Land Policy BULLETIN

LEGEND

Land: Enhancing Governance for Economic Development

Can technology revolutionise efforts to secure land rights?

By **Frank Pichel**, Co-Founder and Chief Programmes Officer, Cadasta Foundation

New technology is revolutionising efforts to document land rights and democratise access to land data around the world.

Innovations, such as GPS and drones, now allow us to document land rights efficiently and effectively in even the remotest locations. Off-the-shelf smartphones and tablets can easily capture and transmit evidence of rights and claims. And cloud computing allows anyone to access this data provided they have an internet connection and the right passwords.

This bulletin explores the lessons from some of these initiatives, highlighting both the opportunities and challenges presented by new technologies as tools for clarifying and documenting land rights.

These innovations have the potential to help secure land rights for the estimated 70 percent of still undocumented land in low- and middle-income countries. With pressure on land and resources growing, this absence of documented rights – whether customary or statutory – is posing a major challenge by creating confusion and fuelling disputes and conflicts between communities, governments and investors.

Existing systems are struggling to keep up. Land administration in the developing world tends to rely on a small cadre of professionals who lack the resources needed to complete the task in any reasonable timeframe. For example, it would take the few dozen licensed surveyors in Uganda more than a thousands years to legally register the country's estimated 15 million parcels of unregistered land.

In the absence of efficient and affordable mechanisms, communities are exploring other avenues to incrementally strengthen their security of tenure – particularly by tapping technological breakthroughs to bypass bottlenecks in formal processes.

To help communities build foundations for sustainable, inclusive, and robust economic and political systems, we can help them make the most of this new technology to clarify, document, and strengthen their security of tenure. This process will be critical to protecting livelihoods in rural communities, and to wider efforts to promote sustainable and responsible agricultural investments.

Organisations have supported successful pilots and projects using 'fit for purpose' technologies that can simplify and speed up the

Open Data and Land Governance: Moving Towards an Information Ecosystem

On 20 March 2017, LEGEND supported a workshop on **Open Data and Land Governance: Moving Towards an Information Ecosystem**. The event, organised in Washington, D.C. by the Cadasta Foundation and the Land Portal, provided participants with a global perspective on the importance of open data and the implications for land governance. Participants learned about different kinds of open data, from national cadastral systems to global databases, and the elements that are necessary to take a standardised approach to the use of metadata and standardised vocabularies in land reporting. They also had the opportunity to explore the practical implications of open data for their own organisations and define steps towards creating their own open systems.

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process of land documentation and reduce costs. These include Namati's **Community Land Protection programme**, which has used GPS-based data collection methods developed by Cadasta to support community mapping processes in Kenya and Zambia, or initiatives such as **the FAO's Open Tenure** app and **USAID's MAST,** which rely on mobile data collection and cloud computing.

This bulletin explores the lessons from some of these initiatives, highlighting both the opportunities and challenges presented by new

technologies as tools for clarifying and documenting land rights.

Even in cases where formal documentation proves impossible, mapping and documenting rights can start a process of community empowerment that can in turn prompt governments to acknowledge their claims. For example, **the Justice and Empowerment Initiatives** in Nigeria are using community mapping projects to press government to provide communities with better services and to recognise their land rights.

While some of these tools have been used for land administration purposes, many of these recent initiatives have not yet been integrated with formal systems. Questions therefore remain as to how quickly formal systems may catch up and recognise these informally documented rights, or interface with them in a way to permanently strengthen land rights. This would require governments to embrace a wider range of 'fit for purpose' approaches to recording tenure information and, where possible, make the information they have regarding concessions, land use rights, and even basic land classifications public. New technologies provide an opportunity to not only collect and access more data about community land rights, but also to democratise access to it.

We urgently need to foster more proactive discussions among stakeholders, including governments, on how we can work together to leverage cutting-edge technology to achieve the recognition of land rights and security of tenure that is so critical for individuals and their communities.

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Land rights and tenure security at the click of a button?

