



Review

A literary analysis of *The Boy Who Harnessed the Wind: Creating Currents of Electricity and Hope* (2009) towards sustainable development through i-Sustainability Plus theory

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Abstract: Through a close reading of William Kamkwamba and Bryan Mealer’s book, *The Boy Who Harnessed the Wind*, this paper examines the importance of literature as a medium of intercultural communication to address the theme of sustainable development. It aims to discern deeper meanings in the narrative by analyzing significant African thematic concerns, such as poverty, lack of education, environmental degradation, and hunger affecting underdeveloped societies such as Malawi. Drawing on Doost Mohammadian’s i-Sustainability Plus Theory (2010), the research also explores how the story engages with and contributes to the sustainability debate. It attests to the importance of the seven pillars of sustainability development goals presented in the literary text in creating a more sustainable society, specifically Malawi. Hence, examining William’s autobiography helps normalize the conversation about sustainability in literature and educates readers about the educational, economic, ecological, social, technical, cultural, and political challenges and hardships Malawi faces and ways to overcome them. In addition, this research intends to portray William’s initiative idea as a possible SME (small and medium-sized enterprise), minor, independent initiatives which employ fewer than a given number of employees. According to Doost Mohammadian, SMEs are critical to economic, environmental, and social sustainability development, thus sustainable and successful SMEs, such as William’s small innovativeness, with high productivity and efficiency can help develop inhabitable and sustainable living environments in developing societies such as Wimbe.

Keywords: *The Boy Who Harnessed the Wind*; literary studies; literature and sustainability; Malawi; William Kamkwamba; sustainable development; i-Sustainability Plus Theory (2010)

1. Introduction

1.1. Africa and Malawi's situation in the 20th Century

Africa is a continent that is often associated with dire economic, political, and health conditions. These circumstances have hindered its countries' progression and, more notably, its long-term survival. Malawi is one of the many countries in Africa that suffer from endemic poverty, lack of education, poor sanitation, and environmental problems. Located in the southeastern part of Africa, Malawi is currently considered one of the least developing countries. It is ranked fourth among the cities with the highest percentage of extreme poverty globally.

Approximately 85% of its population lives in rural areas where people rely heavily on agricultural production for survival. More specifically, the citizens depend almost entirely on subsistence farming, a pastoral practice in which farmers grow crops and raise livestock only sufficient for their family's use, without any excess for trade. This convention is mainly practiced by poor farmers and has a disadvantage of low productivity due to climate change and scarcity of resources. This reliance means that if the farmer's crops fail or livestock dies, the farmer's family is at risk of starvation.

James C McCann states that "In southern Africa maize has become by far the most important staple food, accounting for more than 50 percent of the calories in local diets; in Malawi alone, maize occupies 90 percent of cultivated land and represents 54 percent of Malawians' total caloric intake" [1]. Most Malawian farm households rely on family resources such as extensive manual labour to farm maize. Those with extra money often hire farm workers to help them tend to the fields. These agricultural employees usually do not own their land and do not have a right over the crops they help grow. Instead, they are paid minimum wages for their physical labour.

Maize, a crop primarily dependent on rain for cultivation, has been vulnerable to Malawi's unpredictable weather, which has always been problematic for the country's agricultural sector. According to "Climate Risk Profile: Malawi", Malawi suffers from extreme climate variations, ranging between severe droughts and floods [2]. The unforeseeable rainfalls, high temperatures, and dry periods, which may all occur in the same season, hinder the production of crops such as maize, tobacco, rice, sugarcane, tea, and coffee. These environmental problems are variable and human-induced. Human activities cause nature's degradation by depleting air, water, and soil resources, destroying ecosystems, and increasing deforestation. These anthropogenic effects on the Malawian natural habitat significantly impact humans and nearly all forms of rural life. Nevertheless, Malawi Country Director, Sanjay Awasthi, explains that it is essential to note that despite Malawi's minimum involvement in increasing greenhouse gas emissions, it remains one of the many emerging countries in the world to be drastically affected by climate change [3]. These toxic air releases continue to exacerbate the many challenges that the Malawi citizens face.

In 2018, the Permanent Representative of the Republic of Malawi to the United Nations, Perks Ligoya, stated that his country is amongst 33 nations who "need urgent food assistance in addition to long-term investment in the agricultural sector to ensure food and nutrition security" [4]. And with the population expecting to double in the next 20 years, Malawi's government will undergo undeniable difficulties to meet its people's needs in terms of food, health, and education. It will also face environmental, economic, and political problems as many inhabitants will continue to contribute to the

increase of ecological degradation and the fast depletion of resources, such as clean water, thus creating a more significant poverty problem.

2. Materials and methods

2.1. Sustainability: history, definition, and theories

One way to overcome these various difficulties is for Malawians to be better educated about the concept of sustainability and have the skills to adopt it to overcome their country's exigent conditions. Thomas Malthus introduced the idea of sustainability in "An Essay on the Principle of Population," where he voiced his concerns on world population increase and exploitation of resources [5]. The term sustainable development later appeared in the Brundtland Commission report in 1987. Sustainability is defined as a concept that endorses the need to meet a country's current necessity without jeopardizing or compromising the ability of future generations' need to meet their own [6]. It is also a value that must be incorporated in policies, activities, behaviors, and lifestyles to create solutions for social equity, environmental preservation, and economic development. Even though the ideas of sustainability are novel, the movement's principles can be found in older civilizations. Jacobus A. Du Pisani states that "As early as the ancient Egyptian, Mesopotamian, Greek and Roman civilizations environmental problems such as deforestation and the salinization and loss of fertility of soil occurred, which we would today refer to as sustainability problems" [7]. By the end of the twentieth century, many of these ideas, which support social justice, conservationism, and internationalism, developed into what we call today: sustainable development.

