

Fit-for-Purpose to Formality: An Analysis of Land Tenure Intervention Applying Fit-for-Purpose Approaches and Leading to Formally Recognized Land Rights

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SUMMARY

With the publication of “Fit-For-Purpose Land Administration” in 2014 as a joint FIG and World Bank Publication, a new era of land administration service delivery began. Initially met with resistance by some land professionals given a perceived relaxation in standards, it has since gained broad acceptance. In the international aid sector, the concept of Fit-For-Purpose (FFP) is seen as having catalyzed and democratized data capture using new technologies, as opposed to eroding data standards. The data capture, and the associated rights, have then been brought into formality for the first time—an initial step along a continuum of land rights.

In recent years, traditional surveying methodologies have been further challenged as a result of COVID-19 restrictions and resulted in the need for an increase of locally led and FFP approaches being used out of necessity for safety. This paper details three recent examples in which Cadasta Foundation and partners employed locally driven FFP approaches leading to formal recognition of land rights in Brazil, Uganda, and India. Particular to note within the paper is the role in which youth, including through the Volunteer Community Surveyor Program (VCSP) and the FIG Young Surveyors Network (YSN) played in supporting or participating in land governance processes.

Each project case study is explored in-depth, detailing the variations and commonalities, based on field observations, data collected, and stakeholder interviews. For each case study, the spatial, institutional, and legal frameworks of the land administration systems will serve as the lens for analysis and comparison. Importantly, input from government agencies responsible for the collection and maintenance of survey data will be gathered with a particular focus on future plans for continued scale-up or cessation of the FFP approaches. These case studies represent two urban use cases (Municipality of Bonito, Brazil and Odisha State, India) and one rural case study (Customary Certificates of Occupancy in Uganda).

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1. INTRODUCTION

In recent years, traditional surveying methodologies have been challenged as a result of COVID-19 restrictions and resulted in the need for an increase of locally led and FFP approaches being used out of necessity for safety. This paper details three recent examples in which Cadasta Foundation and partners employed locally driven FFP approaches leading to formal recognition of land rights in Brazil, Uganda, and India. Particular to note within the paper is the role in which youth, including through the Volunteer Community Surveyor Program (VCSP) and the FIG Young Surveyors Network (YSN) played in supporting or participating in land governance processes.

Each project case study is explored in-depth, detailing the variations and commonalities, based on field observations, data collected, and stakeholder interviews. For each case study, the spatial, institutional, and legal frameworks of the land administration systems will serve as the lens for analysis and comparison. Importantly, input from government agencies responsible for the collection and maintenance of survey data will be gathered with a particular focus on future plans for continued scale-up or cessation of the FFP approaches.

1.1 Fit for Purpose Land Administration | An Overview

Seemingly intuitive, the concept of “fit-for-purpose” land governance is intended to ensure that land administration systems and processes, as defined in the joint FIG and World Bank Publication on Fit-For Purpose Land Administration “be designed to meet the needs of people and their relationship to land, to support security of tenure for all and to sustainably manage land use and natural resources.” In other words, the system should be designed to function as needed for the circumstance. Indeed, field realities and local governance needs often necessitate that fit-for-purpose approaches are taken—with the recognition that the purpose and needs differ between Amsterdam to Zanzibar, to say nothing of variations in needs between urban and rural contexts.

Many jurisdictions around the world have strict standards for cadastral surveys for a variety of reasons: colonial legacies, well-meaning advice from international consultants, and a natural desire for land professionals to strive for the highest accuracy possible. These established standards often meet accuracy requirements that could be applied to the central business district of an advanced economy, as opposed to sparsely populated rural districts in a country in which governments are struggling to deliver basic services. In these contexts, the reality often seen is limited technical capacity, outdated equipment, lack of systems to manage the data, weak enforcement of data standards, and lack of budget to allow for field verification. The result should be hardly surprising, as noted by the authors of Fit-For Purpose Land Administration: “75 percent of the world’s population do not have access to formal systems to register and safeguard their land rights.”

The fit-for-purpose approach, as defined by the joint World Bank/FIG publication, encompasses four core principles:

- General boundaries rather than fixed boundaries;

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- Aerial imagery rather than field surveys;
- Accuracy relates to the purpose rather than technical standards; and
- Opportunities for updating, and improvement along a continuum of data accuracy.

Each of these principles must be addressed in the context of how they align within the land administration system in place; particularly relating to the spatial, legal, and institutional frameworks, while noting differing needs within each framework. In many ways, it could be argued that the spatial framework—that is the basic large-scale mapping at a national level—has been in part solved by the growing ubiquity of, and access to, high-resolution imagery at a relatively low cost, even if the actual process of demarcation has not yet been accomplished. This is further supplemented by the growing ubiquity of low-cost, high-accuracy receivers.

More complex are legal frameworks, oftentimes outdated and perhaps designed more by urban (or colonial) elite with an extractive relationship of the land and resources, as opposed to an equitable system for sustainable national land governance. Updating and passing laws that will support more flexible regulations are a time-consuming, but necessary step impacting how quickly fit-for-purpose applications can be applied.