By **Chris Penrose Buckley**, Senior Advisor – Land Policy Lead, DFID

Finding ways to reduce the costs and speed up the process of mapping and documenting – and thereby securing – poor people's tenure rights is an important priority for the Department for International Development (DFID). This LEGEND Bulletin introduces a number of exciting new initiatives that harness technology to address some of the perceived bottlenecks and challenges with traditional, formal land surveying and registration processes, or to extend access to land rights and other information services to hitherto excluded communities. These technologies offer no silver

bullet for strengthening tenure rights and can even pose new challenges, but they also create opportunities by disrupting business as usual. As these new approaches are tested and scaled up, it is important to assess where and how they are driving change and where the technology can make the biggest difference. To guide this process we need a better understanding of the following issues:

- What is our theory of change? Is the aim to catalyse change in the traditional system – to speed it up and drive down costs – or to substitute it with other

independent or complementary approaches? Recent land tenure regularisation programmes supported by DFID and others in East Africa have already seen an important shift towards a 'fit for purpose' approach that is creating space for new technology and the use of para-surveyors. Is the tide already turning?

- We need more evidence that efforts to map and document rights that start outside the formal system ultimately lead to formal recognition of individuals' or communities' tenure rights. That may be through formal

recognition of the data collected by the community or one-off use of this data as an advocacy tool to persuade governments to include these communities in the formal registration process.

- How much cheaper and quicker are these new approaches? They can drive down some costs, but to what extent? Can they be a game-changer? We need better analysis of the key cost drivers of 'traditional' or formal approaches and to clarify where new technology can significantly reduce costs. Is there a trade-off between democratising the process, e.g. opening it up to community surveyors, and thereby reducing costs, on the one hand, and ensuring robust procedures, e.g. qualified staff and slower procedures, that are more costly but provide the foundation for formal recognition, on the other?

- What are the other potential applications? In practice, many of these new approaches are about a great deal more than registering land rights. Based on Cadasta's experience, they may support land use planning processes, collect data on basic services and other urban planning needs, or facilitate greater efficiency and transparency in agricultural value chains. It is important to disentangle these different uses and opportunities so we can understand where technology can make the biggest difference.

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MAST and Open Tenure: how mobiles and clouds can democratise land rights

By **Anne Girardin**, Land Information Management Specialist, owner at Land Clarity and **Jeffrey Euwema**, Director, CIPA, Inc.

Anne Girardin has been involved in the field test of FAO's Open Tenure in Uganda and Cambodia; she is currently helping to pilot USAID's MAST in Burkina Faso. Jeffrey Euwema was Technical Manager under the ERC Task Order for USAID, where he was in charge of the design, development and implementation of MAST in Tanzania and of the redesign and deployment of MAST in Burkina Faso. They examine each tool and compare the challenges and opportunities they create.

New technologies such as smartphones and online data platforms have huge potential to help communities in developing countries to strengthen security of tenure by documenting their land rights. While traditional surveying methods rely on small groups of experts, local people armed with smartphones and tablets can rapidly document claims for themselves and share the data using cloud computing. Mobile technology also enables the collection of far richer data by enabling beneficiaries to capture land related data themselves.

With the technology constantly evolving – and land tenure systems varying widely –, there are many possible approaches to documenting land rights. We consider the strengths and weaknesses of two recent innovative systems with a view to drawing wider lessons. These are the **Open Tenure** system, created by the Food and Agriculture Organization (FAO), and the **Mobile Application to Secure Tenure (MAST)**, developed by the United States Agency for International Development (USAID). Both these systems rely on mobile technology

and cloud computing, but they also have important differences. Most significantly, Open Tenure was designed as a generic tool, while MAST needs to be configured according to the legal system in any given context.

