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Taking Matters Into Their Own Hands: Why Innovation in Community Land Data Collection Matters

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WASHINGTON DC, MARCH 25-29, 2019



Abstract

This paper addresses practical, on-the-ground solutions to bridging the gap between government land systems and undocumented or informally documented communities through case studies of how communities are using community-driven, digital data collection to analyze data for decision-making, advocate for land rights and tenure recognition, and access public services and private sector offerings, such as loans, insurance, and other goods and services. This paper shares data on how putting accessible and appropriate land documentation technologies and training into the hands of local partners and vulnerable communities has transformed and empowered communities left out of the land registry system to collect and use their data strategically. Four case studies are highlighted at the end of this paper to show different uses of land rights data to include, land rights for slum dwellers with Tata Trust and the Odisha government, supply chain transparency with Seed Change, rural community land governance with iCT-F and prevention urban settlement evictions with CMAP.



Catalyzing Innovation

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
WASHINGTON DC, MARCH 25-29, 2019



Key Words: data, technology, land rights

Left Out

Effective land registries and cadastral systems that reach most of a country's people in emerging economies are few and far between. By some estimates, 70 percent of the world's population lives without securely documented land and resource rights.¹ This leaves them highly vulnerable to land disputes, land grabs, illegal extraction of natural resources, and the effects of unchecked development and climate change.

The lack of data and information on land rights, property boundaries, and infrastructure is a constraint, not only to economic development and growth, but also to household- and community-level decision-making, including investments in properties, farms, and businesses. Lack of tenure security is a strong disincentive

¹ The Application of Geospatial Information: Land Administration and Management. United Nations Committee of Experts on Global Geospatial Information Management Version 3.1, 13 July 2015.
http://ggim.un.org/ggim_20171012/docs/meetings/GGIM5/land%20admin%20and%20mngnt%20background%20paper%203.2%20final.pdf



Catalyzing Innovation

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
WASHINGTON DC, MARCH 25-29, 2019



to produce crops or invest in homes, and hinders access to credit.² Conversely, research indicates a direct positive relationship between land rights, bargaining power, and household decision-making, particularly for women.³ Even without formalization of land or property rights, there is a benefit to initial documentation and mapping of a community. Communities can use data for a range of purposes, such as recognition, community planning, and advocacy for formal rights and access to public services, such as water, sanitation, financial services, and other benefits.

As evidenced by the fact that approximately 1.5 billion people feel insecure about their land tenure,⁴ developing country governments are for the most part failing to cost-effectively and equitably document and manage land rights for the most vulnerable people⁵. There are many reasons for this, including inefficient and ineffective formal registry systems, limited number of professional surveyors, antiquated and bureaucratic processes, high transaction costs, bottlenecks created by vested interests, limited access to government offices, and lack of political will. In fact, looking at just one country as an example, Uganda, Cadasta calculated that it would take 1,000 years to document the 15 million unregistered parcels in the country with the current number of surveyors in the land office, based on the legal processes in place at the time.⁶ Regardless of the reasons, vulnerable people and communities find themselves unable to enjoy the benefits—stability, access to services, investment—of more secure land tenure.

The intention of this paper is to share some practical, on-the-ground examples of how organizations and communities around the world are bridging the gap between government land systems and undocumented or informally documented communities by using innovative community-driven digital data collection and mapping tools. The use cases include using data for urban formalization and upgrading; supply chain transparency and certification for smallholder farmers; rural community land rights, improved natural resources governance; and advocacy for recognition and access public services. These examples illustrate

² USAID Landlinks, Roth and McCarthy, Feb. 5, 2014, <https://www.land-links.org/issue-brief/land-tenure-property-rights-and-economic-growth-in-rural-areas/>

³ ADB Economics Working Paper Series, No. 559, Women's Land Title Ownership and Empowerment: Evidence from India, September 2018, pg. 12.

⁴ This number is estimated based on the findings in 15 countries that 1 in 4 people feel insecure about their tenure security. Prindex Comparative Report, October 2018. <https://www.prindex.net/reports/prindex-comparative-report-october-2018/>

⁵ Cadasta uses the term “vulnerable people” broadly to mean those groups of people who are typically excluded, disadvantaged or marginalized based on their economic, environmental, social, or cultural characteristics, and in general, communities of varied socioeconomic strata living without access to basic land rights and other basic services.