Most complex are institutional frameworks that require not just reforms of laws and processes within a single organization, but the coordination and integration of diverse government entities, each of which plays a role in the land administration process. These government agencies are often competing for their own resources and influence and building truly sustainable institutional coordination is an ongoing challenge.

This paper will assess each project against the four key principles of FFP land administration in order to analyze how the projects align with each principle, as well as the land administration framework (spatial, legal, and institutional). We will also assess the approaches against existing standard approaches used in adjacent jurisdictions of each project. Ultimately, the paper seeks to assess the overall alignment of each project with fit-for-purpose principles, the overall success or failure of the fit-for-purpose approaches, and common contributing factors for successful/unsuccessful implementation.

It is important to note that these projects were not designed to be “fit-for-purpose;” instead these projects developed organically through the leadership of local organizations working together to address specific needs. Through the realization that only pragmatic approaches applied collaboratively between government and citizens would allow stakeholders to achieve desired outcomes—improved tenure security for citizens and data on land use and occupancy for governments—the foundation for service delivery and governance can be achieved.

2. ISSUANCE OF CUSTOMARY CERTIFICATES OF OCCUPANCY WITH MINISTRY OF LAND, HOUSING AND URBAN DEVELOPMENT OF UGANDA

Security of tenure continues to be a major challenge throughout Uganda. With an estimated 80 % of land in Uganda held under customary tenure, most of Uganda’s land claims rely on traditional arrangements rather than legal documentation according to the Ugandan Ministry of Lands Housing and Urban Development (MLHUD) 2013 land strategy. While this may have historically provided a sense of security, natural population growth compounded by recent

events—including the influx of refugees, the increased presence of extractive industries, and pressures on development and land acquisitions—have resulted in increased land vulnerability.

Uganda was among the first countries in Africa to recognize customary land as a legal category of land with the same privileges and rights as other land ownership. The Land Act of 1998 created provisions for the registration of customary land rights through a number of reforms, such as mandating adjudication of customary land rights to be undertaken at the local level by the area land committee. The Act also introduced the requirement of a sketch map using general boundaries in the place of a fixed survey drawing by a qualified land surveyor. While the Land Act of 1998 enabled the fit-for-purpose land administration approach, it did not expedite the customary land adjudication process.

The District Livelihood Support Program in Uganda supported by the International Fund for Agricultural Development (IFAD) attempted to register customary lands in 13 districts in Uganda subsequent to the passage of the Act. The Act did translate to the final issuance of a Customary Certificate of Ownership (CCO) but faced a number of challenges that slowed down the process leading to the halting of the process, according to *Fit-for-Purpose Land Administration: Country Implementation Strategy for Addressing Uganda's Land Tenure Security Problems* from the journal *Land* in 2021. Due to the participatory nature of the data collection, the process of walking and describing boundaries was tedious and time-consuming, and expensive. The pilots did however serve a role in informing the process, establishing data needs, and in some ways, allowing the technology to catch up with the potential application.

In 2018 and 2019, the Ministry of Lands, Housing, and Urban Development (MLHUD) entered into agreements with NGOs to support documentation of land rights and issuance of Customary Certificates of Ownership. Cadasta Foundation, supported by local NGO Ujaama Tribe, utilized a technology drive participatory approach, empowering the Area Land Committee in mapping and gathering both spatial and attribute data, automating the development of forms and printing of CCOs. Data collection occurred in the Namutumba, Apac, and Agago districts in Uganda in 2021 and 2022, with a total of 4,241 parcels having been collected in less than a year and a total of 745 CCOs generated and issued as of February 2022.

2.1 Alignment with Fit-for-Purpose Principles

The Ugandan MLHUD adopted the ISO Standard Land Administration Domain Model (LADM). Configuring a country profile specifically for the Ugandan context and the National Land Information System (NLIS), ensuring feasibility of data migration from the field to the national system. Cadasta Foundation designed a workflow that entailed using android devices to collect spatial and party information, with staff from sub-county and district offices, along with customary leaders. Boundary delimitation was participatory and included the area land committee, the parcel claimant(s), and adjacent land occupant(s), meeting legal requirements while ensuring the elimination of prolonged boundary disputes amongst parcel owners.

The area land committee members picked boundary points, with the mobile application automatically generating the sketch of the parcel. Youth play a critical role, as the Area Land

Committee enlisted the services of youth volunteers both male and female to support the capturing of the information into the smartphone.

To improve boundary accuracy and to provide context for the viewers, high-resolution aerial imagery provided by the MLHUD was loaded into the mobile application so that field data collection could be visualized in real-time. Data collection did not rely on an internet connection, as the application supported offline data collection. Following data collection, and when connected to the internet, the party and parcel information are then transferred to the Platform where it is reviewed before printing and submitted to the District Land Committee for approval. Upon approval, the CCOs are printed from the Cadasta Platform based on the government prescribed format and template, before signing by the District Land Committee.