The idea behind the FAO's approach is to use technology to help community members document their customary land rights in sufficient detail to win recognition from the formal legal system. Open Tenure grew out of a software suite known as SOLA, which the FAO developed to provide countries with a set of open-source land administration tools to facilitate the implementation of the Voluntary Guidelines on the Responsible Governance of Tenure (VGGT). Open Tenure was designed to gather data in accordance with international standards and utilizes the '**Land Administration Domain Model**'. This standard aims to provide a framework that will make it easier
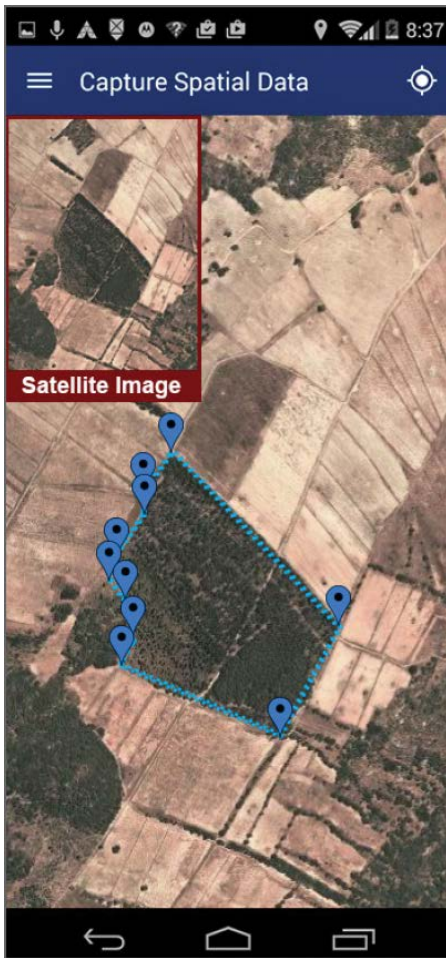
for formal legal systems to recognise customary claims.

Open Tenure is designed to be flexible enough to be used anywhere. Before they start gathering data, community members can adjust the system to capture the data required by the legal system in their particular context. To make this task as easy as possible, the Open Tenure interface employs a simple system of onscreen 'panels' and does not require more than basic technical skills to tailor. The community then nominates designated 'recorders' who gather the relevant data on mobile devices and then upload it onto a cloud-based server. The data is then scrutinized by a community-designated reviewer, while a moderator mediates any disputes. Once the data has been approved, citizens can print out their individual claims in order to start formal proceedings to register their land rights.

Open Tenure has been used in Nigeria, where it was linked with SOLA to support a project to modernise deeds registries and to digitally produce land title certificates; in Cambodia, it was used to map land in the Oddar Meanchey Community Forest in a pilot designed to empower communities; it has also been used to facilitate boundary mapping in La Bendición community in Guatemala. The version of Open Tenure currently used in Uganda to verify claims in paper-based records and convert them into a digital database will be integrated into a planned national Land Information System.

USAID's MAST, by contrast, was originally conceived as an alternative to the more structured, top-down approaches used by land administration agencies in many developing countries. The idea was to test whether new technologies could be combined with a more participatory approach to capture the data needed to document land rights effectively. The goal was twofold: to develop an easy-to-use mobile application that would suit the needs of people in rural communities; and to foster a participatory approach to encourage villagers to take part in mapping their land. Programme leaders also sought to broaden inclusion by providing specific training for local women.

Like Open Tenure, MAST also hinges on mobile technologies and cloud computing. The mobile application is used to capture spatial and non-spatial information at the community level, which is then validated on the cloud-based server. However, unlike Open Tenure, which is tied to a larger system, MAST programme leaders, have calibrated its data model, and subsequently its data collection tool, to meet the specific requirements of the land laws in areas where it has been implemented. In another contrast with Open Tenure, which provides participants with printed summaries of the data they have collected, MAST's cloud-based

management system can produce land rights documentation, such as title certificates.

While land administration systems remain weak, there is a pressing need to support innovative approaches that simplify procedures, reduce transaction costs and open new avenues for communities to participate.

Open Tenure and MAST can make the capture of land rights information more citizen-focused and transparent, both in terms of the way data is gathered and administered. Although cloud-based solutions still remain contentious in many countries, the real power of these technologies lies less in their data storage systems and more in their ability to facilitate the rapid and inclusive documentation of land rights on the ground.

However, implementing these systems poses challenges. Programmes must rely on intermediaries with the technical skills and resources to introduce these systems into poor communities. Open Tenure and MAST depend on complex software and digital infrastructures that demand considerable technical and financial resources. Nevertheless, while land administration systems remain weak, there is a pressing need to support innovative approaches that simplify procedures, reduce transaction costs and open new avenues for communities – and particularly their most vulnerable members – to participate in the process of land governance.

