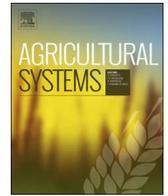


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Women's land rights as a pathway to poverty reduction: Framework and review of available evidence

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A B S T R A C T

This paper reviews the literature on women's land rights (WLR) and poverty reduction. It uses the Gender, Agriculture and Assets Project (GAAP) conceptual framework to identify pathways by which WLR could reduce poverty and increase wellbeing of women and their households in rural areas. It uses a systematic review search methodology to identify papers for inclusion, but adopts a more synthetic approach to assess the level of agreement and the amount of evidence within this literature. The paper examines the evidence from qualitative as well as quantitative studies on each of these pathways. Owing to the scarcity of experimental studies, the review of empirical work is based mostly on observational studies. We find some evidence on these relationships, but many of the key pathways have not been empirically analyzed. The evidence is strong for relationships between WLR and bargaining power and decision-making on consumption, human capital investment, and intergenerational transfers. There is a high level of agreement, but weaker evidence on the relationship between WLR and natural resource management, government services and institutions, empowerment and domestic violence, resilience and HIV risk, and consumption and food security. There is less agreement and insufficient evidence on the associations between WLR and other livelihoods, and a higher level of agreement, but still limited evidence on associations between WLR and credit, technology adoption, and agricultural productivity. Notably, we find no papers that directly investigate the link between WLR and poverty. Many gaps in the evidence arise from a failure to account for the complexity of land rights regimes, the measurement of land rights at the household level, the lack of attention paid to gender roles, and the lack of studies from countries outside Africa. Many studies are limited by small sample sizes, the lack of credible counterfactuals, lack of attention to endogeneity and selection bias, and possible response bias on questions of domestic violence and empowerment. There are very few rigorous evaluations of reforms that strengthened WLR. The paper concludes that gaps in the evidence should not deter the careful design and implementation of programs and policies to strengthen WLR, given the ongoing land tenure reforms in many countries. Different modalities and mechanisms for strengthening WLR could be tested, with appropriate counterfactuals. Program designers and evaluators can strategically identify pathways and outcomes where evidence gaps exist, and deliberately design studies to close those gaps.

1. Introduction

Rural households depend on a wide range of natural resource assets for their livelihoods—land, water, trees, and other resources. Among these, land is clearly the most valuable asset in most rural households' portfolios, and is the foundation for agricultural production. A large literature exists on the relationship between land tenure security, livelihoods, and poverty (e.g. Deininger et al., 2008a, 2008b; Prosterman et al., 2009), but most of this literature is based on household-level data. We know very little about the relationship between women's land rights and poverty, not only because data on women's land rights (WLR)

are rare, but also because of the assumption that women belong to households that pool resources completely, and thus household land rights, not those of women in particular, are the key to poverty reduction.

However, a growing body of research demonstrates the importance of women's ownership of and control over assets for a range of development outcomes (Agarwal, 1994; Haddad et al., 1997; Quisumbing and Maluccio, 2003). In general, men own more and higher value assets than women (Deere and Doss, 2006; Deere et al., 2013; Quisumbing and Maluccio, 2003). In particular, women tend to own less land, whether solely or jointly, than men (Doss et al., 2015; Kieran et al.,

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2015, 2017; Deere and Leon, 2003; Agarwal, 1994). Given the empirical evidence showing that who owns and controls the assets affects household outcomes (Haddad et al., 1997; Schultz, 2001; Quisumbing and Maluccio, 2003; Doss, 2006), it is worth investigating the extent to which WLR—and interventions to strengthen these rights—affect poverty reduction.

This paper develops a conceptual framework based on that from the Gender, Agriculture, and Assets Project (GAAP) (Meinzen-Dick et al., 2014) to review and interpret empirical evidence published since 2000 on the association between WLR and poverty reduction. It goes beyond early research on WLR and natural resource management in Ghana and Indonesia undertaken by IFPRI and ICRAF (Quisumbing and Otsuka, 2001) to examine a broader range of outcomes and a wider set of pathways. Although it uses a systematic review search methodology (Waddington et al., 2012) to identify papers for inclusion, it adopts a more synthetic approach to assess the level of agreement and the amount of evidence within this literature (Moss and Schneider, 2000).

We find some evidence on these relationships, but many of the key pathways have not been empirically analyzed. The evidence is strong for relationships between WLR and bargaining power and decision-making on consumption and human capital investment, and on inter-generational transfers. There is a high level of agreement, but weaker evidence on the relationship between WLR and natural resource management, government services and institutions, empowerment and domestic violence, resilience and HIV risk, and consumption and food security. There is less agreement and insufficient evidence on the associations between WLR and other livelihoods, and a higher level of agreement, but still limited evidence on associations between WLR and credit, technology adoption, and agricultural productivity.

Notably, we find no papers that directly investigate the link between WLR and poverty. There are several possible reasons for this. First, it is difficult to identify causality, particularly when pathways extend through numerous steps. Second, most studies only address one aspect of these broader relationships. Finally, the interventions that have been rigorously evaluated are fairly recent and long-term impacts on poverty reduction may not yet have been realized. The lack of direct evidence must not be interpreted to mean that women's land rights do not contribute to poverty reduction. Given that studies did not directly and systematically investigate this relationship, absence of evidence does not mean that the link does not exist.

The paper is organized as follows. Section 2 discusses how WLR are conceptualized and measured. Section 3 presents a conceptual framework that links WLR to poverty reduction. Section 4 lays out the methodology for the literature search, Section 5 presents the findings, and Section 6 concludes.

2. Conceptualizing women's land rights

Land rights is a broad term with both economic and legal components. Different rights exist within a broad bundle of potential rights and the dimensions related to security of tenure. Land may be held under statutory or customary tenure systems and many countries, particularly those in Africa, may have several systems operating simultaneously.

One commonly used framework (Schlager and Ostrom, 1992) identifies five rights regarding land, which may be bundled together into what we commonly refer to as ownership or they may be vested in different people. Access is the right to enter a property. Withdrawal is the right to remove things from the property, such as gathering from the forest or fishing from a lake. Management is the right to change the property, by planting crops or cutting trees. Exclusion is the right to keep others off the property. Alienation is the right to transfer the property rights to others, through sale, bequest, or gift.

Drawing from the gender and assets literature, the WLR literature often talks about use, control, and ownership rights to land (IFPRI, 2013; Johnson et al., 2016). Each of these terms refers to different

components within larger “bundles of rights” discussed above. Use rights involve the ability or permission to employ an asset; control rights signal greater levels of power, including potentially management, exclusion, and alienation. Ownership is the state of independently having all these rights, including sale or other forms of disposal, backed by formal legal institutions. In practice, however, the definitions are often not clear cut; men and women can accrue benefits from land even without having full land ownership rights.

The security of property rights is also important. Place et al. (1994) define three dimensions of tenure security: robustness, duration, and assurance of rights. Robustness refers to how many of the bundle of rights are held. Duration is the length of time for which a right is valid, ranging from a season to a lifetime. Assurance is the certainty with which the rights are held and the extent to which the rights are enforceable.

When considering the impact of WLRs on poverty reduction, we would want to know which rights are held by women and the security of their tenure. Yet, rarely do we have this full range of information, as is true of the land rights literature more generally. In an analysis of empirical papers on land tenure security, Arnot et al. (2011) find that tenure security is often ill-defined, using a wide range of indicators, making it challenging to make comparisons across studies.