⁶ <https://cadasta.org/resources/infographics/surveying-the-landscape-to-reduce-poverty/>



Catalyzing Innovation

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
WASHINGTON DC, MARCH 25-29, 2019



the value and need for more community-driven land and resources documentation, “fit-for-purpose” approaches that accept alternative forms of land data collection, and how these data are informing both local and national decisions around land tenure, investment, and development.

Community-led Efforts

Communities often lack basic knowledge of national land governance systems and laws. Even if they do understand the laws and processes, they are not able to easily access formal land documents. Formal titles issued through government systems are simply out of reach for the majority of people. Even in contexts where governments are beginning to test and accept alternative forms of data for formalization, most communities lack the tools and skills to collect, document, and manage the necessary land information.

Technical skills and tools are only a part of challenge. Another is engaging in legitimate community-based processes that address land claims, mitigate conflict, address gender inequities, and provide workable solutions to land insecurity. Engaging community leaders and residents in a meaningful process of discovery and giving voice to these issues is time-consuming and requires commitment and resources. As a result, informal communities often exist in a precarious data vacuum, invisible to government and private sector service providers, and disempowered to use their voice and power to affirmatively advocate for their own rights.

Despite these barriers to community tenure recognition, community led initiatives to develop maps through participatory processes have long been a part of development initiatives, and in recent years that have been notable efforts to link these bottom up processes to formal tenure systems.⁷ Community-led exercises to produce collectively-drawn paper maps of assets and community features—homes, farms, pastures, water sources, buildings, sanitation facilities, sacred or religious sites, natural resources, disaster-prone areas, and other land uses—provide valuable information and build important social cohesion and social capital.

These community-drawn maps are particularly useful as a tool for negotiation when there are known conflicts, when local planning and development decisions are being made and as large scale land investments begin to occur. And although these processes are effective at mobilizing community buy-in

⁷ See examples from Namati, a Cadasta Foundation partner. namati.org



Catalyzing Innovation

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
WASHINGTON DC, MARCH 25-29, 2019



and decision-making, they are typically inefficient at managing large amounts of data, adapting to shifting dynamics, integrating the data with formal systems, or sharing the data with local authorities and others outside the community.

Data from paper maps cannot be easily accessed, categorized, analyzed, or stored. They provide a snapshot in time but it is difficult to add to or amend the information over time in a way that captures changes and lends itself to decision-making. Paper maps deteriorate over time and are a temporal tool to discuss community issues rather than a real-time record that can be safely accessed and stored. Community mapping efforts are effective mobilizing tools but often lack accuracy for more precise land documentation required for recognition or formalization. These maps lack the ability to effectively visualize, analyze, and communicate priority issues through quality visualization and documentation to local, regional, and national authorities who set standards for land documentation and whose support and services are needed to further community objectives.

Why Innovation, Why Now?

It is time to re-think both top-down government systems and community-based mapping and land documentation strategies. We know the limits of formalized land titling efforts and the massive number of vulnerable people left out of the system compounded by difficulties in maintaining data as citizens forego formal registration of subsequent transactions. We understand the limitations of paper-based efforts to meet the communities' needs to use geospatial and household-level data to defend, protect, and advance their own development objectives in the face of mounting and urgent pressures, like land grabbing, large-scale development, and illegal resource extraction.

Of course, many communities are already using digital tools to collect data and map land and property information. This is not new. Over the last 15-20 years, a panoply of mapping tools has emerged. Some have grown out of local firms and NGOs that have built their own tools, while others have been adopted from existing technology developed for other specific uses. Very often, these tools often do the basic job of digitally documenting community land data. However, they are often not compatible with, or accurate enough for government requirements, lack functionality, have limited data security, do not include imagery or other data layers, are not designed for scale, and don't adhere to standards for land information. Even with fairly high quality mapping tools and imagery, many projects collecting sensitive land data do not



Catalyzing Innovation

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
WASHINGTON DC, MARCH 25-29, 2019



have a stable platform for securely managing, storing, analyzing, and reporting these data. Much of the data get shelved or lost after a project ends, raising concerns about privacy and data landing in the wrong hands.

Other land tenure mapping tools have been developed by donor institutions, such as the FAO, UN Habitat, USAID, and others, which have advanced efforts in certain projects or sectors, such as in the rural setting. It is outside the scope of this paper to assess or compare these tools. However, land mapping is a fragmented space, with a lack of consensus and collaboration that could benefit from dedicated efforts to bring best practices and the most up-to-date and affordable tools to support on-the-ground community needs.

