

Social Innovation and Tech Breakthrough as a Catalyst for Change: Addressing Poverty in the Era of Global Crises

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ABSTRACT: The research paper explores the role of social innovation in reducing poverty, emphasising the significance of interdisciplinary approaches that address the complex challenges of sustainable development. The research highlights how innovative technologies and community empowerment can drive significant progress toward achieving Sustainable Development Goals (No Poverty), particularly in light of recent global crises such as the COVID-19 pandemic and geopolitical conflicts. By examining various case studies of social innovation, the paper illustrates the transformative potential of new social practices, emphasising the importance of collaboration across sectors to foster resilience and adaptive responses to emerging challenges and finding the tech breakthrough in the world where we can work on eradicating poverty.

Keywords: Social Innovation, Poverty Reduction, Tech breakthrough, Community Empowerment, Resilience, Geopolitical Conflicts

I. INTRODUCTION

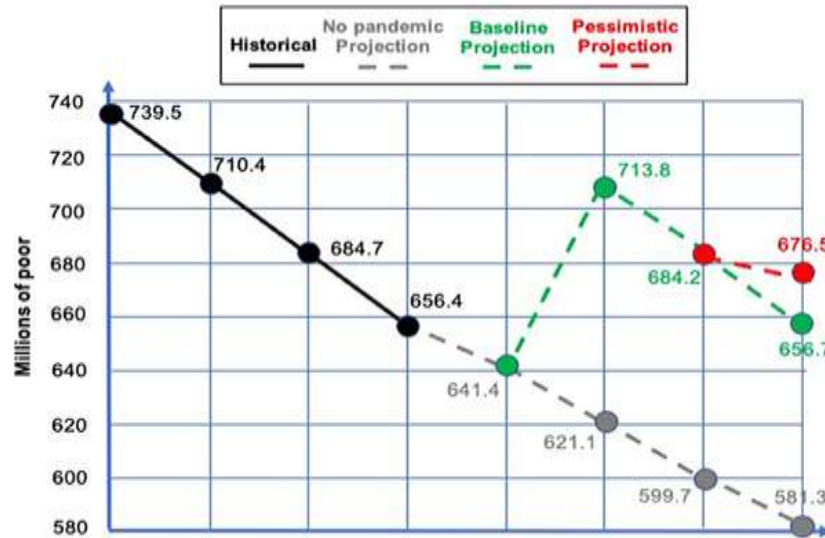
Poverty remains a critical global challenge despite significant efforts to address it. With approximately 10% of the world's population living in extreme poverty, there is an urgent need for innovative solutions to achieve Sustainable Development Goal 1: No Poverty (Sachs, 2012). Over the subsequent 30 years, the worldwide network has an excellent possibility to remove intense poverty. That will not be easy, given a global context where two billion more people will be added to today's 8.1 billion. 90% of humanity will live in low and middle-income countries, and crucial new disruptive influences and demands on natural resources and human capital will need to be

confronted. These numbers are calculated primarily based totally on profits and a person's cap potential to satisfy primary needs (Jensen, 2010). However, when looking beyond income to people experiencing deprivations in health, education, and living standards, 1.2 billion people in 111 developing countries are multi-dimensionally poor (Syed et al., 2021a).

Poverty on a Global Scale, Before and After 2020: Despite significant reductions in extreme poverty worldwide over the fifteen years preceding the onset of the COVID-19 pandemic, recent baseline projections for 2020, 2021, and 2022 indicate alarming increases, as depicted in Figure 1. According to the United Nations (2022), COVID-19 has triggered the first uptick in absolute poverty in a generation. An additional 119-124 million individuals were thrust back into extreme poverty in 2020 alone, and projections suggest a global poverty rate of 7% by 2030, falling short of the target for poverty eradication (Muluneh, 2021).

The Strain of Poverty in Europe: In the aftermath of COVID-19, relative poverty in Europe has surged threefold. In 2020, an anticipated 96. five million human beings throughout the EU27 have been liable to poverty or social exclusion, constituting 21.9% of the population. Notably, income inequality and various other forms of social disparity have spiked significantly across nearly all European nations (Eurostat, 2021). This widening gap is exemplified by the fact that the wealthiest 5% of the population continue to outpace the remaining 95% in terms of financial assets and overall quality of life, as highlighted by Oxfam (2020) stating that "the world's richest 1% possess more than double the wealth of 6.9 billion people" (Marley & Desai, 2020).

Figure 1: The global poverty rate is measured as the share of the world's population living on less than \$1.90 per day



Source: (Mahler et al., 2022)

Deteriorating Indicators of Poverty: Alternative metrics shed light on the worsening poverty landscape. The global Multidimensional Poverty Index (MPI), released by the United Nations Development Programme (UNDP) and the Oxford Poverty and Human Development Initiative, offers insights, particularly in the most vulnerable regions. This index measures poverty by evaluating various forms of deprivation experienced by individuals in their daily lives, including health, education, and living standards (Muluneh, 2021). Across 109 countries surveyed, the 2021 report reveals that nearly 1.3 billion out of approximately 6 billion people are afflicted by multidimensional poverty, with a significant majority residing in sub-Saharan Africa or South Asia, and half being under the age of 18. Common deprivations include a lack of access to education, basic assets, clean water, electricity, adequate nutrition, clean cooking facilities, sanitation, and adequate housing. The pandemic has exacerbated inequality among nations in their response to COVID-19, particularly evident in high-MPI countries where emergency social protection measures have been limited, non-wage employment has surged, and many children have been forced to discontinue formal education (Bambra et al., 2020).

Finding innovative solutions to complex development challenges will drive progress toward the Sustainable Development Goals and enable billions of people to overcome hardship and reach their full potential. A timetable of innovation will unharness the energy of human organizations to

invent higher futures. Innovations in health, agriculture, finance, and different sectors have been essential in the latest life-saving and life-enhancing breakthroughs (Wong, 2014). Where inadequate practices slow progress, more effective approaches will need to be found, and the future depends on how well innovation can super advance. This lesson drives into the intersection of sustainable development, innovation, and poverty alleviation to identify strategies that can contribute to lasting positive impacts.

