

Strategic Options for Technology for Tomorrow, Ltd. to Pursue to Sustainably Increase Market Access to MakaPads in Uganda

By

Kendra Moffett & Meredith Reisfield

A practicum submitted in partial fulfillment of the requirements for the degree of Master of Science (Natural Resources and Environment - Sustainable Systems)
at the University of Michigan, December 2015

Clients:

Sustainability Without Borders & Technology for Tomorrow, Ltd.

Advisors:

Dr. Jose Alfaro, Professor of Practice, School of Natural Resources and Environment
Dr. Avik Basu, Senior Research Area Specialist & Lecturer, School of Natural Resources and Environment

Table of Contents

Abstract	2
Introduction.....	2
<i>Our Clients</i>	
<i>The Problem</i>	
Literature Review & Theoretical Framework.....	3
<i>Access to Sanitary Napkins as Barrier to Education for Women & Girls in East Africa</i>	
<i>Peer Organizations</i>	
<i>Refugees & Poverty in Uganda</i>	
Project Objectives.....	5
<i>Short Term Objectives & Deliverables to Our Client</i>	
<i>Research Questions and Related Data Collection Methods</i>	
<i>Conceptual Model</i>	
<i>Methods to Develop Deliverables</i>	
<i>Timeline</i>	
<i>Research Flow Diagram</i>	
<i>Limitations of Research Approach</i>	
<i>Human Subjects Review and Procedures</i>	
Technology for Tomorrow, Ltd.: Resources and Capabilities.....	10
<i>Technology for Tomorrow, Ltd. Leadership Team</i>	
<i>Production Facilities</i>	
<i>Workers</i>	
Strategies.....	15
<i>Overview</i>	
<i>First-Tier Strategies</i>	
<i>Mobile Marketing</i>	
<i>Sales in Kyaka</i>	
<i>One-For-One</i>	
<i>White Paper Sourcing</i>	
<i>Second-Tier Strategies</i>	
<i>Distribution</i>	
<i>Customer Education with Other NGO</i>	
<i>Packaging</i>	
<i>Environmental Impact Analysis of MakaPads</i>	
Conclusions.....	24
<i>Our Overall Thoughts and Opinions</i>	
<i>Next Steps for Technology for Tomorrow, Ltd.</i>	
<i>Capabilities Needed</i>	
<i>Potential Support from the University of Michigan and Others</i>	
<i>Remaining Issues and Potential Challenges</i>	
Appendix A: Contacts in Uganda Outside of Technology for Tomorrow, Ltd.....	27
Appendix B: Contacts at the University of Michigan.....	28
Appendix C: Resources Technology for Tomorrow, Ltd. has Already Tapped into at the University of Michigan.....	31
Works Cited.....	32

Abstract

This project sought to explore options for Technology for Tomorrow, Ltd. to expand access of their sanitary napkins product, MakaPads, to local women in Uganda. At present, approximately 95% of Technology for Tomorrow, Ltd.'s MakaPad supply goes to the United Nations, where it is then redistributed for use in refugee camps, primarily in east African countries. This both introduces significant risks for the company and restricts the supply of MakaPads available to be sold locally in Uganda, which was one of the original goals of the product.

The master's practicum team developed a list of possible several strategic options for the company and prioritized these options according to their potential cost and impact in consultation with the Technology for Tomorrow, Ltd. leadership, and began developing an implementation plan for the most promising of these strategies. The "first tier" options were identified as the most promising or desirable and are outlined in the highest level of detail, as well as second-tier options which are more or less desirable depending on Technology for Tomorrow's ability to access capital or partner with third parties. The practicum team concludes by discussing next steps needed for Technology for Tomorrow, Ltd. with a holistic review of capabilities needed to implement solutions, potential support from the University of Michigan and other outside sources, as well as remaining issues and potential challenges the company faces.

Introduction

Our Clients

The practicum clients are Technology for Tomorrow, Ltd. and Sustainability Without Borders. Technology for Tomorrow, Ltd. is a registered company in Kampala, Uganda working to apply appropriate technologies for the betterment of the environment and humanity. Technology for Tomorrow, Ltd. produces MakaPads: an effective, low-cost sanitary napkin made from papyrus and recycled paper waste. Sustainability Without Borders is an interdisciplinary student-led organization sponsored by the Center for Sustainable Systems at the University of Michigan. Sustainability Without Borders' mission is to create a network of sustainability practitioners through the design and implementation of sustainable projects in developing countries to address resource scarcity issues. Technology for Tomorrow, Ltd. is currently one of Sustainability Without Border's partner organizations.

The Problem

At present, approximately 95% of Technology for Tomorrow, Ltd.'s MakaPad supply goes to the United Nations, where it is then redistributed for use in refugee camps, primarily in east African countries.⁽¹⁾ This both introduces significant risks for the company and restricts the supply of MakaPads available to be sold locally in Uganda, which was one of the original goals of the product. Technology for Tomorrow, Ltd. would like to expand access to sanitary napkins to women in Uganda and requested a team of students to analyze the current state of the market, current market actors, current community needs, and Technology for Tomorrow, Ltd.'s current capabilities in order to develop a range of options to begin expanding local access to their product.

Expansion of access to sustainable sanitary napkins, such as those manufactured by Technology for Tomorrow, Ltd., has social, public health, economic, and environmental significance. Research indicates that access to sanitary napkins is a crucial barrier to the education of women in the developing world. Technology for Tomorrow, Ltd. produces MakaPads to provide effective, low-cost protection for women in Uganda. The organization also employs UN

refugees as manual workers. The company prioritizes social impact, both on its employees and on its customers. Technology for Tomorrow, Ltd. has set up its own supply chain, from the collection of papyrus, to its softening, processing, and solar drying. All tasks are manual, and electricity from a photovoltaic solar array is used for sealing the pads and for sterilization at the end of the process. To expand access in retail stores where MakaPads are not yet available, Technology for Tomorrow, Ltd. needed further understanding of the current state of the market and current market actors, as well as an analysis of current capabilities to develop options to expand local access.

Technology for Tomorrow, Ltd. has engaged in several past attempts to expand their market access, but have yielded underwhelming results.

Literature Review & Theoretical Framework

Access to Sanitary Napkins as Barrier to Education for Women & Girls in East Africa

Lack of access to feminine hygiene products is a major public health issue globally. According to UNICEF estimates, 1 in 10 girls do not attend school during menstruation; causing them to miss about 25% of the school year and, in many cases, eventually drop out.⁽²⁾ This problem is particularly prevalent in low-income communities in east Africa, and these young women and girl's absence from school leads to a reduction in overall education and usually a disadvantaged start in the workplace resulting in decreased income.

Keeping girls in school through the secondary level has proven to have far-reaching positive effects on national well being. Fewer early pregnancies, lower HIV transmission rates, and reduced infant mortality are all related to keeping girls in school longer.⁽³⁾ This venture, however, proves to be particularly difficult for low-income families -- usually for cultural reasons. Often, these Ugandan families tend to favor investing in their son's education, family business needs, and household needs and duties; all of which make it difficult for a girl to access menstrual pads to continue her education.⁽³⁾ Even though, statistically, a box of sanitary pads will last for a month and can usually be bought for less than \$1 USD, many households typically spend many times that much each week for the male head-of-household to do recreational activities. This obstacle as Scott, et al. mention, is not necessarily price, but the gender power imbalance typically found within Ugandan households.⁽³⁾

Reported alternative menstrual management methods such as rags, old newspapers, sand, ash, and leaves all place the wellbeing of the women in jeopardy. From a hygienic and health standpoint, these alternatives are not very safe and can oftentimes lead to vaginal infections. From a societal standpoint, these alternatives are also not as effective as menstrual pads in preventing accidental leakage. Some of these methods require the need to wash and dry the used rags/cloth, and to do so they may need to be dried in open sunlight. This proves problematic, as there is a very large social stigma associated with drying underwear and other intimate clothing items out in public in the very conservative Ugandan culture. Drying used rags in open sunlight provides little privacy for women and calls attention to the fact that she has begun menstruating. In these communities, once a girl has begun menstruating she is perceived "fair game" for sexual activity, which can often lead to unwanted sexual attention/advances, early pregnancies, and transmission of sexual infections and diseases.⁽³⁾

The use of ineffective/unhygienic materials, long distances to school, lack of privacy while at school, and the challenges of washing and drying all appear to be the biggest menstrual management obstacles for school-aged girls in Uganda.

Peer Organizations

There are currently some organizations that have developed reusable pads to address this issue, but disposable pads are still the predominant solution due to the limited availability of water in some regions required to wash reusable pads, and the social stigma associated with washing reusable pads in public.⁽²⁾

However, there are three major cloth pad companies that have done well in the East African market: KMET Pads, AFRIPads, and Mwezi Pads. KMET Pads are washable pads that are made by teenage mothers in the Nambale District in Kenya. Made of terrycloth and a soil-resistant liner, these pads fasten to underwear and come in a pack of six and cost around \$4.00 USD. These pads have a very high wear-time, and can be worn up to 10-hours without leaking. However, in some preliminary testing done by Scott, et al. they found that these pads took days to dry, and in Uganda's humid climate, that dry time could increase even more.⁽³⁾

AFRIPads, unlike KMET Pads, are actually produced in Uganda and also provide village-based employment for women like MakaPads. AFRIPads are meant to be reusable, and these pads are made out of a soft, quick-drying fleece. These pads are designed to securely fasten to the wearer's underwear. AFRIPads come in a pack of 6, with three liners that have wings, and three straight liners without wings, and two small bags for carrying. This AFRIPad pack costs roughly \$6.00USD.⁽³⁾

Lastly, Mwezi Pads are handmade on sewing machines by Kenyan women that collectively use fabrics that are locally made and affordable. The design of these pads still require a disposable pad to be strapped into the elastic holders, but the actual homemade and reusable part of the Mwezi Pad is designed to fasten to the wearer's underwear and prevent leakage due to its plastic lining. A packet of four inserts to put into the Mwezi Pad costs around \$2.40USD.

