SANITARY TOWELS MADE FROM PAPYRUS AND PAPER WASTE: AN INNOVATIVE RESEARCH EMPOWERING DISADVANTAGED SCHOOL GIRLS AND WOMEN IN UGANDA

[1]MOSES KIZZA MUSAAZI, [2]JULIET NAKIBUULE

Technology for Tomorrow Ltd (T4T), Makerere University, Uganda.
E-mail: julienakibuule@yahoo.co.uk

Keywords: Absorbent, Biodegradable, Innovation, Makapads, Menstruation, Women Folk

I. INTRODUCTION

In 2001, Makerere University Institute of Social Research (MISR), with the support of the Rockefeller Foundation (RF), conducted a research in several primary schools in Uganda to determine why mainly Primary 5-7 school girls in rural areas continuously performed poorer than their male counterparts. Results out of the research pointed basically to the girls' menstrual days and thus lack ofaccess to affordable sanitary towels during theirmenstruation cycles. This problem not being unique to Uganda is a now widely recognized fact amongst school-going female learners in poor societies of the world. Research and Development on this problem under MISR ensued between 2004 – 2006. Following these R&D efforts on the finding, subsequent studies were conducted in 2013 under the auspices of both the International Rescue Committee (IRC) and a Dutch Agency(SNV)to confirm whether earlier findings were still prevalent, and to what extent the prevalence was being experienced. Results out of these studies clearly indicated that 20% of Ugandan school girls from mainly rural communities dropped out school due to lack of affordable sanitary towels. On this basis, therefore, the Rockefeller Foundation, amongst other sponsors, supported Eng. Dr. Moses KizzaMusaazi (RIP), then in the Makerere University's Faculty of Technology (Department of Electrical and Computer Engineering), now the College of Engineering, Design, Art& Technology (CEDAT) to innovate low cost sanitary towels for school girls while using locally fabricated machinery. A combination of papyrus and paper waste, two naturally occurring bio-degradable and chemical – free elements, was discovered to contain the necessary materials rich in the absorption of blood during the girls' menstrual cycles. It's out of this combination that low-cost sanitary towelsfor economically disadvantaged school girls and young women, otherwise called MakaPads, were locally innovated in Uganda.

Once MakaPads were unveiled onto the public domain, the Uganda Government through Uganda National Council for Science and Technology (UNCST) funded the next phase of their commercialization. Siemen Stiftung, a German – based organization, through Empowering People Network (EPN) program, also contributed to the commercialization of MakaPads and capacity building of key personnel in the innovation.

II. SCOPE

2.1. THEORETICAL APPROACH

School girls (at puberty level) that come from mainly poor backgrounds in Uganda face a lot of stigma during their menstrual cycles. In the absence of affordable sanitary towels, many resort to using crude materials.Occasionally, a good number of these girls miss school, perform low on their classroom assignments or out rightly drop out of school. Availability of affordable sanitary towels thus improves their personal hygiene, health and retention in school.

2.2. PRODUCTION

MakaPads, acronymic for 'Menstruation, Administration, Knowledge, Affordability' low-cost menstruation towels are produced from a combination of papyrus and paper waste materials. Papyrus abundantly grows in several swamps and along river banks in many parts of Uganda, while waste paper is collected from a number of places that include but are not limited to offices, schools, universities, places of worship, newspaper companies, etcetera. The resultant product provides an absorbent with a high capacity that accommodates a menstruating person for more than 8 hours per day, and no artificial enhancement for their performance is required. The production process of thesetowels starts withmixing of dried, softened papyrus fibers into a thick paste with paper waste and water. The uniformly resultant paste is then dried in the sun, smoothed, pressed and subsequently cut to equal size into absorbent inserts using locally fabricated machines that are manually operated. Solar panels of 350 wattage are sometimes used to generate minimal electrical energy necessary in their production. Before they are packaged into packs of either 3 (big size) 10(small size) napkins, they get exposed to ultra violet light that kills off any present bacteria in them. Subsequently, they are assembled with a moisture barrier, non-woven material with an adhesive ready for packaging and distribution.



Harvesting papyrus from a swamp



MakaPads

2.3. COMMERCIALIZATION

In many parts of Uganda, not uncommon in many other areas of the less developed world, the average income per person is less than a USD $ 1 per day. Comparatively, this means that a packet of otherwise imported sanitary towels, typically made of less biodegradable materials, would cost a poor rural woman twice as much as an innovated MakaPads. Obviously, this is a luxury many women in Uganda would not afford. In these circumstances, many economically less privileged rural women resort to using crude and unhygienic materials such as rags, waste paper, banana leaves, toilet papers, etcetera. The production and commercialization of the MakaPads in Uganda and other parts of the developing world becomes necessary. Presently in Uganda, a pack of 10 MakaPadscosts barely USD $ 0.70 while a pack of 3 MakaPads costs USD $ 0.25. Besides the local market for these low-cost biodegradable products, international organizations and/or agencies such as the United Nations High Commission for Refugees (UNHCR) operating mainly in Uganda, the Democratic Republic of the Congo, Sierra Leone have also found them favorable. Out of this success, Technology for Tomorrow (T4T) (www.t4africa.co) was founded as a commercial vehicle to propel the product both internally and externally. Sub production centers within the suburbs of Kampala City as well as other major towns of the country have been built to propel the various benefits of this innovation.

