

How Big is Global Insecurity of Tenure?

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SUMMARY

Traditional sources of security of tenure data, e.g. administrative data, national census and household surveys and global polls, to support land indicators for national statistical systems are currently limited, expensive and do not normally have the outreach to the most vulnerable. New, innovative sources of data need to be explored to create a much more comprehensive and meaningful set of statistics that are technically feasible, politically acceptable and obtain stakeholder ownership. Smart phones, satellite imagery, social media, and the ‘Internet of Things’ continuously generate data everywhere faster and more detailed than ever before all the time. These technologies offer new measurement opportunities and challenges for the land sector.

A number of innovative land tenure initiatives are using this new technology and encouraging citizens and communities to directly record their evidence of land rights on global platforms, outside of the formal land administration systems. For example, Cadasta Foundation is developing a global platform to record and manage crowdsourced land rights and Rights Resource Initiative is creating a global baseline of indigenous and community land rights. Pervasive mobile phones could be used to capture perceptions on insecurity of tenure across populations not included in official statistics. However, their success in closing the land information gap is dependent upon convincing citizens to trust these solutions and understand the benefits of participation. Privacy and security of information is paramount and if not managed effectively then these sources of information will be switched off.

The paper reviews the current sources of Global Land Indicators and highlights new, innovative sources of land information to strengthen our understanding of the size of the insecurity of tenure gap.

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1. INTRODUCTION

The land sector has not been good at monitoring progress of the global initiatives in fighting insecurity of land governance and tenure. But now there is no hiding. Solving land issues is on the radar of the G8, has been reflected in the adopted Voluntary Guidelines on the Responsible Governance of Tenure and, after a successful lobbying campaign, land is integrated into the post 2015 Sustainable Development Goals (SDGs). This tenuous nature of our 70% insecurity of tenure statistic highlights the challenge for the land sector to design and implement global land indicators and monitoring frameworks associated with land governance and land tenure security that are based on feasible data sources and data collection strategies.

Traditional sources of data, e.g. administrative data, national census and household surveys and global polls, to support land indicators for national statistical systems are currently limited, expensive and do not normally have the outreach to the most vulnerable. New, innovative sources of data need to be explored to create a much more comprehensive and meaningful set of statistics that are technically feasible, politically acceptable and obtain stakeholder ownership. Smart phones, satellite imagery, social media, and the 'Internet of Things' continuously generate data everywhere faster and more detailed than ever before all the time. These technologies offer new measurement opportunities and challenges for the land sector.

A number of innovative land tenure initiatives are using this new technology and encouraging citizens and communities to directly record their evidence of land rights on global platforms, outside of the formal land administration systems. For example, Cadasta Foundation is developing a global platform to record and manage crowdsourced land rights and Rights Resource Initiative is creating a global baseline of indigenous and community land rights. Pervasive mobile phones could be used to capture perceptions on insecurity of tenure across populations not included in official statistics. However, their success in closing the land information gap is dependent upon convincing citizens to trust these solutions and understand the benefits of participation. Privacy and security of information is paramount and if not managed effectively then these sources of information will be switched off.

The paper reviews the current sources of Global Land Indicators and highlights new, innovative sources of land information to strengthen our understanding of the size of the insecurity of tenure gap.

2. NEED FOR CORE SET OF LAND INDICATORS

Over the past decade the global land community has seen a growth in consensus that land tenure security for all and equitable land governance are foundations for sustainable economic development and the elimination of poverty (UN Habitat / GLTN 2014). This consensus is reflected in the Voluntary Guidelines on the Responsible Governance of Tenure, Forests and Fisheries (FAO 2012) and in other related regional and global instruments such as the Framework and Guidelines on land policy in Africa (LPI 2011) and the Principles for Responsible Investment in Agriculture and Food Systems (CFS 2014). The international donor community has also paid renewed attention to land governance in responding to the new wave of private land acquisition and land-based investment in the global south, seeking to improve their potential to drive agricultural growth and economic development (GLII, 2015).

