketplace experience and classifying them into three different groups: marketplace context, interactional environment and exchange elements (Viswanathan et al., 2012).

A common attitude inherent to most definitions of poverty is the universality through which they depict a segment of society. As the authors of this paper suggest, generalizing the economic or social boundaries that define poverty and imposing them into different communities is not the most effective approach when attempting to understand the adoption of innovation that potentially shift deeply engrained in everyday practices in the social ecology of slum life. This paper attempts to explore how local behavior patterns and cultural references might affect the adoption of different cooking systems in Kitintale, thus offering two new lenses that can inform the development of innovations for slum residents.

COPING WITH DAILY CIRCUMSTANCES

Kitintale residents are faced with an everyday reality: managing the basic, necessary resources to address their physiological, psychological and social needs. An interesting set of insights emerges from the analysis of the daily decisions related to the management of resources. These decisions hint into specific behavior patterns used by Kitintale residents to adapt to daily circumstances and, as the examination of the stories below suggest, we found informants displayed four broad categories of behaviors. Although the stories presented below are drawn from actual narratives, the participants' names were changed to protect their privacy.

Behavior Pattern 1: Avoidance

Sarah is a homemaker in an 8 people household. She lives with her grandmother, her two nieces, school-age kids and a newborn. Her oldest child, a nine-year-old daughter, helps her with some household tasks, as well as taking care of some of her younger siblings, while Sarah caters to her newborn baby.

Sarah is currently unemployed and gets her money mainly from her grandmother, who sells crafts in the neighborhood and sometimes in the city. Sometimes, friends also send her mobile money gifts, which she either uses to invest in her grandmother's business or to buy treats for her kids. She wants to start a business, but she worries about how she would take care of her kids in case she started working. She would rather have them around. For Sarah, becoming a charcoal vendor would be a good alternative, as she can run the business from home while taking care of her children, but as of the day of my visit, Sarah lacked the money to start her business.

About a year before my visit, Sarah received a TivaWater filter from the eponymous organization. The 60-liter filter has been given to Sarah's family for free, but has never been used. Instead, she prefers buying tap water from her neighbor and boiling it before drinking. However confusing this may sound, her reasoning is valid. When TivaWater gave her the filter, they also provided instructions on how to setup the equipment: before using it, Sarah would have to fully load the filter with water and discharge the entire volume without consuming it. For her, that would mean carrying three 20-liter water containers – or simply put, 60 kilograms of wastewater—from the nearby water well. But she doesn't feel that she has the physical energy to perform that setup and prefers boiling water for drinking instead. To do that, she uses her charcoal stove.

Sarah buys charcoal every day, from her neighbor, a lady she knows and trusts. In Kampala, charcoal is sold by retailers in used paint tin units, each of which costing between 1,000 and 2,000 shillings, depending on the season. The price of a tin is generally the same in the entire area, but most retailers deform their tins so that they will fit a smaller amount of charcoal. Sarah likes her supplier because her tins are in fairly good shape. The proximity to her house is also convenient: she can buy charcoal while still keeping an eye on the kids at home. For the same reason, when she has to take care of her baby, she may also send one of the older children with money to buy charcoal for her.

To avoid the stress of lighting up the charcoal stove several times per day, she says, she lights it up once a day, in the morning, and she cooks throughout the day. The truth is, this way, her stove is also always ready to prepare food for the kids whenever they're hungry. Sometimes the kids are hungry and cry. At that stage, she can't risk going through the whole procedure of lighting the charcoal stove as it takes a long time. In fact, Sarah's built her daily routines entirely based on her kids, and all she does, now that she doesn't have a job, is to cater to the children's needs. And when she's not cooking for her children, she uses the lit stove to boil drinking water.

At the core of Sarah's choices is the fact that all transactions, financial and non-financial in nature, involve physical, mental, emotional and opportunity costs—or bio-costs (Dubberly, Maupin, Pangaro, 2009). If the perceived value obtained from a transaction is lower than the anticipated bio-cost consumed to perform that exchange, the transaction will be either avoided or achieved on the basis of a different resource.

