

Innovation and Entrepreneurship for Social goals and Sustainability in developing countries

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*"I am because we are"
African Ubuntu wisdom*

Abstract

The shift towards a sustainability-driven society includes changes to the educational system, business operations, innovation and entrepreneurial ecosystems as well as policymaking. Moreover, such a shift demands particularly a combination of top-down policy-making initiatives and bottom-up social entrepreneur-driven changes. Social innovation and entrepreneurship are providing solutions for globally recognized social and sustainability challenges such as poverty, education, environmental and climate change, peace support – worldwide yet also in the particularly challenging context of developing economies.

We aim to showcase the best practices of social and sustainability-oriented innovation and entrepreneurship in the context of developing economies. In particular, we address the question of how social entrepreneur and innovator with bottom-up ideas could complement the top-down policymaking initiatives. Our design implies qualitative research aiming to disseminate the inspiring story of a social innovative enterprise, which represents a successful example of complementing policy-making efforts. Accordingly, our findings contribute to the literature on social innovation and entrepreneurship in the context of developing economies and simultaneously informs social entrepreneurs and policymakers on potential opportunities for synergy in their efforts.

1. Introduction

Even as we are facing the challenge of the global COVID19 pandemic, other major issues such as poverty, health, clean energy, environment protection, peace education and others are recognized as urgent and crucial to be solved for a shift towards long-term

sustainable development. Such challenges are particularly prominent in the developing economies. The seventeen Sustainable Development Goals identified by the United Nations (UN) provide an overview of these global challenges and targeted solutions (see www.sdgs.un.org/goals). The related policy-making initiatives represent a top-down approach to problem-solving that is also relevant in developing regions. The budgets allocated for any policy-making initiative are limited, and need to be distributed across several sustainable development goals according to policy-driven (top-down) priorities. Bottom-up initiatives such as social enterprises, in turn, arise from individuals and groups facing unresolved issues, social and political movements, where the best innovators and entrepreneurs “spot needs which aren’t being adequately met by the market or the state” [1, p. 150].

Some of the most effective ways to cultivate social innovation is to accept the presumption “that people are competent interpreters of their own lives and competent solvers of their own problems” [1, p. 150]. Following this assumption, a top-down policy-making approach should be at best complemented with bottom-up initiatives for a holistic social innovation [2]. However, what does it involve in practice? Bottom-up initiatives require in-depth research on the context [1] because, commonly, they are non-systematic, spontaneous, and very difficult to trace. At the same time, such initiatives if widely disseminated, could inspire more of the bottom-up social innovators and entrepreneurs, and thus, complement top-down policy efforts. That is why disseminating the stories of social entrepreneurs is particularly important for developing economies, as on top of resource complementarity those could inform the policymaking efforts.

In our broader work and data collection on developing economies and peace engineering, we came across an interesting case of a social innovative enterprise, which represents a complement to top-down policymaking initiatives in the developing country (Kenya).

Driven by a desire to tell this story to the world, we have initiated this study with the following broader research question:

How the bottom-up initiative of a social innovative enterprise may contribute the efforts in achieving sustainable development goals in the context of developing economies (focusing on a specific country, Kenya)?

Despite the constantly growing interest towards social entrepreneurship worldwide, developing economies remain largely under researched [3], and our paper aims to complement the growing body of work by enhancing knowledge on the developing world.

Inspired by a focal case, we followed a data-driven approach in analyzing it but were constantly consulting the relevant literature – as is done in a multi-grounded theory approach [4]. Multiple literature streams were found relevant and at the same time suffering from a lack of empirical insights. Among these are the literature on social entrepreneurs, entrepreneurship and enterprise, sustainable business models and innovation, social innovation, open innovation and stakeholder engagement, peace engineering and policymaking – generally and specifically in the context of developing economies. In such a broad framework, our analysis required an in-depth case analysis enriched by examining multiple secondary data sources.

