iasdr 2021 [WITH DESIGN]

PolyU Design
School of Design
The Hong Kong Polytechnic University
5–9 December 2021

Title: The Miswak Toothbrush: Incorporating Traditional Knowledge into Contemporary Product Design

Changede Sejal*[a]; Thomas Lisa[b]; Walker Stuart[c.]

[a] Lancaster University, Lancaster, United Kingdom
[b] Lancaster University, Lancaster, United Kingdom
*s.changede@lancaster.ac.uk

Dominant approaches to developing more sustainable ways of living are often underpinned by the modern values and knowledge that have been instrumental in creating our unsustainable world. Such approaches tend to emphasise reducing unsustainability via technological fixes rather than addressing sustainability more comprehensively. This paper argues that more traditional forms of knowledge (associated with deeper ecological, spiritual and ethical values) are important for addressing sustainability more holistically. To demonstrate this, we present and discuss the Miswak Toothbrush designed by the lead author. The Miswak Toothbrush has been designed to appeal to modern teeth cleaning customs but its brush head is made from Miswak, a natural twig that has a long tradition of use for teeth cleaning in rural India. This paper contributes insights into what contemporary product design can learn from traditional knowledge by discussing the implications of the Miswak Toothbrush for the development of a more meaningful and more sustainable material culture.

Keywords: Traditional Practices and Products; Design for Sustainability; Meaningful Future

1 Introduction

Concerns about sustaining our world are not a recent phenomenon; visionaries through the ages have deliberated on the impact of human activities on the Earth's ecosystems (Waas *et al.*, 2011). The consequences of unsustainable lifestyles, manufacturing and consumption habits are now evident through climate change, catastrophic biodiversity losses, growing global inequities and pandemics like COVID-19 (Holmes *et al.*, 2011; Brian Bethune, 2020; United Nations, 2020). Sustainability is therefore becoming an increasingly central concept in reshaping and safeguarding our world for future generations (WCED, 1987).

Modern approaches to sustainable development tend to focus on reducing unsustainability but as Ehrenfeld (2013) contends, reducing unsustainability will not create sustainability. The main problem

with modern approaches is that we are trying to solve our problems with the same kind of thinking that created the problem in the first place but as Einstein once famously said, “The significant problems we face cannot be solved at the same level of thinking we were at when we created them.” Moreover, approaches like Eco-efficiency, Natural Capital, The Natural Step, Triple Bottom Line, and many others are “part of the problem, not the solution: they all will fail sooner or later and, worse, shift the burden away from more fundamental actions” (Ehrenfeld, 2008). Contrary to this, traditional knowledge and practices have been developed over generations by “[taking] account of a wider complex of human values, tastes, attitudes, spiritual and religious aspects, social and cultural norms and patterns of consumption to theorize dynamic relationships between people, place, resources, techniques, and processes of making” (Evans, 2018; Walker *et al.*, 2018).

2 Miswak Tooth Cleaning Twig

A ‘Miswak’ is a twig from a medicinal ‘Neem’ tree or ‘Indian lilac’. These twigs have a have a very long tradition of use as a primary tool for oral hygiene in rural India. Additionally, the miswak is widely used among Muslim communities due to religious norms and was used by ancient Arabs to clean their teeth in the belief that it contributed to ritual purity (Dagher and Farook, 2019). Miswak twigs are chewed until one end is frayed – this end can then be used to brush against the teeth. The twigs are economical, more ecological, and readily available. Moreover, they can be used without the need for toothpaste. As Miswak twigs are obtained from trees, they are far less polluting than the large production processes of synthetic toothbrushes and toothpastes. They are also biodegradable, thus there is no need for recycling or sending them to landfill. When dried, miswak twigs can be soaked in water to soften the end bristles, which provides long-lasting sustainable usage. Twigs can also be cut afresh and can be replaced every few weeks to maintain proper hygiene.

Miswak has properties that effectively fight plaque, gum disease, and even prevent any existing decay from getting worse. It also contains minerals such as chloride, sodium bicarbonate and potassium to strengthen the enamel in teeth (Malik *et al.*, 2014). Most commonly twigs of trees are used that have a high content of tannins (astringent and antibacterial) or other compounds that benefit the health of gums and teeth (Malik *et al.*, 2014). The process of chewing this stick has also revealed equal and at times greater mechanical and chemical cleansing of oral tissues than the modern toothbrush (Mitra *et al.*, 2017). Furthermore, different species of trees have various levels of hardness so they offer similar options to synthetic toothbrushes in terms of selecting the desired level of brush head firmness (Malik *et al.*, 2014).