To answer the question of why now, one need only look at the growing concerns of indigenous peoples, environmental scientists, urban planners, sustainable development professionals, and many other community, governmental, and civil society groups around the social, cultural, economic, and environmental pressures on the finite resources of land. Transparency International (TI) stated it this way: “Weak land governance tends to be characterised by low levels of transparency, accountability and the rule of law. Under such a system, land distribution is unequal, tenure is insecure, and natural resources are poorly managed. As a consequence, social stability, investment, broad-based economic growth and sustainable development are undermined.”⁸ TI goes on to say that based on a 2009 study, land agencies are the third most corrupt sector after the police and judiciary. Bringing new technologies into the land sector that promote transparency, community empowerment, equity, and social, cultural, and economic justice is more critical than ever and requires urgent responses.

It is important to note that technology—for mapping or other purposes—should never supplant good community engagement strategies, nor be used as stand-alone tool outside of well-designed development activities. Technology should be used only when it enhances a process or activity, makes it more efficient, provides opportunities for inclusion, speeds up delivery, and helps achieve progress toward stated community goals. As with any tool, community trust, ethical practices, and good development approaches must always take center stage in any data collection effort, particularly with highly sensitive land and household data.

Use Cases on the Value and Use of Community-driven Data

⁸ Transparency International, Working Paper, 04/2011, pg. 3.



Catalyzing Innovation

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
WASHINGTON DC, MARCH 25-29, 2019



If government authorities are the only ones who can issue formal land tenure documents, why focus on community-led data collection? It is increasingly recognized that there is inherent value to land and resource documentation, even when it doesn't always directly to a government issued title.

The short case studies below demonstrate how mapping community rights has advanced the communities' advocacy and development goals, even in cases when a formal document was not issued. Cadasta believes that access to appropriate land documentation technologies and training can contribute to a range of positive outcomes—from community planning to real economic and social transformation.

As Cadasta continues to work with partners to scale up land data collection efforts, some of the key questions the team is asking to assess the value and potential impact of community-led data collection are:

- What is the community's main purpose in collecting the data?
- What type of data will they collect (parcels, hectares, ownership, type of land, demographic information, etc.)?
- How will they use the data and how will it contribute to their ultimate household and community objectives?
- Will the data be shared with other organizations or publically?
- How does technology add value to the process?
- What is the impact of community-led land data documentation in terms of equity, access to services, or other socioeconomic benefits?

Though Cadasta doesn't have all the answers to these questions, some important information is starting to emerge as its tools and services are scaled by partners around the world.

Data for Formalization and Upgrading of Urban Settlements:

Land Rights for Slum Dwellers in Odisha State, India

In August 2017, the Government of Odisha enacted landmark legislation; the “Odisha Land Rights to Slum Dwellers, Act 2017” to enable the identification, securing, and transferring of land rights to slum dwellers in all municipalities and Notified Area Councils (NACs). Odisha is one of the major states of India,



Catalyzing Innovation

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
WASHINGTON DC, MARCH 25-29, 2019



urbanizing at a fast rate. As per the 2011 census, while the total state population growth rate over the past decade was 13.97 percent, it was 26.8 percent for the urban areas. Much of this high urban growth rate is due to the migration of poor people from rural to urban areas in search of better livelihood opportunities, contributing to the growth of informal settlements or “slums.”⁹

This increasing slum population poses high demands on urban local bodies to provide land for housing as well as basic services. Lack of legal land tenure has a detrimental impact on their overall quality of life. Without a certificate of residence, they are barred from getting loans for starting businesses, accessing basic services or finding a formal job.¹⁰ The Act covers 109 towns, more than 2,000 slums and 200,000 households, affecting a population of more than 1,000,000 people. In addition to conferring formal certificates, the government has stated its broader mission of transforming the slums into livable habitats, which will have all essential civic infrastructure, amenities and services.¹¹

Cadasta partnered with Tata Trusts and the Odisha State Government on an innovative project to issue a formal land right document (20-year mortgageable, inheritable occupancy certificate) to community dwellers and set the foundation for longer term infrastructure and services upgrading.

In all stages of project execution, advanced technology added value to enhance accuracy, create transparency in the process, remove discrepancies, reduce the dependency on manual processes, and increase speed of formalization. Mapping was done with the community using imagery from Unmanned Aerial Vehicles (drones). Household level survey data collection was collected by community members using the Cadasta’s platform and digital-based mobile applications. The project was managed through digital networking using WhatsApp among data collectors and project managers.

⁹ As summarized from remarks made by Narayana Gatty, Professor, Azim Premji University during a webinar on this project, *Land Rights for Slum Dwellers in Odisha: Making technology work for the urban poor*, February 14, 2019.

