

HARNESSING THE POWER OF DATA:

Inclusive Growth and Recovery Challenge Impact Report





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Foreword

It is with tremendous support from the Mastercard Center for Inclusive Growth, The Rockefeller Foundation, and additional support from the Paul Ramsay Foundation that data.org funded nine breakthrough ideas over the past two years — ideas so transformative that they have already made a tangible impact on communities around the globe, helping them remain resilient amid the backdrop of a devastating global pandemic.

In fact, five of the Inclusive Growth and Recovery Challenge awardees have already expanded to new countries and more than \$30.8 million has been raised in direct follow-on funding.

The incredible output of these organizations has bolstered our confidence in the landscape and future of both inclusive growth and data for social impact. We are heartened by the innovative thinking of these leaders to implement programs and policies to lift up all segments of society.

What's more, the awardees have had real influence on their peers within social impact — including data.org. Through this process, we have seen how critical it is to have open tools, global purpose-driven data talent, and cross-sector collaboration. As such, we have tailored and strengthened our programmatic offerings. The Challenge also provided us with some of the first “cases” to show what great looks like in data for social impact.

This is only the beginning of what we hope will be transformative, global, and sustained solutions — solutions that require the ethical application of insights drawn from timely and responsibly sourced data.

data.org is committed to continuing to support, fund, and amplify such visionary — but also practical — projects that fundamentally and positively impact and encourage resilient communities.

This two-year Challenge would not have been possible without our funding partners. Thank you, also, to the volunteer judges and our panel of expert judges who supported our efforts to identify breakthrough applications of data to the field of inclusive growth and recovery. Finally, thank you to DataKind, for their intellectual engagement, hands-on collaboration, and willingness to extract and share insights from the Challenge.

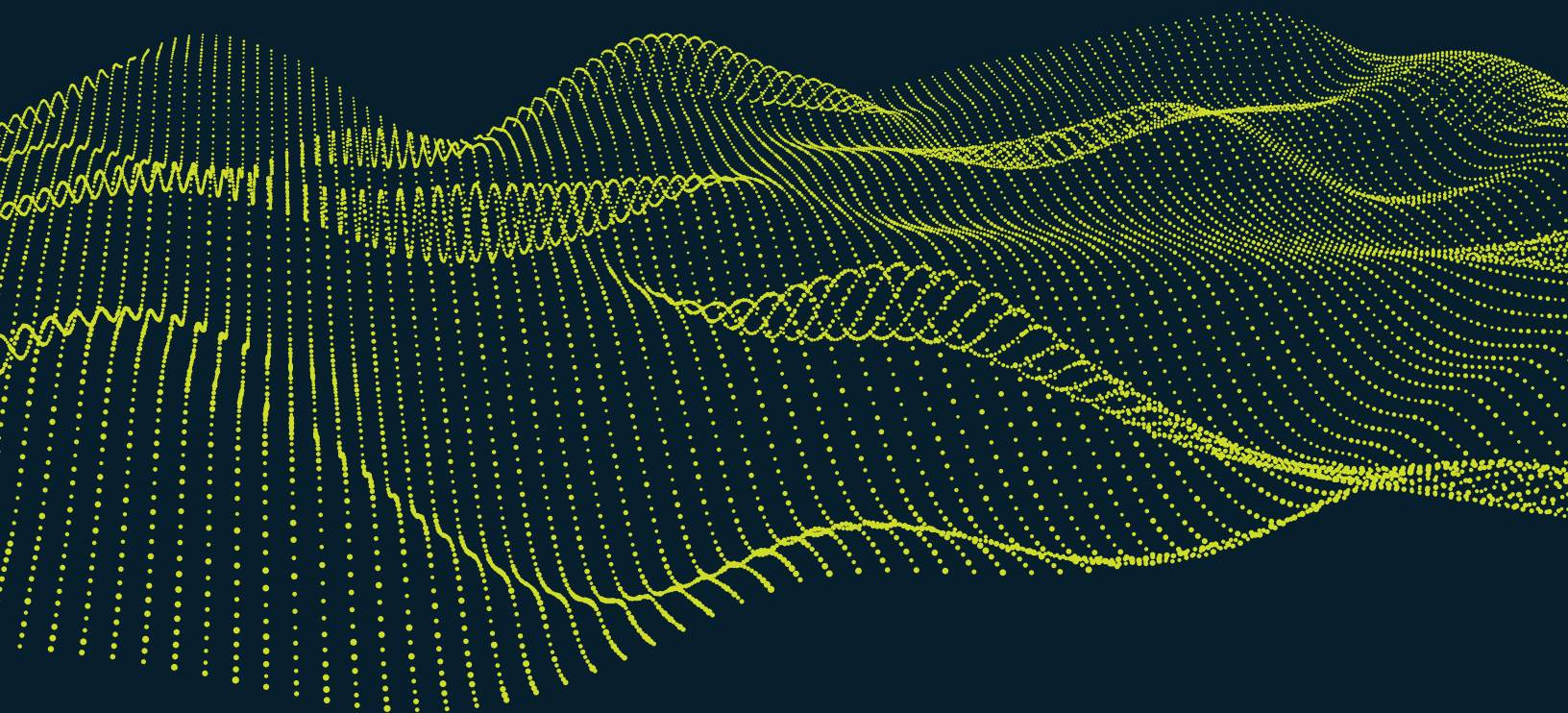
We hope that this report offers actionable insights, but most importantly, provides inspiration and understanding that data for good is changing the world. Let's go faster to achieve even more.

Sincerely,



Danil Mikhailov, Ph.D.
Executive Director
data.org

Overview



About data.org

data.org is accelerating the power of data to solve some of our greatest global challenges.

Launched in 2020 by the Mastercard Center for Inclusive Growth and The Rockefeller Foundation, data.org serves as a platform for partnerships to build the field of data for social impact by widening access to the tools, resources, and talent needed to make sustainable and equitable change.

A global organization, data.org convenes and coordinates across sectors and is committed to supporting and amplifying visionary — but also practical — solutions to drive greater impact, through data.

Inclusive Growth and Recovery Challenge

With generous support from the Mastercard Center for Inclusive Growth and The Rockefeller Foundation, data.org issued an open call in May 2020 for breakthrough ideas that harness the power of data to help people and communities rebound and remain resilient in the wake of COVID-19 and its economic impact.

Through the \$10 Million Inclusive Growth and Recovery Challenge, data.org sought to address a systemic issue: the majority of social initiatives don't have the budget, staff, capacity, or partnerships to take full advantage of our current data revolution. But with support, mission-driven organizations can use data, tools, and methods to make their work go further and faster, helping more people.

Response to the Challenge highlighted growing demand for purpose-driven data projects

Our global outreach yielded 1,263 applications. We received a wide range of proposals at different stages of development — from a budding idea to an established methodology seeking international replication. Applicants rightly recognized that inclusive growth and recovery touches every aspect of how individuals and communities are evolving, and how data-driven and data science centered solutions can be employed creatively and widely. Inclusive growth is not sector-specific, and the breadth of applications shared a diversity of solutions across various areas of the social sector.

The applications also demonstrated the benefit and necessity of partnerships: some organizations are strong on the technical side but don't have social impact expertise, while others have strong social impact experience but lack the technical. Together, and translating across these different competencies, it was clear that organizations have an opportunity to create stronger projects and have more lasting impact through collaboration.