II. LITERATURE REVIEW

The concept of social innovation has emerged as a pivotal approach to addressing complex societal challenges, particularly in the context of sustainable development and poverty alleviation. Social innovation is defined as the development and implementation of new ideas, services, and models that meet social needs more effectively than existing solutions while simultaneously creating new social relationships and collaborations (Choi & Majumdar, 2015). The literature underscores the multidimensional nature of social innovation, which integrates technological, social, and business innovations to provide holistic solutions to pressing global issues.

Recent studies highlight the transformative potential of social innovation in tackling poverty by fostering inclusive growth and enhancing societal resilience. Social innovation initiatives often focus on community empowerment, capacity building, and participatory

governance, enabling marginalized groups to actively engage in the development process (Castro-Arce & Vanclay, 2020). This empowerment fosters social cohesion and enhances the ability of communities to adapt to changing socio-economic conditions. The significance of social innovation has been further underscored by recent global crises such as the COVID-19 pandemic and geopolitical conflicts, which have exacerbated socioeconomic disparities and highlighted the need for resilient and adaptive responses (Goniewicz et al., 2023). These crises have revealed vulnerabilities in existing systems and underscored the necessity for innovative approaches that can address interconnected challenges and enhance societal resilience (Uddin Syed, 2023).

Moreover, social innovation is increasingly seen as a critical component of achieving the United Nations Sustainable Development Goals (SDGs). It provides a framework for addressing complex, interrelated issues such as poverty, inequality, and climate change through collaborative and cross-sectoral efforts (Castro-Arce & Vanclay, 2020). By fostering partnerships between governments, businesses, non-profits, and communities, social innovation initiatives can mobilize resources, and knowledge, to drive sustainable change.

In summary, the literature emphasizes the role of social innovation as a catalyst for transformative change, capable of addressing the root causes of poverty and fostering sustainable development. Through its emphasis on collaboration, inclusivity, and adaptability, social innovation offers a promising pathway for creating resilient societies that can thrive in the face of global challenges. As such, it represents a crucial strategy for achieving long-term, positive social impact and advancing the No Poverty.

III. METHODOLOGY

The study employs a mixed-methods approach to explore the role of social innovation in poverty reduction and sustainable development, structured into two main phases: qualitative mapping and in-depth case study analysis. Initially, a comprehensive global mapping of social innovation projects was conducted, drawing from a diverse range of sources, including surveys, online databases, and project reports from international organizations and research institutions. This phase aimed to identify initiatives that specifically target poverty reduction and contribute to the achievement of No Poverty. The mapping focused on cataloguing projects that exemplify innovative

approaches and involve multiple stakeholders, such as community organizations, governments, and private sector partners (Robinson et al., 2009). From the mapped projects, a subset of 82 cases was selected for in-depth analysis based on geographic diversity, scale of impact, and the uniqueness of the approaches employed. Qualitative data were gathered through semi-structured interviews with key stakeholders, including project leaders, beneficiaries, and community members, complemented by project documentation, field observations, and literature reviews. The data were analyzed using thematic analysis to uncover key themes (Syed et al., 2021b) related to the processes and outcomes of social innovation, focusing on community empowerment, governance structures, resource mobilization, and the challenges and enablers of scaling innovative solutions. Ethical considerations were paramount, with informed consent obtained from all interviewees and data anonymized to protect participants' confidentiality. This qualitative methodology provided a nuanced understanding of how social innovation contributes to poverty reduction and sustainable development, capturing the complexities and variations in practices across different regions and contexts.

IV. INNOVATION TOWARDS NO POVERTY

4.1 Taking on poverty with vital tech breakthroughs

Getting to the core of poverty means solving multiple issues along the way, and pioneers are up for the challenge. Poverty isn't just insufficient access to income, it also manifests in a lack of access to health services, education, and vital goods. It can also lead to societal instability, allowing sexism, ableism, classism, and racism to flourish (Williams, 2021). Every day, innovators create new technologies and other solutions with the world's poor in mind. Innovation plays a crucial role in addressing poverty by introducing novel solutions to long-standing challenges. These products exemplify innovative solutions aimed at addressing various challenges, from providing clean water and sustainable cooking solutions to promoting access to education and cooling in hot climates (Richard, 2015). Here are some of the best innovations that have shown promise in tackling poverty, as well as potential areas for future innovations.

4.1.1 Eco-Cooler

In growing regions without electricity, hovering temperatures can go away when huts are

unbearably hot. In regions like West Asia (India, Bangladesh, Pakistan, and other Asian countries, characterized by a hot, wet, and humid tropical climate, temperatures can soar to 45 degrees Celsius (113°F) during the summer months. The majority of the rural population resides in corrugated tin huts, which become uncomfortably hot under intense sunlight, particularly as many households lack electricity to power affordable cooling devices such as ceiling fans (Weaver, 2004). To address this challenge, a novel social venture has emerged with a simple yet effective solution. Grey Dhaka, the Bangladesh arm of the New York-based advertising agency Grey, partnered with Grameen Intel Social Business, an information technology company established in 2009 by Grameen Trust and Intel, to develop the Eco-Cooler. Eco-Cooler, a low-cost cooling system made from recycled plastic bottles, helps end the issue by keeping cool air in homes. The cooler is made of equal-sized plastic bottles on a board, which is later installed like a window. It consists of a panel arranged in a grid-like pattern on a wooden frame. The Eco Cooler works on the principle of evaporative cooling, where hot air entering the device passes through the bottles filled with water. As the air passes over the wet bottles, they cool down through the process of evaporation. When the installation is in place, each bottle's neck squashes the hot breeze cooling it down and reducing temperatures inside a hut to as much as 40 degrees Fahrenheit. Rural groups in Bangladesh have carried out the environmentally pleasant solution.

Benefits: The Eco Cooler offers a sustainable and affordable solution for cooling homes in areas where access to electricity or traditional air conditioning is limited. It reduces reliance on energy-intensive cooling systems and promotes the recycling of plastic bottles.

Sustainability POV: The Eco-Cooler demonstrates our potential to tread the path toward a cleaner and more sustainable world and this innovation, ideal for addressing similar conditions in other developing nations, not only offers relief to those battling sweltering heat but also exemplifies the concept of upcycling by utilizing old plastic materials to construct a constructive solution from urban waste, thereby contributing to sustainability.