With this research, we contribute to the to the multiple research streams mentioned above, specifically the literature on social innovation and entrepreneurship in the context of developing economies. Our study simultaneously informs social entrepreneurs and policymakers on potential opportunities for synergy in their efforts. We propose a new framework for emerging entrepreneurship and innovations addressing sustainability challenges with sustainable and social solutions, identify core stakeholders of social innovation processes relying on an empirical analysis of the relevant case – an example of a successful social innovation in Kenya.

The rest of the paper is structured as follows. First, we give an overview of the relevant literature, then we describe the methodology of our study and discuss the exciting results.

2. Social entrepreneurship, innovation, and sustainability

In this research we focus on sustainability-oriented innovation and entrepreneurship in developing countries. These phenomena have been approached from several research domains. We follow by reviewing the key literature streams and unsolved questions along with highlighting the role of social entrepreneur-driven perspectives.

2.1. Innovation and technology for social entrepreneurship

Throughout human history, many forms of technology have been purposefully selected, designed or reconfigured – reflecting the innovation process' stages identified by Bessant and Tidd [6]. In addition to civic goals, technologies were also reconfigured for military applications, thereby top-down policymaking decisions on innovation becoming major threats to peace, political balance, and stability [7]. This trend has recently become even more prominent on policymaking and on lower levels, considering examples such as social media, artificial intelligence, smartphones, drones, 3D printing, autonomous vehicles, and cyber warfare. Policymaking initiatives such as General Data Protection Regulation (GDPR), Digital Markets Act nowadays are aiming at protecting individuals from technology misuse. These measures are taken because on organizational or even lower levels, innovation and technology development, once implemented, pose a challenge when engineering projects, sometimes unintentionally, may not only solve societal problems, but even endanger peace. This phenomenon is also known as dual-use technologies [e.g. 8, 9], where value capturing may have not only a social and commercial sense, but also a political one, which is particularly challenging for resource and power constrained developing economies prone to internal conflicts. How social entrepreneurs could orient themselves in a complex context of a developing economy and at the same time understand the role of different stakeholders including policymakers remains a topic under research [10].

Miklian and Hoelscher argue that “incorporating contextual, area-specific and conflict-sensitive guidance enhances the quality and depth of innovation” [11, p.189] and discuss the concept of peace innovation. In addition, principles of peace and social engineering draw from a multidisciplinary approach to establish rigorous design principles and processes for safer, more ethical development and deployment of emerging technologies [12]. Indumathi and co-authors propose

that “the field of peace engineering distinguishes itself from other knowledge areas of engineering by holistically considering factors that contribute to violence and conflict” [13, p.1]– including the policymaking level factors. Thus, peace engineering and innovation can be defined as “the intentional application of systemic-level thinking of science, engineering principles and innovations that promote peace” (<https://www.ifees.net/peace-engineering/>). It can provide a roadmap and philosophy to policymakers, technology developers and managers focusing on global social challenges.

Academic research is addressing the exploration of related top-down thematic areas such as: “forecasting political economies of conflict; business and virtual peacebuilding; climate and environmentalism; migration and identity; and urbanization.” [11]. The change to a peace- and sustainability- driven society includes changes in the education of engineers, businesses, policymakers, and innovators. Technology dissemination and commercialization in developing countries address the challenge of ‘hybrid organizations’[14] that seek to pursue both for-profit and non-profit activities and have social and economic value creation objectives [15], that applies even more to social entrepreneurs in developing countries. While the ethics of technological development is declared to be indispensable, the roles and responsibilities of innovators, entrepreneurs, engineers and other stakeholders are not clearly defined [16]. We aim to demonstrate some best practices of social and sustainability-oriented innovation and entrepreneurship to address sustainability challenges in developing countries focusing on the following problem: How entrepreneurs, innovators and engineers can foster high impact innovation to address societal, peace and sustainability challenges in developing countries?

2.2. Stakeholders and open innovation in social entrepreneurship

Engineering, innovation, and business are integral processes of societal change and civilization’s progress. Addressing the focal problem, we recognize that the number of stakeholders involved goes beyond the innovators and entrepreneurs, but also include policymakers, users and communities [11].