When considering WLR land rights, there is an additional layer of complexity. Most studies consider household land rights, without identifying who within the household holds the rights. When land rights are only measured at the household level, comparisons are based on the sex of the household head. We do include papers that use this framework within our analysis because excluding them would yield very few papers to analyze. But using headship ignores the impact of land rights held by the majority of the world's women who live in dual-adult households. Data on individual land rights are beginning to be more widely available, creating opportunities for better analyses of WLR.¹

When we consider individual level land rights, it is also useful to know whether the person holds them alone or jointly with another person or persons. There is evidence that holding land jointly is common in many, but not all, places in the world (Doss et al., 2014; Kieran et al., 2015; Deere and Leon, 2003). Whether a woman is the sole owner of a plot of land, rather than owning jointly with her husband, may have different implications for many outcomes. Analyses of the dimensions of joint ownership are still emerging (Jackson, 2003; Ambler et al., 2017; Doss et al., 2013), it should not be assumed that joint and independent ownership have the same implications.

The papers analyzing WLR considered here use a wide range of conceptualizations and indicators of WLR. Although we attempt to identify the rights that are being considered in each paper, the papers themselves are not always clear. Surveys typically use one of three approaches: whether the person has formal, documented land rights; whether the respondent simply reports that they own it; or finally, whether the person is the farmer or manager of the plot. Some qualitative studies have more nuanced definitions of WLR including local definitions and perceptions of tenure security.

Our conceptual framework does not distinguish among the various rights. Yet, different forms of land rights and levels of tenure security may be needed for different pathways to reduced poverty. For example, duration of tenure security will affect the type of investments made in land. Formal legal documentation of one's rights may strengthen tenure security, but women's rights have often been ignored in formalization efforts (Lastarria-Cornhiel, 1997). Several of the more recent land formalization programs, such as in Ethiopia and Rwanda, have paid particular attention to ensure that women's names are included, but women also need to be aware of their rights for such efforts to have

¹ The FAO Gender and Land Rights Database, <http://www.fao.org/gender-landrights-database/en/>, documents many of these datasets.

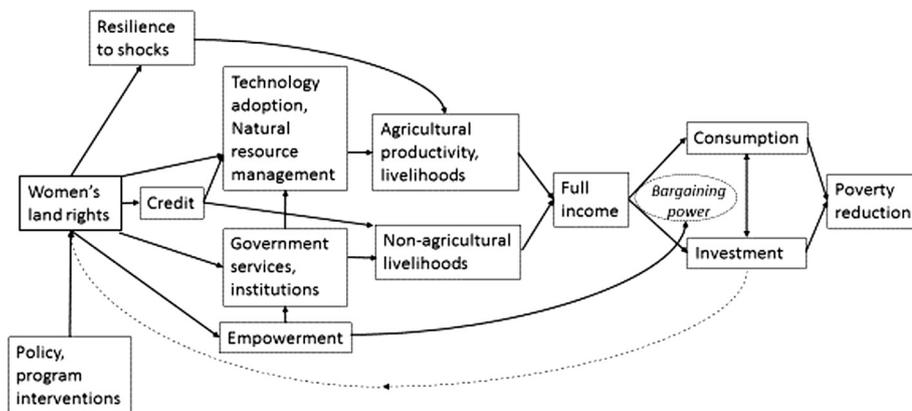


Fig. 1. Conceptual framework for links between women's land rights and poverty reduction.

Source: Authors.

impact.

3. Conceptual framework

A broad conceptual framework relating gendered rights over assets and multiple outcomes is developed by the Gender, Agriculture, and Assets Project (GAAP) (Meinzen-Dick et al., 2014). Here we adapt the framework to focus specifically on WLR and the linkages to poverty reduction, and use the adapted framework in Fig. 1 to guide our search for and presentation of the evidence.

Starting in the lower left hand corner of the framework, policy and programmatic interventions may positively or negatively impact WLR, either intentionally or unintentionally. We do not review papers that analyze the impact of interventions on WLR, but this pathway is critical because if they do not change WLR, they will not have the other expected impacts.

We would expect to see direct effects of WLR on resilience to shocks, technology adoption, natural resource management (NRM) practices, credit, government services and institutions, and empowerment (Deininger, 2003; FAO, 2002; Grown et al., 2005; Higgins et al., 2017; Place, 2009). In turn, credit and government services (notably extension services, but also water supply, electricity, etc.) or participation in institutions (e.g. cooperatives) can affect technology adoption and NRM practices. Empowerment can affect access to government services and institutions.

We hypothesize that women with strong land rights are more resilient to adverse shocks that affect their communities and households. Some of these links work through the investment pathway, discussed in greater detail below. For example, women with stronger land rights may be more likely to invest in NRM technologies that reduce their exposure to climatic shocks. Like other assets, land may also be sold or leased out to bring in income. Even if the typically smaller pieces of land owned by women may often be sold first to cope with adverse shocks, it preserves the economic base of the household unit and provides the household with an additional consumption-smoothing mechanism.² Women with strong land rights may also be less likely to engage in risky behavior (such as transactional sex), reducing their vulnerability to HIV/AIDS and other sexually transmitted diseases.

While some forms of technology adoption, such as use of new crop varieties or fertilizer, are conceptually distinct from NRM practices such as agroforestry or mulching, in practice there is considerable overlap, and many of the studies address both. We group them together. These, together with resilience, access to credit, and government services or institutions, are expected to influence agricultural livelihoods. Access to

² In Bangladesh, for example, the finding that adverse shocks have generally insignificant impacts on joint land and asset holdings – while individual assets are sacrificed at the margins – indicates that husbands and wives try to preserve the economic base of the household unit (Quisumbing et al., 2017).

credit could expand opportunities to diversify into nonagricultural livelihoods. Together these livelihood strategies would provide full income (including cash and in-kind income as well as the value of time.)

Full income, in turn, is allocated between various forms of consumption and investment. Those allocation decisions are influenced by the bargaining power of household members; the empowerment effects of WLR might therefore be expected to affect women's bargaining power, and hence consumption and investment outcomes. Consumption is an indicator of poverty reduction; investment lays the basis over the long term. Investment may take the form of human capital in the next generation or physical capital. Intergenerational land transfers are important in this context. Although we examine NRM along with technology adoption, many NRM practices such as tree planting, fallowing, or other investments in soil fertility are also investments in the land, and can have feedback effects on WLR by increasing their tenure security.

4. Methods

This review uses a systematic search process to assess the available high-quality evidence on the effects of strengthening WLR on development outcomes related to poverty reduction. It evaluates the strength of the causal links between land rights and expected effects, identifies patterns and gaps in the existing evidence base, and generates insights on factors that mediate the effect of WLR on development outcomes. Although this review uses a systematic search process, it is not a systematic review, but an evidence review, for reasons discussed below.

Previous systematic reviews on land tenure security have examined broad development outcomes (see Higgins et al., 2017), agricultural productivity and investment (see Lawry et al., 2017), and food security (see Holden and Ghebru, 2016). This review complements these reviews by synthesizing the evidence on how women's land rights affect various development outcomes. Rather than assessing the effectiveness of interventions on WLR themselves (see Giovarelli et al., 2016), this review focuses instead on the implications of WLR on other outcomes of interest.

The search methodology follows the guidelines of Waddington et al. (2012) for systematic reviews in international development, which are designed to establish a comprehensive, documented, and replicable protocol to search defined databases, screen and select evidence against pre-specified eligibility criteria, and synthesize the selected evidence. The review specifies the types of studies, population, interventions, comparator, and outcomes of interest, detailed in Table 1, as part of the eligibility criteria (the “PICOS” framework, Higgins and Green, 2011; Petticrew and Roberts, 2006). We include peer-reviewed publications and published working papers, in English, published between January 1, 2000 and April 10, 2017.

