

AFRICAN INDUSTRIAL DESIGN PRACTICE

Perspectives on Ubuntu Philosophy

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Introduction

The United Nations Human Development Report (2020) highlighted that “broken societies [have] put people and planet on [a] collision course.” A year later, the Intergovernmental Panel on Climate Change (IPCC) report on the Physical Science Basis (Masson-Delmotte et al., 2021) made humanity’s ‘code red’ even more apparent. Based on the outcomes of the last report, the Secretary-General of the United Nations (UN), António Guterres, highlighted that “The alarm bells are deafening and the evidence is irrefutable: greenhouse gas emissions from fossil-fuel burning and deforestation are choking our planet and putting billions of people at immediate risk” (IPCC, 2021).

A significant reason for humanity’s current mess is the constant growth agenda of Western capitalism, which ignores inherent planetary resource limits (Meadows et al., 2004). Such a world view selfishly places humans at the top of the food chain instead of understanding its complex interconnection. The scale of the human impact on the earth has led many scientists to accept the description of the contemporary era as the ‘anthropocene’ (Crutzen & Stoermer, 2000) – an era in which the impacts of human activity are evident at almost every level of the planetary ecosystem.

In this chapter, the authors will contextualise how the Global North has responded to unsustainable development, focusing on the Sustainable Development Goals (SDGs). The parallel shift in industrial design will be explored from the perspective of the Global North. This will be contrasted with the Afrikan concept of Ubuntu to explore a more endogenous conception of sustainable design in Afrika. Finally, case studies will be discussed with examples of how Afrikan sustainable design is attempted in contemporary Afrikan industrial design.

Sustainable Development and Design

The definition of human development has been described as being at loggerheads with the natural world. In his seminal book *The History of Development*, Gilbert Rist (1999, p. 13) describes it as:

a set of practices, sometimes appearing to conflict with one another, which require – for the reproduction of society – the general transformation and destruction of the natural environment and social relations. It aims to increase the production of commodities (goods and services) geared, by way of exchange, to effective demand.

Rist (1999, p. 19) notes that such a definition is “scandalous” because it seemingly contradicts the belief that development is focused on enhancing humanity’s equality. However, when the origins of development are contextualised as a post-war drive to further the markets of the Global North (Truman, 1949), it becomes clear that such a project did not derive from altruistic intentions. With a narrow focus on economic growth, the initial development measurements were crudely measured by gross domestic product (GDP). It was only after the report from the Brundtland Commission in 1987 that sustainability and broader conceptions of human well-being were identified as additional metrics for human development.

The Brundtland Report (United Nations, 1987, p. 41) defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” The Brundtland definition further unpacks these needs in two concepts: firstly, the priority of meeting the basic needs of the world’s poorest and, secondly, the immense pressure technological advancement and social organisation have placed on the environment’s ability to sustain present and future needs. These concepts of sustainable development sought to redress human activity misaligned with the natural ecosystem to regenerate from the uncontrolled extraction of resources.

The United Nations Department of Economic and Social Affairs (2022) alludes that the 17 Sustainable Development Goals (SDGs) are considered one of the most critical metrics for the world’s progress towards environmental sustainability. However, with what seems to be a hang-on from the original conception of development, many of the nations with the highest SDG scores in the index – the most ‘developed’ in terms of the socio-economic and political characteristics in the Global North – also have excessive and highly unsustainable material consumption practices (Hickel, 2020). Bhutan and Suriname are the only carbon-negative countries (Goering, 2021). This is primarily due to their small populations and a large proportion of forests. However, despite their stellar environmental standing, they are considered

‘underdeveloped’ countries in the Global South. All nations are developing despite the binary of developed and underdeveloped. However, the indices that measure sustainable development bring biases of the past.

The same bias is experienced in the development of design (Campbell, 2013). Industrial design as a discipline also originated in post-war Global North economies, where its focus was also economical, specifically focusing on increasing production and consumerism of products through enhancing function and aesthetics. In the opening of his book *Design for the Real World: Human Ecology and Social Change*, seminal designer and educator Victor Papanek notes, “There are professions more harmful than industrial design, but only a few” (1971/1985).