The open innovation paradigm [17] contributes here as an umbrella framework by making organizational boundaries more porous and embracing opportunities for external knowledge use and also for new channels for innovation dissemination. Innovating openly, together is a form of collective action reflected, for instance, by the top-down social initiative of a non-profit called African Entrepreneurial Collective, which

seek for even greater resource complementarity via for instance training refugees to become entrepreneurs [14]. One notable characteristic of this organization is that among priorities they also aim to focus on and support the existing entrepreneurs, similarly to [1] seeing them as “the most ready to move forward”. In fact, that represents exactly a combination and complementarity of top-down and bottom-up initiatives, where a non-profit creates infrastructure, attracts resources and builds an entrepreneurial capacity, yet at the same time dedicates special attention to self-made entrepreneurs, who developed their businesses bottom-up.

Chesbrough and Vanhaverbeke and other researchers suggest that open innovation practices applied in combination with a closed innovation approach support the performance of social businesses in both for-profit and non-profit sectors [17, 18]. Moreover, Stephan and co-authors highlight that combining social and economic goals is not harmful but rather supportive for open innovation and generally for innovation performance [19]. Furthermore, Yun and colleagues show that entrepreneurial capabilities and culture support open innovation dynamics across levels – individual and organizational [20]. Those altogether imply that social enterprises could benefit from open innovation regardless of their organizational forms, while openness could be promoted both top-down and bottom-up. However, how those links are reflected in the context of developing economies remains unresolved and is the subject of further research [21, 22], thus, we analyze the openness and stakeholder engagement in the focal case as well.

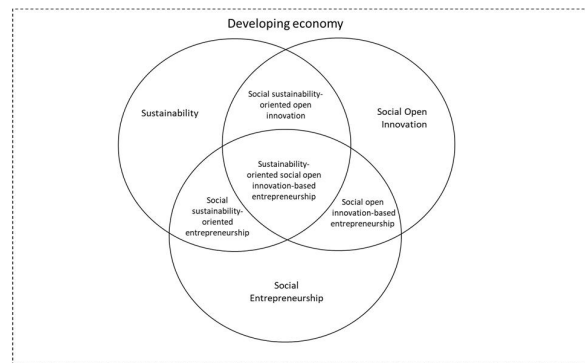


Figure 1. Theoretical Framework

To summarize theoretical grounding, following the suggestions of this and other reviewers we developed a theoretical framework (Figure 1), where we show the key theoretical streams, that this study focuses and contributes to. Those include social entrepreneurship (we explore the case entrepreneur’ motivations, triggers for decision-making and entrepreneurial challenges in their social enterprise);

sustainability (the focal case addresses sustainable development goals of poverty, affordability of clean energy, reduced inequality and quality education); and social innovation (we also analyze the challenges related to innovation management in the specific context). The framework is still limited to the specific context of a developing economy.

We follow with the research design, findings and discussion.

3. Research Design

This research is explorative in its nature and relies mostly on a qualitative approach to data collection and analysis. Our design implies qualitative research aiming to explain in-depth a successful example of a bottom-up social innovation enterprise, which complements the top-down policymaking initiatives in the context of developing countries.

3.1. Case Context

The energy crisis and moving towards sustainable energy technologies is a global challenge of the 21st century. Developing countries are facing even more cruel phenomena of energy poverty. Providing affordable access to electricity and contributing to challenge of energy poverty reflects one of the sustainable development goals (see www.sdgs.un.org/goals, SDG n.7). Our story is about Kenya, where energy poverty is extremely high as 74 % of households do not have access to electricity and 84 % still rely on traditional fuels [23].

Despite top-down governmental subsidies in Kenya, electricity costs are high, and the reported inflation was about 22 % in 2018 [24], therefore many households cannot afford it. Many people in Kenya, especially in the rural areas live on less than a dollar a day [25] and cannot afford an LPG (liquefied petroleum gas) cylinder that costs about 400 USD for cooking. They have to spend about 10 % of their low income on unhealthy, unclean and unsafe types of energy sources such as dry cell batteries, dangerous and unhealthy kerosene lamps, and charcoal to keep their household running [26]. Bottom-up initiatives which we discussed earlier, are nurtured by people spotting needs which are not addressed by top-down policies and market regulations [1]. Here it is time to introduce a main character of our story – a young social entrepreneur, Salima Visram, who provided a sustainable solution that helps to decrease spending on kerosene lamps while offering a cheap and a healthy source of energy for better life and better educational opportunities for children (SDG n.4).