As Table 1 describes, the inclusion criteria define WLR more broadly than the often used definition as a woman's individual, documented

Table 1
Inclusion and exclusion criteria.

		Include	Exclude
Study type	Publication Type	<ul style="list-style-type: none"> ● Peer reviewed publications, published working papers 	<ul style="list-style-type: none"> ● Abstracts, reports, briefs, declarations, laws
	Date of Publication	<ul style="list-style-type: none"> ● January 1, 2000–April 10, 2017 	<ul style="list-style-type: none"> ● 1999 and earlier
	Language	<ul style="list-style-type: none"> ● English 	<ul style="list-style-type: none"> ● Language other than English
	Study type	<ul style="list-style-type: none"> ● Quantitative, qualitative, mixed methods ● Observational and impact assessment 	<ul style="list-style-type: none"> ● Historical analyses
Types of Participants	Landholder	<ul style="list-style-type: none"> ● Women in dual-adult households ● Women in female-headed households 	<ul style="list-style-type: none"> ● Men only
	Type of land use	<ul style="list-style-type: none"> ● Agricultural land, agroforestry 	<ul style="list-style-type: none"> ● Rangeland, wetlands, mangrove, forest, water, urban, housing ● High income countries
Indicators of WLR and Types of Interventions	Geography	<ul style="list-style-type: none"> ● Low and middle income countries 	
	Type of land tenure	<ul style="list-style-type: none"> ● Women's documented (certificate, title) and undocumented land rights ● Customary and statutory tenure regimes ● Joint land rights 	
	Types of changes to land tenure security	<ul style="list-style-type: none"> ● Laws, policies, programs, projects (documenting land rights; land allocation; awareness campaigns; legal aid; dispute resolution; agricultural development projects) ● Inheritance and family law ● Privatization ● Conflict 	<ul style="list-style-type: none"> ● Large-scale land-based investments ● Descriptions of the gender gap in land ● Assessment of data available on gender and land
Types of Outcomes	Types of effects related to poverty reduction	<ul style="list-style-type: none"> ● Resilience 	<ul style="list-style-type: none"> ● Women's land tenure security
		<ul style="list-style-type: none"> ● Technology adoption and natural resource management 	<ul style="list-style-type: none"> ● Perception of tenure security
		<ul style="list-style-type: none"> ● Credit 	<ul style="list-style-type: none"> ● Awareness of land rights
		<ul style="list-style-type: none"> ● Agricultural productivity and livelihoods 	<ul style="list-style-type: none"> ● Gendered distribution of property rights
		<ul style="list-style-type: none"> ● Government services and institutions, including political participation 	<ul style="list-style-type: none"> ● Evaluation of the efficacy or efficiency of land reforms, policies
		<ul style="list-style-type: none"> ● Women's empowerment, including violence against women and HIV risk 	<ul style="list-style-type: none"> ● No disaggregation of outcomes by gender
		<ul style="list-style-type: none"> ● Consumption and food security 	
		<ul style="list-style-type: none"> ● Bargaining power and decision making over consumption 	
		<ul style="list-style-type: none"> ● Bargaining power and decision making over human capital investment and intergenerational transfers 	
		<ul style="list-style-type: none"> ● Poverty 	

rights to land. Women in both dual-adult households and female-headed households were defined as potential participants. We include studies that examined relationships between WLR and our outcomes of interest (associational or observational studies) as well as those that attempted to assess the impact of policies and interventions that strengthened both documented and undocumented rights (e.g. perception of security), under customary, statutory, or legally pluralistic regimes.

A set of online databases (Web of Science, PubMed, IFPRI Ebrary) were searched and then screened against the eligibility criteria. Additional titles were added via “snowballing” sources found in articles' reference lists, reviewing websites of leading land tenure institutions, and manually searching the World Bank 2017 Land and Poverty Conference for research papers in the pipeline but not yet published in peer-reviewed journals.

The search yielded 52 references that examined a wide range of property rights interventions, definitions of WLR, and outcomes. For each, the type of study, sample design, methodology, definition of land rights, degree of sex-disaggregation, and outcomes measured were recorded. Unlike the biomedical or nutrition literature in which effect sizes can be judged against what is biologically possible, there are no clear benchmarks for evaluating the effectiveness of a land tenure intervention. The context-specificity of gender norms also makes it difficult to predict *ex ante* the direction of influence. Given that many different themes of outcomes and methodological approaches are considered in this review, a qualitative (or narrative) review approach was chosen to synthesize the findings.

5. Evidence on the contributions of women's land rights to poverty reduction

As noted in the conceptual framework, WLR may affect both agricultural and non-agricultural livelihoods. Secure land rights are expected to increase investment on the land, both directly and through

greater access to credit for investment, and thus increase agricultural productivity. They may affect non-agricultural livelihoods by increasing access to credit, which facilitates diversification into nonagricultural livelihoods and by increasing access to land rental and sales markets.

5.1. Resilience

The conceptual framework indicates that WLR can affect resilience by encouraging investment in NRM techniques, by providing women with an asset base that can be used to obtain credit for consumption smoothing (or, that can be disposed of to protect the household's main asset base), and by reducing the likelihood of risky behavior. WLR can also affect women's exposure to agricultural risk. However, there is little direct evidence on WLR and resilience, with the exception of a recent observational study using panel data in Malawi (Asfaw and Maggio, 2017) which finds that high temperature shocks during the agricultural season disrupt households' consumption more severely when plots are solely managed by women. However, it also finds that the effects are less severe when female-headed households live in matrilineal districts, suggesting that tenure security is also important. Because the evidence on this issue is closely related to other outcomes or pathways of interest, we discuss this in greater detail below.

5.2. Technology adoption and natural resource management

While land use rights are needed to adopt any agricultural production technologies, control rights and security of tenure may affect the adoption of longer-term investments, particularly NRM practices (Besley, 1995; Meinzen-Dick and Di Gregorio, 2004). Unfortunately, while a large literature focuses on the factors correlated with the adoption of improved seed varieties and fertilizer, almost none specifically consider women's land rights or tenure security as factors affecting technology adoption. Of the 15 studies identified, five were impact assessments that use some type of formalization as an indicator

of tenure security, primarily comparing male and female headed households; and 10 were observational studies using some form of self-reported tenure security. All come from seven countries in Africa, with most studies from Ethiopia, Ghana, and Malawi, particularly areas with some form of matrilineal inheritance in the latter two countries.

Land registration programs in Rwanda, Benin, and Ethiopia that have emphasized WLR have had some impact on technology adoption. In Rwanda, program participants were twice as likely as control households to invest in or maintain bunds, terraces, and check dams for soil conservation, and female headed households whose lands were regularized were the most likely to undertake such long-term investments. However, participation did not increase their use of improved seed, which is a short-term investment (Ali et al., 2014). In Benin, a demarcation program did not find that the resulting investments varied by the sex of the household head (Goldstein et al., 2015). In Ethiopia, Deininger et al. (2008a, 2008b) find a strong positive impact from first stage land certification on land-related investments, especially terracing and bunding, for both male and female headed households. Persha et al. (2017) finds that the marginal impact of second-level certification (that included GPS demarcation and the development of a land certificates database) relative to first-level certification in Ethiopia did not have any effect on investment in soil and water conservation, but households also did not report improved tenure security.