Boundary Identification | *General Boundaries* were used in delineating properties, using a participatory approach combined with simple and affordable technical tools for the capture of boundaries by community members. What would be a long process involving sketching the boundary of the land and filling the parcel owner information on a physical form was simplified by using the mobile application to capture all the parcel right holder(s) information, and thereafter picking the coordinates of the parcel to serve as the basis for a sketch map, with the added benefit of it being a georeferenced sketch map. The use of General Boundaries made the participatory mapping process possible, as community members were, for the most part, aware of boundary markers such as trees and bodies of water that serve as historical boundaries

Role of Aerial Imagery | *Aerial Photography*, captured nationally as part of earlier donor support, served as the backbone of data collection. This high-resolution imagery has made available by MLHUD to partner organizations to support field data collection. The specific mixture of tools used in this pilot allowed for the applications to have the imagery loaded onto the device directly, ensuring accessibility of imagery in the field regardless of connectivity.

The imagery also allowed for effective participatory mapping and guided the community boundary validation process in which community members had a right to review and contest any land claims. In the context of the large community-held parcels, or in those communities with many members, the visualization of boundaries on imagery has proven to be the most effective way to validate data efficiently.

Accuracy Requirements | Accuracy requirement for the mapping of customary land rights was not a major concern. The Land Act of 1998, in conjunction with the Land Regulations of 2004 (Land Regulations Nos. 31-34) “provides for a simple hand drawing of a sketch map after the boundaries of a piece of land have been measured using a tape. It is not necessary to draw the sketch to scale and the total area shall only be estimated. No spatial framework is needed and the sketch maps are not geo-referenced by any other means. No cadastral index maps have to be established for customary land.”

Cadasta Foundation's approach and tools offer accuracy of less than a meter with the potential to further improve the accuracy to a centimeter with the use of additional tools and services such as mobile GNSS devices.

Data Upgrade Plans | In the case of the work in Uganda, the data was captured using a combination of GPS, and on the bases of sub-meter aerial photography, and is thus already being captured at a high level of accuracy. Furthermore, it should be noted that the approach being used is a natural upgrade to the basic sketch map, ensuring that the data can be integrated into the National Land Information System (NLIS), and overlaid in order to ensure other land right types do not overlap the customary land claims. The Ugandan Constitution of 1995 specifically allows that “(a) all Uganda citizens owning land under customary tenure may acquire certificates of ownership in a manner prescribed by Parliament, and (b) land under customary tenure may be converted to freehold land ownership by registration”, effectively ensuring a maturation of rights.

2.2 Land Administration Framework

The land administration framework of Uganda is well adapted to the needs of fit-for-purpose land administration, with many key decisions made in previous decades having established a foundation for flexible land governance decision making. The technical methods for improving land governance, however had not yet proven to be widely scalable, in part due to the lack of cost-effective and accessible technology—though this is decreasingly the case. More recently, with increasing access to technology, a number of tools and approaches have been tested with the new challenges being managing different data formats and outputs and needing to enforce the spatial framework.

Legal Framework | With the passage of the 1995 Constitution in Uganda, “Land in Uganda belongs to the citizens of Uganda and shall vest in them in accordance with the land tenure systems provided for in this Constitution” and furthermore “Land in Uganda shall be owned in accordance with the following land tenure systems- (a) customary; (b) freehold; (c) mailo; and (d) leasehold.” With the ability of customary rights to transition to freehold rights, Uganda became a leader in Africa for not just recognizing customary land rights but putting customary land rights on a path towards equal legal footing as traditional freehold land rights. With estimates of approximately 70 percent of land available in Uganda held under customary tenure according to MLHUD estimates in 2010, this represents most land in Uganda.

The Land Act of 2008, the Local Government Act of 2009, and the Local Council Courts Act of 2006 provided the necessary guidance for a participatory, localized systematic approach to Customary Lands administration. The laws directed that there be established customary land registries at the sub-county level, essential in ensuring that registration of land is localized and accessible. Dispute resolution also was decentralized, with the village local council mandated to hear and resolve disputes relating to land. The flexibility offered by the Survey Act of 1939, allowed the Commissioner of Survey to provide that survey for customary land rights would not require a registered surveyor but sketches from the Area Land Committee would suffice. This legal framework has been integral to the success of the locally led approaches in Uganda.

Spatial Framework | As noted earlier, the flexibility provided by the Survey Act of 1939, and subsequent guidance allows for a flexible path towards tenure recognition, beginning with a simple sketch map provided by the Area Land Committee. The tools utilized in the project allowed for the realization of not just this modest goal of the Survey Act, but the use of GNSS,

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and orthophotos, also allowed for higher accuracy spatial data collection. The tools used allowed for the “snapping” of other parcels in the field, ensuring adjacent parcels shared boundary markers without any overlap or gaps. Furthermore, the use of aerial photography and flexible tools ensure the Customary Certificate of Occupancy can be created on the platform, with all the information captured being linked to the National Land Information System and limiting the potential for overlapping claims.

Institutional Framework | In 2013, the Uganda National Land Policy (NLP) was approved by the Ugandan Cabinet, providing, as the Policy states, a governing framework for “optimal utilization and management of Uganda’s land resources” across all the land tenure systems in Uganda. Land is a national priority, as it represents the most essential pillar of human existence and national development. The National Land Policy harmonizes the diverse needs for human settlement, production, and conservation by adopting best practices in land utilization for the purpose of growth in the agricultural, industrial and technological sectors.