4.1.2 LifeStraw

1 in three humans globally no longer have to get entry to secure consuming water – UNICEF, WHO. About 2.2 billion people or 28 percent of the world's population lack access to safely managed sources of drinking water. Drinking infected water

can cause devastating sickness and illness. Research says that every two minutes a child dies from a water-related disease. LifeStraw makes drinking contaminated or infected water safer, which can be a groundbreaker in poor regions where water access is minimal. The straw-like device uses a simple filtration system made of specially designed cloth to furnish water safe to drink. It works by using a hollow fibre membrane filter to remove bacteria, parasites, and microplastics from water as it is sucked through the straw. While earlier versions of the LifeStraw filter were unable to remove *Giardia lamblia*, current models boast the capability to eliminate a minimum of 99.999% of waterborne protozoan parasites, including *Giardia* and *Cryptosporidium*. While the original device does not filter viruses, chemicals, saltwater, and heavy metals, newer iterations such as the LifeStraw Flex or LifeStraw Home can effectively remove chemicals and heavy metals, including lead. The LifeStraw does not require batteries or electrical power and can filter up to 4,000 litres (1,000 gallons) of water, making it an essential tool for outdoor enthusiasts, travellers, and communities facing water scarcity.

LifeStraw devices have been deployed in various humanitarian crises and initiatives, including the 2010 Haiti earthquake, the 2010 Pakistan floods, the 2011 Thailand floods, and the 2016 Ecuador earthquake. In regions like the Mutomo District in Kenya, which grapples with prolonged drought, the Kenya Red Cross distributed filters to thousands of school children and households (Vandewalle, 2014). Additionally, the company supports a retail give-back program that, as of 2018, has provided safe water to over 1 million school children in rural Kenya.

Benefits: LifeStraw helps prevent waterborne diseases and improves access to safe drinking water, particularly in remote or disaster-affected areas. It is lightweight, easy to use, and requires minimal maintenance, making it a practical solution for individuals and communities in need, it is Long-lasting and capable of filtering 1,000 gallons (4,000 litres) of water, equivalent to over 5 years of drinking water for an individual. Most important each purchase contributes to providing clean water for one school child for one year.

Sustainability POV: LifeStraw offers sustainable access to clean drinking water while minimizing waste, it has negated the necessity for millions of disposable plastic water bottles and Access to clean water, Reduction in Plastic waste, Community impact, and awareness.

4.1.3 The XO Laptop

Education and gaining knowledge are ordinary goals for ultra-modern youth. But poor communities don't always have the means to give children the extensive education they deserve. The XO Laptop is helping to fill that need. The XO Laptop also known as the XO-1 or the "\$100 Laptop," or Green Machine is a rugged, low-cost laptop designed for educational purposes, particularly in developing countries. The XO Laptop, "is a rugged, low-cost laptop designed for educational purposes, particularly in developing countries. It was developed by One Laptop per Child (OLPC) to provide children in remote and underserved areas with access to modern educational tools and resources. Established by faculty members at the MIT Media Lab, OLPC aims to design, manufacture, and distribute laptops to children worldwide (Warschauer & Ames, 2010). The initiative was announced in January 2005 at the World Economic Forum in Davos, Switzerland, by Nicholas Negroponte, president and co-founder of the Media Lab (Tabb, 2008). The XO Laptop features a durable design, low power consumption, and a sunlight-readable display. It runs on open-source software and comes pre-loaded with educational software tailored to the needs of students in diverse cultural and linguistic contexts and equipped with built-in wireless internet, enabling children to connect to information from around the world. Tailored for children in developing nations, this tech solution aims to provide youth with access to self-empowered education. Over 3 million XO Laptops have been generously donated to children in various countries, including Peru, Kenya, Nepal, and Afghanistan.

Benefits: The XO Laptop aims to bridge the digital divide by providing children with access to technology and educational resources. It promotes collaborative learning, creativity, and critical thinking skills, empowering students to explore and engage with digital content. The rugged design and low-cost nature of the XO Laptop make it suitable for use in challenging environments where access to electricity and traditional educational resources may be limited.

Sustainability POV: The XO Laptop's emphasis on energy efficiency allows the laptop to be used for longer periods using alternative power sources such as solar panels or hand-crank generators, its durable design ensures a longer lifespan, reducing the need for frequent replacements and lowers overall environmental impact. The laptop is designed to be long-lasting, with software and hardware features that can be easily upgraded, this extends the

laptop's lifespan and reduces electronic waste by allowing users to adapt the device to changing needs without discarding it and its low cost makes it accessible to students in developing regions, empowering them with educational opportunities and skills for the future. The XO Laptop operates on open-source software, allowing for collaborative development and customization to meet the specific needs of different communities. This approach encourages innovation and knowledge sharing while promoting sustainability through resource efficiency and community engagement.

4.1.4 Flo Pads/Kits

Lack of admission to menstrual merchandise has devastating influences on girls and ladies in growing nations. Menstrual challenges often result in girls missing school, as evidenced by girls in Kenya, who, on average, miss four days of school per month due to their periods. Improper menstruation sanitation also has devastating health impacts, with reproductive tract infections around 70 per cent more common among women with poor menstrual hygiene in India. Flo, a simple, reusable menstrual hygiene kit, affords an answer for ladies and women in growing countries to take care of their bodies. Included in the affordable kit are reusable pads, a convenient wearable pouch for carrying them, and a washer-dryer container to enhance cleanliness. In regions where menstruation is stigmatized, access to affordable pads and tampons is limited, if available at all. Women and girls often face the challenge of discreetly washing and drying reusable pads due to the taboo surrounding periods (Kaur et al., 2018). This results in poor menstrual hygiene practices, leading to infections, reproductive health issues, and school absenteeism.

Fortunately, Flo offers a solution to this pressing issue by revolutionizing menstrual hygiene practices in developing countries. The innovative kit comprises two plastic bowls connected with nylon, creating a discreet washing and drying apparatus for sanitary cloths (Tierney, 2017). Users simply place the soiled cloth inside the bowl filled with water and detergent, then spin the bowl using the attached strings to clean and partially dry the pads. After detaching the strings, the bowl and burlap cover serve as a compact drying rack, allowing the pads to dry discreetly under the sun, effectively killing bacteria. Additionally, the kit includes a zip-top pouch that attaches to underwear, enabling girls to carry the reusable pad discreetly to school. Priced at just \$3 per kit, Flo is not only affordable but also has the

potential to challenge societal attitudes towards menstruation and promote its social acceptance.