Effective monitoring is central to ensuring changes in land governance result in improved conditions and sustainable development opportunities for all, especially for vulnerable groups and those living in poverty. In 2013, the G8 committed to support greater transparency in land transactions, including the responsible governance of tenure of land, increased capacity in developing countries; and release of data for improved land governance. The UN High-Level Panel of Eminent Persons on the Post-2015 Development Agenda report have proposed a target on “secure rights to land, property, and other assets” as a building block for people to lift themselves out of poverty, and discussions on the integration of land into the framework for measuring progress towards the now agreed set of post-2015 Sustainable Development Goals (SDGs). Better knowledge and understanding of a) the extent to which people benefit from secure land and property rights; and b) the effectiveness of land-related policies and land administration systems in helping to deliver tenure security for all and achieve sustainable utilization of land resources are now needed. These developments have created the need for a core set of land indicators that have national application and are globally relevant and comparable (GLII, 2015).

To date, however, development agencies and programmes undertaking land related interventions have established their own systems for monitoring the outcomes of land-related development interventions reflecting specific agency and project goals; there is no overall comparability of progress in different countries or the effectiveness of different approaches. Monitoring has also tended to focus on land policy and legislative processes and on performance of individual projects rather than on people’s perceptions of tenure security and the development outcomes of land governance systems as a whole. In addition, there are large gaps in available data, including baseline conditions, and coverage of national land information systems / National Spatial Data Infrastructures (NSDIs) is extremely limited, fragmented and confined to segments of the population. These circumstances led to collaboration between the UN Habitat, the Millennium Challenge Corporation and the World Bank in 2012, facilitated by the Global Land Tool Network GLTN (the Global Land Tools Network, initiated and hosted by UN Habitat), to establish a Global Land Indicators Initiative (GLII) a platform for knowledge generation, sharing and dissemination on land indicators, which aims to develop a set of core land indicators to measure tenure security

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globally and at country level (UN Habitat / GLTN 2014). An initial Conceptual Framework for the Development of Global Land Indicators has been formulated (GLII 2015).

Traditional sources of security of tenure data are currently very limited, expensive and do not normally have the outreach connect with the most vulnerable. The rest of the paper explores new, innovative sources of data that can support much more comprehensive and meaningful statistics that are technically feasible, politically acceptable and obtain stakeholder ownership.

3. TRADITIONAL SOURCES OF LAND INDICATORS

The current, principle available data sources (UN Habitat / GLTN 2014) to support comparable global reporting, include:

- Administrative data, in particular that derived from national land information systems, although in many countries these data sets are incomplete (only 30% of the world's population is included) and not up to date, or gender-disaggregated, and therefore requiring supplementation from other data sources;
- National censuses and household surveys, for which there is considerable scope for expansion by introduction of specific land-related modules into existing national surveys, designed and adapted so as to elicit consistent data across different countries;
- Purpose designed global polls, comprehensive sample surveys managed on a global basis to supplement data available nationally on questions not easily integrated into demographic and household surveys, for example, perceptions of tenure security for which a "perception module" is under development by the World Bank; and
- Expert assessment panels and expert surveys, which provide important ways of assessing the quality of legal frameworks, qualitative improvements and changes, and of making sense of institutional processes and complex and incomplete data sets from different sources.

Data collection of globally comparable data to meet the requirements of GLII's identified land indicators will require significant investment in additional data sets and capacity.

3.1 Accelerating Official Sources of Land Information

A number of new, innovative approaches to land administration are appearing that will accelerate the coverage of security of tenure and extend the data available to support global indicators. Some examples are discussed below.