2.3 Conclusion

While the 1998 Land Act made a Fit-for-Purpose approach theoretically possible, lack of local capacity to administer the process was a hinderance, resulting in no Certificate of Customary Ownership being issued anywhere in the country as of 2010. In the last decade, however, Uganda has benefited from several interventions to test approaches for sustainable, scalable, and socially acceptable approaches to issuance of CCOs and increased land formalization. The pressure to close the significant data gap is particularly acute given the investment made by the World Bank to fund the establishment of a National Land Information System over the last decade—an investment of over 72 Million US Dollars, for a system that “is only applicable to registered land which account for less than 20 percent of all the land across the country” according to land specialist Christopher Burke in an April 2022 Editorial of The Nile Post.

Indeed, three specific projects (detailed in the table below) purposefully applied fit-for-purpose principles and were detailed in the article *Fit-for-Purpose Land Administration: Country Implementation Strategy for Addressing Uganda’s Land Tenure Security Problems* from the journal *Land* in 2021, providing a critical foundation for learning. These projects, implemented between 2015 and 2020, served as a critical learning experience for CSO, donors, citizens, and the government, allowing actors to test field approaches and govt. processes alike. The pilot detailed below drew from the lessons of earlier pilots, but benefited from the increasing maturity of the NLIS and increased adoption of technology within MLHUD to finally develop a scalable fit-for-purpose approach

Project Name	Location	Implementing Org.	Funder
Community-led land dispute mediation and customary land tenure registration	Nwoya District	ZOA	Private Foundation
Enhancing Global and Nutritional Gov. of Tenure of Land, Fisheries & Forests	Kasese District	FAO	DFID (Now FCDO)

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In Uganda, the evidence can be seen in the progression of pilots and learnings by Cadasta Foundation. In 2019, Cadasta initially contracted Ujaama Tribe to serve as local trainers and support for the testing of the tools and approach in Hoima and Buliisa districts, leading to the issuance of community validated CCOs. Despite significant data collection, an ongoing land dispute has subsequently locked the land occupants in a court battle. In 2020, Ujaama Tribe was awarded a subsequent grant to expand work, leading to work in Namutumba District and leading to the issuance of 745 certificates to date. As noted on January 24, 2022, during a CCO distribution ceremony, Mr. Dennis Obbo, Principal Information Scientist, MLHUD stated "Cadasta has enhanced the efficiency and effectiveness of the Area Land Committees. It has reduced the time taken by the Area Land Committee...The work that we have done in Namutumba in one month, in other places has taken five months. So that alone is a very big difference. We should be able to issue the documentation faster using these technologies other than those of the hard paper which take so long."

In late 2021, the MLHUD expanded the agreement to include the additional Districts of Apac, Maracha, and Agago. These districts contracted with the Ujaama Tribe to provide the tools, training, and technical support resulting in the printing and issuance of CCOs. Ujaama Tribe is now contracting Cadasta and other third-party service providers as part of a truly sustainable, locally-driven business model to support districts in the collection of data, issuance of CCOs, and subsequent land use and information management.

3. DOCUMENTING URBAN LAND RIGHTS AT THE MUNICIPAL LEVEL IN BONITO, BRAZIL

Access to adequate housing is a major policy priority across most jurisdictions in Brazil. According to the Brazilian National Housing Authorities (União Nacional Por Moradia Popular), the number of individuals living without shelter has grown significantly in the last decades. To address this, the federal government has enacted a series of policy instruments to advance multidimensional solutions to address socio-territorial disparities, as well as protect land tenure and rights of urban and rural dwellers.

In Pernambuco State, municipal authorities in Bonito have joined efforts with a local NGO, Espaço Feminista, to address land registration, particularly targeting women-led households. Espaço Feminista works with local communities in the State of Pernambuco, addressing social inclusion and women's rights, including empowering local women's groups to advocate for improved land rights and housing. Under the Federal Government designed program, "Minha Terra Legal," authorities in Bonito aim to map and document 3,000 household properties across the municipality. In 2020, Cadasta was invited to support the design and conceptualization of the data collection approach, ensuring the approach and data meet the technical requirements of the municipal cadastral system and the local land administration requirements.

To implement the process, field data collectors were trained in data collection using mobile applications. The group of field data collectors was composed largely of youth, with 70 percent coming from the local universities. Part of the training process related to the interpretation and use of very high-resolution drone imagery data—a critical aspect of the data collection workflow. By March of 2022, approximately 1,200 households had been mapped and documented, with 550 families having already been issued property deeds by the municipality.

3.1 Alignment with Fit-for-Purpose Principles

The Minha Terra Legal Program was designed to respond to social inequalities affecting low-income families without property registration. In the case of Bonito, the project targeted mostly residents without any type of documentation that proved land ownership. According to Tereza Borba, a Brazilian lawyer specializing in urban housing in a recent article, “with Constitutional Amendment 26/2000, the right to housing became a fundamental urban right, recognized in city and municipality statutes.” The implementation of the Amendment has proven to be a challenge for authorities across various municipalities given financial and technical capacity constraints that limit a scalable regularization process.