A pool of experts and over 400 volunteer judges, coordinated by technical partner DataKind, evaluated applications based on the Challenge's five principal criteria: their potential impact, replicability, scalability, practicality, and breakthrough ideas.

Projects demonstrate a range of possibilities to use data to drive social impact for workers, entrepreneurs, and communities

After thorough review, we awarded \$10 million in funding and technical assistance across eight exemplary awardees from a pool of over 1,200 applications. The Paul Ramsay Foundation, which is focused on philanthropy in Australia, funded a ninth project. These awardees show the range of opportunities that exist to use data to drive social impact for workers, entrepreneurs, and communities.

1. **Aalborg University, Department of the Built Environment (BUILD)**
Denmark
2. **Basel Agency for Sustainable Energy (BASE)**
India
3. **Community Lattice**
United States of America
4. **Fundación Capital, UX Information Technologies, and Data Elevates**
Mozambique
5. **GiveDirectly and Center for Effective Global Action (CEGA)**
Democratic Republic of the Congo, Malawi, Nigeria, and Togo
6. **Solar Sister**
Kenya, Nigeria, and Tanzania
7. **University of Chicago, Data Science Institute Internet Equity Initiative**
United States of America
8. **Women's World Banking**
Colombia, India, and Mexico
9. **University of Melbourne**
Australia



A BASE cold room and pilot site, set up by Koel Fresh in Keonjhar, Odisha, India.

Over the past two years, data.org and partners worked with awardees, beyond monetary support and fostered an environment in which they could create partnerships and receive technical support, feedback, and expert advice. For this reason, each award was tailored to the specific project, organization, and partnership to ensure the maximum level of support possible.

Awardees implemented breakthrough ideas to harness the power of data to help people and communities thrive

Using data mining and a recommendation algorithm, Fundación Capital armed informal workers in Mozambique with essential labor-market insights to increase income and employment opportunities. Basel Agency for Sustainable Energy used machine learning and physics-based food modeling to give smallholder farmers in India access to sustainable cooling facilities to reduce food loss and improve livelihoods.

In Kenya, Nigeria, and Tanzania, Solar Sister shared market insights with its network of women entrepreneurs to grow their renewable energy businesses. Addressing gender bias in lending algorithms, Women's World Banking developed a bias audit and toolkit to enable financial service providers around the world to increase credit access for low-income female entrepreneurs. Community Lattice created a platform to predict the cost and risk of brownfield redevelopment projects in the US to transform a community's ability to secure redevelopment funding, improve community health, and create economic opportunities.

Using a rich, longitudinal population dataset, Aalborg University created interactive maps for policy-makers and urban planners that identified regions in Denmark that are most vulnerable to out-migration and economic instability. The University of Melbourne supported young people at risk of wage theft while also providing data for regulators, policymakers, and businesses to drive system change.

GiveDirectly and the Center for Effective Global Action combined algorithmic poverty targeting with remote cash transfer technology to create a new model for delivering humanitarian and development aid faster to those who need it most. Lastly, to address the digital divide, the University of Chicago created open-source maps and toolkits to highlight inequities in broadband access and advocate for more equitable policies and investments.

Suzanna Simon and her neighbor, Mary, walking in a Maasai village in northern Tanzania.



There is tremendous potential for these projects to scale to new geographies, as well as inform similar projects across the world.

In fact, as you'll see highlighted in this report, many already have expanded to new countries and received additional funding. And this is only the beginning — these awardees will go even further in the months and years to come, scaling and replicating their solutions around the world. We are heartened by the innovative thinking of these leaders to implement programs and policies to lift up all segments of society. data.org is committed to continuing to support, fund, and amplify such visionary — but also practical — projects that fundamentally and positively impact and encourage resilient communities.