The idea of sustainability focuses on encouraging the need for global equity by which resources are redistributed to poorer countries. This restructuring strategy will help develop these nations and enable almost human beings to attain their basic needs. Three fundamental pillars of sustainability are environmental responsibility, economic efficiency, and social cohesion. Ecological integrity can only be maintained when humans adjust their habits to improve environmental quality and preserve natural resources by decreasing anthropogenic effects. This method ensures that environmental systems are well-preserved while natural resources are consumed at a rate where they can replenish themselves. Economic sustainability ensures that communities worldwide have financial resources to support their economic production. This economic system guarantees a secure source of income and employment for citizens. Social sustainability strengthens human beings' social well-being by protecting human rights and providing necessities to all people. This process ensures healthy and secure societies that enjoy personal and cultural rights and prevents poverty, illiteracy, and discrimination.

Between 2010–2017, Hamid Doost Mohammadian developed the Seven Pillars of Sustainability (7PS) Model and i-Sustainability Plus Theories (2010) by adding four more pillars—cultural, educational, political, and technical sustainability—to the original three sustainable development indicators. He states that these new additions are essential to "deal with urbanization challenges" and must evolve in tandem to foster and allow societies to reach high sustainability levels [8]. Doost Mohammadian also explains that in recent years, the world has been confronted with global concerns such as poverty, slums, health issues, insecurity, social instability, economic problems, and environmental problems such as climate change, to name a few. These problems are a result of unplanned and rapid urbanization. They also jeopardize today's quality of human life and the world's livability for future generations. Figure 1 below which encompasses economic, social, and environmental sustainability addresses these issues and proposes solutions to preserve the planet and humanities.

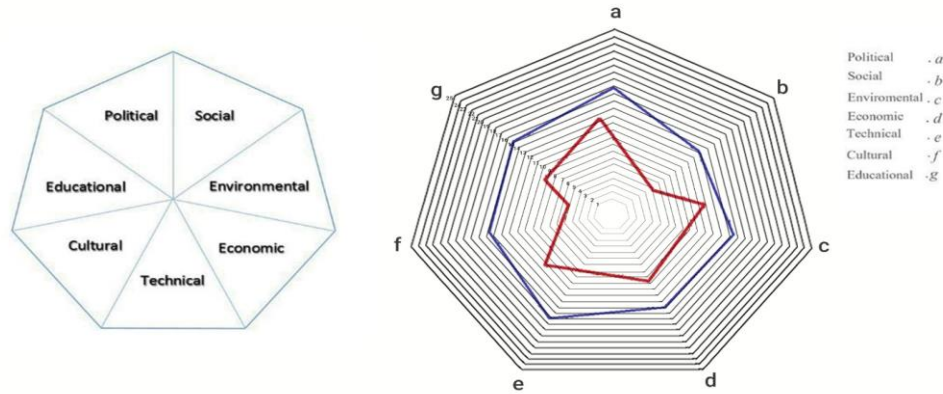


Figure 1. Seven Pillars of Sustainability (7PS Model) [8].

As shown in Figure 1 above the model proposes that the seven segments should be approximately equal to reach high levels of sustainability. Doost Mohammadian states that “generally, high quality of livability and life, health and prosperity with social justice, being environmentally friendly and preserving the earth’s capacity to support future life are the main aims of the sustainable development” [8]. In addition, Doost Mohammadian’s idea of attaining sustainable development goals is connected to his concept of SMEs (small medium-sized enterprises), which account for more than 95% of all enterprises worldwide [9]. He believes that SMEs require innovation, management, leadership, economic behavior, education, and intellectual capital, qualities that are inherent in sustainable development goals. He also states that because urbanization has outpaced business growth in recent decades, small initiatives, such as SMEs must learn to adapt to rapid change and their society’s needs in a modernized way. Technology enables these small enterprises to stay up with humans’ desire for sustainable, high-productivity, and efficient operations [9].

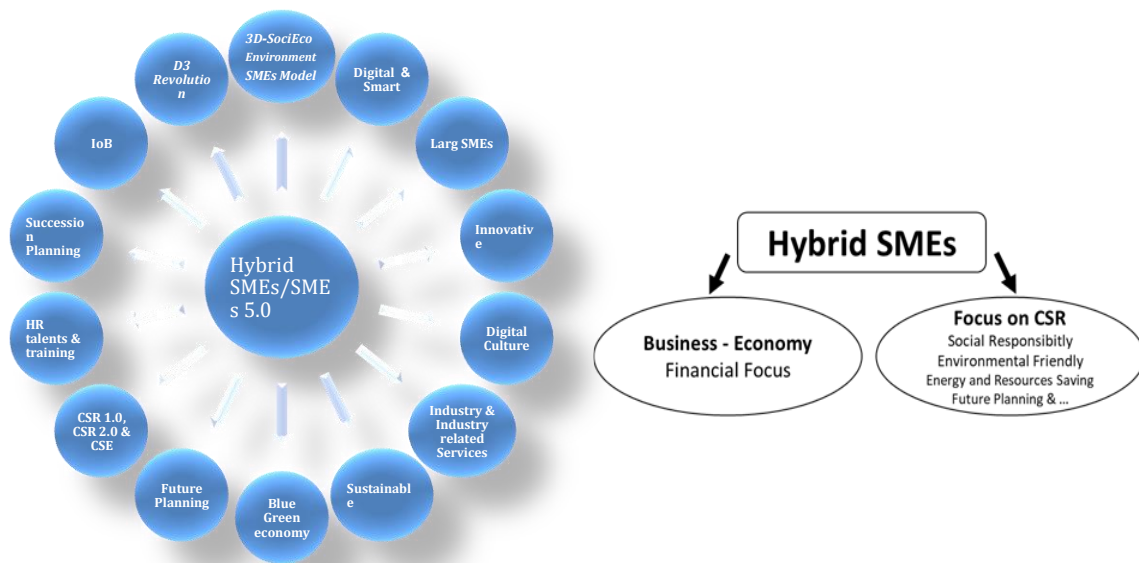


Figure 2. Hybrid SMEs/SME 5.0 or Tomorrow’s SMEs. [10]

Doost Mohammadian's concept of tomorrow's SMEs states that Hybrid SMEs should entail the sustainable development criteria such as environmental responsibility, social cohesion, and economic efficiency [11]. In addition, SMEs should create innovative projects which focus on future planning, clean economy, and succession planning. HR talents, competencies, qualifications, skills, and training (focus on EQ and conversational intelligence).

i-Sustainability Plus Theory comprises three characteristics: open innovation, sustainability pillars, and future 4.0 smart high technologies [12]. This construct explores ideas derived from the combination of real life, high technology, and virtual reality, remarkable sustainable development drivers, to reach a higher quality of life. The i-Sustainability Theory allows communities to avoid impacts of global crises on sustainability, today's sustainability challenges, and tomorrow's sustainability shocks. Generally, there has been an increased interest in the quality of life by researchers who have made it a key concept in the field of global and human issues. Thus, today, along with the ideas of sustainable development, the concept of quality of life has become a priority. In other words, the quality-of-life index in today's community indicates the degree of achieving welfare and providing greater citizen satisfaction. Any community with a high score in the quality-of-life index is a desirable community for living. Instead of accelerating and moving forward, societies want more attention to the viability, quality of life of citizens, and sustainable development.