Boundary Identification | The identification of boundaries was based on *General Boundaries*, with data collectors using very high-resolution imagery. As a first step, a certified surveyor from the municipality generated individual maps for each of the selected neighborhoods within Bonito. Parcel digitalization was done by processing imagery in AutoCAD (a computer-aided design and drafting software) the municipality staff already uses. The AutoCAD digitization enabled field data collection teams to skip the manual process of identifying boundaries in the field and collecting precise measurements. Instead, data collectors need only verify the parcel limits while visiting land occupants.

Role of Aerial Imagery | High-resolution *drone imagery* was captured for each of the neighborhoods participating in the program using local service providers and through an open and competitive tendering process. The use of high-resolution imagery has significantly reduced the costs of parcel surveying as compared to the process done previously, as well as improved the accuracy.

Using this process, it took a week to capture, process, and digitize six neighborhoods (prior to field verification)—a reduction of six months' worth of work as compared to initial estimates based on the use of a traditional parcel surveying approach. The imagery also facilitated the participation of residents in the process of boundary validation and confrontation, as validation was conducted by involving neighbors sharing the same borderline during the boundary demarcation.

Accuracy Requirements | To address the standard accuracy requirements for parcel mapping, Espaço Feminista has worked closely with the various municipal agencies to verify data needs, and to ensure the data met the technical specificities of the municipal cadastral system. While the parcel digitization was done prior to the field data collection, the process has facilitated the workflow for property identification when the data collection team were deployed to the field, and the use of general boundaries has decreased land disputes.

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Data Upgrade Plans | With the use of very high-resolution drone imagery, in conjunction with existing neighborhood plans, spatial data was captured at a very high degree of accuracy from the outset. In the event of a proposed plot subdivision or development, an additional cadastral survey might be requested using traditional methods to ensure an even higher degree of accuracy on an ad hoc basis.

3.2 Land Administration Framework

Spatial Framework | The surveying and mapping framework was established and implemented through a special legal provision enacted in 2019 by the Mayor of Bonito (DECRETO N° 35/2019 REGULARIZAÇÃO FUNDIÁRIA). The provision, which was specifically designed to address tenure insecurity in Bonito, allowed for a collaborative approach between the government and NGOs, such as Espaço Femenista and Cadasta Foundation. While the technical component of the process was led through institutional arrangements, the involvement of local, has galvanized the community and leveraged their social cohesion to address tenure insecurity across the municipality.

Legal Framework | Minha Terra Legal program is the flagship land regularization program led by the Federal Government. The program takes a holistic approach to land tenure security, integrating legal, urban, environmental and social dimensions. Based on the legal provision established through the Federal Law n° 13.465/17, the municipal authorities of Bonito using the legal authority conferred in the Municipal Organic Law, approved Decree N° 35/2019 that provided guidance for urban land regularization and property registration.

Institutional Framework | Federal Law n° 13.465/17 was designed taking into consideration the ability of local authorities to implement the process of land registration with greater flexibility. Such flexibility has allowed the Municipality of Bonito to partner with other organizations and institutions to use existing resources in the most effective manner to regularize properties and integrate the households into formality. While the Law allows for innovative approaches to land registration, the actual implementation of the law has been applied rarely. In practice, challenges were found in the legal process of filing the paperwork as the process is not yet streamlined across other technical departments, and it depends mainly on scarce resources within the municipal notary services. With limited resources to expedite the process, the entire formalization process can be delayed in the final stage of certification and notarization prior to regularization.

3.3 Conclusion

The collaborative approach taken in the implementation of Minha Terra Legal in Bonito has proven to be an example of effective modernized processes of land and property regularization, though efficiency of bureaucratic processes remains an ongoing challenge. The unique partnership between government and civil society actors, the inclusion of youth and community members in the data collection and validation process, all contributed to the unique model which has only expedited the land formalization process.

While the traditional approach has led to a historical backlog in the notary in the approval process, the use of innovative approaches such as mobile data collection tools and applications, as well as high-resolution imagery has cut down the time needed to survey significantly. According to municipal authorities, the traditional approach required, on average, three to four field technicians for two to three days to survey one property. Using the current approach, a single technician collects the data in less than an hour. Such reduction in data collection time has expedited the process of delivery of documentation to the notary, and in a standardized format, improving the processing time of the document.

While no figures have yet been disclosed on the total time and cost savings using the new approach, a further assessment is planned. The value of the digitally led approach does not stop with the greater efficiency in data collection, indeed a greater benefit is the participatory nature of the data collection, ensuring the community members themselves are part of the process.

The success of the Bonito project paves a way to scale up the use of a fit-for-purpose approach across municipalities in Pernambuco and across Brazil. There are discussions on replicating similar processes in the neighboring municipalities as a part of the expansion of the work that Espaco Feminista is doing with local women groups.

Through legislative reform, the entire project was made possible, and there is a move towards decentralization of services so as to allow for localized and flexible implementation. The spatial requirements for parcel surveys have been amended by legislation, allowing for the digitization of imagery as an approach and the gradual refinement of data on an as-needed basis. What remains a challenge however has been navigating the government institutions and ensuring government staff have the requisite skills and mindset to use a new approach, and to gradually identify bottlenecks resulting from new processes, and refine the approach accordingly.