By the Numbers

1,263

applications

400

volunteer Challenge judges

+\$10M

distributed to 9 awardees

22

products launched

12

countries initially impacted through awardee projects

5

projects scaled or replicated in new countries

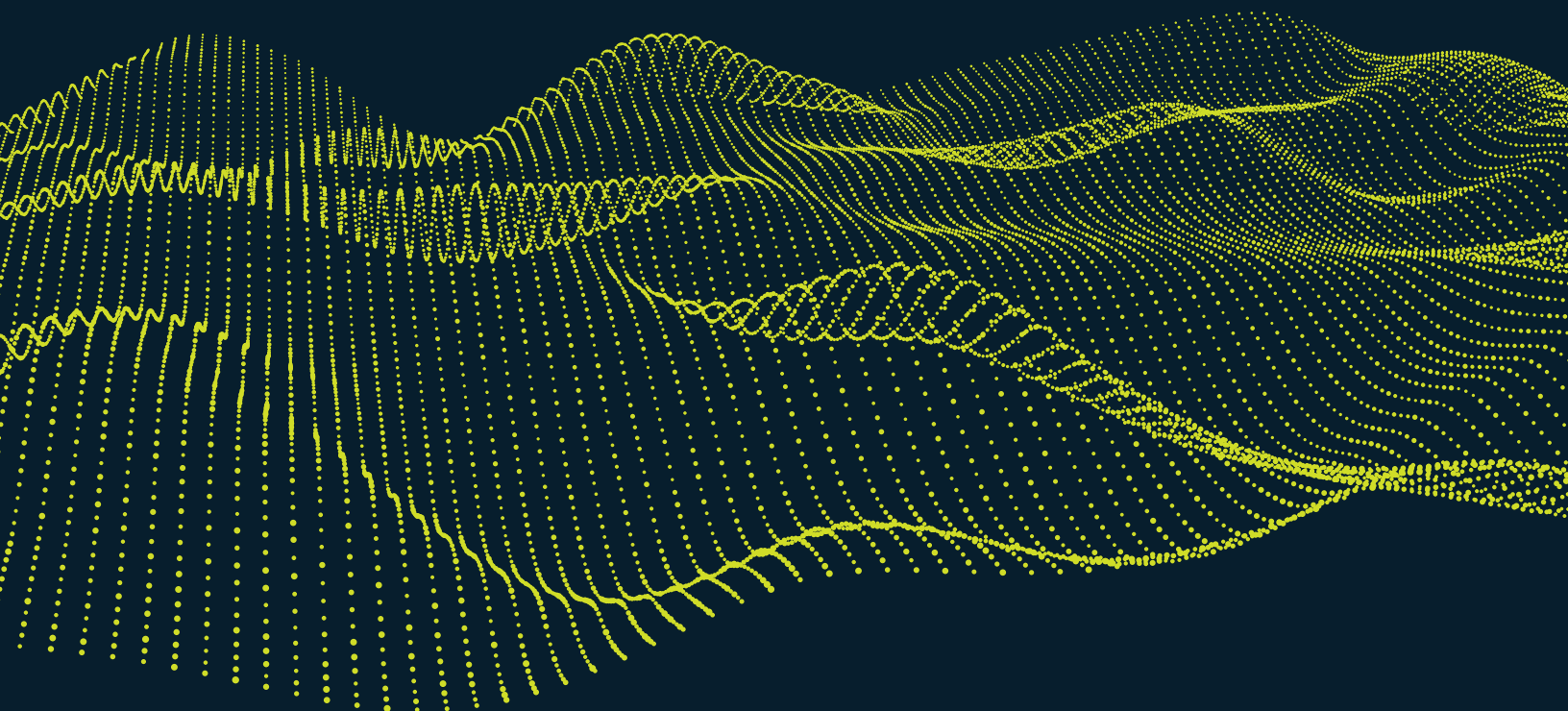
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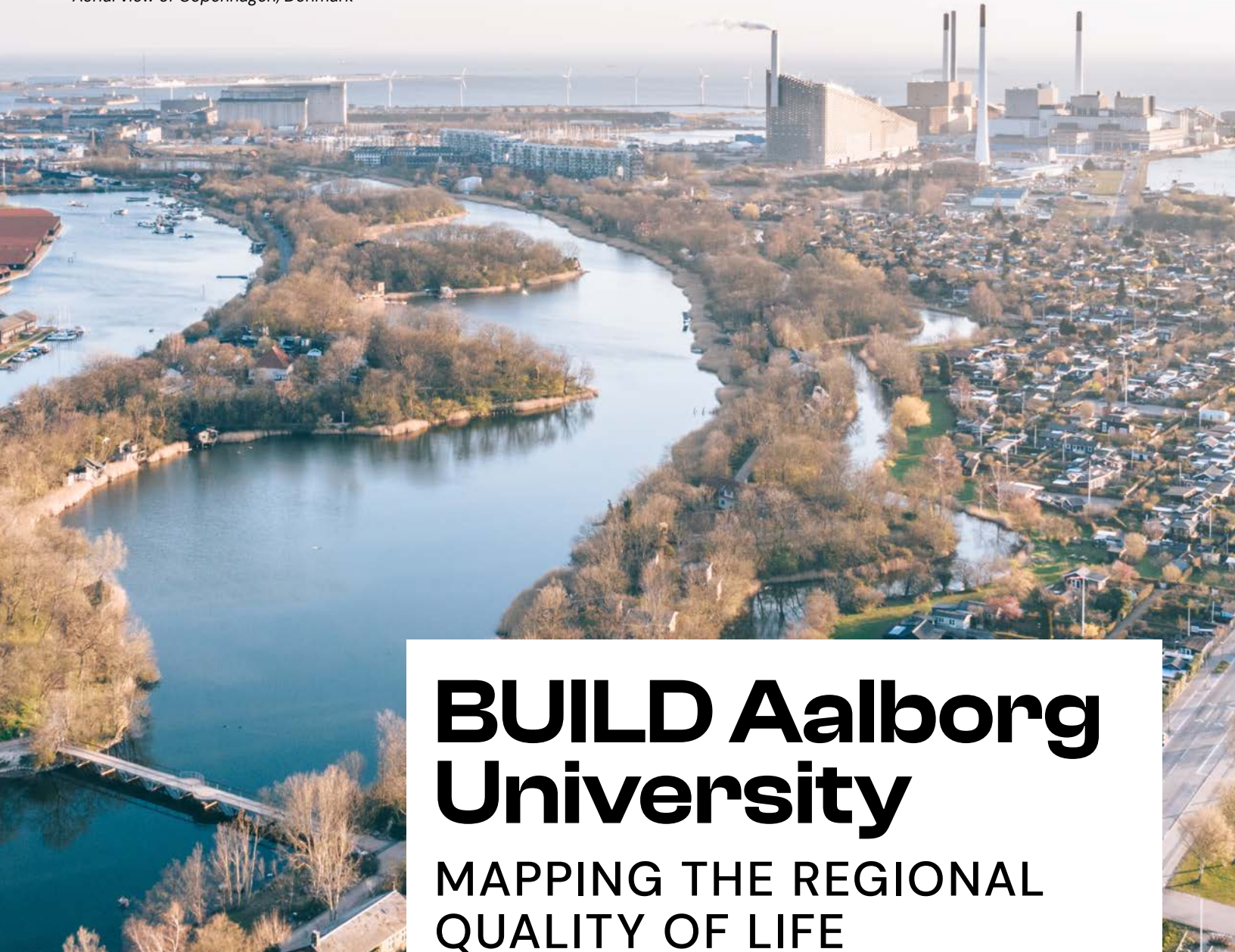
organizations secured additional funding

+\$30.8M

raised in direct follow-on funding

Awardee Achievements





BUILD Aalborg University

MAPPING THE REGIONAL QUALITY OF LIFE

As economic inequality between regions increases across much of Europe and North America, more and more highly-educated young adults are migrating out of underserved communities to large urban areas to pursue education and job opportunities. These persistent patterns of who leaves and who stays behind only serve to further reinforce regional inequity.

BUILD has provided public authorities and decision-makers in Denmark with tools to compare areas and identify those with less local economic opportunity. To spread the use of data-driven insights, they are building an interactive website containing key indicators of economic prosperity in any given area in Denmark. Indicators include housing prices, human capital, local wage levels, transportation, migration rates, and local amenities. The website will feature interactive maps and infographics illustrating the key insights, and give an overview of the regional differences.



Highlights

1. Granular Geospatial Areas in Denmark

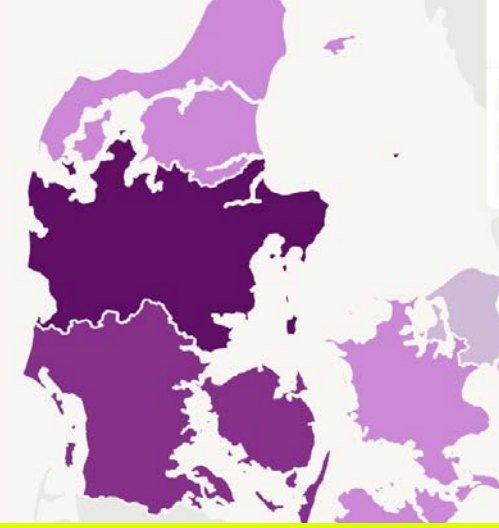
In collaboration with Data Clinic (Two Sigma), BUILD developed an open-source method to create homogenous residential areas in Denmark, which does not currently exist. These areas are critical toward understanding and analyzing local developments over time.

2. Promotion of Data-Driven Insights in Regional Planning

BUILD organized and aggregated population data on core quality of life indicators, which include housing prices, education levels, local wage levels, access to education, migration rate, and labor market status. The data has been collected over a 30-year period (from 1990–2021), allowing for the evaluation of past and future political initiatives at the local and regional level. The processed data and geospatial areas themselves will also become open-source, enabling researchers and other interested parties to be able to do their own analyses and further aggregate geographies.

3. Interactive Website on Economic Prosperity

In 2023, BUILD will launch a website on which the public can compare each area's development across a 30-year period. The website will feature interactive maps and graphs illustrating key insights and supplying an overview of regional differences, empowering all key stakeholders to use it as part of their decision-making process.



IMPACT

BUILD's aggregated population data, representing 30 years of quality of life indicators, is now available and being used in collaboration with an urban research and design consulting firm to impact the development of a new residential neighborhood in Copenhagen.