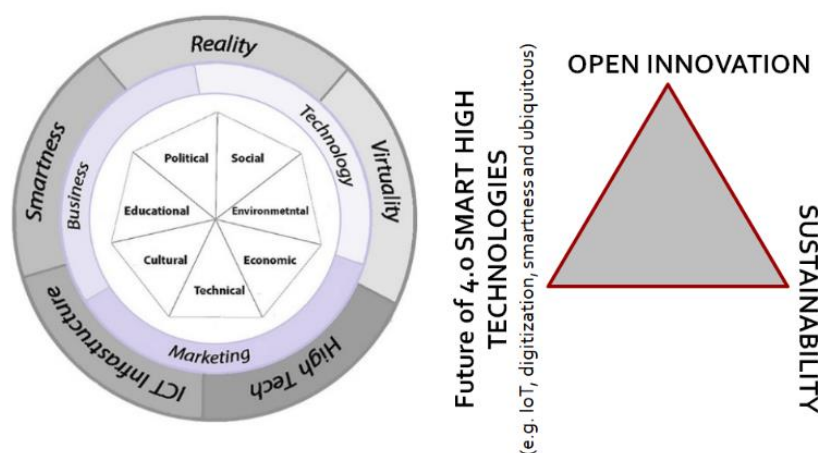


Figure 3. *i-Sustainability Plus Theory* (2019) [12].

2.2. Sustainable development in Malawi

Despite its significance, sustainability development is scarce in the African dialogue as people are more focused on surviving starvation and poverty, dire conditions preventing them from reaching a sustainable life. Due to extreme poverty, there is an evident lack of exposure to this invaluable knowledge of sustainability and the inability of many citizens to gain an education, let alone a basic one. Most Malawians are unaware of the developments occurring in other developed countries. For example, according to the Sustainable Development Index, many European countries such as Denmark, Luxembourg, Switzerland, and Germany are highly sustainable due to their engagement in “processes and practices that are sustainable and reduce or minimize harm upon ecosystems and the environment” [13]. These countries are sustainably developed because they have the financial and educational means to advance. Their high-ranking positions in sustainable development complement their high ranking in the list of highest educated countries. Thus, education does play a significant role

in raising awareness of the problems and solutions to solve them. In contrast, Malawi still struggles to attain sustainable development goals despite some progress in several sectors, such as reducing child mortality rates and combating diseases (HIV and Malaria). In short, until today, Malawi remains to be one of the world's poorest countries left behind in reaching sustainable development goals.

2.3. Sustainability Ideas in Literary Works

The association between literature and sustainability ideas has been a current interest for many literary scholars in recent years. Of late, literary texts have addressed the most pressing and contemporary issues related to the sustainability discussion. According to Tatiana Prorokova, various narratives “document the relationship between humans and nature, foregrounding the abusive, hostile, and oppressive attitudes of the former toward the latter, which is perhaps one of the most evident reasons for the ecological and environmental decline that humanity faces today” [14]. Examples of such literary texts are *No One is too Small to Make a Difference* (2019) and *All We Can Save: Truth, Courage, and Solutions for the Climate Crisis* (2021), written by environmental activists Greta Thunberg and Ayana Johnson and Katherine Wilkinson respectively. These works, which entail essays, speeches, poetry, stories, and art call for the desperate need for a conversation on the climate crisis. In addition, they draw attention to the necessity of living a more sustainable life to secure a better future for coming generations.

However, many African stories that engage with sustainability issues and potential solutions are still unknown and under researched. One significant literary work is *The Boy Who Harnessed the Wind: Creating Currents of Electricity and Hope* (2009). Written by William Kamkwamba and Bryan Mealer and based on the former's real-life experience, the story showcases a true example of the journey of a villager boy who gets inspired by an 8th-grade Physics book, *Using Energy* to create a basic invention that sparks hope towards sustainable development. By building a wind turbine from material scraps he and his friends find in junkyards and garbage areas, William succeeds at providing electricity and water for his village. The importance of *The Boy Who Harnessed the Wind* lies in its context as a literary narrative as it calls for long-term sustainability. Also, the autobiography focuses on how a 14-year-old Malawian boy came up with an idea out of necessity. He did not learn it from school or get introduced to it by a foreign context.

According to Krista Hiser, the book models “learning as discovery” and explains an “essential truth that *we have within us all we need to know to solve problems of sustainability*” [15]. William's simple visionary of an invention leads his community toward a sustainable path, and his story can be used as an example for future economic and life-saving projects. Through a close reading of William Kamkwamba and Bryan Mealer's book, *The Boy Who Harnessed the Wind*, this paper examines the importance of literature as a medium of intercultural communication to address the theme of sustainable development. It aims to discern deeper meanings in the narrative by analyzing significant African thematic concerns, such as poverty, lack of education, environmental degradation, and hunger affecting underdeveloped societies such as Malawi. Drawing on Doost Mohammadian's 7PS Model and i-Sustainability Plus Theory, the research also explores how the story engages with and contributes to the sustainability debate. It attests to the importance of the seven pillars of sustainability development presented in the literary text in creating a more sustainable society, specifically Malawi. Hence, examining William's autobiography helps normalize the conversation about sustainability as it educates readers about the educational, economic, ecological, social, technical, cultural, and political challenges and hardships many communities in Malawi face and ways to overcome them. In addition, this research intends to portray William's project, windmill used for creating energy, as a possible

SME (small and medium-sized enterprise). This minor, independent initiative employs fewer than a given number of employees as the story conveys. According to Doost Mohammadian, SMEs are critical to a society's economic, environmental, and social sustainability development. Thus, a thriving SME, such as William's, with considerable productivity and efficiency, can help develop inhabitable and sustainable living environments in developing societies like Wimbe.