Behavior Pattern 2: Optimization

Hannah considers herself unemployed after she stopped working as a cook at a restaurant. Nevertheless, she is currently self-employed as a tailor, as well as the leader of a women's group she founded in the community to help women learn manners and duties. She lives with her daughter, a curious child who's currently in primary school. When she's at home, she likes helping her mother with daily house routines. She is particularly excited to go out by herself to buy basic household needs, such as food and cooking fuel.

Hannah has used all types of cooking fuels in the past. She remembers the time when an entrepreneur offered her a new, alternative cookstove that used a greasy fuel. She was convinced by him to buy a kit, which had the stove and one batch of fuel. After consuming all the fuel provided in the first package, she never found the seller again, a fact that she resents, specially because she also bought a kit for her family that lives in the village, who like her, don't have the fuel to use the improved stove anymore.

Now that she's unemployed, she resorted back to charcoal, her second most affordable option. Wood, the most affordable alternative, is not an option as she cooks inside and doesn't have proper ventilation to manage the smoke it produces. Besides, after using charcoal for years professionally, she considers herself very experienced in correctly measuring the amount of charcoal she needs for each meal. She normally buys charcoal for more than a day and then puts it in a bin in the kitchen, because she doesn't want to buy fuel every day. Besides, when she buys larger amounts she also gets extra charcoal chunks from the vendor, which is also her friend.

She lights her stove once a day and cooks enough food for lunch and dinner. To keep her food warm until dinner time, she stores it in thermal bags she learned to make by observing someone else making it. Sometimes when her daughter is at school, however, she prefers eating outside with her friends rather than cooking. If she could choose, her fuel of preference would be gas, because it is fast and the cylinder can last for a long time. Yet, apart from being expensive, she also thinks that cooking the food fast takes away its flavor. And she can't afford to ruin her reputation as a good cook. Even though Hannah doesn't work as a cook anymore, her reputation is well established in the community. She has mastered the recipe for her signature pilaf rice, known in the area and frequently asked for when Hannah walks around the area.

Hannah's household is connected to the electric grid and she usually buys prepaid electricity credits between the first and the fifth days of every month, because when she does that, the power utility company gives her extra power units.

Hannah is disciplined with her money and keeps it spread across four different "wallets". She has a bank account to keep her money safe from herself, as she believes that cash in hand is a temptation to spend. Her mobile money account is used to keep some of her money, which she uses to pay for electricity and water. Hannah has tap water at home, but because she knows that she may experience water outages frequently, she also has a prepaid water credit token, which gives her access to the ubiquitous standpipes installed in slums by the National Water and Sewerage Corporation to expand access to clean water for its residents. She also uses cash for her daily expenses with food and charcoal.

Unlike avoiders, optimizers accept to spend certain resources, but do so with a conscious effort to optimize their allocation, within the boundaries of their control. In some circumstances, the optimization can come as a response to a necessity to save. A recurring case observed in Kitintale is related to homemakers living on fixed budgets who don't have enough money to buy a certain type food—usually those requiring a long cooking time, such

as beans—and the needed amount of fuel to cook it, forcing them to accommodate the amount of food and fuel to be purchased within the set budget.

In other occasions, optimization comes as a more proactive, deliberate decision to save financial resources in general or in its various forms, like Hannah's four distinctive "wallets", which help her allocate her money more efficiently and plan future expenditures, but most importantly, works as a strong barrier to impulse spending.

Behavior Pattern 3: Hedging

Curiously for Hannah, certain "wallets" also perform the role of reserves: for her, the water token is an emergency water reserve and her cash reserve is considered a reserve of charcoal and food. In certain circumstances, Kitintale residents go beyond saving resources and make investments to reduce their vulnerability to adverse, unforeseeable future incidents.

