

CASE STUDY

# Sub-Saharan Africa

Built for All: Incorporating an inclusive economy framework



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1.0

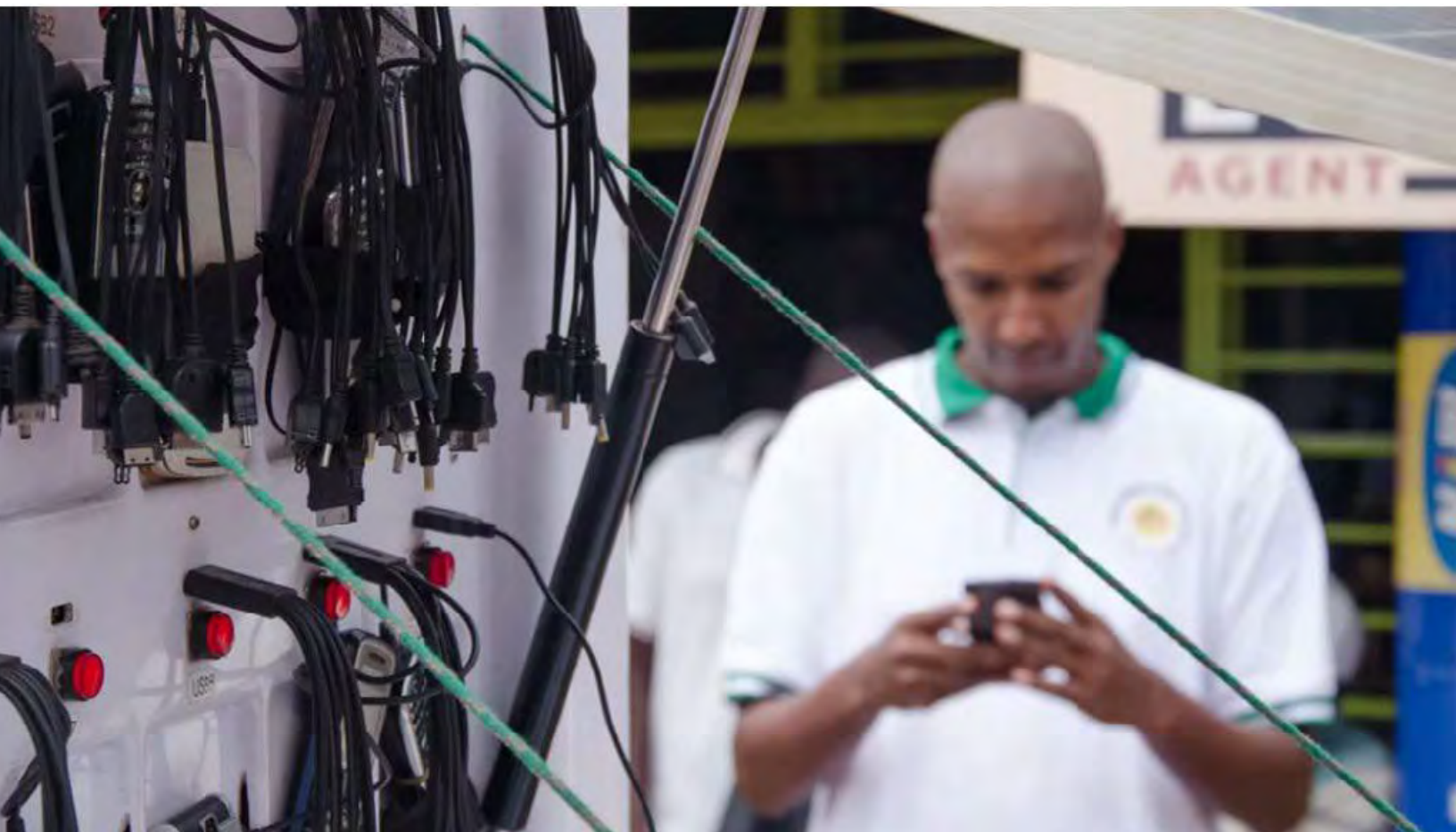
# Electrification of isolated areas



### 1.1 Background

Sub-Saharan Africa is home to over one billion people, of which half will be under the age of 25 years old by 2050.<sup>1</sup> This diverse continent has the potential to achieve inclusive growth and eradicate poverty through their human and natural resources, allowing Africans to live healthier and more productive lives.<sup>2</sup> Despite the economic setbacks experienced in 2020, Africa is creating a new development path with a 1.2 billion-person market and the world's largest free trade area.<sup>3</sup> One integral step to achieve this path in sub-Saharan Africa is a more inclusive digital economy that works to alleviate debt and promotes investments in human capital.<sup>4</sup>

This case study will focus on the company ARED, which operates at the intersection between deep technology and renewable energy. Since 2013, the company has been working to change 'the way people from semi-urban, rural, and refugee camps in Africa access digital content and undertake transactions to pay for services digitally.'<sup>5</sup> They currently operate in four African countries: Côte d'Ivoire, Burkina Faso, Uganda and Rwanda, with plans to cover the entire continent by 2050.<sup>6</sup>



## 1.2 ARED: Solar energy access for rural and refugee communities

ARED identifies and addresses four challenges currently facing the region.