¹⁰ Ibid.

¹¹ Statement by G. Mathi Vathanan, IAS, Principal Secretary, Housing & Urban Development Department, Government of Odisha, Webinar: *Land Rights for Slum Dwellers in Odisha: Making technology work for the urban poor*, February 14, 2019.



Catalyzing Innovation

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
WASHINGTON DC, MARCH 25-29, 2019



As Shishir Dash, Project Lead, Tata Trusts points out, “the project adopted a multi-stakeholder partnership strategy from the beginning.”¹² Each slum community was mobilized to form a Slum Dwellers Association (SDA), if one was not already established in the community. The SDAs drove the entire process, from identification of the slum boundaries to household level data collection, to the issuance of land rights to the beneficiaries. About 27 NGOs partnered on data collection and validation at the field level, using about 600-700 field facilitators. Global partners like Omidyar Network provided funding of drone surveys in 12 districts. Cadasta Foundation provided the tools and training for data collection through its GIS- based mobile application and use of a global platform to store, manage, and visualize the data. The Norman Foster Foundation supported designs for slum upgrading plans under the Odisha Liveable Habitat Mission. Tata Trust provided funding, leadership, and training throughout the project.

National partners like Sparc Pvt Ltd, Transerve Technologies, and Jurong Consultants Pvt Ltd. were brought in for conducting drone surveys of the slums and linking the GIS data. Cadasta trained Tata Trusts and provided tools for the training of over 600-700 field data collectors at the district and regional levels. Training was organized for 2,700 stakeholders to familiarize them with the key aspects of the Act and the implementation process based on learning from an initial pilot with 2,000 households. Tata Trusts team provided leadership and hands-on support. To date, over 103,000 households have been documented in 120 communities. This partnership has resulted in the distribution of 70,000 Certificates of Occupancy with a planned total of 1 million people benefitting from this initiative.

The stakeholders of this project value the baseline data collected and its use to issue land rights through inheritable, mortgageable certificates. Amita Girish Bhide, Professor and Dean, School of Habitat Studies, Tata Institute of Social Sciences, shared that they also place tremendous value on the data collected in order to understand the nature of slums, the relationship between the slum and the people, and the relationship between living and life within the city.¹³ She stated that the other major impact of this project is its use by the communities and government to determine priority programs to upgrade living conditions and foster further economic development and growth.¹⁴

¹² Shishir Dash, Project Lead, Tata Trusts, Webinar: *Land Rights for Slum Dwellers in Odisha: Making technology work for the urban poor*, February 14, 2019.

¹³ Stated by Amita Girish Bhide, Professor and Dean, School of Habitat Studies, Tata Institute of Social Sciences in the February 14, 2019 Webinar.

¹⁴ Ibid.



Catalyzing Innovation

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
WASHINGTON DC, MARCH 25-29, 2019



Data for Supply Chain Transparency and Sustainable Farming Certification:

Seed Change, Kigoma Tanzania

Investment in the palm oil industry has been growing rapidly worldwide, primarily in Southeast Asia, but in recent years, also in Latin America and Africa. It is used locally for cooking oil and by international companies for a wide range of food, cleaning, cosmetic, and other products. However, expansion of oil palm plantations has concerned many environmental, wildlife, conservation, and land and indigenous rights groups worried about unchecked production and the potential negative social, environmental, cultural, and economic impacts.

The Roundtable on Sustainable Palm Oil (RSPO), founded in 2004 by stakeholders across the value chain, has set out to create standards and practices to avoid these negative impacts, including the loss of smallholder, indigenous, and community land rights, which include old growth forests, and other critical resources. According to Abraham Baffoe, Africa regional director at Proforest, an environmental rights and responsible sourcing NGO, “Investment and expansion in palm oil is growing—and growing fast—in Africa. If palm is planned and implemented very well then it has the potential to provide jobs and economic development; but if planning and implementation are poor, it has the potential to create deforestation, loss of habitat, and loss of livelihood in local communities.”¹⁵

In the Kigoma region of Tanzania, more than 30,000 smallholder families farm the trees that produce palm oil. Though Tanzania is not yet a large producer of palm oil, its climate and location are conducive to growing the industry. These smallholder farmers struggle to earn a sustainable living from their businesses and have a number of challenges to overcome, including lack of investment, weak market linkages, and lack of formal recognition of land rights that makes them vulnerable. Of particular concern is the loss of rights over customary lands. The Land Rights Research and Resources Institute, a Tanzanian NGO, recently warned that “one of the biggest and real threats of bio-energy is land grabbing and the resultant displacement of village communities along with shattered livelihoods.”¹⁶

¹⁵ Kelly, Annie. Palm Oil Boom: companies must clean up their act in Africa. The Guardian, Dec. 7, 2016.