3. Discussion: *The Boy Who Harnessed the Wind*: an African story showing sustainable development goals achievement

The Boy Who Harnessed the Wind recounts William Kamkwamba's childhood and teenage life in Wimbe, a small rural village in Malawi, during the beginning of the 21st century. The story focuses on a series of unfavourable climate changes, such as flooding and drought, that struck William's hometown, thus forcing its people into a fatal crisis overcome by poverty, starvation, and fighting for survival. Kamkwamba and Mealer's narrative also revolves around the protagonist's great interest in learning and his success in building a wind turbine to provide electricity and water for agricultural purposes, despite not getting an education.

From the beginning of William's autobiography, Kamkwamba and Mealer provide a vivid description of the difficult situation of most Malawian families, who spend almost all their lives in the outskirts of the cities as farmers raising cattle and growing crops for food. Their lives are a representation of hard labour and are devoid of comfort: Farmers here have always been poor, and not many can afford an education. Seeing a doctor is also difficult, since most of us don't own cars. From the time we're born, we're given a life with very few options. Because of this poverty and lack of knowledge, Malawians found help wherever we could [16].

The above excerpt makes a clear connection between the vulnerability of being poor and the citizens' inability to meet and satisfy their education or healthcare needs. According to Abayomi Oyekale and Eliya Kapalasa's study on the vulnerability of rural farm households, "Majority of the farmers ... lacked formal education ... in their productive years" [17]. With hunger, poverty, and disease being Malawi's priority concerns, education is lower in the country's hierarchy in terms of importance. Evident in Kamkwamba and Mealer's description, William's village does not have the luxury to worry about education, or the lack of it, as they are more concerned with surviving. *Moving Windmills* mentions three crucial reasons that prevent Malawians from getting an education: (1) poverty, which stops at least 67% of eligible Malawians from finishing primary school; (2) limited agricultural curriculum in schools, which does not improve students' farming practices; (3) a growing population, which hinders an already over-enrolled and under-resourced education system [18].

Even though secondary school and university studies remain to this day increasingly limited to those who can afford their very high fees, in 1994 primary schools became free for citizens. Paradoxically, this significant improvement resulted in other major problems such as excess number of student enrollment, "huge class sizes and an inadequate supply of infrastructure, teachers, and teaching and learning materials" which "has led to extremely poor student performance, particularly in the area of literacy" [19]. Kamkwamba and Mealer explain that Wimbe Primary, "a community school supported by the government," yet with a strained academic and financial system is quite similar, and "secondary school wasn't free. It cost money to attend, and because of that, most kids in Malawi didn't even bother going" [16]. As a result, many students drop out of school right after primary school because their families do not have the financial means to support their education. A study by Coulibaly et al. confirms that "about 65% of Malawi's population lives below the poverty line, the majority in rural areas," and these people do not go beyond primary education [20].

In the narrative, Kamkwamba and Mealer also subtly disapprove of educational curriculum by insinuating that the agrarian courses are quite basic and do not advance students' knowledge about farming strategies beneficial for Malawian environment. They narrate, "For agriculture, they wanted us to know things like how to tell if your animals were sick with infections, and if so, how to help cure them. Most kids already knew these kinds of things from working with their fathers" [16]. Because farmers lack the proper knowledge of weather change on crop production, they cannot farm their crops successfully. Coulibaly et al. state that this level of illiteracy in agricultural matters increases Malawian's failure to understand climate and crop variability, two major constraints in agricultural production [20]. In addition, a report published in *Trócaire* reveals that Malawi's "climate extremes and weather events severely erode the resilience and adaptive capacity of individuals and communities via declining yields and food security resulting in a vicious cycle of food insecurity and malnutrition, with devastating consequences ... on long term development" [21]. Because of the fluctuation in global air temperatures, Malawi's weather suffers from increased weather intensity. Consequently, with no proper education geared towards helping Malawian youths to grow into competent farmers familiar with extreme climate changes, as reflected in the story, agricultural production is hindered, sometimes obliterated, and food security is risked.

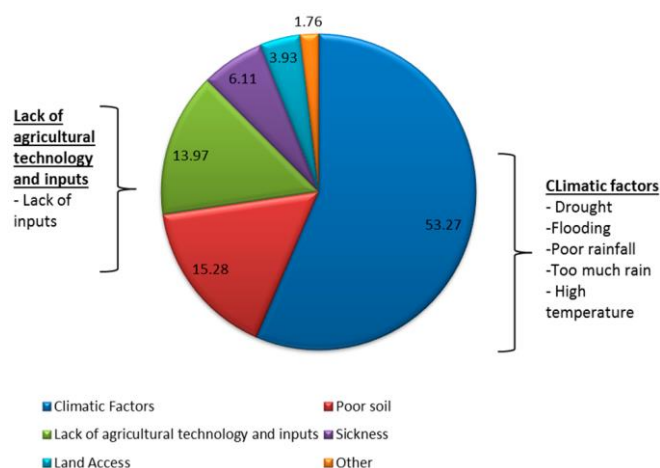


Figure 4. Main causes of crop failure reported by households [20].