3 The design of the Miswak Toothbrush

A ‘research through design’ method was adopted, in which the act of designing and creating new solutions is regarded as a valuable process for generating knowledge (Frayling, 1993). For all its sustainability benefits, the Miswak twig represents a radically different approach to oral hygiene for modern societies accustomed to using plastic brushes. To appeal to contemporary customer tastes and routines, the Miswak Toothbrush (figure 2) adopts the visual language of the increasingly common bamboo toothbrush.

As Wu et al. (2018) note, we are currently seeing a shift in the consumer choices of ecological products as bamboo toothbrushes and charcoal toothpastes are being increasingly in demand due to their attributes of being eco-friendly, nontoxic, vegan, organic, healthful and non-hazardous to the environment (Wu *et al.*, 2018).

The Miswak Toothbrush consists of four parts in total: three individual cylindrical Miswak bristle heads and a ready-made ergonomically designed bamboo brush handle modified to fit these bristle heads. Thus, the toothbrush handle has three threaded depressions of 0.6mm in diameter and 0.4mm in depth into which the bristle heads are fitted; these are threaded into place and are easily replaceable after their life span, which is approximately two weeks depending on the strength and hardness of the twig. To help clean teeth effectively the bristle heads are fitted in the length of approximately 25 mm (ChemistDirect, 2021).

Packaging and branding design can be used as an added value to take advantage of consumers subconscious visual appeal and understanding of a product (Lewis, Verghese and Fitzpatrick, 2012). Packaging for the Miswak Toothbrush has been designed using the bamboo-straw as raw material, which is commonly used in many regions of India for various purposes including as a substitute for wood, building and construction material, for handicrafts and paper, etc. The design is kept minimal and functional. The branding originates from the image of the, 'Neem Leaves'.

Figure 1. ***Traditional way the Miswak twig has been used*** **(wikiHow, 2020).**

Figure 2. ***People in rural India using and selling Miswak twigs to clean teeth*** **(AJP, 2016; clicksabhi, 2017; Barman, 2020; DebashisK, 2021).**