Since the 1980s, the discipline of industrial design has undertaken two significant shifts. The first was a move to a more human-centred design approach that was less focused on creating consumers but on meeting real human needs by designers who acknowledged that they were not necessarily the experts on others’ lived experiences. There was also an acknowledgement that industrial design had moved from being predominantly solution-oriented to becoming strategic as it includes a more comprehensive range of outcomes ranging from products to services, systems and experiences (World Design Organization [WDO], 2015).

However, as per the human-centred descriptor, this approach to industrial design still hierarchically tended to serve the interest of privileged people over the planet. This led to the next important and more recent shift towards earth-centred approaches to design. This shift acknowledges design interventions’ complex and interconnected context from a socio-technical systems perspective, including natural ecologies. The seminal book *Design for Sustainability: A Multi-level Framework from Products to Socio-technical Systems* by Ceschin and Gaziulusoy (2020) explores the evolution of sustainable design from green design to design for sustainability transitions. Ceschin and Gaziulusoy (2020) present a comprehensive overview of the development of sustainable design from its insular and technocentric beginnings to a more systemic and earth-centric future. As an open-source published book, the book provides a detailed resource that attempts to document the development and range of methods used in sustainable design in the Global North. Some of the critical approaches to design for sustainability are discussed next.

Sustainable Product Design

Most conceptions of sustainable product design are focused on the entire life cycle of a product, from its natural resource until its final demise, or in more considered conceptions, into a new life as something else (McDonough & Braungart, 2002). These approaches are described under green design, eco-design, whole life cycle, or cradle-to-cradle. Some are more authentic than

others, with the idea of green-washing pervading many supposedly sustainable products using what seem to be natural materials or green or eco-branding. For a more authentic approach to sustainable product design, designers must carefully consider and measure all the resources, manufacturing processes, potential deconstruction and remanufacture in a product's entire life-cycle (Cradle to Cradle Products Innovation Institute [CCPII], 2022). As an example of cradle-to-cradle thinking, McDonough and Braungart (2002) return to nature in their description of a tree-growing fruit cycle. The fruit will provide sustenance for other animals before being returned to the soil, decomposing to its constituent molecules without degrading them. It will make them fully available as compost for the tree seeds or for other life to grow. Energy is used in the fruits' creation through light and nutrients from the soil. Still, nothing becomes unusable waste or harms the environment in this life cycle of making and decomposition.

The main problem with a product-centric focus for design is that products tend to be resource- and energy-intensive. Despite the best attempts at design for disassembly, reuse or recycling, many of the reimaginings of a product tend to result in a less valuable or useable form than their original form. Another problem with a product-centric focus is that many products are already available worldwide. The problems faced today, particularly the intractable ones, do not necessarily need more products to 'solve' them. This is where a service-oriented approach to design can add a more sustainable alternative.

Service Design for Sustainability

Service design is increasingly becoming important for organisations wishing to transform or improve their customers' services. Service design is defined as the "design for experiences that happen over time and across different touchpoints" (Service Design, n.d.). Touchpoints are crucial in designing services, as they are the points of interaction between customers and service providers (Stare & Križaj, 2018). A shift from product to service and experience inherently limits a need for more resources. It also allows existing products to be more pleasurable or used more efficiently.

A focus on service experiences by society puts pressure on manufacturing companies that focus on product development to re-direct their innovation activities towards service-oriented differentiation. This is analogous to the shift from a manufacturing to a service economy (Vargo & Lusch, 2004). A service differentiation strategy for manufacturing companies means the value is defined less in tangible terms and more in intangible and dynamic services produced and consumed simultaneously (Tukker, 2015; Vargo & Lusch, 2004). This strategy makes services the core offering supported by enabling products rather than being add-ons to products, as in traditional product-oriented strategies (Gebauer et al., 2016). Service differentiation depends on

the capabilities companies develop over time with their stakeholders (Bello et al., 2016). A stakeholder relationship approach also means that revenue can be generated at different life cycle stages of the offering (Manzini & Vezzoli, 2003; Tan & McAloone, 2006).