3.2. The Soular Backpack Case

Our chosen case study is the Soular Backpack, an example of a social enterprise which successfully (although not without challenges) complements policymaking efforts in the region. In terms of the sampling strategy, it is a purposefully selected extreme case [27], as we were dedicated to look for a social enterprise that complements policy-level efforts in a developing economy context. The company was founded in 2014 by a 23-year-old female entrepreneur. The main product of the social enterprise is a backpack with solar panels, which when charged during the day give kids from rural parts of Africa the opportunity to use electricity and study in the evening. The project was launched through a crowdfunding campaign. The implementation of such idea, in addition to its impact on education and the kids' future, decreases the number of health issues (SDG n.3) caused by use of kerosene lamps and aims at sustainable solutions to poverty (SDG n.1). The key innovation comes from combining several existing technologies (a flexible solar panel that can be installed on a backpack; a rechargeable battery; and a LED lamp) into a "tool" (the backpack) that empowers young students as it is directly linked to their education and therefore their future. This business also implies a specific business model. The operations rely on online distribution based which follow the principles of sustainability, social entrepreneurship, and involve multiple stakeholders. The firm distributes products based on the one-for-one model (also known as "buy-one give-one"). This social entrepreneurship business model is implemented in Kenya, and further extended to Uganda and Tanzania.

3.3. Data Collection and Analysis

Following the literature review and theoretical framework, we developed the interview guide which covers the questions on social entrepreneurship and innovation, peace engineering, open innovation and stakeholder engagement (see the appendix). The interview lasted for about one hour and was recorded and transcribed. The primary data were complemented by multiple secondary data sources such as reports of the United Nations, African Entrepreneurial Collective reports, previously published interviews as the one in Forbes, and TEDx Talks and other multiple web-based mentions of the focal case. First, manual thematic analysis of data was conducted, which helped to identify several data-driven categories, as well as then cross checked against the main categories emerging from the literature – as it is done in a multi-grounded theory approach [4, 28].

4. Discussion of the Social Innovation and Entrepreneur journey

4.1. Sustainability-oriented innovation and entrepreneurship

According to the World Health Organization reports, 96% of Kenyans in rural areas use kerosene as their source of light, which hardly helps and even sprouts additional problems [29, 30]. First, kerosene fumes threaten children's health as they cause severe headaches and lung problems. One night of inhaling kerosene fumes is equivalent to smoking 40 cigarettes [31]. Second, kerosene lamps endanger the household to be set on fire if the lamp is knocked over [29, 30]. Third, although kerosene is relatively cheap, many Kenyan families living under one dollar a day spend on it up to 25% of their monthly budget [25], which has a significant effect on their health and overall standard of living.

In addition to poverty, energy (electricity) poverty has a significant effect on the quality and availability of basic school education in Kenya [23], lack of light in the evenings affects school children's ability to do their homework and thus lowers the overall performance and opportunities to attend secondary school.

Without an opportunity to access quality basic education, many children in Kenya have no chance to find a good job and raise out of poverty. As a result, they turn to troublemaking and lose any prospects for a brighter future [32].

On a policymaking level (top-down perspective) these sustainability problems have been addressed by the United Nations (UN). Overall, "the Sustainable Development Goals are a global call to action to end poverty, protect the earth's environment and climate, and ensure that people everywhere can enjoy peace and prosperity" (see www.undp.org/sustainable-development-goals). Figure 2 shows how UN allocated resources across each of the SDG in Kenya (<https://kenya.un.org/en/sdgs>, 2021-03-24). The shares of budget allocated to affordable and clean energy (0.18%) and education (1.76%) are significantly lower than more primary aims such as poverty (26.53%) and hunger (20.71%).

Inspired by the top-down (policymaking) and bottom-up (social entrepreneur) perspectives to sustainability-oriented innovation we follow the social entrepreneur journey motivated by poverty, education, energy and health sustainability problems in development economy context.