Benefits: By providing reusable menstrual products, the kit helps reduce the environmental impact of disposable menstrual products, such as pads and tampons. Investing in a menstrual kit can save money in the long run compared to purchasing disposable products every month. Reusable menstrual products are designed to be comfortable, absorbent, and leak-proof, helping women and girls manage their periods with dignity and confidence.

Sustainability POV: From a sustainability perspective, both the Flo Kit menstrual cup and eco-friendly tampons offer environmentally conscious alternatives to traditional single-use menstrual products. The Flo Kit menstrual cup stands out for its reusable design, significantly reducing waste generation compared to disposable tampons. Its long lifespan and lower resource requirements contribute to a smaller environmental footprint. Additionally, the cup's convenience, cost-effectiveness over time, and freedom from harmful chemicals make it an attractive option for eco-conscious individuals. On the other hand, eco-friendly tampons, crafted from materials like organic cotton, prioritize biodegradability and reduce chemical exposure. These tampons often come with minimal or recyclable packaging and may also support ethical sourcing practices, aligning with sustainability goals. Ultimately, both options offer sustainable solutions for menstruation, catering to diverse preferences while contributing to environmental conservation efforts.

4.1.5 Wonder Bag

Cooking meals adequately with constrained resources is something many negative households in rural regions warfare with each day. Using stoves or open fires for long periods without proper ventilation can cause sickness or even death. Annually, 3.2 million global deaths are attributed to household smoke inhalation during meal preparation (Juntarawijit & Juntarawijit, 2019). It consists of an insulated bag filled with recycled foam and covered with a durable fabric. Wonder bag serves as a reusable, energy-free slow cooker, significantly reducing the cooking time required for food on stoves or fires. Once ingredients are brought to a boil using traditional methods, a pot can be placed in a Wonder bag, where it continues to cook for up to 12 hours using retained heat. The Wonder bag can cook a variety of dishes, including stews, soups, and rice, and can also be used to keep food warm for serving. The company is distributing this innovation to African regions and individuals

affected by the conflict in Ukraine, assisting families in reducing cooking durations in favour of a more sustainable approach (Galanakis, 2023).

Benefits: The Wonder bag helps conserve energy by reducing the need for prolonged cooking times on stoves or other heat sources. It is particularly useful in areas where access to electricity or clean cooking fuels is limited, helping to reduce indoor air pollution and deforestation associated with traditional cooking methods.

Sustainability POV: The Wonderbag significantly enhances families' disposable income by reducing their expenditure on cooking fuel. Through regular use, a single bag typically leads to fuel savings of up to 70 per cent. With less money spent on electricity and fuel, families can allocate these savings towards purchasing food, building their savings, launching entrepreneurial ventures, and enhancing their overall quality of life.

4.1.6 Hippo Roller

For poor ladies and youngsters in rural areas, accumulating water may be a bodily worrying and threatening task. The Hippo Roller, a water collection drum designed to roll across rugged terrain, enables safe and efficient water collection for users. The Hippo Roller shall we ladies acquire sufficient water to maintain our circle of relatives for a complete day at some point of daytime while there's much less hazard of harassment and sexual violence on the walk to a water source (Reichel & Wu, n.d.). The Hippo Roller is typically pulled by hand or by animals such as oxen or horses and is used to prepare fields for planting crops such as maize, rice, and wheat. The drum also reduces the risk of injury, allowing women to roll the hefty drum instead of carrying a heavy, smaller pail on their heads. Over the past several years, 65,000 rollers have been distributed across 56 countries.

Benefits: The Hippo Roller offers a cost-effective alternative to mechanized farming equipment, making land preparation more accessible to smallholder farmers with limited resources. It helps improve soil structure, water infiltration, and seed-to-soil contact, leading to better crop establishment and higher yields. The Hippo Roller is easy to use, maintain, and repair, making it suitable for small-scale farming operations in rural areas where access to machinery may be limited.

Sustainability POV: The Hippo Roller represents a significant advancement in sustainable technology, particularly in regions facing water scarcity. Its innovative design allows for the efficient transportation of large quantities of water, reducing

the need for multiple trips and minimizing physical strain on users, often women and children in rural communities. By enabling more efficient water collection, the Hippo Roller not only enhances productivity but also conserves valuable resources. Additionally, its durability ensures a long lifespan,

reducing the frequency of replacements and the associated environmental impact. Overall, the Hippo Roller promotes sustainability by improving access to water, reducing energy expenditure, and supporting the well-being of communities in need.

Figure 2: Hippo Roller Global Impact
HIPPO ROLLER GLOBAL IMPACT



Source: (Campbell, 2022)

4.1.7 Jet Injections

Vaccines and immunizations are important in curtailing the influences of illnesses and ailments around the sector however accurately administering a vaccine in a growing country may be tough with the Complexities of sterilization, mainly on the subject of regularly misused needles. Jet injectors address this issue by administering vaccines to patients through pressure-induced skin penetration, eliminating the need for needles (Skountzou & Compans, 2015). Jet injection devices use compressed air or gas to propel liquid medication through the skin and into the underlying tissue. The single-use medical device administers a vaccine through a fine stream of fluid that passes through the skin into tissue. The solution is cost-effective and highly efficient, using up to 80 per cent less vaccine than a traditional needle injection.

Benefits: Jet injection offers several advantages over traditional needle injections, including reduced pain and anxiety associated with needle phobia, decreased risk of needlestick injuries and bloodborne infections, and improved vaccine coverage and compliance. Jet injection devices are also faster and more efficient than needle injections, making them particularly useful for mass vaccination campaigns and healthcare settings with limited resources.