Design for Social Innovation

Social value can be created by solving social problems through new ideas that work at meeting social goals (Porter & Kramer, 2019). All human needs have a social dimension to them. This includes needs met through profit-making ventures. Phills et al. (2008) defined social innovation as

any novel and useful solution to a social need or problem that is better than existing approaches (i.e., more effective, efficient, sustainable, or just) and for which the value created (benefits) accrues primarily to society as a whole rather than private individuals.

This definition implies that creativity is required for solutions to improve on existing ones. The edge in social innovations emanates from the co-creation of value by all stakeholders for mutual social benefit rather than profit – the driver to innovate is social needs rather than opportunities to make money.

Socio-technical Systems Design

Product-service systems (PSS), also widely discussed alongside servitisation (Baha et al., 2014; Baines & Lightfoot, 2013; Morelli, 2003; Vezzoli et al., 2021), can be viewed as an integration of new product development and new service development (De Lille et al., 2012). By simultaneously addressing product and service components of value creation, PSS aims to shift the business focus from designing (and selling) physical products to designing (and selling) a system of products and services which are jointly capable of fulfilling specific client demands while re-orienting current unsustainable trends in production and consumption practices (Manzini & Vezzoli, 2003).

PSS is a business strategy based on continuous life cycle improvement, considering the product and service life cycles (Kjaer et al., 2019; Tan & McAloone, 2006). In this way, the concept represents a holistic approach to sustainable innovation. Through this strategy, manufacturing companies can undergo servitisation to redefine value creation in non-product terms (Rapitsenyane et al., 2019). According to Tomiyama (2001), the value of this process of servitisation is in intensifying service contents of offers to arrive at the environmentally conscious design and manufacturing and create more added value in future advanced societies. A view of the whole landscape of the problem, the environment in which the problem is being investigated,

relationships between factors causing the problem and possible factors that might lead to a solution is necessary for this holistic view, especially if looked at from the design perspective. A whole system design approach is necessary to aid such decisions (Fiksel, 2006) and move design away from its traditional focus on material products (Morelli, 2003). The position of PSS in a systemic context can be articulated in terms of the tangible and intangible value that requires an environment, provider, consumer and product to facilitate its provision (Tomiyama, 2001).

An Afrikan Concept of Sustainability

These brief prior explorations of sustainable design arise from a hierarchical global position from the Global North. Development and the indices that measure it do not account for the fact that most ‘developed’ nations could achieve their position in the world on the back of the labour and resources of their colonies. Latin American and decolonisation scholar Nelson Maldonado-Torres defines decoloniality as “the dismantling of relationships of power and conceptions of knowledge that foment the reproduction of racial, gender, and geo-political hierarchies that came into being or found new and more powerful forms of expression in the modern/colonial world” (2006, p. 117).

Colonisation and the political, social and economic systems that arose from it consciously undermined indigenous Afrikan cultures. Many Afrikan societies have pre-colonial oral traditions with a deep cultural appreciation for the interdependence of a person’s physical well-being, the well-being of the environment, the community (past and present) and spiritual factors beyond the physical realm (Kideghesho, 2008). The Nguni Bantu concept of Ubuntu acknowledges these more comprehensive relations, connections, and responsibilities as,

A collection of values and practices that people of Africa or African origin view as making people authentic human beings. While the nuances of these values and practices vary across different ethnic groups, they all point to one thing – an authentic individual human being is part of a larger and more significant relational, communal, societal, environmental, and spiritual world.

(Mugumbate & Chereni, 2020, p. vi)

The separation between people and the planet is evident in the Global North (Eisenstein, 2013). Indigenous world views such as Ubuntu present a far more sustainable, integrated and communal conception of human relations and relationships with the natural environment (Katz, 1937/2011; Ogude, 2019; Zondi, 2021, pp. 237–238). Ubuntu, as a philosophy, is ultimately