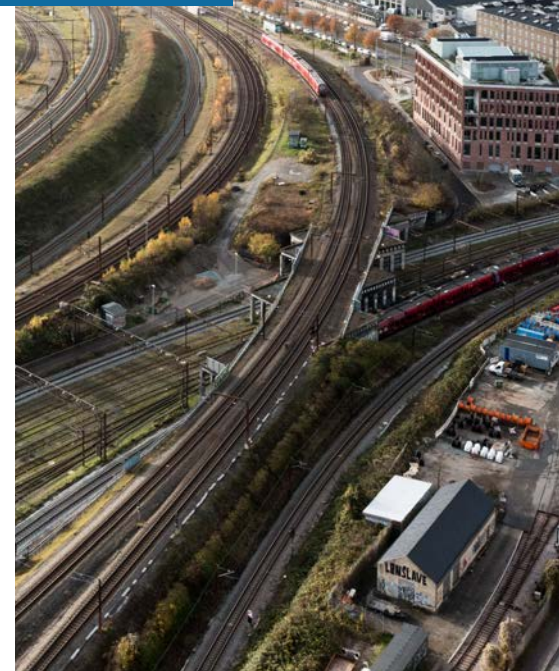
“The Challenge has given us a unique opportunity to propel our use of open-source solutions in data-driven decision-making for public benefit in Denmark, making population data and actionable insights available to community organizations, decision-makers, researchers, and the general public.”

Sixten Maximillian Thestrup, Postdoctoral Researcher at Aalborg University



Looking Ahead

BUILD has secured five years of additional funding from Realdania, a Danish philanthropic association with almost 175,000 members. The funding will secure future maintenance of the webpage, increase public awareness, and serve as the basis for future analyses about quality of life following the COVID-19 pandemic. Additionally, BUILD has secured funding from Splunk to further support their work.



A cold room operator at one of the BASE pilot sites set up by Oorja in Muzzarfapur, Bihar, India.



Basel Agency for Sustainable Energy (BASE)

YOUR VIRTUAL COLD CHAIN ASSISTANT

As one of the world's largest food producers, India wastes about 25–35 percent of its food due to a lack of proper refrigeration and other supply chain bottlenecks. Only six percent of the food produced in India currently moves through the cold chain, compared to about 60 percent in developed countries.

To increase the percentage of food supplies saved and support smallholder farmers who make up the bulk of India's hungry and poor, BASE and the Swiss Federal Laboratories for Materials Science and Technology (Empa) created Coldtivate, an open access, data science-based mobile application that uses machine learning and physics-based food modeling. Your Virtual Cold-Chain Assistant enables smallholder farmers to access clean and efficient cooling, easy to access pre- and post-harvest expertise, and market intelligence serviced by another BASE initiative: Cooling-as-a-Service.



energy-base.org

Highlights

1. Mobile App Launch

Designed and launched the Coldtivate mobile application with local partners in three pilot regions in India, helping to reduce post-harvest loss for smallholder farmers by leveraging pay-per-use decentralized cold storage and data-driven post-harvest intelligence for food preservation and digital inventory management. Coldtivate enables tracking the shelf-life of produce in real-time and provides a knowledge hub for sharing of information on post-harvest handling and storage.

2. Interactive Multi-layered Data Map

Homogenized the open-sourced data collected in the project (census, climate, market prices, cropland maps) into a geospatial format for better visualization on a single map via Google Earth Engine, available on the project website yourvcca.org. This application upcycles already available open-source data and empowers technology providers to make informed decisions to serve more farmers and expand their business. For example, data layers about shelf-life provide insights into different crops and suitable locations to install new cold rooms.

3. Capacity Bridging and Increased Awareness

Conducted in-person training sessions with more than 300 farmers during field trips; surveyed over 800 farmers and traders; and developed a comprehensive interdisciplinary capacity-bridging toolkit for operators and cooling users. The toolkit is being transferred into creative formats using simple language to make them accessible to farmers, such as comic strips and videos, in addition to being accessible via the Coldtivate app.



IMPACT

Preliminary data already shows farmers using the cold rooms reduce their food loss by 20 percent and increase the selling price of their produce by 15 percent, all while reducing greenhouse gas emissions and improving food security.

“This opportunity gave us the resources to mobilize a highly interdisciplinary team to tackle post-harvest food loss. Not only have we successfully developed and rolled out the solution, but the team also acquired the skills and knowledge to strengthen our capacity as a not-for-profit and a research organization working to shape a more sustainable world.”

Thomas Motmans, former Project Lead and Senior Sustainable Energy Finance Specialist at BASE

Looking Ahead

BASE secured additional funding from the German Federal Ministry for Economic Cooperation and Development, launching replication of the solution in Nigeria in collaboration with ColdHubs, a cold storage provider based in Nigeria. BASE also launched the “Your Virtual Cold Chain Assistant Incubator” to train five additional companies around the world to adopt the solution.





Community Lattice

ENVIRONMENTAL RISK MODEL FOR REVITALIZATION

Rehabilitating underutilized properties in disadvantaged communities — disproportionately home to low-income persons and minorities — can stimulate economic growth and quality of life improvements. But with the potential high cost and liability for cleanup due to known or unknown environmental conditions, these properties (known as “brownfields”) can deter investment and exacerbate a neighborhood’s decay.

Utilizing the 25-years of historical brownfields clean-up data in the US with environmental records and economic data, Community Lattice created two tools to understand environmental uncertainty and financial risk associated with brownfields redevelopment. By understanding potential cost and risk of brownfield redevelopment projects using machine learning methods, they are working to transform a community’s ability to secure redevelopment funding, improve community health, and create economic opportunities.



Highlights

1. Promotion of Platform for Exploring Environmental Records (PEER)

PEER is an interactive, open-source tool that aggregates and displays publicly-available environmental records in an easy-to-use, accessible way. PEER was launched in March 2022 and immediately gained almost 300 users throughout the United States. With partners at Kansas State University's Technical Assistance to Brownfields (KSU TAB) program, Community Lattice aggressively promoted the tool through a national webinar, at the Tribal Land and Environment Forum, and at the EPA's National Brownfields Training Conferences and has made PEER accessible to thousands of communities.

2. Launch of Analysis of Brownfields Costs (ABC) Tool

In partnership with DataKind, Community Lattice participated in a project to predict cleanup costs of brownfields sites based on the EPA's Assessment, Cleanup, and Redevelopment Exchange System (ACRES) database. Realizing the database did not contain enough data and reporting over time to derive accurate cleanup cost models, Community Lattice created the ABC tool to share cost variables for assessment and cleanup of brownfields, which is used to inform project decisions, budgeting, and fundraising.

3. Influence on Policy and Regulations

As a member of American Society for Testing and Materials (ASTM) International's E50 Committee on Environmental Assessment, Risk Management, and Corrective Action, Community Lattice offers critical insights on the development of consensus-based standards and guidelines based on knowledge gained through the Challenge. This level of influence on ASTM's standards impacts the way federal and state governments create policies, rules, and regulations; professional practices around environmental planning and risk management; and most importantly, the way community needs are analyzed and understood to inform decisions that impact the lives of vulnerable populations.



IMPACT

Since the launch of PEER, local government and nonprofit organizations in Houston, Texas, have adopted the tool into their community and environmental justice projects. As a result, PEER has helped secure over \$2 million in U.S. EPA Brownfields grants awarded to the City of Houston and Houston Land Bank, as well as a \$200,000 EPA Environmental Justice Collaborative Problem-Solving grant for an urban agriculture and climate action pilot project.