Vulnerability is a function of an individual's exposure, sensitivity and capacity to adapt to unfavorable events. Yet, moving to a better area, getting a better paying job or improving physical and mental health come at a cost and people in Kitintale are rarely able to change their exposure or sensitivity to living circumstances instantly. Their only possibility to reduce vulnerability is by increasing their adaptive capacity. To do so, common approaches include the accumulation of capital.

Most of the research informants stressed the fact that their money has to be kept in circulation, reducing their capacity to accumulate financial resources. Yet, as Viswanathan et al. noticed, marketplace relationships and interactions can yield social capital reserves, which can be traded in the informal economy (Viswanathan et al., 2012) and result in a range of benefits that emerge from the collaboration, trust, reciprocity and knowledge flowing within social networks. In fact, the investment in social capital is such a central aspect of Kitintale life that the conversion of private activities into social activities has also been observed. Take for example Hannah, who would not prioritize cooking only for herself, meeting friends for meals instead. She also voluntarily started a women's support group to teach them how to cook, among other activities.

Behavior Pattern 4: Growth

Michael is a charcoal seller, a construction contractor and above all, a resourceful inventor. He lives at his own house with his wife and his kids, all still young.

As a charcoal vendor, his household's main source of cooking energy is charcoal, but sometimes they also use wood in an improvised three stone stove. As an inventor, Michael is proud of his recent creation, a fuel-efficient anthill stove, which he built as an experiment, based on knowledge he acquired while rearing chicken, another of the family's businesses. He found out through a TV program that anthills are very efficient in retaining the heat and so he had the idea to experiment with it and create a stove that could keep his chicken warm throughout the night. From that invention, he then created a stove, which is capable of burning both, wood and charcoal. He lends his anthill stove and his regular stove to neighbors whenever they ask for it, as he believes his neighbors are the most important people in your life... it is very important to be in good terms with them.

Michael's house is connected to the electric grid, mostly as a result of his own efforts to bring an electric pole to his front yard. He paid a significant amount of money in that

investment, but according to him it paid back, as every new user that connects through his pole pays him an installation fee. He likes being involved in community projects and walks extra miles to bring development to his neighbors.

As an entrepreneur, Michael very well aware of how to leverage social connections. His connections with truck drivers and charcoal producers were crucial in helping him start and operate his charcoal business. He also leverages his network to find construction businesses in Kampala and even abroad. And whatever income he makes, he prefers keeping in circulation, what he believes, is a better way to grow as compared to keeping savings in a bank. He dreams of becoming a farmer and he has attempted to grow vegetables in a nearby swamp, which turned out to be an unproductive venture. Unsuccessful attempts do not intimidate Michael, who sees taking risks and eventually failing as an opportunity to learn and evolve. He finds it particularly important to keep accounts of all his expenses and revenues and believes that everyone should live within the limits that their current conditions allow. For Michael, his businesses are just learning steps in his personal evolutionary path and being stuck in one of them would not let him evolve.

If we want to consider Michael's attitude towards evolution, his philosophy towards life can be summarized by the passage below, inspired by a quotation from the informant himself:

> "To me gas is a luxury. People end up buying cars and yet they're still renting… they're doing things the wrong way. It is supposed to be a step at a time, a step at a time until you get there. You use what you can afford… it's like a stage to get you to some place."

Even though one may argue that Michael has the financial resources to use improved cooking systems in his household, his decision to never used them lies on a belief that he hasn't reached that evolutionary stage in his life, preferring to take one step at a time. Furthermore, he believes that investing in his children's education is also a way to achieve evolution, as can be seen from the passage below.

> "My children are too young and I have to educate them, so they will know that they once used firewood and charcoal. And because I'm able to use what I can at each time and educate them, when they grow and there's an even better cooking fuel, because they're educated, they can afford it and maybe they'll bring it to me."

As Carole Dweck (Dweck, 2006) notes:

> "When parents help their children construct growth-minded ideals, they are giving them something they can strive for. They are also giving their children growing room, room to grow into full human beings who will make their contribution to society in a way that excites them."