focused on the essence of humanity through our relations and connectedness to others. *Umuntu ngumuntu ngabantu* translates from isiZulu as ‘a person is a person through other people.’ The recently deceased Desmond Tutu (2012, pp. 34–35) once described someone who displayed Ubuntu as one who understood that “my humanity is caught up, is inextricably bound up, in theirs.” Although Ubuntu as a concept is never directly mentioned, Bowles and Gintis’s (2011) book *A Cooperative Species: Human Reciprocity and Its Evolution* explores the significant effect that ancient morally defined cooperation had on the survival and success of the human species. One might suggest that such a philosophical relational positioning of people may present an anthropocentric view of the world – as the humanity-centred design seems. However, Ramose (1999) argues that in Ubuntu, people and nature are considered interdependent, so care for relations between people also implies care for the natural environment. Likewise, Etieyibo (2017, pp. 633–634) goes to great lengths to also argue that Ubuntu is not anthropocentric, but it “promotes a much better attitude towards the environment or environmental sustainability than the current dominant ethical orientation that is welded to capitalism.” It is against this robust co-existence of people with the environment that local indigenous and embedded Afrikan approaches to sustainable design should be built.

The way that education inducts students into engaging with the world around them is critical to changing dominant paradigms (Jansen, 2019). Post-colonial theorist Mbembe (2015) highlights that to set our institutions firmly on the path of future knowledge, we need to reinvent a classroom without walls in which we are all co-learners, a university that is capable of convening various publics in new forms of assemblies that become points of convergence of and platforms for the redistribution of different kinds of knowledge.

Educating design students to appreciate the relational concept of Ubuntu, the acknowledgement of the interdependence of people with each other and the natural world, could begin to change some of the hierarchical and patriarchal pedagogies that have tended to distort significant aspects of design education in the Global North, as well as its influence design education on the Global South. An Ubuntu-inspired approach to design education might parallel Anil Gupta’s work in India’s similar Global South context.

Agriculturalist turned economist Anil Gupta from the Indian Institute of Management and founder of the Honey Bee Network questions:

Why is it . . . that the designers of pedagogies and curricula, policies and programmes the world over neglect the need for learning from knowledge rich-economically poor people? Why are there so few papers on innovations by workers in [the] organised and unorganised sector compared to managerial innovations?

(Gupta, 2012, p. 29)

In his book *Grassroots Innovation: Minds on the Margin Are Not Marginal Minds*, Gupta (2012) describes how for the last two decades, he has biannually walked a *Shodhyatra* or ‘journey on foot’ searching for knowledge, creativity, and innovation at the grassroots in India. Thus far, Gupta has covered thousands of kilometres and partnered with various governmental organisations to contribute towards the world’s largest open-source innovation platform. The Honey Bee Network (2020) has helped to document and, in partnership with India’s National Innovation Foundation (2020), to protect the intellectual property of over 200 000 innovations as part of a grassroots to global strategy for knowledge-based approaches to poverty alleviation and employment generation. This approach to scaling localised indigenous knowledge from the Global South could be highly inspirational for similar Afrikan contexts.

The sustainable design approaches discussed in this chapter use a participatory design approach. The approaches place the design wisdom in the hands of the designer. The designer supposedly knows what a consumer or community requires, particularly in a ‘developing’ context. However, an Ubuntu-inspired approach to Afrikan sustainable design would expect a horizontal, empathic, caring, authentic relationship between the expert designer and the community lay designers or local experts (Campbell, 2017). A key aspect of Ubuntu is to building interrelationships among the community. Therefore, Afrikan design education should take inspiration from Afrikan indigenous knowledge systems and the passions and experts who have found creative ways to solve their problems, within limited means, in their contexts. In such an approach, designers are tasked with amplifying pre-existing endogenous creative activities or interventions, not to celebrate informality but to acknowledge that the real experts are the lay designers.

Afrikan Sustainable Design Projects

The following section discusses two case studies of Afrikan sustainable design. They are not perfect solutions but are a start towards a more authentic approach to sustainable product design in Afrika, wherein the indigenous philosophy of Ubuntu inspires both cases.

Beegin Bee Bunka Beehive

Beegin started in 2016 as a University of Johannesburg Bachelor of Technology – Industrial Design student research project in South Africa. It emerged out of a broader research project that had been ongoing since 2013 called *iZindaba Zokudla* in isiZulu, which means ‘conversations about the food we eat together.’ *iZindaba Zokudla* made use of the facilities of the University of Johannesburg, Soweto Campus to bring a wide range of stakeholders

together to create opportunities for more sustainable urban agriculture and entrepreneurship in the Johannesburg food system (iZindaba Zokudla, 2022). The inception of *iZindaba Zokudla* and bringing local expert urban farmers together to learn from and connect, creating various forms of social capital (Malan, 2015; Malan & Campbell, 2014), was inherently aligned with the socio-environmental relational conception of Ubuntu.