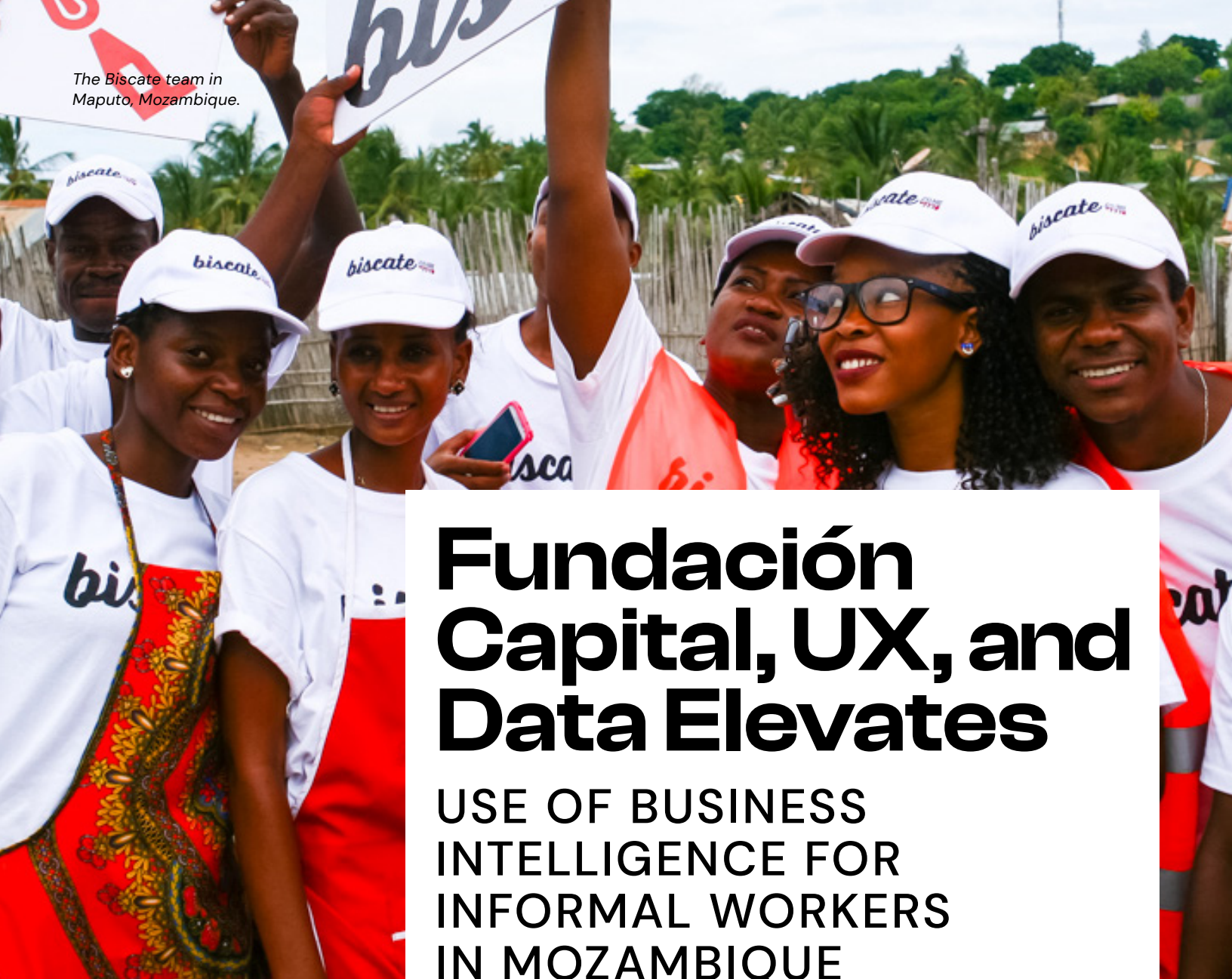
“We have experienced the power of collaborative partnerships to drive social impact and we intend to continue to build this momentum with a focus on data literacy, additional tool development, and capacity building of communities.”

Danielle Getsinger, Co-founder and CEO at Community Lattice

Looking Ahead

Community Lattice was awarded two grants from Splunk totaling \$125,000 to build on their Challenge project with a focus on data literacy, user education, and capacity building to achieve greater levels of inclusivity to bridge the data divide. Community Lattice's project partner, KSU TAB, was also awarded an EPA Exchange Network grant of \$400K in October 2022 to enhance API functionality and integrate PEER and ABC Tools into their publically available Brownfields Inventory Tool (BiT). Community Lattice continues to work with KSU TAB, DataKind, and other collaborative partners to explore opportunities with organizations like Google.org to advance research and tool development for social good.

The Biscate team in Maputo, Mozambique.



Fundación Capital, UX, and Data Elevates

USE OF BUSINESS INTELLIGENCE FOR INFORMAL WORKERS IN MOZAMBIQUE

 **Fundación Capital**

UX



DATAELEVATES

➤ fundacioncapital.org

➤ ux.co.mz

➤ dataelevates.com

In Mozambique, more than 90 percent of all workers are employed in the informal sector — jobs that are neither taxed nor monitored by the government, such as domestic workers, street vendors, or home-based workers. These workers face higher poverty rates, economic insecurity, and fewer opportunities for economic advancement. To increase opportunities for informal workers, UX launched Biscate, a digital job platform where workers can advertise their profession, experience, and location, and potential clients can browse services, contact workers, and leave ratings.

Fundación Capital, UX Information Technologies, and Data Elevates are amplifying Biscate's impact through data mining, visualization techniques, and a data-powered recommendation system to deliver real-time labor market insights directly to informal workers, helping to increase their job opportunities and potential income. These insights, as well as tools that help workers improve their marketing and business management skills, are accessible through Com-Hector, Fundación Capital's virtual assistant on WhatsApp.

Highlights

1. Creation of D4WN Data Warehouse

Data for Workforce Nurturing (D4WN) is a data warehouse developed and deployed to power delivery of data insights back to workers. To do so, an extensive data analysis on Biscate historical data was conducted to glean the insights needed to make the solution more equitable and impactful.

2. Re-design of Algorithms to Address Inequities

When the team discovered inequities in the distribution of job opportunities on Biscate in addition to missed opportunities to improve data quality that impeded value for users, they launched a re-design of the Biscate platform and matching algorithms with a focus on fairness and equity, while still rewarding productive workers. The project strengthened their conviction that data science needs to hold the highest ethical standards because mission-driven organizations have an enormous responsibility to their users. They also set up an Ethics Committee to monitor and give recommendations about actions they implemented to address ethical issues.

3. Launch of Com-Hector Virtual Assistant

Com-Hector takes data from D4WN and delivers it to workers via user-friendly messages to improve their decision-making capacity. As the Challenge evolved, Com-Hector became a toolkit for informal workers, adding features like an automatic CV generator, a price calculator, and more recently, a flier-maker for publicity.



IMPACT

The project was developed based on two key impact indicators: increasing workers' income and increasing women's participation. Both were achieved by the end of the Challenge, with calculations indicating an 8 percent rise in income and women's presence doubling in D4WN.

“The Challenge was a journey of self-discovery fueled by data insights that spurred the need to do more good.”

Tiago Borges Coelho, Co-founder of UX

Looking Ahead

Fundación Capital, UX, and Data Elevates and are focusing on replicating and expanding D4WN to increase opportunities for those in the informal economy. They are considering services like edutech, fintech, insurtech, incubators, social enterprises, and others that could be promoted and even purchased through the solution. With this growth, D4WN will become a product akin to data warehousing, and could serve the organizations across social innovation, data for impact and international development.