Two studies emphasize the importance of knowledge of legal rights. Using the 2009 Ethiopian Rural Household Survey data, Quisumbing and Kumar (2014) find that knowledge of land rights in three domains (tenure security, land transferability, and gender rights) significantly affect adoption of soil conservation practices, planting of tree crops and legumes, and that women's relative lack of knowledge about their land rights is a significant constraint to adoption of these investments. Similarly, Deininger et al. (2008b) find, based on observational survey data in Uganda, that knowledge of land rights increases tree planting and soil conservation, and has a greater effect than having transfer rights to the land, with female headed households significantly more likely to make such investments.

Four observational studies from Ghana demonstrate the relationship between security of tenure and investments in the land. Goldstein and Udry (2008) use political standing as a proxy for tenure security, and found that those without political power, including women, leave land fallow less often. In studies combining surveys and qualitative methods, Antwi-agyei et al. (2015) found that both migrant and local women in two districts were more likely than men to say that complex tenure is a barrier to short term soil conservation (mulching, inorganic fertilizers) and longer term tree planting, and Bugri (2008) found that men were more likely than women to report that customary tenure had better security than statutory tenure for environmental management and agricultural production.

Awanyo's (2009) study in Ghana draws on local definitions of land tenure to identify the relationships between tenure and investments that favor tree biodiversity. While tenure security increases selective clearing, income and gender do not have significant interaction effects with land rights. This study also notes that tenure insecurity can prompt both women and men to invest in the resource base to strengthen claims on the land itself. Similarly, in a study of cocoa-growing communities in Ghana, Quisumbing et al. (2004:165–166) found: “people invest not only in trees but also in social relationships, the wife's help in planting trees is also an investment in the stability of her marriage. Helping the husband also guarantees the wife a share of the land should the marriage eventually end in divorce.” They observe endogenous change in tenure, with men gifting land to wives and children, as well as changes in the Intestate Succession Law of 1985, strengthening women's tenure security.

Dillon and Voena (2017) demonstrate that WLR affect household technology adoption in Zambia. Limiting the sample to only couple-headed households, they find that in communities where widows inherit, households are more likely to invest through fertilizer use and fallowing.

While the overall evidence is that women's lack of land tenure security is a constraint to investment in the resource base, several studies from Malawi provide a cautionary note; men's tenure security is also relevant. In areas where men move to live with their wives, and thus have less secure land tenure, they are less likely to invest in tree planting (Hansen and Luckert, 2005; Lovo, 2016) and soil conservation and hybrid maize (Lovo, 2016). This is similar to the findings in Malawi that when women move to live with their husbands, they invest less in soil improvements (Lovo, 2016; Pircher et al., 2013) because they do not have long-term land tenure security.

5.3. Credit

It is routinely claimed that formal land rights allow the holder to access credit, which can be invested to reduce poverty (De Soto, 2000). Yet, there is little evidence supporting this, partly because it requires well-functioning credit markets, banking systems that accept land as collateral, and legal systems that effectively adjudicate cases where land is used as collateral. In their systematic review of the impact of increased tenure security (not specific to WLR), Higgins et al. (2017) only two of seven studies found any link between increased tenure security and credit.

We only found two studies that assessed the impact of women's property rights on credit. In Ethiopia, mortgaging of land is illegal, so land cannot be used as collateral for formal loans, but Persha et al. (2017) notes that land certificates may help in obtaining microfinance or loans from informal sources by signaling that the holder is attached to a place and has capacity for repayment; strengthening women's land rights through second tier land registration increased access to credit for both male and female headed households, but with a larger effect for the former. In addition, in West Bengal beneficiary households in a land allocation and registration program were more likely than non-beneficiary households to use credit for agriculture (Santos et al., 2014).

5.4. Agricultural productivity and livelihoods

Ideally, information on the impact of WLR on agricultural livelihoods would include information on productivity, crop choice, and profitability. While there has been a recent resurgence of literature comparing the productivity of men and women farmers (see Doss, 2017), almost none of it considers the impacts of WLR. This literature has shifted away from comparing male and female headed households to analyses of the productivity of plots farmed by men and women, but the land rights themselves are not generally considered. For example, Peterman et al., 2011 analyze agricultural productivity differences on plots managed by men and women in Uganda and male- and female-headed households in Nigeria. To identify the plot managers in Uganda, they asked who owned the crops produced on the plot, but not the owner of the land itself. A recent set of papers (Aguilar et al., 2015; Ali et al. 2016; Slavchevska, 2015; de la O Campos et al., 2016; Oseni et al., 2015; Kilic et al., 2015 all use the sex of the plot holder as the stratifying variable in decomposition analyses to understand the factors behind the differences in the value of output on men's and women's plots. While being the plot holder implies having land use rights, it does not provide any information about tenure security.

Three of the six papers that explicitly examine the relationship of land rights and productivity use quasi-experimental methods, while the remainder are observational. Five of these six papers are based in Africa. The three quasi-experimental studies analyze the impact of various government land allocation or registration programs on productivity outcomes. In Ethiopia, Bezabih et al. (2016) find that the value of agricultural output increases in the households with certificates relative to those without and the impact is greater for female headed households. Similarly, Mendola and Simtowe (2015) analyze a land reform program in Malawi, using difference in difference analyses

and propensity score matching. They do not find significant improvements in agricultural productivity and income, food security or access to social services for beneficiary households headed by women, while there is an impact for those headed by men. Yet other impacts, including increases in total income and assets are similar for beneficiary households headed by men and women. Newman et al. (2015) use panel data from Vietnam to analyze whether including women's names on land use certificates impacts household rice productivity. Plots with land use certificates have higher productivity; productivity was not lower on plots that were jointly titled.

Goldstein and Udry's (2008) observational study in Ghana finds that women have lower productivity and earn lower agricultural profits, which they relate to their lower tenure security and hence lack of fallowing. The other two observational studies simply compare households with different land rights. In Malawi, Bhaumik et al. (2016) find that even if WLR are stronger in matrilineal areas, male farmers may still have the advantage in entering high value agriculture in an environment where women do not have adequate access to markets and complementary resources such as capital and hired labor. In Kenya, Owoo and Boakye-Yiadom (2015) finds higher maize yields on men's plots than on women's plots and on plots with titles compared to those without titles, but the approach does not address selection issues.

Other analyses find more indirect effects. Deininger and Castagnini (2006) use find that female headed households are more likely to experience land conflict. They also find that productivity is negatively correlated with land conflict, but do not explicitly consider productivity by sex of the head.

5.5. Government services and institutions

Because many government services are provided to recognized land owners, there is a potential link between WLR and government services or institutions. However, much of the literature on such linkages such as electricity, water, and even police protection is related to housing or urban issues, which are not covered in our rural-focused paper. Participation in public institutions may be empowering and provide access to services. However, although Meinzen-Dick and Zwartveen (1998) note that, because membership in water users' associations is often restricted to land owners, women are excluded from participation, we found no studies showing the links between WLR and extension services or irrigation.

Three papers explore the link between WLR and three aspects of women's participation in institutions. Grabe (2015) finds that land ownership is positively and significantly correlated with speaking in community meetings and household decision making and that it decreases the extent to which women feel controlled by her partner in northern Tanzania. Goldman et al. (2016) find that the work of NGOs in Tanzania to educate women about their land rights strengthened women's social relations, expanding access to customary authorities, and increasing knowledge of political processes. Finally, Selhausen (2015) finds that women's land ownership increases women's probability of joining a women's coffee cooperative in Western Uganda but does not significantly affect the degree of her participation.