MakaPads is the only Ugandan-made disposable sanitary napkins brand, and a pack of 10 costs around \$0.45. Each pad can last anywhere from 8-12 hours, and was classified by Uganda's National Bureau of Standards with the classification "super." Many of the women who use MakaPads like that they do not have a perfumed smell to them, and that they are made from natural resources. Many of the women interviewed in our research indicated that the chemicals in western sanitary pad brands made them nervous, and they felt safer using MakaPads.⁽⁵⁾ Technology for Tomorrow, Ltd. has relations within the government, although the latter has no budget to dedicate to sanitary pads. The Technology for Tomorrow, Ltd. leadership team believes it is very easy to export papyrus, and other countries could benefit from this innovation.⁽⁶⁾

Refugees & Poverty in Uganda

Uganda has a population of around 39 million people, and the vast majority (80%) of the workforce in Uganda work in agriculture, and the dominant export is coffee. Of those near 39 million people, around 33 million Ugandans live in rural areas. Uganda has a substantial amount of natural resources (forests, copper, wetlands, gold, etc.) and recently, oil has been discovered in some pockets of the country. Current economic policies are focused on stabilizing inflation and raising civil service wages among other initiatives in hopes to better the quality of life of many Ugandans. Unfortunately, due to unreliable power/electricity, high energy costs, inadequate transportation infrastructure, and corruption much of the economic development in the country is inhibited and incites uneasiness in many potential investors.⁽⁷⁾⁽⁹⁾

The GDP per capita is roughly \$1,500 with an exchange rate of approximately 2,604.60 Ugandan shillings per USD as of 2013.⁽⁸⁾ In Uganda's capital city of Kampala, there are lowlands where the majority of the population reside in flood-prone shantytowns, as over 75% of Kampala's population lives close to or in poverty. Nationally, 20% of the Ugandan population

lives at or below the poverty line, and 22% of the rural population lives at or below the poverty line.⁽⁷⁾⁽⁹⁾

Uganda is subject to armed fighting among hostile ethnic groups, rebels, armed gangs, militias, and various government forces that extend across its borders. The refugees who have come to Uganda to escape the conflicts in their own country are as follows:

- Democratic Republic of Congo (155,742)
- Rwanda (13,376)
- Burundi (10,578)
- South Sudan (137,844)
- Somalia (18,534)⁽⁷⁾

Project Objectives

Short Term Objectives & Deliverables to Our Client:

The short-term and long-term objectives of the project were informed by Technology for Tomorrow, Ltd.'s past work and efforts to break into the local market, as well as the social, public health, economic, and environmental significance of this company's work. In the short term, by which we mean the time frame of our work on this practicum, was to provide well-supported, realistic, and actionable recommendations to the Technology for Tomorrow, Ltd. leadership team that will allow them to expand access of their product in local stores outlets where MakaPads are not yet available. We hoped to provide the MakaPads leadership team with the following:

- 1) A list of distinct options available for Technology for Tomorrow, Ltd. to expand access of their product as well as the challenges and next steps associated with each of these options
- 2) A prioritization of these options according to the company's preferences, values, and capabilities
- 3) A recommendation of which of these options are most worthwhile for company to pursue based on (1) and (2)
- 4) Next steps necessary for the company to take in order to pursue these options
- 5) An initial workplan for the MakaPads leadership team to use to complete these next steps
- 6) Presentation of our project and its main findings to Sustainability Without Borders

These goals were met and are referenced in later chapters and were designed with the personal and professional development of the practicum team in mind, including but not limited to the accomplishment of our team learning goals. These include developing industry experience, enhancing presentation skills, and enhancing project development/implementation skills.

Long-Term Objectives:

In the long term, by which we mean the time following the conclusion of our practicum and the conclusion of our studies at the University of Michigan's School of Natural Resources and Environment, our goals included:

- 1) The successful implementation of some of our recommendations to the Technology for Tomorrow, Ltd. leadership team
- 2) Availability of MakaPads in local markets where the product was not previously sold
- 3) Future work for Sustainability Without Borders in partnership with MakaPads pursuant to SWB's mission to create a network of sustainability practitioners through the design and

implementation of sustainable projects in developing countries to address resource scarcity issues

- 4) a) Furthering the ability of Technology for Tomorrow, Ltd. to leverage resources at the University of Michigan to pursue their social, public health, economic, and environmental mission; and b) further strengthening the ongoing relationship between Technology for Tomorrow, Ltd. and the University of Michigan, which has both provided valuable assistance to the company and rewarding experiences and learning opportunities for students

We hope our practicum serves as the initial step and the foundation toward meeting these long-term goals over the next several years.

Research Questions and Related Data Collection Methods:

What factors currently limit MakaPad's market access? We addressed the question of "What factors currently limit MakaPad's market access?" through interviews with Technology for Tomorrow, Ltd.'s leadership team, employees, customers, partners and other stakeholders and through conversations with pharmacists, education and public health workers.

Which of these limitations can be changed or bypassed? Data to address the question of "Which of these limitations can be changed or bypassed?" was collected through interviews with Technology for Tomorrow, Ltd.'s leadership team and partners, and the leadership teams of businesses and NGOs with comparable missions. Our conversations with pharmacists and public health workers and our analysis of product availability around the country and within the different cities and regions we are visiting were also critical to amassing the data needed to address this question.

What capabilities does Technology for Tomorrow, Ltd. have or will be able to develop to address these factors? Data needed to address the question of "What capabilities does Technology for Tomorrow, Ltd. have or will be able to develop to address these factors?" largely came from conversations with Technology for Tomorrow, Ltd.'s leadership team and partners.

Conceptual Model

Several inputs were needed for the practicum team to effectively make recommendations to Technology for Tomorrow, Ltd.'s MakaPads leadership team. These primarily consisted of:

Community Needs Assessment: Identifying important sectors in the community such as: access to health care, primary employment, income level, morbidity/mortality rates, nutrition, and safety will help us identify and merge the needs of the community, along with the needs of Technology for Tomorrow, Ltd. These informed methods we used to gather information was critical to the success of our practicum while on the ground in Uganda.

Literature Review: Conducted simultaneously with our Community Needs Assessment, our literature review covered a wide range of information: from a background on the history and current state of Kampala and other communities we visited, to the history of the United Nations refugee camps where MakaPads operates several of its manufacturing facilities, to the current social norms surrounding menstruation, along with other culturally relevant topics. We analyzed other social enterprises seeking to increase access

to hygienic and affordable sanitary pads in the developing world, such as ZanaAfrica in Kenya and Sustainable Health Enterprises in Rwanda. This work informed what initiatives may be most likely to be successful, helped us to develop a relationship with the MakaPads team, and improved our ability to connect with other stakeholders in Uganda upon our arrival.

Market Assessment: To understand the competitive landscape of the sanitary napkin market in Uganda and gain insights into the successes and failures of brands including MakaPads, we researched and gather data on the cost and availability of different sanitary napkin brands from several different points in Uganda. We also collected information on the packaging decisions of each manufacturer, including the number of sanitary napkins per package, the language or dialect used, and whether the product itself differs cosmetically, functionally, or visually from MakaPads. Furthermore, we collected information on the manufacturer and parent company of each sanitary napkin brand when it was available.

Analysis of Technology for Tomorrow, Ltd.'s goals and capabilities: A thorough understanding of the goals of Technology for Tomorrow, Ltd.'s goals (i.e., to keep production of MakaPads primarily in the hands of local women) and capabilities (i.e. financial situation, current and foreseeable production capacity, distribution channels, etc.) was needed to understand which of the options available to the company may be pursued.

Methods to Develop Deliverables

Our approach to develop these deliverables involved: the development of research questions related to our goal of expanding local access to MakaPads, data collection to address these specific research questions through interviews with Technology for Tomorrow, Ltd.'s leadership team, employees, customers, partners and other stakeholders, and through conversations with pharmacists, education, and public health workers as well as through secondary research. The practicum team interviewed the entire Technology for Tomorrow, Ltd. leadership team, as well as Technology for Tomorrow, Ltd.'s employees, partners, and customers. The practicum team interviewed a total of fifty two employees at seven Technology for Tomorrow sites and spoke with pharmacists, educators, public health workers in four cities in Uganda: Kampala, Jinja, Kyaka, and Fort Portal.

When the practicum team visited the refugee camps and the production facilities we gathered data from interviews with workers, women, and management in those camps. The practicum team spoke with the leadership teams of as many businesses and NGOs with comparable missions, and the frequency and depth of these interviews was predominantly dependent on the number of responses to our inquiries and the willingness of participants to give us their time. We conducted extensive secondary research through our literature review phase before we made our initial trip to Uganda. This included doing an extensive literary analysis on MakaPad documents given to us by Technology for Tomorrow, Ltd., as well as past research projects on the company and market completed in the past. We also conducted brief community needs assessment of Kampala, and focused on many health, gender, and community structures that are currently in place to help guide our research as well as our final deliverables.

Timeline

Prior to departing for Uganda we conducted extensive literature reviews and case study analyses regarding previous projects that are similar to what we would like to complete for Technology for Tomorrow, Ltd.. This literature review covered a wide range of information: from a background on the history and current state of Kampala and other communities we will be visiting, to the history of the United Nations refugee camps where MakaPads operates several of its manufacturing facilities, to the current social norms surrounding menstruation, along with other culturally relevant topics. We also analyzed other social enterprises seeking to increase access to hygienic and affordable sanitary pads in the developing world, such as ZanaAfrica in Kenya and Sustainable Health Enterprises in Rwanda. This work helped us to develop a relationship with the MakaPads team, and connect with other stakeholders in Uganda prior to our arrival.

We also created a brief community needs assessment before our first trip to Uganda. This community needs assessment involved identifying important sectors in the community such as: access to health care, primary employment, income level, morbidity/mortality rates, nutrition, safety, along with a multitude of other sectors. This community needs assessment helped us identify and merge the needs of the community, along with the needs of Technology for Tomorrow, Ltd. and prepared us to gather information critical to the success of our practicum while on the ground in Uganda.

