

MAKING THE CASE

# Nigeria

Case Studies on Inclusive  
Economic Development



Center for  
Inclusive Growth

MUNK SCHOOL  
OF GLOBAL AFFAIRS  
& PUBLIC POLICY



October, 2022  
Mastercard Center for Inclusive Growth

Marly Augustine, April Geng, Sarah Klein, Grace Liu, Yunxuan Zhang



1.0 Background

1.1 Agriculture and food security in Nigeria ..... 4

1.2 ColdHubs’ cold storage solutions in rural Nigeria ..... 5

2.0 Built for All: Applied

2.1 Pillar One: Equitable access to resources and opportunities ..... 7

2.2 Pillar Two: A level playing field for work and competition ..... 8

2.3 Pillar Three: Collective stewardship of shared resources for future generations..... 9

3.0 References

3.1 Endnotes..... 11

3.2 References ..... 12





1.0

# Background





### 1.1 Agriculture and food security in Nigeria

The largest economy in Africa, Nigeria is a resource-rich, lower middle income country. Despite its resource wealth, Nigeria faces a range of development challenges. Population growth and urbanisation outpace poverty reduction and food production.<sup>1</sup> In 2019, 40% of the population was living below the poverty line.<sup>2</sup> In 2022, Nigeria ranked 107 out of 113 on the Global Food Security Index, faring poorly in terms of food affordability (ranked last at 113th place) and availability (ranking 108th).<sup>3</sup> Some 43% of the population has no access to electricity.<sup>4</sup>

Nigeria is also characterised by high levels of economic inequality. In 2021, the share of personal wealth held by the top 10% of the population was 59%, compared with the 5% held by the bottom 50%.<sup>5</sup> Gender, education levels, region (urban/rural), location (north/south) and sectors of employment contribute to these inequitable outcomes.<sup>6</sup> For example, women and girls are highly represented in buying and selling (44%) and agriculture (39%) and constitute the largest proportion of low-wage earners.<sup>7</sup> Though women represent between 60% and 79% of the rural workforce, they are five times less likely to own land.<sup>8</sup>

Nigeria's agriculture sector is significant to both the country's economic productivity and food security. Agricultural activities make up more than 22% of the country's gross domestic product.<sup>9</sup> More than 80% of Nigeria's farmers are smallholders, and small-scale farms produce 98% of food consumed in Nigeria, excluding wheat.<sup>10</sup> The agricultural sector is characterised by low productivity and inefficiency.<sup>11</sup> Every year, 40% of Nigeria's total food production is lost or wasted; this waste accounts for 31% of the country's land use and 5% of its greenhouse gas emissions.<sup>12</sup> However, the sector's steady growth during the recession in 2020 demonstrates its potential to improve rural livelihoods, boost food security and bolster inclusive economic growth for all.<sup>13</sup>





### 1.2 ColdHubs's cold storage solutions in rural Nigeria

Nigerian journalist and entrepreneur Nnaemeka Ikegwuonu sought to find a solution to the challenges facing smallholders across the country. As an agricultural radio broadcaster, he had frequent engagements with local farmers and learned about the problems in the agricultural sector, with food spoilage as one of the most commonly identified challenges.<sup>14</sup> These discussions ultimately inspired him to establish a robust cold chain system that would not only decrease food waste but also increase accessibility to agricultural markets and reduce farmers' income losses.<sup>15</sup> In 2015, his efforts culminated in the creation of ColdHubs Limited, a social enterprise that provides inexpensive and accessible cold storage facilities to farmers.

The ColdHubs model was built around several key strategies to maximise economic and social impact in Nigeria. It follows a unique pay-as-you-store system that allows even the poorest of farmers access to cold storage options.<sup>16</sup> The affordable price of US\$0.25-\$0.50 per day (compared to the average cold storage facility price of US\$37.50 per day) in tandem with the strategic placement of the units in remote farming clusters and busy marketplaces creates a highly accessible storage solution for rural farmers.<sup>17</sup> In response to both the omnipresent threat of climate change and limited electricity access, the storage facilities are powered by solar panels to reduce its carbon footprint.<sup>18</sup> The company has also integrated gender equality into its model with a primary focus in training and employing women to manage its facilities.<sup>19</sup>

Since ColdHubs's establishment, the company has established 54 cold storage units, serving 5,250 farmers in 22 states across Nigeria.<sup>20</sup> Its impact is growing and the enterprise currently has set its sights on expanding to other regions in sub-Saharan Africa.<sup>21</sup>