5.6. Other livelihoods

Most of the possible ways in which WLR may affect non-agricultural livelihoods have not been analyzed. Only three studies consider women's ability to earn an income through renting out land—all based on Ethiopia. Holden et al. (2011) use a quasi-experimental approach in Tigray before and after the land registration process. They find that women landholders are more likely to rent out their land if they have a certificate. Similarly, using observational data, Akpalu and Bezabih (2015) find that female household heads are more likely to rent out land when their risk of losing a plot is low, livestock ownership is low, marginal cost of litigation is low, and climate variability is high. Holden

and Bezabih (2008) suggest that productivity is lower on plots rented out by women than those rented out by men because women have weaker tenure security and, less bargaining power, and are more likely to rent out the land to relatives, who have lower productivity.

5.7. Empowerment

The conceptual framework indicates a direct link between WLR and empowerment, and seven papers identified through the systematic search focus on how WLR strengthens three different manifestations of empowerment, including one paper on sexual behavior and HIV risk (Muchomba et al., 2014), three on women's participation in collective action (Grabe, 2015; Goldman et al., 2016; Selhausen, 2015), and three on domestic violence (Grabe, 2010; Grabe et al., 2015; Panda and Agarwal, 2005).

Of these seven papers, three were written in the context of an intervention and have “intervention” and “comparison” groups, and four are observational. Although the intervention based papers had intervention and control groups, no attempt was made to use statistical matching techniques such as propensity score matching to create a counterfactual. Three of the papers also included a qualitative component. In almost all the papers, land rights are defined as self-reported land ownership (e.g. interpreting an affirmative response to “do you own land” or interpreting respondent who farms her “own land” to mean respondent owns land). One paper looked additionally at ownership of a house. One paper distinguishes between individually owned land and jointly owned land (Selhausen, 2015), and one differentiates between owning land, having title to land, and being able to “control” (make decisions) on land (Goldman et al., 2016), but the rest do not record whether land rights are documented.

This group of papers also reflects how empowerment affects other outcomes, as indicated in the conceptual framework. The papers on participation suggest that WLR affects access to government services/institutions via empowerment. The papers on HIV risk and domestic violence show how WLR affect bargaining power and resilience.

As noted in an evidence review of the literature on women's property rights and HIV status (Tumlinson et al., 2015), Muchomba et al., 2014 is the only empirical paper to date that uses quantitative data to test the relationship between WLR and risky sexual behavior associated with HIV infection. Findings from their observational study suggest that land ownership can decrease HIV risk by reducing women's economic reliance on high-risk sexual partnerships, but not from greater ability to negotiate safer sex. In this context women's land ownership did not significantly improve women's bargaining power (for safer sex) but did reduce the need for survival sex as a livelihood option. To the extent that WLR empower women to avoid risky sexual behavior and HIV risk, they can also improve resilience.

Our review also includes papers that examine the relationship between WLR and domestic violence, one of the clearest indicators of disempowerment. Three of the four observational studies analyze violence that occurred at any time during the course of a marriage, and current violence (experienced in the past twelve months), and include both psychological and physical violence; the fourth examines just current violence.

In an observational study on property ownership and domestic violence in one district of Kerala, India, Panda and Agarwal (2005) find that women's property ownership is significantly and negatively associated with both long-term and current physical and psychological violence. The effect is strongest when women own both house and land, followed by just house ownership, then land, and the effects outweigh other significant variables. Studies comparing landowning and non-landowning women in Nicaragua (Grabe, 2010) and Tanzania (Grabe, 2015), find significant links between land ownership, relationship power, and reduced domestic violence. However, neither study addresses selection bias in NGO program participation nor look at other pathways besides relationship power through which property

ownership decreases domestic violence.

5.8. Full income

The conceptual framework shows that WLR (and interventions or policies strengthening them) will affect full income through the pathways discussed above. The systematic search identified 17 papers that examine linkages between WLR and full income, and WLR and bargaining power, which would affect the allocation of full income toward consumption and investment. Evidence of a direct association with full income, however, does not exist, possibly because of the difficulties in conceptualizing or measuring full income. Instead, we review two papers that investigate the links between WLR and food security, broadly defined as household calorie availability. The bulk of evidence is on bargaining power and decisionmaking: we found nine papers on bargaining power, decisionmaking, and expenditure allocation, and six papers on bargaining power, investment in human capital (health, education, nutrition), and intergenerational transfers.

Among the 17 papers reviewed, six were quasi-experimental (QE) studies (including “natural experiments”) that took advantage of the timing of a property rights reform or exogenous differences in eligibility for the reform and the rest were observational studies. These property rights reforms were: (1) the community-based land registration in Ethiopia; (2) the Hindu Succession Act Amendment in India, (3) joint titling of land in Peru, (4) changes in the inheritance law in Nepal; (5) laws providing for joint titling in husbands' and wives' names in Vietnam; and (6) the distribution of documents (with women's name) in West Bengal, India. The observational studies were undertaken mostly to examine the association between men's and women's control of assets (including land) and household decisionmaking outcomes, often in the context of tests of the collective model of the household. Some of the studies of property rights reforms were also observational.

5.9. Consumption and food security

Food consumption is a priority of rural households, accounting for the bulk of household expenditures among the poor. The two papers examining food security outcomes are from Ethiopia and India. [Ghebru and Holden \(2013\)](#) found significant positive effects of holding a land certificate on food availability and BMI of children in Ethiopia, with effects on calorie availability (but not BMI) higher for female-headed households. In their study of a land allocation and registration program in West Bengal (cited above), [Santos et al. \(2014\)](#) find greater women's decision-making over household food and agriculture among beneficiary households of a land allocation program, but no evidence of significant short-term improvements in food security in the two years analyzed.

5.10. Bargaining power and decisionmaking over consumption

Among the nine papers on bargaining power and decisionmaking, three used quasi-experimental methods and six were observational. Most of the quasi-experimental studies exploited eligibility criteria or variations in the timing of reform relative to the timing of the survey to identify impacts. [Brule \(2010\)](#) found that amending the Hindu Succession Act to give sons and daughters equal rights to inherit has increased women's perceived ownership of household land, women's self-reported bargaining power in the household, and women's probability of inheriting land. Although the law had a very limited substantive impact on the equality of women's land shares, households with an HSAA beneficiary spend more on women's goods, medical care, and children's education. [Wiig \(2013\)](#) compared decisionmaking outcomes in Peruvian peasant communities that were eligible for joint titling with those communities that were not eligible. Women living in the former communities participated in a significantly higher number of household decisions compared to those in communities without titled plots, with

the strongest effects for agriculture decisions and land-related investments. Examining data before and after the reform of inheritance laws in Nepal, [Mishra and Sam \(2016\)](#) find that women's land ownership significantly increases their empowerment, defined by household decision-making in areas of own healthcare, major household purchases, and visits to family or relatives. While they cannot empirically test the impact of the land rights reforms of 2002 and 2007 in Nepal, they note that the strength of the association between land ownership and empowerment seems to have risen following their enactment, suggesting that staggered implementation of similar progressive laws could result in more empowerment for women.