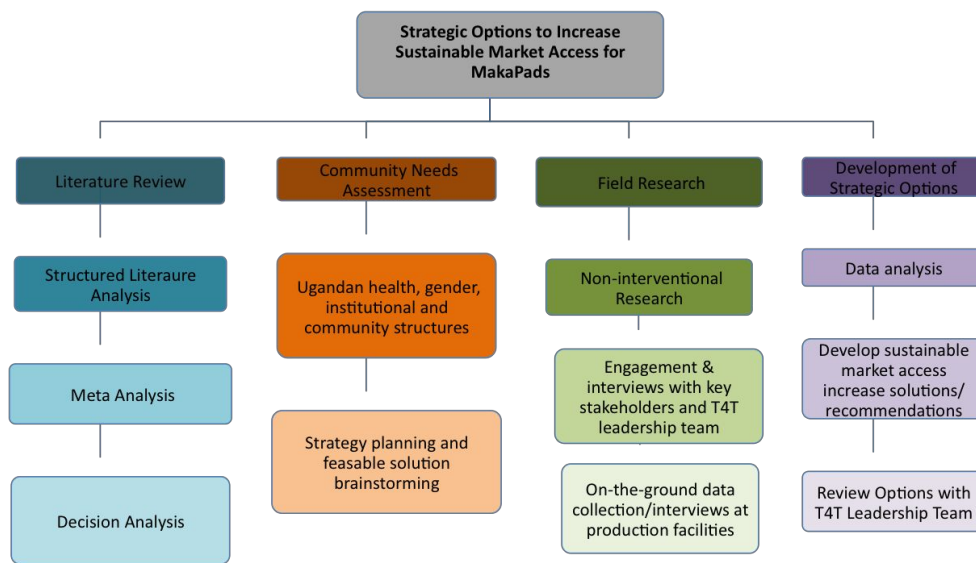
During our research trip, conducted over three weeks in April / May 2015, we sought to obtain information and build key relationships that were not possible to obtain in the US. While we were in Kampala, we wanted to analyze the current capabilities of Technology for Tomorrow, Ltd. through interviews with the their leadership team, employees, business partners, customers, and other stakeholders. In our work with Technology for Tomorrow, Ltd.'s leadership team, employees, and business partners we planned to gain an understanding of the goals and current challenges of Technology for Tomorrow, Ltd. and the perceived ability to expand production of MakaPads or sell the product in adjacent markets. We also needed to build a sound rapport with the Technology for Tomorrow, Ltd. leadership team so that they would trust our final deliverables, and would be able to successfully implement them. From customers and other stakeholders, we anticipated learning information regarding the cost of MakaPads relative to other household purchases, the perception of the MakaPads brand and of local products in general, as well as the average customer's awareness of MakaPads' environmental and social mission and its importance in their purchasing decisions.

While on our research trip we conducted a market analysis of the current sanitary napkin competitive landscape in Uganda. We gathered data on the cost and availability of different sanitary napkin brands from several different points in Uganda. We also collected information on the packaging decisions of each manufacturer, including the number of sanitary napkins per package, the language or dialect used, and whether the product itself differs cosmetically, functionally, or visually from MakaPads. Furthermore, collected information on the manufacturer and parent company of each sanitary napkin brand. When Technology for Tomorrow, Ltd. first launched Makapads, the company had only 2 competitors in Uganda. At that time, speaking publicly of sanitary pads was a taboo. Today, 34 imported brands exclusively sell pads in the country, making Technology for Tomorrow, Ltd. the only Ugandan manufacturer. The Technology for Tomorrow, Ltd. leadership team at that time estimated the market for sanitary pads at eight million people using sanitary pads – and they think MakaPads can capture up to 50 percent of that market, because so many people cannot afford western menstrual management products.(3)

Upon our return from Uganda, we worked to synthesize the findings from our initial research trip in order to identify and answer outstanding questions regarding the expansion of Technology for Tomorrow, Ltd.’s market access, and prioritize these alternatives based upon feasibility. Members of the Technology for Tomorrow, Ltd. leadership team should be available to answer further questions between our return from Uganda and the projected practicum completion in December 2015 / January 2016. Over the remainder of the summer and fall semester, findings from this trip were combined with further follow-up research to develop actionable recommendations for the Technology for Tomorrow, Ltd. leadership team. We reviewed these findings with the Technology for Tomorrow, Ltd. leadership team in order to develop a workplan for the company to successfully implement our recommendations.

Research Flow Diagram

Figure 1: This diagram illustrates the Practicum team’s research and strategy framework.



Limitations of Research Approach

Our research approach was limited by our inability to fund a second trip to Uganda, the limited nature of our time on the ground in Uganda on our research trip, the cooperation and availability of stakeholders including the Technology for Tomorrow, Ltd. leadership team and MakaPads customers; and the availability of information on multiple topics including, but not limited to: the social perception of feminine hygiene in the region, the availability of sanitary napkins at different points around the country, and keeping in mind our personal safety and well-being while attempting to answer these questions.

The practicum team was limited by the availability of our interview subjects. The frequency and depth of these interviews was predominantly dependent on the availability of interviewees, which were commonly affected by environmental and occupational factors such as malaria (several of our planned interviews were cancelled or rescheduled because the interviewee or their dependents were malarial), as well as on our ability to make contacts in these regions prior to our arrival, the number of pharmacists, educators, and public health workers present in each of these regions and the language abilities of the participants.

A final limitation was the data Technology for Tomorrow was willing to supply us with. Many of our requests for data - including, but not limited to, data on their sales pilot on mobile markets, their client list, further detail on their workforce - were not completed. This limited our ability to develop strategic options to expand market access and provide more detailed next steps for the company to pursue strategic options.

Human Subjects Review and Procedures

On February 16, 2015, we received a Notice of Determination of “Not Regulated” Status from the Health Sciences and Behavioral Sciences Institutional Review Board at the University of Michigan. Accordingly, IRB approval was not required for this project, as it did not include identifiable private information about individual members, employees or staff of the organization that is the subject of the research.

Technology for Tomorrow, Ltd.: Resources and Capabilities

Technology for Tomorrow, Ltd. Leadership Team

Technology for Tomorrow, Ltd. is a social enterprise that is housed within Makerere University -- the oldest and one of the most prestigious universities in all of Uganda. Technology for Tomorrow, Ltd. is going on its 12th year of operation as of 2015. Much of the research and development of the organization’s products are done with at least some help from Makerere University. The leadership team of Technology for Tomorrow, Ltd. is as follows:

Dr. Moses Kizza Musaaazi:

Founder and Team Leader, Dr. Moses Musaaazi is essentially the CEO of Technology for Tomorrow, Ltd. An engineer by trade, Dr. Musaaazi first came to Makerere in 1979 after receiving his Doctorate Degree from the University of London. A natural innovator, Dr. Musaaazi is passionate about creating appropriate technologies, particularly for the economically disadvantaged. It is his ultimate goal to emancipate the economically disadvantaged through his innovations and help enable them to become self-sustaining and economically empowered. Dr. Musaaazi splits his time by overseeing daily operations at Technology for Tomorrow, Ltd. while also spending time as a senior lecturer in the Department of Electrical and Computer Engineering at the College of Engineering, Design, Art and Technology at Makerere University. Dr. Musaaazi also often travels for conferences and speaking engagements nationally and internationally regarding MakaPads, and is revered for his innovative prowess and successes.

Ms. Juliet Nakibuule

Ms. Nakibuule has worked with Dr. Musaaazi and Technology for Tomorrow, Ltd. for 11 years in 2015. Originally a teacher by trade, Ms. Nakibuule joined Dr. Musaaazi when she became connected with Dr. Musaaazi through Makerere University and decided to devote her work full-time to Technology for Tomorrow, Ltd.’s MakaPads. Officially Ms. Nakibuule’s title is Human Resource Manager, but her tasks and duties are much like that of a COO. Ms. Nakibuule has worked with Dr. Musaaazi since the inception of the company, and she has taken on the role over overseeing the daily operations of Technology for Tomorrow, Ltd. which include, but are not limited to: managing production site employees, delivering products, handling employee paychecks, corresponding with potential clients, and ensuring that all the cogs in the production process move smoothly. Ms. Nakibuule was our main contact while we were in Uganda, and she was the member of the leadership team with whom we spent the most time with.

Her and Dr. Musaazi have a very good working relationship, and Dr. Musaazi ensured us that we were in very good hands with Ms. Nakibuule and noted, “Julie and I don’t have the typical boss-employee relationship -- it’s very much a two-way street between us.” Ms. Nakibuule, like Dr. Musaazi, is fluent in her local language, Luganda, and English. This was incredibly helpful as she acted as our translator in many circumstances.

Mr. Paul Kimera

Mr. Kimera is a Civil Engineer by trade, and works with Technology for Tomorrow, Ltd. as their Construction Manager and with their Design Team.

Ms. Mirembe Nassuuna

Ms. Nassuuna is a Civil Engineer by trade, and works with the Technology for Tomorrow, Ltd. Design Team.

Mr. Jjuuko Kwagala

Mr. Kwagala is trained and educated as an Architect, and works with the Technology for Tomorrow, Ltd. Design Team.

Mr. Nicholas Kasekende

Mr. Kasekende works with Technology for Tomorrow, Ltd. by doing Energy System Design work.

Mr. Godfrey Ssezibwa

Mr. Ssezibwa is an Accountant by trade and is the head of Finance and Accounting at Technology for Tomorrow, Ltd., Ltd.

Mr. Emmanuel Miyingo

Mr. Miyingo is an Electrical Engineering student at Makerere University who works with Technology for Tomorrow, Ltd. by heading Technical Sales and Marketing. Mr. Miyingo is also a University of Michigan African Presidential Scholars (UMAPS) who will be attending the University of Michigan in the Fall 2015 semester for an elite, academic, study abroad experience.

Aaron Tushabe

Aaron is a Computer Science student at Makerere University whose responsibility at Technology for Tomorrow, Ltd. includes System Administration as well as being a Research Assistant.

Production Facilities

Technology for Tomorrow, Ltd. currently operates using six (6) different production facilities. There was a seventh production facility in the town of Soroti, but due to inefficiencies in that location, the Technology for Tomorrow, Ltd. leadership made the decision to temporarily shut down the Soroti production facility. It is still uncertain whether or not the Soroti production facility will re-open, but that possibility is still on the table. The other production facilities and their capabilities are as follows:

Kawempe

The Kawempe production facility is the main manufacturing site for MakaPads. Located in the outskirts of Kampala, the Kawempe property sits at the top of a hill in a residential area. The residents that live around this area are somewhat to mostly impoverished and live in very humble living situations. Many of the employees that work in the Kawempe production facility live around the area of the production site.