Sustainability POV: Jet injection technology offers sustainability benefits by revolutionizing healthcare

practices, particularly in vaccination programs. With its needle-free delivery system, jet injection minimizes the need for single-use needles and syringes, thereby reducing medical waste and the associated environmental impact. Furthermore, jet injection's efficiency in administering vaccines allows for quicker immunization processes, optimizing resource utilization and reducing the energy footprint of healthcare delivery systems. By streamlining vaccination campaigns and mitigating the environmental burden of medical waste, jet injection technology contributes to a more sustainable healthcare infrastructure worldwide.

4.1.8 The PeePoo Toilet

Around 3.6 billion human beings globally lack access to a secure toilet. Managing human waste is a massive issue in developing nations, with improper sanitation partially responsible for the spread of deadly diseases. Approximately 484,000 children under five die from diarrhoea every year, with poor sanitation being a leading contributing factor (Black et al., 2003). Disregarding its whimsical name, The PeePoo Toilet is an essential sanitation solution for individuals in developing nations, particularly those with contagious diseases. Utilized by individuals in the absence of traditional toilets, the slim, biodegradable bag serves its purpose. After use, the bag can be sealed and disposed of in a designated waste collection site,

where it breaks down naturally over time, converting human waste into compost. The bag sterilizes human waste, converting its contents into fertilizer within a month. While The PeePoo Toilet offers a single-use solution, it may not be suitable for every restroom visit. Nonetheless, it presents an innovative, secure means of disease prevention where sanitation is lacking.

Benefits: The Peepoo Toilet provides a safe and hygienic sanitation solution for communities facing humanitarian crises or lacking access to traditional toilet facilities. It helps prevent the spread of waterborne diseases and reduces environmental pollution associated with open defecation. The biodegradable nature of the Peepoo bags eliminates the need for sewage infrastructure and allows for the safe disposal of human waste in areas where sanitation facilities are scarce or nonexistent.

Sustainability POV: The Peepoo toilet addresses sustainability challenges in sanitation and waste management, especially in underserved communities lacking access to proper toilet facilities. By providing a portable and biodegradable sanitation solution, the Peepoo toilet offers a hygienic and eco-friendly alternative to traditional pit latrines or open defecation practices. Its design facilitates safe containment and decomposition of human waste, minimizing health risks and environmental pollution. Moreover, the Peepoo toilet's biodegradable material ensures that it can be disposed of safely, without leaving a long-term ecological footprint. Overall, the Peepoo toilet promotes sustainability by improving sanitation, protecting public health, and mitigating environmental degradation in resource-constrained settings.

4.1.9 Safari Seat

Wheelchairs are vital gadgets for lots of people, however, in rural, growing regions with tough terrain and few roads, conventional wheelchairs are not constantly realistic or maybe usable. SafariSeat, a cost-effective, all-terrain wheelchair, is specifically designed for production and maintenance in impoverished nations, establishing a self-sustaining product (Bucchianico, 2018). The innovation is manufactured from bicycle parts, and the tool is propelled ahead through hand levers and sturdy wheels. The Safari Seat features a lightweight, adjustable seat and backrest, and pneumatic tyres for smooth mobility on rough terrain. It is designed to provide individuals with mobility impairments with increased independence and access to essential services and opportunities. As of 2023, nearly 250

SafariSeats have been distributed, with The Accessibility Institute focusing on developing an attachable cart for the wheelchair.

Benefits: The low-cost and locally sourced materials make the Safari Seat accessible to individuals and communities with limited resources. The adjustable design of the Safari Seat allows it to be customized to fit the specific needs and preferences of users, providing optimal comfort and support. The Safari Seat is designed to withstand the rigours of everyday use and rough terrain, ensuring long-lasting performance and reliability. By providing individuals with mobility impairments with access to a wheelchair, the Safari Seat promotes independence, mobility, and inclusion in community life.

Sustainability POV: SafariSeat offers innovative solutions to mobility challenges in rural communities while prioritizing environmental conservation. Its design, utilizing bicycle parts and locally sourced materials, not only makes it affordable but also reduces the need for specialized manufacturing processes and imported components, thus lowering its carbon footprint. Additionally, by providing an alternative to motorized vehicles for transportation over rough terrain, SafariSeat minimizes reliance on fossil fuels and mitigates air pollution. Furthermore, its open-source nature encourages local production and customization, fostering community engagement and self-sufficiency. Overall, SafariSeat promotes sustainability by enhancing mobility, reducing environmental impact, and empowering communities to address their unique needs through accessible, low-impact transportation solutions.

4.1.10 NIFTY Cup

When a little one in a growing developing Country is not able to nurse, they may be vulnerable to intense malnutrition or maybe death. The NIFTY Cup is solving this issue in rural areas of Africa. Developed over five years, the NIFTY Cup is a reusable silicone menstrual cup designed to provide women and girls with a sustainable and eco-friendly alternative to traditional menstrual products such as pads and tampons (M. McKinney et al., 2020). It is made from medical-grade silicone and is designed to be inserted into the vagina to collect menstrual fluid during menstruation. The NIFTY Cup features a bell-shaped design with a soft, flexible rim and a firm body for easy insertion and removal. It is available in different sizes to accommodate varying menstrual flows and body types.

Benefits: The reusable design of the NIFTY Cup

helps reduce the environmental impact of disposable menstrual products, such as pads and tampons, by eliminating the need for single-use products. Investing in a menstrual cup can save money in the long run compared to purchasing disposable products every month. The soft, flexible silicone material and bell-shaped design of the NIFTY Cup make it comfortable and easy to use, providing leak-proof protection and allowing for up to 12 hours of wear. The NIFTY Cup is made from medical-grade silicone, which is hypoallergenic and non-toxic, making it safe for use inside the body. It also helps maintain the natural pH balance of the vagina and reduces the risk of bacterial infections compared to traditional menstrual products.

Sustainability POV: NIFTY Cup contributes to sustainability efforts by revolutionizing neonatal care practices with a reusable and environmentally friendly alternative to single-use medical devices. Its durable silicone construction allows for repeated sterilization and reuse, significantly reducing medical waste generated in neonatal intensive care units. By replacing disposable alternatives like feeding tubes or syringes, the NIFTY Cup minimizes the environmental burden associated with medical supplies and contributes to healthcare facility sustainability goals. Moreover, its effectiveness in supporting breastfeeding and infant nutrition promotes long-term health outcomes, reducing the need for additional medical interventions and resource-intensive treatments. In essence, the NIFTY Cup aligns with sustainability principles by prioritizing waste reduction, promoting health equity, and supporting sustainable healthcare practices in resource-limited settings.

