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LAND AND DEVELOPMENT:

A RESEARCH AGENDA FOR LAND AND RESOURCE GOVERNANCE AT USAID

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A Research Agenda for Land and Resource Governance at USAID

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ACRONYMS

CEL	Communications, Evidence, and Learning
CLPP	Community Land Protection Program
D&G	Democracy and Governance
DO	Development Objective
ESG	Environmental, Social, and Governance
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GLTN	Global Land Tool Network
IDP	Internally Displaced Person
IE	Impact Evaluation
IFAD	International Fund for Agricultural Development
IR	Intermediate Results
LGSA	Land Governance Support Activity
LRG	Land and Resource Governance
LU	Office of Land and Urban (USAID)
MAST	Mobile Applications for Secure Tenure
MCC	Millennium Challenge Corporation
RCTs	Randomized Control Trials
SDG	Sustainable Development Goal
SIP	Sustainable Intensification Practices
SO	Strategic Objective
ToC	Theory of Change
UN	United Nations
USG	U.S. Government

EXECUTIVE SUMMARY

This Research Agenda positions land and resource governance (LRG) within USAID's goal of promoting the journey to self-reliance and provides the foundation for USAID and others to undertake a carefully considered, systematic approach to reducing key knowledge gaps in the LRG sector. This is the first attempt in almost two decades to synthesize USAID's experience with LRG programs and the state of the evidence into a single document, which will guide USAID's learning priorities on LRG in the coming years. In revisiting these issues, this Research Agenda relies upon others' efforts to synthesize, systematize, and render accessible the enormous amount of accumulated evidence on the relationship between LRG and key USAID development objectives.

For more than 50 years USAID has been a significant donor in the LRG sector. The Agency's LRG programs historically focused on the development nexus with agricultural outcomes, although these programs now cover a wide-range of sectors. Over the years, the Agency has also committed resources to learning and adaptive programming, most notably with establishment of the Land Tenure Center at the University of Wisconsin. For the first three decades of USAID's existence, the Center provided the Agency with extensive programmatic and technical expertise. Much of what we understand today about LRG programs is a result of USAID-funded research by the Center. Unfortunately, due to multiple factors, including an 86 percent decline in evaluations across the Agency, as of 2003 USAID produced only one counterfactual study on the development impact of its significant LRG programs.

In the first decade of this millennium, LRG research and evaluations experienced a revival. Over the last 15 years, USAID produced a large and diverse volume of research and evaluations on LRG, with more than 150 research products, including eight impact evaluations and eight performance evaluations. USAID has thus been instrumental in improving the evidence base and advancing evidence-based programming.

A thorough analysis of high-quality systematic reviews, meta-analyses, and other studies, has identified the following key findings on the state of the evidence:

- Insecure land tenure is widespread in the developing world, a condition that has far-reaching social, environmental, and economic consequences. Addressing tenure insecurity is necessary but is often not enough to guarantee positive development outcomes.
- Ample evidence links improvements in LRG with better economic growth.
- Formalizing land rights will not lead to improved access to formal credit, unless other conditions are also met. Yet, innovative financial models may prove viable, especially in Africa.
- Strengthening land rights can lead to substantial increases in on-farm investment, however more rigorous evidence is needed on how land rights are linked to productivity, food security, and income.
- Carefully constructed LRG policies – such as strengthening the rights of Indigenous Peoples and customary communities – in conjunction with other policy levers to protect forests, can reduce deforestation and help mitigate climate change, while also improving incomes and contributing to economic growth.
- Strengthening women's land rights has a significant positive impact on women's empowerment. However, research on this important topic remains thin, and the evidence base must be strengthened. Notably, more rigorous evidence is needed on the link between strengthening women's land rights and poverty alleviation.
- Land is a significant driver of conflict, particularly in Africa. The twin forces of climate change and population growth will likely exacerbate land conflict in the near future. However, rigorous research on the extent to which LRG can decrease the likelihood and recurrence of conflict is scarce.

The review also provided insights into the methodological gaps in existing LRG research. Specifically:

- Surprisingly little rigorous research, including impact evaluations and longitudinal studies, compared to other development fields. In particular, a lack of rigorous research on the intersection of LRG and food security, conflict, fisheries, and urbanization. As a result, systematic reviews can examine only a narrow subset of LRG linkages.
- A lack of longitudinal studies on long-term LRG impact, especially in Africa, less so in Latin America and Asia.
- Too few studies investigate more than one link of the causal chain, and in particular too few studies examine links between LRG and multiple consecutive links in the causal chain. A realist synthesis approach may help fill this important gap in our understanding of the relationships between intervention, context, mechanism, and outcome.
- Too few studies employ mixed methods approaches that use qualitative and quantitative data collection and analysis.
- Studies too often measure tenure security at the household level, obfuscating potentially critical differences in how secure different members of the household feel, especially women and girls.
- Studies too often treat beneficiaries as a homogenous category, failing to account for differences between women and men, the old and the young, and the poor and the wealthy, among others.
- Few, if any, rigorous studies have examined the effects of statutory recognition of customary tenure.
- Too many studies use 'title' as shorthand for tenure security, failing to appreciate differences between perception and documentation. However, this is changing as the Sustainable Development Goal 1 indicator on land distinguishes between perception and documentation.
- Studies focus disproportionately on measuring the impact of titling programs, to the exclusion of measuring the impact of programs that combine multiple LRG interventions, such as titling and community governance, land administration, legal reform, conflict resolution, and social-behavioral change.

Our review of the evidence, coupled with insights from multiple LRG experts, provide the basis of the following research priorities organized by thematic and sectoral area, which are expanded upon in Section VI.

Theme	Topic
Theme 1: Cross-cutting Research Topics	**Customary tenure and the continuum of rights**. Further research should examine the emerging class of formalized customary rights and its impact on key sectoral outcomes, looking specifically at the features of this new hybrid system, the insecurity that each system (formal, customary, formalized customary) is best at addressing, and whether some formalized customary rights regimes have been more successful than others in reducing threats and obtaining positive development outcomes. **Links between titling, documentation, and tenure security**. Although titling and other formal and informal mapping and documentation programs generally lead to improved tenure security, why is this not the case in some contexts? Are there other documents (for example, contracts) that make holders feel more secure than do titles? If titling does not increase security, then what does? Although the literature calls attention to the importance of context (Deininger and Feder 2009), more rigorous research is needed.

	LRG and what else? Digging into 'necessary but not sufficient.' A better understanding of which complementary conditions are most important, and how to leverage LRG programs with complementary programs, would be valuable for policy and programming. As the Higgins et al. systematic review finds, there is not enough rigorous evidence on the impacts of LRG programs when combined with non-LRG programs.
Theme 2: Economic Growth	**Unpacking the link between LRG and economic growth**. Studies show a strong link between LRG and economic growth, particularly on a macroeconomic level. However, further research is needed to examine how this link works. **Economic growth for whom, and what additional enabling conditions are required?** LRG is correlated with robust macroeconomic growth, however it is not clear how this link plays out on a micro level, and in particular whether LRG-related economic growth occurs on the backs of certain vulnerable groups.
Theme 3: Women's Empowerment	**More rigorous, longitudinal research, especially on intra-household bargaining power and decision-making.** Given the critical importance of women's empowerment to development writ large, and given the promising links between LRG and women's empowerment surfaced by the few rigorous studies we do have, this entire sector deserves a large investment in rigorous, longitudinal research. **Testing the link between women's LRG and poverty alleviation**. While it may seem reasonable to assume that strengthening women's land rights can reduce poverty, no studies demonstrate this specific link. **Developing more accurate and nuanced methods for assessing the impacts of LRG programs on women**. In order to capture these nuances, the land sector should prioritize studies with high sample sizes and counterfactuals, studies that account for the heterogeneity of women (rather than treating them all as a single category), and studies that survey women specifically, instead of conducting research at the household level. **Formalization of women's land rights and spousal death or divorce.** Research should explore what exactly is driving women's insecurity in certain contexts, and which LRG programs protect women in the event of spousal death or divorce. **Social norms and women's land rights.** Changing social norms is as necessary to promoting women's empowerment as is statutory tenure reform (Prindex 2019). More research is needed to understand how changing social norms can be best accomplished.

Theme 4: Sustainable Landscapes and Biodiversity	**Which LRG programs are most cost-effective in mitigating climate change and how to address economic trade-offs?** While the link between certain LRG programs (e.g. protection of indigenous land rights), soil conservation, combatting deforestation, and mitigating climate change is well established, there is significantly less research on the cost-effectiveness of specific types of LRG programs. Not much research looks at the costs of implementing these programs, including the opportunity costs and economic trade-offs to program participants who may forego the economic gains associated with landscape conversion in favor of reduced externalities and broader public gains. **Unpacking the links between private tenure, forest protection policies, and deforestation.** What types of forest protection policies can reduce deforestation and increase reforestation on private lands? Why, and in what contexts, does improved tenure security on private lands contribute to reduced deforestation and increased reforestation? If improved private tenure security increases deforestation and reduces reforestation, why? Are there cases of sufficient forest protection policies without private tenure security that resulted in positive forest outcomes? Given the importance of secure private tenure for investment, productivity, markets, incomes, and economic growth, this line of research could investigate how to effectively manage trade-offs between economic growth and deforestation and the role of secure private tenure. **Integrating indigenous knowledge into the design of LRG programs.** A key unanswered question is how to effectively incorporate local and indigenous communities, especially traditional land management practices, into the design of LRG programs. A related unanswered question is whether a community's level of trust, social cohesion, and collective action can be augmented or resuscitated in situations where it has been depleted? **More studies that incorporate spatial analysis and more spatially explicit econometric studies, particularly in Africa and Asia.** Despite a proliferation of mapping databases like LandMark, and the increased availability of geospatial imagery at various temporal and spatial resolutions, there are relatively few spatially explicit econometric studies in Africa and Asia on the link between tenure security, community forestry, sustainable landscapes, and biodiversity outcomes. **What is the link between LRG, sustainable intensification practices (SIP), and reducing environmental damage?** A farmer's decision to intensify crop production inside their existing footprint, instead of expanding into forests and other landscapes, can reduce the environmental damage that comes with landscape conversion. However, while some scholars hypothesize that LRG programs will prompt farmers to pursue SIP (instead of expansion), there is little research to prove this.

Theme 5: Food Security and Resilience	**Long term impacts of LRG on food security.** More rigorous evidence is needed on whether LRG leads to long-term food security impacts. Research may include longitudinal studies that follow up on USAID or other donors' impact evaluations, as well as remote sensing research to measure land use and land cover trends and understand impact over a longer time period. **Taking another look at credit.** Research should dive into the full spectrum of mechanisms by which land rights can and do facilitate informal or innovative credit access, the conditions that are needed for various mechanisms to be viable, the extent to which customary land rights can be used to access credit, and what can be done by policymakers to strengthen and promote these mechanisms. **Taking another look at productivity and income.** A review of two recent LRG meta-analyses revealed that while the average exposure period for all studies was more than 10 years, for food security studies it was only six years. Given the critical importance of productivity and income within the food security causal chain, it is worth investing in longitudinal studies that can answer the question of whether LRG translates into productivity and income gains or not. **Farmland tenure models in Africa.** Landholding in Africa's agricultural sector used to be dichotomous: producers were either smallholders or large-scale commercial operators. Now that is shifting, with the rise of medium-scale farms (Jayne et al. 2019). Additional research is needed on the advantages and disadvantages of these alternative land tenure models.
Theme 6: Conflict, prevention, and stabilization	**Improved cross-national data on the causes of land conflict, particularly when it comes to non-State actors.** Further research should dig into the motivations behind land conflict, as well as into the reasons why land insecurity may contribute to conflicts that are not themselves land-related. **Is LRG an effective way to prevent conflict?** We know communities and individuals fight over land, but is improving LRG an effective means of preventing these conflicts? If so, what types of LRG programs are most effective at preventing or mitigating conflict? Is titling, for example, more effective than strengthening local dispute resolution mechanisms? And are there certain types of conflict that different LRG programs are better able (or not) to prevent or mitigate? **The link between climate change, migration, and conflict.** More rigorous research is needed on the potential for LRG programs to mitigate climate-related displacement and the ensuing governance challenges. **The relationship between improved LRG and large-scale land-based investment.** Does improving the land tenure of the local communities, including through formalizing customary tenure, help head off adverse land-based investments by the private sector? Might the very act of tenure recognition render a piece of land more attractive to outside interests, because it provides clarity as to the interest in the land? Further research should examine this link to understand how LRG programs in desirable areas should be structured, and thus prevent unintended consequences. **Effective mechanisms for post-conflict property restitution.** LRG is critically important to post-conflict recovery because property is often the most

	valuable asset of those displaced by conflict. And yet, while the existence of restitution programs is important, other factors must be in place for these programs to work quickly and equitably, and for them to be considered legitimate. What are these other factors, and how can governments who may be in the early stages of rebuilding acquire the capacity to effectively restitute land? Would involving local leaders and community members foster trust and help to develop local-level institutions that are better able to ensure that returnees have secure property rights?
Theme 7: Research on Emerging LRG topics	**Ground truthing new land rights approaches.** New people-centered approaches (community mapping, crowdsourcing) place communities at the center of processes to map and document their property rights. Not only that—new research suggests that digital trails (smartphone location data, social media posts, and online purchase histories, among others) can provide rich data to supplement traditional evidence of land and property claims. Can this locally derived data be trusted by various stakeholders as a basis for making decisions regarding land and resources? **Are new technologies delivering on their promise?** New technologies promise to make it faster, easier, and cheaper to map and record land rights at scale. Are these promises bearing out? What are the contextual factors that make or break the adoption of these technologies? Are these technologies leading to unintended consequences, both positive and negative? **LRG and managed coastal retreat.** Rising oceans threaten to inundate vulnerable coastal areas and low-lying islands. In cases where adaptation is not feasible, there will have to be a strategy for relocating people, either by incentivizing them to move voluntarily or through a planned, proactive relocation. Research is required to prepare national LRG systems to accommodate large-scale displacement and property loss. **The impact of urbanization on land rights.** Recent research by the European Commission shows that 84 percent of the world's population lives in urban areas. Urbanization rates in Africa and Asia are at 80 percent and 90 percent, respectively (Dijkstra et al. 2018). What are the impacts of this mass urbanization on tenure security in urban settings (to which people are flocking), rural settings (which people are leaving and sometimes returning to access land) and peri-urban areas (which are expanding as cities swell)? What are the implications of this massive shift, for USAID LRG programming? **Urban MAST.** USAID's MAST project developed a new approach that uses smartphones to map land parcels and compile information needed for first-time land registration. Following pilots in rural areas of Tanzania and in a peri-urban commune in Burkina Faso, MAST has proven to be an effective, low-cost, and participatory system for formalizing rights and creating land information systems. The MAST approach holds promise for urban areas as well, but adapting it to an urban context entails a number of complications. For example, urban settings require greater accuracy due to higher population density. Research could thus pilot and test different options for adapting MAST to urban environments. **Private sector perceptions, policies, and practices related to land tenure risk.** Little information exists about investors' attitudes and practices towards LRG. A recent study found that less than 10 percent of companies have

	public, normative statements on LRG (Stevens et al. 2019). This begs the question: to what extent do investors prioritize land tenure risk amongst other Environmental, Social, and Governance (ESG) factors? To what extent do they feel equipped to address land tenure risk, or do they instead make a decision to either write off the risk or not proceed with investments? Do investors in certain regions, or in certain sectors, prioritize land tenure risk differently? How many investors are making normative commitments related to land tenure risk (what are those commitments, and in which fora are they made?), and how well do those commitments align with actual practice? **Sustainability of land administration systems.** Building on DFID's recent Land at Scale report, which analyzes lessons learned from DFID's land regularization programs, research should examine why some first-time registration programs have taken hold and others have not, and which lessons we can draw for future programming, including the sustainability and cost-effectiveness of impacts (Deininger and Feder 2009). **How must legal frameworks adapt to take advantage of new land technologies?** Research could examine how national legal frameworks must adapt to new technologies and other innovations, while providing examples of best practices. **Better understanding of the artisanal and small-scale mining sector.** Under what conditions can efforts to formalize and regulate the mining sector have a positive impact on a country's journey to self-reliance? And how should formalization efforts engage with customary tenure systems? Finally, is formalized tenure better able to resist encroachments on the ASM sector by transnational criminal organizations and other actors external to ASM communities?

INTRODUCTION

Mark Twain famously quipped, "Buy land, they aren't making it anymore." Land is a finite, ubiquitous, and fundamentally important asset. In developing countries, real property, whether land, housing, or natural resources, constitutes a substantial part of national wealth.[1] If well managed, land can be an engine for economic development and a pathway towards self-reliance. But when poorly managed, it can exacerbate inequality, corruption, and conflict. Whether land is used for good or ill, as an asset or a liability, land is shaped by the country's land tenure system, also referred to as land and resource governance (LRG).

What is land and resource governance? LRG encompasses a broad understanding of how land is interwoven into a country's economy, social fabric, and politics. It is useful to contrast LRG with related terms. Economists and anthropologists originated the term land tenure, which is the relationship that individuals and groups hold with respect to land and land-based resources, such as trees, minerals, pastures, and water. Land tenure rules define the ways in which property rights to land are allocated, transferred, used, or managed in a particular society (USAID n.d.). Meanwhile, lawyers often prefer the term real property. Lawyers outside international development circles tend to focus narrowly on formal legal rules rather than the complex pluralistic norms that make up most people's relationship to land. For most developing countries, formal state law governing land and resources is only one of several sources of norms, and often not the most influential one.

By the time the UN Voluntary Guidelines on the Responsible Governance of Tenure were adopted in 2012, experts had begun using the term 'land and resource governance.'[2] For the purposes of this Research Agenda, land tenure and land and resource governance, or LRG, are used interchangeably. However, LRG is broader than land tenure and denotes that land, and its associated structures and resources, touch on disparate elements of a country's society, culture, politics, economics, and history. Put another way, LRG refers to the bundle of rules, rights, policies, processes, institutions and structures created to manage the use, allocation of, access to, control, ownership, management, and transfer of land and land-related natural resources. LRG recognizes that one cannot fully understand a country's past, present, or future without understanding its people's relationship to their land.

This proposition may seem grandiose to those in the developed world. In wealthy countries, only the most vulnerable or those engaged in complex business transactions are likely to be aware of their LRG systems because those systems generally function well. Nevertheless, as many as 1.5 billion people globally experience insecure land and property rights (Prindex 2020). In developing countries, LRG systems often serve the interests of the privileged few at the expense of the public interest. Ineffective LRG has repercussions for all facets of governance and economic activity. Put starkly, without an effective and inclusive LRG system, the rapid economic development needed to eradicate poverty is impossible.

One of the most influential works on land and resource governance is the 2003 World Bank report *Land Policies for Growth and Poverty Reduction*. This report argues that secure property rights can play a significant role in economic growth, poverty reduction, good governance, and sustainable development in several

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[1] No reliable data exists on the global economic value of all land, housing, real property, and natural resources. However, World Bank data on natural resource extraction rents (or revenue above the cost of extracting the natural resources) is suggestive. Natural resource extraction rents accounted for 2.151% of global GDP in 2017 or 1.72 trillion US dollars. The presence of rents typically suggests market inefficiency and broader governance dysfunction. Rents can be in the form of bribes or other illegal action that harms overall productivity, value, and wealth creation. Thus, this data constitutes merely the tip of the iceberg in terms of the global economic importance of LRG.

[2] There is no definition of this term in the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security, however. For more on this issue see Munro-Fuare & Palmer 2012.

ways: 1) incentivizing investment and improving access to credit, 2) reducing expenditures on defending one's land against encroachment, 3) promoting market efficiencies by, for example, landowners renting out their land to take up higher value off-farm employment; 4) economic empowerment for women, and 5) supporting democratic and participatory local development (Deininger 2003).

As discussed below, these arguments are reflected in many elements of USAID's 2013 Land Tenure and Property Rights Framework and Matrix and GLTN and IFAD's recent theory of change for land tenure programs. Both products are valuable contributions, which benefited from leading experts on LRG. The Framework and Matrix provides a coherent structure for diagnosing LRG development constraints across sectors and resource type and prescribing appropriate programs (USAID 2013). GLTN and IFAD's theory of change is the first such model that unpacks the various assumptions and causal chains that should, in theory, explain how specific LRG programs result in higher level development impacts, such as poverty reduction, economic growth, and self-reliance. Unfortunately, for many of these causal pathways the evidence is scant (Lisher, GLTN/IFAD 2019).

Nevertheless, in the years since the development of USAID's Framework and Matrix and the publication of *Land Policies for Growth and Poverty Reduction*, a substantial body of research has been carried out on LRG issues, and the state of evidence and knowledge in the sector has improved dramatically. More rigorous, mixed methods impact evaluations, systematic reviews, and meta-analyses are emerging. And data from the Sustainable Development Goal 1 indicator on land tenure as well as the Property Rights Index promises the first globally comparable, data-driven answer to the question: how many people in the world lack secure property rights? Yet many unanswered questions remain. Too often policies and programs are designed with an insufficient or non-existent evidence base to draw on.

Building on this prior work, this Research Agenda positions LRG within USAID's goal of promoting the journey to self-reliance and provides the foundation for USAID and others to undertake a carefully considered, systematic approach to reducing key knowledge gaps in the LRG sector. This is the first attempt in almost two decades to synthesize USAID's experience with LRG programs and the state of the evidence into a single document, which will guide USAID's learning priorities on LRG in the coming years. In revisiting these issues, this Research Agenda relies upon others' efforts to synthesize, systematize, and render accessible the enormous amount of accumulated evidence on the relationship between LRG and key USAID development objectives. Finally, this Research Agenda is intended as a living document to be revisited periodically as USAID priorities and strategies adjust and new data and evidence emerges.

The Research Agenda is organized as follows. First, we provide a brief history of USAID's engagement on land tenure from the Agency's origins to 2003, with a focus on key inflection points, such as adoption of Policy Determinations and retrospective analyses. We then briefly discuss USAID's recent experience with evaluations and research, as part of a general resurgence across the Agency from the early 2000s onward. Next, we situate LRG within the broader context of the journey to self-reliance by presenting the state of the evidence for causal links between LRG programs and USAID objectives across a range of different sectors. Finally, we lay out research and evaluation priorities for USAID to improve evidence-based programming and policymaking so that USAID and other donors may ultimately program more effectively and for maximum impact.

A BRIEF HISTORY OF LAND TENURE AT USAID, 1961 TO 2003

This section summarizes the Agency's engagement with land tenure[3] from its inception in 1961 to 2003, when USAID commissioned a retrospective evaluation of land tenure programs in Eastern Europe and Central Asia in the 1990s and early 2000s. Based on a review of 174 relevant sources from USAID's Development Clearing House, this section centers on key inflection points on policy and learning from 1961 to 2003. These are: establishment of the Land Tenure Center; the Alliance for Progress; the 1970 Spring Review on Land Reform; the 1979 Policy Determination on Land Reform; the 1986 Policy Determination on Land Tenure; and a 2003 retrospective evaluation on the impact of USAID's LRG programs. Given this structure and focus, this brief discussion is not comprehensive.

Nevertheless, since its creation, USAID has provided land tenure assistance to numerous countries across a variety of issues, and many of these initiatives have produced remarkable impacts. For instance, USAID helped establish community concessions in Guatemala's Maya Biosphere Reserve in the early 1990s and maintained high levels of sustained support (USAID DCA n.d.). These impacts include saving a massive area of tropical forest and improving the livelihoods of indigenous peoples and customary communities (Blackman 2015). These, and many other success stories, such as groundbreaking work on tree tenure by the Land Tenure Center and peri-urban issues, are not included here for the sake of brevity and given the focus on key policies and inflection points. Fortunately, reflecting the cross-sectoral concept of land and resource governance, LRG programs today are linked to a variety of development sectors and challenges, including conflict, sustainable landscapes, biodiversity, domestic resource mobilization, transnational crime, and many others.