The observational studies used data from household surveys in Ethiopia ([Dercon and Krishnan, 2000](#); [Fafchamps and Quisumbing, 2002](#)), Bangladesh, Ethiopia, Sumatra (Indonesia), and South Africa ([Quisumbing and Maluccio, 2003](#)), Ghana ([Doss, 2006](#)); India, Malawi, Mali, and Tanzania ([Doss et al., 2014](#)), and Karnataka, India ([Swaminathan et al., 2012](#)). The data sets contain information on women's and men's property rights, although definitions differed across studies, and many of the studies did not explicitly set out to test the relationship between WLR and bargaining power, but differential control of resources, more broadly, and bargaining power. Notably, because most of these studies tested the hypotheses that women's property rights over assets significantly affected household decision-making outcomes, in four of these studies the property rights variable aggregated both land and assets. The findings should therefore be interpreted as the associations between women's land and asset ownership and various outcomes, and not associations with WLR alone. Two studies used similar definitions of women's property rights: [Doss et al. \(2014\)](#) used whether women own land individually or jointly, or whether women own a house individually or jointly, and [Swaminathan et al. \(2012\)](#) used a binary variable: whether woman was an owner of either land or a house and a continuous variable capturing the proportion of women's gross value of land and house to total household gross value of land and house in alternative specifications. [Doss \(2006\)](#) used the share of farmland owned by women, and [Fafchamps and Quisumbing \(2002\)](#) and [Quisumbing and Maluccio \(2003\)](#) focused on land and livestock brought to marriage. [Dercon and Krishnan's \(2000\)](#) study on risk-sharing within households in Ethiopia was not focused on examining the impact of WLR; however, in testing the determinants of the sharing rule, the interaction term between the household's landholding and location in the South (where women are more disadvantaged) is a proxy for the weakness of WLR.

The findings from the associational studies indicate that, although WLR have significant and positive associations with women's increased decisionmaking ability and empowerment, these associations are not significant across the entire range of outcomes nor consistently significant across countries, owing to the context specificity of gender norms.

The consensus from this set of studies is that strengthening WLR increases women's decisionmaking power, mobility, and empowerment and via a hypothesized increase in bargaining power, is associated with greater decisionmaking power over land within marriage and greater control over consumption decisions, including increased budget shares for child schooling.

5.11. Bargaining power and decisionmaking on human capital investment and intergenerational transfers

The conceptual framework predicts that by influencing bargaining power, WLR affects investment decisions, including investment in human capital. Our search yielded six papers on human capital (health and nutrition of children), two of which were quasi-experimental and the other four, observational. [Allendorf \(2007\)](#) found that women in Nepal who own land are significantly more likely to have the final say in household decisions, and children of mothers who own land are significantly less likely to be severely underweight. [Menon et al. \(2014\)](#) exploit panel data before and after the joint titling reform in Vietnam

and distinguish between women-only-held and jointly-held land use certificates (LUCs). They find that woman-only held land-use rights decreased the incidence of illness among children, increased their health insurance coverage, raised school enrollment, and reallocated household expenditures toward food and away from alcohol and tobacco. These effects were almost all stronger than in households with male-only or jointly-held land-use rights.

Finally, WLR may affect transfers to the next generation either by increasing the absolute stock of resources to be transferred, or by affecting women's bargaining power, which would affect the allocation of transfers among sons and daughters. Two quasi-experimental studies analyze the impacts of the Hindu Succession Act Amendments, but arrive at very different results. [Deininger et al. \(2013\)](#) use the timing of the father's death relative to the implementation of the HSAA and [Roy \(2015\)](#) uses the death of the grandfather as the event that triggers the partition of the estate. The former finds positive effects of the reform on women's inheritance of land and other assets and on education. Roy's findings are less optimistic: parents appear to be compensating their daughters for disinheriting them from household property by transferring to them alternative forms of wealth like dowry or education. Two observational studies on the reform of the Family Code and the land registration in Ethiopia ([Kumar and Quisumbing 2012](#), [Kumar and Quisumbing, 2015](#)) found that awareness about the land registration process is positively correlated with the shift in perceptions toward equal division of land and livestock upon divorce, especially for wives in male-headed households, signifying stronger bargaining power. Stronger bargaining power is reflected in investments in child schooling: children in households where perceived divorce allocations favor the husband do worse compared to children of the same age, but girls fare even worse than boys in these households.

[Quisumbing et al.'s \(2004\)](#) observational study of intergenerational transfers explores how WLR in Ghana, Indonesia (Sumatra) and the Philippines affect the allocation of land and schooling among sons and daughters and how this, in turn, affects their lifetime incomes. Using retrospective data on inheritance, the study finds that, in Ghana, there is parental discrimination against girls in land transfers and schooling (although lessening through time); in Indonesia, the distribution of land and schooling is equal between sons and daughters, and in the Philippines, sons are favored in land inheritance and daughters in schooling. WLR effects on intergenerational transfers may come full circle, by affecting the incomes of the next generation.

6. Conclusions

Our review of the literature on WLR and a range of outcomes identified in our conceptual framework indicates that, despite the fairly high levels of agreement, the amount of evidence is uneven. [Table 2](#) presents our assessment of the quality of evidence on women's land rights along various pathways to poverty reduction, based on the amount of evidence and the level of agreement. The evidence is strongest (with high levels of agreement and a larger body of evidence) in the areas of bargaining power and decisionmaking on consumption, bargaining power and decisionmaking on human capital investment and intergenerational transfers. There is a high level of agreement, but insufficient documentation on NRM, government services and institutions, empowerment and domestic violence, resilience and HIV risk, and consumption and food security. There is a low level of agreement and insufficient evidence on the associations between WLR and other livelihoods, and a higher level of agreement, but still limited evidence on associations between WLR and credit, technology adoption, and agricultural productivity. Finally, although there is a high level of agreement that WLR ultimately reduce poverty, this assertion is unproven, partly because there are no rigorous studies that measure the link between WLR and poverty directly.

Some of the gaps in evidence cut across outcome areas. For example, the need to identify the bundles of rights held by women, the security of

those rights, and knowledge of those rights is common to all studies. The divergent conclusions observed may arise from “a failure to account for the complexity and multi-dimensional nature of land rights in Africa which are often not adequately captured by traditional tenure categories.” ([Deininger et al., 2008b:614](#)). Indeed, land tenure regimes in all parts of the world are characterized by differences in the importance of customary vs. statutory law, differences in underlying inheritance and kinship systems, and differences in social norms.

Another gap relates to the long-standing practice of defining and measuring land rights at the household level. One would expect, for example, that WLR would positively impact both technological adoption and agricultural productivity. There is certainly agreement that stronger land rights would have a positive impact, but there is almost no evidence on women's land rights specifically. The few studies on agricultural productivity focus on women farmers—but not their land rights. Other gaps relate to the lack of attention paid to gender roles—the socially determined relationships between women and men. In the literature examining NRM and long-term investment, for example, there is supporting evidence that stronger WLR encourages investment. However, the Malawi cases show that if men don't have secure tenure, this may limit their incentives to invest. Having land rights may be insufficient if there are few investment opportunities, if women do not know about them, or if social norms, in general, are biased against women.

An important gap in the literature on NRM is that most cases (and all that we cite) are from Africa, not from Asia or Latin America. To some extent this may be because studies on gender consider either female-headed households or women managed plots, which are more common in Africa. In Asia, joint family farming is more often the norm. However, family farming in Asia is changing, especially in areas with high rates of male outmigration, like Nepal.

Interestingly, despite the rhetoric that WLR increases the ability of women to obtain credit, thereby encouraging investment and diversification of income portfolios, there is remarkably little evidence on this issue. Associations between WLR and livelihoods are suggestive but unproven because most studies focus only on rental markets and our exclusion criteria exclude studies in urban and peri-urban areas, where women who may have diversified livelihoods may have migrated.

Although there is more agreement and evidence on outcomes related to empowerment and bargaining power, gaps in the evidence remain. Most papers that directly explore other aspects of empowerment apart from household decision making agree that WLR support women's empowerment, but only a small number of papers explore this link. Most of the evidence is limited by small sample sizes, observational methods without counterfactuals, ignoring endogeneity of women's land ownership, vague definitions of land rights, selection bias in participating in land rights interventions, and possible response bias on questions of domestic violence and empowerment.