GiveDirectly and Center for Effective Global Action (CEGA)

USING DATA SCIENCE TO TARGET CASH TRANSFERS FOR COVID-19 RELIEF

On the road to recovery from COVID-19, many countries lack reliable and up-to-date information about economic conditions on the ground and have no way of collecting it during a pandemic. Traditional aid modalities relying on in-person enrollment and delivery are no longer safe or scalable, with governments and NGOs lacking personnel and relief taking weeks to arrive.

GiveDirectly and the Center for Effective Global Action at UC Berkeley (CEGA), together with Innovations for Poverty Action (IPA), developed a new model for targeting humanitarian support that enables cash transfers to be targeted effectively, accurately, and at scale to those who need them most. The project incorporates new data and computational technologies to identify people and places in economic distress and integrates data from mobile phones, satellite imagery, and traditional surveys.

GiveDirectly



➤ givedirectly.org

➤ cega.berkeley.edu

Highlights

1. Launched GiveDirect–Novissi

CEGA used satellite imagery and call detail records (CDR) data to develop hyper-localized wealth estimates at the canton-level for individual cell phone users in rural Togo. The research team then conducted a phone-based survey of a representative sample of 8,915 cell phone subscribers across the poorest rural cantons, and used this data to train and validate a machine learning algorithm to predict an individual's wealth from their mobile use. The government of Togo then used the algorithm to target individuals living in extreme poverty nationwide. By combining this innovative targeting approach with remote USSD enrollment and instant payments, the Togolese government provided unconditional cash transfers contactlessly to 138,585 of its citizens in most need between December 2020 and April 2021.

2. Shared Methodology and Code Base

Researchers from CEGA and the Innovations for Poverty Action (IPA) published an article about this work in *Nature*, demonstrating that the phone-based targeting methodology helped the government of Togo target COVID aid more effectively than traditional targeting methods through enabling more accurate and rapid identification of the most vulnerable. The phone-based approach improved the precision of the social assistance program targeting by 42 percent relative to a naive geographic targeting of the 100 poorest cantons in Togo. GiveDirectly and CEGA published the targeting methodology behind MobileAid as an open-source codebase so that governments and NGOs can use this new methodology to improve the targeting and delivery of aid.

3. Scaled Model to Other Countries

Using lessons learned from the work in Togo, GiveDirectly launched pilots for remote cash transfer programs (called MobileAid pilots) with additional external funding of \$18.75 million in three new countries: the Democratic Republic of Congo (DRC), Malawi, and Nigeria.



IMPACT

GiveDirectly supported the government of Togo's GiveDirect–Novissi program to deliver emergency cash transfers to almost 140,000 individuals in poverty nationwide and the Democratic Republic of Congo's STEP-KIN program to deliver emergency cash transfers to around 50,000 individuals in vulnerable neighborhoods of Kinshasa.

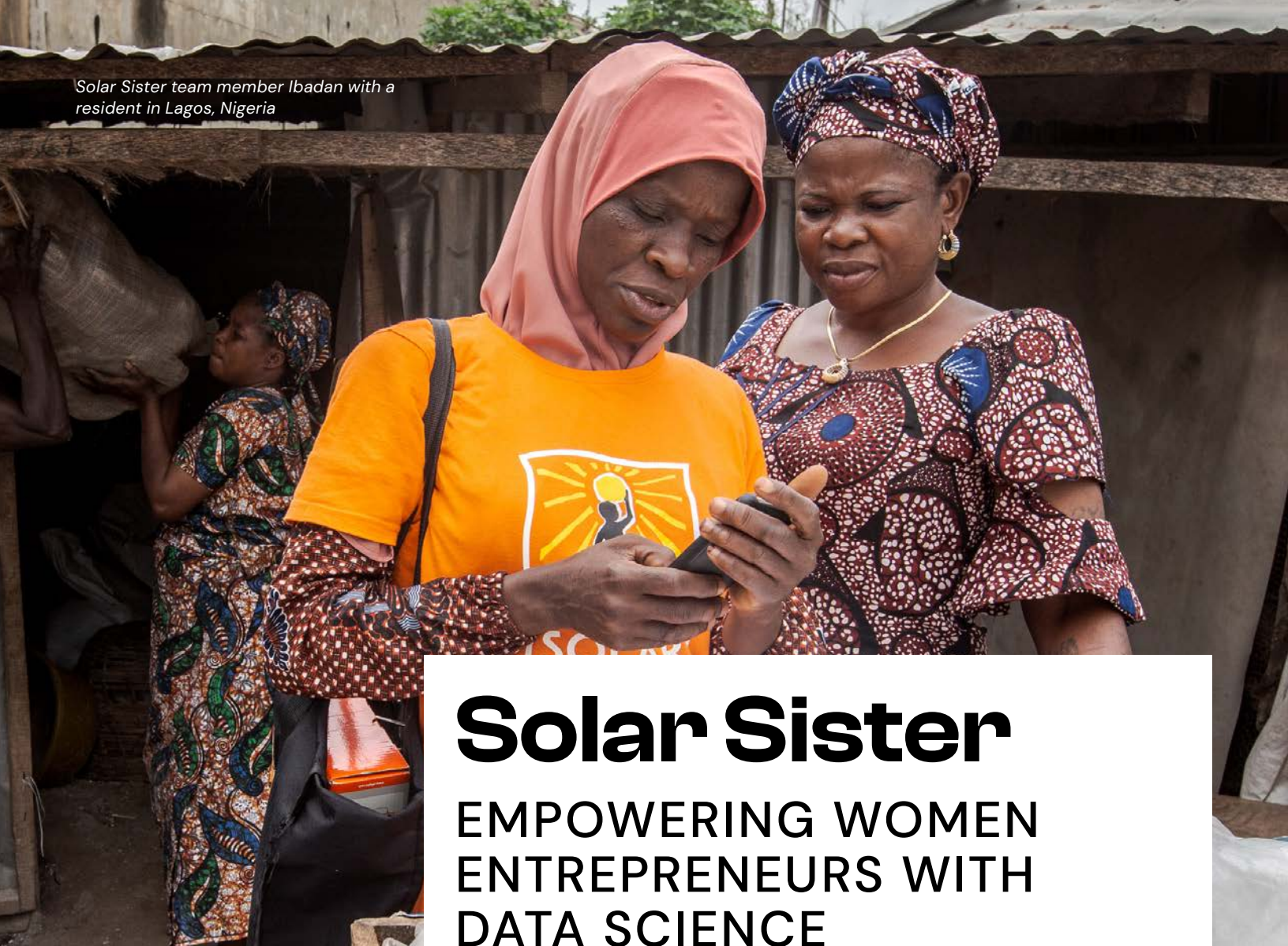
“This Challenge has been transformative for us — with support from data.org, we and the Center for Effective Global Action have developed groundbreaking tools for leveraging phone metadata and machine learning to improve the targeting of aid.”

Vera Lummis, Senior Manager, Innovation at GiveDirectly

Looking Ahead

GiveDirectly is launching additional MobileAid pilots in Bangladesh and Mozambique to set up infrastructure for remote cash delivery based on the model from Togo. GiveDirectly is also working to launch public-private partnerships in multiple countries to enable instant targeting and cash payments to support crisis response and social protection.