<https://www.theguardian.com/sustainable-business/2016/dec/07/palm-oil-africa-deforestation-climate-change-land-rights-private-sector-liberia-cameroon>

¹⁶ Viet, Peter, Brief: Biofuels and Land Use in Tanzania, Focus on Land in Africa, 2019.

<http://www.focusonland.com/fola/en/countries/brief-biofuels-and-land-use-in-tanzania/>



Catalyzing Innovation

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
WASHINGTON DC, MARCH 25-29, 2019



Seed Change, a local non-profit in Tanzania, is working to help these families protect their environment, strengthen their land rights, and increase farmer incomes by capturing price premiums paid for certified sustainable palm oil. Seed Change partnered with Cadasta to take the first step to create a transparent palm oil supply chain that also protects farmers' rights and their environment. Cadasta helped Seed Change develop a tailor-made digital questionnaire collected via mobile devices that documented the farmers' land rights and created an evidence base for their land use and sustainable farming practices. It also collected information about Seed Change's impact in the community and data on farm growth patterns. To date, data collectors, using GPS-enabled smartphones, have gathered data from nearly 500 households.

By documenting each farmer's land rights and gathering other information about farming practices, Seed Change is helping farmers become RSPO-certified. The sustainable practices mandated by the RSPO improve livelihoods for smallholder farmers and help protect the environment for generations to come. In addition, it supports the farmers' land claims, reducing the threat of eviction or displacement. The Managing Director of Seed Change stated, "The data collected through Cadasta's platform is a great resource for our organization. We can see farm changes and growth, compare villages and farms, and better understand the different land use pressures at play. It makes it much easier to know where we should target our work moving forward." The tools help create an evidence base for sustainable farming certification, improve livelihoods, and document a transparent, sustainable palm oil supply chain in an environmentally sustainable way.

Data for Rural Community Land Governance:

Fundação Iniciativa para Terras Comunitárias (iTC-F), Mozambique

In 1997, Mozambique passed a new land law that was aimed to protect the rights of local communities and develop conditions to revive the economy after a 17-year-long civil war. It also established a mechanism, the DUAT, to register and certify a community's or a citizen's right to use land, which is all ultimately owned by the Government of Mozambique. In 2015, the Government of Mozambique adopted the *Terra Segura* Program which lays out the policies and political commitment to improve and expand Mozambique's land administration and management system, strengthen and protect the rights of all land users, and ensure an efficient and effective provision of services to institutions and the citizens at large.¹⁷

¹⁷ World Bank Terra Segura Data Sheet, pg. 5.



Catalyzing Innovation

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
WASHINGTON DC, MARCH 25-29, 2019



The Program sets out an ambitious goal of regularizing 5 million (individual) DUATs and completing the delimitation of 4,000 communities' land (including the issuance of DUAT certificates) by end of 2019. The government of Mozambique has collaborated with other civil society and local organizations to accomplish this goal.

iTC-F is a non-profit Mozambican organization with the mission of complementing the efforts of the Government of Mozambique in implementing the Land Law to protect the rights of rural communities over land and other natural resources and promote economic development through partnerships between communities and the public and private sectors. iTC-F focuses on securing community land rights through the process of community land delimitation, a participatory approach that ends with the registration of community land titles in the national cadaster, and in building land and natural resource governance structures at the community level as a path to improve participatory decision-making and land use planning.

Cadasta partnered with iTC-F with the aim of collecting community data for local and community governance. Since boundary data was already held by the government and accessible to iTC, the community data collected through a participatory mapping approach was used to discuss community land use, access, and resources. For the first time, these small rural villages had data for internal community development, planning, and advocacy. iTC-F has documented 1,200 households in over 60 communities to improve land governance and empower communities to make informed decisions for land-based investments.

The Knowledge Manager of iTC-F explained, "Improving land and natural resources governance at the community level is still a complex challenge in Mozambique. Working with Cadasta and using the Cadasta platform helped us to consolidate our community land delimitation approach, emphasizing the need to deliver community land satellite maps as one of the key tools to complement security of land rights and improve land use planning at the community level."