Upon entering the production site, the visitor is greeted by one of the initial production processes: papyrus and white paper mixing. These mixtures are then placed on plastic placard screens and dried in the sun. Further moving into the site the visitor can see many more drying racks in which papyrus mixtures and white paper mixtures are drying. Kawempe has a main house on the property that strictly serves for storage and production. Each room serves as a different cog in the production process. After the papyrus mixture and white paper mixtures are dried, they are brought to one room in the house where they are slid through softening cranks that are manually operated and require no electricity. This process makes both the papyrus and white paper sheets softer in texture. After the softening process, these sheets are moved into another room and cut into the exact size of the pad. All scraps are recycled back into the first cycle of the production process. Those cut-outs are then moved to another room where they are then assembled in the order that they will be arranged in the pad and pressed and sealed into a plastic absorbent sheet. This pressing process is one of only two stages in MakaPads production that uses electricity. Once the pads are sealed together, they are moved to a different team of workers who cut them accordingly depending on whether or not the pads need wings, or are without wings. These same workers also apply the adhesive sticker to the bottom of the pad. Once the pads are made, they are gathered in groups of ten where they are again sealed into the MakaPads packaging. After the packages are arranged the second process that uses electricity occurs. This process is requires a bin that has a UV light inside of it. The MakaPads packages are then circled around that light in the bin and then covered for two hours. This process ensures that the pads are sterilized from any human contact. After this process the MakaPads are ready for sale.

The Kawempe production facility also serves as the main storehouse for employees to buy MakaPads from. This production facility is the largest, and employs the most individuals at around 50 at any given time. The Kawempe production facility also holds all surplus stock and surplus materials. The leadership team prefers to always have a surplus of stock stored at the main house on the property in case a large order comes in unexpectedly.

Kymwanyi

The Kymwani production facility is unique in the fact that the sole purpose of the site is to create papyrus mixture sheets. The Kymwanyi production facility is located in Entebbe, 20 miles outside of the center of Kampala. Tucked away off the main road, the Kymwanyi production facility is located in a lush, remote, quasi-rural location. The Kymwanyi production facility employs only 2-4 people at any given time, and is the smallest of the Technology for Tomorrow, Ltd. production facilities.

The site has one main small house structure which is used for storage. The rest of the property is used for drying racks and papyrus mixture production. When the sheets are

dried and ready to be transferred to Kawempe, a pick-up is scheduled at the Kymwanyi production facility and a Technology for Tomorrow, Ltd. employee drives to the site to retrieve them.

Masooli

The Masooli production facility is also located on the outskirts of Kampala and sits on a property that used to serve as a school. The buildings that are used for storage and equipment used to be classrooms. The employees that work at Masooli production facility are almost exclusively women. Many of them are also mothers of young children, and those children are brought with them to the production facility daily.

The Masooli production facility also is solely responsible for making papyrus mixture sheets and white paper mixture sheets. Similar to production facility Kymwanyi, when there are a sufficient amount of sheets dried and ready for softening, a pick-up is scheduled at production facility Masooli and a Technology for Tomorrow, Ltd. employee drives to the site to receive them.

Masajja

Not far from the Y production facility, around 10 miles away, also in the outskirts of Kampala is the Masajja production facility. The Masajja production facility operates on a half acre plot with a small house located on the property that serves as storage for supply and equipment. The Masajja production facility is unofficially managed by an elderly woman whom the young men that work there refer to as “grandmother.” The Masajja production facility is the second smallest production facility with 4-6 young men working there at any given time.

The sole purpose of this production site is to produce white paper mixture sheets. When there are a sufficient amount of sheets dried and ready for softening, a pick-up is scheduled at the Masajja production facility and a Technology for Tomorrow, Ltd. employee drives to the site to receive them.

Independently owned Papyrus chopping facility

This independently owned papyrus chopping facility is technically not managed by Technology for Tomorrow, Ltd., but with a private partner. This private partner has worked with Technology for Tomorrow, Ltd. for several years now to provide the chopped and dried papyrus for production. The leadership completely trusts this private partner, and she has never failed to deliver in all of her years working with Technology for Tomorrow, Ltd. Because of this strong relationship between Technology for Tomorrow, Ltd. and this private partner, she runs this production site without any supervision from Technology for Tomorrow, Ltd.

Located closer to the Kampala city center, this production site is only about one quarter of an acre in size and has a lean-to set up where one or two workers use machetes to strip the papyrus that they either harvested themselves in the adjacent wetland, or was delivered to them through that private partner from another wetland. After they strip the papyrus, they chop it up into very fine pieces and lay it out in the sun to dry. This production site on average produces around 200kg of papyrus every 2 weeks, and

Technology for Tomorrow, Ltd. typically schedules a pick up every 2 weeks to distribute to all the production sites accordingly.

Kyaka

The Kyaka production facility is the only production facility that is not in the greater Kampala area. Located in the UNHCR Kyaka Refugee Settlement, the Kyaka production facility is most similar to the Kawempe production in that it is one of the largest at around 50 employees working at any given time throughout the year. The Kyaka II refugee settlement houses roughly 16,000 people in mud huts. The UNHCR is responsible for 40,000 girls and women from ages 12 to 49 living in Kampala and eight refugee settlements across the country. Currently, the Kyaka settlement's MakaPad production facility employs 45 refugees earning as much as \$200 a month.⁽⁴⁾

The population is comprised of Rwandese, Congolese, Sudanese, Kenyans, Somalis, and Burundians. The majority of this population is Congolese (86%) or Rwandese (13%). The population surrounding the refugee settlement is comprised of mainly native Batooro and Bakiiga peoples.⁽⁸⁾

The Kyaka production facility however is also distinctly unique in a couple of different ways. First, the Kyaka production facility only hires refugees. Also, the daily operations are managed by a refugee, Abra, who has been working with MakaPads for nearly 10 years as of 2015. Kyaka is also unique in that it is the only production facility that does all the functions of manufacturing all in one place; meaning: the papyrus is stripped, chopped, and dried there; the papyrus sheets and white paper sheets are manufactured there; the sheet-softening process occurs there; and then the cutting, assembling, and packing of the pads are also done in that one site.

Workers

Technology for Tomorrow, Ltd. makes a concerted effort to provide employment to those who need it most. Women make up the vast majority of Technology for Tomorrow, Ltd.'s staff, as they tend to be the demographic most vulnerable to poverty in Uganda. These women vary in age from 17 to 45, and with the exception of the Kyaka production facility, they are all Ugandan. These women are also varied in their amounts of education, but for the most part they all had finished primary school, and many had stayed in school until they were 16-18. Many of these women were also married and had children. There were a few women who noted they had children but were not married, but the majority of women who had children were also married. Many of these women also had younger sisters, whom they provided MakaPads for as well.

The other demographic that Technology for Tomorrow, Ltd. employs are refugees. These refugees work at the Kyaka production facility and there can be anywhere from 30-50 workers at that production site at any given time depending on the season. Currently, the majority of these refugees are from the Democratic Republic of Congo and Burundi. While there are a handful of men that work at this site, the majority of the workers are women.

The workers are compensated by what they produce on a daily basis. Due to the nature of the Cottage Industry model that Technology for Tomorrow, Ltd. each worker has a slightly different task/unit of production. The leadership has taken into account these factors and pays their workers anywhere from \$0.05-\$0.10 per unit of material that individual makes.

All workers are free to stop working whenever they choose to do so. Some workers will stop working for a period of time and then return back to work, pending there is still a position open for them. These hiatuses often happen if there is an illness in that employee’s family, a birth, sickness, or a variety of other issues. Most workers do not like to miss work or stop working because so much of their livelihood depends on their income from making MakaPads.

In each production facility, the staff breakdown is as follows: QC, papyrus processing team (x2), absorbent sheet production team, softening absorbent team, cutting absorbent team, sealing team, plastic cutting, adhesive ad packaging team, night guards, and cleaners.

Strategies

Overview

The practicum team sought to: identify the universe of strategic options available to the client in order to expand local market access of MakaPads, prioritize these options according to their potential cost and impact, and begin developing an implementation plan for the most promising of these strategies. In consultation with the Technology for Tomorrow, Ltd. leadership team, we agreed to identify the entire range of options the practicum team identified as being available to the company to expand local market access for MakaPads. The practicum team then assessed these options to estimate the potential value-added, challenges, time frame and capabilities needed to pursue each option. The team gave these options an initial prioritization based on these factors and identified major knowledge gaps.

After an additional round of interviews with the management team to attempt to address these knowledge gaps, the practicum team presented the Technology for Tomorrow, Ltd. leadership with an initial list of options available to the company to pursue and a rough prioritization of these options (see Figure 2). This list was reviewed in extensive detail with the Technology for Tomorrow, Ltd. leadership team, minor adjustments were made according to their preferences; and the group jointly identified five options as “first-tier” options, to which the practicum team would direct the majority of their efforts, and four “second-tier” options which might be appropriate for future practicum or masters project groups, partner work with Sustainability Without Borders, or other efforts in concert with different stakeholders the University of Michigan or other entities, but should be addressed after the “first-tier” options. The following chapter outlines these five “first-tier” options in details, going into the explanation of, rationale for, challenges associated with, estimated time frame to completion, and next steps for each “first-tier” option. The “second-tier” options are then outlined summarily.