3.1.1 Fit-For-Purpose Land Administration

New approaches have recently been tested in implementing countrywide land administration solutions in countries such as Rwanda, Ethiopia, in the Europe and Central Asia region, in the South East Asia region, and also in many Eastern European Countries in the 1990s when undergoing a transition from centrally planned to market based economies. The experiences in these countries

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have u to form the FFP approach to land administration. Rwanda provides one of the best examples, where a nationwide systematic land registration started after piloting in 2009 and was completed in only four years. Boundaries of spatial units (plots of land) were identified on prints of orthophotos in a highly participatory approach using locally trained land officers acting as trusted intermediaries. This reduced the need for conventional surveying techniques to a minimum. The highly efficient approach resulted in 10.4 million parcels being registered and 8.8 million land lease certificates being issued. The average unit cost was around US\$ 6 per spatial unit. This radical approach required considerable political commitment to achieve in the timeframes. Benefits are already being accrued, especially in social stability and economic development, and the national framework of land rights is providing opportunities for raising property based taxes, improved state land management, greater inward investment and better stewardship of land. Prior to this initiative, only 40,000 of Rwanda's spatial units had been registered.

This new type of approach in creating integrated and scalable land administration solutions has the following characteristics:

- The solution is directly shaped by the country's requirements for managing current land issues and is not biased towards the need to always use the latest technology and costly, time consuming field survey procedures.
- A countrywide solution encompassing all tenure types and all land is attainable within a reasonable timeframe, depending on size of country, and is affordable.
- The 'minimal viable product' (MVP) philosophy is adopted to create an entry point solution that is initially suitable for the stakeholders' needs. The outcome can then be upgraded in terms of the quality and scope of evidence of land rights information when relevant and required according to societal development.
- The solution can be adapted to different regional needs within a country, e.g. differences in topography and density of development, to provide solutions along variations in types of tenure (the continuum of land rights) that are most appropriate to specific regions and communities.
- The creation and maintenance of the solution is sustainable through the use of a network of locally trained land officers that expands the outreach of the limited number of land professionals.

This approach is called Fit-For-Purpose (FFP) land administration and has emerged as an enabler, accelerator and game changer and offers a promising, practical solution to provide security of tenure for all and to control the use of all land. UN-HABITAT Global Land Tool Network (GLTN) as recently released a reference document "Fit-For-Purpose Land Administration Guiding Principles," authored by Prof Stig Enemark (Aalborg University), Dr Robin McLaren (Know Edge Ltd) and Dr Christiaan Lemmen (Kadaster). Politicians and senior civil servant decision makers involved in formulating policies in the land sector need to read this Guide to start solving their land issues (Enemark et al, 2015).

3.1.2 Technology Supporting Direct Citizen Capture of Land Rights

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A good example of the innovative use of new technology to accelerate security of tenure is the USAID Mobile Applications to Secure Tenure (MAST) project in Tanzania (USAID 2015). USAID has completed an innovative pilot that utilised an easy-to-use, open-source mobile application that can capture the information needed to issue formal documentation of land rights. Coupled with a cloud-based data management system to store geospatial and demographic information, the project is designed to lower costs and time involved in registering land rights and, importantly, to make the process more transparent and accessible to local people. The project was implemented in rural Tanzania working directly with villagers (trusted intermediaries) to map and record individual land rights, strengthen local governance institutions, and build government capacity.

Following best practices, the MAST team provided training on land laws to raise awareness of women and men's legal rights and worked with community institutions to strengthen capacity to implement these laws. The team also conducted outreach efforts to ensure that mapping and registration processes were participatory, see Figure 1. Through MAST, local people were trained in data collection and verification and the results of mapping activities were presented to community-wide gatherings for validation. The Ministry of Lands then had the information necessary to issue MAST beneficiaries with official Certificates of Customary Right of Occupancy.



Figure 1: Trusted Intermediary Capturing Evidence of Land Rights on Mobile Phone
(Source: USAID)

3.1.3 The Rise of the Trusted Intermediary

A key feature of these citizen centric approaches is the use of a network of locally trained land officers acting as trusted intermediaries and working with communities to support the identification and adjudication process. This approach builds trust with the communities and allows the process to be highly scalable. The training, support and supervision of these local land officers requires new

strong partnerships to be forged with land profession associations, NGOs, CSOs and the private sector. The land administration institutions need to introduce strong supervision of these partners with an associated quality monitoring program. The recruitment process for these local land officers can be very simple: those who apply have to demonstrate that they can understand aerial images, find their position on an image and have the attention to detail to draw boundaries. Over time, the trusted intermediaries will most likely self-organize into collaborating networks and resources may be shared with other information services, e.g. health and agriculture.