2.0

# Built for All: Applied



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

ColdHubs's model exemplifies Pillar One of the Built for All framework. By offering affordable cold storage, ColdHubs provides Nigerian farmers — especially smallholders — with greater opportunities for prosperity. For example, ColdHubs:

- **Builds economic opportunities and wealth:** By increasing access to cold storage for all farmers, ColdHubs ensures that everyone has pathways to generate wealth, improve economic productivity and explore economic opportunities. ColdHubs's solar-powered walk-in cold rooms extend the shelf life of perishable foods from two to 21 days, allowing farmers to increase their annual income by 50%.<sup>22</sup> ColdHubs's pay-as-you-store model helps farmers who would otherwise be unable to access cold storage solutions to extend the shelf life of their produce, sell more of their harvests and increase household incomes.
- **Supports families and communities:** ColdHubs also promotes social capital by supporting community belonging and household resilience, particularly in rural regions of Nigeria. The cold rooms are designed to operate in the most rural and remote areas; this ensures that the most marginalised farmers have equitable access to cold storage solutions and agricultural markets. In turn, improved connectivity to the country's agricultural markets fosters pathways to build individual and community wealth and strengthens small-scale farmers' sense of belonging and integration.

### Lessons for action

Create solutions that meet communities where they are: ColdHubs's cold rooms address the challenges faced by rural populations and deliver a low-cost and sustainable storage solution for areas with less regular electricity access. The pay-as-you-store model is an effective way for providing smallholder farmers with access to cold storage, especially as individual storage options can be prohibitively expensive.

Start small and leverage public-private partnerships: As of July 2022, ColdHubs had expanded to 54 storage facilities across Nigeria thanks in part to funding and support from public and private actors (e.g., Heifer International, USAID, Microsoft).<sup>23</sup>





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

ColdHubs also contributes toward the values and outcomes under Pillar Two of the Built for All framework as it enables smallholders to become value creators along the agricultural production chain and levels the playing field for farmers who are normally unable to store, preserve and sell their produce. By eliminating some 50% of food loss, ColdHubs has doubled the household incomes of 5,240 small farmers, retailers and wholesalers and brought average monthly earnings up to US\$120.<sup>24</sup> ColdHubs also:

- **Builds capacities to prepare farmers for the future of work:** ColdHubs involves small-scale farmers in its work to design, operate and monitor its cold rooms. Many hubs are managed by local farmers acting as Hub Operators in charge of loading and unloading crates and collecting fees. Moreover, ColdHubs is distinctive for its complimentary, post-harvest management education. These classes provide instruction on cooling, transporting and storing fruits and vegetables.<sup>25</sup> As farmers adopt these best practices, they become more competitive in the local market. In short, ColdHubs makes local food markets more inclusive and competitive by building the capabilities of small-scale farmers.
- **Invests in women workers:** ColdHubs has been creating jobs for local women by recruiting women employees at ColdHubs stations. In a country where around 35% of all employment is in agriculture and women face significant challenges in accessing quality jobs, these new opportunities improve rural women's livelihood prospects.<sup>26</sup> By 2021, ColdHubs had created 66 new jobs for women by recruiting and training them to work as Hub Operators and Market Managers in markets and farm clusters.<sup>27</sup> Many of these women have become change agents in their households and communities.<sup>28</sup>

### Opportunities for enhancing inclusion

In an inclusive economy, everyone has the training necessary to thrive at work and capital is circulating and used productively. To enhance the programme's alignment with Pillar Two, ColdHubs could examine how to build partnerships with other actors along the supply chain (e.g., banks, distributors or retailers) to offer skills training, support access to capital and enhance business development for all rural workers.





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

ColdHubs's innovation epitomises long-term thinking by promoting the use of renewable energy sources and strengthening agricultural supply chains and food security. More specifically, ColdHubs:

- **Uses renewable energy sources to lessen the effects of climate change:** A key strength of ColdHubs's model is its reliance on renewable energy sources that mitigate climate change effects and offer low-cost energy solutions. The business model is self-sustaining and aligns with the Sustainable Development Goal 7 of providing affordable and clean energy to all.<sup>29</sup> ColdHubs harnesses solar energy generated from solar panels to refrigerate its cold rooms. By 2020, ColdHubs refrained from generating more than 1 million kilograms of carbon dioxide, which would have been emitted by the burning of fossil fuels to refrigerate conventional cold rooms.<sup>30</sup>
- **Reduces food wastage and improves local food security:** ColdHubs's approach not only keeps food fresh and healthy but also reduces food spoilage. In 2019, the ColdHubs rooms saved over 20,000 tonnes of food from spoiling because of its provision of proper cold storage services.<sup>31</sup> Wasting less food is beneficial to the environment because it reduces greenhouse gas emissions produced from transporting waste food to landfills as well as from food incineration and decomposition. In addition, Nigeria faces significant challenges to ensuring food security. Increasing supply improves food availability and affordability, strengthens purchasing power and fosters community well-being.