Figure 4 shows that the highest factors impacting agricultural production are climate factors (53.27%) and poor soil (15.28%). Inhospitable climates such as drought, flood, erratic rainfall, and high temperature reduce and destroy organic matter and nutrients in the soil during critical stages of plant growth. Due to these factors, during the 2001/02 season, maize production witnessed an evident decline by one million tons. According to "Special Report: FAO/WFP Crop and Food Supply Assessment Mission to Malawi", "Maize production in 2002 is estimated at 1,539,000 tonnes, 10 percent below last year's poor harvest" [22]. William reflects on this time in his story by describing his village's situation in December 2000. Adding to the social, educational, and environmental factors which are causes for poor agricultural production, William clarifies that the Malawian government plays a significant role in the deterioration of the citizen's situation. He states that the "new president, a businessman named Bakili Muluzi, didn't believe the government's job was to help farmers. So that year, the price of fertilizers was so expensive that most families—ours included—couldn't afford to buy it" [16]. Thus, the situation in Malawi during the beginning of the 21st century witnessed great difficulties of famine due to social, educational, environmental, and political factors, which are crucial segments in sustainable development.

Between 2001–2002, two years of famine and drought, William completes elementary schooling, however, his family are unable to pay for his Kachokolo Secondary School’s annual tuition, a sum of \$80. Despite difficult challenges and with the help of his friend Gilbert, William does not stop pursuing knowledge on his own. He continues on the path of what he calls “independent studies: ... We had lots of questions. But no one seemed to have any answers, so I set out to find them myself ... I was filled with the desire to understand, and the questions never stopped coming” [16]. Determined to learn more about science, he often visits the local library to find books to help him with his newfound curiosity. There, he stumbles upon a few textbooks, *Malawi Junior Integrated Science* and *Explaining Physics*, that familiarizes him with the mechanics of hydro plants and electromagnetism. However, an 8th-grade Physics book *Using Energy* introduces William to the concept of the mechanization of energy. Reading this book changes his life, as it presents him with the idea to create a windmill, a workable and lasting solution to help his family and village from famine and drought. William’s interaction with the environment and insight into how science works manifested his eagerness apply to build the windmill.

According to JC Cooper in his classic book *An Illustrated Encyclopaedia of Traditional Symbols*, the windmill in literary texts symbolizes “harvesting and fertility” while the wind represents “the power of the spirit in sustaining life and holding it together” [23]. The windmill is not just a scientific discovery for William. It is more of an ultimate creation that embodies his success to saving his family and society. The windmill also becomes a symbol of hope, persistence, and continuation. Even though many of the people in William’s town only considered that superstition and magic are the saviors of their problems, they came around to believing in William’s windmill after witnessing its success. They began to it as a symbol of life, serenity, resilience, self-sufficiency, and perseverance in a harsh environment.

Through self-study, William understands that energy is a fundamental necessity for human existence. He deduces that generating power from the wind allows his family and village to have electricity (light) at night, harvest twice a year (especially during drought seasons to prevent famine), have water for cleaning and cooking, and avoid the use of kerosene, a harmful substance that causes health and environmental hazards. As Kamkwamba and Mealer explain, creating a windmill means a “release ... from troubles of darkness and hunger. A windmill meant more than just power. It was freedom” [16]. William’s desperate need to survive dire conditions “ignited Williams’ mind and disciplined him to keep learning and keep trying to manifest the vision of a windmill in his mind” [15]. The windmill is symbolic of William’s determination, self-reliance, and success against poverty, lack of resources, and hunger. More importantly, it is an urgent call for survival and sustainable living that countries such as Africa, a place where life is threatened, should regard the sustenance of their societies.

From his description, it is evident that William’s windmill encompasses numerous criteria of most of Doost Mohammadian’s seven pillars of sustainability (7PS Model) and i-Sustainability Plus Theory: educational, economic, environmental, social, technological, and cultural:

Education for sustainable development: This segment encompasses environmental education, knowledge of the relationship between humankind and the environment and ways to preserve it. However, more importantly, it sets out to include and support the idea that education empowers learners with the necessary knowledge, skills, and attitudes to address and find solutions for interrelated global challenges (climate change, environmental degradation, loss of biodiversity, poverty, and inequality) that face the world today. Finding solutions for such problematic issues that risk the future of our world and planet enhances the possibility of shaping a more sustainable future. Based on Doost Mohammadian’s concept of SMEs, to optimize any creative idea that can turn into a good initiative, individuals need to get a proper education enhanced with the appropriate training and cooperation from educational sectors. It is also necessary for individuals to use their education to implement, develop, and apply their knowledge to identify their talents, improve their abilities, and

help them succeed. Despite not getting a proper education that could have helped enhance and expedite his creation of the windmill, William relies on his unquenched ambition to learn science, a study that embodies sustainable progress and his nation's better future. He self-educates himself by reading scientific textbooks to reach a sustainable solution in the form of a windmill that will provide water for his family his society. His educational journey is geared towards change and creation, allowing him to deepen his appreciation for the environment and strengthening his relationship with nature. These qualities lay the foundations for an environmentally responsible adult. The reader witnesses William's radical transformation for the better as knowledge motivates him to make informed decisions and take responsible action for environmental integrity, economic viability, and just society for present and future generations while respecting cultural diversity. Instead of holding on to his people's regressive values and attitudes, William chooses progress instead of superstition and magic. His educational journey represents empowerment towards achieving better sustainable living patterns, thus proving that education for sustainable development is a key enabler of all other sustainable development goals.

Economic sustainability: This pillar is one of the metrics that help societies achieve long-term development. It proposes the methods that support continuing economic growth without negatively impacting societies' social, environmental, and cultural aspects. SMEs have a crucial role in ensuring economic sustainability and minimizing environmental problems. According to Doost Mohammadian, SMEs should be introduced as the economic backbone of each country, as they provide employment and labour for many citizens, thus boosting enduring economic development and acting as a vehicle for achieving sustainable development [11]. In addition, if such initiatives incorporate environmental accounting procedures, tools that assist in the management of ecological and operational costs of natural resources, they can reduce energy costs, improve the workplace environment, save money, and benefit society from increased productivity, engagement, and efficiency [12]. In William's story, the windmill idea can be seen as an innovative SME even though it is not a typical business enterprise due to the lack of its financial profit. William's project is not aimed at gaining profit; it rather aims to provide the necessary energy needed by his family and community. He benefits his town by providing water, electricity and charging mobile phones for free. William reduces costs and makes use of second-hand finds. He recycles discarded materials, such as machine parts and stripped bodies of cars and tractors, which he finds in an old tobacco plantation, abandoned garages, and scrapyards to build his windmill. Seeing potential in these unused supplies allows him to initiate his creation while forgoing the money he initially does not possess. William also relies on Geoffrey (his cousin), Gilbert (his neighbour), and himself for labour work. These workers do not get paid; they only help William with his project. Gilbert supports the windmill creation by constantly paying his saved money for spare parts such as the dynamo. In the story, Kamkwamba and Mealer explain "Gilbert's father had given away all their food during the famine, and he wasn't farming as much because of his health. I was pretty sure their money was low. Still, Gilbert had bought my nuts and bolts for the rotor, and he now reached into his pocket and pulled out two hundred more kwacha—two red paper notes—and handed them to the man" [16]. Moreover, William's windmill occupies only a fraction of his father's land, so it does not waste essential farming areas. In the autobiography, Kamkwamba and Mealer clarify that it took William months to gather all the necessary constituents of the windmill. In short, William's recycled windmill contributes to achieving economic sustainability as this invention gives life to his village by introducing a labour-saving tool.