Figure 2: List and prioritization of strategic options

OPTIONS	PATHS/STEPS	CHALLENGES	TIME TO COMPLETE
Mobile Marketing	<ul style="list-style-type: none"> - Identify neighborhoods to start in - Train select employees in sales - Hire independent marketers - Hire relatives of workers looking for a job - Quantifiable results 	<ul style="list-style-type: none"> - Worker's reluctance to do sales - Providing a guaranteed income/compensation of employees - Lack of experience 	6-18 months

		- Need for training	
Sales in Kyaka	<ul style="list-style-type: none"> - UNHCR discussion to resolve potential packing issues - Work with existing shops - Point person doing sales in bi-weekly market days - Kyegegwa 	<ul style="list-style-type: none"> - Potential push-back from UNHCR - Need for trusted shopkeeper/point person 	Less than 1 year
One-For-One	<p>Option 1:</p> <ul style="list-style-type: none"> - Find existing organization to partner with 	<ul style="list-style-type: none"> - Difficulty finding partnership - Need to move towards mechanization - Potential need to Westernize product 	Minimum 3 years
	<p>Option 2:</p> <ul style="list-style-type: none"> - Build organization with Dow Sustainability Institute with the help of professors at UM 	<ul style="list-style-type: none"> - Building a partner organization - Need to move toward mechanization - Potential need to Westernize product 	
Paper Sources	<ul style="list-style-type: none"> - Making this a UM Master's project - Making this a Sustainability Without Borders project - Making this an Alternative Spring Break project - Couple this project with a marketing, LCA, or industrial ecology project etc. 	<ul style="list-style-type: none"> - Identifying funding sources that would get students to and from Uganda - Building student interest 	Less than 1 year
Schools	<ul style="list-style-type: none"> - Schools Makapads already has a relationship with - Schools where employees siblings or friends go - Push the biodegradability aspect of Makapads - Change curriculum to emphasize importance of menstrual management (Government, NGOs, churches) - Employees teaching health class lessons about menstruation 	<ul style="list-style-type: none"> - Difficulty getting into schools - Receiving push-back from parents regarding curriculum changes 	6-18 months
Distribution	<ul style="list-style-type: none"> - Partner with company that has existing distribution network - build distribution network as mobile market presence expands 	<ul style="list-style-type: none"> - Difficulty identifying partner organizations need to successfully market product in Kampala first 	2 years
Customer Education with other NGO	<ul style="list-style-type: none"> - Partner with like-minded organization in Uganda - Rotary training, Bank of Uganda, etc. - Make the education NOT about Makapads, but about menstrual management 	<ul style="list-style-type: none"> - Need to build relationships with relevant NGOs 	Minimum 3 years

<p>Packaging</p>	<ul style="list-style-type: none"> - Kendra's creative services connections - Customer's feedback on what they like best in Makapads (natural, herbal, chemical free, etc.) - Trends in competitor packaging 	<ul style="list-style-type: none"> - Cost 	<p>6 months or more</p>
<p>Environmental Impact Analysis of MakaPads</p>	<ul style="list-style-type: none"> - Master's Project - Professor Ming Xu, Professor Keolian, Caroline Larose - LCAs, IOAs, etc. 		

First-Tier Strategies

The five first-tier strategic options identified by the practicum team and client leadership range widely on almost every factor. They include easily pilotable projects and long-term relationship-based projects, strategies that could be implemented before conclusion of the project and others that would be unlikely to be accomplished in a year, as well as projects that would be primarily undertaken by Technology for Tomorrow, Ltd., and others that may be more appropriate for Sustainability Without Borders to spearhead. These first tier options include: deploying mobile marketing teams to allow Technology for Tomorrow, Ltd. to gain a toehold in local sales in a low-cost and scalable manner; providing an outlet for MakaPads to be sold in the Kyaka II refugee settlement; creating a One-for-One relationship with a western company to provide funding for further distribution of MakaPads and diminish local conceptions of MakaPads as a product that is unpalatable to a western audience; send teams of students from the University of Michigan to work with companies in East Africa to address a bottleneck in the MakaPads supply chain related to the acquisition of white paper; and to develop Technology for Tomorrow, Ltd.'s relationships with schools to both expand local sales and educate young women about menstruation.

Mobile Marketing

The “mobile marketing” option involves deploying small, charismatic teams of 2-3 salespeople in weekly and bi-weekly local pop-up markets to allow Technology for Tomorrow, Ltd. to gain a toehold in local sales in a low-cost and scalable manner. Technology for Tomorrow, Ltd.'s mission is to provide access to safe, affordable and sustainably produced sanitary napkins. Currently approximately 95% of Technology for Tomorrow, Ltd.'s MakaPad is purchased by the United Nations High Commissioner for Refugees. Much of the remaining 5% is purchased by NGOs, with only a sliver of the company's purchased directly by users, many of whom are friends with or related to Technology for Tomorrow, Ltd.'s employees. This both introduces significant risks for the company and restricts the supply of MakaPads available to be sold locally in Uganda, which was one of the original goals of the product.

Technology for Tomorrow, Ltd. would like expand access to sanitary napkins to women in Uganda, but past attempts to get MakaPads stocked in local markets at all levels have failed. Dr. Musaaazi attempted to convince a large Kampala supermarket to stock MakaPads without success, and efforts to keep MakaPads stocked in a smaller, one-room market did not meet an acceptable threshold of returns to continue the endeavor. Additionally, for a brief period Julie spent a three month period visiting mobile markets every Wednesday with Kathryn and other employees, both male and female. As with the one-room market, the operational costs of sending Julie to the markets exceeded returns from sales and this effort was discontinued. Technology for Tomorrow, Ltd. met several challenges in their initial attempt to sell their product in mobile

markets, including the reluctance of employees to sell MakaPads in mobile markets. Salespeople in these markets are considered “hawkers” and are considered low-class. Employees were aware of this perception and did not want to be associated with this stigma. Technology for Tomorrow, Ltd. also had to ensure that Julie and employees moved off of the production line to test the appetite of local consumer for MakaPads would need to be compensated equally to their roles in the production line. This raised costs above typical payments for salespeople and may have made this attempt prohibitively expensive. Their experience selling MakaPads at mobile markets also prompted Technology for Tomorrow, Ltd. to introduce a 3-pad pack to supplement their typical 10-pad pack.

The company’s leadership remains optimistic about their ability to gain a foothold in local markets and is eager to try new strategies. As a local outlet with the lowest barriers to entry and ability to scale up or down the salesforce quickly, mobile markets remain the most attractive manner to test whether MakaPads can be sustainably sold to local markets in their current form. The leadership team has identified finding the time to set up a sales program and being able to adequately compensate employees as the largest barriers to implementing a mobile market sales team. Costs to participate in mobile markets, paid to the market organizers, are not well known. Another challenge may be the current use of sanitary pads by women shopping at local markets. As mentioned previously, the percentage of the Ugandan population that uses sanitary pads in lieu of other methods of menstrual hygiene management such as cotton, cloth, or toilet paper remains small. Challenges anticipated by the practicum team, such as the safety of and trust in employees as potential sales people, were dismissed by the Technology for Tomorrow, Ltd. leadership team as immaterial.

Technology for Tomorrow, Ltd. can either take advantage of its potential in-house sales talent or recruit sales people from outside their existing structure. Should they choose to pursue the former option, both Moses and Julie have identified employees at Kawempe that might have an aptitude for sales. For the latter option, Moses has suggested recruiting relatives of their employees as sales people. The leadership team has also identified potential avenues to pilot this program, namely in the mobile markets adjacent to Kawempe. The leadership team also expressed interest in partnering with the University of Michigan or other organizations to work on training sales teams, since there are not currently employees with sales or marketing backgrounds at MakaPads. Discussions of the mobile marketing strategy have also led the Technology for Tomorrow, Ltd. leadership team to consider other sales and marketing approaches, including opening a storefront at Kawempe, hiring boys and girls to hawk MakaPads, using a sound system mounted on a car and driving around Kampala, trying a promotion. They have acknowledged the need for marketing and are becoming more open to spending money on advertising.

Unlike other options discussed in detail later in this chapter, the practicum team and client jointly estimated that a full-scale implementation of this strategy with consistent sales would likely take more than a year, though a pilot might be accomplished in a matter of months. Our estimated time frame for full or partial implementation of the mobile marketing option is 6-18 months.

Sales in Kyaka

The “Sales in Kyaka” region involves setting up a marketplace for MakaPads to be sold at the Kyaka Refugee settlement. Currently, the Kyaka production facility makes MakaPads, and then the UNHCR purchases them from Technology for Tomorrow, Ltd., and once they are purchased by UNHCR, they are then distributed to the refugees in the Kyaka settlement. Currently, refugees are not able to purchase MakaPads directly from the production facility, they can only access them from UNHCR. As of May 2015 there had been no distribution of MakaPads

to the refugees in the Kyaka settlement. According to the Technology for Tomorrow, Ltd. leadership team, this hold-up of distribution of MakaPads was due to certain budget cuts and administration skepticism within UNHCR; and currently there are no estimates on when or if MakaPads will be distributed to the refugees at the settlement again. So at present, the refugees that are making the MakaPads at the Kyaka production facility have not been able to use the products that they make due to the UNHCR hold-up.

This current situation has the Technology for Tomorrow, Ltd. leadership team unhappy, as their company is built on the value of enabling their employees to have access to the products that they make. To establish this option, Technology for Tomorrow, Ltd. needs to establish a marketplace and a storefront in the Kyaka refugee settlement to sell MakaPads directly to refugees. Currently, there are other storefronts in the settlement that sell toiletries and other goods. Some of these storefronts sell sanitary pads, but they are mostly western brands like *Always*, and a Chinese brand. These products are not moved very often, as they tend to be out of the price-range of the average refugee woman. Naturally, without the distribution of MakaPads by UNHCR and expensive alternatives, these women tend to use rags and cloth instead. This practice poses both hygienic and health risks to the woman, including bacterial infections.

To set up this marketplace storefront in the settlement, Technology for Tomorrow, Ltd. would need to provide the means to either erect a new booth, or occupy an existing one. Technology for Tomorrow, Ltd. would also need to appoint a trustworthy shop keeper who would handle the finances, keep books, and exchange the revenue to the leadership team when needed. Abra is currently the manager at the production facility, and a business owner himself in the settlement, so he, or someone he recommends, would be a good person to start the shop. Technology for Tomorrow, Ltd. also would need to package the pads that would be sold in the Kyaka refugee settlement differently from the ones that are distributed by UNHCR. When this was brought up to the leadership team, they quickly agreed and offered that they could easily package the MakaPads in some older packaging designs that they had in stock. The shopkeeper would need to keep numbers on how many MakaPads were sold each month, and place the orders from the Kyaka production facility. The estimated time frame for full or partial implementation of the sales in Kyaka option is less than 1 year.