Namati's experience of using GeoODK: the potential and pitfalls of participatory GPS mapping processes

By **Marena Brinkhurst**, Programme Officer, Community Land Protection Programme, Namati

Namati's **Community Land Protection programme** supports communities in Africa and Asia to document their customary lands, strengthen local land governance and pursue formal legal recognition of land rights. This includes creating maps that communities can use to inform land management decisions and to register their lands or defend their claims in legal cases or negotiations. Until recently, Namati and partner organisations could only support communities to make hand-drawn sketch maps, because the costs and technical complexity of taking GPS measurements or surveys made these tools largely inaccessible.

> Participatory GPS mapping can be a deeply empowering process for communities; low-cost, accessible technologies can enable them to independently create maps on a par with those used by governments and companies.

In 2016, Namati partnered with the Cadasta Foundation to pilot participatory mapping technologies in six communities in Kenya and Zambia. Namati supported partner organisations to design mapping processes that fit their specific goals and constraints, coaching teams through various technical and procedural considerations and principles of participatory GPS mapping. After considering various options, partners chose to use mobile tablets paired with Bluetooth GPS receivers (which improve accuracy) and the **GeoODK** application. Partners worked with Namati and Cadasta to design GeoODK survey forms to collect boundary coordinates and information on community features. Data from the GeoODK forms was automatically uploaded into the Cadasta Platform where it could be stored securely, with community permission, and used to make maps for communities to review and approve.

Namati has found that participatory GPS mapping can be a deeply empowering process for communities and the organisations that support them, if designed and implemented with empowerment as an explicit goal. Low-cost, accessible mapping technologies can enable communities to independently create maps on a par with those used by governments and companies. Co-designing the process with a supporting organisation gives communities a sense of control over how their maps are made, which is critical for the maps' legitimacy. The process of GPS mapping also strengthens many aspects of broader community land protection, such as ensuring that agreed boundaries with neighbours are precisely documented.

Despite the encouraging outcomes of the 2016 mapping pilots, Namati has realised that GPS mapping may not always align with the goals and constraints of partners and communities. Even with easy and affordable data collection tools, using GPS technology to map community boundaries and features is time- and resource-intensive and presents a number of logistical, financial, technical and political challenges. These include:
• Increased potential for land conflicts to escalate and the need to provide extensive land conflict mediation support;

- Barriers to communities being empowered as the owners of their spatial data, both in terms of establishing meaningful data sharing agreements between organizations and communities and in terms of the long-term maintenance of the data;

- Unclear official technical or procedural requirements for spatial data in community land registration applications, and therefore uncertainty about whether and how government will recognise or use communities' maps or GPS data;

- Dependency on donor funding to cover the logistical costs for GPS data collection and political challenges in advocating for that support to come from government; and

- Reliance on specialized experts for map production, after data is collected, because cartography tools and skills continue to require more extensive training and experience than short-term training can provide.

If GPS data collection is not feasible, other emerging mapping tools like free satellite imagery for non-profit organizations (such as that made available through the Cadasta Platform), the Field Papers website, and Quantum GIS and the open-source spatial data available within it (such as **OpenStreetMap**) can all be used to greatly improve the detail, precision and scale of sketch maps.

Unlocking the full potential for new mapping technologies to revolutionise the documentation and recognition of land rights requires more than training organisations and communities to simply use data collection tools. They must also be empowered to independently design and implement fair, rigorous and complete mapping processes that integrate with formal land administration systems. Otherwise, we will only have shifted the bottleneck.

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4th UK Land Policy Forum: New technologies to map and document rights – learning from DFID & other programmes

Wednesday, April 26, 2017 1.00pm–4.30pm – ODI, London

The 4th UK Land Policy Forum meeting will discuss the use of new technologies to map and document land rights and their impact on land registration and administration. It will also provide updates on recent activities of Forum members, including DFID

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Cadasta's work in developing documenting and mapping tools

By **Frank Pichel**, Co-Founder and Chief Programmes Officer, Cadasta Foundation

The Cadasta Foundation develops and supports innovative digital tools that allow its partners to document, store and analyse information about people's relationship to land and natural resources.