Through the designer's involvement in the *iZindaba Zokudla Farmers' Lab* (Figure 2.1), Ivan Brown met many emerging urban farmers trying to keep bees but with limited equipment and apiary knowledge. Most of these urban farmers kept bees because they knew having pollinators on their farms increased their crop productivity. Furthermore, honey was a valuable commodity, resulting in almost R3000 (\$200) worth of honey per season per hive – at the time, the average monthly household income of most South African households. Therefore, such a valuable crop added significant resilience to emerging and marginalised urban farmers.

Inspired by the passions of these emergent beekeepers, Brown (2017) further explored the wide range of problems beekeepers face in South Africa; these included the loss of beehives due to theft, vandalism, fires, honey badgers, weathering and insect infestation. Using a participatory humanity-centred design process inspired by the concept of appropriate technology (Brown & Campbell, 2017) (Figure 2.2), Brown collaborated with five urban farmers who were either interested in becoming beekeepers or had tried to keep bees in the past. He also worked with six expert beekeepers, who developed, tested and refined a range of Beegin beehives together with the emergent beekeepers.

Using a humanity-centric approach, all the hives were co-designed by the emergent and expert beekeepers to accommodate their needs. However, the



FIGURE 2.1 iZindaba Zokudla Farmers' Lab

Source: iZindaba Zokudla (2022) (Naudé Malan)

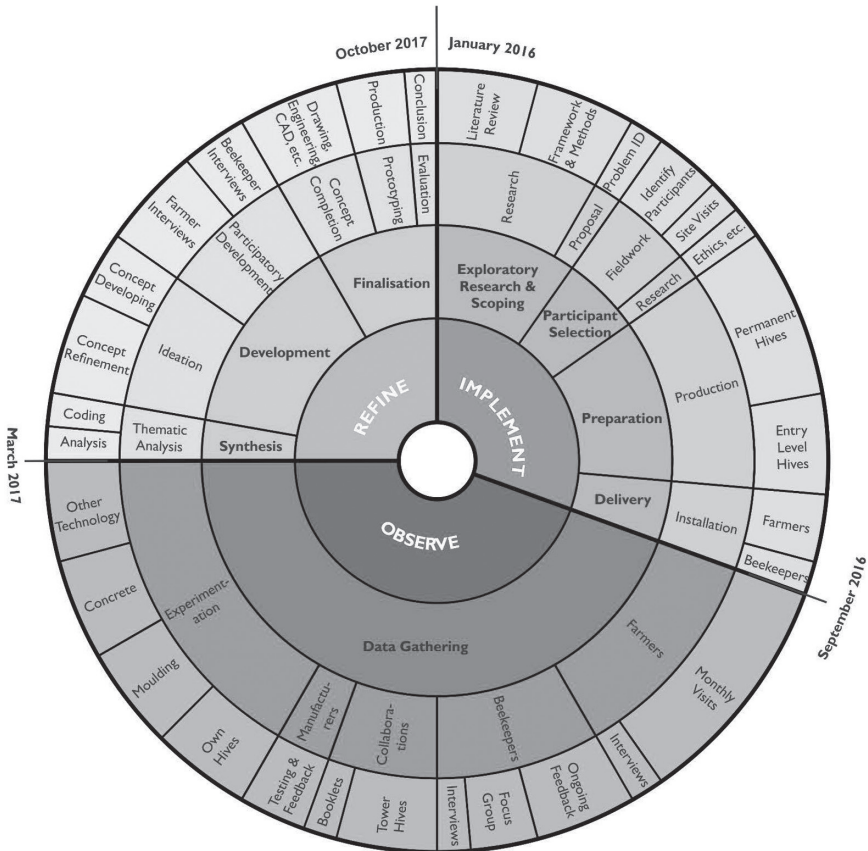


FIGURE 2.2 Beegin design research process

Source: Brown (2017, p. 27)

beehives were designed from the point of view of supporting bee health and natural behaviour, an additional bee-centric approach which was consistent with a socio-ecological conception of Ubuntu. The final design outcome (Figure 2.3), the Beegin Bee Bunka, is a lightweight concrete beehive, a durable, low-cost alternative to wood, and the moulding tools for making them. The design was based on the standard Langstroth hive, with the new Beegin hives protecting both beekeepers and bees from hive losses.