Salima Visram, who was born and raised in Kenya said "I really saw how a lot of kids my age were not able to do their homework every night. They wouldn't be able

to access better education... and it was really like all around me when I was growing up". She also recalls: "One father said that his kids used to only be able to study 3 times a week because he could only afford kerosene 3 times a week and this heavily affected their [kids'] performance in school".



Source: www.kenya.un.org/en/sdgs

Figure 2: The Sustainable Development Goals in Kenya

This societal challenge was spotted by Salima while she was obtaining her degree in International Development at McGill University in Canada. "I was introduced to the concept of social entrepreneurship and I decided to just find a solution for the problem of the lack of access to electricity and also reduce use of kerosene for kids," – says Salima. She turned to the technological developments available in Kenya aiming to create sustainable, safe, and affordable sources of light for Kenyan children.

"Solar backpacks was not my first entrepreneurial endeavor", - says Salima. – "I produced jewelry to sell it in the local tourist shops before but this one became the first real business and the name for it was ready-made - Soular Backpack". At first the company was positioned as a non-profit organization. The development of the Soular Backpack took two years.

Converting energy from the sun is a mature technology which is developing rapidly, making production costs go down and efficiency go up [33]. Solar irradiation is a highly available resource in East Africa, which can be used to generate electricity using affordable and sustainable solar panels. There are many solar energy companies providing solar panels in the region; however, the problem of electricity production in the remote areas persisted and Salima was curious to understand why.

After interviewing the 10 largest solar companies in the East Africa, Salima found the reason: *“they all said that a big problem was that the kid would never get to use the lights. So, the parents would always take the lights themselves. ... and they would never like allow for a child to do their homework.”* Child’s homework was the lowest on any list of priorities. Parents would use energy from solar panels to do their own work: *“house chores or sell fruits and vegetables outside or even charge their phones,”* says Salima. –*“there was no child centric solution to the problem”*.

This finding sparked an idea of creating a product that could be carried around and used solely by a child. Salima recalls: *“So we started with the solar powered pen and then went to solar patched shoes. The patch was just a sticky panel so children could put it on anything they were wearing. And then we came up with the idea of a backpack specifically because we wanted it to be dual purpose, child centric and have relation to education”*. In addition to solar panels, the backpack contains a battery that can be charged while children are walking to school and back. The accumulated energy can be used in the evening to supply small LED lamps. An hour of walking to school and back provides at least five hours of light for the evening.

Salima started a crowdsourcing campaign to obtain initial funding and managed to raise around \$50 000. The funds were used to manufacture the first 2 500 backpacks, which were distributed among disadvantaged schoolchildren in Kibera slums, the Dadaab Refugee Camp, and various schools across Kenya, Uganda and Tanzania. At this end, she worked with several distribution partners. After quite a successful start she began to receive orders for thousands of backpacks from different NGOs and donors.

Salima said: *“I worked on it [the project] full time after I graduated from university and then I realized after a while that it was very hard to keep it going as a not for profit. ...at that time, my goal was to create a social enterprise, but it was set up as a not for profit, which meant that we were pretty reliant on donations.”* *“...it’s been a bit hard because we’ve not fundraised, we’ve not taken on any venture capital money”*.

The Soular backpack created as a social enterprise needed to overcome this challenge and find a way to scale up and continue to serve its social purpose. *“So, in 2017, I understood that I need to find a way to have a more sustainable business model. And so, we transitioned into a company called Samara”*. Now Samara is a fashion company which uses a hundred percent vegan and cruelty free materials for manufacturing their products. 10% of the profit from every purchase is channeled to the manufacturing of Soular backpacks. Salima is happy that *“this model lies and keeping it going on a large scale. ...once you have a solid business and then you can channel the resources back into Soular”*. Aside from the successful idea of one business supporting the social initiative, Salima sees Samara as an impact company: *“ ...when I think about the future of Samara, it’s very much an impact company. So, like ideally, we’d want to expand Soular and really create more impact through Soular, but also to move all our factories to Kenya. I’m really trying to create good employment for people.”*

Salima aims to expand her business abroad across North America to raise awareness about the electricity problem in Kenya and raise more money for Soular backpack. *“The next phase of Soular was to scale the one-for-one model across North America in a big way and make sure that everyone who needs a backpack is aware that they could buy a backpack that gifts light to a child in need,”* says Salima. Currently, one-for-one backpacks are available on the online platforms for around \$50.