Environmental sustainability: Perhaps the most crucial of all sustainability factors is the environmental. It is the key strategy against humans' habits of exploiting the environment and its resources. With the advancement of urbanization and industrialization, people have been occupied with

the comforts of economic development and ignorant of their misuse of natural resources and polluting of the environment which risks the future of upcoming generations. The *Commission for Human Future* published “Surviving and Thriving in the 21st Century” to numerate some of the most potentially disastrous dangers to human survival. Some of these which are related to ecological problems are: decline of natural resources, particularly water; collapse of ecosystems and loss of biodiversity due to pollution; human population growth beyond Earth’s carrying capacity; global warming and human-induced climate change; rising food insecurity and failing nutritional quality [24].

Thus, environmental sustainability is a crucial segment that should be considered as it is the human race’s responsibility to protect the planet and lead a self-sustainable life providing equal opportunities of survival not only to our future generations, but also to other species co-habiting with us. William’s windmill is eco-friendly, renewable, ample, and a clean fuel source as it does not release carbon dioxide or other toxic emissions that pollute the air or water. In addition, it is a form of solar energy which depends on wind and sun. The energy produced from these sources can be harnessed to send power across a whole vicinity of farmland. Using the windmill for energy reduces the amount of electricity generated from fossil fuels, which results in lower total air and water pollution. In the autobiography, the windmill can be regarded as a symbol of rebirth and recycling because it provides life to the village as it supplies them with necessary, reusable energy and clean water without negatively affecting the environment. In addition, the fact that the windmill, a safe and eco-friendly structure, is made up of recycled material sends a message about reusing discarded materials which could help in preventing pollution. William sees the potential in old and thrown away things which can be useful again, and so he uses them to create an invention that could help his society’s ecosystem. In the narrative, William explains that “going to the scrapyards began to replace school in [his] mind. It was an environment where he learned something each day. He’d see strange and foreign materials and try to imagine their use” [16]. Thus, the windmill characterized by an eco-friendly trait, results in a better liveability for the village of Wimbe as it provides better living conditions for the community’s inhabitants ensuring better physical and mental wellbeing.

Social sustainability: This pillar is concerned with managing the impacts, whether positive or negative, on the lives of members in a specific society. Several areas which are connected to social sustainability are social responsibility, which encourages individuals to work with other members of their community; thus, promoting teamwork, in a manner that benefits society and contributes to the preservation of the environment while lessening any negative impact on either. Community development, which empowers community members so that they can identify and confront disempowering conditions. Initiatives with this trait help members to achieve long-term results such as stronger and more cohesive communities. Community well-being, which combines social, economic, environmental, cultural, and political factors to thrive and reach their highest potential; thus allowing society members to feel a sense of belonging and enabling them to support each other and their environment; and community resilience, which supports the individual and the society to work together by using available resources such as energy, food, and transportation to respond, tolerate and recover from adverse situations (e.g., climate change, starvation, economic collapse, or even catastrophic risks).

Living in Wimbe and knowing the kind of hardships his family, society, and himself go through allows William to sympathize with its needs and to promote his community’s welfare by providing them with what his people need. For example, William’s windmill provides electricity to his community. Thus, it fits the several criteria of the social segment of sustainable development: a) social support and equity, b) community resilience and competence, c) community development, and d) social responsibility. “When the news of the invention reached the trading centre, the line of people

arriving to charge their phones reached the road. Most of the time people still pretended to be sceptical that I could do this. I think they were hoping I wouldn't charge them money" [16]. William never took money from his fellow neighbours, he rather felt a sense of social obligation to help them in anyway even if it means to charge their phones for free. In addition, William's bigger goal is to empower Malawians in the Kasungu province, with access to solar-powered electricity, clean water, and sustainably powered schools. These projects contribute to the rise in community spirit, consequently saving people from the hardships of and lowering energy costs. In addition, the success of William's small, scaled SME is shown in his reliance on getting the support of his friends who help him build electric generators and water pumps, gather materials, and assemble machinery. Gilbert helps out William with his windmill project and other inventions, both with funds and labour. His act can be seen as a sign of the importance of community support. Geoffrey shows the importance of familial support in Malawi.

Cultural sustainability: Even though the association between cultural sustainability and development has been underestimated, there is no doubt that it is an important segment to reaching sustainable development goals. Sustainability is vital to the survival of humanity; however, it is also very much about being able to live a good life, and this makes the link between liveability and culture even more important. Cultural sustainability can be described as maintaining and improving cultural values, attitudes, and practices that should be preserved despite external influences. It is an enabler and driver of sustainable development as it encourages society members to be more accessible and inclusive and to uphold heritage conservation to ensure the existence of culture in the future. William's windmill represents the sustenance of his society's cultural heritage as it serves to develop and strengthen defining social practices in his village: farming and harvesting. These two traditional customs are expressions of the ways William's ancestors lived. His windmill ensures that his predecessor's lifestyle is preserved and gets passed to future generations. Looking at William's project as a possible SME, it is possible to consider that it addresses global concerns and improves liveability and human existence as it provides members of the community with a sense of fulfilment in their lives.