Incomplete definitions of land rights are problematic across outcomes studied, but are glaring in the papers on empowerment outcomes. To better understand the mechanism by which land empowers women, the measure of land rights must go beyond self-reported ownership or even possession of a document; investigations of women's control over the use and revenues from this land and how she acquired it are needed. This information would help us answer why land rights deter domestic violence or increase women's power in her relationship. Women could use land as a source of independent income from her husband, gain status from owning land, access alternate income if they leave a relationship, or use it as a physical shelter to escape her home.

Most papers also do not situate a woman's land rights in the context of the household to which she belongs. For example, the paper on HIV risk behavior indicates the importance of distinguishing between land rights for women in married vs. female-headed households. In this context, land rights only decreased HIV risk behavior for female heads of household by mitigating dependence on survival sex. Although most of the papers that look at empowerment do so for women in dual-adult

Table 2
Assessment of quality of evidence on women's land rights and pathways to poverty reduction.

		Amount of evidence		
		Limited	Medium	High
Level of agreement	Low	Suggested but unproven Other livelihoods	Speculative	Alternate explanations
	Medium	Tentatively agreed by most but unproven Credit Technology adoption Agricultural productivity	Provisionally agreed by most	Generally accepted
	High	Agreed but unproven Poverty reduction	Agreed but incompletely documented Natural resource management Government services and institutions Empowerment and domestic violence Resilience and HIV risk Consumption and food security	Well-established Bargaining power and decisionmaking over consumption Bargaining power and decisionmaking on human capital investment and intergenerational transfers

households, considering women's power relative to her spouse, the papers on participation in institutions reflect that power within a relationship has implications for empowerment in the public sphere. These papers indicate that WLR may have different implications for the empowerment of women in married vs. female-headed households.

Finally, there are evidence gaps even in the outcome area where both the level of agreement and the quantity of evidence is strongest—that of bargaining power and decision-making on household consumption, human capital investment, and intergenerational transfers. Despite the large number of papers, there are very few rigorous evaluations of reforms that strengthened WLR. Although the data sets contain information on women's and men's property rights, the definitions differed across data sets, countries, and contexts, making generalizations difficult. Moreover, because most of these studies did not explicitly set out to test the relationship between WLR and bargaining power, the land variable was aggregated with other assets (notably housing), making it difficult to identify the separate impact of WLR.

While further research is needed to address these gaps in the evidence, the gaps should not deter the careful design and implementation of programs and policies to strengthen WLR. Land tenure reforms are proceeding in many countries, owing to pressures on the resource. If these reforms do not specifically seek to strengthen women's land rights, they are likely to weaken them, with clear negative consequences. If programs and policies are designed with careful consideration of existing land rights institutions, gender inequalities, and social norms, and if these are designed and implemented with an impact assessment strategy from the start, evaluations of these programs could themselves contribute to the body of evidence. Different modalities and mechanisms for strengthening WLR could be tested, with appropriate counterfactuals. Rather than relying on assertions that reflect agreement, but are unsupported by evidence, program designers and evaluators would do well to strategically identify pathways and outcomes where evidence gaps exist, and deliberately collect data to close those gaps. Some of the impacts to be measured—such as those on poverty reduction—may require a longer time period to assess impact. A careful mapping of the evidence, such as that we have attempted in this review, could be the beginning of a strategy to make strengthening WLR an important part of agricultural development strategies.

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References

- Agarwal, B., 1994. *A Field of One's Own: Gender and Land Rights in South Asia*. Cambridge University Press, Cambridge, UK.
- Aguilar, A., Carranza, E., Goldstein, M., Kilic, T., Oseni, G., 2015. Decomposition of gender differentials in agricultural productivity in Ethiopia. *Agric. Econ.* 46 (3), 311–334. <http://dx.doi.org/10.1111/agec.12167>.
- Akpalu, W., Bezabih, M., 2015. Tenure insecurity, climate variability and renting out decisions among female small-holder farmers in Ethiopia. *Sustainability* 7, 7926–7941. <http://dx.doi.org/10.3390/su7067926>.
- Ali, D.A., Deininger, K., Goldstein, M., 2014. Environmental and gender impacts of land tenure regularization in Africa: Pilot evidence from Rwanda. *J. Dev. Econ.* 110, 262–275. <http://dx.doi.org/10.1016/j.jdeveco.2013.12.009>.
- Ali, D.A., Bowen, D., Deininger, K., Duponchel, M., Bank, T. W., 2016. Investigating the gender gap in agricultural productivity: evidence from Uganda. *World Dev.* 87, 152–170. <http://dx.doi.org/10.1016/j.worlddev.2016.06.006>.
- Allendorf, K., 2007. Do women's land rights promote empowerment and child health in Nepal? *World Dev.* 35 (11), 1975–1988. <http://dx.doi.org/10.1016/j.worlddev.2006.12.005>.
- Ambler, K., Cheryl, D., Caitlin, K., Passarelli, S., 2017. *He says, she says: exploring patterns of spousal agreement*. In: IFPRI Discussion Paper 01616. International Food Policy Research Institute, Washington, D.C.
- Antwi-agyeyi, P., Dougill, A.J., Stringer, L.C., 2015. Land use policy impacts of land tenure arrangements on the adaptive capacity of marginalized groups: the case of Ghana's Ejura Sekyedumase and Bongo districts. *Land Use Policy* 49, 203–212. <http://dx.doi.org/10.1016/j.landusepol.2015.08.007>.
- Arnot, C., Luckert, M., Boxall, P., 2011. What is tenure security? Conceptual implications for empirical analysis. *Land Econ.* 87 (2), 297–311. <http://dx.doi.org/10.3368/le.87.2.297>.
- Asfaw, S., Maggio, G., 2017. Gender, weather shocks, and welfare: evidence from Malawi. *J. Dev. Stud.* <http://dx.doi.org/10.1080/00220388.2017.1283016>.
- Awanyo, L., 2009. Exploring the connections: land tenure, social identities, and agrobiodiversity practices in Ghana. *Geogr. Ann.* 91 (2), 137–155.
- Besley, T., 1995. Property rights and investment incentives: theory and evidence from Ghana. *J. Polit. Econ.* 103 (5), 903–937.
- Bezabih, M., Holden, S., Mannberg, A., 2016. The role of land certification in reducing gaps in productivity between male- and female-owned farms in rural Ethiopia the role of land certification in reducing gaps in productivity between male- and female-owned farms in rural Ethiopia. *J. Dev. Stud.* 52 (3), 360–376. <http://dx.doi.org/10.1080/00220388.2015.1081175>.
- Bhaumik, S.K., Dimova, R., Gang, I.N., 2016. Is women's ownership of land a panacea in developing countries? Evidence from land-owning farm households in Malawi is Women's ownership of land a panacea in developing countries? Evidence from land-owning farm households in Malawi. *J. Dev. Stud.* 52 (2), 242–253. <http://dx.doi.org/10.1080/00220388.2015.1060314>.
- Brule, R., 2010. Changes in India's property rights regime and the implications for