By actively adopting experimentation as a way to approach personal evolution, overcoming failure in a constructive way and introducing this mindset to his kids, Michael can be considered someone who embraces what Dweck calls the growth-mindset.

Stuck in the Present?

When attempting to describe the behaviors of the poor, social scientists typically characterize them as either calculated adaptations to prevailing circumstances, or as emanations from a "unique culture of poverty" that is rife with deviant values (Bertrand, Mullainathan, & Shafir, 2004). In the first case, the economically disadvantaged are seen as rational decision-makers and planners, taking coherent steps to pursue their future goals, while the proponents of the second perspective emphasize the psychological and attitudinal weaknesses that lead to imperfect decisions (Bertrand, Mullainathan, & Shafir, 2004).

Backing the latter view, some authors defend that in poverty contexts, the management of assets and activities pursued are often opportunistic reactions to variable circumstances rather than planned strategies (Rakodi, 1999), implying the need for a paternalistic approach to poverty alleviation. Yet, while the foundational circumstances that support this viewpoint are aligned with particular individual and social dynamics observed in Kitintale, the product adoption and usage schemes embraced by Kitintale residents can't be qualified as purely planned or purely reactive. In fact, neither of these predominant viewpoints on poverty and its alleviation make sense given our observations of localized cooking and social practices in the "village" setting of Kitintale' s slum. There may be a central originating observation from Betrand (2004) that suggests that inter-generational poor people are highly adaptive, but the supposition of deviance or misplaced values seems completely false in this African slum. Kitintale residents are only a generation or less removed from rural villages, and they have replicated and reproduced many practices from their village life. In comparison to their remaining rural relatives, they may experience their lot as well off. If we judge their lifestyles and preferences by Western consumer values, there would be considerable differences. However, conventional consumer values are unlikely to be drivers or considerations in the strong family-centred lives of the Kitintale residents.

The four proposed behavior patterns shouldn't be seen as the starting point for the segmentation of a target consumer-base, as observations suggest that informants engaged in a combination of all four behavior patterns over time, depending on specific motivations and circumstances.

As seen from the stories shared above, the daily decisions that facilitate or deter product adoption and use follow a combination of behaviors, some triggered by daily circumstances and others more oriented towards the future. A comparison of the four proposed behavior patterns uncovers an interesting difference between the first two behavior patterns (i.e. avoidance and optimization) and the two latter ones (i.e. hedging and growth): the timeframe based on which decisions are made. While avoidance and optimization are mostly based on trade-offs between the immediate costs and returns of an exchange, the more informants moved towards hedging and growth, the longer the expected time to see a return on their resource investments. This is an important finding, as it challenges a common underlying assumption of generalized descriptions of the lives of the poor: the fact that they live in the present, for the present.

THE WEIGHT FROM THE PAST

The push from the present and the pull from the future are not the only elements impacting the adoption and usage of foreign improved cooking systems in Kitintale. Drawing on the

origins and evolution of Kampala's informal settlements, together with evidence from the field, one can conclude that urban dwellers have strong ties to the land and their villages. Rural roots are so powerful that, in a predominantly catholic country, it is not unusual for city dwellers to travel back to their villages over Christmas bringing with them all the fruits of the largesse created over a year to celebrate with their families over just a few days, a cycle that repeats itself yearly and to most urban Ugandans.

Broad statements about the ubiquity and pace of urbanization across Uganda are shifting the industry away from a relevant fact: in some informal urban settlements, even though individuals and families belong to a growing urban community, they still perform a rural lifestyle. Migration to the city, in this case, is not symbolic of social mobility, but an indication of the necessity to find a livelihood that provides a largesse to be shared back with families in the villages. Most of Kitintale's household practices bridge their current urban locality with their traditional roots in the village. Despite the general differences in livelihoods, in several aspects the lifestyle in Kampala's slums is curiously similar to that of rural areas. Outside the core business district and planned residential neighborhoods, Kampala can be considered a rural city, with many of its settlements resembling rural villages and mostly occupied by rural-urban migrants, with urban agriculture playing an important role as a source of food and income (Otiso, 2006). The maintenance of certain symbols, such as traditional Ugandan food and cooking processes, are fundamental in preserving and strengthening their traditional rural origins as a colonized and evolving society.