A good example of this approach is the BRAC's 'Property Rights Initiative' in Bangladesh (BRAC 2014). A key component of this program was the creation of a new class of government-certified BRAC *amins* or land entrepreneurs. These entrepreneurs were trained by BRAC to measure land and certify property rights, as well as deliver a range of other services and human rights monitoring for their local communities. Land entrepreneurs have the opportunity to earn an income from their survey work while also carrying an obligation to provide free surveys and services to the local poor.

4. NEW, INNOVATIVE SOURCES OF INFORMATION FOR LAND INDICATORS

The UN Secretary General has proposed that the framework for monitoring progress towards the SDGs should take full advantage of the data revolution offered by new ICT and that necessary innovations should be embedded within national data collection and statistical systems; thereby stimulating innovation in data collection, analysis and communication resulting in gradual and sustainable improvements in monitoring capacity. Increasingly, comprehensive datasets are becoming available globally as a result of ICT and Internet connectivity, including growing capacity of mobile phones in developing countries, and the expansion of crowdsourcing for global data. "Big data" must be accompanied by "big analysis", however, and the full potential from the data revolution will only be realised if the detailed, lengthy work in data analysis can be undertaken. Nevertheless, specific opportunities are likely to emerge, for instance for, increased coverage and rapidity in analysis and reporting of household survey data, meta-analysis of multiple data sets, and crowd-sourcing of data on topics such as indigenous and community land claims and land disputes, as well as the interoperability of global data bases and platforms and integration of spatial and socio-economic data sets for both national and global level analysis, reporting and communication of findings. With the right combinations of skills and expertise, and strong institutional and stakeholder partnerships, significant levels of aspiration and ambition are appropriate, alongside a necessary focus on a set of feasible, meaningful and relatively simple land indicators (GLII, 2015).

This section identifies a wide range of innovative land rights initiatives that are adopting this data revolution.

4.1 Crowdsourcing Evidence of Land and Resource Rights

The range of devices in the mobile ecosystem, such as tablets, cameras, GNSS, mobile remote sensing / photogrammetry and mobile power, are enabling citizens or trusted intermediaries to

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directly capture evidence of land rights (McLaren, 2011). An increasing number of crowdsourcing of land rights initiatives are emerging to provide increased security of tenure to vulnerable communities. A selection are discussed below:

- **Rights Resources Initiative (RRI)** – RRI’s forest tenure database is an interactive tool to compare changes in legal forest ownership from 2002 to 2013 between countries, regions, and lower- and middle-income countries. The quantitative approach monitors spatial forest tenure data—that is, who owns how many hectares of a given forest. RRI recognizes four categories of land ownership: owned by Indigenous Peoples and local communities, designated for Indigenous Peoples and local communities, administered by governments, and owned by individuals and private firms. Learn more about these categories here. This statutory forest dataset currently covers 52 countries containing nearly 90% of the world’s forests. Much of the information is crowdsourced.
(<http://www.rightsandresources.org/en/resources/tenure-data/tenure-data-tool/>)
- **Rainforest Foundation UK** - Rainforest Foundation UK's "Mapping for Rights" program has been active in the Democratic Republic of Congo. It trains forest people to map their land using GPS devices, marking the areas they use for activities such as hunting and fishing -- as well as their sacred sites -- and the routes they use to access these vital areas. The information captured is used to create a definitive map of the land used by these semi-nomadic communities, which can be used to challenge decisions that see them excluded from areas of forest (<http://ictupdate.cta.int/en/Feature-Articles/Crowdsourced-land-rights/%2869%29/1353928539>).
- **Open Tenure (SOLA)** - Open Tenure supports a crowd sourcing approach to the collection of tenure related details by communities. Once the community has discussed and agreed to the way tenure right claims will be collected, moderated and displayed a Community Server will be established (possibly as a cloud-based server) and community members with specific roles in this process will be trained
(http://www.fao.org/fileadmin/user_upload/nr/land_tenure/OPEN_TENURE.pdf).
- **Landmapp** – Landmapp is a mobile platform that provides smallholder farmer families with documentation of their land. They also provide them a profile with which they can access technical and financial services that are precisely tailored to their circumstances
(<http://www.landmapp.net>).
- **Cadasta Foundation** – This foundation is implementing a global platform to manage crowdsourced land rights information. It is due for release in 2016 and could provide a common platform for all the currently discrete land rights initiatives to manage evidence of land rights and create transparency and publicity (<http://cadasta.org>).
- **STDM** - A pro-poor, gender responsive and participatory land information model recognising the need for legal pluralism and a broader set of person-land relationships found in legitimate tenure types. GLTN have also produced a STDM solution, based on QGIS, that manages land rights data in the STDM model (<http://www.stdm.gltn.net/>; FIG/GLTN, 2010).