Many of the Cadasta tools rely on simple handheld GPS-enabled smartphones or tablets. No internet connection is needed to collect data. Once an internet connection is available, however, the data stored on smartphones and tablets can be uploaded onto a secure cloud-based platform. Alternatively, data can be entered into the platform directly via our web-based interface on any desktop or mobile device with an internet connection.

The **Cadasta Platform** can store, organize and utilize many types of

data including: information collected through traditional paper-based surveys and maps, GPS coordinates, footage from drones, digital maps, video interviews, photographs, paper attestations, tax receipts and other supporting documentation. The technology is provided under an open source license, which means it can be freely modified by users as the project changes or partners' needs change. The platform compiles a digital record of land and resource rights data that can help efforts to:

- Incrementally establish evidence of formal or customary land rights – even in the absence of government support;

- Survey and document the land use and rights of women and other vulnerable groups;

- Inform, plan and deliver urban resilience strategies for the most at-risk citizens;

- Certify sustainable farms and commodity production;

- Identify factors undermining productivity;

- Identify overlapping claims and potential conflicts over land and resources;

- Document and monitor natural resource concessions and extractive industries; and

- Conduct research and advocacy for land rights as a cross-sectoral development issue.

Cadasta follows a stringent privacy protocol, certifies the security of the platform and retains no rights to partners' data.

For more information see **cadasta.org**

NEWS AND UPDATES

DFID Challenge Fund grantees kick-off innovative land governance projects

By **Nathan Hill**, Fund Manager, LEGEND

The DFID Challenge Fund supports the development and testing of innovative approaches to strengthening land governance. Seven civil society organisations have partnered with businesses to pilot approaches to responsible land-related investments. The fund supports projects that drive approaches to responsible land investment based on the principles of the globally negotiated **VGGT**. The projects use a variety of context-specific approaches that balance respect for the legitimate land rights of local people and investments. The fund supports activities that test a variety of approaches and tools, including: inclusive business models; due diligence tools; and the **Analytical Framework for Land-Based Investments in African Agriculture.**

The selected projects are as follows:

- **Bonsucro** and **TMP Systems** (Ethiopia, Mozambique, Tanzania and Zambia) – The partnership will apply an innovative approach to due diligence and data collection in the critical sugar supply chain, which will improve business practice and transparency on land rights. The project aims to directly improve livelihoods for 50,000 people across four countries.

- **Landesa** and **Illovo Sugar Ltd** (Malawi, Mozambique and Tanzania) – The project will pilot an approach that aligns Illovo's Land Guidelines, along with its Road Map on Land Rights, with VGGT principles and approaches to responsible agricultural investments in land set out in the Analytical Framework for Land-Based Investments in African Agriculture. This will be done on Illovo sugarcane investments in three countries.

- **MICAIA Foundation** and **Baobab Products Mozambique Ltd** (Mozambique) – The project will support 24,000 women in Northern Mozambique to secure access to forest land and to generate income from forestry. The value chain will be based on the famous baobab tree, which has a reputation as a hidden "gold mine" for health and nutrition-sensitive agricultural production and business ventures.

- **ORAM** and **Portucel** (Mozambique) – This project will use an integrated approach to securing community, family and individual land rights by partnering with Portucel, a major forestry investor. The pilot includes: the creation of 20 representative entities at community level; development of detailed community land use plans; certified tenure over land resources for 14,000 households, and the creation of a legitimate local land administration system.

- **Solidaridad** and **Natural Habitats Sierra Leone Ltd** (Sierra Leone) – The project will apply the VGGT to a Natural Habitats palm oil operation in Sierra Leone. This seeks to directly increase the annual income of over 3,000 smallholder farmers. Experience gained in this pilot will be used to promote industry-wide adoption of these guidelines.

- **Welthungerhilfe** and **Balmed** (Sierra Leone) – The project will assist Balmed, a cocoa producer, in developing an equitable and sustainable income-sharing arrangement between Balmed, land owners and workers. This project supports 900 smallholder farmers in acquiring and securing new tenure rights for themselves and their families.

- **Vétérinaires Sans Frontières Belgium** and **Dorobo Safaris** (Tanzania) – This project will work with local communities to build the capacity of local land management institutions and encourage local people's engagement in land and tourism planning. It aims to secure community land for farmers and hunter-gatherers with legitimate tenure rights, and for tourism.