Until relatively recently, however, USAID land tenure policy focused almost exclusively on the development nexus with agricultural outcomes. The only land tenure policies issued by the Agency between 1961 and 2003 were focused on the relationship of land tenure to smallholder farmers, farm distribution, and agricultural investment, productivity, and markets. Then, as now, most of the world's poor lived in rural areas.[4] However, Sub-Saharan Africa, the world's poorest region, is poised to experience rapid urban growth, with a doubling of its urban population in the next 25 years (Saghir and Santoro 2018). In the coming decades sub-Saharan Africa will see its urban population swell to nearly one billion without the necessary LRG systems in place to mitigate the risk of adverse development outcomes (Ibid). The result may be horizontal urbanization that degrades the natural environment and expands into customary lands, produces acute social and cultural dislocation, swells the ranks of the landless and informal urban settlements, undermines balanced economic development, and exacerbates the drivers of conflict (Payne et al. 2014).

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[3] Throughout this history section we refer to 'land tenure' in acknowledgment that the more expansive term 'land and resource governance' only recently entered the sector lexicon.

[4] According to World Bank data, for virtually all developing countries the rural poverty gap is higher than the urban poverty gap. This data tracks "Urban [and rural] poverty gap at national poverty lines is the urban [and rural] population's mean shortfall from the poverty lines (counting the nonpoor as having zero shortfall) as a percentage of the poverty lines. This measure reflects the depth of poverty as well as its incidence." For more information visit https://www.worldbank.org/en/topic/poverty.

THE EARLY YEARS: LAND TENURE CENTER, ALLIANCE FOR PROGRESS, AND VIETNAM

In 1962,[5] just one year after the Agency's birth, USAID funded the establishment of a Land Tenure Center at the University of Wisconsin (Montgomery et al. 1982). For the first three decades of USAID's existence, the Center provided USAID with extensive programmatic and technical expertise. Much of what is known today is due to the Center's research. With USAID support, the Land Tenure Center became a renowned institution for research, training, and technical assistance to developing countries on land tenure. In many ways, the Center acted as an external, technical arm of USAID.

The Cold War loomed large for land tenure programs in the 1960s and 1970s. The Alliance for Progress was a US initiative launched in 1961 designed to facilitate inclusive social and economic development as a bulwark against more leftist development models (White House remarks 1961; Peterson 1962). A critical element was agrarian reform, a term that entered the development lexicon in the 1960s, which prescribed the allocation of government land and large landholdings to smallholder farmers combined with infrastructure, inputs, and technical support. To this end, US foreign assistance under the Alliance for Progress promoted redistributive land reform (Scrieciu 2009). These reforms would provide more balanced, market-driven development solutions, so the theory went, and undercut the political resonance of competing reforms espoused by the Left (Peterson 1962). However, domestic political and social forces beyond the manageable interest of USAID meant that many recipient countries did not enact the agrarian reform legislation required to trigger development assistance (Szulc 1962).

Consequently, results were mixed. Reforms were sometimes stymied when new governments repudiated the policies of their predecessors (Montgomery et al. 1982). Moreover, expensive investments in services and infrastructure were required to render the land productive for reform beneficiaries and for land reform initiatives to achieve positive impacts (McClelland 1994). Nevertheless, significant land tenure programs continued in Latin America from the 1980s to early 2000s with some of the Agency's most significant titling programs. For example, in Honduras USAID undertook a multimillion dollar titling project, which as of 2003 benefited from the Agency's only impact evaluation on LRG.

In Vietnam in the 1960s and 1970s, USAID struggled to provide meaningful technical assistance on land tenure in the face of volatile security, with inequitable land distribution used by the Viet Cong, a non-state armed group allied with North Vietnam, to garner support in rural areas (Prosterman 1970). Even with a relatively more stable security situation, in the late 1960s the South Vietnamese government demurred, preferring to delegate the issue to the village level. In January 1968, the South Vietnamese government issued a decree decentralizing land tax authority to the local level. A month later the Tet Offensive rendered this reform a nullity. Perhaps a fitting coda to land reform programs in Vietnam, a USAID retrospective report noted, "The 1968 Tet offensive dealt a serious setback to the tax collection effort" (Stern et al.1970).[6]

In 1970, USAID convened 300 land reform experts for a conference titled the Spring Review on Land Reform to discuss "the political and economic aspects of land reform." (USAID 1970 Spring Review) Land redistribution (i.e., agrarian reform) was endorsed because of the perceived beneficial social and political effects. This conclusion validated the Alliance for Progress' focus on agrarian reform as a means to benefit smallholder farmers and was reinforced in 1979 with USAID's "Policy Determination on Land Reform"

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[5] US government engagement in land tenure assistance to developing countries dates to 1951, when, with support from Point 4, the predecessor agency to USAID, the University of Wisconsin convened the World Conference on Land Tenure. The conference brought together academics, government experts, and graduate students from more than forty countries for six weeks (Raup 1951).

[6] Nevertheless, the South Vietnamese government enacted the Land to the Tiller law in 1970 to further land redistribution (Prosterman 1970).

(McClelland 1994). However, the review identified a noticeable evidence gap: "[T]here has been no real discussion of the causal relation flowing *from* land reform to general economic growth" (Long 1971).

At the end of the 1970s the Agency pivoted towards sub-Saharan Africa. Although a 1977 USAID conference reflected the prior two-decade focus on agrarian reform, the conference foreshadowed USAID's early work on customary land and resource governance by prioritizing consideration of communal land tenure. Over the next decade, USAID and the Land Tenure Center would discover the inaccuracy of this framing and the implicit assumption of a dichotomous relationship between customary tenure and 'modern' land tenure (Bruce 1986).

THE TURN TO AFRICA

Although significant land tenure programs continued in Latin America from the 1980s onward, in the 1970s the Agency's land tenure assistance began to include more African programs. The number of USAID Missions in sub-Saharan Africa went from eight in 1973 to 28 in 1980 (Tarnoff 2015). The geographic shift also saw a change in development theory and practice. In 1980, of 52 countries surveyed, 50 percent had USAID activities addressing inequitable land access and another third had such activities under development (Scrieciu 2009). Yet the 1980s brought a new development zeitgeist, with a focus on macroeconomic policy and the private sector enabling environment (Ibid). The new era was perhaps best captured in a 1986 USAID "Policy Determination on Land Tenure" that did not reference land reform or land redistribution (McPherson 1986). Instead, the policy focused on markets, land titling, and real property registration.

In addition, in 1987 the Peruvian economist Hernando de Soto published *El Otro Sendero* ("The Other Path"), a fascinating work of urban anthropology that documented in detail the struggles of the Lima poor and small businesses to secure the benefits of formalization. De Soto's thesis dovetailed with the new focus on markets and the private sector by arguing that the vibrant informal economic sector is hampered by irrational and predatory government regulation, particularly around property rights (De Soto 1989).

When applied to sub-Saharan Africa, privatization was juxtaposed against state-centric policies that, when implemented across the continent during the post-colonial era, converted significant areas under customary tenure to public land.[7] Yet sub-Saharan Africa exposed shortcomings to the new theory because of the puzzling persistence of customary tenure. Early forays into customary land and resource governance in sub-Saharan Africa were confronted by the tragedy of the commons. This theory holds that common pooled resources, such as communal forests held by a customary community, would invariably degrade through overexploitation (Bruce and Fortmann 1989).

Prior to the groundbreaking work of Elinor Ostrom on common property systems (Ostrom 1990), conventional wisdom held that tenure security, and thus investment, productivity, and market efficiencies, were attainable only by converting customary tenure to individualized holdings. Thus, the development solution offered by some was individualization, in effect sundering communal land governance systems in favor of allocating secure private ownership to individual households (Barrows 1973). Fortunately, the Agency's 1986 Policy Determination on Land Tenure avoided this pitfall by declining to endorse individualization at the expense of customary tenure systems (McPherson 1986).

Indeed, by 1986, because of work funded by USAID through the Land Tenure Center, the realities of customary tenure were readily apparent. The Agency's first land tenure country profiles, focusing exclusively on sub-Saharan Africa, noted that, "African countries with relatively good production records

[7] One of the notable exceptions to this trend is Botswana, which shortly after independence formally recognized customary tenure and established Community Land Boards (Knight 2010).

over the last twenty years have achieved them under remarkably diverse set of tenure arrangements, in which customary tenure figures prominently" (Riddell and Dickerman 1986).[8] The Center's findings belied the classic economic view of private individualization to combat the tragedy of the commons (Bruce 1986).

Proponents of individualization argued that extinguishment of customary tenure was necessary to overcome the "constraint on investment" posed by these tenure systems in order to spur agricultural transformation (Barrows 1973). The resulting landless would be employed in the industrial sector (Ibid). In reality, such policies were resisted by the people who bore their brunt, and countries lacked an industrial sector to absorb the newly landless (Bruce 1986). The Center and USAID recognized these failings early on, with a 1973 study presaging Ostrom's later work: "Basic changes in tenure rules may result in far-reaching social change and imply a disruption of traditional social systems. The costs of this social disruption must be counted as a cost of individualized land tenure" (Barrows 1973).

What is more, De Soto's focus on access to credit, first touched on in *The Other Path* and later made the subject of his 2000 book *The Mystery of Capital*, proved unsound in many respects (De Soto 2000).[9] In 1986, when reviewing the Government of Kenya's push towards individualization in the 1960s, the Land Tenure Center identified the flaw in De Soto's thesis and the traditional economic view: banks were reluctant to lend to landholders even with formal, registered land documents. Mortgageability requires marketability: "[A]s banks do not wish to become farmers, there is a further requirement which must be satisfied: the land must be readily transferable to someone who does want to use it, for a consideration which will satisfy the debt" (Bruce 1986). Moreover, when lending did occur, foreclosures did not. Banks declined to seize land in the event of loan default "because of the vigorous protestations by those holding residual rights in the land through customary rules" (Riddell and Dickerman 1986). Customary tenure in Africa was a dynamic, deeply ingrained reality to be reckoned with, not an aberration to be programmed away.

END OF THE COLD WAR

In the 1990s, with the end of the Cold War, USAID land tenure investments largely focused on countries in Eastern Europe and Central Asia, which prior to the end of the Soviet Union restrained or prohibited private land ownership (McClelland 1994). These programs facilitated the privatization of state-owned enterprises and the private individualization of collective farms. With a generally strong desire and need for privatization, and limited customary tenure, the country conditions were amenable to the classical economic views reflected in USAID's 1986 Policy. These programs in Eastern Europe and Central Asia were USAID's first forays into significant land tenure investments since the Alliance for Progress program in Latin America. In Ukraine, from 1995 to 2000, USAID helped issue 235,000 land titles (USAID 2013). In Moldova, virtually all collective farms were broken up and the lands transferred to more than one million households (Ibid).

The lack of counterfactual, causal evidence for USAID's land tenure programs during this period frustrated later attempts to assess impact on investment, productivity, and markets (Scrieciu 2009). Except for a titling program in Honduras, USAID land tenure projects during this period did not collect time series data (Ibid). A 2003 retrospective study concluded, "The lack of post-project impact evaluation studies made it impossible to determine economic and social impacts" (Bloch 2003). Both the quantity and quality

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[8] Country Profiles have since expanded to more than 100 countries and remain one of USAID's most downloaded LRG products. For more information please visit land-links.org/country-profiles.

[9] For more than a decade, USAID provided funding to De Soto's organization, the Institute for Liberty and Democracy (ILD), to, among other things, "improve ILD's existing property registry system, which serves as a model for land titling and registration and business formalization in Peru and developing countries worldwide" USAID 1994; *Grant Agreement Between USAID and the Institute for Liberty and Democracy, 1994*; USAID n.d.).

of evaluations were lacking; studies labeled 'impact evaluations' lacked a rigorously defined counterfactual, consisting of qualitative field assessments (Gritzinger et al. 1989). This lack of rigorous evidence was experienced across the Agency and throughout the land sector. The number of evaluations at USAID dropped precipitously from 528 in 1994 to 79 in 2001—an 86 percent decline (Tarnoff 2015). Indeed, a 2007 literature review could not identify a single empirical study of a land tenure intervention that included a baseline, an important limitation to the rigor of the evidence base (Conning and Partha 2007). In addition, a recent systematic review of rigorous studies on the impacts of LRG programs, found no sufficiently rigorous studies prior to 2000 (Higgins et al. 2018).[10]

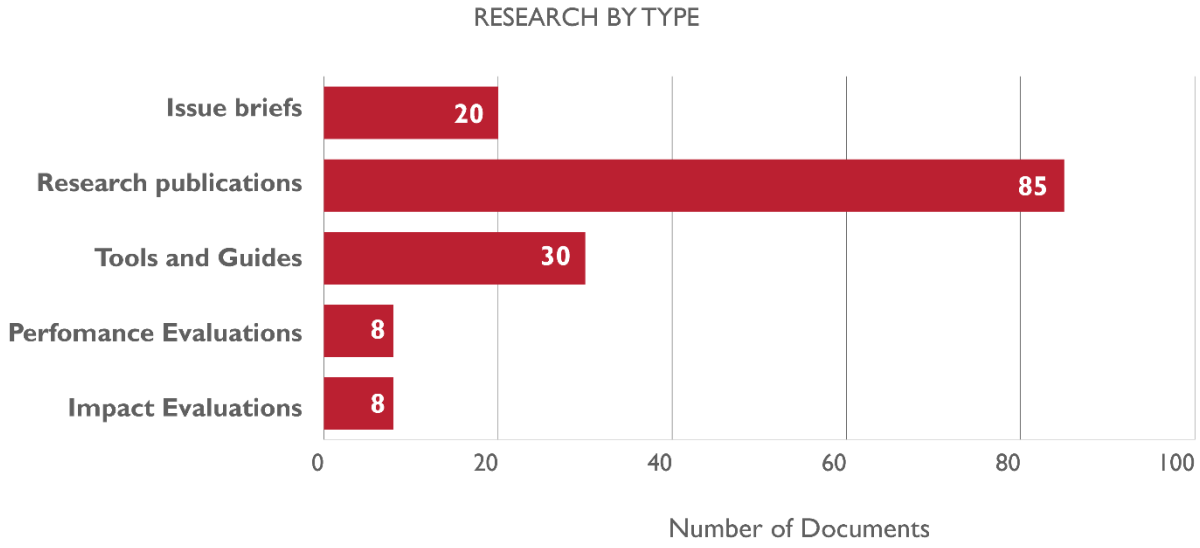
PHOTO: USAID LAND

[10] That said, USAID, through the Land Tenure Center, supported numerous qualitative and context-specific case studies in the 1990s and early 2000s, often through the participation of rural and urban communities. This type of research led to significant progress in national policy reform. This Research Agenda's focus on mixed-methods research and other rigorous research methods is not intended to discount the value of qualitative, highly contextual, and participatory research. Rather, the Research Agenda's focus on other types of research and evaluations is a recognition that a lack of rigorous research that meets systematic review criteria undermines the credibility of the sector and consequently can lead to lower funding levels and weaken programs and policies.

LRG RESEARCH AND EVALUATIONS AT USAID, 2003 TO 2018

Rigorous research and evaluations in LRG have experienced a revival from their nadir in the 1990s. Reflecting this renewed focus on evaluations, the Land Tenure and Property Rights Framework and Matrix bemoaned past excessive attention to outputs rather than impacts, with a focus on "measuring the number of land titles that have been issued as opposed to focusing on market performance, investment increases, reduced conflict, or improved use of sustainable management practices" (USAID 2013). Over the last 15 years USAID has produced a large and diverse volume of research and evaluations on LRG, with more than 150 research products, including eight impact evaluations and eight performance evaluations (Figure 1).

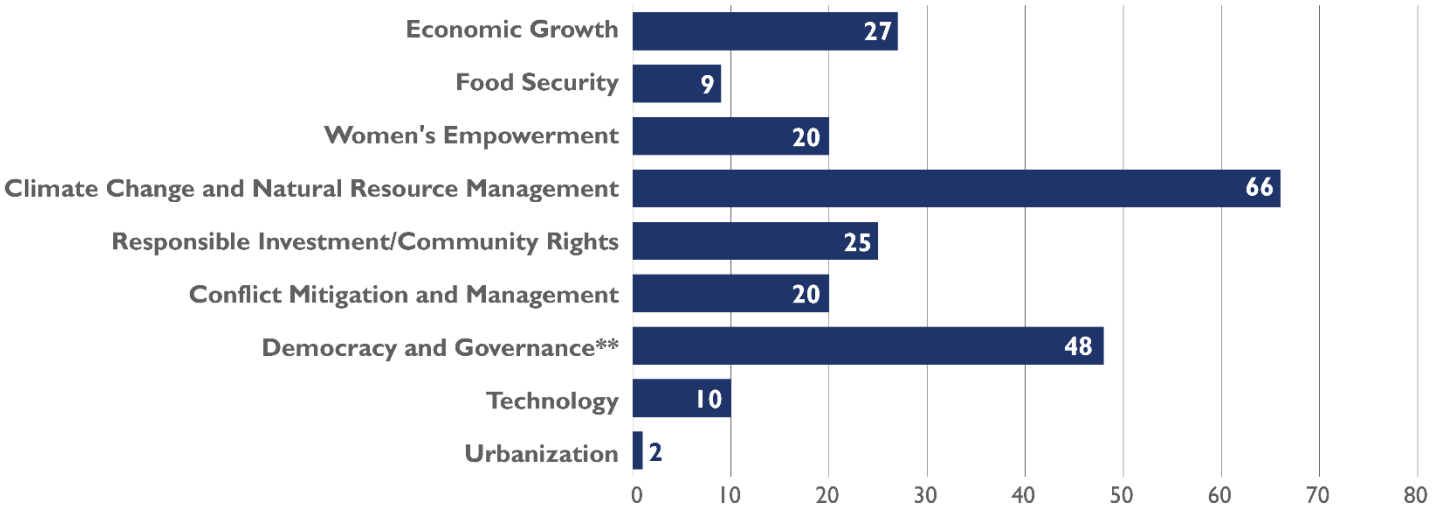
FIGURE 1. USAID RESEARCH ON LRG BY TYPE OF PRODUCT



Source: Original analysis by USAID CEL project.

Consistent with the renewed focus on sub-Saharan Africa, that region dominates USAID's research and evaluations. This also reflects the availability of research and evaluation funds, which follow the Agency's regional focus. Approximately half of all products focus on Africa, with the bulk of research coming from East and Central Africa, followed by Southern Africa and then West Africa and the Sahel. Approximately 37 percent of products are global in nature, while the rest are split between Asia (10%), Latin America (6%) and Europe/Eurasia (.5%), with none focused on the Middle East.

FIGURE 2. RESEARCH ON LRG BY SECTOR



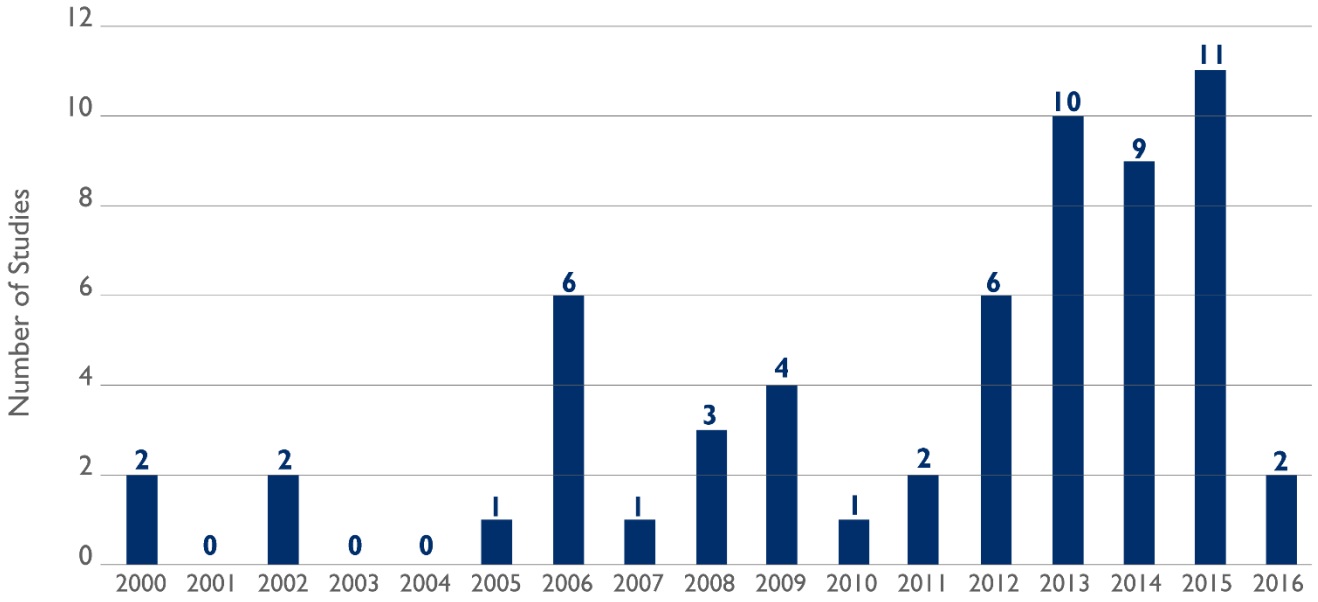
Source: Original analysis by USAID CEL project.

Thematically, USAID's research rightly sees LRG as a policy or programmatic means to a development end; a necessary component to achieve development objectives in certain sectors. Since 2010, the Agency's research related to LRG has spanned a diverse set of thematic areas, largely aligned with other offices and bureaus. The bulk of the research has focused on sustainable landscapes and natural resource management, followed by democracy and governance, and responsible private sector investment (Figure 2). Too little research has been done on three key areas: technology, urbanization, and food security. Moreover, renewed focus is needed on women's economic empowerment and economic growth to better link LRG programs to macro-level outcomes necessary to end the need for donor assistance.

Impact evaluations on LRG initiatives now apply methods long practiced in the health sector, such as randomized control trials, that more effectively isolate causal explanations.[11] When combined with qualitative and quantitative methods (in addition to contextual data), impact evaluations now provide a clearer picture of when an intervention has the desired impact or not, and why. From 2000 to 2016, the LRG sector produced 60 rigorous studies on the impacts of LRG programs, defined as possessing a low risk of bias (Figure 3). Thirty-seven of these studies are quantitative; with most using ex-post quasi-experimental techniques to determine counterfactual impact, and two were randomized control trials (RCT) (Higgins et al. 2018). Unfortunately, only one evaluation in the sector is on long-term impact. USAID and other donors can help fill this critical gap by committing to long-term impact evaluations in order to better understand when, how, and why discrete LRG programs lead to self-reliance.

[11] Impact evaluation methods present challenges for evaluating impact across the spatial units that comprise the geographic focus of a project, including difficulties in designing experiments analogous to health trials, complexities in defining land units, and spatial autocorrelation, among other issues.