A key innovation in the hive is using lightweight concrete in its manufacture – in field testing, this was found to increase bee productivity by up to 40%. This significant productivity improvement was due to the insulating properties of the lightweight concrete composite hive, which meant the bees needed less energy to heat or cool the hive. The bees were able to spend more time producing honey.



FIGURE 2.3 The final Beegin Bee Bunka beehive

Source: Ivan Brown (2017)



FIGURE 2.4 Urban farmers learning to make Beegin hives with initial prototype moulds

Source: Ivan Brown (2017)

Instead of shipping the giant bulky beehives around the world, which would be costly in terms of financial and environmental impacts, the Beegin business model was conceived on a decentralised model of supply and manufacture. Beegin sells the moulds and production tools in an innovative, open manner for people to make their beehives and potentially begin a local beehive production business (Figure 2.4). Key indicators of the success of this

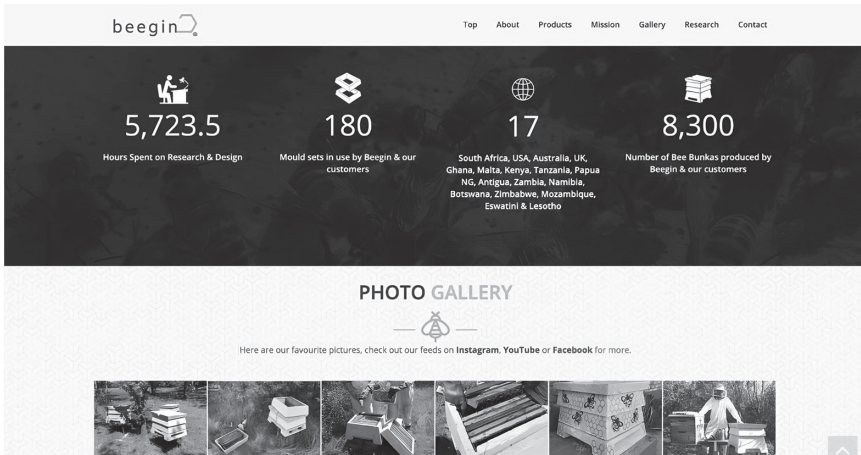


FIGURE 2.5 Beegin website and Bee Bunka impact

Source: Beegin (2022)

approach are the wide range of different experimental fillers various producers have tried and the uptake of moulds and hives around the world. As of March 2022, Beegin has sold 180 mould sets, which have produced 8300 Bee Bunka hives in 17 countries around the world (Figure 2.5).

The relational concepts of Ubuntu within the Beegin project were extensively explored within the concept of critical citizenship (Campbell & Brown, 2018), with a specific focus on power and love (Kahane, 2010). The positive relationships between those that helped conceive the Beegin beehives, the socio-economic benefits of the Bee Bunka's low-impact decentralised production model and its support of bee health and natural behaviour all acknowledge the positive impact a more relational conception of Afrikan sustainable design may have.

The Learning Network on Sustainable Energy Systems (LeNSes)

LeNSes was a collaborative project between universities in the Global North and the Global South, co-funded by Erasmus+ and facilitated by the Learning Network on Sustainability International (2022). The LeNSes project aimed to promote a new generation of design educators and researchers capable of designing sustainable energy systems for all in Botswana, Kenya, South Africa and Uganda, explicitly focusing on Sustainable Development Goal 7: Affordable and Clean Energy.