### Opportunities for enhancing inclusion

Nigeria faces challenges in ensuring electricity access particularly in rural parts of the country. As ColdHubs's operating model successfully harnesses solar energy solutions, the enterprise could partner with local and complementary businesses to boost the proportion of renewable energy users. As it continues to expand across Nigeria and the region, ColdHubs could champion renewable cooling technology to local enterprises, supporting businesses to consider short- and long-term stakeholder interests, accelerate renewable energy adoption and improve community access to clean and healthy ecosystems.





3.0

# References





### 3.1 Endnotes

1. The World Bank, 2022; Mghenyi et al., 2021.
2. Figure excludes Borno. National Bureau of Statistics, 2020.
3. Economist Impact, 2022.
4. Joseph-Raji et al., 2021.
5. World Inequality Database, 2021.
6. National Bureau of Statistics, 2020; Mayah et al., 2017.
7. Adeosun and Owolabi, 2021; Mayah et al., 2017.
8. Mayah et al., 2017.
9. National Bureau of Statistics, 2021.
10. Mgbenka et al., 2015.
11. Mgbenka et al., 2015; Mghenyi et al., 2021.
12. The World Bank, 2020.
13. Mgbenka et al. (2015); Mghenyi et al., 2021.
14. 'ColdHubs: Solar cold rooms to preserve and store all perishables', 2016.
15. 'ColdHubs: Solar cold rooms to preserve and store all perishables', 2016.
16. Taylor, 2020.
17. Taylor, 2020; Cairns, 2021; Climate and Clean Air Coalition, 2018.
18. ColdHubs 2021 Data Impact, 2021.
19. ColdHubs 2021 Data Impact, 2021.
20. ColdHubs, 2022.
21. Food Planet Prize, 2021.
22. ColdHubs, 2022.
23. ColdHubs, 2022.
24. Cairns, 2021; ColdHubs, 2021.
25. Food Planet Prize, 2021.
26. Cairns, 2021.
27. Cairns, 2021.
28. Cairns, 2021.
29. Engineering for Change, n.d.
30. Ventures Africa, 2021.
31. Taylor, 2020.