4.2. Stakeholders and open innovation in social entrepreneurship

Social entrepreneurship is rarely realized without a significant involvement of external stakeholders: from co-developers, society, partners on ideation and innovation stage to fundraisers, investors, and venture capitalists. Applying open innovation approach, using external knowledge and partnerships for innovation, manufacturing, and distribution processes provides better resource complementarity and scalability for social enterprises [17]. In her business model, Salima highlights several core stakeholders: school children, their parents, community, teachers, and health workers. All of them participate and benefit from the Soular backpack business in the following ways: school children have access to lighting, and it helps them to improve their performance at school. Also, they are not exposed to harmful kerosene lamps anymore. Parents spend less money on kerosene and have better prospects for their children. Teachers observe improved academic performances across the class. Health workers have less visits from children affected by kerosene induced

illnesses. Other stakeholders are suppliers, manufacturers, distributors, investors, donors and customers of one-for-one backpacks.

Salima emphasizes the importance of building networks and trust with the partners. *“We have partnered with [local] factory so they produce the backpacks whenever we need. We just place the order. We do not need anyone to supervise it because we have really strong ties with the people who work there and who own it,”* – says Salima. – *“We buy some materials in China but production is in Kenya so there is actually a local producer”*. In addition to Salima, there are several other people in the company, including members of the Advisory Board. Salima mentioned that they *“still work with a lot of NGOs, businesses who want to distribute backpacks in their communities. So, they place an order with us and we still have our factory running there. ...we produce in Kenya, so it provides employment for local women.”*

Contributing to energy and education challenges in Kenya, the Soular backpack is contributing to the health and poverty issues as well. Salima underlines problems in the healthcare sector and the need to attract more entrepreneurs and policy makers to contribute to the problem in Africa.

The important impacts of this project are job creation, contribution to healthcare and poverty, and children education and wellbeing: *“especially in healthcare, ...to create jobs in East Africa....and I think healthcare is another big thing. I think that like Africa or East Africa especially where I grew up is still really behind on the healthcare.”* More social entrepreneurship projects, products and accessible services are needed in these areas. That is where our insights could be taken beyond this single case study.

5. Conclusions and perspectives

The sustainability is high on the agendas of both developed and developing nations. Social innovation and entrepreneurship significantly contribute directly or indirectly to the Sustainable Development Goals worldwide, including poverty, education, environmental and climate change, energy, peace support. In terms of sustainable impact, developing countries represent one of the most challenging contexts. Thus, the efforts of entrepreneurs and innovators are not enough, the shift towards a sustainability-driven society includes changes to the energy, social, educational and health systems, innovation and entrepreneurial ecosystems as well as policymaking changes. Moreover, such a shift requires a combination of top-down policy-making initiatives and bottom-up social entrepreneur-driven changes.

Scoping our research along the spectrum of top-down and bottom-up approaches, we use these flows rather for picturing the gap of top-down policy efforts which could be met by bottom-up initiatives especially in the developing economies. Thus, this comparison does not frame our theoretical contribution, but relates rather to the context. In this paper, we aimed to showcase examples and best practices of social and sustainability-oriented innovation and entrepreneurship in the context of developing economies. We discuss the sustainability problems faced in Kenya and the consequences of these problems for the health of its population. The findings of this single case study contribute most to the bottom-up side of the discussed process and shed more light on social entrepreneur motivation and perspective, rather than on the policy initiatives. We focus on entrepreneurial struggles of operating a non-for-profit organization. Following an inspiring case study of the entrepreneurial journey, we show how using solar panels as a source of electricity would enable children to improve their performance at school as well as eliminate the harmful effects of kerosene on their health. Also, it would save their family the money spent monthly on kerosene.