One-for-One

The “One-for-One” option involves creating a One-for-One relationship with a western company to provide funding for further distribution of MakaPads and diminish local conceptions of MakaPads as a product that is unpalatable to a western audience. Technology for Tomorrow, Ltd. has met with significant challenges in convincing potential customers that MakaPads is equivalent to western menstrual management products, which the leadership team hypothesizes is largely due to the fact that MakaPads are not only made from bleached, white paper, and are known to be produced locally. The Technology for Tomorrow, Ltd. believes the ability to market their product as one that is used by western women would eliminate this social barrier. Furthermore, such an arrangement could directly provide or indirectly free up much-needed capital and liquidity for Technology for Tomorrow, Ltd. to scale up production, invest in marketing, and other essential capacity-building initiatives.

The “One-for-One” option refers to the business model of Toms, which seeks to deliver a pair of free, new shoes to a child in need for each sale of their retail product. Toms has expanded the principle of this model to other products, including eyewear, where part of the profit is used to save or restore the eyesight of people in developing countries; coffee, where part of the profit is used to provide safe water to those in need; and to a bag collection, where a portion of the profits goes to provide training to skilled birthing attendants and distribute birthing kits in developing

countries. The company gave away its 10 millionth pair of shoes in 2013, and has inspired other companies to adopt similar concepts.

To establish such a partnership, Technology for Tomorrow, Ltd. would have to either find an existing organization to partner with or build its own organization with Dow Sustainability Institute with the help of partners in the US. Multiple challenges arise in pursuing either strategy, including difficulty finding an existing company that would be open to this type of partnership or building a partner organization, the potential need to westernize the product and move toward mechanization, to name only a few of the most general challenges. Regulations and certification standards in western markets present another potential challenge and area for further research. With three years as the estimated minimum time frame to arrange such a partnership, the One-For-One option holds the longest time frame to completion of all the options identified in both tiers, and possibly the lowest chance of success. However, due to its potential to positively impact multiple challenges the Technology for Tomorrow, Ltd. team has been dealing with since its inception around MakaPads, the leadership team at Technology for Tomorrow, Ltd. requested that this option be explored in depth and, ideally, be brought to as many potential partners as possible. The leadership team at Technology for Tomorrow, Ltd. also suggested that one of their products currently under development, a diaper created from recycled paper and papyrus, might be the most appropriate vehicle to explore this type of partnership.

White Paper Sourcing

One of the major bottlenecks of the production of MakaPads is the access to recycled white paper. This white paper is pivotal to the production of MakaPads because it acts as one of the absorbent layers, and also provides a soft texture for the user, unlike the papyrus absorbent mixture, which serve as the bottom layers of the pad. Currently, Technology for Tomorrow, Ltd. gets the majority of their recycled white paper from Makerere University. UNHCR provides some of the shredded recycled paper as raw material input to the process, but that supply is not always consistent.⁽⁶⁾ The leadership team expressed that accessing other sources of recycled white paper has proven to be rather difficult in the past, and that many companies and embassies they approached have an innate distrust of what Technology for Tomorrow, Ltd. will be using their paper for. However, when Technology for Tomorrow, Ltd. had students work with them in the past and sent the students out to embassies and companies asking for their recycled white paper, they were able to access it much more easily than the leadership team.

This option is geared towards creating future projects and opportunities for University of Michigan students. The Technology for Tomorrow, Ltd. leadership team expressed interest in hosting a group of students and sending them out to embassies and companies in Kampala, and maybe beyond, to develop relationships with companies and embassies to use their recycled white paper. This could be arranged by creating an Alternative Spring Break trip for undergraduate students at the University of Michigan interested in development work. They would travel to Kampala during the week of their spring break in the Winter semester, meet with Technology for Tomorrow, Ltd. leadership, and during that week try to sign contracts with as many companies and embassies that they can for their recycled white paper.

This option certainly hosts challenges, the biggest one being the funding for the student's airfare and living and food costs while Uganda. Funding to aid in the cost of the trip could be applied to by the students interested in going, but that is not guaranteed. A curriculum and plan of action for each trip would need to be created for each of the students to follow, and either a faculty member or graduate and/or doctorate student would need to go with the troupe of undergraduate students and act as a team leader.

This need for white paper could also potentially work as another Sustainability Without Borders project for University of Michigan graduate and undergraduate students. The same challenges such as funding apply, but the time frame in which this group of students could travel to Kampala could be either on spring break in the Winter semester, or for a period of time in the summer. This option would continue to foster the relationship that Technology for Tomorrow, Ltd. has with the Sustainability Without Borders group, and would help increase the longevity of that relationship by continuing to host students for short term projects such as this.

This white paper project could also be coupled with a marketing, Lifecycle Analysis (LCA), or an industrial ecology project. With this option, it would provide Technology for Tomorrow, Ltd. a more well-rounded final deliverable, because the contracts signed during this project for white paper would be an added benefit of another deliverable such as an LCA, marketing strategy, or blueprints of an industrial ecologic adaptation the company could adopt. The estimated time frame for full or partial implementation of the white paper option is less than 1 year.

Relationships with Schools

The leadership at Technology for Tomorrow, Ltd. expressed that one of the main target audiences they feel they are under-serving due to their current circumstances are school-aged girls. As the literature regarding this matter reports, school-aged girls are the most vulnerable to the consequences of not having access to sanitary napkins. This includes: absenteeism, higher dropout rates, and an increase in unwanted sexual attention by their male community members. This option would allow Technology for Tomorrow, Ltd. to dive deeper into opportunities that exist with the primary girls schools that they already have a relationship with, and then eventually branch out into other schools.

Initially targeting the schools where Technology for Tomorrow, Ltd. already sells MakaPads to, this campaign would first involve really selling the environmental and economical benefit the school would have if they required their female students to only wear MakaPads. MakaPads are 95% biodegradable and don't take up as much room in the latrines as their counterparts do. This means a decreased cost of maintenance, as the latrines would not need to be emptied as often as they would if MakaPads were not the only brand used.

Next, Technology for Tomorrow, Ltd. could serve as advocates for the need in a curriculum improvement that would focus on the importance of menstrual management. For the schools that they already work with, Technology for Tomorrow, Ltd. could design their own menstrual management curriculum that could be easily incorporated into the school's existing health class curriculum using the resources already available to the leadership team. Both Ms. Juliet Nakibuule and Dr. Moses Musazi sit on boards and are members of organizations that seek to improve the education of menstrual management to young girls. Partnering with an NGO, churches, or even branches of the Ugandan government to help draft a new curriculum with these menstrual management additions would be very advantageous for Technology for Tomorrow, Ltd. in their pursuit to change the curriculum in the schools they are already partnered with.

Additionally, Technology for Tomorrow, Ltd. could seek out some of their well-spoken and confident MakaPads employees, and have them teach health class lessons regarding menstruation at the schools that they are already partnered with. This option provides the school girls an opportunity to ask experts certain questions that they may not feel comfortable asking their teacher, and also personally introduce girls to the MakaPads brand early, which will hopefully foster brand loyalty as those girls age.

Should these ventures with the schools that Technology for Tomorrow, Ltd. already have a partnership with become successful, the next step to expand would be to target getting

MakaPads into schools where employees' sibling or friends currently go. According to the employees at the Kawempe production facility, many of the employees who work there buy MakaPads for their younger sisters and friends. Many of these schools have an unknown presence of MakaPad users already, so naturally it makes sense to then approach those schools and set up a contract with them, and then continue to discuss the option of curriculum adaptations, and guest-taught health classes by MakaPads employees.

The main challenges these ventures face are the initial difficulty of signing a contract with a school and getting a presence in that facility, and receiving any push-back from parents regarding any curriculum changes. Ugandans are very conservative about sexual education, and there is certainly room for a lot of criticism when it comes to education regarding a woman's menstruation. The estimated time frame for full or partial implementation of the relationship with schools option is anywhere between 6 and 18 months.

Second-Tier Strategies

The following four second-tier strategic options identified by the practicum team and client leadership also range widely like their first-tier counterparts. All of these second-tier projects are more long-term and/or relationship-based projects, with the shortest project time-frame being 6 months at the earliest. These second-tier options include: partnering with key organizations and individuals in order to improve the distribution channels of MakaPads for current and future production demands; provide customer education about menstrual management to women through a partnership with a like-minded NGO; develop new packaging for MakaPads that mimic the look of western brands to improve shelf-appeal; and finally, perform an environmental impact analysis of MakaPads as a baseline for future work.

Distribution

Creating a sound distribution network is key to the success and movement of MakaPads. Currently, due to the vast majority of their demand going to the UNHCR, Technology for Tomorrow, Ltd. only caters to one major customer. The movement of all other MakaPads is through Technology for Tomorrow, Ltd. employees.

This option pushes for Technology for Tomorrow, Ltd. to create a partnership with an organization or a company that already has an existing distribution network. This partnership is one that should be mutually beneficial. This partnership will especially need to be created as MakaPads start to gain a foothold in more commercial stores. In particular, should the Mobile Marketing option recommended earlier really prove to be successful, a distribution network will be needed as MakaPads mobile market presence starts to expand beyond Kampala. This option's major challenges are identifying a logical distribution partner while simultaneously marketing MakaPads in Kampala and its' suburbs successfully. This option is projected to take at least 2 years to implement.

Customer Education with Other NGO

Providing customer education about menstrual management with another organization would not only be a great way to spread information, but also to create a partnership with another organization that could be beneficial to Technology for Tomorrow, Ltd. in the future. This option would require Technology for Tomorrow, Ltd. to partner with a like-minded organization in Uganda such as the Ugandan Rotary Club, the Bank of Uganda, Set Her Free, etc. and work with them to educate young women about menstruation. It is important to note that this option is not designed to promote MakaPads per se, but sound menstrual and sex education. Technology for Tomorrow, Ltd. doing this customer education will hopefully create goodwill with a partner

organization and the people they are teaching, but also educating their customer base on the importance of using menstrual pads instead of cloth, gauze, or nothing at all. Even if not all of the customers choose to use MakaPads, the hope is that they will at least be more likely to purchase some brand of sanitary pad with the proper education.