This is not to say, for instance, that more modern, cleaner cooking fuels are not acceptable by low-income urban Ugandans. The endorsement and use of foreign cooking systems tends to be associated with foreign modes of food consumption, introduced by colonizers and immigrants – using kerosene to rapidly boil water for tea is a persistent practice in Kitintale. Traditional Ugandan food, conversely, is expected to be fresh and cooked over long periods of time to allow for the full spectrum of flavors to develop. This is an important aspect, as serving food is a regulator of social exchanges, and a way to create reserves of social capital and thus, a social activity in the area. Traditionally, food was an indispensable sign of reverence, used to please the Gods (Otiso, 2006) and in a context of extreme material scarcity, offering freshly cooked food is not only a culturally and socially relevant sign of honor and appreciation to visitors, but an expectation.

When it comes to the introduction of new cooking fuels, while users can go up and down the fuel ladder according to daily circumstances, charcoal is still a very strong attractor in the fuel system. As an economic entity charcoal means security for vendors. Unlike food, the physical proprieties of the fuel allow for very long storage times with virtually no maintenance costs, thus reducing cost and losses to retailers. It also means security for users, as its pervasive availability in the area is seen as a guarantee of supply, despite sporadic shortages.

But beyond its economic properties, which endorse its material transmission and appropriation, charcoal is also a form of objectified cultural capital, symbolically appropriable. In an oral society where history, culture and norms are passed on via stories, music and rituals, and traditional socialization processes are based on early gender role definition in order to prepare children for successful family lives, the symbolic appropriation of charcoal by the parents exert a strong educational effect on children. As Bourdieu noticed, "a growth in the quantity of cultural capital accumulated in the objectified state increases the educative effect automatically exerted by the environment" (Bourdieu, 1986).

In Uganda, the cooking fire also has a deeper meaning. Ugandan social life usually revolves around the community and the family, the latter extending to grandparents, uncles and aunts, orphans, etc. This extended family also plays an important role in educating and socializing children through stories told at evening firesides while people sit around it and chat as they wait for the meal to cook, a tradition that traces back to the rural villages of Uganda. Thus, even though most informants complain about the long cooking times associated with charcoal, the introduction of new cooking systems that advertise reduced cooking time as a value proposition might miss the mark completely. A more nuanced exploration shows that the stress users typically associate with cooking actually stems from the process of setting up and lighting the charcoal stove. Once consistent heat is available, users seem to be less concerned about time and willing to wait for the food to be ready, with quality. When expressing their opinions about cooking alternatives faster than charcoal, a common perception is that the food cooked on a gas stove, for instance, does not taste as good as food cooked over long periods of time in the charcoal stove.

DISCUSSION

The impetus to help the poor comes from well intentioned individuals and organizations. Yet, the models based on which these agents have been trying to address poverty are filled with often imprecise images of the poor, perpetuating a widespread assumption that these people are consistently helpless and dependent on external support. The introduction of culturally and contextually insensitive innovations in existing marketplaces might not only be as fruitless as its very inexistence, but can also undermine the credibility of initiatives that legitimately attempt to provide better cooking alternatives to underserved consumers.

Logically, a desire to change is a strong leverage to the adoption of innovation. But however strong this motivation may be, adoption in poverty contexts goes far beyond availability and affordability, and perhaps we ought to reconsider the market-driven view of "adoption" but instead consider their uptake of cooking resources as a fit to cultural practices. The commonly stated "build it, and they will come" approach fails to take into account cultural nuances and contextual drivers that may dramatically affect product uptake. Even though internal surveys show that four out of five people in Kitintale have something to complain about charcoal, cultural and contextual anchors remain in place, perhaps even into the next generation, and will prevent them from completely switching to a different cooking system.