Although this project received funding from the European Union (EU), it was conducted in Botswana with a range of local participants, experts and researchers to ensure it was cognisant of local culture. The co-design project

was undertaken with a primary school and its community in a township in Gaborone, Botswana. Teachers, students, members of the Parents-Teachers Association (PTA), security guards at the school, a local solar energy products entrepreneur, researchers from a local research institution and the Department of Energy Affairs were all participants in the research and co-design activities. The diverse array of participants allowed for the broader social relations of the context to be considered authentically and Ubuntu inspired.

The emergent project brief focused on co-designing a PSS to improve the safety of townships by providing light and security to the public, passages and open spaces which were not lit at night. The project was situated on the school premises, and the various stakeholders contributed their expertise to the project from their local knowledge and experiences (people, technologies and cultures).

The process involved field trips to communities, analysis of the energy context in Botswana, details from project associates to inform the brief, understanding the problem and the stakeholders, generation of ideas, initial concept design, mapping of initial design concepts on a polarity diagram, concept selection and development, field trips to get user feedback, concept and detail design and presentation from student teams to share their work. On its basis of connection, the common good and collaboration (Bremer, 2015), the Ubuntu co-creation process facilitated the generation of results that all stakeholders accepted.

A sample day two plan is shown in Figure 2.6. Through a situated immersive process with local participants, the design students from the University

Day 2

Field trip to the communities

A field visit to Tshwaragano Primary School, Old Naledi and stop over at hotspots where crime occurs at night due to lack of proper lighting.






FIGURE 2.6 Sample day plan

of Botswana could understand some of the energy challenges of the school community. It is worth noting that the proposed solution has moved from a product that can provide light to a PSS – which is aligned with the sustainability design agenda.

Key Results of the LeNSes Project

In order to make the process and the philosophy behind the process available to a broader audience, the project's key results were made available in two formats for the benefit of the design community in Afrika, including design students and design educators. The key results of this project were:

An Open Learning E-package

Following Ubuntu's common good concept, the fruits of the land can be shared with everyone regardless of who owns it. As Bremer (2015) articulated, the common concern of sustainability in Afrika is global. Hence the need to share resources and experiences from a highly interactive and Afrikan design for sustainability projects through an open source, open-use, free-to-download and modified online knowledge repository. The open-source platform contains all project material used and produced during the project, including resource persons and their work in the project. The project resources can be accessed under System Design for Sustainable Energy for All (SD4SEA) at www.lenses.polimi.it. These resources can be used to learn and teach sustainable product service systems applied to renewable and distributed energy systems. Examples in Afrika demonstrate various sustainable energy contexts showing the common good amongst communities and collaboration in the shared use of resources.

Integrated Curricula on Sustainability and Distributed and Renewable Energy Systems

The knowledge was built into the existing sustainability courses/modules designed at the participating universities in Botswana, South Africa, Kenya and Uganda. This knowledge was built into a Design for Sustainable Development course at the University of Botswana. Topics on sustainable PSS and distributed energy systems were integrated into the course description. An assignment was also done with the group taking the course the following year after the completion of the project to engage the students with the new curricula content areas and expose them to the Ubuntu co-creation process (See Figure 2.7).

The solution-seeking process involved conducting user research to understand the problem space, defining the solution space, exploring solutions and proposing scenarios for a solution. Observations are key in Ubuntu