Solar Sister team member Ibadan with a resident in Lagos, Nigeria



Solar Sister

EMPOWERING WOMEN ENTREPRENEURS WITH DATA SCIENCE

In sub-Saharan Africa roughly 600 million people lack electricity and 890 million cook with harmful fuels. To address this acute energy poverty, Solar Sister recruits, trains, and supports local women entrepreneurs to deliver clean energy directly to homes in last-mile, underserved African communities.

To further support this network of women and expand their social enterprise, Solar Sister launched Empowering Women Entrepreneurs with Data Science, a collaboration with Fraym. Through this partnership, data scientists at Fraym worked closely with Solar Sister to provide insights on where potential customers and potential entrepreneurs may live. These insights help women entrepreneurs better target their customers, thereby supporting them in sustaining and growing their clean energy businesses. This data also allows the organization to more efficiently and effectively recruit new women who may benefit from the Solar Sister business opportunity.

Leveraging data in this way builds healthy markets for renewable energy by driving innovation and sales, in turn increasing community access to affordable and reliable modern energy, catalyzing socio-economic development, and improving community productivity and livelihood.



➤ solarsister.org

Highlights

1. Finalized Profiles of Entrepreneurs and Customers

Fraym's data analytics, in partnership with Solar Sister's on-the-ground perspective and gender lens, produced new insights on where Solar Sister customers and future entrepreneurs are likely to be concentrated.

2. Fraym Dashboard Launch

Using the recruitment and customer profiles, Fraym built a dashboard allowing Solar Sister to explore the data at multiple geographical levels. The platform has allowed headquarter staff to make more informed decisions about where to focus resources, how to structure programming, and how to better understand beneficiaries.

3. Field Staff Data Training and Deployment

Solar Sister field staff received training on basic data analysis along with their first set of data on potential hotspot recruitment locations. Field staff were empowered to determine which areas to prioritize for recruitment based on their own analysis of the shared data, using newly acquired skills.

4. Solar Sister Entrepreneur Data Delivery

Solar Sister Entrepreneurs received data-based recommendations on ideal customer hotspots via SMS — the first time in Solar Sister history that entrepreneurs gained access to external, data-based information about their communities to help them make decisions about their businesses. Entrepreneurs reported that this helped them learn about new communities to market and sell to that they previously would not have known about or considered.



IMPACT

After receiving data about where future entrepreneurs were likely to be concentrated and training on data analysis techniques, Solar Sister field staff experienced a 25 percent increase in the number of new entrepreneurs they recruited, as compared to the same time period the previous year.

“This Challenge has given Solar Sister access to data that was previously completely untapped. Thanks to the support of data.org and our partnership with Fraym, we are thrilled to have been able to put data into the hands of last-mile clean energy entrepreneurs for the very first time.”

Kathryn Farley, Director of Programs at Solar Sister

Looking Ahead

Fraym has already expanded the dashboard to display profile data for Kenya, where Solar Sister recently expanded operations. This dashboard included additional contextual variables that will allow Solar Sister to make targeted decisions about recruitment of new entrepreneurs and sales to new customers as the work in Kenya scales in the coming years. The next step along the data journey is to further the data literacy of both Solar Sister field staff and the entrepreneurs Solar Sister serves. Their ultimate goal as an organization is to empower more people to use data at every level.





University of Chicago

MAPPING AND MITIGATING THE URBAN DIGITAL DIVIDE

Access to telehealth, professional environments, and education all depend on affordable, high-speed internet access. The COVID-19 pandemic has accelerated and magnified a lack of access and equity to reliable internet, even within the same city. Access refers to whether high-speed internet infrastructure is available where you live, and equity is about whether people can afford to pay for internet, whether they know how to use it effectively, and how well the infrastructure they connect to actually performs.

Finding a systematic way to remove barriers to access and equity is at the center of the University of Chicago's pursuit of mapping — and ultimately closing — the digital divide. The University of Chicago Data Science Institute Internet Equity Initiative team took hyper-local decisions and used them to inform an open-source toolkit and public maps and dashboards for cities and states nationwide.



➤ internetequity.uchicago.edu

Highlights

1. Home Internet Performance Study

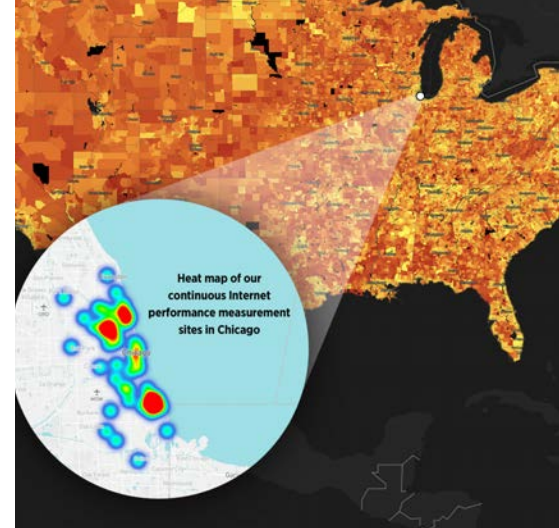
Through a pilot study in Chicago, Internet Equity Initiative (IEI) created the first wide-area deployment of dedicated measurement devices in the country, which continuously collect network performance data at the household level. To date, IEI has deployed over 150 devices across Chicago through the study. The deployment generated a unique dataset on home internet performance containing measurements of upload and download bandwidth, latency, and reliability along with supplemental survey and geographic data, enabling unprecedented comparisons of disparities between neighborhoods. In 2022, the dataset saw a 500-percent increase, growing from 58 GB to 350 GB.

2. Establishment of Community Partnerships

IEI initiated multiple partnerships with community organizations to support their efforts to advance internet equity, including collaboration with the City of Chicago to create and execute a research agenda responsive to the city's most pressing broadband policy needs. They also collaborated with the non-profit organization, the Quilt Corporation, which runs the Chicago Area Broadband Initiative to develop low-cost wireless solutions for the south and west sides of Chicago. Thanks to successful outreach, the team connected with three state broadband offices (Massachusetts, Michigan, and Illinois) and will continue exploring synergies to aid each office with their specific needs.

3. Field Staff Data Training and Deployment

IEI launched a public-facing website and data repository to disseminate information on the initiative's mission and progress; to share new research and insights stemming from the initiative's work; to showcase the national map displaying data on internet adoption, usage, and performance; and to provide access to their unique dataset on home internet performance in Chicago. The website highlights key research findings stemming from the in-home broadband study and the work with community organizations and student groups. The portal received significant local media coverage during the initial launch and continues to serve as a useful hub for local and national resources for advancing internet equity.



IMPACT

The Internet Equity Initiative, through distribution of its internet measurement toolkit, has generated approximately 1.11 billion unique data points across eleven standard network performance measurements from 139 devices deployed across Chicago from October 2021 to March 2023. The data has been used to validate one local ISP's approach to extending internet infrastructure to underserved communities; expose and fix inaccuracies in commonly used measurement tools, such as, Measurement Lab's NDT7 tool and identify performance gaps between communities in Chicago, Detroit, and beyond to Massachusetts, Michigan, California, and Oregon.