The biggest challenge associated with this option is finding a relevant organization teaching menstrual management and then successfully partnering with them in their education promotion. A smaller challenge associated with this option is the time commitment, and whether or not Technology for Tomorrow, Ltd. can afford to have one of its' leadership team members devote a portion of their time to a project like this. Should Technology for Tomorrow, Ltd. choose to move forward with this option, it is projected to take a minimum of 3 years to successfully implement.

Packaging

One of the issues with MakaPads that women who used them expressed is their packaging. Unlike the majority of western brands, whose packaging is predominantly blue and white, MakaPads' are packaged in a bright pink and green packaging. The reasoning behind this color scheme is that when Technology for Tomorrow, Ltd. interviewed women about colors they like they had stated that bright green and pink were among their favorites. However, a lot of market research has been done citing that the colors blue and white evoke the sense of cleanliness and purity to the person looking at it. Now, these women may have stated that bright pink and green were their favorite colors, but when put on a sanitary product, those colors may not sit well with those women because those colors do not evoke a sense of cleanliness, and that's why they expressed they did not like the packaging.

There are a few potential solutions to this problem. The first is to seek out a graphic designer that Kendra has worked with in the past and has a rapport with and see if they would be willing to do a pro-bono design for MakaPads. The major challenge associated with this is that they could easily say "no," or simply not have enough time to devote to designing it.

A second option would be to seek out a graphic design student who is looking for a project to work on to build their resume and have them do the design work for the new packaging. The major challenge with this is that this would be a student's work, and there is a potential for the work not to be the caliber Technology for Tomorrow, Ltd. would prefer. With either one of these options the estimated time frame to complete it would be around 6 months.

Environmental Impact Analysis of MakaPads

When going through all of these options with Dr. Musaazi, he intimated that at some point he would really like to have an environmental impact analysis completed on MakaPads. Having an environmental impact analysis done on MakaPads would help Technology for Tomorrow, Ltd. build data on the impacts the company is having, and potentially help them apply for sources of funding if they have this analysis done. While this strategy is less of a priority for the present, it would behoove Technology for Tomorrow, Ltd. to start building the foundation of making this strategy a reality as soon as they can.

This would be an ideal opportunity to build this out into a new Master's Project or Thesis for a graduate student at the School of Natural Resources and Environment. Professors Greg Keolian and Ming Xu specialize in environmental impact analyses through life cycle assessments (LCAs) and input-output analyses (IOAs) respectively. By connecting Dr. Musaazi with these professors they could easily formulate a plan on how to have a student or group of students execute an environmental impact analysis over the next couple of years. This strategy is estimated

to take upwards of 3-years to complete - the first year to design the project, and the next year and a half for the student or team of students to actually complete and report on the analysis.

Conclusions

Our Overall Best Thoughts and Opinions

Three strategic options - deploying mobile marketing teams to allow Technology for Tomorrow, Ltd. to gain a toehold in local sales in a low-cost and scalable manner; providing an outlet for MakaPads to be sold in the Kyaka II refugee settlement; and sending teams of students from the University of Michigan to work with companies in East Africa to address a bottleneck in the MakaPads supply chain related to the acquisition of white paper as the most promising in the short-term. These options had both been identified as “first tier” options with the Technology for Tomorrow, Ltd. leadership team due to their overall promise and potential success of implementation, and unlike creating a One-for-One relationship with a western company to provide funding for further distribution of MakaPads and diminish local conceptions of MakaPads as a product that is unpalatable to a western audience or developing Technology for Tomorrow, Ltd.’s relationships with schools to both expand local sales and educate young women about menstruation, these options have a shorter potential time frame and are not inherently relationship based.

Next Steps for Technology for Tomorrow, Ltd.

Within the next two years, we recommend Technology for Tomorrow, Ltd. takes steps to pursue the three options outlined above, while keeping an eye for opportunities to build the relationships fueling the remaining first-tier options. Specifically, this involves identifying neighborhoods to start in and training select employees in sales, hiring independent marketers, or hiring relatives of workers looking for a job to test the mobile marketing plan; discussing the sales of MakaPads in Kyaka with the UNHCR, working with existing shops in Kyaka, and determining a point person to conduct sales on bi-weekly market days; as well as creating a project through SNRE as a Masters Project, a Sustainability Without Borders project, Alternative Spring Break, or other student group to help Technology for Tomorrow, Ltd. expand its supply of white paper sources. For the remaining first tier options - one-for-one and relationships with schools - will require Technology for Tomorrow, Ltd. to identify and act upon partnership-building opportunities and may be impossible to act upon until such opportunities are identified. Second tier options, including partnering with key organizations and individuals in order to improve the distribution channels of MakaPads for current and future production demands; providing customer education about menstrual management to women through a partnership with a like-minded NGO; developing new packaging for MakaPads that mimic the look of western brands to improve shelf-appeal; and performing an environmental impact analysis of MakaPads may be potentially pursued in the future depending on Technology for Tomorrow, Ltd.’s most pressing needs, leadership capacity, and internal capabilities.

Capabilities Needed

While the specific capabilities needed for each strategic option vary considerably, Technology for Tomorrow, Ltd.’s general needs can be categorized roughly into: human capital needs, availability of capital, partnership development, and ability to address physical and cultural challenges unique to Uganda. Training will play a large role in Technology for Tomorrow, Ltd.’s ability to pursue many strategic options, notably in worker training needs to implement the mobile marketing option, and a need for human capital from the west to pursue additional white

paper sources. Access to capital is a critical issue for the company to pursue all of its potential strategies and projects, due to the company's narrow profit margin and turbulent operating environment. Partnership development will also be crucial to implementing many strategic options, including the one-for-one plan and developing relationships with schools. Finally, both the physical conditions in which Technology for Tomorrow, Ltd. operates, including infrastructure concerns such as access roads and availability of a consistent supply of electricity, and the cultural concerns, such as perception of local products, understanding and social perception of menstruation, will be inherently limiting to Technology for Tomorrow, Ltd.'s ability to expand access of their product to local women if strategies are not developed with these challenges in mind and with plans to surmount them.

Potential Support from the University of Michigan and Others

Technology for Tomorrow, Ltd. can leverage support from the University of Michigan through student and faculty help and expertise to pursue the majority of both first and second tier strategic options. Across the list of strategic options, needed skills and experience vary widely. Some options are more conducive to work with less experienced student/faculty teams, such as work with companies in East Africa to address a bottleneck in the MakaPads supply chain related to the acquisition of white paper, and others such as a life cycle assessment may be more appropriate to more experienced and specialized teams. The University of Michigan can also play a role in connecting Technology for Tomorrow, Ltd. to other resources outside the University, such as in facilitating a One-for-One relationship with a western company to provide funding for further distribution of MakaPads and diminish local conceptions of MakaPads as a product that is unpalatable to a western audience. These collaborative efforts could both assist in advancing Technology for Tomorrow, Ltd.'s work and indirectly provide access to feminine hygiene products and employment to communities in Uganda as well as enhancing the education of student participants and advancing the mission of groups like Sustainability Without Borders.

Remaining Issues and Potential Challenges

Regardless of which strategic options Technology for Tomorrow, Ltd. elects to pursue in efforts to increase market access to MakaPads, the company is likely to face a variety of challenges related to their business model, management structure, and operating environment. The first category of these challenges surround access to capital. Technology for Tomorrow, Ltd.'s low profit margin makes the company vulnerable to unexpected expenses and changes in their anticipated purchase volumes, as well as leaving the company with little available capital to pursue new strategies or expand its operating capacity. The company is also highly dependent on its relationship with the UNHCR, which purchases the overwhelming majority of MakaPads. Technology for Tomorrow, Ltd.'s operations and financial options are accordingly subject to the timeliness and consistency of the UNHCR's purchases, as well as the interest, funding and purchases of other NGO partners. Availability of human capital presents another set of challenges. Technology for Tomorrow, Ltd.'s current management team is nearly stretched to its limit, and a lack of employable individuals with skills in key areas, such as marketing, were a frequent topic of discussion between Technology for Tomorrow, Ltd.'s leadership team and members of this practicum. The third category of challenges encompass cultural dynamics. Several cultural barriers have limited MakaPads' market penetration, including a perception of western products as superior and the tendency of many women to use cloth or gauze as a menstrual management strategy rather than feminine hygiene products. Furthermore, Technology for Tomorrow, Ltd. operates in a high-risk business environment, where infrastructure and other factors present separate and unique challenges across potential distribution areas. Technology for

Tomorrow, Ltd. and its partners will need to carefully formulate strategies that address these issues in order to successfully pursue these strategic options.

Appendix A: Contacts in Uganda Outside of Technology for Tomorrow, Ltd.