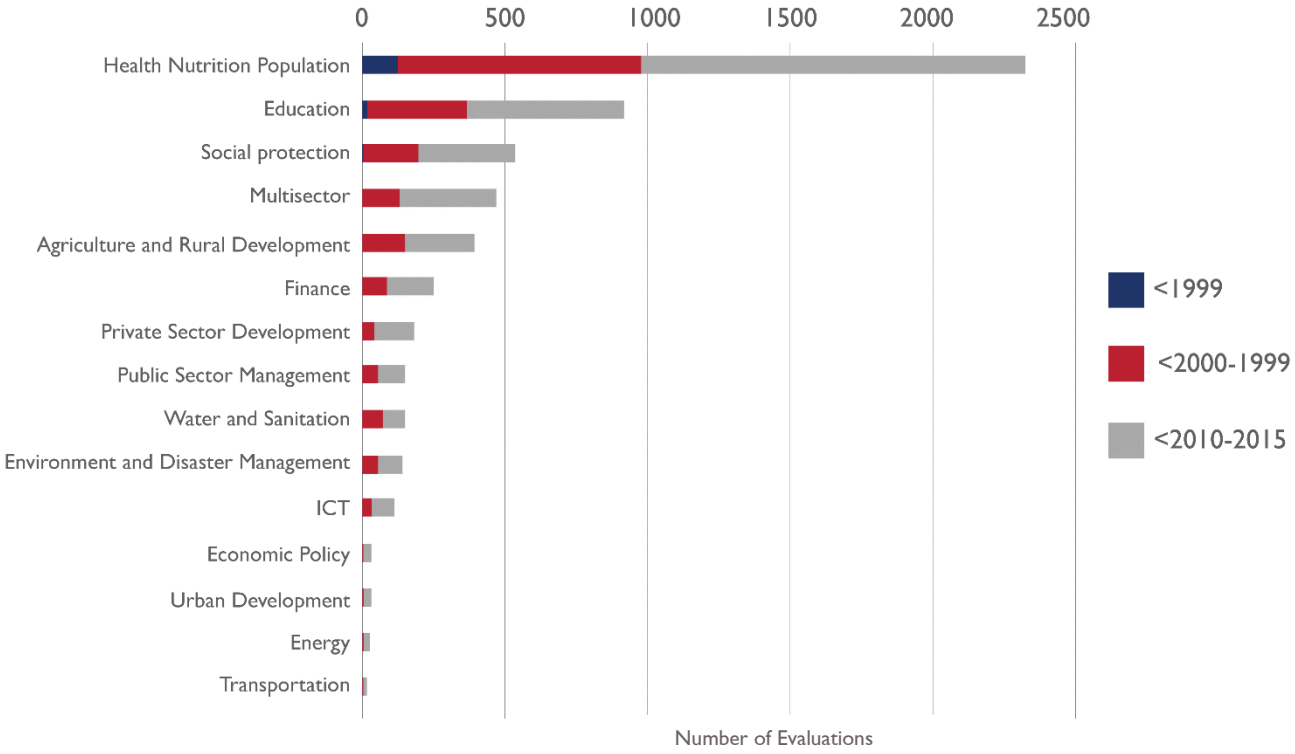
FIGURE 3. RIGOROUS STUDIES ON THE IMPACTS OF LRG PROGRAMS, 2000-2016



Source: Higgins et al. 2018.

Fortunately, there is a noticeable upward trend in the number of LRG rigorous studies. This tracks the broader trend in international development, which experienced a more than 10 fold increase in impact evaluations from 2000 onward (Sabet and Brown 2018). As expected, 65 percent of impact evaluations are in the health sector, with programs such as vaccinations that are conducive to counterfactual study (Figure 4). The land sector is--alongside transportation, energy, urban development, and economic policy--benefiting from less than 100 total impact evaluations.

FIGURE 4. IMPACT EVALUATIONS BY SECTOR AND PUBLICATION DECADE



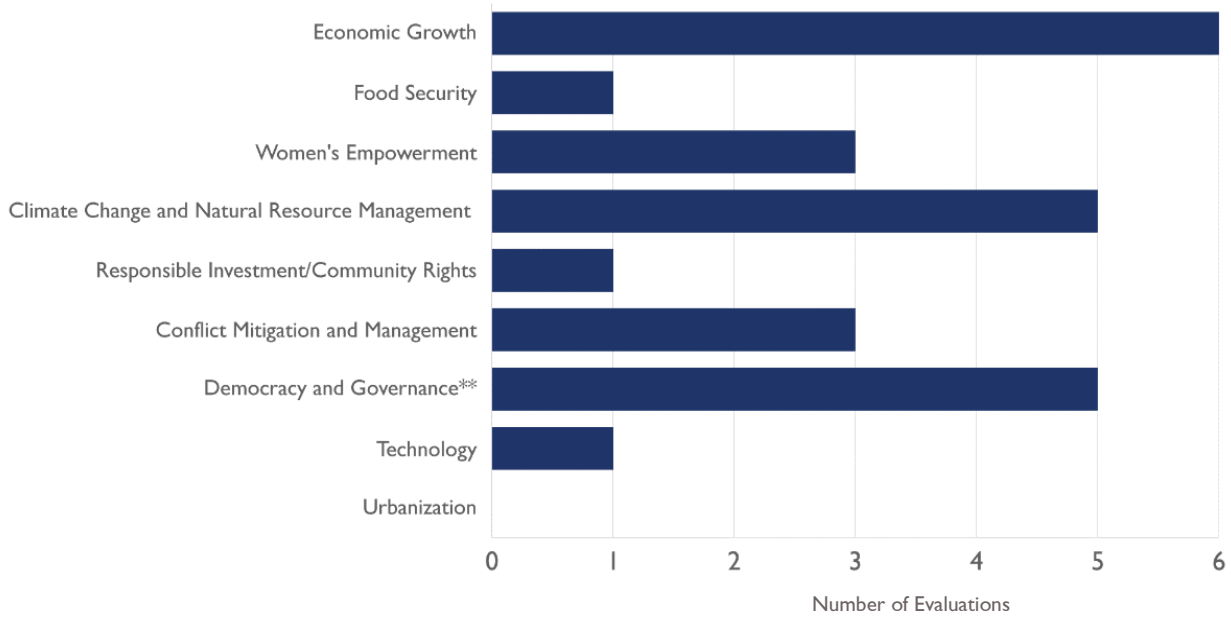
Source: Sabet and Brown 2018.

USAID was relatively late to pursue impact evaluations on LRG, with the bulk beginning in 2013-2015. By comparison, the Millennium Challenge Corporation (MCC) has been conducting evaluations since 2007, and its portfolio of ongoing or completed LRG evaluations currently consists of eight impact evaluations and seven performance evaluations (MCC n.d.). Structural factors are at play. As a newly formed development agency with an existential focus on accountability, MCC focused more on evaluations from the start. Conversely, USAID began to truly focus on evaluations in response to the need to demonstrate whether programs were working.

Impact evaluations can be an exercise in gratification deferred. They require a commitment of hundreds of thousands of dollars and take several years to produce findings. Moreover, when programs end and development priorities change, mustering support for additional data collection can be challenging (Lisher, GLTN/IFAD 2019). These incentives may partly explain the startling lack of long-term impact evaluations of LRG programs. However, as revealed by the attempt to retrospectively evaluate USAID's LRG investments in the 1990s, failure to remain committed to impact evaluations can significantly set back smart, evidence-based programming and policy-making.

USAID has conducted sixteen LRG evaluations, eight of which are impact evaluations and eight performance evaluations. USAID's LRG impact evaluations are of the highest caliber. Two are RCTs; all others use rigorous quasi-experimental methods. The Agency's LRG evaluations are thematically quite diverse, covering everything from women's empowerment, climate change, responsible investment, and food security to democracy and governance (Figure 5). By contrast, they are geographically homogenous: every single impact evaluation thus far has focused on Africa.

FIGURE 5. USAID LRG EVALUATIONS BY ISSUE AREA, 2000-2018



Source: Original analysis by the USAID CEL project. The categories denote which issue areas predominated in the research product, as some products included more than one issue area.

Looking ahead, USAID will commit to collecting additional data to measure the impact of LRG programs over longer exposure periods and initiating new LRG impact and performance evaluations, but also place a focus on leveraging existing datasets, in particular, the considerable body of data collected for USAID's LRG impact evaluations. These data contain a wealth of information that could generate valuable new learning beyond the original impact evaluation findings, and at a much lower cost than a new impact evaluation or survey.

STATE OF THE EVIDENCE

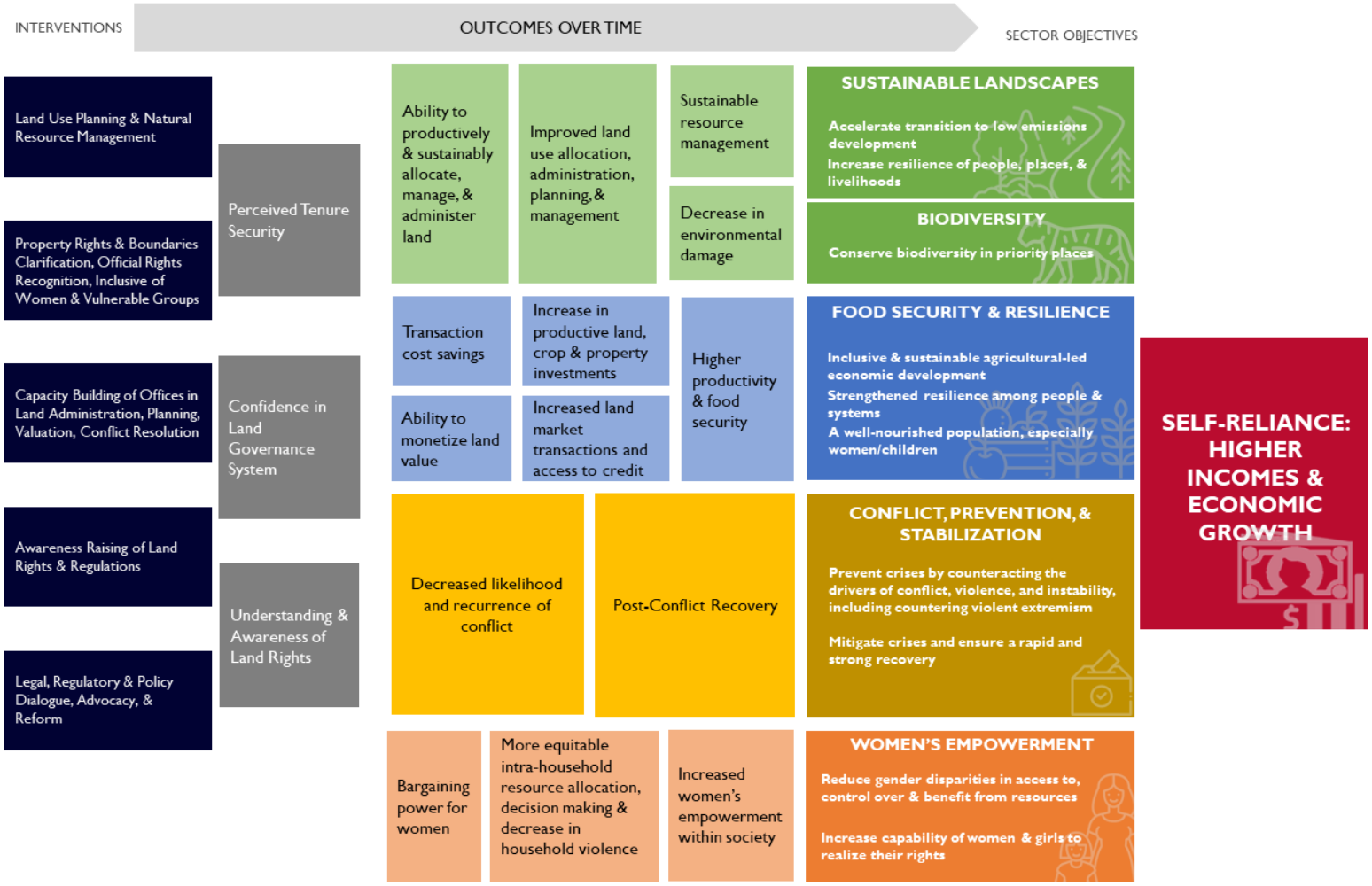
Before delving into the evidence, a reality check is warranted. As land and development practitioners are well aware, progress on LRG in developing countries is not merely a function of evidence and policy effectiveness. Progress is often stymied by corruption, electoral politics, political patronage, personal enrichment, and torpor (Boone 2014; Kjaer 2017; Klopp 2017). Insecure land tenure or dysfunctional LRG systems are thus, "often a symptom of more broad political and economic systemic incoherence" (Robinson et al. 2014). In many countries there are strong incentives to keep LRG systems as 'grey zones' because numerous interests benefit from the chaos (Kjaer 2007). Nevertheless, evidence-based programs and policies can achieve progress and successfully overcome these forces.

This section discusses the state of the evidence on the link between LRG and the following development sectors: sustainable landscapes and biodiversity, food security and resilience, democracy and governance, and women's empowerment. These sectors are the focus of significant USAID programs and contribute to the Agency's overall objective of self-reliance for partner countries through economic growth and poverty reduction.

In presenting the state of the evidence, we rely heavily on recent systematic reviews and meta-analyses, which follow predetermined review protocols to filter out studies of insufficient quality and high risk of bias. Studies captured thus skew towards rigorously defined counterfactuals, spatially explicit econometrics, and regression analyses, although high-quality qualitative research is also included.

The discussion maps this evidence onto a Roadmap developed by USAID's Office of Land and Urban (LU) in order to link the evidence to the theoretical causal pathways from LRG intervention to sectoral outcome and, ultimately, higher incomes and economic growth (Figure 6).

FIGURE 6. ROADMAP FOR LAND AND RESOURCE GOVERNANCE

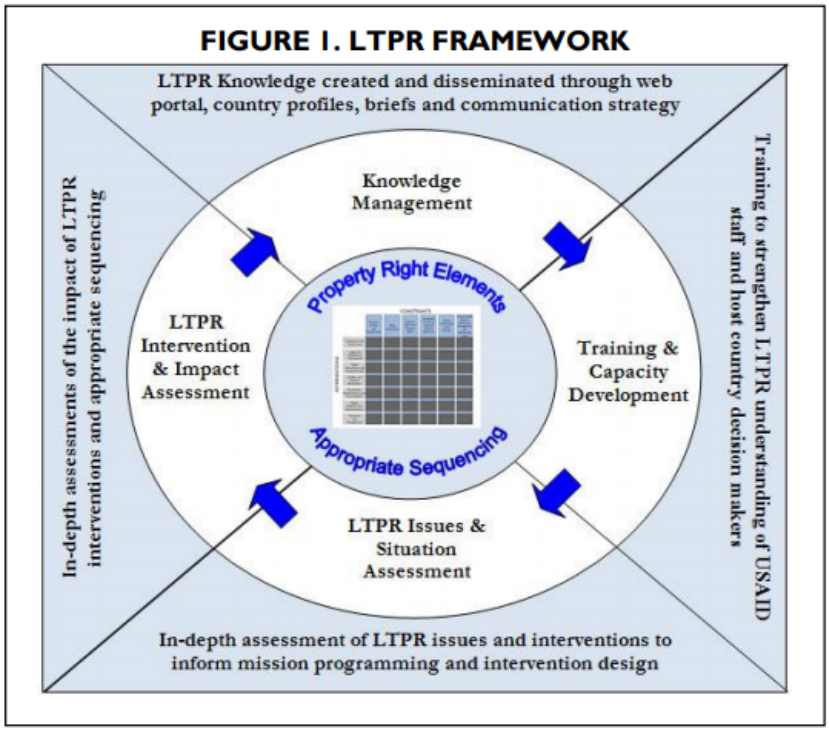


Note: The Roadmap is not strictly speaking a theory of change. Arrows denoting causal pathways are purposefully omitted because the Roadmap is not intended to capture the countervailing and synergistic effects, feedback loops, and micro-processes, all highly context dependent, by which a discrete LRG intervention leads to long-term and higher-level outcomes. Rather, the Roadmap is intended as a general guide on the logical and temporal relationship between the LRG programs on the far left and the ultimate objective on the far right—ending the need for donor assistance. Source: Adapted from Lisher, GLTN/IFAD 2019.

Adapted from the Theory of Change developed by GLTN and IFAD, the Roadmap thus acts as scaffolding around which we can place significant evidence on LRG. Put simply, does evidence match theory? Unfortunately, setting a high bar for evidence reveals many startling gaps in our knowledge. Yet these gaps are also opportunities for policy-oriented, actionable research and learning on LRG.

Indeed, caution is warranted when interpreting this section. Absence of evidence is not evidence of absence. Although a platitude, the point cannot be over-emphasized. For instance, in recent years USAID has invested heavily in various LRG programs informed by an in-depth, qualitative understanding of the context, coupled with analyses by LRG experts, drawing on relevant high-quality evidence from other countries. In other words, the robust studies in this section are invaluable to learning, mobilizing, and efficiently allocating scarce resources, and to strong program design. But they are complementary to, and not a replacement for, more qualitative analyses integral to USAID's program cycle as reflected in the Land Tenure and Property Rights Framework (Figure 7).

FIGURE 7. LAND TENURE AND PROPERTY RIGHTS (LTPR) FRAMEWORK



Source: USAID 2013.

STATE OF THE EVIDENCE: A MACRO VIEW

Robust evidence links land tenure security with a host of development outcomes – from women's empowerment to on-farm investment – that in turn are proven to reduce poverty and spur economic growth (Meinzen-Dick et al. 2019; Higgins et al. 2018; Locke 2013). So recognized is this link, that Sustainable Development Goal 1 to "End poverty in all its forms everywhere" is tracked in part by an indicator on the proportion of adults with legally recognized documents over their land or who perceive their tenure rights as secure.[12] So, how many people in the world experience tenure insecurity, or are at risk of losing their land rights? Though efforts are underway to collect this SDG data through the World Bank Living Standards and Measurement Survey and the Global Property Rights Index (Prindex), among others, until recently this fundamental question could not be reliably answered.

[12] For more information visit https://sustainabledevelopment.un.org/sdg1.

In place of reliable evidence 'zombie statistics' proliferate, which rely on questionable data to paint a broad picture about the global rate of land documentation and the distribution of land ownership, among other things.

For example, a ubiquitously cited LRG statistic is that 70 percent of the world's population, and 90 percent of Africa's population, lack land documents. These statistics are presented as facts, so much so, that the vast majority of publications do not cite their sources.[13] Similarly, it is often stated that 65 percent of the world's land area is held under customary tenure systems (Wily 2011). While this statistic can be traced back to its source, the research method behind this claim is questionable.[14]

The emergence of these statistics is natural: such headline findings are an easy way to demonstrate the importance of LRG. These statistics have found their way into countless funding proposals and policy papers. Moreover, defending land rights carries real risks and leads to threats in many developing countries. Land rights defenders are often subject to violence and even murdered (Global Witness 2019). Statistics that raise the profile of the issue may galvanize vital resources and political support. However, it is easy to pick apart the science behind these statistics, thus casting doubt on the body of evidence around LRG, potentially undermining the credibility of the sector, and jeopardizing effective programs.

Recently, Prindex emerged as a more scientific attempt to measure global rates of tenure insecurity and documentation, among other things. A recent survey by Prindex shows that 20 percent of respondents in 93 countries reported feeling tenure insecure. Interestingly, Prindex's findings have been dismissed by some in the LRG community as being "too conservative" despite the fact that, extrapolated globally, Prindex data suggests that between one and two billion people are property insecure.[15] This tension demonstrates just how much the LRG sector relies on the small number of 'zombie statistics,' and underscores the need for a more robust body of evidence around LRG. Yet, although uncertainty remains as to the most accurate estimates for tenure insecurity and tenure types, all data and evidence underscores the same basic points. First, a significant amount of land and resources are held by indigenous peoples and customary communities. Second, a substantial proportion of the global population lacks security over their land and resources.

Fortunately, recent systematic and high-quality reviews provide a detailed discussion of the state of the evidence on LRG programs and sectoral development outcomes. Although not necessarily superior to qualitative research, nor an end in themselves, systematic reviews help answer "the question of 'what works'" in an environment in which appropriately "donors are under increasing pressure to adopt

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[13] For example, see "Securing Africa's Land for Shared Prosperity", World Bank, 2013 (https://www.worldbank.org/en/news/opinion/2013/07/22/securing-africa-s-land-for-shared-prosperity) and "Why Land Administration Matters for Development", World Bank, 2016, https://ieg.worldbankgroup.org/blog/why-land-administration-matters-development

[14] This figure originated in a 2011 study, which counted as community land all land that is not urban, actually cultivated lands, snow and ice lands, and planted forests. The analysis thus assumes all other resource types and land uses are community lands subject to customary tenure (Wily 2011).

[15] Prindex has also contributed to a technical, but vitally important, debate on the most appropriate measures of tenure security perception. For instance, in Zambia an alternative measure of tenure security perception finds much higher rates of tenure insecurity compared to the Prindex measure; 44% of respondents perceive a risk of losing their land over the next 5 years according to the Zambia Labour Force Survey, compared with 27% according to Prindex. The difference may depend on sample size, response code scaling, the exclusion of certain types of property, and persons within the household captured by the survey (Ali et al. 2019). These methodological differences are not academic or arcane but critically important to policies and programs. As early as 2009, it was recognized that "more analysis is also required of how results are influenced by methodological aspects such as how tenure security is measured" (Place 2009). Efforts are underway to further our understanding of tenure security perception measures (Stickler et al. 2018).

spending practices that not only generate positive development outcomes, but also represent value for money." (Mallett et al. 2012). Thus, systematic and high-quality reviews serve as the foundation of this section, supplemented with other high-quality evidence, including recent survey data and traditional literature reviews. Finally, some sectors lack systematic or high-quality reviews on the link to LRG (e.g., artisanal and small-scale mining and pastoralism). For these sectors, we rely on other evidence and data of sufficient quality. The focal reviews and the sectors and development outcomes covered are listed in Table 1.

SPATIAL ANALYSIS OF LRG

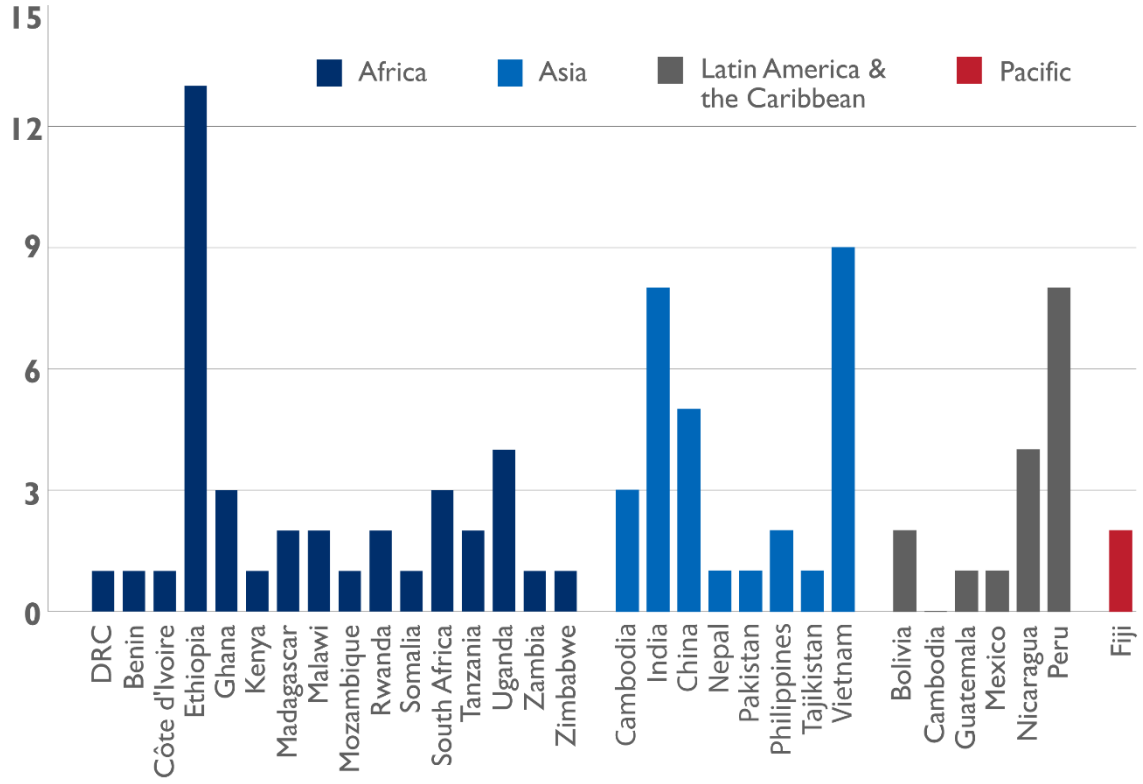
LRG is inherently spatial. Land, real property, and natural resources are spatially located assets. Improved access to a high volume of information and extraordinary technological advances mean spatial data is more readily available, easier to verify, more accurate, and cheaper than ever. For example, remotely sensed data at high spatial and temporal resolution can now be interpreted and compared using trained algorithms to more rapidly and reliably identify patterns of land dynamics, such as land cover change. Platforms such as Global Forest Watch and LandMark provide access to data on global land and resource use and change. And affordable tools and services for mapping land and collecting geospatial data, such as USAID's MAST, Cadasta Foundation's platform, and others, are widely available, allowing for customizable, low cost mapping and documentation. In addition to other programmatic and policy benefits, these data are improving the rigor and quantity of impact evaluations.