“The public portal, software tools, data, and community resources created by the initiative in the last two years will undoubtedly benefit broadband offices and their partner organizations as we continue to push toward universal digital access and equity.”

Nick Feamster, Neubauer Professor of Computer Science and Faculty Director of Research at the Data Science Institute, University of Chicago

Looking Ahead

IEI worked with important leaders in internet measurement and mapping to promote the use, standardization, and replication of their measurement software, backend infrastructure, and resources for collaborating with communities to collect granular internet performance data. In addition, IEI has begun to leverage the methods, data, and tools flowing from data.org's grant to secure over \$1 million in additional funding to expand the platform into a functional research network testbed. These new funds will be directed toward scaling their deployments from 100 devices to 1000 devices in Chicago over the next couple of years.

Young woman accessing her financial institution through her mobile phone.



Women's World Banking

MAKING DATA WORK FOR WOMEN: INNOVATIVE AI FOR WOMEN'S FINANCIAL INCLUSION

Currently, female entrepreneurs are more likely to get lower loan amounts, higher interest rates, and increased penalties for mistakes, due to out-of-date, gender-biased lending technology and practices. One billion women remain outside the formal financial system today. A solution for this is particularly important in the present climate as emerging markets look to recover from the effects of COVID-19.

To address these issues, Women's World Banking, in partnership with the University of Zurich, explored the implications of artificial intelligence (AI) based modeling and credit scoring on women's financial inclusion in Colombia, India, and Mexico.

With a strategic focus on Women's World Banking's key priority markets, researchers assessed how algorithms in digital credit applications can increase lending to women borrowers, studied the applications of machine learning and AI, and explored the challenges facing digital financial services as a result of COVID-19.



Women's World Banking

➤ [womensworldbanking.org](https://www.womensworldbanking.org)

Highlights

1. Conducted Gender Bias Audits

Using data from financial institutions in three countries — Colombia, India, and Mexico — Women’s World Banking and its partner University of Zurich audited credit processes for gender bias using AI and machine learning techniques alongside other statistical methods. They found two trends: First, “reject inference bias” existed in all three markets, meaning a subset of women rejected for loans should have been granted loans. Second, they found a high risk of future bias in credit assessment in institutions heavily dependent on existing data to “train” algorithms to spot creditworthy applicants. Low representation of women in datasets drove this risk.

2. Developed Open-Source Tools to Evaluate Gender Bias

Recognizing that not every institution has months to spend auditing their risk process for bias, Women’s World Banking and University of Zurich assembled a set of easy-to-understand analytical tools to begin conversations about gender credit bias within financial institutions. Their “Check Your Bias” tool is a six-dimension scorecard for CEOs and data scientists alike to assess how well they make decisions about whether and how to lend to women compared to men. This toolkit includes publicly available code for advanced data analytics to spot bias among rejected applicants.

3. Built a Gender-Fair, Open-Source Algorithm

For the institution with the highest proportion of rejected women customers, they built a gender-fair algorithm to be able to approve new loans for women entrepreneurs. More importantly, they are processing this algorithm for other institutions struggling with similar issues and making them publicly available on GitHub.



IMPACT

Partnering institutions on this project reached 29.2 million low-income customers with financial services, 54 percent of which are women. In addition to direct impact on borrowers, Women’s World Banking focused its efforts on industry-wide advocacy for systemic change. As a result of their work on this project, Women’s World Banking had several advocacy opportunities and participated in closed-door roundtable discussions to underscore the importance of data for social impact in inclusive finance with organizations such as the Aspen Institute, UNSGSA, and the US Department of State.

“Our partnership with data.org has enabled us to think differently about the challenges women face in getting access to credit. Our work focused on solving the self-reinforcing challenges of women’s low data footprint and their lower likelihood of seeking credit, increasing their access and use of credit for their businesses.”

Dr. Sonja Kelly, Director of Research and Advocacy at Women’s World Banking

Looking Ahead

Recognizing that success means scale, Women’s World Banking is packaging all of these tools into a replication toolkit for other financial services providers, alongside publishing a report with lessons-learned and case examples. In the next year, they will be working with at least four financial institutions to implement these tools directly, and will also work to build capacity within financial institutions to address these challenges in-house. They are also pursuing opportunities to use AI to increase women’s access to and use of other products, including savings, insurance, and payments, to close the global gender gap in women’s financial access.



University of Melbourne

A FAIR DAY'S WORK: DETECTING WAGE THEFT WITH DATA

Young workers face an epidemic of underpayment and exploitation, popularly known as wage theft, and are especially vulnerable for reasons that include: a culture of wage theft in industries where young people make up the majority of employees; a lack of awareness of workplace rights; reluctance to complain about exploitation; and lack of resourcing for proactive detection of non-compliance by regulators.

This last point, in turn, makes it difficult for regulators, unions, and other organizations to detect wage theft, let alone address it. Wage theft also impacts business by creating an anti-competitive effect: unscrupulous businesses exploiting workers gain a competitive advantage over businesses who comply with employment laws, which then normalizes wage theft in certain industries.

The University of Melbourne has taken a multi-pronged approach to support young people at risk of wage theft while also providing data for regulators, policymakers, and businesses to drive system change. The project has drawn upon cross-disciplinary expertise in labor law and regulation, digital design, information science, UX design, data analysis, and data ethics to design three interlinked components: the Fair Day's Work portal, a Wage Theft Database, and finally, a Wage Theft Risk Assessment Model.



THE UNIVERSITY OF
MELBOURNE

➤ government.unimelb.edu.au

Highlights

1. Working Towards the Creation of a Wage Theft Database

The University of Melbourne assessed the availability and evaluated the quality of wage theft data in Australia that could be used to develop a wage theft database. The project is about to launch a major survey of young workers to assist in the further development of the database.

2. Investigating the Feasibility of a Wage Theft Risk Assessment Tool

Using the Wage Theft Database and the forthcoming national survey, the project is developing a model to help workers and regulators identify the high-risk areas and businesses where wage theft is more likely.

3. Co-Developing Fair Day's Work Portal

The project has held co-design workshops with young workers to assist in the development of an online portal to support young people to access tailored information about their employment rights; upload data about their employment; and enable wage theft risk assessment and preventive measures. The portal will be particularly aimed at young workers who are among the most vulnerable to wage theft, including employees in industries at high-risk of wage theft, such as the hospitality and retail industries, and industries that employ large numbers of young migrant workers.

IMPACT

As a result of their work on this project, the co-leads Timothy Kariotis and John Howe were invited to join the Australian Government's RegTech Award Compliance Working Group. This group includes representatives of the key employment standards regulators, along with industry participants from digital service provider firms and is exploring ways to use data science to improve business compliance with minimum wages.

“The Challenge has been an exciting opportunity to experiment with data science tools to educate young workers about their employment rights and help prevent wage theft. It has been heartening to see the burgeoning interest in these tools and the interest from young workers.”

Timothy Kariotis, Research Fellow, and John Howe, Director of the Melbourne School of Government and Director of the Centre for Employment and Labour Relations Law at University of Melbourne

Looking Ahead

The project has been accepted into the global GovLab's Solving Public Problems Accelerator, supported by the MacArthur Foundation, which trains participants in equitable innovation skills needed to become more effective and legitimate change makers. The project is launching a national survey in 2023 to develop a new source of data on young people's employment and pay experiences.



data.org