4.2 Social Innovation to Reduce Poverty

Addressing the swift escalation of global poverty stands out as one of today's most urgent challenges, particularly amidst this era of upheaval. On top of the ongoing environmental crisis, the last fifteen years have been rocked by the financial crisis of 2007–8, compounded by the 2020 COVID-19 pandemic and then by the 2022/2023 war in Ukraine and Palestine, each of which has negatively impacted all aspects of sustainable development. Despite the longstanding application of social innovation methods by development organizations to combat poverty and vulnerability, it is only recently that they have begun to systematically analyze and formalize their impact on these and other Sustainable Development Goals (SDGs). Social innovation affords useful social results for residents and different actors, frequently

on the nearby stage with the sturdy bottom-up involvement of civil society and through its cross-actor, cross-sector, cross-disciplinary, and cross-cutting strengths (Lisetchi & Brancu, 2014). Notably, the aim is to empower those facing social needs, especially when starting with limited resources. The emphasis lies on enhancing beneficiaries' autonomy and capacity instead of relying passively on external assistance. This entails reshaping social dynamics and fostering novel collaborative processes. Drawing from various contemporary sources, this paper examines a comprehensive global survey of social innovations targeting poverty and vulnerability across different regions worldwide. It explores diverse poverty definitions, encompassing extreme, absolute, and relative measures (Perrini & Vurro, 2006). The paper advocates for recalibrating social innovation strategies to address emerging threats in the current era of turmoil, advocating for increased proactive involvement of the public sector in social innovation. Additionally, calls for a new integrated approach that combines SDG1 with other closely linked SDGs.

Social innovation has garnered significant attention in recent years, both in public discourse and academic circles, particularly within the social sciences. It encompasses a diverse range of meanings and applications across various fields and disciplines, making it challenging to define rigidly. Consequently, there exists a rich body of literature exploring its definitions, processes, and key actors. Social innovation is often described as innovative initiatives and services driven by the aim of addressing social needs, primarily developed and disseminated through organizations with social objectives. It involves a process aimed at meeting human needs by transforming social relations and governance systems, ultimately enhancing society's capacity to act (MacCallum, 2009). These innovations simultaneously address social needs more effectively than alternatives while fostering new social relationships or collaborations, thereby enriching society's collective capabilities.

Two primaries emerge from the current landscape. Firstly, it is evident that social innovation plays a pivotal role in sustainable development across various dimensions. This significance is underscored by the growing acknowledgement of the necessity for an intensified focus on interdisciplinary studies (Klein, 1999). Real-world complexities demand holistic approaches and social innovation excels in bridging disparate facets of sustainable development, unlike other forms of innovation such as technology and

business. By centring on the actual challenges and opportunities faced by individuals and directly involving all stakeholders, including beneficiaries, social innovation inherently adopts a multidimensional perspective.

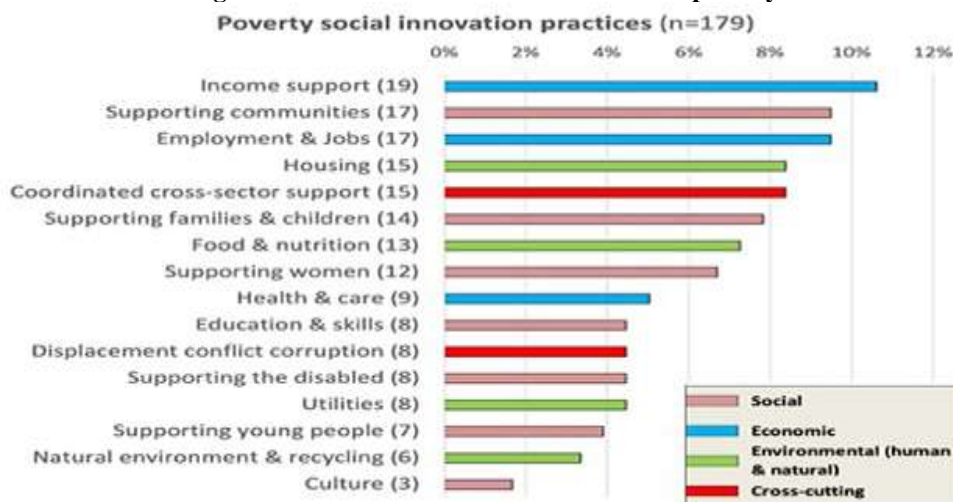
Secondly, the global landscape has undergone significant upheaval in recent years, notably exacerbated by events such as the COVID-19 pandemic and the ongoing conflict in Ukraine (Tsutsunashvili et al., 2024). These crises have precipitated a profound shift in perceptions among politicians, researchers, businesses, and citizens, thrusting sustainable development into the forefront of global consciousness. This heightened awareness has been further intensified by escalating poverty rates and soaring prices of essential commodities like food and energy. With societies navigating a landscape characterized by perpetual uncertainty and disruptive change, the imperative to cultivate resilience against existing and anticipated shocks has never been more pressing. Anticipated challenges, spanning from pandemics to climate crises and socio-economic disparities, underscore the need for proactive resilience-building measures. Social innovation, with its inherently inclusive and multidimensional nature, emerges as a paramount tool in mainstreaming resilience efforts, capable of addressing interconnected shocks and fostering adaptive responses to emerging challenges.

Social innovation revolves around the introduction of new social practices, characterized by novel combinations or configurations of social practices within specific areas or contexts (van der Have & Rubalcaba, 2016). These innovations are

driven by intentional efforts from various actors or actor constellations, aiming to better address societal needs and problems compared to established practices. Over time, socially accepted innovations diffuse throughout society or specific societal sub-areas, becoming established and institutionalized as social practices.