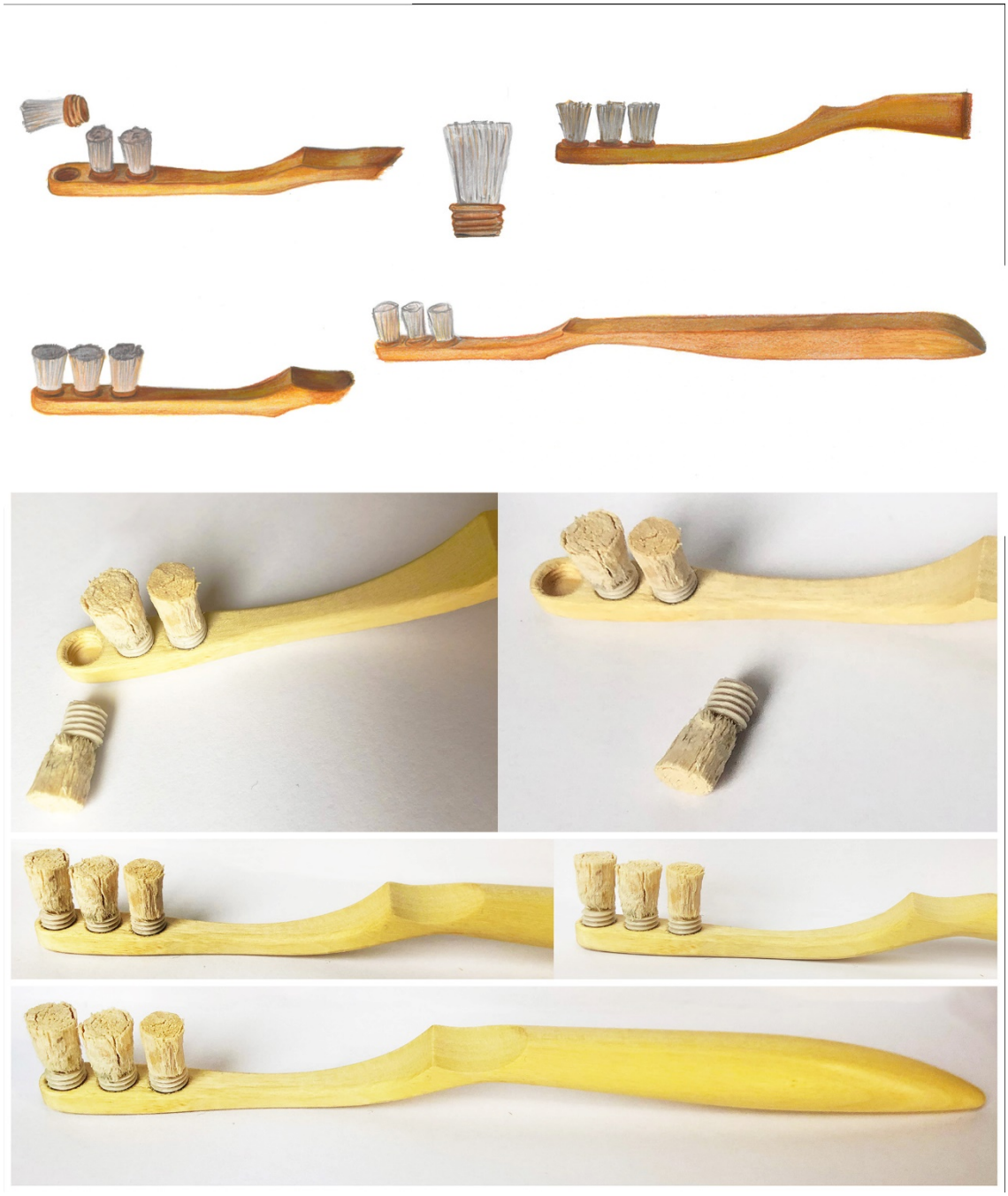

Figure3. ***Sketches and prototype design of the 'Miswak Toothbrush'.***

Figure 4. ***Packaging, branding and final prototype design of the 'Miswak Toothbrush'.***

4 Discussions

Many forms of traditional knowledge and associated practices which still exist in many parts of the world are valuable inheritances due to their ability to cater for people's needs whilst being in harmony with nature (Walker *et al.*, 2018). Our inquiry illustrates the potential for design to contribute more substantively to sustainability by drawing on traditional knowledge and practices, revealing that contemporary understanding of sustainability needs to consider synergies with environmental, ecological, social, spiritual, materialistic and utilitarian norms, and a sense of responsibility for past, present and future generations.

Contemporary product design can learn and adapt from traditional practices to suit modern consumer preferences (Walker, Evans and Mullagh, 2019). Thus, there is potential for using appropriate technologies while creating a product in accordance to contemporary design principles e.g. working with state-of-the-art tools and machines, digitisation, etc. However, mindful intervention is needed in such approaches to ensure traditions and values of particular practice are not lost (Walker, Evans and Mullagh, 2019). Contemporary design also provides the potential to enhance the perceived value of the relationship between sustainability and traditional practices through effective branding, marketing and packaging design, which can support contemporary consumers to make appropriate choices.

5 Conclusion

The Miswak Toothbrush demonstrates that contemporary product design can learn from traditional knowledge and practices to create more sustainable products. Our design proposal draws on the traditional knowledge and use of a natural resource rooted in cultural heritage. By reinterpreting its beneficial features into a recognisable, modern product, it demonstrates a different way to conceptualise and develop future products. (Cloete, 2020). This Miswak Toothbrush offers a tangible example of how and what design can learn to holistically contribute to a meaningful sustainable future.

6 References

AJP (2016) *An Unidentified Rural woman Brushing her teeth with Neem Stick or Neem Datun. Selective Focus is used.*, *Shutterstock*. Available at: https://www.shutterstock.com/image-photo/varanasi-india-mar-04-unidentified-woman-1592147578 (Accessed: 9 November 2021).

Barman, A. R. (2020) *An Unidentified Rural woman Brushing her teeth with Neem Stick or Neem Datun. Selective Focus is used.*, *Shutterstock*. Available at: https://www.shutterstock.com/image-photo/purulia-west-bengal-india-october-312020-2041896155 (Accessed: 9 November 2021).

Brian Bethune (2020) *The unsustainability of modern life and how COVID-19 may be exposing cracks in our society - Macleans.ca*, *St. Joseph Communications.* Available at: https://www.macleans.ca/culture/books/author-tara-henley-lean-out-coronavirus-covid19/ (Accessed: 27 May 2021).