Mpindi Abaas: Global Health Corps, Uganda Program Associate

Prior to joining GHC, Mpindi worked with the Uganda Youth Forum under the First Lady's Office as a Community Outreach Coordinator. He also worked with Saracen Uganda Limited as a Document Controller in charge of tender management and proposal writing. He is the CEO and Founder of Global Media Enterprise, a media company focusing on events management, publishing and graphics, and is also the brain behind the Inter-Institutional Media Challenge. The Media Challenge brings together university students to compete in news anchoring and reporting, essay writing and photography to be directly judged, guided and scouted by media experts and companies. Mpindi is a research student for a Masters Degree in International Relations and Diplomatic Studies from Makerere University. He holds both a BA in Adult and Community Education and a Post Graduate Diploma in Journalism and Mass Communication. Learn more about Mpindi and Global Health Corps at:

<http://ghcorps.org/why-were-here/staff/>

James Kassaga Arinaitwe: Acumen 2015 Global Fellow

James was raised in rural Western Uganda. He graduated with a Bachelor's degree in Computational Biology and a Master's in Public Health & Public Policy from Florida State University, and with a second Master's in Sustainable Development & International Policy from the SIT Graduate Institute in Washington, D.C. He served as a Global Health Corps 2012-13 fellow, working as a program assistant for the poverty alleviation NGO Single Stop in New York City. James also served as the School Partnership Manager for Educate!, an NGO based in Kampala that partners with the Ugandan Ministry of Education to change Uganda's education system through youth leadership and entrepreneurship. Currently James is a 2014-15 Acumen Global Fellow, and works for LabourNet in Bangalore, a social enterprise that offers workers a platform to access financial inclusion services and social protection. He kindly connected us to his contacts in public health currently working in Uganda. Learn more about James at his work at

<https://about.me/jamesarinaitwe>

Sadira Clarke & Stephen Lamoreaux: Entrepreneurs

Sadira and Stephen both hold an MS in Urban Policy Analysis and Management from The New School University in New York City. Stephen provides GIS and data analysis support to companies, agencies and NGOs on development and policy projects in Uganda. Contact them at

smclarke09@gmail.com

Jennifer Lee Johnson: Postdoctoral Associate with the Program in Agrarian Studies at Yale University

Jennifer completed her PhD at SNRE in fall 2013 and has considerable experience conducted fieldwork in East Africa, particularly in the Lake Victoria region. Her research on Lake Victoria's fisheries focuses on the movements, material forms, and meanings generated within Lake Victoria's diverse fisheries-related economies to develop a historical ethnography of the role of fisheries there. Jennifer was invaluablely helpful, and connected us to many of her contacts in Uganda. Learn more about Jennifer and her research at

<http://www.jenniferleejohnson.org/about.html>

Barbara Kayanja: Africa Regional Director, Global Health Corps

Before joining Global Health Corps, Barbara was the East Africa Regional Representative for Trickle Up (a New York-based non-profit organization empowering people

living on less than \$1.25 a day to take the first steps out of poverty) where she was tasked with launching the regional office in Kampala, building the organization's visibility and effectiveness in the region, and recruiting and managing partner organizations. Barbara also previously served as the CEO and Credit Manager at Gatsby Microfinance Ltd. She holds a B.A. in Social Work and Social Administration from Makerere University and an MSc. in Development Management from the UK's Open University. During her master's studies, Barbara was a Kulika Charitable Trust Scholar—a UK and Uganda charity for education grants, scholarships and sustainable agriculture education. Learn more about Barbara and Global Health Corps at: <http://ghcorps.org/why-were-here/staff/>

Doreen Kembabazi: Doctoral Candidate in History at the University of Michigan

Doreen is conducting research in Uganda for her dissertation in African History focusing on Gender, Women, Youth, Reproductive Health, Sexuality, Fashion and Dress. She expects to conclude her research and graduate in 2016. She completed her BA in Education and MA in History at Makerere University. Learn more about Doreen and her research at https://www.lsa.umich.edu/history/people/graduatestudents/ci.kembabazidoreen_ci.detail

Harriet Kemigisha: Directors of Harrier Tours

Harriet is Uganda's only female Bird guide. Harriet has guided birding trips in Uganda and Rwanda since 2003. She has worked for Avian vocalization Center (Project Avocet) recording sounds of rare species that have not been recorded to science and are now available on their website. Learn more about Harriet's work at <http://www.harriertours.com>

Eve Kirabo: Archivist at the Uganda National Archives in Entebbe

Eve lives outside of Jinja works for the Uganda National Archives in Entebbe. In addition to her research, editing and data analysis responsibilities she also engages in community outreach and educational initiatives at the archives. Contact her at evekayash@gmail.com

Ronald Mugisa K.C.: Director of the Foundation for Rural Development and District Chairman in Fort Portal

Contact Ronald at forudfort@gmail.com

Evarist Ngabirano: Former UMAPS scholar, Lecturer at Mountains of the Moon University in Fort Portal and Student at Makerere Institute of Social Research

Evarist is a lecturer at the Mountains of the Moon University in Fort Portal, Uganda. He received his MA in theology and religion at KU Leuven in Belgium. He has initiated a heritage institute at the Mountains of the Moon which supports research focused on different aspects of indigenous knowledge and practice, archiving, documenting, publishing, disseminating and teaching in order to contribute to practical models and approaches to development. Learn more about Evarist's work at: <http://misr.mak.ac.ug/graduate-education/students/evarist-ngabirano>

Danielle Raso: Business Development and Communications Officer, Global Health Corps Fellow at Set Her Free

Danielle attended American University's School of International Service in Washington DC prior to her GHC fellowship. Her primary posting during her fellowship was with Set Her Free, a non-profit organization that is working to restore the lives of young girls formerly enslaved by the sex trades. Learn more about Danielle's work with Set Her Free at <http://ghcorps.org/fellows/current-fellows/2014-2015/>

Appendix B: Contacts at the University of Michigan

Dr. Derek Peterson

Professor of History & African Studies

drpeters@umich.edu

Dr. Derek Peterson is an expert and historian in eastern African cultures. Dr. Peterson has written many books about east African cultures including: *Creative Writing* (2004), *Ethnic Patriotism and the East African Revival* (2012); and has edited books ranging from Idi Amin's reign in Uganda, politics of British slave abolition, colonial Africa, and missionary work in the region. Dr. Peterson also teaches undergraduate courses on African Literature, African Christianity, and Global Familial Structures and History, along with other subjects. With a recent shift in focus to Uganda, Dr. Peterson's research and many doctoral students have recently completed dissertations in the country and surrounding regions.

Dr. Howard Stein

Professor

Department of Afroamerican and African Studies & The School of Public Health

howstein@umich.edu

Dr. Howard Stein is a Professor in the Department of Afro-American Studies and also has a dual appointment with the Department of Epidemiology at the School of Public Health. Dr. Stein has studied and taught all around the globe including Asia and Africa. Much of his work and research centers on foreign aid, finance and development, structural adjustment, health and development, and industrial policy. Dr. Stein has written a variety of books, and his latest book published in 2008 examines the evolution of the World Bank agenda aimed at explaining the failure of their policies in regions like sub-Saharan Africa.

Dr. Kelly Askew

Professor

Department of Afroamerican and African Studies & Anthropology

kaskew@umich.edu

Dr. Kelly Askew is the Director of the African Studies Center and is a Professor in the Anthropology Department and has a dual appointment with the Department of Afroamerican and African Studies. Dr. Askew has worked for over two decades in eastern Africa, with a specific focus on Kenya and Tanzania. Along with Dr. Askew's published written works, she has produced a variety of critically acclaimed film projects as well. Her work centers on two primary research areas: poetic arts as vehicles for populist engagement with politics, and the formalization of property rights.

Dr. Roy Clarke

Professor

Department of Applied Physics

royc@umich.edu

Dr. Roy Clarke is a professor in the Applied Physics Department, and head of The Clarke Group which researches the role of interfaces in thin films and quantum nanostructures. The group's work is currently funded by the National Science Foundation, The Department of Energy, the Air Force Office of Scientific Research, and the Michigan Economic Development Corporation. Recently, Dr. Clarke has conducted research and implemented projects regarding energy storage and conversion in Gabon, Africa. Dr. Clarke's daughter, Sadira Clarke, also works in lives in Kampala, Uganda and is very with that region in eastern Africa.

Caroline Larose

M.B.A. and M.S. Candidate

Ross School of Business and School of Natural Resources and Environment

larosecl@umich.edu

Ms. Caroline Larose is currently a student pursuing her M.B.A. and M.S. at the Ross School of Business and the School of Natural Resources and Environment. Ms. Larose is currently closely involved in the non-profit Sustainable Cycles, whose mission is to promote the importance of sustainable menstrual management in the United States. More information about Sustainable Cycles may be found here: <http://sustainablecycles.org/>

Appendix C: Resources Technology for Tomorrow, Ltd. has Already Tapped into at the University of Michigan

Dr. Musaazi is very well-connected in the University of Michigan system. To date, he has friendships and partnerships with faculty in 4 different schools and departments at the University of Michigan. From the School of Natural Resources, School of Engineering, School of Applied Physics, the School of African Studies, and the Ross School of Business, Dr. Musaazi continues his interdisciplinary work by collaborating with professionals in many different areas of expertise.

Dr. Musaazi has worked on projects with some other University of Michigan faculty, but none specifically on MakaPads. There has been work on certain energy and water projects, but none with the specific focus on MakaPads until recently with Dr. Jose Alfaro.

In the Fall 2015 Semester Dr. Musaazi's personal assistant, Emmanuel Miyingo who is an Electrical Engineering student at Makerere University and who works with Technology for Tomorrow, Ltd. by heading Technical Sales and Marketing will be attending the University of Michigan in the Fall 2015 semester for an elite, academic, study abroad experience as a University of Michigan African Presidential Scholar. After his semester in Michigan, Emmanuel will return back to Technology for Tomorrow, Ltd. and use what he learned at the University of Michigan to enhance the daily operations for the company.

Works Cited

- (1) "T4T Makapads: Ecological and Low-cost Sanitary Pads for Disadvantaged Schoolgirls in Uganda." *Facebook.com*. Les Explorateurs, 27 July 2013. Web. Feb. 2015.
- (2) Sawyer, O. S. "OUTLOOK ON GLOBAL EFFORTS TO IMPROVE MENSTRUAL HYGIENE USING LOCAL PAD MANUFACTURING." (2014): n. pag. 31 May 2014. Web. Feb. 2015.
- (3) Scott, L. M. et al. "Sanitary Pad Interventions for Girls' Education in Ghana: A Pilot Study." *PLoS ONE* 7.10 (2012): n. pag. Web. Feb. 2015.
- (4) Buchanan, Leigh. "This Man Can't Stop Innovating." *Inc.com*. N.p., 01 May 2012. Web. Feb. 2015.
- (5) "MakaPads Employee Interview." Personal interview. May 2015.
- (6) Sayinde. *Bullet Point Excerpts/Summary from the Findings on Makapads*. 02 June 2014. Bullet Points of Findings.
- (7) "Field Epidemiology Training Program (FETP)." *FETP Community Needs Assessment Guidelines*. CDC, n.d. Web. Mar. 2015.
- (8) "HIV Behavioural Surveillance Survey (BSS) Kyaka II Refugee Settlement and Surrounding Host Community Uganda." IGAD - UNHCR, 2010. Web. Feb. 2015.
- (9) "Rural Poverty Portal." *Rural Poverty Portal*. N.p., n.d. Web. 23 Nov. 2015.