TABLE 1. FOCAL LRG REVIEWS

Source	Sector/Development Outcomes Covered
Meinzen-Dick et al. 2019	Women's Empowerment
Higgins et al. 2018	Food Security, Economic Growth, Women's Empowerment, Democracy and Governance, Sustainable Landscapes and Biodiversity
Busch and Ferretti-Gallon 2017	Sustainable Landscapes and Biodiversity
Lawry et al. 2017	Food Security, Economic Growth
Ojanen et al. 2017	Sustainable Landscapes and Biodiversity
Holden et al. 2016	Food Security
Robinson et al. 2014	Sustainable Landscapes and Biodiversity
Henley 2013	Economic Growth
Locke 2013	Economic Growth
Place 2009	Food Security, Economic Growth

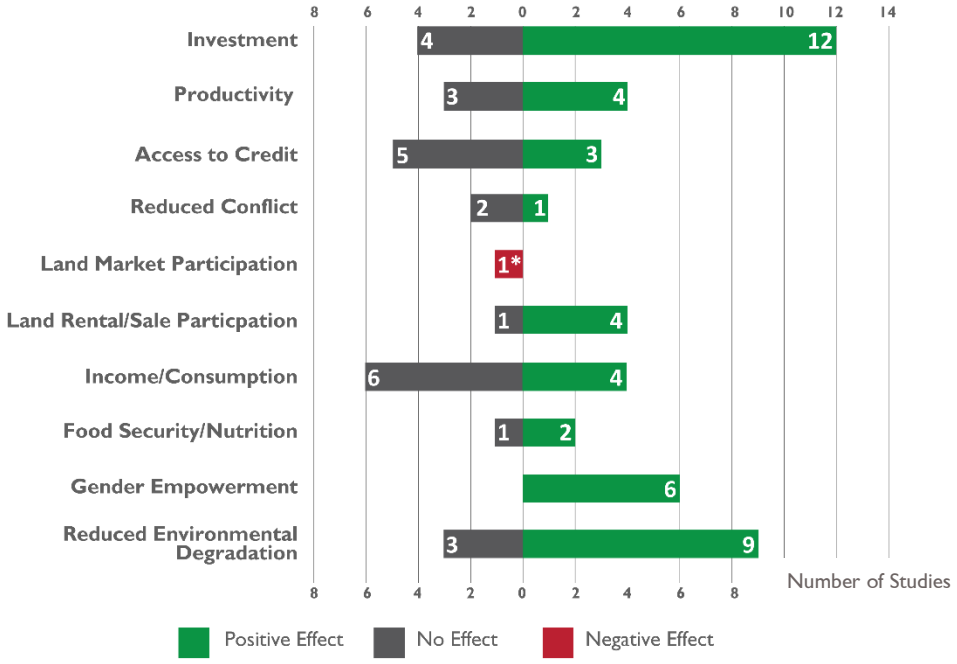
This body of evidence spans a wide range of countries (See Figure 8, illustrating the geographic reach of just two of the 10 focal studies) and covers a large range of development outcomes (See Figure 9, illustrating the topical coverage of these same two studies).

FIGURE 8. COUNTRIES REPRESENTED IN HIGGINS ET AL. AND LAWRY ETAL. SYSTEMATIC REVIEWS



Duplicate studies were removed. Source: Higgins et al. 2018; Lawry et al. 2017.

FIGURE 9. NUMBER OF STUDIES IDENTIFYING A POSITIVE, NO, OR NEGATIVE RELATIONSHIP BETWEEN LRG PROGRAMS AND SECTORAL IMPACTS



Source: Higgins et al. 2018.

The reviews can sometimes challenge the prevailing wisdom of policymakers, development professionals, and academics. For example, while there are compelling reasons to believe that strengthening women's land rights can reduce poverty, no studies have been conducted that test that link (Meinzen-Dick et al. 2019). These reviews also highlight the seemingly disparate results of empirical studies that examine similar LRG programs. For example, Higgins et al. 2018 examined four studies on the link between land titling programs and land rentals; two of the four studies found a positive association, one found no effect, and one demonstrated mixed results (Higgins et al. 2018). The different outcomes presented in these analyses, however, do not make the evidence inconclusive. LRG programs occur across a wide variety of geographic, social, political, historical, and environmental contexts. If systematic reviews organized by theme or sector do not find sufficient similarities among the results of LRG programs, this may be attributable more to the difficulty of evaluating programs across different contexts than to a deficiency in the evidence base. In the absence of data and long-term, cross-national comparisons, it is difficult to isolate context-specific factors that might influence intervention outcomes. In other words, it is important not to be dismissive of programs because the literature finds that they yield different results in different contexts. In addition, the systematic reviews are consistent in one overarching finding: more high-quality evidence is necessary for each of the sectors and outcomes discussed in this Research Agenda.

KEY FINDINGS: SECTORAL OUTCOMES

With a focus on the reviews listed in Table 1 above, our analysis of over 150 studies, reports, meta-analyses, and systematic reviews has yielded the following topline findings:

Finding: The problem of insecure land tenure is widespread in the developing world, with far-reaching social, environmental, and economic consequences. Addressing tenure security is necessary – but not usually by itself sufficient – to achieving positive development outcomes.

Prindex has found that across 93 countries, approximately 20 percent of respondents self-identified as tenure insecure (Prindex, 2020). In Africa, the figure stands at 29 percent (Ibid). Extrapolated globally, this means that approximately 1.5 billion people may have insecure land and property rights. As discussed below, tenure insecurity can decrease land productivity and investment, and perceptions of tenure insecurity have particularly negative consequences for women and other vulnerable groups. Additionally, land disputes that arise from tenure insecurity have led to outbreaks of conflict and civil war. However, in order to fully realize the benefits of strengthening property rights, reforms and interventions in other sectors are often needed. For example, Lawry finds that access to credit depends not only on tenure security, but also on the existence of financial institutions that are willing to lend, a property rights regime that includes the right of alienation, and the attractiveness of the property being used as collateral (Lawry et al. 2017). Similarly, Robinson and Ojanen find that while tenure security can help keep forests and other landscapes intact, alone it does not guarantee the preservation of forest cover (Robinson et al. 2014; Ojanen 2017). In order to yield the strongest conservation outcomes, LRG should be combined with governance support, land use planning, provision of public goods (e.g., effective enforcement) and, in some cases, subsidies. These and similar findings underscore that secure land rights may be a necessary, but not sufficient, factor to achieving positive economic outcomes, and that LRG programs must be undertaken as part of a broader intervention.

Finding: Ample evidence links LRG with higher rates of economic growth.

In particular, the existence of strong property institutions can help build citizen confidence and enable robust economic performance. By contrast, weak institutions hinder economic growth by making citizens more insecure (Acemoglu et al. 2001, 2002, 2005). However, additional research is needed to more conclusively establish that the relationship is causal or merely corollary, and to understand the extent to which this growth results in winners and losers.

SPOTLIGHT ON PERCEPTIONS

Having the confidence to make long-term investments in land, or to engage freely in land transactions, is ultimately a matter of a landholder's perception of their tenure security, regardless of whether that landholder possesses a formal document proving their tenure. As a result, a large and growing body of research is starting to examine perceptions of tenure security.

Indeed, Prindex's pioneering research shows that while in 41 of 93 countries, having formal property documents is associated with significant perceptions of tenure security, the relationship is far from a 1:1 correlation (Prindex 2020). In particular, Prindex found that in several countries, the proportion of owners and renters who said they possess formal property documents was about 25% higher than the proportion of owners and renters who said they felt tenure secure. That means formal property rights do not necessarily translate into perceived tenure security (Prindex 2019), which has long been recognized in the literature (Arnot et al. 2011) but only now do we have globally comparable data. Indeed, studies from Ethiopia (Ege 2017) and Madagascar (Bellemare 2012) support this finding. Without sound evidence-based programs, formalization can actually have detrimental effects by, for example, leading to elite capture (Lawry et al. 2017).

Vice versa, Prindex found that some respondents felt secure without documents. In Burkina Faso, for example, more owners and renters with no documentation say they are secure than those with formal documentation.

So, what are the best ways to make people feel tenure secure? As with all programs, the answer is context dependent. Yet, what it is clear that formal titling or documentation is not necessarily required, nor sufficient, to bestow tenure security. For example, a forthcoming research paper analyzing a randomized control trial data from Zambia finds that informal mapping and registration of customary land rights, combined with support for community land governance, can reduce landholders' perceived risk of short- and long-term land appropriation by both internal and external actors. Importantly, this finding held true in female-headed households and with other vulnerable populations (Huntington et al. forthcoming). In Rwanda, land tenure regularization rapidly improved perceived land tenure security on demarcated and adjudicated parcels for both male and female participants (Ali et al. 2015). Deininger similarly concluded that in Ethiopia, de jure recognition of tenure rights made farmers more secure (Deininger et al, 2007). Finally, in his systematic review, Higgins et al. found that contextual factors such as historical instances of state-sponsored land appropriation could play a significant role in perceptions of tenure security (Higgins et al. 2018).

Finding: Formalizing land and resource rights should not be expected to lead to improved access to formal credit unless other conditions are also met. Yet, innovative financial models may prove viable, especially in Africa.

Research does not support the link between titling and access to formal credit, at least not in the developing world (Holden and Ghebru 2016; Higgins et al. 2018; Lawry et al. 2017). Strong financial and regulatory institutions must also be present for individuals to be able to use their land as collateral to obtain loans. Conversely, alternative financing such as community-based lending or microfinancing may not require formal title to land. Recent research is beginning to surface interesting links between possession of customary land documents and access to informal credit or innovative financial products (USAID ELTAP 2016). This is an area for further research.

Finding: Strengthening land and resource rights can lead to substantial increases in on-farm investment. However, more rigorous evidence is needed on the links of land and resource rights to productivity, food security, and income.

The empirical evidence generally supports the link between LRG programming and increased investment (Lawry et al. 2017). The magnitude of these effects is greater in Asia and Latin American than in sub-Saharan Africa, though it is possible that the geographic homogeneity of studies within Africa — most focus on Ethiopia — provides a skewed picture. More rigorous evidence is needed on the links between LRG programming and productivity, food security, and income.

Finding: There is a fundamental tension between combatting deforestation and economic growth. Nevertheless, carefully constructed LRG policies, such as strengthening the rights of Indigenous Peoples and customary communities, in conjunction with other policy levers to protect forests, can reduce deforestation and help mitigate climate change while also improving incomes and contributing to economic growth.

Forests contain vast deposits of resources, the extraction and sale of which can be hugely profitable. Clearing forests to make way for crops and grazing land can also lead to high economic returns for the private sector (Busch and Ferretti-Gallon 2017). As a result, there is a fundamental tension between combatting deforestation and economic growth. Nevertheless, a variety of policy levers, including support to Indigenous Peoples and customary communities, government-protected areas, land use planning, and effective enforcement, can help achieve sustainable landscape goals while also promoting economic growth (Blackman 2015; Nolte 2013; Blackman 2016). Although the evidence base is geographically skewed towards Latin America, some spatially explicit econometric analyses support an all-of-the-above approach to avoiding deforestation and greenhouse gases (GHG) emissions and protecting biodiverse landscapes. That is, sustained government and donor support of indigenous and customary land tenure and formal protected areas, coupled with sound and *enforced* land use planning, are necessary to achieve sustainable landscapes and biodiversity outcomes. Yet, macro, countervailing forces are also effective in driving adverse outcomes, namely population growth, infrastructure development, and increases in commodity prices (Busch and Ferretti-Gallon 2017).

Finding: Strengthening women's land and resource rights has a striking and positive impact on women's empowerment. However, research on this important topic remains thin, and the evidence base must be strengthened. Of particular note, more rigorous evidence is needed on the link between strengthening women's land and resource rights and poverty alleviation.

Of all the benefits of LRG discussed in this review, perhaps the most striking is the impact on women's empowerment. Studies also show a less robust but still positive impact on women's bargaining power and decision-making ability over things like consumption, spending money on children's needs, and intergenerational transfers (Meinzen-Dick et al. 2019; Higgins et al. 2018). However, only a small number of papers explore this link in a rigorous and methodologically sound way, and more research is needed to cement this link (Meinzen-Dick et al. 2019).

Finding: Land is a significant driver of conflict, particularly in Africa. The twin forces of climate change and population growth will likely exacerbate land conflict in the near future. However, rigorous research on the extent to which LRG can decrease the likelihood and recurrence of conflict is extremely thin.

A 2018 review of land and conflict data found that "literature on land conflicts in individual countries is rich, but quantitative, cross-national data are more limited" (Travaglianti 2018). Indeed, a recent systematic review found only three studies on the interaction between LRG and conflict. Some evidence does suggest that certain LRG programs can: decrease the likelihood and recurrence of conflict by safeguarding customary norms; foster local institutions adept at dispute resolution by promoting education and awareness; and contribute to post-conflict stability by ensuring that those who return after fleeing a conflict are secure in their land tenure and property rights (Beyene 2017; Blattman et al. 2012; Sonmez et al. 2018). Moreover, formal recognition of customary tenure, including governance support, can increase social capital and trust within a community (Hartman et al. 2018). However, given the growing importance of this topic, more research is urgently needed.

LRG AND PRIVATE SECTOR ENGAGEMENT

Returning in part to the development theory undergirding the Agency's 1986 Policy Determination on Land, USAID and other donors are exploring private sector, profit-driven solutions to LRG problems. Linked to the emergence of more and better data, these projects aim to quantify and mitigate LRG risks or demonstrate that LRG good practice increases profitability (USAID 2018). Currently, these efforts are nascent, with more promise than practice. LRG guidance for the private sector is extensive (Interlaken Group 2015; RRI n.d.; Boudreaux and Neyman 2015), but few companies adopt them (Stevens et al. 2019). A well-functioning LRG system is a public good. Although there are exceptions, such as privatization of land registries, in general companies are not in the business of providing public goods. Rather, companies are appropriately concerned with their raison d'etre of generating profit by creating value, which in the aggregate increases a society's productivity and wealth—the greatest single driver of poverty reduction. Of course, companies can impose devastating externalities in the form of deforestation, greenhouse gas emissions, displacement, and conflict, among others (Landesa 2012; Deininger 2011; CLUA 2014). Moreover, if a company self-regulates by adopting LRG good practice then their competitors may free ride on that action by capturing market share. Consequently, a race to the bottom may ensue. These dynamics are why rational laws effectively enforced by governments are the preferred solution to development challenges. Nevertheless, in line with USAID's Private Sector Engagement Policy, harnessing the profit motive of companies for the provision of limited public goods is a promising avenue for addressing a variety of LRG development challenges.

KEY FINDINGS: RESEARCH METHODS

Despite the recent emergence of high-quality systematic reviews, and a multitude of program-specific research and evaluations, the evidence base on land tenure remains thin. Specifically, we have identified the following deficiencies in the evidence base, some of which are reframed as research recommendations in the subsequent "Research Priorities" section:

- Surprisingly little rigorous research, including impact evaluations, compared to other development fields. In particular, a lack of rigorous research on the intersection of LRG and food security, conflict, fisheries, and urbanization. As a result, systematic reviews can examine only a narrow subset of LRG linkages.
- A lack of longitudinal studies on long-term impact, especially in Africa, less so in Latin America and Asia.
- Few studies investigate more than one link of the causal chain, and in particular too few studies examine links between LRG and multiple consecutive links in the causal chain. A realist synthesis approach may help fill this important gap in our understanding of the relationships between intervention, context, mechanism, and outcome.
- Few studies employ mixed methods approaches that employ qualitative and quantitative data collection and analysis.
- Studies too often measure tenure security at the household level, obfuscating potentially critical differences in how secure different members of the household feel, especially women and girls.
- Studies too often treat beneficiaries as a homogenous category, failing to account for differences between women and men, the old and the young, and poor and the wealthy, among others.
- Few, if any rigorous studies, have examined the effects of statutory recognition of customary tenure.
- Too many studies use "title" as shorthand for tenure security, failing to appreciate differences between perception and documentation. However, this is changing as the Sustainable Development Goal 1 indicator on land distinguishes between perception and documentation.
- Studies focus disproportionately on measuring the impact of titling programs, to the exclusion of measuring the impact of programs that combine multiple LRG interventions, such as titling and community governance, land administration, legal reform, conflict resolution, and social-behavioral change.

SECTOR-SPECIFIC FINDINGS

Keeping these topline findings in mind, we explore below the evidence that relates to LU's development objective, each of LU's sector objectives (women's empowerment, sustainable landscapes and biodiversity, food security, and democracy and governance), and how LRG programs impact these objectives' intermediate outcomes.

HIGHER INCOME AND ECONOMIC GROWTH

Finding: Ample evidence links secure property rights with better economic growth. However, more research is needed to understand exactly what this relationship looks like, and to more conclusively establish that the relationship is causal rather than merely corollary.

A substantial body of evidence supports the link between LRG and economic growth (Locke, 2013).[16] That's because strong institutions, including property rights institutions, build citizen confidence and encourage robust macroeconomic performance. By contrast, weak institutions hinder economic growth by making citizens more insecure (Acemoglu et al. 2001, 2002, 2005; Knack and Keefer 1995; Hall and Jones 1999; Kerekes and Williamson 2008). A 64-country study found that property rights institutions have a "highly significant" impact on per capita income (Acemoglu et al. 2001, 2002, 2005).

However, some experts caution that it is difficult to separate property rights from the "cluster of institutions" that affect investment and economic growth (Haggard and Tiede 2011). In other words, if a country's institutions are generally strong, how do we know, specifically, if strong property rights institutions contributed to economic growth? Indeed, studies linking strong property rights to economic growth have only managed to establish a corollary relationship, not a causal one (Locke 2013).

A related challenge is the difficulty in proving that strong property rights lead to economic growth, and not the other way around (Locke 2013). In fact, a study of 142 countries found that increases in per capita GDP actually improved the quality of private property rights institutions (Mijiyawa 2009). This two-way causality appears to exist on a micro level as well (Green and Moser 2012). The link between LRG and income is discussed in detail in the Food Security section, below.

Nevertheless, the general body of evidence supporting these links is strong, suggesting that LRG programs have a critical role to play in improving livelihoods through promoting economic growth and, ultimately, setting individuals and communities on a path toward self-reliance. Given the transformational impacts of economic growth, researchers would be well-served to dig into this topic through the following:

- Studies that go beyond economic growth and consider the impact of property rights on the distribution of income and wealth, both within the household and within the larger community (Locke 2013).
- Studies on the impact of secure property rights on corporate decisions about whether to invest in a given area (Locke 2013).
- Studies that isolate the 'land institutions' variable from strong institutions more broadly, to understand the degree to which economic growth is specifically impacted by LRG, as opposed to strong institutions more broadly.

[16] Most studies measure economic growth through changes in GDP per capita.

WOMEN'S EMPOWERMENT

Women's empowerment cuts across other sector objectives and has been linked to broad improvements in the human and social capital of local and national communities, stronger economies, more secure livelihoods, and, ultimately, greater self-reliance. Put simply: when women do well, society does well. Why? Because women usually take care of the entire household. As a result, empowering women improves children's health and education outcomes, increases food security, strengthens the economy, and generally strengthens communities (Meinzen-Dick et al. 2019; Holden and Ghebru 2016; USAID IB LTPR and Gender).

So where do land rights come into the picture? Experts hypothesize that strengthening women's land and resource rights helps to empower them by providing them with more financial security and higher standing within the household and their communities. When women are more empowered, they have more bargaining power and greater say over household and community decisions. One of the most important decisions within a household is how to allocate precious resources like food and money. When women are empowered to have a greater say in these decisions, more of the resources are distributed through the entire household, rather than being spent by the male head of household.

Does the evidence for this causal chain bear out? The short answer is that it looks promising, but we need more research. Two recent meta-analyses show a robust link between programs that strengthen women's land and resource rights and positive impacts on women's empowerment, bargaining, and decision-making over things like consumption, spending money on children's needs, and intergenerational transfers (Meinzen-Dick et al. 2019; Higgins et al. 2018). Meinzen-Dick et al.'s analysis shows a less robust but also compelling link to other outcomes like natural resource management, lowering HIV risk, lowering instances of domestic violence, and food security (Ibid).[17]

Notwithstanding the studies mentioned above, there remain gaps and inconsistencies in the overall body of evidence. We believe there are four primary reasons for this. First, a paucity of experimental studies means that most findings are based on observational studies. These studies are helpful for identifying positive relationships, but less helpful for empirically analyzing and identifying causal pathways (Meinzen-Dick et al. 2019). Importantly, there has been almost no research on whether strengthening women's land and resource rights leads to the ultimate goal of poverty reduction (Meinzen-Dick et al. 2019). Because poverty reduction is the final link in a long chain, it is best studied via sustained exposure to a program, of which there are few. Furthermore, studies often measure land and resource rights at the household level, and assume that if a household has a title or other land document, that the woman in the household is just as secure as the man (Meinzen-Dick et al. 2019). This is often untrue, particularly when only the man's name appears on the document. We cannot assume that land and resource rights are equitably distributed across the entire household, nor that the male's tenure security levels are representative. Finally, too few studies examine the causal link between increasing women's land and resource rights and their empowerment within a community as part of customary tenure systems.

[17] LRG programs do not have to be aimed specifically at women to achieve these impacts. For example, it has been found that because women are disproportionately vulnerable to the impacts of climate change, LRG interventions that promote sustainable land use can disproportionately improve women's health and socioeconomic standing (IPCC 2019), leading to greater empowerment. In Ethiopia, a second-level land certification program led to an 11% increase in the likelihood of a wife possessing land in her name, as well as a statistically significant increase in the total area of land possessed by wives (ELTAP / ELAP).

Recognizing this gap, the Gates Foundation and the World Bank Innovation Lab are undertaking numerous RCTs on joint titling programs. In Uganda, offering customary households fully subsidizes titling on the condition that the household accept a joint title increased the probability of joint titling by 89% (Cherchi et al. 2018). In Benin, widows who received land certification were more likely to stay within their deceased husband's village four years after land certification. Customary tenure systems in Africa often require widows to return to their natal villages to access land and livelihoods, with male relatives acquiring the widow's land in their deceased husband's village. The Benin RCT suggests land certification can mitigate this dynamic, securing the widow's land rights in her marital village by increasing women's decision-making authority over land within the household (Botea et al. forthcoming). In addition, land certification increased the fallowing period for female-managed landholdings, which is important for soil fertility (Goldstein et al. 2018).

The third problem is that studies tend to treat women as a homogenous category, rather than looking at the how LRG is experienced differently by different segments of the female population (e.g., married and unmarried) (Henley 2013). For example, women are eight percent more likely than men to express worry about losing the right to use their property if their spouse died, and seven percent more likely if they were divorced (Prindex, 2020). Consequently, strengthening women's land rights is particularly important in cases of spousal death or divorce.

Differences in tenure regimes (Meinzen-Dick et al. 2019), marital practices, prevailing social and cultural norms, and the degree to which women's rights are codified and enforced in domestic law can all lead to variation in the impact that LRG programs have on women's empowerment. For example, a survey experiment in Liberia asked respondents about their views of land reform and then asked the same question to a comparison group that included the prime that land reform would mean equal land rights for women. Although support for land reform after the prime remained high, linking otherwise beneficial land reform to equal land rights for women saw an 8.6% reduction in favorable views toward land reform (Hartman et al. 2018). This supports the notion that discriminatory gender norms are a significant barrier to LRG programs. Additionally, evaluation of the impact of Rwanda's massive titling program found that the program diminished the property rights of women who were not married (Ali et al. 2015). In response, the Rwandan government took steps to ensure that the program's benefits were extended to all women, regardless of their marital status, in the second phase of the program (Ibid).