ChemistDirect (2021) *Toothbrush shapes and sizes*. Available at:

https://www.chemistdirect.co.uk/oral-b-toothbrush-shapes-and-sizes (Accessed: 8 November 2021).

clicksabhi (2017) *A young Indian boy brushing his teeth using a Neem stem. Neem plant has medicinal properties and its juice is good for teeth*, *Shutterstock*. Available at: https://www.shutterstock.com/image-photo/patna-india-july-20-2017-young-683632627 (Accessed: 9 November 2021).

Cloete, S. (2020) *Behaviour Change: Covid-19 lockdown kicks open the door to a net-zero pathway - Energy Post*, *Energy Post*. Available at: https://energypost.eu/behaviour-change-covid-19-lockdown-kicks-open-the-door-to-a-net-zero-pathway/ (Accessed: 27 May 2021).

Dagher, A. and Farook, T. (2019) 'Miswak: A Toothbrush Alternative?', *BDJ Student*, 26(1), p. 08. Available at: https://www.researchgate.net/publication/335612156_Miswak_A_Toothbrush_Alternative (Accessed: 27 May 2021).

DebashisK (2021) *An old woman using the primitive method of brushing teeth with a branch of neem tree.*, *Shutterstock*. Available at: https://www.shutterstock.com/image-photo/old-woman-using-primitive-method-brushing-1956342754 (Accessed: 9 November 2021).

Ehrenfeld, J. (2008) *Sustainability by Design: A Subversive Strategy for Transforming Our Consumer Culture*. New Haven and London: Yale University Press.

Ehrenfeld, J. (2013) 'The Roots of Unsustainability', in Giard, J. and Walker, S. (ed.) *The Handbook of Design for Sustainability*. London: Bloomsbury Academic, p. 15.

Ehrenfeld, J. and Hoffman, A. (2013) *Flourishing: A Frank Conversation About Sustainability*. California: Stamford University Press.

Evans, M. (2018) 'Editorial Introduction', in Stuart Walker, M. E., Tom Cassidy, Jeyon Jung, A., and Holroyd, A. T. (eds) *Design Roots*. London and New York: Bloomsbury Academic, pp. 9–10.

Frayling, C. (1993) 'Research in Art and Design', 1(1), pp. 1–5.

Holmes, T. *et al.* (2011) *The Common Cause*, *Public Interest Research Centre*. United Kingdom: Public Interest Research Centre. doi: 10.7208/chicago/9780226020075.001.0001.

Lewis, H., Verghese, K. and Fitzpatrick, L. (eds) (2012) *Packaging for Sustainability*. California, US: Springer-Verlag.

Malik, A. S. *et al.* (2014) 'Comparative effectiveness of chewing stick and toothbrush: A randomized clinical trial', *North American Journal of Medical Sciences*, 6(7), pp. 333–337. doi: 10.4103/1947-2714.136916.

Mitra, J. *et al.* (2017) 'Formulation and Qualitative Assessment of Mouth Wash Using Terminalia Chebula Seeds and Neem Twig', *WORLD JOURNAL OF PHARMACY AND PHARMACEUTICAL SCIENCES*, 6(2), pp. 661–674. Available at: https://www.researchgate.net/publication/313161537_FORMULATION_AND_QUALITATIVE_ASSESSMENT_OF_MOUTH_WASH_USING_TERMINALIA_CHEBULA_SEEDS_AND_NEEM_TWIG (Accessed: 27 May 2021).

United Nations (2020) *THE 17 GOALS | Sustainable Development*, *Department of Economic and Social Affairs*. Available at: https://sdgs.un.org/goals (Accessed: 21 February 2021).

Waas, T. *et al.* (2011) 'Sustainable development: A bird's eye view', *Sustainability*, 3(10), pp. 1637–

1661. doi: 10.3390/su3101637.

Walker, S. *et al.* (2018) *Design Roots*. Edited by S. Walker et al. London and New York: Bloomsbury Academic. doi: 10.1017/CBO9781107415324.004.

Walker, S., Evans, M. and Mullagh, L. (2019) 'Traditional Maker Practices and Sustainable Futures. The implications of expertise', *Design Journal*, 22(sup1), pp. 835–848. doi: 10.1080/14606925.2019.1595403.

WCED (1987) *Our Common Future: Report of the World Commission on Environment and Development*. Switzerland.

wikiHow (2020) 'How to Use Miswak', *wikiHow*. Available at: https://www.wikihow.com/Use-Miswak (Accessed: 9 November 2021).

Wu, H. C. *et al.* (2018) 'What drives green brand switching behavior?', *Marketing Intelligence and Planning*, 36(6), pp. 694–708. doi: 10.1108/MIP-10-2017-0224.