4.2 Potential New Innovative Sources of Land Information

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A number of innovative approaches are emerging to remotely derive land information. Two crowdsourcing examples are described below:

4.2.1 Crowdsourcing information from satellite imagery

The DigitalGlobe's Tomnod platform (<http://www.tomnod.com>) is using Artificial Intelligence(AI) powered by crowdsourcing to automatically identify features of interest in satellite and aerial imagery. Tomnod runs crowdsourcing campaigns that attract 10,000s of volunteers around the globe. One campaign is mapping populations across Ethiopia. Population data is important for growing economies and stopping the spread of preventable diseases. Volunteers are supporting the mapping of Ethiopia by validating the results of a village detection image mining algorithm. These techniques could equally be applied to efficiently mapping land parcels

4.2.2 Passive Crowdsourcing from Mobile Phones

The location of mobile phones carried by members of a community can be passively monitored over a period of time to track the movements across their territory. Overtime, the extent of these recorded tracks will define the boundaries of their land and resource rights.

4.3 Crowdsourcing Perception of Insecurity of Tenure

The increasingly pervasive mobile phone in developing countries provides opportunities for obtaining data on citizens' / communities' perception of tenure insecurity. A number of options are discussed below:

4.3.1 Extending existing community mapping initiatives

This option would use the opportunity of engagement with communities through existing community mapping initiatives. A significant number of community mapping initiatives are being activated across the globe. Examples include:

- The Extreme Citizen Science (ExCiteS) research group at UCL are recording community resources with forest villages (it is described at <http://www.scidev.net/global/indigenous/multimedia/mapping-the-congo.html>). This could be extended to ask the anthropologists who are working in the field to talk about perceptions of ownership and land use.
- The OpenDRI initiative of the World Bank involves extensive OSM mapping with a focus on disaster preparedness. A good example is in Kathmandu, Nepal (<http://www.youtube.com/watch?v=L2IFYJigcQs>). Specific mapping sessions with OSM could include collection of perception data.

4.3.2 Radio awareness campaign & voice crowdsourcing

Local radio communication campaigns could be designed with facilities for citizens to leave voice messages or SMS responses. The deciphering and geo-referencing of the voice messages could be crowdsourced.

4.3.3 Big Data

The evolving capabilities of big data and big analyses may prove to be another effective way of deriving perceptions of insecurity of tenure across communities and regions. The use of datasets such as property valuations, micro-financing, mortgages, addresses, business registers, school registers, census, marketing campaigns, social security payments, property tax, agricultural grants, mobile phone users could be used to model, analyse and derive perceptions of insecurity of tenure, especially when many of the datasets are georeferenced.