What can we conclude from all of this? We believe the early evidence is promising, and more rigorous studies will allow us to discern with more sophistication the ways in which LRG impacts women and girls. In particular, we recommend investing in studies with high sample sizes and counterfactuals, studies that account for the heterogeneity of women (rather than treating them all as a single category), and studies that survey women specifically, instead of conducting research at the household level.

EMPOWERING WOMEN IN SOCIETY

Finding: There is a strong link between women's land and resource rights and greater levels of empowerment, both within the household and in society at large. More rigorous research would help to more firmly establish this link, as well as to better understand the relevant mechanisms and contextual factors and their implications for policy and programming.

Of all the benefits of LRG discussed in this State of the Evidence review, perhaps the most striking is the impact on women's empowerment.

Systematic reviews by Meinzen-Dick et al. and Higgins et al. find that a key way to empower women is to strengthen their land and resource rights. Meinzen-Dick et al. find that "there is widespread agreement

that strengthening women's land rights supports women's empowerment." Similarly, Higgins et al. conclude, "one of the main potential headlines to emerge from this review is the unanimously positive findings relating to effects of LRG-related programs that aim to improve women's empowerment" (Higgins et al. 2018). However, it should be noted that three of the four studies Higgins et al. reviewed were from a single country–India. This puts into question how generalizable the conclusions are on this topic.

Women's land and resource rights are associated with greater empowerment within the household (Meinzen-Dick et al. 2019). For example, a 2016 study in Nepal found that women's land ownership empowered them to make decisions about their healthcare needs, major household purchases, and visits to family or relatives (Mishra and Sam 2016). As another example, women's land and resource rights are associated with a drop in domestic violence, which is one of the clearest indicators of disempowerment (Meinzen-Dick et al. 2019). Studies in India, Nicaragua, and Tanzania all find significant links between land ownership and reduced rates of domestic violence (Grabe 2010; Grabe 2015; Panda and Agarwal 2005). However, this encouraging result may not occur in all contexts. In some cases, the attempts of women to exercise their property rights lead to an increase in violence from men who perceive these attempts as a threat to their power (Boudreaux 2018).

Within the society at large, women's land rights are correlated with increased access to government services and participation in collective action in several countries in Africa, Asia, and Central America (Ibid).

An interesting question these findings raise is: *why* does strengthening women's land rights help to empower women? An obvious answer is that strengthening land rights gives women control over more assets. Nevertheless, research has surfaced an additional, more nuanced correlation: at least one study in Burkina Faso finds that women's land rights programs can shift social perceptions of gender roles, leading to greater empowerment within society (Van den Bold et al, 2013). Interestingly, the study also found that nearby villages that did not benefit directly from the program began to adopt some of the same practices. This is an important spillover effect, given that changing social norms is as necessary as statutory or regulatory reform to promoting women's empowerment (Prindex 2019).

Despite the relatively robust body of research, the evidence base on women's empowerment is far from perfect. Meinzen-Dick et al.'s critique of women's land rights research writ large–in particular the lack of counterfactuals and muddy definitions–hold true for empowerment research. In fact, Meinzen-Dick et al. conclude, "incomplete definitions of land rights are problematic across outcomes studied, but are glaring in the papers on empowerment outcomes" (Meinzen-Dick et al. 2019). This is an important point to note for further research.

INCREASED BARGAINING POWER AND DECISION MAKING

Finding: Women with rights to land and other resources tend to have a stronger bargaining position within the household, and they use that position to make important decisions. But again, most studies are observational and more rigorous research will strengthen the case for this link, as well as our understanding of the implications for policy and programming.

Meinzen-Dick et al. (2019) found that women with rights to land and other resources have a stronger bargaining position within the household, and they use that position to make important decisions about land, money, and intergenerational transfers. Meinzen-Dick et al.'s findings are supported by multitude of program evaluations and other studies. For example:

- An impact evaluation in Ethiopia found that women with second-level land certificates were 44% more likely to decide which crops to grow on their land (ELTAP/ELAP Endline Report 2016).

- A 2007 study in Nepal found that when women own land, they are significantly more likely to have the final say in household decisions (Allendorf 2007).
- Studies from Peru (Wiig 2013 in Higgins et al. 2018) and India (Santos et al. 2014; Brule 2010 in Higgins et al. 2018) demonstrate that LRG programs can increase women's involvement in household decision making by increasing their bargaining power.
- A study found that South African and Ugandan women with secure rights to land were better able to insist that their partner use a condom, thereby mitigating HIV transmission (Swaminathan 2007).
- Research across several Central American countries also shows that women with secure land rights are more likely to have control over household income and household access to credit (Katz and Chamorro 2002). In Nicaragua, for example, women with individual or joint title to their land controlled over half of the income from crops; women who did not possess title to their land controlled only 14% of income (Ibid).

However, despite the strong evidence that women's land rights increase bargaining power, there remain research gaps. The body of research on women's land rights contains very few rigorous evaluations, and definitions of women's land rights differ across the datasets, countries, and contexts captured by these papers, making it difficult to generalize findings (Meinzen-Dick et al. 2019). Moreover, because most of the studies did not explicitly set out to test the relationship between women's land rights and bargaining power, land is aggregated with other assets like housing, making it difficult to draw conclusions specific to land rights (Meinzen-Dick et al. 2019).

EQUITABLE INTRA-HOUSEHOLD RESOURCE ALLOCATION

Finding: When stronger land rights provide women with more bargaining power within the household, they tend to use this bargaining power to influence household spending decisions in ways that lead to improved health, nutrition, and educational outcomes, particularly for children.

Experts say that securing women's land rights gives them more bargaining power, which in turn allows them to make better decisions about how to allocate resources within the household.

Meinzen-Dick et al.'s review bears out this hypothesis. Research shows children of landowning mothers in Nepal are significantly less likely to be severely underweight (Allendorf 2007). A study from Vietnam shows that children in households where women own land were less likely to get sick, and more likely to have health insurance and be enrolled in school. In those households, women were able to reallocate household expenditures away from alcohol and tobacco, and towards food (Menon et al. 2014). Interestingly, these resource allocation impacts were almost always stronger in households where land was held solely by women, as opposed to households where land was jointly held (Meinzen-Dick et al. 2019).

SUSTAINABLE LANDSCAPES AND BIODIVERSITY CONSERVATION

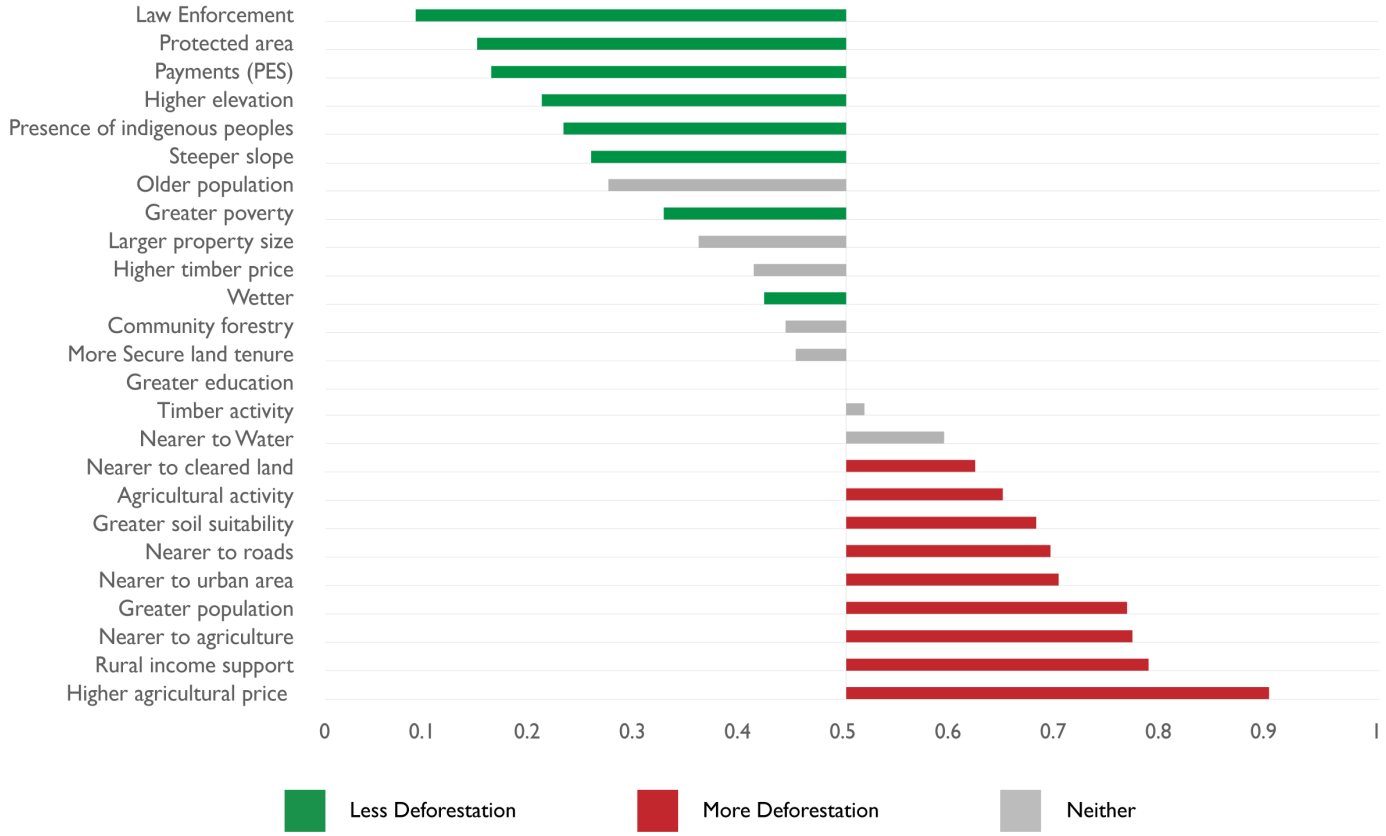
How to demonstrate that forests are worth more alive than dead? This question gets to the heart of the challenge of sustainable landscapes and forest protection programs. On one hand, forests provide a wealth of public services including carbon storage, biodiversity habitat, water filtration, storm mitigation, products, wild foods, medicine, and recreation. On the other hand, forests contain vast deposits of timber, minerals, and other resources, the extraction and sale of which can be hugely profitable. Clearing forests to make way for crops and grazing land can also lead to greater private economic returns (Busch and Ferretti-Gallon 2017). Commercial agriculture accounts for 71% of all deforestation (Climate and Land Use Alliance 2017). The IPCC has found that agriculture, forestry, and other land use accounts for 23%

of GHG emissions globally (IPCC 2019). The IPCC also found, with medium confidence, that the "world's terrestrial ecosystem services have been valued on an annual basis to be approximately equivalent to the annual global Gross Domestic Product" (IPCC 2019).

The current destruction of the Brazilian Amazon provides a stark illustration of this tension. From 2004 to 2015, Brazil managed to increase its agricultural production while decreasing deforestation. This success was driven by the devolution of land and resource rights to indigenous peoples and customary communities, combined with supportive government policies that included a strong network of protected areas, land use planning, and enforcement (Seymour and Busch 2016). However, towards the end of this period, Brazil entered a serious economic recession, with its economy contracting by almost 7% in 2015 and 2016 (Financial Times).[18] In 2019, Brazil's incoming president Jair Bolsonaro vastly scaled back public lands protections, and opened the Amazon to commercial logging, ranching, and mining in order to stimulate the economy. In the six months after Bolsonaro took office, the Brazilian Amazon lost more than 1,330 square miles of forest cover, a 39% increase over the same period the prior year.[19]

This recent example illustrates the multitude of complex factors that determine whether the forest is worth more alive or dead–and to whom. The graph below (Figure 10) illustrates several factors that either drive deforestation (black bars), stop deforestation (white bars), or have no impact (grey bars) across 592 statistical analyses.

FIGURE 10. FACTORS THAT DRIVE, REDUCE, OR HAVE NO IMPACT ON DEFORESTATION



The color of the bar indicates whether the driver variable is consistently associated with less deforestation (green), more

[18] https://www.ft.com/content/b0886e9c-8f1b-11e7-a352-e46f43c5825d

[19] https://www.nytimes.com/2019/07/28/world/americas/brazil-deforestation-amazon-bolsonaro.html

deforestation (red), or neither (grey) across 592 statistical analyses. For more information see Busch and Ferretti-Gallon 2017.

How then, should the dynamic between these different drivers, and their long-term and short-term impacts, be managed? And where does land tenure fit into the picture?

One framework that has emerged to make sense of the complex dynamics around deforestation is that of supply, demand, and risk (Seymour and Busch 2016). Researchers posit that the three ways to combat deforestation are to reduce the **supply** of forest available for conversion (e.g., via protected indigenous lands), reduce the **demand** for forestland, and increase the **risk** (or cost) of deforestation. They then ask: what is the interplay between these three levers, and what are the costs and benefits of deploying each?

Stifling demand for forestland is a tricky proposition, because many of the drivers of deforestation (e.g., the building of roads and infrastructure) are hallmarks of economic growth and poverty reduction. It is unfair to preserve the forest by keeping communities that live in that ecosystem poor. So then, arguably the question of how to promote economic growth in a way that does not come at the expense of forests and other critical landscapes must focus on supply and risk.

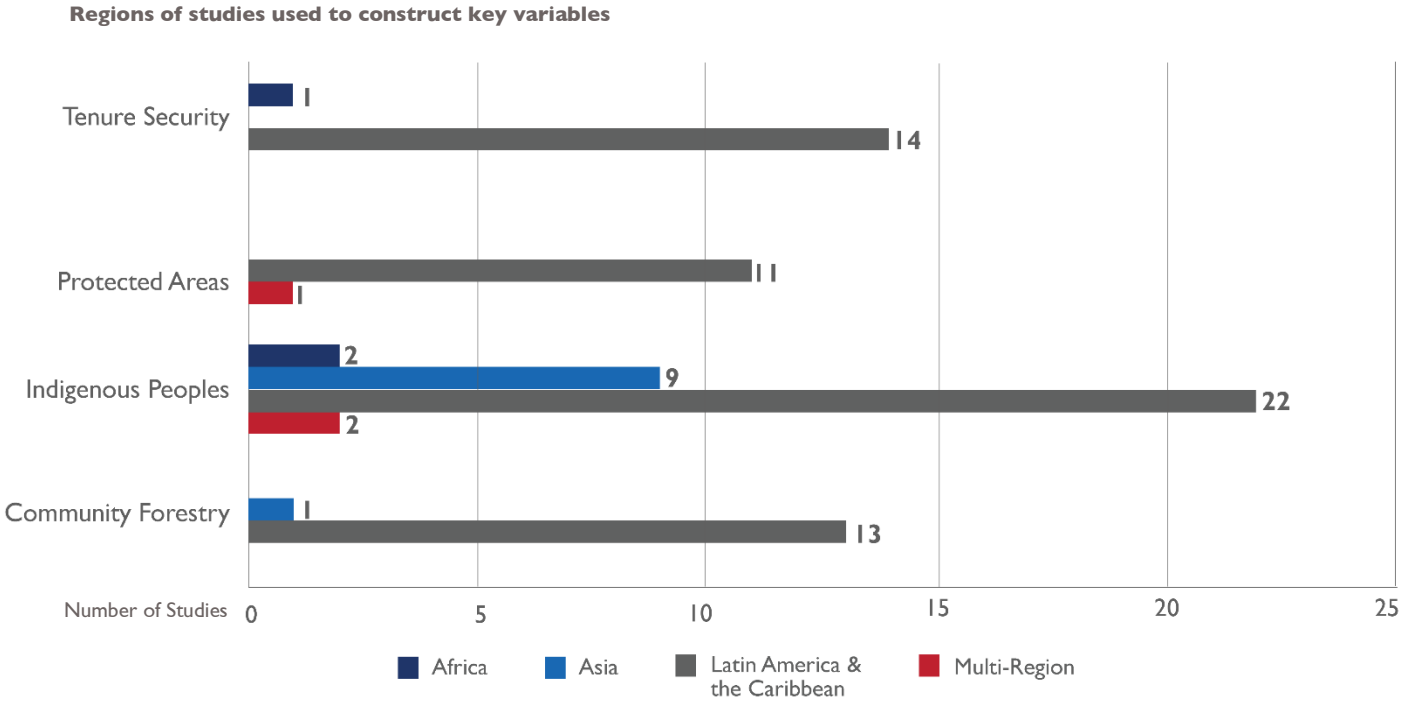
This is where LRG comes in. Carefully constructed LRG policies, in conjunction with other policy levers, can help conserve forests and other landscapes while still allowing for economic growth.

It bears noting that a recent meta-analysis did not find land tenure security to consistently impact deforestation rates (Busch and Ferretti-Gallon 2017).[20] This contrasts with findings from Robinson et al. 2014, which found that tenure security improved the probability of good forest outcomes by 40% (Robinson et al. 2014).[21] Moreover, successful community-based forest enterprises are unlikely to be achieved without secure land and resource rights (USAID CBFE report forthcoming; Ding et al. 2016). Busch and Ferretti-Gallon also found that the drivers consistently associated with lower deforestation were land elevation; degree to which land was sloped; the existence of protected areas and indigenous peoples; and high poverty rates (Busch and Ferretti-Gallon 2017). On the other hand, hallmarks of economic growth—like the existence of infrastructure and agricultural activity—were consistently associated with higher deforestation (Ibid).

[20] An important limitation of this study is that of the 14 studies that included a tenure security variable, 13 were conducted in Latin America (with 6 of the 13 conducted in a single country, Mexico). As a result, the data is quite geographically skewed, and may not be generalizable. A more general limitation of the meta-analysis is that the exposure period of most studies included was limited to 5-10 years. The proliferation of high-quality global forest cover datasets presents an opportunity to study a more diverse set of countries, and for a longer period of time.

[21] One possible reason for the discrepancy is that whereas Busch and Feretti-Gallon limited their review to spatially explicit econometric studies, Robinson looked at both remotely sensed data and qualitative studies, broadening the pool of studies available.

FIGURE 11. THE SKEWED STATE OF THE EVIDENCE



Source: SEED Database/Ferretti-Gallon and Busch (2014).

How to reconcile these seemingly contradictory findings? Does tenure security contribute to positive forest outcomes or not? Although the Busch and Ferretti-Gallon systematic review is a valuable contribution to the literature, like many systematic reviews related to LRG, it suffers from a skewed and thin evidence base. The studies on the links between indigenous peoples, community forestry, and tenure security are heavily based on findings in Latin America (Figure 11). Moreover, both studies' general findings on tenure security cannot speak to tenure types (i.e. the specific rules governing the land), which are critically important. In Busch and Ferretti-Gallon, the tenure security variable only captured studies that measured whether tenure security changed (up or down) and thereby conflated vastly different tenure types into a single variable. For instance, the tenure security variable covers 13 studies, including a study on private tenure in the Brazilian Amazon, which found that tenure insecurity increased deforestation because claimants cleared the forest to demonstrate productive use and thereby strengthen their land claims (Araujo et al. 2009). Another of these studies focused on private tenure in Haiti, which similarly found that illegal, and thus insecure, private landholders converted more forest to agriculture (Dolisca et al. 2007). However, secure private tenure may also result in deforestation without enforced, rational planning for land use. In Nicaragua, a geospatial, econometric study found that titling private land decreased forest cover by 13.7%. Thus, general findings on tenure security mask critical heterogeneity that influences outcomes.

Given the complex systems that govern sustainable landscapes and biodiversity conservation decisions, the application of realist synthesis methods to this issue may be appropriate (McLain et al. 2018). Realist synthesis, which is increasingly used in the health and education fields, attempts to explain how context influences mechanisms to generate outcomes within a complex system. In a landscape and conservation context, realist synthesis may help explain when, how, where, and why LRG, which typically occur in the context of complex socio ecological systems, are likely to result in positive environmental outcomes (Ibid).

In a sense, a focus on realist synthesis brings LRG full circle, back to the more qualitative case study approach of prior decades. However, realist synthesis is best deployed in tandem with rigorous, counterfactual studies and high-quality meta-analyses that estimate effective sizes.

SUSTAINABLE LAND AND RESOURCE MANAGEMENT AND DECREASED ENVIRONMENTAL DAMAGE

Finding: The role of tenure security in sustainable land and resource management depends on the tenure type. Secure private land rights, without enforced land use planning and other environmental protection measures, may result in adverse environmental outcomes. Secure land and resource rights for indigenous peoples and customary communities tend to improve sustainable land and resource management. To yield the strongest outcomes, LRG should be combined with governance support, land use planning, provision of public goods and, in some cases, subsidies.

The impacts of LRG on forest management and on soil conservation have been particularly well studied. The IPCC report on Climate Change and Land states, with medium confidence, that "insecure land tenure affects the ability of people, communities and organizations to make changes to land that can advance adaptation and mitigation" (IPCC 2019). A recent systematic review found that tenure security improved the probability of good forest outcomes by 40% (Robinson et al. 2014). Another systematic review of the environmental impacts of property rights regimes found that the presence of clear, stable, and legitimate rights was largely associated with positive environmental outcomes in forests, fisheries, and rangelands (Ojanen et al. 2017).

The evidence on improved natural resource management, including soil conservation and tree planting, is equally compelling. In her systematic review, Meinzen-Dick et al. find that improving women's land rights encourages investment in various natural resource management techniques, with an emphasis on soil conservation, terracing and bunding.[22] Another systematic review found robust evidence linking LRG to improved soil conservation (Lawry et al. 2017). In Rwanda, farmers whose parcels had been registered almost doubled their investments in soil conservation measures like bunds, terraces, and check dams. (Ali et al. 2014). A study in Ethiopia found a 30% increase in investments in soil and water conservation measures only one year after land certificates had been issued and a strong, positive correlation between land certification and investments in terracing and bunding (Deininger et al. 2008a, 2008b). Another study in Ethiopia found that knowledge of land rights significantly affected adoption of soil conservation practices (Quisumbing and Kumar, 2014). In a meta-analysis of rigorous impact evaluations in West Africa, five of six studies found that farmers with more secure tenure were more likely to fallow land, by an average of 16% (Fenske 2011). Other examples of studies that find secure tenure increasing environmentally beneficial investments include tree planting in Rwanda and Benin (Ali et al. 2011; Goldstein 2015) and terracing in Indonesia (Grimm and Klasen 2015).

Yet, these topline findings mask important nuances about the *types* of LRG programs that improve sustainable landscapes outcomes, as well as the *complementary factors* that must be in place for these LRG programs to work.

As noted above, the type of land tenure at issue is a critical consideration for programs and policies as is the fact that forest users feel secure (Robinson et al. 2014). Robinson et al. reviewed more than 150 studies on deforestation, dividing them based on the types of tenure held by the study subjects (communal, customary, protected, private, and public). The researchers found private land is associated with mixed forest outcomes, which is unsurprising given that private land can provide the landholder with unrestricted

[22] Bunding is a traditional low-cost method of soil conservation that increases rainfall filtration in the soil and reduces runoff.

rights to convert forest, absent enforced land use planning. The only type of tenure that consistently generated better results than the others was a protected area, which often excludes human access to the forest. This is consistent with Busch and Ferretti-Gallon's findings, across 35 studies, that the existence of protected areas is regularly associated with less deforestation (Busch and Ferretti-Gallon 2017). Protected areas should not be viewed as necessarily distinct from a governance, rights or people-centered approaches. Indeed, protected areas are an integral part of LRG, all the more so because of conservation's troubled history with expropriation and displacement of customary communities and indigenous peoples (Robinson et al. 2017; Dear 2008).

Unsurprisingly, the researchers find that open access (or the absence of tenure) is associated with significantly worse outcomes than all tenure types. Some rules around access are better than no rules (Ibid.). This is consistent with Ojanen's research, which compared 47 forestry studies and found that open access is worse than state-managed systems at protecting forests (Ojanen et al. 2017).[23] This is also confirmed by a retrospective, geospatial impact evaluation of forest outcomes in the Maya Biosphere Reserve, which found that areas of the Reserve subject to de facto open access experienced 58 percent higher deforestation than areas with land and resource rights devolved to local communities (Blackman 2015).