### 3.2 References

- Adeosun, O. T., & Owolabi, K. E. (2021). Gender inequality: Determinants and outcomes in Nigeria. *Journal of Business and Socio-Economic Development*, 1(2), 165–181. <https://doi.org/10.1108/jbsed-01-2021-0007>.
- Ayre, K.-L., & Orozco, M. G. (2022, May 31). Why we invested: ColdHubs is decreasing food spoilage by reducing barriers to cold storage access. BFA Global. <https://bfaglobal.com/catalyst-fund/insights/why-we-invested-coldhubs/>.
- Bonjour Idée. (2016). ColdHubs: Solar cold rooms to preserve and store all perishables. Retrieved October 27, 2022, from <https://www.bonjouridee.com/en/coldhubs/>.
- Cairns, R. (2021, September 23). ColdHubs: How solar-powered cold storage is reducing food waste in Nigeria. CNN. <https://www.cnn.com/2021/09/23/africa/coldhubs-nigeria-food-supply-chain-hnk-spc-intl/index.html>.
- Climate & Clean Air Coalition. (2018). 2018 Climate and Clean Air Awards Finalist. United Nations Environment Programme. <https://www.ccacoalition.org/en/content/coldhubs-ltd>.
- ColdHubs. (2021, January 21). ColdHubs's 2020 in Numbers. Retrieved October 27, 2022, from <https://www.coldhubs.com/coldhubnews/2021/1/30/coldhubss-2020-in-numbers>.
- ColdHubs. (2022, February 26). 2021 in Numbers: ColdHubs Impact Data and foundation for 2022. Retrieved October 27, 2022, from <https://www.coldhubs.com/coldhubnews/2022/2/26/2021-in-numbers-coldhubs-impact-data-and-foundation-for-2022>.
- Economist Impact. (2022, September 20). Global Food Security Index 2022. Retrieved October 22, 2022, from <https://impact.economist.com/sustainability/project/food-security-index/explore-countries/nigeria>.
- Engineering For Change. (n.d.). Cold Hubs: Co-engineered by ColdHubs and The German Society of Refrigeration and Air Conditioning. Retrieved October 29, 2022, from <https://www.engineeringforchange.org/solutions/product/cold-hubs/>.
- Food Planet Prize. (2021). ColdHubs—A cool new way to tackle food loss. The Curt Bergfors Foundation. Retrieved October 30, 2022, from <https://foodplanetprize.org/initiatives/coldhubs-a-cool-new-way-to-tackle-food-loss/>.
- Joseph-Raji, G., Saldarriaga, M.A., & Hernandez Ore, M.A. (2021). Resilience through Reforms (English). Nigeria Development Update, Washington, D.C.: World Bank Group. <http://documents.worldbank.org/curated/en/389281623682704986/Resilience-through-Reforms>.
- Mayah, E., Mariotti, C., Mere, E. & Okwudili Odo, C. (2017). Inequality in Nigeria: Exploring the Drivers. Oxfam International. [https://oi-files-d8-prod.s3.eu-west-2.amazonaws.com/s3fs-public/file\\_attachments/cr-inequality-in-nigeria-170517-en.pdf](https://oi-files-d8-prod.s3.eu-west-2.amazonaws.com/s3fs-public/file_attachments/cr-inequality-in-nigeria-170517-en.pdf).
- Mgbenka, R. N., Mbah, E. N., & Ezeano, C. I. (2015). A review of smallholder farming in Nigeria: Need for transformation. *International Journal of Agricultural Extension and Rural Development Studies*, 5(2), 19–26.
- Mghenyi, E.W., Dankers, C., Thurlow, J., & Anyiro, C. (2021). Nigeria Transforming Agribusiness for Inclusive Recovery, Jobs Creation, and Poverty Reduction: Policy Reforms and Investment Priorities. The World Bank: Washington, DC. <https://openknowledge.worldbank.org/handle/10986/35589>.
- National Bureau of Statistics. (2021). Nigerian Gross Domestic Product Report (Q1 2021). (Issue 21). Retrieved October 22, 2022, from <https://nigerianstat.gov.ng/elibrary/read/1241175>.
- National Bureau of Statistics. (2020). 2019 Poverty and Inequality in Nigeria: Executive Summary. Retrieved October 22, 2022, from <https://nigerianstat.gov.ng/elibrary/read/1092>.
- Taylor, S. (2020). ColdHubs Is Bringing Solar-Powered Cold Storage to Farmers in Nigeria. Food Tank. <https://foodtank.com/news/2020/09/coldhubs-is-bringing-solar-powered-cold-storage-to-farmers-in-nigeria/>.
- Ventures Africa. (2021). COLDHUBS WILL EXPAND INTO NEW MARKETS THANKS TO A \$500,000 GRANT FROM HEIFER INTERNATIONAL. Retrieved October 29, 2022, from <https://venturesafrica.com/coldhubs-will-expand-into-new-markets-thanks-to-a-500000-grant-from-heifer-international/>.
- The World Bank. (2020). Nigeria: Food Smart Country Diagnostic. International Bank for Reconstruction and Development. The World Bank. <https://openknowledge.worldbank.org/bitstream/handle/10986/34522/Nigeria-Food-Smart-Country-Diagnostic.pdf?sequence=1&isAllowed=y>.
- The World Bank. (2022, September 14). Nigeria Overview. The World Bank in Nigeria. Retrieved October 30, 2022, from <https://www.worldbank.org/en/country/nigeria/overview>.
- World Inequality Database (WID). (2021). Nigeria. WID.World. <https://wid.world/country/nigeria/>.





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)



MUNK SCHOOL  
OF GLOBAL AFFAIRS  
& PUBLIC POLICY



DISCLAIMER:

The opinions expressed in this publication are those of the authors. They do not purport to reflect the opinions or views of Mastercard, including the Mastercard Center for Inclusive Growth, the Centre for Public Impact, or the Boston Consulting Group (BCG).

The presentation is intended solely for informational purposes and not as investment advice or recommendations for any particular action or investment and should not be relied upon, in whole or in part, as the basis for decision-making or investment purposes. Mastercard and BCG disclaim all express and implied warranties and assume no responsibility or liability with respect to recipient's use of this report.