4. THE JAGA MISSION | SLUM UPGRADING IN ODISHA STATE, INDIA

Like many states in India, Odisha has experienced significant growth in the urban population in recent years, mainly due to rural-to-urban migration. In search of better livelihood opportunities, many migrants settle in informal settlements, where local government struggles to provide basic infrastructure and services such as electricity, sanitation, water, and roads. Without formal rights to the home and land they occupy, these informal residents are often barred from getting loans for home improvement, starting businesses, accessing basic services, enrolling their children in schools, or finding a formal job.

In an effort to document the growing informal settlements and transform slums into livable communities, the Odisha State Government, supported by the Indian philanthropic group, Tata Trusts, developed the Odisha Livable Habitat Mission “Jaga”—an innovative project designed to improve living conditions of informal settlements. Through the project, more than 700 community data collectors were trained, and with the use of Cadasta’s technology and services, were able to efficiently document and map 1,725 slum communities and 173,162 households to create an official data set of slum dwellings in Odisha. Once documented, the state government issued nearly 58,000 Land Rights Certificates and 105,000 Land Entitlement Certificates, benefiting an estimated 1 million people to date.

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In 2019, the Jaga Mission was recognized by World Habitat and UN-Habitat as one of the world's most “innovative, outstanding and revolutionary ideas, projects, and programmes” and won the Bronze World Habitat Award. In addition to the award, Jaga Mission has been publicized by the media as the “world's largest slum titling initiative” and has been the inspiration for numerous other Indian states seeking to replicate the process as they face similar challenges of urban informality.

4.1 Alignment with Fit-for-Purpose Principles

The Jaga Mission was specifically designed to address the lack of data on hundreds of thousands of informal households in urban Odisha state, for which there was no feasible path to formal tenure. Precisely because of the lack of ability for traditional land administration processes to integrate these households—to the detriment of service delivery, revenue collection, and effective governance, to say nothing of tenure security for citizens—new fit-for-purpose approaches were applied from the outset. Issues of unclear tenure, small plot size, and inaccessibility to boundaries, which might paralyze field data collection using traditional approaches, were rendered moot by the application of new technology and approaches.

Boundary Identification | *General Boundaries* were used to delineate properties due to the challenges of dense urban housing in which properties might regularly abut two, three, or more other parcels. Given the lack of tenure data, properties are limited to the land they physically occupy, with physical structures serving as the boundary. The use of general boundaries also lowered interpretation requirements for field data collectors, and thus the need for additional training. According to estimates from the government cited in Analytics India Magazine article “*How the Govt of Odisha Used Geospatial Technology to Provide Land Rights to Slums,*” in 2020 “manual survey and mapping would have taken nearly a decade, considering the built-up area is usually dense for conducting a physical survey” as compared to the months it took for much of the data capture to occur.

Role of Aerial Imagery | *Drone imagery*, geo-referenced and captured specifically for cadastral mapping served as the basis for boundary demarcation, proving to be cost-effective as well as a sound tool for community engagement and participatory decision making. The use of very high-resolution drone imagery, captured by local contractors, also minimized the potential challenges of GPS accuracy, particularly in a dense urban environment. This allowed for higher accuracy data capture by relatively less trained data collectors.

Critically, drone imagery also contributed to the participatory nature of the data collection and the community trust in the process, as the members of the household were able to actually view and identify their own imagery on boundaries, as opposed to relying on an outside technician. According to government officials quoted in the Analytics India magazine, “While traditional surveys would have taken years to complete the work, the drone-based approach not only cut down the implementation time by almost 90 percent, the imagery thus generated gave background and context to all the stakeholders involved.”

Accuracy Requirements | The accuracy related to the *purpose* of the mapping—integration of properties existing in-situ into the formal land administration where possible—also includes

service delivery, addressing, WASH facilities, and government recognition of the community's actual existence. Given the need for the data captured to serve not just as the basis of rights, but also for subsequent road engineering and water/sanitation service delivery, high accuracy data collection based on very high-resolution imagery was critical.

Using a state ordinance (as opposed to legislation), drone-based surveys were deemed acceptable for data capture. The government noted that “using GPS was not an option as the GNSS (global navigation satellite system) signals were not strong and reliable as the receivers required clear sky...The government of Odisha also tried to implement Total Stations... However, it turned out to be time-consuming due to the limited line of sight in slums” according to reporting from Analytics India Magazine.

Data Upgrade Plans | Data was captured with a high degree of accuracy from the outset, with expectations that refinement would occur as needed—particularly in the event of a dwelling needing to be relocated, the installation of infrastructure (roads, electricity, water, sanitation, etc.), or a property dispute. The expectation is that when the data is thus refined, the updates would be reflected across the registry and cadastral systems, as well as other relevant government agencies. While actively planning for such a spatial data infrastructure, the implementation of the system has not yet been verified.

4.2 Land Administration Framework

Spatial Framework | Approaches to mapping within the context of the Jaga Mission were developed in consultation with the survey community and designed to meet the needs of municipal land information management systems. Indeed, the community-led approach to data capture and management, and the use of drone imagery, resulted in the slums of Odisha becoming among the best mapped and most well-integrated slums within India.