Although protected areas are an important policy tool to reduce deforestation, LRG programs that strengthen the land rights of indigenous peoples and customary communities can also significantly reduce deforestation (Stevens et al. 2014; Blackman 2015, Nolte et al. 2013; Blackman 2016).[24]

Indeed, more than a decade of studies using advanced econometric methods, including rigorously defined counterfactuals, support the link between positive forest outcomes and devolving land and resource rights to indigenous peoples and customary communities (Blackman 2015; Nolte 2013; Blackman 2016). For example, one study found that titling Peruvian indigenous lands decreased forest clearing by more than 75% and forest disturbance by approximately 66% over a two-year period.[25] Other studies found that local, community-based management of forests produce similar effects. In Nepal (Odelkop et al. 2019; Bluffstone et al. 2018) and in Guatemala (Blackman 2015), community-management practices reduced deforestation. In Nepal, counterfactual, matching analysis of more than 3500 municipalities with and without community forests demonstrated both reduced deforestation and reduced poverty from 2000-2012 if the community forest was larger (greater than 8.3% of the municipality's land area) and longer established (Odelkop et al. 2019). Similarly, a 2018 comprehensive review by USAID found "reliable evidence that community-based forest management can improve forest conditions in many contexts" (USAID 2018).

This link is particularly important because of the vast amount of carbon sequestered in forests held by indigenous peoples and customary communities, with one estimate putting the figure at 37.7 billion tons of carbon in government-recognized community forests—roughly equivalent to the carbon in North

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[23] Ojanen also found that monitoring, protection, and low resource use pressure were more likely predictors of good forest outcomes than any particular type of tenure (Ojanen et al. 2017).

[24] This proposition should be appropriately caveated, as "customary communities" is an ambiguous term, amenable to many different interpretations. In its broadest sense, the term encompasses communities that exhibit a variety of different characteristics, social capital, degrees of ability at inclusive collective decision making, and history with the land, among others. Which rights are devolved to communities are critically important. The Rights and Resources Initiative (RRI) argues that the following rights customarily held by indigenous peoples and communities should be recognized by governments: access, withdrawal or use, management, exclusion, due process and compensation, and duration (RRI 2012b).

[25] Critiques of Blackman 2016 noted the limited rights bestowed by titling without obtaining permits so that indigenous peoples could make full productive use of their land, among other limitations of the study (Robinson et al. 2017).

America's forests (Stevens et al. 2014). Carbon measurements of forests held by indigenous peoples in the Amazon show that their forests store more above-ground carbon than all the forests in the Democratic Republic of Congo (Walker et al. 2014).

Why are indigenous and local communities such good stewards of their forests? One reason is that these communities may have longer, more established connections to the land. In Nepal, as discussed above, municipalities with longer-established community forestry arrangements were 20% better at combating deforestation, and had 3.4% less poverty, than those with shorter-running community forest arrangements (Oldekop 2019). Deeper roots in the area may mean pre-existing land uses and norms consistent with sustainable forest management, such as deriving livelihoods from non-timber forest products as opposed to cattle ranching and agriculture (Blackman 2015). Another possible explanation is that indigenous peoples tend to exhibit higher levels of trust, community cohesion, and collective action, making them less susceptible to dysfunctional land and resource governance. This explanation is supported by the counterfactual study in Nepal, which found that "collective action has important and generally positive effects on forest quality" (Oldekop 2019).

The involvement of local communities in planning and implementing programs can also magnify the effects of LRG programs by incorporating local knowledge and understanding of communities' relationships with the land (Bayrak and Marafa 2016). A key unanswered question is whether a community's level of trust, social cohesion, and collective action can be augmented or resuscitated, combined with participatory land use planning, to improve forest and broader landscape outcomes while also increasing incomes, investment, and productivity. Two ongoing USAID evaluations in Liberia and Ghana are the first attempts to test this question in a rigorous manner.[26]

Despite the importance of tenure security and rights devolution, to yield the strongest outcomes, LRG should be combined with governance support, land use planning, provision of public goods (e.g., effective enforcement) and, in some cases, subsidies (Stevens et al. 2014; Busch and Ferretti-Gallon 2017; Robinson et al. 2014). This last point on subsidies is important: in many countries, agriculture benefits from significant subsidies. Adopting a subsidy scheme that specifically benefits indigenous and customary land and resource stewardship could help GHG emissions stay in the forest, rather than exacerbating climate change. Payment for ecosystem services, the most famous example being REDD+, and community-based forest enterprises, are designed to help communities capture some of the value of this enormous and diffuse positive externality they bestow by sustainably managing their forest.

Institutional support is also critical to positive outcomes. For example, the remarkable results from the Guatemala Maya Biosphere Reserve are in part due to significant, focused, and sustained engagement by the Government of Guatemala (which granted the concessions), USAID, and other stakeholders over three decades (Hogdon et al. 2015). However, this arrangement is now under threat because several government concessions are due to expire in 2020, and it is uncertain whether the Government of Guatemala will renew them (Sherriff 2019).

What should be clear from the above discussion, is that without sound land and resource governance one is unlikely to see a host of positive benefits, such as soil conservation, reduced deforestation, and climate change mitigation.

[26] See Persha and Protik (2019); Marple-Cantrell et al. 2017.

FOOD SECURITY

Food insecurity levels are on the rise after a decades-long decline (FAO 2019). Increased competition over land due to climate change is leading to food insecurity, particularly in Africa, Asia, and South America (IPCC 2019). At the same time, the emergence of land markets and improved ability to acquire "new," formalized customary land may be spurring agricultural transformation across sub-Saharan Africa (Jayne et al. 2019; Chimhowu 2019). Although evidence supports a link between LRG programs and agricultural investment and productivity, do LRG programs actually lead to better food security outcomes?

Perhaps surprisingly, there is a dearth of rigorous research that explicitly tests this link. Since 2000, only two rigorous studies have tested the linkages between LRG and food security, with split results—one study showed a positive impact and the other no impact (Higgins et al. 2018). Moreover, only one study—focused on fisheries in Fiji—tested the link between LRG and nutrition (Ibid.). Other well-regarded researchers similarly conclude that the evidence base on the direct causal pathway between tenure security and food security is thin and needs to be strengthened (Holden and Ghebru 2016; Rockson et al. 2013).

Part of the problem is that the causal chain from LRG to food security is a long one, both in terms of the number of links, and in terms of how much time must pass for the impacts of each link to be seen.

Experts find that the two most important factors affecting food security are food prices and farm income (Saleth and Dinar 2009). Income is hypothesized to be driven by productivity: the more a farmer produces, the more money they make. Productivity, in turn, is hypothesized to be driven by on-farm investment: the more a farmer invests in things like fertilizer, seeds, equipment, and the like, the higher their productivity will be. And finally, it is hypothesized that land tenure security gives farmers the confidence to make these investments.

Broken down in this way, it becomes more apparent why so few studies test the entire chain. Taken together, Higgins et al.'s and Lawry et al.'s systematic reviews reveal that the average exposure period of food security-related quantitative studies is just six years. The lack of longitudinal studies of USAID programming is particularly frustrating; the Agency invested heavily in rural land tenure programming throughout the 1990s, but a de-prioritization of evaluations ensured that only one program in Honduras allowed for tracking the impact on specific beneficiaries over time.

Furthermore, studies examining both the direct and intermediate links between tenure security and food security are context-specific, and therefore difficult to generalize. For example, Lawry's systematic review finds that land titling leads to significant productivity gains in Latin America and Asia, but not in Africa (Lawry et al. 2017). Why? Lawry hypothesizes that stronger customary tenure systems that may provide sufficient tenure security without titling, smaller farms, worse infrastructure conditions, and lower overall incomes may be the culprit. More rigorous studies, and more cross-country comparisons, will help us better understand the degree to which these linkages bear out, and why they bear out in some parts of the world but not others.

MONETIZING LAND VALUE AND INCREASED LAND MARKET TRANSACTIONS

Finding: Individuals and communities with secure land tenure are better able to monetize the value of their land, including by renting it out. However, these findings are stronger in Asia and Latin America, than in Africa.

A cross-national, systematic review finds that formal recognition of land rights leads, on average, to a 40% increase in the monetary value of land productivity (Lawry et al. 2017)[27]. The authors admit, however, that these results mask regional variation. Monetary gains are significantly lower in sub-Saharan Africa than in Asia or Latin America. Additionally, the authors could identify only six sufficiently rigorous case studies, with two each coming from the three regions. Further research into the link between LRG programs and increases in land value will allow for more thorough empirical analyses across geographic regions.

The overall body of evidence indicates that, at least in Africa, tenure security and formal recognition of land rights are necessary but not sufficient conditions for increased monetization of land value. Although others are underway, only two African countries have completed large-scale land regularization programs—Rwanda and Ethiopia. Notably, both programs occurred within a context of individualized, private land rights, not community, customary tenure. An examination of these two programs provides a glimpse as to why this is the case, and which types of additional measures may maximize the impact of LRG programs.

The first example comes from DFID's nation-wide land tenure regularization (LTR) program, which titled the entire country of Rwanda in just 3.5 years. Unfortunately, no reliable longitudinal data exists for the entire LTR program. However, an evaluation of the LTR pilot program found increased participation in rental markets and increased tenants' access to and cultivation of arable land (Ali et al. 2015). An evaluation of the entire program, using data in the land registry, among other sources (but no baseline or endline data), found that most benefits of titling accrued to individuals and families in higher value urban areas. Lack of awareness about the process for registering and transferring property, and high transaction costs dampened the impact of titling in poorer, rural areas (Ali et al. 2017). The Rwandan government policy of levying a $40 fee on all land registrations—amounting to about five percent of average GPD per capita at the time—meant that, despite LTR's success with first-time registration, a substantial number of land transfers remained informal (Deininger 2017). Poorer, rural landowners, precisely those who could benefit most from titling, were the least aware of the process and the least able to afford the high costs of registering subsequent transactions. The evidence from Rwanda therefore suggests that regularization must be accompanied by awareness raising and lower transaction costs.

The second example comes from DFID's more recent titling in Ethiopia. The DFID program provided beneficiaries with geo-referenced, digital land certificates, and introduced a standard land rental contract with a network of service providers to facilitate land rental transactions. Survey data suggests that the combination of these measures encouraged people to enter the land rental market for the first time, decreased land rental disputes, and increased the amount of land under productive use (LIFT 2019). But the survey did not have a rigorously defined counterfactual, and more research is needed to understand how this combination of measures translated into the gains detected. Without piloting these additional measures, titling would not have had the expected, positive impact because Ethiopian law restricts land market activity in various ways. For example, land sales are illegal and in some areas, the failure to maintain residency results in forfeiture of land rights. Use of land as collateral is also illegal.

[27] A recent review found that while in Ethiopia and in Mexico land titling did correspond with better land rental and land sale outcomes, in Rwanda land titling actually had a negative impact on land market participation, and in Vietnam land titling had no impact one way or another (Higgins et al.2018).

PRODUCTIVE LAND USE AND INVESTMENT

Finding: There is robust evidence for the link between LRG and investment, but experts disagree about whether there is enough evidence to show the link to higher productivity and income. More longitudinal studies are needed to truly understand this full causal chain.

Two recent meta-analyses have looked at the LRG–investment–productivity-income chain: a 2018 study by Daniel Higgins et al. and a 2017 study by Lawry et al. The analyses agree that LRG leads to investment, but disagree about whether the link also extends to productivity and income.

Both studies find ample evidence that LRG leads to increased investment in land (Higgins et al. 2018; Lawry et al. 2017). Eight of ten studies Higgins et al. cite in their meta-analysis found that LRG has a positive impact on investment; the other two studies found no link. Importantly, investment effects were observed all over the world, from China and India to Rwanda and Peru. Likewise, Lawry finds that across ten studies from sub-Saharan Africa, Asia, and South America, formal recognition of tenure increases long-term investment by five percent.

However, the studies diverge when it comes to productivity and income. Lawry finds that formal tenure recognition leads to a whopping 40 percent increase in productivity, and a 15 percent increase in income (Lawry et al. 2017). By contrast, Higgins et al.'s review found less evidence to support the link between LRG programming and improved productivity or income (Higgins et al. 2018). Not a single one of the five titling programs Higgins et al. included in their analysis led to increases in income (as opposed to other programs like vouchers or strengthening forest rights, which did seem to increase incomes). Higgins et al.'s review of the LRG-productivity link is less consistent, with about half of the studies finding that LRG was associated with increased productivity (of which several find strong productivity increases, as high as 35%), and about half of the studies finding no clear association.

It is difficult to know what accounts for these differences, given that there is almost no overlap in the studies used by Higgins et al. and Lawry et al. It is possible that the short time frames of the studies Higgins et al. analyzed (six years on average) meant there was not enough time to observe increases in productivity that result from investment. By contrast, a study with a 12-year exposure period of land registration and certification in Ethiopia found that certification and land registration led to increased investment and productivity, and ultimately led to positive impacts on calorie intake, food availability, and children's body mass index (BMI) (Ghebru et al. 2015).

Another possibility is that Higgins et al.'s review focused on titling programs, which are not always correlated with increased tenure security. For example, a study in Ethiopia found that titling can actually have a detrimental effect by encouraging elite capture of the titled land (Ege 2017). A recent study in Ghana, suggests that different types of LRG programs, such as those that promote the adoption of different technologies to support sustainable intensification practices, may have a more positive effect on income than simply titling (Kotu et al. 2017).

In addition to the meta-analyses, these individual results bear mentioning:

- In Ethiopia, a program to map and register use rights to farmland parcels led to productivity increases of 35 percent to 45 percent (Melesse and Bulte 2015).
- In Colombia, Afro-Colombian households with collective property titles had a per capita income almost $15,000 higher than non-titled households (Pena et al. 2017).
- Evidence from a RCT in Zambia finds that customary land registration increased investment in long-term productivity-enhancing practices (TGCC IE Endline 2018).
- In India, land allocation and titling led to more investment in fertilizer and seeds (Santos, Fletshcher, Savath and Peterman).

- A study in Burkina Faso found that landowners and tenants who fear conflict are 40 percent less productive than those who do not, and that, overall, areas in which farmers were less tenure secure were also nine percent less productive (Linkow 2016).
- A separate study in Burkina Faso demonstrates that tenure security increases investment, which, in turn, strengthens land rights (Bambio and Agha 2018).
- In Benin, an RCT found that customary households benefiting from demarcation of their parcels were "22-43 percent more likely to grow perennial cash crops and invest in trees on their parcels" (Goldstein et al. 2018).

So, do investment, productivity, and income actually translate to improved food security? Again, the short, unsatisfying answer is that it depends on a variety of contextual factors such as the overall economic health of the community, existing infrastructure and access to markets, to name a few. While we have anecdotal evidence in the affirmative from individual programs, there have not been enough studies to rigorously test how different contextual factors influence these links, especially in Africa (Higgins et al. 2018).

Of the evidence that exists, the most robust links appear to be between investment and food security. Investment *has* been shown to have a positive, though indirect, impact on food security. For example, investment in soil conservation practices can promote sustainable intensification, which in turn enhances food security outcomes (Holden and Ghebru 2016; Ali et al. 2017). This finding is encouraging because the link between LRG and investment is quite strong, meaning that one could hypothesize a viable link from LRG to investment, and from LRG to food security.

Further research is necessary, however, to bolster these studies and more conclusively establish the long-term effects of investment on food security outcomes (Ghebru and Holden 2015). In particular, further research should interrogate the link between LRG and productivity, given that meta-analyses are split on how robust this link is, despite several LRG programs resulting in productivity gains of 30 percent or more.

ACCESS TO CREDIT

Finding: Studies show that in the developing world, the theory that titling increases access to credit (via using land as collateral) does not generally hold. However, some LRG programs are revealing that land documentation can unlock informal or innovative credit channels–this link deserves further study.

Economists have often presumed that tenure security via formalization and titling increases access to credit by allowing landowners to use land as collateral (De Soto 2000). In practice, while this link does bear out in developed countries that have robust formal banking and property sectors, it is less viable in much of the developing world. Evidence suggests that without several other factors in place, the hypothesized linked to credit access, espoused most prominently by De Soto, fails to materialize (Holden and Ghebru 2016; Higgins et al. 2018; Lawry et al. 2017).

In the 1980s, the Land Tenure Center and USAID found that access to formal credit depends on strong financial institutional capacity, as well as a robust property rights regime that confers the right of alienation (Bruce 1986; Lawry et al. 2017). Even with these institutions in place, small, rural parcels of land may be unattractive to financial institutions, which may have no means or interest in repossessing them in case of default (Ibid.). A recent systematic review confirmed these findings: of seven studies assessing the impacts of LRG on access to credit, only two (in India and Vietnam) found any positive impact (Higgins et al. 2018). In Vietnam, the impact only applied to formal credit received from banks with a collateral-based lending policy. Similarly, the study in India found that households that received titles were 12 percent more likely to take a formal bank loan but was silent on the topic of informal credit (Lisher, GLTN/IFAD 2019). Given

the lack of formal lending in much of the developed world, particularly in rural areas, these findings are of limited utility for policies and programs.

However, recent programs *are* starting to show interesting links between LRG and informal credit. For example, a recent USAID LRG program in Ethiopia resulted in a 10 percent increase in credit use, as well as a slight increase in the amount borrowed. This finding is significant because land certificates cannot be used as collateral for formal lending in Ethiopia (USAID ELTAP 2016). This means households were able to parlay their tenure security into obtaining credit through informal channels (Ibid.).

This finding is bolstered by recent documentation from DFID's Land Investment for Transformation (LIFT) program, which worked with the Government of Ethiopia and microfinance institutions to create a special agricultural loan product for farmers with land certificates. The program's early results have been promising, delivering significantly larger loans than were previously available, in many cases to people who had no prior access to formal credit. The loans are secured by the "produce of the land and/or the land use right." Although the program has not benefited from an impact evaluation or counterfactual analysis, only two percent of recipients have ever missed a payment to date, and their average land productivity increased by 33.6 percent (DFID LIFT 2019).

These findings suggest that LRG could make people more attractive borrowers, either to microfinance institutions or informal lenders, even if their land cannot be used as collateral. However, this finding is only beginning to emerge, and further research is needed to elucidate the link between tenure security and alternative credit channels.

CONFLICT PREVENTION AND STABILIZATION

Competition over land and resources drives conflict around the world. Disputes over land and minerals precipitated wars in Liberia and Sierra Leone, and the nearly 25-year war in Sri Lanka was fought over geographic claims to an ethnic homeland for the country's minority population (USAID Land and Conflict Issue Brief 2013). As ISIL retreats from Syria, forces from Turkey, Iran, and Russia are already beginning to jockey for control of the lands once held by the Islamic State, foreshadowing yet another descent into land conflict (Foreign Policy, Dec. 4, 2019).[28]

Africa, in particular, is a hotbed of land-related conflict: between 1989 and 2011, "territory" was the most common cause of non-state conflict on the continent (Von Uexkull and Pettersson 2018). Land-use conflicts, particularly where access to agricultural land or water resources are at stake, accounted for one quarter of all African conflicts from 1989 to 2011 (Ibid.).

The twin forces of climate change and global consumption threaten to exacerbate this trend. Climate change is forcing entire populations to migrate in search of food, water, and jobs. As a result, climate change-related displacement will likely emerge as a major source of conflict in the coming decades. The World Bank estimated in 2018 that climate change will result in an additional 143 million "climate migrants" from sub-Saharan Africa, Southeast Asia, and Latin America by 2050 (Rigaud et al. 2018). The potential for LRG programs to mitigate climate-related displacement and conflict may therefore emerge as a major area of focus within this sector objective.

Not only that, but as global demand for food, fuel, and other natural resources continues to rise, large-scale land-based investment exposes local communities to land grabbing and related conflicts. Developing countries often consider unregistered land to be "available" for allocation to investors. However, governments and investors alike fail to take into account that what appears to be vacant and sparsely

[28] https://foreignpolicy.com/2019/12/04/syria-iraq-fight-for-isis-old-territory-just-beginning/

settled land may in fact be claimed by local communities (USAID Land Tenure Issue Brief 2013). This dynamic sets up conflicts between investors and local communities, as well as intra-community conflict (Neyman and Boudreaux 2015).

It is therefore intuitive that insecure land rights are significant factors in the incidence and recurrence of conflict, violence, and instability. Similarly, it makes intuitive sense that strengthening land rights could therefore prevent conflicts, mitigate crises, and ensure a strong and rapid post-conflict recovery.

However, while the conceptual links between LRG and conflict prevention and stabilization are compelling, the evidence is thin. Of the systematic reviews examined, only Higgins et al.'s study looks at the links between LRG and conflict, based on a sample of only three sufficiently rigorous studies. A 2018 review of land and conflict data similarly found that "literature on land conflicts in individual countries is rich, but quantitative, cross-national data are more limited" (Travaglianti 2018). Additionally, while there is *some* research on land as it relates to conflicts involving state actors, land conflicts that are fought between non-state actors have remained less explored (Travaglianti 2018).

The paucity of evidence may be due to the challenge of untangling the complex web of factors that lead to conflict and war. After all, war and violent conflict often signal a complete breakdown of governance, and are likely the culmination of multiple triggers, of which LRG is just one. For example, while a conflict over water points between pastoral herders may seem to be caused by resource scarcity, the underlying cause may be a political decision that shifted administrative boundaries, cutting off pastoral groups from water resources they had previously relied upon (Beyene 2017).

The other reason may be that conflict is defined in many different ways, ranging from a simple land dispute or an instance of corporate land grabbing, to a foreign invasion. When "conflict" is hard to define, it is likewise difficult to measure.

Despite these difficulties, some evidence suggests that certain LRG programs can: decrease the likelihood and recurrence of conflict by safeguarding customary norms; foster local institutions adept at dispute resolution by promoting education and awareness; contribute to post-conflict stability by ensuring that those who return after fleeing a conflict are secure in their land tenure and property rights; and build social capital and trust (Beyene 2017; Blattman et al. 2012; Sonmez et al. 2018; Hartman et al. 2018).

The evidence on the links between LRG and conflict suggests several avenues of further research, including the ability of local-level institutions to decrease the likelihood and recurrence of conflict and assist with post-conflict recovery; the extent to which land formalization impacts a community's exposure to land grabbing; and, relatedly, whether formalized customary land recognition is a viable way to protect against the adverse impacts of large-scale land-based investments (Lawry et al. 2017).

DECREASED LIKELIHOOD AND RECURRENCE OF CONFLICT

Finding: Some research does show a link between LRG programs and decreased likelihood and recurrence of conflict, but there is simply too little of it to draw any general conclusions. This is a critical area in need of further research.

Research shows that many conflicts occur because of fights over land. But does strengthening LRG actually prevent these conflicts? The evidence on whether LRG decreases the likelihood and recurrence of conflict is sparse and inconsistent, and quantitative studies provide little insight on whether formal tenure helps prevent conflict (Higgins et al. 2018; Lawry et al. 2017).

A recent systematic review found only three studies on this topic sufficiently rigorous to include in its

parameters (Higgins et al. 2018). The first study, from Guatemala, found that peasant farmers with titles experienced significantly lower levels of conflict over land parcels than those without titles (Macours 2009). The second and third studies, from the DRC and Bolivia, respectively, found that having a title had no impact on the prevalence of any type of conflict (Fatema and Kibriya 2015; Reyes-Garcia et al, 2012). Looking more closely, these three studies are evaluating very different scenarios. The Bolivian study looked at disputes over access to indigenous forestland in the Bolivian Amazon; the DRC study looked at land in the North Kivu region, which is already in the midst of violent conflict; and the Guatemala study looked largely at disputes between neighbor peasant farmers over titled land. This unsatisfying comparison of the above studies tells us very little.