2.4. EMPOWEREMENT

MakaPads do not only impact a socioeconomic value to economically disadvantaged womenfolk of the 3rd world through their affordability, accessibility and alleviation of stigma that comes along with women's menstrual cycles but also empower them through employment opportunities resulting from their production. Production of MakaPads is labor – intensive and requires only minimal training. The source of materials required for their production is almost open-ended. The application of waste paper management through recycling as well as naturally sustainable raw materials from the open swamps and rivers in our part of the world ensures that disposable problems do not arise. Their use also ensures that the health of the consumers is protected since they are both chemical-free as well as being an organic absorbent. They neither irritate the private skin of the user nor omit any odor to the external environment.



Assembling *MakaPads*



Making the absorbent



MakaPads ready for distribution



Beneficiaries of the *MakaPads*

2.4 .ENVIRONMENTAL SUSTAINABILITY

MakaPads are environmentally friendly in threefold: (1) the materials out of which they are produced are biodegradable. This means that huge costs which would otherwise have been made towards their incineration and/or any other means of disposal are avoidable; (2) the naturally growing papyrus isreplenished every 3-6 months after being manually cut down to be used in the production process of the pads; (3) Waste-paper from a variety of sources, which would otherwise have been either dumped or burnt in the open air or even incinerated, indeed bearing a negative impact on the environment, is used in the production of the pads, thus saving our environment of pollution.

III. A SIMILAR INNOVATION IN OFFING

Closely following a successful innovation of MakaPads, a prototype diaper made out of similar materials and conditions has been developed. Production of the diapers still awaits the finalization of an appeal for support from mainly the Uganda Government and Non-Governmental Organizations.This additional innovation also needs to be patented. Technical and financial support from all possible sources towards the full realization of the envisaged 100% biodegradable diaper innovation is much anticipated. Once out of production, it will also save our environment the burden of disposal as used diapers form the biggest landfill all over the world.

IV. RESULTS

Through Research and Development, our efforts have yielded, amongst others, MakaPads and a prototype diaper made out of local absorbent materials and whose production is yet to start. The benefits are mainly to the local environment, the product user and the economy.

CONCLUSION

The invention of local sanitary towels in Uganda has been an enormous contribution to the girl-child education through Menstrual Hygiene Management practices. Empowerment to the wider womenfolk has also come with employment opportunities that requires almost minimal to basic training. In spite of

the prototype diaper not being produced yet, research on its realization is in progress.

ACKNOWLEDGMENT

Juliet Nakibuulespecially thanks the late Engineer Dr. Moses KizzaMusaazi(RIP) for having been the lead brain behind the MakaPadsinnovation. She owes her participation into the innovation right from its start to the end as well as her own contribution towards the empowerment of African school girls and adult women to him.

REFERNCES

[1] Build Africa. "Girls Education in Uganda; The case for sanitary pads support to girls in UPE schools. Retrieved February 26, 2019 fromhttp://fenu.or.ug/wp-content/uploads/2013/02/Menstruation-challenge-briefing-note.pdf

[2] Cognoscenti. (08-02-2019). "It's Time to Free All Women from the Menstrual Tent". Retrieved February 27, 2019 from https://www.wbur.org/cognoscenti/2019/02/08/chhaupadi-menstruation-tents-anita-diamant

[3] Design Without Borders Uganda Ltd. "MakaPads, Low – cost sanitary pad for girls and women". Retrieved February February 26, 2019 from https://www.designwithoutborders.com/makapads

[4] Elizabeth DiCesare (13-07-2014). "MakaPads Make a Difference – Innovated Development". Retrieved February 26, 2019 from http://innovatedevelopment.org/2014/07/13/makapads-make-a-difference

[5] Evelyn Angiji. "Papyrus, Waste Paper Reinvented into Sanitary Pads" (07-10-2008). Uganda Radio Network. Retrieved February 26, 2019 from https://ugandaradionetwork.com/story/papyrus-waste-paper-reinvented-into-sanitary-pads

[6] George Miiro, RwamaheRutakumwa, Jessica Nakiyingi-Miiro, Helen Weiss et.al (03-01-2018). "Menstrual health and school absenteeism among adolescentgirls in Uganda (MENISCUS): a feasibility study". Retrieved from https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-017-0502-z