Technological sustainability: Technology has an important role to play in sustainable development because it is an applied scientific knowledge serving to improve the human life. It is an intrinsic part of our individual and social lives. For societies to reach a more sustainable life with a high level of liveability, it is important for technology and society to co-evolve while co-existing. The technological sustainability segment focuses on how innovative initiatives consider the use of natural resources in fostering economic and social development. The goal of these projects is to reach success in terms of sustainability by drastically reducing ecological risks and creating a sustainable product. Three technological sustainability criteria are: a) reducing ecological risks, b) utilizing renewable resources, and c) preventing negative environmental impacts through its use or production. William's windmill is a product that provides a variety of services which use free energy (wind) to generate electricity and provide water with no chemicals involved. It also reduces waste in the process. According to Mulder, Ferrer, and van Lente, "technological change will create social change by offering new options and social change will trigger new needs and new conditions for technology. In the world of today, technology is often is often limited to a few large enterprises. Technological designers, therefore, have great responsibilities. Their designs can have tremendous effects on various aspects of our societies, in the short as well as in the long term" [25] Wind energy has been used for centuries to pump water, process farm products and power industrial applications. William recreates this use in the 21st century as he sees the wind as an appealing fuel source because it is free, renewable, abundant, and does not produce greenhouse gas emissions or other toxic emissions. The windmill can be regarded as an innovation that uses natural resources (wind and sun) and recycled materials to foster

economic, environmental, and social sustainable development segments which were mentioned in the previous sections.

Doost Mohammadian's theory SME 5.0/Hybrid SMEs/Tomorrow's SMEs proposes that any new project requires management and leadership which are crucial in creating a successful, highly efficient initiative [11]. Such managements should succeed in convincing others to achieve the proposed defined goals and objectives. A specific management system only becomes an effective instrument for SMEs if it can depict dynamic environmental influences as realistically as possible. If management has access to and insight into management-related activities such as planning, organization, and decision-making, then leadership can also mean communicating new horizons [26]. If we apply his theory to William's journey, we can see that William's journey depicts a strong sense of leadership. His insight into activities such as planning, organization, and decision-making allows him to lead his family and friends to communicate new horizons by putting appropriate efforts into activating creativity, identifying opportunities, and realizing ideas. William instinctively cultivates sustainable goals, such as empowering social responsibility, increasing economic opportunity, and targeting progressiveness through knowledge and creation. As a result, using certain social values such as responsibility, integrity, and determination, William succeeds at coping with environmental challenges to create a sustainable environment and a sustainable economy.

One important sustainable segment lacking in Kamkwamba and Mealer's account is the absence of political sustainability. A political government is a multifaceted and central force influencing the broad spectrum of development issues. It entails political strategies, management, and leadership. The main goal of any government is to preserve and support the best interests of its citizens by investing in projects and strategies which promote sustainable development. How does governance help citizens achieve a better quality of life? Quality of life is meant to represent either how well human needs and aspirations are met or the extent to which individuals or groups perceive satisfaction or dissatisfaction in various life domains. This definition allows us to link sustainability to quality of life: the environmental, social, political and economic sustainability refers to the ability of humans to improve their current quality of life while not jeopardizing future generations' potential to achieve an equally desirable level of future quality of life.

According to Doost Mohammadian and Rezaie, governments have a crucial role in developing a country's political sustainability, a significant indicator needed to achieve a sustainable society. Governments are responsible for providing citizens with high quality of livability and quality of life. They state that:

In particular, governance requires to utilize proper strategies, policies, solutions and laws to make political sustainable. In addition, strategies and solutions are needed to struggle with what threatens political indicators in order to make citizens be aligned with political policies of a country. There are different reasons such as sanction(s), low quality of life, economic challenges, unemployment, improper education ... which make political sustainability disturbed. Therefore, government needs to apply appropriate and innovative strategies and policies to deal with these challenges influenced on political sustainability" [27].

Based on the quotation above, progressive governance is significant for the prosperity and continuity of small projects such as SMEs that function against financial, ecological, and social pressures. By addressing complex development needs and promoting prosperity, it should provide notable opportunities for initiatives by strengthening and improving efficient, innovative plans and practices to achieve sustainable development goals set by the United Nations. However, throughout the story, Kamkwamba and Mealer showcase the absence of the Malawian government's aid to its people during tough times. Instead of supporting citizens, "corrupt politicians and predatory

corporations use climate anxiety and falling grain prices as levers to further their own agendas” [28]. He also describes the struggles that many African countries face by highlighting the government’s exploitation of citizens, and the country’s deteriorating conditions. These circumstances lead to “a low quality of life, economic challenges, unemployment, improper education ... which make political sustainability disturbed,” as mentioned by Doost Mohammadian and Rezaie above [27].

More specifically, Kamkwamba and Mealer clarify that William does not rely on government, private, or foreign aid organizations to succeed in trying to save his family. In several parts of the narrative, they describe the governmental corruption that hinders several sustainability sectors. They relate William’s experience of being forbidden from returning to school because the Minister of Education expelled students who could not afford school fees despite his knowledge of the farmers’ poverty situation. In a report published in *Global Corruption Report 2000*, Patrick Mawaya explains that “The education system in Malawi is a clear tale of how rot at the top seeps down through all levels ... At stake is the next generation, who are burdened by this system, in terms of both their own personal development and the socio-economic future of their country” [29]. William is representative of the victimized younger generation whose opportunities are controlled and impeded by such deceiving governmental institutions. Students, especially those with untapped potential like William, become victims to unjust regimes that force the young into menial vocations—farmers—just like their ancestors.

In addition, Kamkwamba and Mealer criticizes the country’s government by mentioning a few presidents such as President Banda (1971–1994), who harshly controlled Malawians’ daily lives during his presidency, and President Muluzi (1994–2004), who ignored the fatal famine crisis in the country for personal gain. The latter, who ran office during the events of William’s story, had a more substantial negative impact on the lives of rural farmers. In his book *Trappings of Power: Political Leadership in Africa*, Z Allan Ntata states that “most Malawians believed that Muluzi was the chief corruption culprit in a government that was considered to be grossly corrupt and shady” [30]. In 2001, five separate investigations kept from the public looked into Muluzi’s presidency accusation of selling Malawi’s reserves of maize to other countries before the commencement of the drought season, which caused nationwide famine across the country. Such corruption not only resulted in the failure of integrating political, social, economic, and cultural sustainable developments to ensure high-quality growth but acted as a barrier to combating the implementation of sustainable development.