High-Cost Digital Access	Unreliable Access to Energy	Unemployment & Social Inequality	Smartphone & Digital Literacy
Despite an overall decrease in internet cost globally, millions in rural communities continue to lack internet access.	Across Africa, less than 30% of the population have access to electricity, which makes it difficult to provide the right infrastructure for connectivity, which would allow individuals to perform tasks such as charging their phones. <sup>7</sup>	The current unemployment rate of youth stands at 60% and the unemployment rate of women is at 8.34% with an employment gender gap of 15% in sub-Saharan Africa. <sup>8</sup>	Overall, Africa has a low literacy rate, and for people to be able to participate in the digital ecosystem, this needs to be addressed. <sup>9</sup>



ARED is interested in building a more equitable economic environment so that no one person is left behind, by addressing the digital challenges so that all Africans can participate in the digital revolution.<sup>10</sup>

## ELECTRIFICATION OF ISOLATED AREAS

In 2013, ARED began using solar-powered kiosks within sub-Saharan Africa to address these challenges and sustainably build equity. By providing up to 30 phones with chargers and offering Wi-Fi access for a nominal fee through their Shiriki app, the kiosks act as a mobile hub for users who would otherwise be excluded from electrification and the internet.<sup>11, 12</sup>

The kiosks are operated under two models: a franchise model and a business-to-business model (B2B). Under the franchise model not only is entrepreneurial spirit nurtured, equity is furthered as women and individuals with disabilities have the franchising kiosk fees waived.<sup>13</sup> Due to the need for electricity and internet access, franchisees are able to then earn anywhere between **\$37 and \$107 per month**, a large opportunity in regions where unemployment can be as high as 77%.<sup>14, 15</sup> The B2B model operates in a very similar fashion with the exclusion of one detail – the kiosks are no longer mobile. In the franchise model, kiosks are easily transportable, enhancing access to remote regions; however, businesses have stationary kiosks attached to their place of business. This model utilizes existing community ties to magnify the impact of the kiosks while offering increased economic opportunity for business owners. Both models work towards two goals: bringing access to affordable electricity to remote regions in need and providing a sustainable income for vendors.



"A lot of the time you see a lot of people that want to be in business for themselves, but they don't want to be by themselves."

– Henri Nyakarundi, CEO and Founder<sup>16</sup>

While having initially started in Rwanda, ARED is progressively expanding their models across the continent and are now in four countries across Africa with future plans to venture into **20 countries** in the next ten years with over **100,000 solar kiosks** throughout the continent.<sup>17</sup>

2.0

# Built for All: Applied



## 2.1 Pillar One: Equitable access to resources and opportunities

ARED provides a sustainable, energy-efficient and low-cost solution that looks to revolutionise how Africans in rural areas or in refugee camps are able to access digital content and manage their digital wealth. Their Shiriki Hubs offer a scalable and self-contained kiosk that provides offline/online digital applications and services, as well as Wi-Fi and phone charging stations.<sup>18</sup>

ARED exemplifies Pillar One of Built for All because it is focused on providing micro infrastructure for last-mile connectivity, creating a for-profit business that creates social impact by increasing accessibility to digital networks and data (building social capital). These mobile community hubs provide increased avenues to education, allowing those who are less privileged to explore novel opportunities to build individual wealth through diversified skills training.<sup>19</sup>



ARED works towards equitable access to resources and opportunities in sub-Saharan Africa.

**Providing equitable access to technology, data and digital networks benefits everyone:** ARED's for-profit business model is built on continually creating and expanding their network of community hubs/kiosks.<sup>20</sup> Business expansion into remote communities will dramatically increase their access to technology and digital networks. Through their franchisees and local business partners, they implemented these kiosks as a solution to creating an inclusive economy.<sup>21</sup>



## BUILT FOR ALL: APPLIED

**Supporting strong families in all places and increasing social capital to better build communities:** Their solution uniquely targets communities that are in remote or more rural locations, or others without consistent access to energy and digital networks such as refugee camps.<sup>22</sup> With these community hubs, they are building social capital by increasing community access to the offline/online applications that include employment and financial literacy training. Creating an inclusive economy requires a populace that has the resources to pursue their entrepreneurial spirit and build individual wealth.