Data Collection and Analysis: The methodology involved an extensive collaboration with other social innovation projects, preceding two rounds of global mapping. Initially, 1,005 detailed case studies were collected using both quantitative and qualitative methods. Subsequently, in-depth qualitative investigations were conducted on 82 selected cases, based on numerous interviews, background research, and data obtained from the first round of mapping. These cases spanned various policy fields, including poverty reduction and sustainable development, alongside education, employment, environment, energy supply, transport and mobility, and health and social care. The poverty policy field contributed 179 cases in round one and thirteen cases in round two from the data of the 179 cases, cluster techniques were applied to identify sixteen distinct clusters of social practice in the poverty policy field, each with its specific objectives aimed at addressing particular social needs. The selection of the thirteen round 2 cases for in-depth analysis aimed for broad geographic coverage and a balance in case characteristics such as size, scope, and actors involved (Wells et al., 2012).

Figure 3: Social innovation aimed to reduce poverty



Source: (Millard, 2023)

The analysis of these cases revolved around these key dimensions:

- **Concepts and Understandings:** This encompasses social practices, social demands, societal levels, and innovation dynamics, covered in the sections on social practices, societal levels, and innovation dynamics.
- **Governance:** This dimension pertains to actors, sectors, and actor roles and is addressed in the actors' section.
- **Resources:** This dimension involves people and finance and is discussed in the resources section.
- **Drivers and Barriers:** This dimension explores the factors facilitating or hindering social innovation and is covered in the drivers and barriers section.
- **Process Dynamics Phases:** This dimension encompasses scaling, transfer, and development paths, analyzed in the sections on scaling and transfer and modelling development paths.

4.2.1 Empowering Communities

One way to use social innovation to reduce poverty is to empower communities to identify and co-create solutions that suit their needs, assets, and aspirations. This can involve engaging with diverse stakeholders, such as residents, organizations, businesses, and governments, and facilitating participatory processes, such as workshops, dialogues, or design sprints, to generate and test ideas. Empowering communities fosters ownership, agency, and resilience among the population served, facilitating more effective utilization of resources (Gil-Rivas & Kilmer, 2016).

Perspective: Self-help group is the key. Community empowerment is an ongoing endeavour requiring active participation, collaboration, and a profound understanding of each community's distinct needs and aspirations. Tailoring empowerment strategies to the specific context and culture of the community is essential for success and it can lead to sustainable poverty reduction by promoting social capital and Trust, improving social concord and solidarity, and constructing nearby potential and leadership. Additionally, it aids in addressing the underlying causes of poverty, as communities are better positioned to devise solutions tailored to their specific challenges and contexts. Furthermore, this approach can create a sense of belonging and pride within communities, as they actively contribute to improving their well-being and prospects (Jabeen et al., 2021). Ultimately,

community empowerment through social innovation proves to be a potent strategy for poverty reduction and sustainable, enduring change.

4.2.2 Leveraging Technology

Another way to use social innovation to reduce poverty is to leverage technology to improve access, efficiency, and quality of social services and programs (Gupta et al., 2015). This may entail utilizing digital platforms, tools, or devices to disseminate information, provide education, deliver healthcare, or offer financial services to marginalized or remote populations, or to gather and analyze data for monitoring and evaluating outcomes. Leveraging technology enhances the scope, efficacy, and longevity of interventions while reducing barriers and costs associated with service delivery.

Perspective: The perspective on leveraging technology for poverty reduction involves the use of blockchain and decentralized finance (DeFi) solutions. Blockchain technology offers transparent and secure financial systems that can provide unbanked or underbanked populations with access to banking and financial services. Smart contracts on blockchain networks allow peer-to-peer lending, microloans, and financial savings platforms, lowering the dependency on conventional banks and intermediaries. This innovative approach can empower individuals economically by allowing them to save, invest, and access capital, thereby contributing to poverty reduction in a financially inclusive manner.

4.2.3 Building Networks

A third way to use social innovation to reduce poverty is to build networks that connect and support different actors and initiatives that aim to address social problems (Goldsmith, 2010). This could involve forming or joining coalitions, alliances, or platforms that facilitate collaboration, learning, and advocacy among social innovators, social workers, funders, policymakers, and beneficiaries. Networking amplifies the visibility, credibility, and impact of endeavours while nurturing an environment conducive to innovation and transformative change within the social sector.

Perspective: Building networks is a powerful strategy in the realm of social innovation for poverty reduction. It allows for the pooling of resources, expertise, and experiences from various stakeholders, creating a synergy that can lead to more effective & sustainable solutions. These networks can also serve as advocacy platforms to

influence policies and allocate resources toward poverty alleviation. Moreover, by connecting social innovators, funders, policymakers, & beneficiaries, you create a rich ecosystem that promotes idea exchange & knowledge sharing, which can significantly enhance the impact of initiatives aimed at reducing poverty. Building networks can catalyze transformative change and foster inclusive, equitable societies.

4.2.4 Developing Skills

Another strategy for leveraging social innovation to combat poverty involves the development of skills that facilitate adaptation and resilience in a rapidly changing world. This can involve acquiring or enhancing competencies, such as creativity, critical thinking, communication, or entrepreneurship, that are essential for identifying and seizing opportunities, solving problems, and creating value (Atta et al., 2021). By developing skills, you can improve your professional practice and performance, and empower your clients to improve their livelihoods and well-being (Glenn, 2007).

Perspective: Developing skills is a critical aspect of using social innovation to address poverty. Social innovation equips individuals and communities with the necessary tools to surmount challenges and build a sustainable future. By enhancing skills such as entrepreneurship and critical thinking, individuals can identify opportunities, devise solutions, and adeptly navigate evolving circumstances. Moreover, fostering skill development among marginalized populations enhances employability and fosters financial independence, thereby breaking the cycle of poverty and contributing to social and economic development.

Evaluating Impact

Evaluating the impact of ideas, products, services, or models on both people and the environment represents another avenue for leveraging social innovation to alleviate poverty. This can involve using methods, such as surveys, interviews, observations, or experiments, to measure and demonstrate the outcomes, effects, and value of your interventions, and to learn from your successes and failures (Khan et al., 2022). By evaluating impact, you can ensure the relevance, effectiveness, and efficiency of your work, and improve your accountability and transparency to your stakeholders.