[7] "HEALTH-UGANDA: Pads From Papyrus". Retrieved February 27, 2019 from

[8] http://www.ipsnews.net/2009/02/health-uganda-pads-from-papyrus/

[9] Hillary Muheebwa (13-03-2914). "MakaPads Helping Disadvantaged Girls And Women in Uganda". Retrieved February 26, 2019 from http://www.ip-watch.org/2014/03/13/makapads-helping-disadvantaged-girls-and-women-in-uganda/

[10] Janelle Teya (29-09-2016). "How Women Dealt With Menstruation Before the Discovery of Menstrual Products". Accessed February 27, 2019 from

[11] https://www.anigan.com/blogs/blog-posts/before-the-discovery-of-menstrual-products

[12] Kathryn Mahoney (14-03- 2013). "UN High Commission for Refugees". UNHCR.UN. Retrieved February 27, 2019 from https://www.capitalfm.co.ke/lifestyle/2013/09/03/makapads-local-technology-makes-papyrus-sanitary-pads-affordable/

[13] KaitlynWylde (16-10-2015). "9 Things You Didn't Know About The History of The Tampon".Retrieved on February 26, 2019 from https://www.bustle.com/articles/117604-9-things-you-didnt-know-about-the-history-of-the-tampon

[14] Kathryn Mahoney (14-03- 2013). "Papyrus and scrap paper: a monthly blessing for refugee women in Uganda". Retrieved February 26, 2019 from https://www.unhcr.org/news/latest/2013/3/5141cc7a6/papyrus-scrap-paper-monthly-blessing-refugee-women-uganda.html

[15] K4H (09-09-2016). "Menstruation Stigma: Why School-going Girls Prefer to Stay Home". Retrieved February26, 2019 from https://medium.com/the-exchange-k4health/menstruation-stigma-why-school-going-girls-prefer-to-stay-home-bf303fc138f9

[16] LarrisaOcampo (08-08-2013). "From papyrus leaf to pad. The journey of a biodegradable sanitary pad". One Girl. Retrieved February 26, 2019 from https://www.onegirl.org.au/blog/papyrus-lead-sanitary-pad-journey

[17] Linda Scott (17-12-2011). "Sanitary Pad Alternative I: MakaPads and MAKA Incinerators". Retrieved February 26, 2019 from https://www.doublexeconomy.com/2011/12/17/sanitary-pad-alternative-i-makapads-and-maka-incinerators/

[18] "MakaPads: Local technology makes papyrus sanitary pads affordable" – Capital Lifestyle. 03-09-2013. Retrieved February 26,2019 from https://www.capitalfm.co.ke/lifestyle/2013/09/03/makapads-local-technology-makes-papyrus-sanitary-pads-affordable/

[19] "MakaPads Project-The College of Engineering, Design, Art, Technology". Retrieved February 27, 2019 from https://cedat.mak.ac.ug/research/maka-pads/

[20] "MakaPads Sanitary Pads – Empowering People Network". Retrieved February 26, 2019 from

[21] https://www.empowering-people-network.siemens-stiftung.org/en/solutions/projects/makapads-sanitary-pads/

[22] Oni Lusk-Stover, Rosemary Rop, Elaine Tinsley, and Tamer SamahRabie (06-27-2016). "Globally, periods are causing girls to be absent from school". Retrieved February 26, 2019 from

[23] http://blogs.worldbank.org/education/globally-periods-are-causing-girls-be-absent-school

[24] Paul Montgomery, Julie Hennegan, Catherine Dolan et.al (21-12-2016). "Menstruation and the Cycle of Poverty: A Cluster Quasi-Randomized Control Trial of Sanitary Pad and Puberty Education Provision in Uganda". Retrieved February 26, 2019 from

[25] https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0166122

[26] RajanbirKaur, Kanwaljit Kaur, and RajinderKaur (20-02-2018). "Menstrual Hygiene, Management, and Waste Disposal: Practices and Challenges Faced by Girls/Women of Developing Countries". Retrieved February 28, 2019 from https://www.hindawi.com/journals/jeph/2018/1730964/

[27] Rodney Muhumuza (20-07-2017). "For many African girls, menstruation means humiliation".Retrieved February 27, 2019 from https://apnews.com/8fbf6e849e59493baaa3c5bd6419218d

[28] "Sustainable and affordable sanitary pads for women and girls in Uganda". Retrieved February 28, 2019 from https://vimeo.com/164991099

[29] The Kasiisi Project (Girls Support Prgram). "Sanitary Pads Keep Ugandan Girls in School". Retrieved February 25, 2019 from https://www.globalgiving.org/projects/girl-support-project-in-uganda-africa/

[30] UGANDA FOR Her (19-05-2018). "Menstrual Dropouts: Period Taboos in Rural Uganda". Retrieved February 26, 2019 from

[31] https://uganda4her.org/menstrual-dropouts-period-taboos-in-rural-uganda/

★★★