From a behavioral point of view, the four observed patterns are useful for defining product and service experiences as they shed light on the motivations behind resource management decisions. They can uncover some aspects related to what users desire to achieve, thus informing the design of new offerings. While, for instance, most products originally developed to address needs at the "bottom of the pyramid" are based on the assumption that low-income consumers only buy in small quantities, this generalization not always applies. As seen in Kitintale, some users prefer to buy larger quantities and stock resources for a variety of reasons, be it motivated by an unwillingness to walk to the vendor every day (avoidance), by an expectation to get a better deal (optimization) or by a desire to accumulate resources to protect them from unforeseen events (hedging). Successful products should incorporate a broad understanding of purchasing and usage decisions, as

well as their implications in order to offer the features that can help users manage resources effectively, in their own terms.

From a cultural point of view, it is critical to acknowledge that in certain contexts, some tasks have added layers of meaning that go beyond pure functionality. The act of cooking in Kitintale represents a way to preserve their ancestral origins in a colonized society and the substitution of existing indigenous cooking systems might attempt to unintentionally replace existing, culturally relevant social dynamics, further reducing its acceptance in the community. On the other hand, investigating the usage of existing offerings in traditional or modern rituals can provide relevant information about expected entry-points for new products and services.

In Ugandan cities, the first order of the day is usually to have a cup of tea and most users would agree that faster cooking systems are ideal for preparing their morning tea, boiling drinking water, or even to prepare side dishes and sauces that traditionally don't require long cooking times. These practices are potential entry-points for faster cooking systems as they closely appeal to existing users' expectations, promising them a satisfying first impression with a much lower adoption barrier.

Clean Cooking Systems as Disruptive Innovation?

Some authors define disruptive innovation as "a successfully exploited product, service or business model that significantly transforms the demand and needs of an existing market and disrupts its former key players" (Lettice and Thomond, 2002), with great emphasis on its potential to impact both users and existing players. Other practitioners emphasize the force that disruptive innovation exerts to change social practices, the way we live, work and learn through the deconstruction of existing conceptual frameworks (Brown, 2003). The well-known Christensen (1997) model of disruption in technological marketplaces does not fit or apply to culturally-rich practices that evolved over many years of rural and now urban living situations. Charcoal may well be a resource, but it represents more than a commodified technology that can be replaced by newer, better, or faster cooking systems as exemplified in the disruption concept. Kitintale may support a robust emerging market for clean cookstoves if the system is thoughtfully integrated, but we should not expect a Christensen-like replacement of technology. Uganda's "emerging consumers" are not driven by efficiencies or consumer values, but of cultural and local practices that are enacted with meaning and an anticipatory foresight matching fuel and food within the micro-scheduling of a family's social activities.

As the findings of this project suggest, broad claims that disruptive innovation can shift existing practices, change demand and displace market leaders through the creation of new value networks might not fully apply in a context where the existence of cultural patterns have shaped the evolution of indigenous solutions over generations, and reactivity to daily circumstances is high. Even though cooking fuels and cookstoves in Kitintale seem to be signifiers of evolution and upward mobility, the association of cookstoves and social status doesn't seem to be strong enough to determine the choice of a new cooking system.

When designing solutions to a complex problem such as household air pollution in poverty contexts, success boils down to understanding users' cultures and contexts. No product should attempt to eradicate economic poverty by introducing cultural poverty. As designers, we have to be able to learn about people in context to prevent cultural-contextual

sensitivity gaps from translating into not only business, but also environmental and social outcome breakdowns.

William Schindhelm Georg is a design researcher for Bridgeable, a service design consultancy in Toronto, Canada. With a background in design and engineering, and a passion for human behaviour, William helps organizations drive innovation as a discipline by integrating design and foresight into the fields of business, technology and society. *williamgeorg@gmail.com*

Dr. Peter Hayward Jones is a founding faculty of the Strategic Foresight and Innovation and Design for Health MDes programs at Toronto's OCAD University. For over 20 years Peter has led design for informatics and educational services for professional practices through field ethnography. He wrote *Design for Care* (2013, Rosenfeld). *pjones@ocadu.ca*

NOTES

My sincere thanks to Greg Murray, Sagun Saxena, Richard Taylor, and the entire CleanStar Ventures crew in Kampala, who provided me an opportunity to temporarily join team as fellow, and who gave access to their resources and facilities in Kampala. Without their precious support, it would not be possible to conduct this research. Special thanks to Terri Karungi, Joan Nakibuuka and Angello Obel, whose contributions were crucial to the completion of this work.