Despite the limitations and limited possibilities to generalize on the findings from the single case study, this research shows insights on how innovation and entrepreneurship contribute to achieving social goals in developing countries. The business model applied in this case was evolving from non-for-profit to the hybrid organization, where parallel sustainable business supported the social project. Hybrid organization (in this case: organizations combining non-profit and for-profit orientation) are not the key focus of our study as we rather focus on the interference of social entrepreneurship, social innovation, and sustainability. A hybrid organization in the studied case is rather an organizational mode to achieve sustainability-oriented social innovation-based entrepreneurship, where for-profit logic serves the non-profit side of the business with required financial resources.

The key theoretical streams we rely on and contribute to include: social entrepreneurship (we explore the case entrepreneur' motivations, triggers for decision-making and entrepreneurial challenges in their social enterprise); sustainability (the focal case addresses sustainable development goals of poverty, affordability of clean energy, reduced inequality and quality education); and social innovation (we also analyze the challenges related to innovation management in the specific context). Accordingly, our findings contribute to the literature on social innovation and entrepreneurship, in the context of developing economies, as well as informs social entrepreneurs and policymakers on sources of potential synergy in their

efforts. The results of this study help to raise awareness towards sustainability challenges and possible solutions both from top-down and bottom-up perspectives, especially in developing countries [34], to understand the role of stakeholders and offer ideas and knowledge for social entrepreneurs, innovators, engineers [13] and to foster sustainability education with ideas exchange and interdisciplinary collaboration [35, 36].

The case study we discussed highlights a very important aspect of the SDGs: most of them are closely interrelated. By addressing directly, the SDGs on energy and education, the Soular Backpack also addresses indirectly other SDGs such as poverty, health, and climate change. Quoting the late Nelson Mandela, “*Education is the most powerful weapon we can use to change the world*”. While this remains true in the 21st century as ever before, effective education can only be built on other basic human needs and in turn will also feed those same needs towards a peaceful and sustainable long-term existence of all living species on planet Earth.

Our last quote, which reminds us of sustainable development as a duty towards future generations, is attributed to the natives of the North American continent: “*We do not inherit the earth from our ancestors. We borrow it from our children*”.

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Appendix: Interview Guide

Social entrepreneurship and stakeholder engagement
Is this your first social entrepreneurship experience? Where the idea came from? What was your motivation (employment, social impact, sustainability issues, environment...)? Did you have partners (local / international)?
What social problem have you identified and how are you responding to it? (Such as poverty, education, health, energy, etc.)
How did you get access to finances? Form of financing?
How important is innovation / technology development / technology adaptation for your project?
How did you choose the technology / innovation for your project (to impact the societal and sustainability problems, etc.)?
What is your added value?
What is your development strategy?
What is your economic model?
What is the role of stakeholders in your project? How do you accelerate your development? By collaborating with other stakeholders of society / communities? How you establish / evaluate your relationship with local and international stakeholders? (owner/ board, investors, employees, suppliers, consumers, community, state, public authorities) How do they influence your decision-making process?
How do you measure your social impact?
What is the best organizational model for your project?
What are the main challenges and constrains you experienced? (human resources, local authorities, finances, juridical/ fiscal challenges, networks, markets, etc.)
Peace engineering, innovation and openness
Are you familiar with peace engineering and peace innovation (PE&I) concepts? How do you understand it?
In your opinion, what are the main principles of PE&I?
In your opinion, who are the main stakeholders involved in the PE&I process?
How you understand the roles and responsibilities of engineers, scientists, managers, innovators, researchers, NGOs, firms, and entrepreneurs in building and sustaining peace (roles of stakeholders) in the context of PE&I?
In your opinion, what are the main risks of technologies/innovation applications to peace? And how the engineers / innovators, companies can mitigate the risks?
How the PE&I and sustainability importance differ in developed and developing countries?
How to increase the awareness in PE&I in developed and developing countries?
How to foster PE&I education with ideas exchange and interdisciplinary collaboration?
How to promote collaborative cross-disciplinary learning for benefit of peace and sustainability?