Two other studies on this topic bear mention:

- A study of pastoralist conflict in Southern Ethiopia revealed that a careless set-up of administrative boundaries contributed to ethnic conflict by cutting off access to land and water points. Insecure rights to communal land also caused certain pastoralists to change their land uses, which in turn put more pressure on land and exacerbated conflict. The study found that strengthening customary courts, improving land use planning and empowering customary authorities would reduce the incidence of inter-clan conflict (Beyene 2017).
- A counterfactual study on land dispute resolution practices in post-conflict Liberia compared 68 villages that received dispute resolution training, and 179 randomized, control towns that did not. The study found little impact on the frequency or severity of disputes, but did observe dramatically higher land dispute resolution among the villages that received the training, and satisfaction with the results (Blatmann et al. 2012).
- A randomized control trial in Benin found that in the immediate term, an LRG program seemed to correlate with a rise in conflict. However, the study predicted that in the medium and long-term, rates of conflict would drop as landholding was clarified (Goldstein et al. 2015). This finding shows that it is particularly important for studies on the intersection of land and conflict to be long term.

Land and Countering Violent Extremism: The Case of ISIL

The desire to control land, property, and natural resources is a major driver of violent conflict, but likely only an indirect driver of violent extremism, which is primarily motivated by political, religious, or economic ideology. Nevertheless, violent extremist groups use land, property, and natural resources to finance their activities and territorial ambitions [1].

For example, ISIL weaponized the property rights system in areas of Iraq under its control. In Mosul, ISIL seized control of Iraq's generally well-functioning land registry, intimidated property owners into fleeing and abandoning critical property documents in the process, reallocated land and housing to their supporters, and sold or rented property to fund their terrorist activities. Even before taking Mosul, ISIL infiltrated the city's land registry as part of an organized campaign to seize control of critical government functions. The documents in the registry were transferred to an unknown location. This ensured ISIL control of a vital asset and source of wealth for local residents. Religious and ethnic minorities and those associated with the Iraqi government were systematically targeted for property confiscation. Christians in Mosul had three choices: pay a tax for non-Muslims; convert; or leave your home within three days. Most Christians fled [2]. If a property was thought abandoned, the rightful owners had 10 days to return. If they failed to do so, ISIL confiscated the property.

Confiscations had the air of official acts, with land and houses formally expropriated by Sharia courts. The type of properties confiscated varied. Most were houses, followed by agricultural land and businesses. Confiscated land and housing were gifted to ISIL fighters for their personal use or rented to them at reduced rates, but also sold to any interested buyer. Sales to the general public occurred through public auction. The sales were typically in bulk, for example the selling of ten houses or entire neighborhoods at a time. The buyers were reportedly Sunni Arabs, considered by ISIL as more desirable residents. Some buyers may have acted in good faith, unaware that ISIL was the ultimate seller. ISIL could have concealed their involvement through intermediaries. Some of these transactions enjoyed the imprimatur of ISIL's caliphate with the creation of a property directorate, an institution outside the land registry system maintained by the Government of Iraq. The directorate issued ownership and lease documents. The revenue generated from these transactions exceeded revenue from selling oil on the black market (Callimachi 2018).

(1) Data on ISIL activities pertaining to property rights is hard to come by. This briefer is based on the only known extensive study of the issue, released by the International Organization for Migration. The report's findings are based on interviews with Internally Displaced Persons and refugees. The report is available here: https://www.iom.int/sites/default/files/our_work/DOE/LPR/A-Preliminary-Assessment-of-Housing-Land-and-Property-Right-Issues-Caused-by-the-Current-Displacement-Crisis-in-Iraq.pdf. For additional information, see https://www.rand.org/pubs/research_reports/RR2076.html.

(2) Even before ISIL's take over, the Yazidi generally lacked records of their ownership rights. The Yazidi are a Kurdish religious minority that practice Yazidism, a combination of Zoroastrianism, Islam, Christianity, and Judaism. ISIL deems them legitimate targets for enslavement and sexual violence against women and girls.

One emerging area that deserves further study is the rise in tensions between local communities and commercial investors (Lawry et al. 2017).

Under what circumstances are investor–community relationships likely to turn antagonistic? For example, in sub-Saharan Africa an emerging class of domestic "investor farmers'" are increasingly acquiring rural lands. It remains to be seen how local communities will view the farmers: as sources of employment, or as exploiters? (Jayne et al. 2019). Will potential conflicts between investors and local communities remain localized, or balloon to the national level (Boone 2014)?

Another question is whether improving the land tenure of local communities, including through formalizing customary tenure, will help prevent potential land grabs (Henley 2013). In Liberia, Mozambique, and Uganda, community land documentation and legal empowerment initiatives were, on their own, not sufficient to balance the significant power and information asymmetries inherent in interactions between rural communities and government officials and/or potential investors (Namati 2019). Some studies go even further, suggesting that because land investments are often accompanied by a tenure clarification exercise (so that the investor can obtain legal right to the land), tenure recognition can lead to displacement of communities or inhabitants (Lawry et al. 2017).

POST-CONFLICT RECOVERY

Finding: LRG is critically important to post-conflict recovery because property is often the most valuable asset of those displaced by conflict. However, strong institutions are needed to effectively carry out these programs, and to make sure the results are enforced.

LRG is critically important to post-conflict recovery because property is often the most valuable asset of those displaced by conflict. As a result, post-conflict land restitution, if undertaken efficiently and equitably, can reduce the likelihood that conflict will recur. The restitution of housing, land, and property rights leads to three practical outcomes that assist with conflict recovery: it is a means of legal redress; it assists internally displaced persons (IDPs) to return; and it prevents new cycles of displacement (Sonmez et al. 2018).

In Bosnia-Herzegovina and Kosovo, property restitution helped to reestablish the rule of law and contributed to reconciliation between parties to the conflict (Von Carolwitz 2005). These programs, led by the international community, were a significant step in achieving post-conflict stability. Similarly, in Iraq, land and property rights have been found to be critical to the safe return of refugees and IDPs (Somnez et al. 2018).

An interesting finding from Bosnia is that financial property restitution may be a more effective post-conflict recovery tool than physical return of property. In other words, the act of restituting property was a successful post-conflict recovery tool, regardless of whether the property owners actually returned, or decided to settle elsewhere (Sert 2011). This makes sense: those displaced by violence may not actually want to return to the site of the crime, but still wish to recoup the financial value of their lost property (Blattman, 2012).

As the number of refugees and IDPs continues to rise, more research is needed on the most effective ways to document and restitute the properties they have left behind.

ADDITIONAL TOPICS

The topics below are not part of USAID/LU's road map. However, given their strategic importance, and the existence of USAID LRG programs in these areas, we provide a cursory examination of the evidence, below. These sections do not rise to the level of a comprehensive state of the evidence review, however they provide some grounding on each topic, as well as ideas for further research.

URBAN AND PERI-URBAN SPACES

The world is urbanizing at a rapid pace (Dijkstra et al. 2018), and rates of insecurity in urban areas are higher than in rural areas, for many reasons. A recent USAID issue brief on urban land tenure describes the problem succinctly:

> "Cities attract newcomers through the prospect of economic opportunity. Growing urban populations lead to competition for housing and increases in urban land and property prices. As property values rise, property owners are able to capture value by increasing rental rates, sellers by charging higher prices when property is transferred. With few, if any affordable choices, the urban poor are forced into high-density slums in the inner city, less expensive peripheral areas with poor access to livelihoods and services, or a wide range of informal settlements." (USAID Issue Brief – Land Tenure in Urban Environments 2014).

Furthermore, rapid urbanization is leading to a mushrooming of informal settlements, where people live in unsafe and cramped conditions and with precarious tenure. One billion people globally live in informal settlements that lack basic services, and 60% of urban dwellers are physically exposed to natural hazards and pollution (USAID Issue Brief – Land Tenure in Urban Environments). Sea level rise threatens these precarious and densely populated areas and is likely to disproportionately impact informal settlements. Sea level rise projections predict that Ho Chi Minh City, Mumbai, Basra and Bangkok will sink under the sea by 2050.[29]

Formalizing urban land tenure can increase perceptions of tenure security among both owners and tenants (Durand-Lasserve and Selod 2007; Payne et al. 2009). This newfound security translates into real savings in cost and time. A study of an LRG program in urban Peru found that more than one-third of titled households reallocated time and resources away from guarding their property and more towards optimal employment, increasing work hours on average by 45 hours per week (Field 2003).

Formalizing urban tenure also leads to increases in investment: just as farmers with titles are more likely to invest in their lands, so urban homeowners with titles are more likely to invest in their homes. For example, in Argentina, informal households that received titles increased their housing quality by 37 percent more than informal households without titles (Ibid).

Titling programs in urban areas are also generally correlated to positive gender outcomes, including an increase in perceptions of tenure security among women (Payne et al. 2009). In a study of informal urban slums in Dar es Salaam, titling increased rates of co-ownership (Ali et al. 2013).

However, titling may come at a cost for tenants, who are already more insecure than owners (Prindex 2020). As market rates increase for titled property, tenants remain vulnerable to subsequent increases in rent or to the potential sale of the land that they occupy (Ibid.). The economic benefits of urban titling programs do not always bear out. As with LRG programs in rural areas, titling per se, has not been shown to increase access to credit among urban households (Payne et al. 2009).

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[29] https://www.nytimes.com/interactive/2019/10/29/climate/coastal-cities-underwater.html

As an alternative to full rights recognition, even limited rights recognition can enhance urban tenure security (Durand-Lasserve and Selod 2007). In Pune, India, one study found that slum declarations, or official recognition of occupancy, can increase household investment in informal settlements, thus producing some of the economic benefits that are generally associated with formalization (Nakamura 2016). This suggests that in urban and peri-urban spaces, programs that incorporate alternatives to titling may be a promising avenue for economic growth.

Because urbanization implicates several key issues within the LRG sector, including the growth of informal settlements and housing, and the relationship between gender and land tenure, understanding how to design and deploy programs that promote security and economic growth in rapidly urbanizing contexts should be a priority.

ARTISANAL AND SMALL-SCALE MINING

Artisanal and small-scale mining (ASM) is "one of the most indispensable rural, non-farm activities in the developing world" (World Bank 2018). It is an important source of employment and income for tens of millions of people and produces economic benefits for millions more who are not directly engaged in ASM. By some estimates, six support jobs are created for every job in the ASM sector itself (Huntington and Marple-Cantrell 2016).

At the same time as individuals and communities reap economic benefits from ASM, a number of adverse consequences accompany the practice, including unsafe labor practices and the use of child labor, pollution and environmental degradation, and the use of ASM as a source of funding for rebel groups, gangs, and transnational criminal organizations (Huntington and Marple-Cantrell 2016; World Bank 2018).

The production and commercialization of minerals has fueled conflict in countries like Liberia, Sierra Leone, Angola, and the DRC, with property rights often at the core of these conflicts (USAID Property Rights and Artisanal Mining Issue Brief). Because mining sites are so lucrative, particularly in areas where other economic and livelihood opportunities are sparse, it is easy to understand why sites are fiercely contested by various actors, such as ASM minors and industrial mining concessions, local communities, and other competing groups. This explains why unclear land and resource rights can fuel these conflicts.

However, the challenges of developing LRG programming that address ASM are two-fold. First, the sector has only recently garnered the attention of policymakers and development professionals, despite its importance as a source of income and economic growth (World Bank 2018). As a result, reliable data upon which to base LRG programs is sparse (Ibid.).[30]

Second, ASM occurs largely in areas with customary land tenure regimes. Attempts to formalize the sector are made more difficult by the lack of awareness of formal domestic and international regulations (such as the Kimberley Process), a lack of governmental capacity to enforce regulations (Huntington and Marple-Cantrell, 2016), and the fact that formalization contrary to good practice can impose transaction costs resisted by customary communities (Huntington et al. under review). Customary LRG regimes are generally considered more legitimate by local communities and are able to ensure that some of the economic benefits of ASM remain in the local community (Huntington and Marple-Cantrell 2016). At the same time, they are more difficult to reform because rules are often unwritten and vary between ASM sites.

[30] This may be changing with the creation of the DELVE database, which is a step in the right direction for improving ASM data.

PASTORALISM

Pastoralists are agriculturalists who keep domesticated livestock on natural pastures and depend upon their animals as their primary source of income (USAID Pastoral Land Rights and Resource Governance Issue Brief). Several hundred million people practice pastoralism around the world (FAO). Pastoralism is a dynamic practice, and there is no archetypal pastoralist (Bisson 2016). However, traditionally pastoral land rights consisted of access to the key natural resources required to sustain mobile livestock production—pastures, watering points, and the movement corridors that linked together seasonal grazing areas, pastoral settlements or encampments, and markets (USAID Pastoral Land Rights and Resource Governance Issue Brief).

Despite persisting for millennia, pastoralism has faced significant challenges over the last century. Throughout the twentieth century, governments tried to "modernize" away from collective pastoral rights, and towards individual and private rights (USAID Land Rights and Resource Governance Issue Brief). Pastoral tenure systems were seen as inferior and ineffective, particularly in the wake of *The Tragedy of the Commons* thesis (Hardin 1968).

Despite decades of research qualifying Hardin's theory, recognizing the viability of collective tenure systems and the economic contribution of pastoralism to developing economies, pastoralism faces a number of contemporary challenges (Ostrom 1990; Platteau 1996; Lawry 1990; Hesse and MacGregor 2006; Hatfield and Davies 2006). Resource scarcity driven by climate change is forcing pastoralists to migrate into farming regions, sparking conflict in parts of Africa, including the Sahel (Freudenberger et al. 2019). At the same time, expansion of settled farming practices due to population growth is putting pressure on pastoral communities (USAID 2016 LAND report; Umutoni and Ayantunde 2018).

While evidence mounts that pastoralist communities are capable of sustainable resource management and that they contribute in important ways to national economies, policies have not shifted in ways that increase the security of these communities. Instead, many pastoralists have continued to experience land loss, physical insecurity, and economic marginalization (USAID Land Rights and Resource Governance Issue Brief). More research is needed on the impact that secure land rights can have on natural resource management in pastoral communities (Holden et al. 2016), and this research must be effectively translated into policy.

Challenges to pastoralism are particularly acute in areas already beset by insecurity, particularly in the Sahel and the Horn of Africa. In the Horn of Africa, the political marginalization of pastoralists has increased food insecurity and reduced their access to land (Pavanello 2009). In southern Ethiopia, insecure property rights and tension over land use has led to conflict over resources among and within pastoral groups (Beyene 2017).

In designing programs that secure the livelihoods of pastoralists, USAID should be particularly aware of tensions between formal LRG regimes and the customary regimes that often govern pastoral LRG. For example, the extension of administrative boundaries into rural areas has been found to induce conflict when pastoral groups begin to claim exclusive rights over particular parcels of land (Beyene 2017). Perceived bias in the administration of property rights can also exacerbate these conflicts (Butler and Gates 2012). LRG programs should fully account for customary institutions and preferences, including the preference that customary leaders resolve disputes that arise over land use rights (USAID LAND 2016).

Lastly, a number of macro-processes affect contemporary pastoralism, including climate change, the expansion of settled agriculture, and demographic shifts (USAID LAND 2016; Beyene 2017). Given that these processes are not likely to abate, LRG programs should be designed and deployed with an awareness of the long-term effects of these processes.

COASTAL RESOURCE GOVERNANCE AND MARINE TENURE

Marine tenure is the set of rights and responsibilities that govern the coastal and marine environment. As with land tenure, this set of rules governs who is allowed to use which marine resources, in what way, for how long, and under what conditions, as well as who is entitled to transfer rights to others and how (USAID Marine Tenure and Coastal Resource Management Issue Brief). Good governance of marine resources can empower communities, promote economic growth, and help ensure resources are not depleted.

Of particular importance are small-scale fisheries, which employ 90 percent of the world's capture fishers, including a large number of female fishers. These fisheries employ a significantly larger amount of people than industrial fisheries and catch the same amount of fish while using less fuel (USAID Marine Tenure Issue Brief 2017). Wild marine fisheries support an estimated $240 billion global industry and are important components of many national economies (Dyck and Sumaila, 2010).

However, due to poor management, wild fisheries are losing up to $50 billion a year (World Bank 2009). The real cumulative global loss of net benefits from inefficient global fisheries has been estimated at $2.2 trillion over a 34-year period between 1974 and 2008 (Ibid.).

Why is this happening? Ineffective tenure systems may be a significant contributor. As USAID's marine tenure primer explains:

"The current lack of secure tenure in many countries leaves many resources claimed by no one or everyone, resulting in 'open access,' which may lead to a 'tragedy of the commons,' where users are incentivized to exploit open-access resources before others do, thereby degrading areas once beneficial to people and biodiversity" (USAID 2017).

Despite a tendency to think of marine ecosystems as the "high seas" or "open water," research shows that these resources should not be governed through open access (e.g., unrestricted) regimes (Ojanen 2017). A systematic review of 29 fisheries studies showed that any sort of property rights regime (community, state, or mixed) was either more than or equally effective as an open access regime, at sustaining fish stocks and protecting the marine environment. Of all the regimes studied, community governance regimes (all of which were found in Asian countries) performed the best (Ibid.).

Terrestrial tenure systems also impact the health of fisheries. As discussed above, weak land governance can trigger and exacerbate violent conflict. An analysis of 123 countries from 1952 to 2004 demonstrated a statistically robust and negative relationship between civil conflict and fisheries, with civil wars depressing catch by over 16 percent relative to pre-war levels (Hendrix and Glaser 2011).

The governance of fisheries and other marine environments is becoming even more important in the context of climate change, which threatens to alter the quantity and distribution of fish stock, change marine migration patterns, and increase competition over dwindling marine resources (USAID 2017).

Effective monitoring systems are critical to maintaining good marine governance outcomes (Ojanen et al. 2017). As a result, strong local institutions are key to marine governance (Ibid.). This finding notwithstanding, few countries have strong marine governance systems (USAID, Marine Tenure and Small-Scale Fisheries: A Sourcebook on Good Practices and Emerging Themes).

RESEARCH AND EVALUATION PRIORITIES

In this section, we lay out a set of priorities to guide future LRG research and evaluations, based on findings from the preceding section and input from senior experts. The research priorities are organized under seven broad research themes. More specific research topics are listed with the intent to provide a basis for activities that could be designed and carried out by USAID and others in the sector.

The primary objective of USAID research on LRG is to generate findings that inform policy and programming. The secondary objective is to contribute to the state of knowledge in the sector and promote understanding of LRG. With these objectives in mind, the themes and topics that comprise the research priorities in this section were determined based on knowledge gaps identified when assessing the state of the evidence, as well as extensive discussions with LU staff and other land tenure experts. The activities fall within or bear on programmatic areas in which USAID is active or could be active, and for which there are important knowledge gaps in the existing literature. The focus of research will be on actionable findings and long-term impacts, reflecting USAID's commitment to help government partners in their journey to self-reliance.

Prior to laying out the priority research topics, it is useful to discuss the *types* of research products that will help USAID/LU achieve its research objectives:

- **Longitudinal studies that reveal long-term impact of LRG programs, particularly in Africa.** Considerable literature exists on the short-term impacts of various LRG programs, and existing evidence strongly suggests a causal link between LRG programs and certain outcomes like on-farm investment, women's empowerment and positive forest outcomes. However, we need more rigorous longitudinal studies to understand whether outcomes are sustained over a longer time period, and whether intermediate outcomes like increased on-farm investment translate into longer-term objectives like increased food security. Longitudinal studies are particularly needed in Africa, where study exposure periods average less than six years.[31] That said, although Latin America benefits from relatively more longitudinal studies than other regions, decades of LRG programs focusing on formalization, which sometimes results in reversion to informality, means Latin America has a lot of data which can inform more longitudinal research.

- **Synergies between LRG and other development programs**. What synergies between LRG and other development programming can help achieve higher-level impacts? We need more rigorous evidence on what type of integrated programming is most impactful and cost-effective for what types of outcomes and in what contexts. In short, we need to go beyond titling and look at the impact of programs that combine titling or tenure security support with other program elements. In a way, this is going back to the early insights of agrarian reform, which realized that allocating land to poor farmers would not in itself lead to improved productivity and incomes. Rather, tenure security support needs to be combined with public goods, training, and other types of support.

- **Realist synthesis and other methods to explain what works when, how, and for whom.** LRG programming tends to generate different outcomes in different countries and contexts. As a result, studies which try to measure the impact of programs across different local contexts cannot explain the highly contextual interplay between intervention, context, mechanism, and outcome. When combined with systematic reviews, particularly meta-analyses that estimate effect sizes, realist synthesis can go beyond what works and answer the question of

[31] Based on an analysis of studies included in the Higgins et al. and Lawry et al. systematic reviews, and excluding an outlier in Madagascar with a 44-year exposure period.

what works when, how, and for whom. In doing so, these studies may help us understand the intermediate causal mechanisms that go from intervention to outcome. This can assist policymakers and development professionals in designing targeted programs that account for the specific characteristics of the places in which they operate. The complex systems that govern forest conservation and other sustainable landscapes decisions may be particularly well-suited to realist synthesis. The use of realist synthesis may help USAID and other donors more effectively grapple with complexity and the appreciation that LRG programs and policies are embedded within complex systems. This reality must inform program design, implementation, and evaluation.

- **High-quality mixed methods impact evaluations of LRG programs.** Many existing studies have methodological limitations such as a lack of baseline data, ambiguously defined or weak counterfactuals that fail to account for selection bias, or measurement problems. As a result, findings from these studies are dubious, and more rigorous, methodologically sound evidence is needed—even on standard relationships and outcomes that have been studied previously. In addition, blending qualitative and quantitative methods will result in more nuanced research, allow us to ask more interesting questions, and perhaps surface connections that neither method, on its own, could have revealed. For example, research should draw in spatial and time-series data for design and matching, including sample design, and combine it with natural experiments as well as randomization (Holden et al. 2016). Advances in remote sensing spatial and temporal resolution and improved access to data for testing algorithms, such as machine learning and neural networks, have provided new tools for identifying and validating patterns of land change. We are better able to map the location of land cover changes, detect land use patterns, observe population movement, and even see populations we did not know existed (for example, slum settlements). Over the last seven years, USAID has pursued an extensive mixed methods impact evaluation agenda, which is already yielding invaluable insights to inform policies and programs. This effort should continue.

- **Better use of already-generated data.** As described in Section 2, impact evaluations of LRG programs are becoming increasingly common. As a result, a considerable amount of survey and other data that has been collected for LRG impact evaluations is now available, with USAID and MCC alone accounting for 16 impact evaluations. In many cases, impact evaluation analyses have been limited to addressing specific questions, and there is more that could be learned from the data. Recent initiatives such as Prindex are generating robust and provocative baseline findings that should be built on. And, spatial data has proliferated. Utilizing these existing data sources can thus be a cost-effective means of generating valuable new research findings. In addition, more work is needed to get existing data into the hands of national and regional policymakers. Far too often data is collected and stored in various databases but not made available to people at the national and regional levels who could benefit most from that data.

- **Studies that go beyond the household.** Rights and perceptions of security within a household are often unequally distributed, yet most research continues to collect data at the household level. We recommend moving beyond household-level data collection, and in particular investing in studies that survey others in the household beyond the head of household, especially women, and that account for the heterogeneity of women (rather than treating them all as a single category). In addition, studies should focus more on community-level impacts, especially around local governance and community resource control and management.

- **Policy briefs and other short, actionable products to inform programs and policies**. The primary goal of this Research Agenda is to generate findings that inform policy and programming. As such, it is critical that findings be presented in an easy to digest format that captures the interest of stakeholders outside the land sector, allowing non-land sector experts to make informed programming decisions.

RESEARCH THEMES AND TOPICS

The research priorities in this section are organized as follows:

1. Cross-cutting Research Topics
2. Economic Growth
3. Women's Empowerment
4. Sustainable Landscapes and Biodiversity
5. Food Security and Resilience
6. Conflict Prevention and Stabilization
7. Research on Emerging LRG Topics

THEME 1: CROSS-CUTTING RESEARCH TOPICS

Cross-cutting research topics have been chosen based on gaps identified across several of the outcome areas discussed in Section 5, State of the Evidence. We believe these topics should be prioritized, given that they bear on several development outcomes.