Data to Prevent Urban Settlement Evictions and Advocate for Land Rights and Services:

CMAP - The Human City Project, Port Harcourt, Nigeria

According to Jeff Forbes, architect and urban planning expert, 480,000 people living in Port Harcourt waterfronts face the threat of demolition by the local authorities. In 2009, over 19,000 people were displaced



Catalyzing Innovation

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
WASHINGTON DC, MARCH 25-29, 2019



due to the forced evictions and demolitions by the government.¹⁸ This resulted in an eruption of violence, led by government security forces. The evicted residents have not seen resettlement plans nor received any form of compensation. The threat of large-scale demolition has the potential to spark an “urbanisation of militancy” in an already vulnerable area and create a large number of internally displaced people.¹⁹

A project led by CMAP called The Human City Project, helps to develop the “strategic and technical capacity of slum communities to participate in the shaping of their city.”²⁰ The two elements of the project are advocacy and community development. The advocacy platform and campaigning gives a voice to waterfront residents to oppose further demolitions and forced evictions. Although advocacy is necessary, residents also want to show that, like the government, they want to develop their communities. CMAP uses a community participatory process that allows residents to demonstrate their desire and capacity for in-situ development, where the good quality features are retained and the bad quality features are removed and replaced.²¹ Mapping capabilities and tools became a critical need for CMAP to understand the needs of waterfront communities for urban planning and development.

In 2017, CMAP invested in six Motorola smartphones and a few computers to collect land-related data in order to produce a cartography of three waterfront communities in Port Harcourt.

About 25 to 30 Chicoco journalists, artists, and others, including about 10 women, volunteered to be mappers for these communities. The data collection methodology used was semi-manual with a team of four people including a Community Liaison Officer, a non-spatial data collector using KoboToolbox, a cartographer reporting the spatial component on a paper map, and an assistant.

Cadasta partnered with CMAP to provide a digital platform and tools and train data collectors, to improve the data collection process. The overall objectives of collecting this data will be to defend their land rights in order to avoid forced evictions and to provide better services to the communities near the waterfront. This collaboration helps improve the data collection and management process and provides a methodology to produce reliable information to better defend the property rights of waterfront communities. Future collaboration plans include working with the Office of the Surveyor General of River State, mapping

¹⁸ Forbes, Jeff. Architect and Urban Planning. January 2012. <https://cargocollective.com/jeffforbes/The-Human-City-Project-Nigeria>

¹⁹ Ibid.

²⁰ Ibid.

²¹ Ibid.



Catalyzing Innovation

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
WASHINGTON DC, MARCH 25-29, 2019



additional communities, and telling the communities' stories as they advocate for recognition, land tenure formalization, and access to services.

Next Steps Toward Advancing Tenure Security Through Community Data Collection

Cadasta is officially launching its new platform with enhanced imagery, capabilities, security, and tools in March 2019. It has plans to significantly expand its work through partners working on the ground in and with communities that can benefit from participatory, community-led land documentation. Cadasta has plans to train a global network of Cadasta Trainers who will train partners on the ground to use the low-cost, high-quality tools and platform. In addition, Cadasta is launching a new Challenge and Innovative Grant Fund to support local community data collection efforts and will be making these funds available through online applications in spring 2019.

As Cadasta grows its partners and users to new use cases and regions of the world, it will continue to share examples of how innovations in community-led land data are advancing both land tenure security as well as broader development objectives. Cadasta's goal is to encourage these innovations and success stories to drive systemic change at the community, district, state, and national levels as countries grapple with how to extend the formalization of land rights to those who need the most protection and have the least access to services and formalization.

Cadasta looks forward to working with a range of partners and invites those interested in using the tools, supporting its mission, or learning about the impact of its work to connect with on its website and through social media at www.cadasta.org/ and @CadastaOrg.

Cadasta Foundation uses innovative technology, services, and advocacy to advance global land and resource rights. Cadasta targets the world's 1.5 billion tenure-insecure people in rural, urban, and peri-urban areas left out of top-down government land registry systems. Cadasta's field-based mobile tools and cloud-based platform allow communities to map and safely store their own property, land, and resource rights data from the ground up. Through partnerships and participatory approaches that encourage the inclusion of women and other marginalized groups, Cadasta enables individuals, organizations, communities, and governments to make data-driven decisions and put communities and their needs on the map.



Catalyzing Innovation

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
WASHINGTON DC, MARCH 25-29, 2019



With support from our donors and over 30 implementing partners, Cadasta has advanced land and property rights for over 1 million vulnerable rural and urban people in 17 countries and continues to expand its tools and services to reach millions more.