This paper has been solely developed by the aforementioned authors and might not reflect—entirely or in part—the views of CleanStar Ventures and any of its officers and employees.

REFERENCES CITED

Bertrand, Marianne, Sendhil Mullainathan, and Eldar Shafir
2004 A Behavioral-Economics View Of Poverty. American Economic Review 94(2). American Economic Association: 419-423.

Bordieu, Pierre
2011 The Forms Of Capital. In Cultural Theory: An Anthology. 1st edition. Imre Szeman and Timothy Kaposy, ed. Pp. 81-93. Wiley-Blackwell.

Brown, Josh
2003 Innovating Innovation. Johnseelybrown.Com. http://www.johnseelybrown.com/fwd_openinnovation.html, accessed July 10 , 2016.

Dubberly, Hugh, C. J. Maupin, and Paul Pangaro
2009 Bio-Cost An Economics Of Human Behavior. Cybernetics And Human Knowing 16(3-4): 187-194.

Dweck, Carol S.
2006 Mindset. New York: Random House.

Gutschow, Kai K.
2012 Das Neue Afrika: Ernst May's 1947 Kampala Plan as Cultural Program. Essay. In Colonial Architecture and Urbanism in Africa: Intertwined and Contested Histories Pp. 236–268. Rutledge.

Hull, Richard W.
1976 African Cities and Towns before the European Conquest. New York: Norton.

Moser, Caroline O. N.
1998 The Asset Vulnerability Framework: Reassessing Urban Poverty Reduction Strategies. World Development 26(1). Elsevier BV: 1-19.

Mugema, Benjamin A.
2013 The City as the Medium: Communication and Culture in Uganda's Urban Space. Thesis.

Mukiibi, Stephen
2012 Second International Conference on Advances in Engineering and Technology. Noida.

Mukwaya, Paul Isolo, Hannington Sengendo, and Shuaib Lwasa
2010 Urban Development Transitions and Their Implications for Poverty Reduction and Policy Planning in Uganda. Urban Forum 21(3): 267–281.

Musinguzi, Bamuturaki
2013 How Kampala Was Designed by Colonialists. Daily Monitor, July 14. http://www.monitor.co.ug/magazines/peoplepower/how-kampala-was-designed-by-colonialists/-/689844/1913894/-/item/01/-/nsfpkf/-/index.html, accessed July 22, 2016.

Nakata, Cheryl and Kelly Weidner
2011 Enhancing New Product Adoption At The Base Of The Pyramid: A Contextualized Model. Journal Of Product Innovation Management 29(1). Wiley-Blackwell: 21-32.

Otiso, Kefa M.
2006 Culture And Customs Of Uganda. Westport, Conn.: Greenwood Press.

Rakodi, Carole
1999 A Capital Assets Framework For Analysing Household Livelihood Strategies: Implications For Policy. Development Policy Review 17(3). Wiley-Blackwell: 315-342.

Thomond, Peter and Fiona Lettice
2002 Disruptive Innovation Explored. In Ninth IPSE International Conference On Concurrent Engineering: Research And Applications.

Traditional Use of Biomass for Cooking
2012 Paris: International Energy Agency.

Viswanathan, Madhubalan, Srinivas Sridharan, Robin Ritchie, Srinivas Venugopal, and Kiju Jung
2012 Marketing Interactions In Subsistence Marketplaces: A Bottom-Up Approach To Designing Public Policy. Journal Of Public Policy & Marketing 31(2). American Marketing Association (AMA): 159-177.