Legal Framework | From the outset, the State Government worked creatively to assess how they might integrate over a million Indian citizens across 250,000 households into formality. An assessment of legal options through the national legal framework made it apparent that it was a technical and logistical impossibility—it would take too long and be too costly to even be considered, thus the creation of a new State-level legal interest was necessitated. The result was the passage of the Odisha Land Rights to Slum Dwellers Act of 2017 (The Act).

The Act is aimed at empowering slum dwellers across Odisha State with tenure security and access to a livable habitat. Importantly, the land rights component is seen as just the first step of a broader process including delivery of water and sanitation, street lighting, social infrastructure, and linkages to economic hubs. While there are limitations in the land rights as stated in the Act - “land shall be heritable but not transferable by sublease, sale, gift, or any other manner whatsoever”, they still “may be mortgaged for the purpose of raising finance in the form of housing loan from any financial institution.” In effect, the State of Odisha created a new type of land right. Even for the passage of new laws to allow for such a flexible type of spatial data capture, the state government took a pragmatic approach; according to G. Mathi Vathanan, the Principal Secretary of Housing and Urban Development in Odisha State, stating

“We took the ordinance route and not the normal legislation route to ensure speed and minimize any misuse.”

Institutional Framework | Rapid implementation and a decentralized approach to decision making were made possible by strong leadership pushing key government agencies to coordinate for rapid implementation. The State Government also created a multi-stakeholder partnership, including private sector, NGO’s and foundation. Indeed, Tata Trusts led the technical support of the project, embedding staff directly in the government offices.

Partnerships were not limited to existing businesses and non-profits, but also slum dwellers associations—resulting in the formation of over 1,800 slum dwellers associations. This approach of creating and empowering local organizations from each of the 1,800 impacted slums, to become the data collectors and coordinate decision making, ensured a localized approach and stymied many of the conflicts which might otherwise have occurred.

4.3 Conclusion

The Jaga Mission meets all the principles and definitions of Fit-for-Purpose Land Administration—the project prioritized the use of imagery as the basis of a participatory mapping approach of capturing general boundaries, and with intent toward upgradable spatial data. Furthermore, it was designed to meet the specific needs of urban Odisha: flexibility in regard to the existing land governance framework, allowing for new approaches to capture data, grant legal rights, and administer the lands going forward. It remains to be seen how effective the state of Odisha will be at maintaining the data accuracy regarding land use and occupants (particularly given the rules against transfers) as well as ensuring data integration across a myriad of government agencies.

5. SUMMARY

It should be noted that while each case study highlights the application of fit-for-purpose principles of land administration, and met with success in realizing formal recognition or land rights, none of the projects were designed to be “fit-for-purpose” per se. Instead, each activity was designed to address the immediate needs of citizens and government—at a municipal, state, or national level—in a cost-effective and equitable manner. Due to failures of existing land governance framework to address significant gaps in formality, in each case, stakeholders were forced to develop new approaches which could expedite land formalization. These projects reflect the realizations of longer-term goals, made possible in part by the increasing availability of tools for collecting and managing spatial data, alongside the growing technical awareness of citizens globally. The Fit-for-Purpose Publication was perhaps foreseeing the imminent revolution in land administration made possible by access to such technology.

In attempting to assess the common success factors and challenges it is important to note the differing project scales (local, state, national). In many ways, Uganda is the most advanced, having undergone purposeful testing with active coordination by the Ugandan Ministry of Lands, Housing and Urban Development (MLHUD). Customary Certificates of Ownership have been used for almost seven years, under a variety of pilot programs. Uganda is also the

only assessed example working to apply the process nationally and in line with a National Land Policy—a level of endorsement perhaps not enjoyed in the India and Brazil cases.

The Odisha project, despite having achieved higher numbers of households recognized than Uganda (though a lower percentage of the population nationally), did not undergo the same degree of field testing a range of tools and approaches in differing geographies. With a more homogenous ethnic and geographic background as compared to Uganda given the urban focus of the Jaga Mission, there was also less of a need for testing in a range of settings. That said, the government was able to test and iterate quickly, and learn from global experiences to define a field data collection approach.

While the process in Brazil was informed by some local experience, it was the work of Espaço Feminista in assessing tools and bottom-up approaches that had been applied successfully globally, and then apply them to the specific national and local context, that made their approach successful. As compared to a national-level process or a state-level process, in Bonito the project occurred at the municipal level, and with strong local political backing and alignment with Federal Law, was implemented relatively quickly.

In looking at the project scaling, a small, and perhaps intuitive lesson to note, as projects progress from the local to the sub-national and national level there is a general expectation that more time will be needed—to institutionalize processes, train a larger number of peoples, understand more complex approvals/workflows, gain greater buy-in for updates of policies and laws. As such, in planning for the application of fit-for-purpose land administration activity, one could assume that greater, the more complex and time-consuming the process.

5.1 Success Factors

Fit-for-purpose land administration, while perhaps initially met with skepticism by some within the land community, has—eight years after initial publication—been proven as the future of land governance, particularly as emerging countries seek to close the data gap regarding land information. Indeed, it would be difficult to identify a current significant donor-funded land activity that doesn't have aspects of FFP land administration integrated.