### Opportunities for enhancing inclusion

ARED's lesser-known programme is their installation of routers into existing infrastructure within the community. For instance, ARED installs these routers at ATMs and cell phone towers as a more affordable way to access the internet. This option is viable for more vulnerable populations who may not be able to afford the licensing fee due to pre-existing financial barriers, as updating existing community infrastructure is less costly than investing in novel technology.

### Lessons for action

This is an excellent example of a business solution that is both sustainable and profitable, with a high degree of social impact. In conventional thinking, social impact is often associated with nonprofit organisations or high-level IGOs, but this for-profit company has created a solution with a higher degree of social impact for last-mile citizens whom conventional solutions often miss due to lack of accessibility. These self-contained solutions that use solar energy create a community-level impact at a relatively low cost for the company as well as its clients. Coordinated at the national level, it could turn out to be a very real solution to creating greater accessibility to the internet and potential learning/employment training and resources.



## 2.2 Pillar Two: A level playing field for work & competition

### Strengths of ARED's approach

ARED's business approach positively contributes to the circulation of capital throughout the economy, as their technology enables transactions to be conducted digitally in hard-to-reach areas such as semi-urban, rural and refugee camps across Sub-Saharan Africa.

ARED allows businesses regardless of size or stage of maturity to compete in a dynamic market ecosystem. ARED's smart solar kiosk closes the energy and infrastructure gap on connectivity by allowing individuals to charge their phones to better their daily lives, such as by digitising inventory management. The inability to manage supply and demand for micro, small, and medium enterprises (MSMEs) can be devastating for businesses, but with the use of simple phone-based systems and connectivity, MSMEs can increase efficiency and scale by inputting transactions, viewing available stock, and easily assessing sales frequency.<sup>23</sup>

ARED is working to ensure marginalised communities do not face barriers to finding and keeping work, by creating self-employment and microentrepreneurship opportunities for women, people with disabilities and refugees through their franchisee model.

### Future opportunities for enhancing inclusion

While the number of internet users in Africa grew by seven times the global average between 2000 and 2012, the continent's ability to produce software, applications and tools still lacks critical mass and knowledge.<sup>24</sup> ARED's mobile app Shiriki Hub provides customers access to digital applications. ARED could further enhance inclusion by partnering with the public and civic sector to provide necessary training to develop digital infrastructure and increase innovative applications.



## 2.3 Pillar Three: Collective stewardship of shared resources for future generations

### Strengths of ARED's approach

Solar power and the recycling programme for kiosk disposal minimises the impact on the environment, ensuring that business expansion will not be at the expense of climate action. Furthermore, the use of renewable energy ensures a level of job security as there is no current fear of solar energy no longer being viable.

The business-to-business model allows ARED's partners access to training on digital literacy to assist their customers in accessing service through Wi-Fi. Partners are located in zones with lower electrification rates, offering wealth-generating services, including employment, to those most vulnerable.

### Future opportunities for enhancing inclusion

To strengthen ARED's alignment with Pillar Three, ARED's expansion could be furthered through a business-to-government model on top of their B2B model. An inclusive economy requires investments for future generations including R&D and sustainable public infrastructure. By exploring a business-to-government model, ARED can offer their specialised knowledge on electrification towards building sustainable public infrastructure in rural areas. In countries such as Rwanda this could act in congruence with their transformed eGovernment services.<sup>25</sup> In other countries with a larger energy infrastructure deficit, like Burkina Faso, a nation with one of the lowest electrification rates, ARED can take a leadership role in R&D and implementation.<sup>26</sup>



3.0

# Looking forward



### 3.1 Future opportunities

Since ARED's founding, they have evolved to keep up with the needs of the communities they serve. From the early days as a simple charging station, to providing Wi-Fi and hosting third-party apps,<sup>27</sup> to providing remote troubleshooting to support franchisees,<sup>28</sup> ARED is always looking one step ahead. As previously mentioned, ARED currently operates in four countries across Africa (Rwanda, Uganda, Burkina Faso and Côte d'Ivoire) and is in the process of expanding into Nigeria and Senegal, with the goal of operating throughout the entire African continent by 2050.<sup>29</sup> There are challenges inherent in this expansion, such as adapting to varying levels of development and diverse tax regimes in different countries.<sup>30</sup> However, the basic technology and business model are designed to be easily adaptable to any situation in Africa.

Another major challenge going forward is the ongoing need to source additional funding from new investors. ARED wants to show the value of African technology and the potential opportunities for both their own business success, as well as growth in the communities that they serve. Founder and CEO Henri Nyakarundi has stated that he wants investment partners and international organisations to see the greater impact of working with local entrepreneurs compared to governments.<sup>31</sup> Developing these relationships directly with investors will be key to the success of this project going forward.