Customary tenure and the continuum of rights. Sometimes research draws a binary between formal and customary tenure. However, this overly simplistic and increasingly recognized view, shortchanges the heterogeneity of rights regimes globally, and in particular leaves out a growing third category of "formalized customary rights." Emerging formal/customary tenure regimes — called "new customary tenure" by Admos Chimhowu — are characterized by an integration of customary tenure practices into formal law, hybrid customary/statutory local governance institutions, and formal recognition of customary lands into the national judiciary system, among other characteristics (Chimhowu 2018). And yet, few if any rigorous studies have examined the effects of statutory recognition of customary tenure in Africa, whether community or household-level impacts (Lawry et al. 2017). For example, there are no completed impact evaluations on formal recognition of customary tenure at the community level, although a USAID-funded RCT in Tanzania on this issue will be completed soon. Further research should examine this emerging class of formalized customary rights and its impact on key sectoral outcomes, looking specifically at the features of this new hybrid system, the insecurity that each system (formal, customary, formalized customary) is best at addressing, and whether some formalized customary rights regimes have been more successful than others reducing threats and obtaining positive development outcomes.

Links between titling, documentation and tenure security. Systematic reviews and recent Prindex studies show that while some households with land titles do perceive their tenure security to be higher, it is not always the case (Higgins et al. 2018; Prindex 2019; Prindex 2020). It is no surprise then that titling programs, whether formal or informal documentation, may not always lead to the impacts hypothesized to flow from improved tenure security. And yet, much of LRG programming continues to focus on titling (to the exclusion of other efforts like legal reform, conflict resolution, and community education). Although titling and other formal and informal mapping and documentation programs generally lead to improved tenure security, why is this not the case in some contexts? Are there other documents (for example, contracts) that make holders feel more secure than do titles? If titling does not increase

security, then what does? What is the impact of certification of customary rights when combined with governance support? Although the literature calls attention to the importance of context (Deininger and Feder 2019), more rigorous research is needed to evaluate which package of interventions are necessary, including titling or documentation.

LRG, and what else? Digging into 'necessary but not sufficient.' LRG is often said to be a "necessary but not sufficient" precondition for achieving the sectoral outcomes discussed in Section 3. So, what are those other conditions that—when paired with strong LRG—lead to positive outcomes and ultimately self-reliance? In a sense, this question is returning to the insights of agrarian reform. Agrarian reform recognized that improved tenure security was insufficient to achieve productivity, income, and economic growth objectives, unless paired with public goods, subsidies, and other support to ensure beneficiaries can make the most out of their improved tenure security. For example, it is hypothesized that in addition to strong LRG, the rural and urban poor need access to infrastructure, technology, capital, and efficient markets to make investments that lead to self-reliance. Strong institutions must be in place to encourage, support, and protect these investments. Women must also have decision-making authority within the household or community. A better understanding of which complementary conditions are most important, and how to leverage LRG programs with complementary programs, would be valuable for policy and programming. As the Higgins et al. systematic review finds, there is not enough rigorous evidence on the impacts of LRG programs when combined with non-LRG programs. One approach would be to compare land tenure-related outcomes in geographic regions which received both stand-alone LRG programming, and LRG programming that was delivered together with complementary programs.

Theme 2: Economic Growth

Unpacking the link between LRG and economic growth. Studies show a strong link between LRG and economic growth, particularly on a macroeconomic level. However, further research is needed to examine how this link works. Further research should elucidate the causal links between LRG and economic growth, beyond a simple correlation. Relatedly, studies should attempt to isolate the 'land institutions' variable from strong institutions more broadly, to understand the degree to which economic growth is specifically impacted by LRG institutions, as opposed to strong institutions writ large.

Economic growth for whom, and what additional enabling conditions are required? LRG is correlated with robust macroeconomic growth, however it is not clear how this link plays out on a micro level, and in particular whether LRG-related economic growth occurs on the backs of certain vulnerable groups. For example, research shows that clarifying land rights may lead to an uptick in private commercial investment, which results in winners and losers within a host community. Studies should look at the impact of LRG programs on the distribution of income and wealth, both within the household and within the larger community (Locke 2013).

Theme 3: Women's Empowerment

More rigorous, longitudinal research, especially on intra-household bargaining power and decision-making. While there is widespread agreement that strengthening women's land rights supports women's empowerment, only a small number of papers explore this link in a rigorous and methodologically sound way. Similarly, while early research seems promising, there is little empirical support for the relationship between women's land rights and intra-household bargaining power and decision-making (Meinzen-Dick et al. 2019). Given the critical importance of women's empowerment to development writ large, and given the promising links between LRG and women's empowerment surfaced by the few rigorous studies we do have, this entire sector deserves a large investment in rigorous, longitudinal research.

Testing the link between women's LRG and poverty alleviation. There is ample research on the impacts of LRG on women's empowerment, and – to a lesser extent – impacts of LRG on decision-

making and household resource allocation. However, while it may seem reasonable to assume that strengthening women's land rights can reduce poverty, no studies firmly demonstrate that link (Meinzen-Dick et al. 2019). One reason may be that it is difficult to identify causation through such a long chain. Another may be that impact evaluations and other studies are conducted too soon after the program's end, and before the long-term impacts on poverty are realized. Rigorous longitudinal research should attempt to answer the critically important question of whether strengthening women's land rights reduces poverty.

Developing more accurate and nuanced methods of assessing the impacts of LRG programs on women. Too often, women's land rights research simply compares female-headed to male-headed households. However, this approach obscures important individual-level dynamics, including the experiences of married women and the status of women within the broader community. Similarly, existing research tends to take a simplistic approach to characterizing land rights — for example, by comparing titled to untitled land — that fails to adequately capture the complexities of gender dynamics and customary forms of land tenure. In order to capture these nuances, the land sector should prioritize studies with high sample sizes and counterfactuals, studies that account for the heterogeneity of women (rather than treating them all as a single category), and studies that survey women specifically, instead of conducting research at the household level.

Formalization of women's land rights and spousal death or divorce. One of the most prominent differences between women's and men's perceived tenure security surfaced by Prindex is that women are less secure in the context of spousal death or divorce (Prindex 2020). Building on this finding, research should explore what exactly is driving women's insecurity in these contexts, and which LRG programs protect women in the event of spousal death or divorce.

Social norms and women's land rights. Changing social norms is as necessary to promoting women's empowerment as is statutory tenure reform (Prindex 2019). More research is needed to understand how this can be best accomplished. For example, do LRG programs succeed in changing social norms around women's land rights, and therefore make women more secure? A study in Burkina Faso, which found that programs can shift social perceptions of gender roles, leading to greater empowerment within society, seems to support this (van den Bold et al.). Or, is it more effective to first work on changing social norms, therefore priming communities to be more receptive to LRG reforms that benefit women?

Theme 4: Sustainable Landscapes and Biodiversity

Which LRG programs are most cost-effective in mitigating climate change and how to address economic trade-offs? While the link between certain LRG programs (e.g. protection of indigenous land rights), soil conservation, combatting deforestation, and mitigating climate change is well established, there is significantly less research on the cost-effectiveness of specific types of LRG programs. Little research looks at the costs of implementing these programs, including the opportunity costs and economic trade-offs to program participants who may forego the individual economic gains associated with landscape conversion in favor of reduced externalities and broader public gains. Research on these questions will help donors and governments understand which programs to prioritize, and also how to properly incentivize parties to participate. Any research should pay careful attention to regional variation, since the relative cost and impact of LRG programs will likely vary by region.

Unpacking the links between private tenure, forest protection policies, and deforestation. Although the link between tenure security and positive forest outcomes for indigenous peoples and customary communities is generally well-established, the evidence on tenure security for private lands is mixed (Robinson et al. 2014; Busch and Ferreti-Gallon 2017). Private land ownership tends to provide increased security as owners benefit from the full bundle of rights (e.g. access, use, management, exclusion, alienation), but this can also mean the right to deforest. Given this, forest protection policies

need to incentivize private landowners to conserve forest and even reforest. Payments for ecosystem services in developing countries is one policy lever, but rigorous evidence on effectiveness is limited (Busch and Ferreti-Gallon 2017). What types of forest protection policies can reduce deforestation and increase reforestation on private lands? Why, and in what contexts, does improved tenure security on private lands contribute to reduced deforestation and increased reforestation? If improved private tenure security increases deforestation and reduces reforestation, why is this so? Are there cases of sufficient forest protection policies without private tenure security that resulted in positive forest outcomes? Given the importance of secure private tenure for investment, productivity, markets, incomes, and economic growth, this line of research could investigate how to effectively manage trade-offs between economic growth and deforestation and the role of secure private tenure.

Integrating indigenous knowledge into the design of LRG programs. Studies in Nepal, Guatemala and Peru find that strengthening local and indigenous land rights significantly decreases deforestation. Involving local communities in planning and implementing programs can also magnify the effects of these programs by incorporating local knowledge and understanding of communities' relationships with the land, and by leveraging these communities' high levels of trust and social cohesion (Bayrak and Marafa 2016). However, a key unanswered question is *how* to effectively incorporate local and indigenous communities, especially traditional land management practices, into the design of LRG programs? A related unanswered question is whether a community's level of trust, social cohesion, and collective action can be augmented or resuscitated in situations where it has been depleted? Further research would supplement ongoing USAID evaluations in Liberia and Ghana, which are asking these questions for the first time.

More studies that incorporate spatial analysis and more spatially explicit econometric studies are needed, particularly in Africa and Asia. Despite a proliferation of mapping databases like LandMark, and the increased availability of geospatial imagery at various temporal and spatial resolutions, there are relatively few spatially explicit econometric studies in Africa and Asia on the link between tenure security, community forestry, and sustainable landscapes and biodiversity outcomes. This is a missed opportunity. Not only that: existing rigorous research is significantly geographically skewed. Of the 76 studies included in Busch and Ferretti-Gallon's meta-analysis, 60 are from Latin America. Of those 60, 31 are from Mexico. This geographic homogeneity puts into question how generalizable the findings are, particularly when it comes to Africa, which only contributed three of the 76 studies. More spatially explicit econometric studies are needed, in particular in Africa and Asia. The lack of such studies is often a function of limited national administrative data. Progress and reporting for the SDGs may help overcome this constraint.

What is the link between LRG, sustainable intensification practices (SIP), and reducing environmental damage? A farmer's decision to intensify crop production inside their existing footprint, instead of expanding into forests and other landscapes, can reduce the environmental damage that comes with landscape conversion. However, while some scholars hypothesize LRG programs will help farmers decide to pursue SIP (instead of expansion), there is little research to prove this. On the contrary, one could argue that LRG programs, particularly those that involve titling, would actually exacerbate environmental damage by stimulating land markets and providing farmers with the money they need to expand production. In short, the linkages between LRG, SIP and environmental outcomes are tricky and underexplored. Further research should test the hypothesis that LRG leads to SIP, which then reduces environmental harm. Research is also needed on the types of complementary programs (like land use planning) that may help this causal chain bear out.

Theme 5: Food Security and Resilience

Long term impacts of LRG on food security. There is considerable literature on the short-term impacts of various land tenure programs, particularly on monetizing land value and on-farm investment. Investment, in turn, has been shown to have a positive, though indirect, impact on food security. However, there is little evidence to establish a clear causal pathway directly from LRG to food security (Holden and Ghebru 2016; Rockson et al. 2013). More rigorous evidence is needed on whether LRG leads to long-term food security impacts. Research may include longitudinal studies that follow up on USAID or other donors' impact evaluations, as well as remote sensing research to measure land use and land cover trends and understand impacts over the long-term.

Taking another look at credit. The relationship between land rights and access to credit is typically thought of in terms of using property as collateral to obtain loans from formal financial institutions. Recent studies show that link to be tenuous (Higgins et al. 2018). However, in practice, land rights are also linked to credit in other, more subtle ways. There is anecdotal evidence that both formal and informal lenders use land ownership or documentation as proof of creditworthiness, even if land is not accepted as collateral. For example, DFID's LIFT program in Ethiopia recently developed lending products that rely on crops and land use rights, instead of freehold rights. USAID has also introduced innovations to improve access to formal credit for landholders, such as brokering financial arrangements between the lender and landholder, and exploring the link between financed farm rehabilitation and tenure documentation, among others. In addition, some countries (e.g., Tanzania) are exploring complementary policy options that could enable customary land to be accepted as collateral by rural banks. Research should look into the full spectrum of mechanisms by which land rights can and do facilitate informal or innovative credit access, the conditions that are needed for various mechanisms to be viable, the extent to which customary land rights can be used to access credit, and what policymakers can do to strengthen and promote these mechanisms.

Taking another look at productivity and income. Whereas the evidence linking LRG and investment is relatively clear, two recent meta-analyses disagree as to whether LRG leads to gains in productivity and income (Higgins et al. 2018; Lawry et al. 2017). Disagreements over the productivity link are particularly confounding: one meta-analysis (Lawry et al. 2017) finds that formal tenure recognition leads to a whopping 40% increase in productivity, while another systematic review (Higgins et al. 2018) finds no consistent link. One potential reason for the inconsistent evidence is that productivity and income gains take time to materialize, and many LRG studies in the food security space have short exposure periods (Higgins et al. 2018). A review of two recent LRG meta-analyses revealed that while the average exposure period for all studies was more than 10 years, for food security studies it was only six years. Given the critical importance of productivity and income within the food security causal chain, it is worth investing in longitudinal studies that are able to fully answer the question of whether LRG translates into productivity and income gains.

Farmland tenure models in Africa. Landholding in Africa's agricultural sector used to be dichotomous: producers were either smallholders or large-scale commercial operators. With the rise of medium-scale farms (Jayne et al. 2019), that is now shifting. Additional research is needed on the advantages and disadvantages of these alternative land tenure models. For example, outgrower schemes and similar contract farming arrangements are typically seen as more beneficial to local communities than direct acquisition of land by the investor. However, this assumption has not been fully explored, and there are cases of outgrower schemes undermining the land rights of individual farmers. Research could explore how outgrower schemes can go wrong and how they should be structured to avoid these pitfalls. Likewise, the rise of medium-scale farming raises important LRG questions that are not yet well understood. For example, how do medium-scale farmers acquire their land, and to what extent (if any) are they able to exploit existing tenure systems at the expense of smallholders? To what extent is the rise of medium-

scale farming contributing to a transition from customary to statutory tenure, and how does this transition affect smallholders? What policy options exist to better align the interests of different types of agricultural producers? How will land use planning approaches need to be adapted in order to accommodate the medium-scale farming model?

Theme 6: Conflict prevention and stabilization

Improved cross-national data on the causes of land conflict, particularly when it comes to non-State actors. A 2018 review of land and conflict data found that "literature on land conflicts in individual countries is rich, but quantitative, cross-national data are more limited" (Travaglianti 2018). While land conflicts are widespread, and land is at the core of many violent disputes around the world, little is known about land conflicts that are fought between non-state actors, despite the fact that, "territory" has been cited as the most common cause of non-state conflict on the African continent (Uppsala Conflict Data Program (UCDP) database). Further research should dig into the motivations behind land conflict, as well as into the reasons why land insecurity may contribute to conflicts that are not themselves land-related.

Is LRG an effective way to prevent conflict? We know communities and individuals fight over land, but is improving LRG an effective means of preventing these conflicts? If so, what types of LRG programs are most effective at preventing or mitigating conflict? Is titling, for example, more effective than strengthening local dispute resolution mechanisms? And are there certain types of conflict that different LRG programs are better or worse able to prevent or mitigate?

The link between climate change, migration, and conflict. The World Bank estimated in 2018 that by 2050 climate change will result in an additional 143 million climate migrants from Sub-Saharan Africa, Southeast Asia, and Latin America (Rigaud et al. 2018). Large scale migration of this sort has serious implications for regional and international security. Large population movements create conflicts arising from the encroachment of migrants upon settled populations and increase ethnic conflict (IOM 2008). Water scarcity threatens to drive mass migration from rural areas to cities, straining existing infrastructure and resources (Ibid.). Pressures on pastoral land continue to increase, fomenting conflicts over water and grazing rights, and exacerbating insecurity. The impacts of climate change will likely accelerate this trend, leading to more frequent and more violent clashes between pastoralists and sedentary populations. As the movement of Middle Eastern and Sub-Saharan African refugees through North Africa has already demonstrated, mass migration also presents criminal and terrorist groups with lucrative opportunities for illicit financing through migrant smuggling, people trafficking, and extortion (OECD 2018). More rigorous research is needed on the potential for LRG programs to mitigate climate-related displacement and the ensuing governance challenges.

The relationship between improved land tenure and large-scale land-based investment. Does improving the land tenure of local communities, including the use of formalizing customary tenure, help prevent adverse land-based investments by the private sector? One might presume that property documents would help communities defend themselves from outside encroachment. However, some studies suggest that because land investments are often accompanied by a tenure clarification exercise (so that the investor can obtain legal right to the land), tenure recognition may lead to the displacement of communities or inhabitants (Lawry et al. 2017). Might the very act of tenure recognition render a piece of land more attractive to outside interests, because it provides clarity as to the interest in the land? Further research should examine this link to understand how LRG programs in desirable areas should be structured, so as not to have unintended consequences.

Effective mechanisms for post-conflict property restitution. LRG is critically important to post-conflict recovery because property is often the most valuable asset of those displaced by conflict.

And yet, while the existence of restitution programs is important, other factors must be in place for these programs to work quickly and equitably, and for them to be considered legitimate. What are these other factors, and how can governments who may be in the early stages of rebuilding acquire the capacity to effectively restitute land? Would involving local-level leaders and community members foster trust and help to develop local-level institutions that are better able to ensure that returnees are secure in their property rights? This area deserves further research. Relatedly – as the number of refugees and IDPs continues to rise, research is needed on the most efficient and effective ways to document and restitute property, sometimes to hundreds of thousands or even millions of people at a time.

Theme 7: Research on Emerging LRG topics

These are emerging LRG topics that have not yet been addressed in detail in existing research. Research on the topics below will directly impact programming decisions and will also position USAID/LU as a thought leader in the field.

Ground truthing new land rights approaches. New people-centered approaches (community mapping, crowdsourcing) place communities at the center of processes to map and document their property rights. Not only that—new research suggests that digital trails (smartphone location data, social media posts, and online purchase histories, among others) can provide rich data to supplement traditional evidence of land and property claims. Can this locally derived data be trusted by various stakeholders as a basis for making decisions regarding land and resources? Building on the lessons learned from the MAST program, research could analyze the factors that allow policymakers and institutions to trust emerging technology and accept citizen-produced data related to land.

Are new technologies delivering on their promise? Over the last decade, several new technologies have been introduced into the land tenure space, including UAVs, mobile mapping, high volume and high resolution imagery, and blockchain. These technologies promise to make it faster, easier, and cheaper to map and record land rights at scale. Are these promises bearing out? What are the contextual factors that make or break the adoption of these technologies? Are these technologies having unintended consequences, both positive and negative? Building on the "MAST time and cost study," which compared the time and cost of delivering certificates of customary rights of occupancy (CCROs) in Tanzania using MAST versus using traditional methods, new research should evaluate the impact and efficacy of these new technologies.

LRG and managed coastal retreat. Rising oceans threaten to inundate vulnerable coastal areas and low-lying islands. In cases where adaptation is not feasible, there will have to be a strategy for relocating people, either by incentivizing them to move voluntarily or through a planned, proactive relocation like Indonesia's effort to relocate Jakarta. In the case of island micronations, domestic relocation will be impossible. Relocations, whether gradual or sudden, are likely to have a disproportionate negative impact on the poor. Research is required to prepare national LRG systems to accommodate large-scale displacement and property loss. Given the cross-sectoral impact on housing, insurance, disaster response, trade, urban planning, and infrastructure investment, solutions will have to be strategic and cannot simply be reactive.

The impact of urbanization on land rights. Recent research by the European Commission shows that 84 percent of the world's population lives in urban areas. Urbanization rates in Africa and Asia are at 80 percent and 90 percent, respectively (Dijkstra et al. 2018). What are the impacts of this mass urbanization on tenure security in urban settings (to which people are flocking), in rural settings (which people are leaving and sometimes returning to access land) and on peri-urban areas (which are expanding as cities swell)? What are the implications of this massive shift, for USAID LRG programming?

Urban MAST. USAID's MAST project developed a new approach that uses smartphones to map parcels and compile information needed for first-time land registration. Following pilots in rural areas of Tanzania and in a peri-urban commune in Burkina Faso, MAST has proven to be an effective, low-cost, and participatory system for formalizing rights and creating land information systems. The MAST approach holds promise for urban areas as well, but adapting it to an urban context will need to overcome several challenges. For example, urban settings require greater accuracy and frequent updates due to rapid construction and infrastructure changes, and higher population and settlement density. Research could thus pilot and test different options for adapting MAST to urban environments. This research should build on the significant experience of UN-Habitat and others applying the Social Tenure Domain Model to urban settings.[32]

Private sector perceptions, policies, and practices related to land tenure risk. Little information exists about investors' attitudes and practices towards LRG. A recent study found that less than 10 percent of companies have public, normative statements on LRG (Stevens et al. 2019). This begs the question: to what extent do investors prioritize land tenure risk amongst other ESG factors? To what extent do they feel equipped to address land tenure risk, or do they instead make a decision to either write off the risk or not proceed with investments? Do investors in certain regions, or in certain sectors, prioritize land tenure risk differently? How many investors are making normative commitments related to land tenure risk (what are those commitments, and in which fora are they made?), and how well do those commitments track with actual practice? A 2018 investor survey commissioned by LU generated some intriguing findings, but the analysis was limited by a small sample size due to low response rates. More rigorous research, with a larger sample size, could usefully build on the early lessons from the 2018 investor survey and the Stevens et al. 2019 study.

Sustainability of land administration systems. First-time land registration programs are intended not only to register and document existing land rights, but to serve as a building block for a formal land administration system that will update land records and use them to provide information to land users. Anecdotal evidence suggests that there have been both successes and failures in this regard for both private lands and community-led documentation of customary lands. Building on DFID's recent Land at Scale report, which analyzes lessons learned from DFID's land regularization programs, research should examine why some first-time registration programs have taken hold and others have not, and which lessons we can draw for future programming, including the sustainability and cost-effectiveness of impacts (Deininger and Feder 2009).

How must legal frameworks adapt to take advantage of new land technologies? Over the last decade, multiple new technologies have emerged to make it faster, easier, and cheaper to map, document, and transact land. These technologies include drones, mobile mapping platforms, satellite imagery, blockchain, and 3D cadasters. And yet, the laws of some countries prohibit or limit the uptake and use of these technologies. In other countries, laws and regulations are silent on these new technologies, creating ambiguity that can be exploited against their adoption. On the other hand, some countries have adopted forward-looking land laws and regulations, which either explicitly or in theory allow for the deployment of new land technologies. For example, in December 2017 the Philippines became one of the first countries in Asia to have an official policy allowing drones to be used for surveying. Research could examine how national legal frameworks should adapt to adopt new technologies and other innovations, and provide examples of best practices.

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[32] The Social Tenure Domain Model (STDM) closes the gap between current land administration systems, which often recognize only a subset of tenure types, and the more complex, on-the-ground reality, "STDM allows for the recordation of all possible types of tenures; STDM enables to show what can be observed on the ground in terms of tenure as agreed within local communities." (FIG 2010).

Better understanding of the artisanal and small-scale mining sector. Despite the importance of ASM to development, there are no credible estimates of the size and importance of the ASM sector. An estimated 300 million people in more than 70 countries depend on ASM to provide for themselves and their families (USAID Issue Brief: Artisanal and Small-Scale Mining, 2020). Yet, we still lack reliable data on this important sector. Moreover, ASM is typically embedded within customary tenure systems, although efforts to formalize the sector tend to focus on legal and policy reform, due diligence, and traceability, among others. Under what conditions can efforts to formalize and regulate the sector have a positive impact on a country's journey to self-reliance? And how should formalization efforts engage with customary tenure systems? Finally, is formalized tenure better able to resist encroachments on the ASM sector by transnational criminal organizations and other actors external to ASM communities?

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