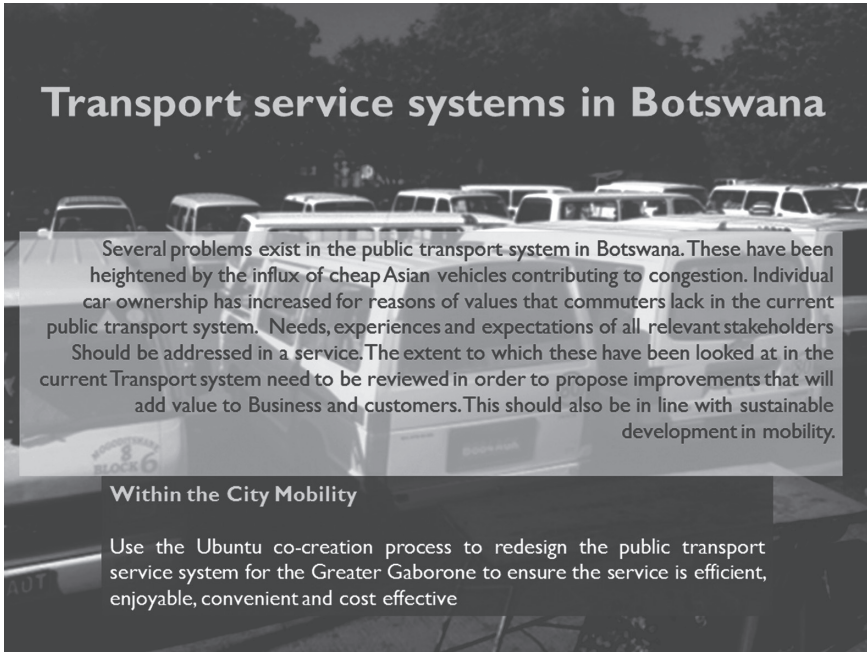


FIGURE 2.7 Assignment description for transport service systems in Botswana

co-creation. Non-obtrusive observations formed a more significant part of understanding how users consume the public transport service. In addition to observations, group interviews were used in the context of *lekgotla*, or tribal gathering, to gain insights into public transport issues from the users' point of view and eventually address them. The *lekgotla* approach makes group interviews acceptable and fruitful in Afrikan settings since it relates to tribal gatherings where consultations are made, and a consensus is reached. The outcomes of the assignment were attractive solutions geared towards improving customer experiences and service efficiency, including reducing energy consumption by the service.

Conference Proceedings (Delfino & Vezzoli, 2016)

Activities of the LeNSes project were concluded with a conference in Cape Town, sharing experiences from Botswana, Kenya, Uganda and South Africa. The Ubuntu philosophical co-design approach of designing for the common good was evidenced in work from various Afrikan countries. The research presented showed examples of implementation of renewable energy in Afrikan communities for various applications such as cooking; pumping drinking

water; generation of electricity; Afrocentric pedagogical approaches in Botswana, South Africa and Kenya; as well as demonstration projects for social impacts of product service system design and distributed renewable energy systems in rural communities in Kenya.

Designing Sustainable Energy for All (Vezzoli et al., 2018) – A Transdisciplinary Book

The book proposes to enable Afrika to harness and exploit renewable energy abundantly available from various sources in the continent and utilise it for social and economic development. Contributions from the LeNSes project partner institutions contributed to the book, with four of the seven co-authors of the book and five contributors from Afrikan countries. Although the book focuses on worldwide use, the context is Afrikan, referencing policies and strategies in Afrikan countries and work from higher education institutions, local companies and practitioners in the LeNSes Afrikan partner countries. The book has also been published as open access to make it widely accessible free of charge to many people across the globe (<https://link.springer.com/book/10.1007/978-3-319-70223-0>).

Conclusion

In this chapter, we have explored what an endogenously inspired conception of Afrikan sustainable design might be. Growth-based human development was contextualised versus the limited resources of a finite planet and how this led to a shift in post-war development into its more recent refinement in the Sustainable Development Goals. The chapter then covered the parallel emergence of the discipline of industrial design and its refinement towards a more sustainable approach to design. In alignment with the focus of this book, a more Afrikan conception of sustainability was then explored with a particular focus on the indigenous Afrikan philosophy of Ubuntu – the inseparable relationship between people and the natural environment.

Two design case studies, the LeNSes project in Botswana and Beegin in South Africa, explored Afrikan approaches to sustainable design. Despite different origins, both cases identified elements of the philosophy of Ubuntu, which brought into focus the highly localised interrelation between designers, community and the environment. Although it has been noted that these are not perfect examples, they are a beginning of a more authentic, localised approach to Afrikan design for sustainability that sincerely acknowledges indigenous knowledge and expertise in developing local industrial design products, services and systems. The fact that both cases emerge from design education institutions is a positive move towards a more authentic approach to design education in Afrika. The next generation of designers will be well-equipped to

consider sustainability issues from the ethos of Ubuntu. An Afrikan approach to sustainable design moves away from products to services, and the idea of the designer as an expert towards an appreciation of lay designers collaboratively and creatively amplified through local design action.

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