Perspective: Evaluating the impact of social

innovation initiatives is a crucial step in the poverty reduction process. It allows for evidence-primarily based totally decision-making and guarantees that interventions are powerful and efficient. Through systematic outcome measurement and learning from successes and failures, social workers and innovators can refine their approaches to maximize positive change. This data-driven approach enhances transparency and accountability, crucial when working with vulnerable populations, and contributes to individual well-being and societal equity and sustainability.

While not a panacea for poverty, social innovation represents a potent and promising approach that complements and enhances social work practice (Mulgan et al., 2007). By leveraging social innovation, practitioners can make meaningful differences in the lives of individuals and communities, contributing to a more just and sustainable world. It plays a pivotal role in addressing poverty by fostering creative solutions and collaborative approaches that target its root causes. Social improvements may contain growing sustainable activity possibilities for marginalized communities, imposing microfinance programs, enhancing get right of entry to to schooling and healthcare, and addressing systemic inequalities. These improvements empower people and groups to interrupt the cycle of poverty and lead extra-pleasing lives.

V. RESEARCH AND FINDINGS

The research aimed to investigate how social innovation initiatives, including technological breakthroughs, contribute to poverty reduction and sustainable development. The study examined diverse projects across different regions and contexts, focusing on key themes and innovations that emerged from the qualitative data analysis. These findings highlight the transformative potential and challenges of social innovation in addressing complex social issues.

Community Empowerment and Participation: A significant finding of the research is the role of social innovation in empowering communities to actively participate in their development processes. The case studies revealed that initiatives promoting participatory governance and community-driven solutions foster a sense of ownership and agency among beneficiaries. For instance, projects that involved local stakeholders in the design and implementation of interventions were more successful in addressing the specific needs of the community. This empowerment enhances the effectiveness of solutions and builds social capital

and resilience.

Innovative Approaches to Service Delivery: The research identified several technological breakthroughs that demonstrate innovative approaches to service delivery, effectively addressing the unique challenges faced by marginalized populations.

Peepoo Toilet: This self-sanitizing, biodegradable toilet provides a safe and affordable sanitation solution for communities without access to traditional plumbing. It has significantly impacted public health by reducing the spread of disease in areas with inadequate sanitation infrastructure.

Wonderbag: This non-electric, portable slow cooker helps reduce fuel consumption and cooking time, providing an eco-friendly cooking solution. By decreasing the need for constant stove use, it addresses issues related to deforestation and indoor air pollution, while saving time and resources for users, particularly women in low-income communities.

SafariSeat: An all-terrain, open-source wheelchair designed for people in developing countries. Its durable and affordable design enables greater mobility and independence for individuals with disabilities, improving their access to education, employment, and social participation.

Flo Kit: A menstrual health solution that provides reusable sanitary pads and educational materials to girls and women in developing regions. By improving menstrual hygiene management, the Flo Kit helps to reduce absenteeism from school and work, contributing to gender equality and empowerment.

These technological innovations have demonstrated significant impacts on poverty alleviation by breaking down barriers to access and creating new economic opportunities for underserved communities.

Cross-Sector Collaboration: The findings emphasize the importance of cross-sector collaboration in driving social innovation. Successful initiatives often involve partnerships between government agencies, non-profit organizations, private sector actors, and community groups. These collaborations enable the pooling of resources, expertise, and networks, enhancing the scalability and sustainability of social innovation projects. Case studies highlighted how multi-stakeholder partnerships facilitated the sharing of knowledge and best practices, leading to more comprehensive and effective solutions to poverty-related challenges.

Challenges and Barriers: Despite the positive outcomes, the research identified several challenges

and barriers that social innovation initiatives face. Limited financial resources, regulatory constraints, and resistance to change were common obstacles encountered by projects. Additionally, scaling successful innovations to broader contexts remains a significant challenge, often due to the complexity of local dynamics and the need for tailored approaches. The study suggests that addressing these barriers requires supportive policy frameworks, increased funding opportunities, and continuous capacity-building efforts for local actors.

Impact on Sustainable Development Goals (SDGs): The study found that social innovation initiatives significantly contribute to the advancement of several SDGs, particularly those related to poverty reduction, health, education, and sustainable communities. By fostering inclusive growth and enhancing the resilience of communities, social innovation projects help address the root causes of poverty and promote long-term sustainable development. The integration of social, economic, and environmental objectives within these initiatives aligns with the holistic approach of the SDGs, demonstrating the potential of social innovation as a transformative force for achieving global development goals.

The research highlights the transformative impact of social innovation on poverty reduction and sustainable development. Through empowering communities, leveraging innovative technologies like the Peepoo toilet, Wonderbag, SafariSeat, and Flo Kit, and fostering cross-sector collaboration, social innovation initiatives address complex social challenges and contribute to achieving the Sustainable Development Goals. However, to maximize their potential, these initiatives require supportive environments that facilitate scaling and sustainability. Continued research and investment in social innovation are essential to harness its full potential for creating positive social change.

VI. CONCLUSION

In conclusion, it has revealed both the challenges and promises on the road to a future without poverty. By understanding its historical context, embracing technological and social innovations, and fostering collaboration across sectors, we pave the way for transformative change. As we move forward, let us remain committed to the goal of no poverty, ensuring that every individual and community has the opportunity to thrive with dignity and resilience. Together, we can build a world where poverty is but a distant memory and prosperity is shared by all. We have

embarked on a comprehensive exploration of the critical issue of poverty, examining its historical background and the innovative approaches driving progress toward its eradication. From groundbreaking technological advancements such as the Eco Cooler, LifeStraw, XO Laptop, Flo Pad, Wonder Bag, Hippo Roller, Jet Injection, Peepoo Toilet, Safari Seat, and NIFTY Cup, to the transformative power of social innovation highlighted by empowering communities, leveraging technologies, building networks, developing skills, and evaluating impact, it is evident that a multi-dimensional strategy is essential in tackling poverty effectively. These lessons underscore the significance of collaborative efforts across sectors, from technological innovation to community-driven initiatives, in addressing the root causes of poverty and fostering sustainable development. As we conclude this chapter, it is imperative to recognize that the journey toward achieving the goal of no poverty requires continued dedication, innovation, and collective action. By embracing inclusive approaches and investing in solutions that empower individuals and communities, we can move closer to realizing a world where poverty is no longer a barrier to human dignity and opportunity.

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