ARED serves as a model for how equitable growth and connectivity are possible in low-income countries that lack the infrastructure that is taken for granted in more developed parts of the world. Projects like these will help ensure African people have equitable access to the technology needed to stay connected and prosper in our increasingly digital world, while ensuring efficient use of resources that will protect our planet for its current inhabitants and generations to come.



### 3.2 References

1. "The World Bank in Africa," The World Bank, June 2, 2021, <https://www.worldbank.org/en/region/afr/overview>.
2. Ibid.
3. Ibid.
4. Ibid.
5. "Who we are," ARED, accessed October 30, 2021, <http://www.a-r-e-d.com>.
6. "Our Presence," ARED.
7. "Challenges," ARED.
8. Ibid.
9. Ibid.
10. "Who we are," ARED.
11. "Our Deep Tech Solutions," ARED.
12. Ibid.
13. Ibid.
14. Ibid.
15. World Population Review. "Unemployment By Country 2021" World Population Review. <https://worldpopulationreview.com/countryrankings/unemployment-by-country>.
16. Al Jazeera. "Innovate Africa - ARED Solar Kiosks" YouTube video. 7:31. March 11, 2012. <https://www.youtube.com/watch?v=gsX9Ycdzaeg&t=4s>.
17. Brun, Viviana. 2021. "Meet Henri Nyakarundi, The Winner Of The "ICT For Social Good" Grant - Ong 2.0 EN". Ong 2.0 EN. <https://www.ong2zero.org/en/blog/meet-henri-nyakarundi/>.
18. "Solutions," ARED.
19. "Challenges," ARED.
20. "Mobile Solar Kiosk." Empowering People Network. May 25, 2021. Accessed November 1, 2021. <https://empowering-peoplenetwork.siemens-stiftung.org/solutions/mobile-solar-kiosk/>.
21. "Challenges," ARED
22. "Charged with a idea to make a fortune." Forbes Africa. 2016. <https://www.forbesafrica.com/cover-story/2015/09/01/chargedidea-make-fortune/>.
23. Kolade, Omoniyi. 2021. "Digitizing Africa's Small and Midsize Businesses". Harvard Business Review. <https://hbr.org/2021/08/digitizing-africas-small-and-midsize-businesses>.
24. Attanasio, Angelo, and Giorgi, Jeronimo. "Internet: Africa starts to open its window to the world". Aljazeera. <https://interactive.aljazeera.com/aje/2016/connecting-africa-mobile-internet-solar/internet-connecting-africa.html>.
25. NEC. "eGovernment in Africa" NEC. February 28, 2020. <https://www.nec.com/en/global/insights/article/2020022516/index.html>.
26. Lingani, Bakary. "Burkina Faso: Plan d'Action National de l'Initiative Energie Durable Pour Tous « SE4ALL »" July 2015. Sustainable Energy for All: Africa Hub. [https://www.se4allafrica.org/fileadmin/uploads/se4all/Documents/Country\\_AAs/Burkina\\_Faso\\_Agenda\\_d%E2%80%99Action\\_de\\_L%E2%80%99initiative\\_Energie\\_Durable\\_Pour\\_Tous.pdf](https://www.se4allafrica.org/fileadmin/uploads/se4all/Documents/Country_AAs/Burkina_Faso_Agenda_d%E2%80%99Action_de_L%E2%80%99initiative_Energie_Durable_Pour_Tous.pdf).
27. CNN Business. "Solar Powered Kiosks Are Charging Phones in Rwanda." September 23, 2019. <https://www.cnn.com/2019/09/23/tech/solar-kiosks-rwanda-intl/index.html>.
28. Rutland Manners, Daniel. "Innovate Africa—ARED Solar Kiosks." Al Jazeera. Video. March 11, 2015. [https://www.youtube.com/watch?v=gsX9Ycdzaeg&ab\\_channel=DanielRutlandManners](https://www.youtube.com/watch?v=gsX9Ycdzaeg&ab_channel=DanielRutlandManners).
29. "Our Presence," ARED.
30. Empower Africa. "How This Entrepreneur Returned to Rwanda for Business Opportunities: The Story of ARED Founder Henri Nyakarundi." Resource Center. Accessed October 30, 2021. <https://www.empowerafrica.com/this-entrepreneur-left-the-us-andreturned-to-rwanda-for-the-business-opportunities-the-story-of-ared-founder-henri-nyakarundi/>.
31. Ibid.



To learn more about Built for All, please visit our website: [www.built4all.org](http://www.built4all.org)

If you are interested in partnering with us to build inclusive economies that serve all people and the planet, get in touch with our team: [inclusive\\_growth@mastercard.com](mailto:inclusive_growth@mastercard.com)



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