Another political corruption hindering political sustainability is embodied in the Electricity Supply Corporation of Malawi (ESCOM), a governmental power transmission and distribution company. This state-owned corporation controls electric power in Malawi. In the autobiography, Kamkwamba and Mealer describe ESCOM as a flawed system that manipulates poor citizens into paying large sums of money for electricity: “only about eight percent of Malawians have electricity in their homes, and most of them live in the city ... but it’s very expensive and hard to get to your house” [16]. ESCOM cuts off the power every week and increases electricity bills for several reasons that are linked to several sustainability segments:

1. Deforestation: Malawian farmers cut down trees to make room for maize and tobacco fields. They also need the trees for firewood. As Kamkwamba and Mealer explain, since electricity is expensive, “most Malawians (including his family) rely on fires for everything from cooking to heating bath water” [16]. This action of deforestation affects the village’s environmental sustainability. With the destruction of trees and forests, unpredictable heavy rains are likely to destroy important soil nutrients needed for crop cultivation. As a result, farmers lose their crops to flooding, and the village suffers from famine and death.

2. Destruction of turbines: During severe rainfall seasons, soil and garbage matters such as plastic bags are washed away into the Shire River and clog ESCOM’s turbines, Malawi’s main source of

electricity. Consequently, the company turns off the power to have the turbine cleaned. As a result, challenges in maintaining technical, environmental, economic, and social sustainability occur due to long outage periods.

3. Loss of money: Kamkwamba and Mealer describe that ESCOM loses money with power cuts. This outage “means they must raise prices to get their money back, making the cost of electricity higher and higher. So, with no crops because of floods, no electricity because of clogged rivers and high prices, people continue to cut down trees for firewood” [16]. This problem causes yet another decline in attaining several sustainability goals.

In addition to these major drawbacks, Kamkwamba and Mealer explain that, without electricity, Malawians do not enjoy the necessities of energy, such as air conditioning, microwave ovens, and lights. Without such services, citizens cannot work, study, or even enjoy life to the fullest. In other words, life in Wimbe stops after sunset. They confirm that the government does not support its people. For example, it fails to use appropriate strategies or create potential policies that may help solve issues such as those mentioned above. Also, the government does not provide funds to elevate its citizen’s quality of life. Malawi’s worsening situation only proves that its government corruption derails the country from reaching a sustainable life. Despite political corruption, William’s social circle proves that cultural values of friendship and familial support are important for the advancement of society. His friends Gilbert and Geoffrey are crucial to his success as they support him morally and financially. They also help him build his windmill by finding material and fixing them together. This bond symbolizes the Malawian culture and is a testament to cultural and social sustainability effectiveness.

According to Katundu Imasiku, sustainable development will not be achieved without major sociocultural determinants, such as governance, education, environment, technology and innovation, economy and financing, and culture and society [31]. In William’s autobiography, Kamkwamba and Mealer portray Malawi as a country that is unable to achieve sustainable development goals due to its poor governance system, financing, inequality, and corruption. Hence, without rectifying many of the government’s flawed administrations to reach a high level of livability and quality of life, Malawi will remain one of the least sustainable countries in the world.

William’s autobiographical account shows a significant chain of events in parallel with the segments of sustainability. It conveys Malawi’s situation in light of the seven pillars of sustainability and its attempt to showcase its citizens’ struggles to sustain a better life for future generations. In addition, it portrays the action William takes as an individual representing a whole community to prove resilience and success despite the overpowering and restraining challenges he faces. Throughout the story, Kamkwamba and Mealer deliver underlying messages signaling the need to change and advance the way governments administer their internal affairs to provide better resources, such as education, employment, and healthcare.

4. Results and conclusions

The idea of sustainability is a developing one, yet an important topic that needs to be addressed in the African dialogue to benefit human life. Real-life experiences of individuals who have faced critical and fatal challenges and invented sustainable creations out of the necessity to survive in a deteriorating world are worth researching since they offer a spectrum of ideas and insights into reshaping society. *The Boy Who Harnessed the Wind: Creating Currents of Electricity and Hope* is a remarkable literary work that captures the resilience and strength of a 14-year-old boy whose passion for knowledge allows him to invent a windmill that not only saves his society from world crises such as poverty, illiteracy, famine, and severe ecological conditions but also gives hope for a more

sustainable living. This invention helped establish a community capable of adapting to a fast-changing world and finding sustainable ways to live in it. Kamkwamba and Mealer story calls for necessary action toward sustainable development. It also calls for something more advanced and innovative: Malawians can achieve sustainable development goals because they can identify their problems better than any foreign body; however, they need to develop seven pillars of sustainability to reach a high level of sustainability.

It is only because of William's persistence to achieve what is nearly impossible in his community that he reached international acclaim for himself and his society. William's windmill drew the attention of Malawian professors from around the country to reconsider the need to invest in poorer regions of the country. Consequently, he earned an educational scholarship, became a part of a prominent community of inventors who promote their innovations in developing countries, and proved that African countries can contribute to the global sustainability dialogue. His work aims at improving lives and using his Malawian roots that value hard work, imagination, and communal strength to create a better future and quality of life for people in all parts of Africa.

Examining Kamkwamba and Mealer's account of William's teenage life should be set as an example to building and expanding the economy, improving education, healthcare, and environmental protection, and becoming financially independent despite challenges. The story reminds people, especially his own, that there are alternative ways to live that do not rely on the rapacious use of natural resources. Through sustainable development, Malawians can depend on themselves instead of relying on Western assistance for survival. The book is an example of this hope and empowerment through self-reliance. It summons solutions toward life-sustaining possibilities which support sustainable economic growth, promotes more and better investments in people, and build resilience, thus maintaining sustainable development of civilization in an underdeveloped city such as Malawi.

Conflict of interest

The authors declare no conflict of interest.

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