While there are numerous examples of FFP practices being applied, the number of cases in which the process was taken to the successful conclusion—government issuance of land documents to rightful occupants and ongoing land and resource management by authorities, has been fewer. In selecting the case studies for analysis, these three examples that did lead to the successful issuance of documents were purposefully selected given the differing geographies, approaches and scale. In comparing these approaches, several commonalities stood out—even beyond the core principles of fit-for-purpose land administration.

Participatory Data Collection | In each case data collectors were drawn directly from the community. According to beneficiaries, the use of community members engendered a sense of trust, sped up the process as the actors and many of the boundaries were known, and helped to build a level of local technical capacity. Furthermore, in each case, property boundaries, once documented, were posted within the community, ensuring transparency in the process and allowing all community members an opportunity to validate or refute claims.

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Strong Political Leadership | Political leadership at the requisite level has been key to each activity's success. In Odisha State, the Jaga Mission has been the signature project of Odisha Chief Minister Naveen Patnaik, an immensely popular head of state who has led the state since 2000 following five consecutive election wins. Chief Minister Patnaik has played an active role in distributing land certificates during public events. In Uganda, the prioritization placed on passing a new Land Policy in 2013 that would, as the policy states, “ensure that the country transforms from a peasant society to a modern, industrialized and urbanized society” and address ongoing land challenges; “arguably the most emotive, culturally sensitive, politically volatile and economically central issue in Uganda” as the Policy itself described land, indicates the high-level political support. It should also be noted that at the launch of the National Land Information System in 2020, it was President Museveni himself who presided over the launch.

In Bonito, it was a young, well-respected and ambitious mayor intent on the development of Bonito municipality, through the implementation of equitable and sustainable economic policies. The mayor has been the driving force for effective implementation of the program, emphasizing the need to empower and protect women's rights. While Minha Terra Legal Program is the flagship Federal initiative, its articulation at the local level and the leadership from the municipal authorities have contributed to the success so far seen.

Changing Role of Land Professionals / In order to close the significant data gap in all three jurisdictions, it has been necessary to train new actors given the paucity of professional surveyors, notaries, lawyers, and other land professionals. In each case, while there was some initial resistance from the land community in devolving authority to local officials or community members, land professionals were able to adapt to a new role—one more focused on the provision of training, development of standards and guidance, data quality assurance and review, and management of field technicians.

Use of very high-resolution imagery | While FFP land administration calls for the use of aerial imagery in the place of field surveys, a principle adhered to by all three cases, it is also important to note that not only was imagery the basis of demarcation, but it was incredibly high-resolution imagery. In Brazil and India, drone imagery served as the basis, while in Uganda it was very high-resolution aerial photography.

Government Partnership | Traditional land governance projects are generally top-down, however, in all three cases, the governments actively partnered with a range of different stakeholders in order to meet the project goals. In the case of Odisha State, the government partnered with Tata Trusts—one of the oldest and largest philanthropic institutions in India—and deputized Tata Trusts staff to work in government offices in direct partnership with the government.

Similarly in Uganda, the Ministry of Lands, Housing and Urban Development has engaged with various actors to pilot and test approaches to FFP land administration by partnering directly with agencies such as UN Habitat, GIZ, and FAO, or by working with non-profits and foundation. The Ugandan government has demonstrated a willingness to coordinate and collaborate, provided partners meet the data standards.

In Bonito Municipality, authorities have embraced a collaborative approach to achieve their programmatic goals. Partnering directly with Espaço Feminista and locally led women's groups, has enabled the mobilization of necessary resources to train and hire data collectors, and contract additional needed services to speed up the process.

Decentralized | Land administration tends to be a centralized and a top-down governance function. While this could contribute to the limited success in substantively increasing the amount of documented land rights globally, it is also indicative of countries that struggle to deliver services in rural areas—an all-too-common occurrence in emerging economies.

Each of the projects assessed took an approach of decentralization to the lowest level possible—whether sub-districts in Uganda, blocks in Brazil, or individual slums in Odisha State—and gave authority to local actors to collect the data, with local government validating the data, and providing the quality control and verification.

Digital Workflows - While fit-for-purpose land administration does not necessitate the use of technology (except for satellite imagery), technology is clearly an enabling factor. In each of the cases, a completely digital workflow has been used for boundary identification, collection of household information, compilation and management of data, and even the eventual printing of certificates. All that remains manual is the wet ink signature from authorities. The increasing availability of accessible high-resolution imagery and data collection devices in the forms of smartphones/tablets has helped turn citizens into consumer. An added benefit of the use of digital workflows and real-time data collection has been the ability to monitor in real-time the data collected, allowing for almost instantaneous analysis of data. The use of technology has contributed to increasing transparency and efficiency and should be considered a practical necessity for FFP land administration at scale.

Role of youth and marginalized groups in data collection - In each case, actors worked to ensure that all community members rights were captured, including youth, women, and other marginalized groups. In Uganda, while data collectors largely come from local government and traditional leaders, elders and youths are intentionally part of the data collection process, particularly in regard to community land boundaries. In Bonito, data collectors were drawn specifically from the youth, giving opportunities for female students from the local universities. Finally, in Odisha State, the implementing team purposefully created gender-balanced and representative Slum Dwellers Associations who in turn selected the data collectors.

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