All grantees have now completed the inception stage and have started implementation.

The dissemination of lessons from the pilot projects is a vital part of the challenge fund. Key successes and failures of the projects will be used to inform various stakeholders about the potential for different approaches to sustainable land investment. These lessons will be crucial if these innovative approaches are to be scaled up and achieve wide-reaching sustainable impacts.

For more information on the grantees and their projects, see
bit.do/dfid-challenge-fund

NEWS AND UPDATES

New analysis in the 2016 LEGEND Portfolio Overview highlights DFID's extensive work on land

By **Giles Henley**, Research Fellow, Overseas Development Institute

DFID supports a broad and growing portfolio of work on land, but much of it passes under the radar. The second LEGEND Portfolio Overview, published in February 2017, looks across 26 of DFID's programmes to capture where and how DFID programmes engage on land tenure issues.

It also looks more closely at the larger and better known land registration and land administration programmes and draws out their successes and common challenges. These programmes seek to encourage large numbers of landholders to register land with government agencies for the first time and to inject efficiency and a service-delivery culture into land bureaucracies. Both objectives are ambitious since they involve changing administrators' and users' often deep-seated approaches to dealing with land.

DFID programmes have been successful in reducing registration costs and encouraging women to register land in their name, thereby addressing two of the major criticisms large-scale land registration programmes have faced in the past. However, several of these programmes also face an uphill struggle to convince households to collect their land titles once issued, and in boosting the capacity of land administration services amid national budgetary constraints. Resolving these challenges – and documenting experiences along the way – will remain critical to achieving success at the programme level and to building the case that transformational land reform is achievable.

To overcome these challenges, managers of programmes and those overseeing them in DFID can take some important steps:

- Programme staff need a better understanding of citizens' appetite for land documentation and their willingness to start transacting land through formal channels. While such exercises are often done when preparing business cases, follow-up surveys during implementation are useful to calibrate expectations and assess incentives and disincentives for households to participate;

- At the same time, programmes need to develop clear messages for beneficiaries on what land registration initiatives will deliver, and what steps they will need to take to make them happen, to avoid raising unrealistic expectations;

- Programmes should make sure that land agencies have the capacity, tools and expertise to administer the surge in documentation that follows land registration drives. This needs to be done in a timely manner to ensure that households encounter a service-oriented bureaucracy when they attempt to register subsequent transactions.

The portfolio overview also includes recommendations on how DFID can ensure its programmes keep up to date with the recent evidence on land programmes. The LEGEND programme is designed to support exchange and learning between DFID programmes working on land issues.

The Portfolio Overview is available at **bit.do/dfid-portfolio**

Photo credits:
Page 2: Test trial of the Open Tenure tool with a community forestry group in northwest Cambodia / Video screenshot, FAO, www.fao.org
Page 3: Example of 3D rendering from a drone survey of a site / Harris Aerial Images, harrisaerialimages.com
Page 4: USAID's MAST smartphone application allows to capture land rights information and transfer the data to a cloud-based server / Screenshot, USAID, www.land-links.org
Page 5: Kivulini staff practice using Field Papers and GeoODK to collect data onto the Cadasta Platform / Marena Brinkhurst, Namati
Page 7: Dokas Omolo (left), Secretary of the Oyola Disaster Committee and Joshua Ondiek (right), another of the committee's members, stand on recently flooded land by the village school, Nyanza Province, Kenya / Robyn Wyatt (www.robinwyatt.org/photography), IIED

About us

Land: Enhancing Governance for Economic Development (LEGEND) is a DFID programme that aims to improve land rights protection, knowledge and information, and the quality of private sector investment in DFID priority countries. It includes the development and start-up of new DFID country land programmes, alongside knowledge management activities, a challenge fund to support land governance innovations, and management of complementary DFID grants, MoUs and contracts, and supported by a Core Land Support Team.

Future issues of this bulletin will feature updates on our most interesting findings and results, keeping you posted and enriching the debate. Contributions reflect their authors' views, not those of DFID or members of the LEGEND Core Land Support Team.

You can send suggestions and comments on this bulletin to **legend@odi.org.uk**