4.3.4 Outreach through building a community

This option would either build a new community or use an existing community that can report on land tenure issues. It would take a similar approach to the UNICEF uReport outreach to youth in Uganda. This is a free SMS-based system that allows young Ugandans to speak out on what's happening in communities across the country, and work together with other community leaders for positive change

4.3.5 Outreach through existing information service infrastructure

Rather than use field resources dedicated to land information services, this option would use established trusted intermediaries that are currently contributing to other information services, such as health and agricultural services, to extend their reporting to land issues.

4.3.6 Market research with SMS surveys

Another possibility would be to use the more "unexamined" type of crowdsourcing. SMS based surveys can be arranged through mobile service providers, globally. For example, Geopoll (<http://research.geopoll.com/>) is the world's largest mobile survey platform, with a database of 200 million users in Africa and Asia. The approximate cost is around \$5 / completed survey.

4.3.7 Outreach through Social Media

The increasing use of social-media (Facebook, Twitter, LinkedIn, WhatsApp....) across the globe (Facebook now has over 1.6 billion users) provides excellent opportunities to tap into these communication channels and forums to derive information on perception of insecurity of tenure.

5. DISCUSSION

Although many of these new sources and channels for capturing evidence of land rights and indicators, such as perceptions of insecurity of tenure, are already delivering successful projects. However, there are several key issues to be investigated, understood and resolved before the approaches can be widely accepted and can go to scale. Issues such as:

- What are the technological limits and opportunities (across a scale of technologies, from simple SMS to 3D smartphones, gathering simple geo-text through to surveyor quality coordinates)?
- How and where is this crowdsourced data stored and accessed?
- How can engagement be maximised and can campaigns be promoted across communities? What is required to make crowdsourcing go to scale?
- What motivates communities to participate, particularly in the long term, such that projects avoid being dependent on external incentives? What rewards might encourage continued participation?
- How can data quality be managed and what is the infrastructure required for communities to police their data collection efforts?
- What are the ethical issues related to the data capture of evidence of land rights? How do such projects sit in the context of customary lore and how do communities adjust to western ideas of land tenure and the alienation of land?
- How is this information used in decision making? Where are those decisions made, and how do such projects improve the quality of decision-making and community participation? More broadly what are the socio technical issues and how does the technology disrupt power relationships within and outside the community?
- How will citizens be convinced to trust these solutions and understand the benefits of participation? How will privacy and security of information be managed effectively to provide the necessary security of these sensitive sources of land rights information?

6. CONCLUSIONS

Traditional sources of data to support land indicators for national statistical systems are highly incomplete in many countries around the world. Due to lack of standards, the data are inconsistent and it is very difficult to integrate this information into a global view. Approaches such as Fit-For-Purpose Land Administration and new technology will hopefully accelerate access to more of this formal land information. However, new innovative sources of data need to be explored to quickly

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create a much more comprehensive and meaningful set of statistics that are technically feasible, politically acceptable and obtain stakeholder ownership. This paper has identified a number of the more promising new sources that can provide an insight into the size of the security of tenure gap and help plan priorities for its reduction.

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BIOGRAPHICAL NOTES

Robin McLaren is director of Know Edge Ltd a UK based, independent management consulting company formed in 1986. The company supports organizations to innovate and generate business benefits from their geospatial information. Robin has supported national governments in formulating National Spatial Data Infrastructure (NSDI) strategies. He led the formulation of the UK Location Strategy and has supported similar initiatives in Kenya, Hungary, Iraq, Western Australia, Kuwait and Canada. He has also supported the implementation of the EU INSPIRE Directive in the UK and was a founding member of the UK Location Council. Robin is also recognized as an expert in Land Information Management and has worked extensively with the United Nations, World Bank and EU on land policy / land reform programs to strengthen security of tenure and support economic reforms in Eastern and Central Europe, Africa, Middle-East and the Far-East. He has co-authored the FIG / World Bank publication on 'Fit-For-Purpose Land Administration' and a more detailed 'Fit-For-Purpose Land Administration Guiding Principles' for GLTN providing legal, spatial and institutional guidance aimed at less developed countries. His recent research focuses on the innovative use of crowdsourcing to support citizens in directly capturing their land rights.

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