- improved gender parity. In: APSA 2010 Annual Meeting Paper, Available at SSRN. <https://ssrn.com/abstract=1644357>.
- Bugri, J.T., 2008. The dynamics of tenure security, agricultural production and environmental degradation in Africa: evidence from stakeholders in north-east Ghana. *Land Use Policy* 25, 271–285. <http://dx.doi.org/10.1016/j.landusepol.2007.08.002>.
- De Soto, H., 2000. *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else*. Basic Books, New York.
- Deere, C.D., Doss, C.R., 2006. The gender asset gap: what do we know and why does it matter? *Fem. Econ.* 12 (1–2), 1–50. <http://dx.doi.org/10.1080/13545700500508056>.
- Deere, C.D., Leon, M., 2003. The gender asset gap: land in Latin America. *World Dev.* 31 (6), 925–947. [http://dx.doi.org/10.1016/S0305-750X\(03\)00046-9](http://dx.doi.org/10.1016/S0305-750X(03)00046-9).
- Deere, C.D., Oduro, A.D., Swaminathan, H., Doss, C., 2013. Property rights and the gender distribution of wealth in Ecuador, Ghana and India. *J. Econ. Inequal.* 11 (2), 249–265. <http://dx.doi.org/10.1007/s10888-013-9241-z>.
- Deininger, K., 2003. Land Policies for Growth and Poverty Reduction. A World Bank Policy Research Report. World Bank Group, Washington, DC. <http://documents.worldbank.org/curated/en/485171468309336484/Land-policies-for-growth-and-poverty-reduction>.
- Deininger, K., Castagnini, R., 2006. Incidence and impact of land conflict in Uganda. *J. Econ. Behav. Organ.* 60 (3), 321–345.
- Deininger, K., Ali, D.A., Holden, S., Zevenbergen, J., 2008a. Rural land certification in Ethiopia: process, initial impact, and implications. *World Dev.* 36 (10), 1786–1812. <http://dx.doi.org/10.1016/j.worlddev.2007.09.012>.
- Deininger, K., Ali, D.A., Yamano, T., 2008b. Legal knowledge and economic development: the case of land rights in Uganda. *Land Econ.* 84 (4), 593–619.
- Deininger, K., Goyal, A., Nagarajan, H., 2013. Women's Inheritance Rights and Intergenerational Transmission of Resources in India. *J. Human Res.* 48 (1), 114–141.
- Dercon, S., Krishnan, P., 2000. In sickness and in health: risk sharing within households in rural Ethiopia. *J. Polit.* 108 (4), 688–727.
- Dillon, B., Voena, A., 2017. Inheritance Customs and Agricultural Investment (January 18, 2017). Available at SSRN. <https://ssrn.com/abstract=2913102>.
- Doss, C., 2006. The effects of intrahousehold property ownership on expenditure patterns in Ghana. *J. Afr. Econ.* 15 (1), 149–180. <http://dx.doi.org/10.1093/jae/eji025>.
- Doss, C.R., 2017. Women and agricultural productivity: reframing the issues. *Dev. Policy Rev.* 1–16. <http://dx.doi.org/10.1111/dpr.12243>.
- Doss, C., Meinzen-Dick, R., Bomuhangi, A., 2013. Who owns the land? Perspectives from rural Ugandans and implications for large-scale land acquisitions. *Fem. Econ.* 20 (1), 76–100. <http://dx.doi.org/10.1080/13545701.2013.855320>.
- Doss, C.R., Kim, S.M., Njuki, J., Hillenbrand, E., Miruka, M., 2014. Women's individual and joint property ownership effects on household decisionmaking. In: IFPRI Discussion Paper 01347. International Food Policy Research Institute, Washington, D.C.
- Doss, C., Kovarik, C., Peterman, A., Quisumbing, A., van den Bold, M., 2015. Gender inequalities in ownership and control of land in Africa: myth and reality. *Agric. Econ.* 46, 403–434. <http://dx.doi.org/10.1111/agec.12171>.
- Fafchamps, M., Quisumbing, A.R., 2002. Control and ownership of assets within rural Ethiopian households. *J. Dev. Stud.* 38 (6), 47–82.
- Food and Agriculture Organization of the UN, 2002. Land tenure and rural development. In: FAO Land Tenure Studies No. 3. FAO, Rome.
- Ghebru, H., Holden, S., 2013. Links between Tenure Security and Food Security: Evidence from Ethiopia. IFPRI Discussion Paper. International Food Policy Research Institute, Washington D.C.
- Giovarelli, R., Richardson, A., Scalise, E., 2016. Gender and Collectively Held Land: Good Practices and Lessons Learned From Six Global Case Studies. Resource Equity and Landesa. <http://www.landesa.org/wp-content/uploads/2016-Best-Practices-Synthesis-Report.pdf>.
- Goldman, M.J., Davis, A., Little, J., 2016. Controlling land they call their own: access and women's empowerment in Northern Tanzania. *J. Peasant Stud.* 43 (4), 777–797.
- Goldstein, M., Udry, C., 2008. The profits of power: land rights and agricultural investment in Ghana. *J. Polit. Econ.* 116 (6), 981–1022. <http://www.jstor.org/stable/10.1086/595561>.
- Goldstein, M., Hounbedji, K., Kondylis, F., O'Sullivan, M., Selod, H., 2015. Formalizing Rural Land Rights in West Africa: early evidence from a randomized impact evaluation in Benin. In: Policy Research working paper; no. WPS 7435; Impact Evaluation series. World Bank Group, Washington, D.C. <http://documents.worldbank.org/curated/en/947811468189268752/Formalizing-rural-land-rights-in-West-Africa-early-evidence-from-a-randomized-impact-evaluation-in-Benin>.
- Grabe, S., 2010. Promoting gender equality: The role of ideology, power, and control in the link between land ownership and violence in Nicaragua. *Anal. Soc. Issues Public Policy* 10 (1), 146–170. <http://dx.doi.org/10.1111/j.1530-2415.2010.01221.x>.
- Grabe, S., 2015. Participation: Structural and relational power and Maasai women's political subjectivity in Tanzania. *Feminism Psychol.* 25 (4). <http://dx.doi.org/10.1177/09593535155591369>.
- Grabe, S., Grose, R.G., Dutt, A., 2015. Women's land ownership and relationship power: a mixed methods approach to understanding structural inequities and violence against women. *Psychol. Women Q.* 39 (1), 7–19. <http://dx.doi.org/10.1177/0361684314533485>.
- Grown, C., Rao Gupta, G., Kes, A., 2005. Taking action: Achieving gender equality and empowering women. In: UN Millennium Project: Task Force on Education and Gender Equality.
- Haddad, L., John, H., Alderman, H. (Eds.), 1997. *Intrahousehold Resource Allocation in Developing Countries: Models, Methods, and Policy*. Johns Hopkins University Press, Baltimore MD.
- Hansen, J.D., Luckert, M.K., 2005. Tree planting under customary tenure systems in Malawi: impacts of marriage and inheritance patterns. *Agric. Syst.* 84, 99–118. <http://dx.doi.org/10.1016/j.agsy.2004.05.003>.
- Higgins, J.P.T., Green, S. (Eds.), 2011. *Cochrane Handbook for Systematic Reviews of Interventions*, Version 5.1.0 [updated March 2011]. The Cochrane Collaboration Available at www.handbook.cochrane.org.
- Higgins, D., Balint, T., Liversage, H., Winters, P., 2017. Investigating the impacts of increased rural land tenure security: A systematic review of the evidence. In: Paper presented at the “2017 World Bank Conference On Land And Poverty” The World Bank, Washington DC, March 20–24, 2017.
- Holden, S., Bezabih, M., 2008. Why is land productivity lower on land rented out by female landlords? Theory and evidence from Ethiopia. In: Holden, S., Otsuka, K., Place, F. (Eds.), *The Emergence of Land Markets in Africa: Assessing the Impacts on Poverty and Efficiency*. RFF Press. https://researchportal.port.ac.uk/portal/files/95598/BEZABIH_2008_pre_Ch9_Gender_and_land_productivity_on_rented_land_in_Ethiopia.pdf.
- Holden, S., Ghebru, H., 2016. Land tenure reforms, tenure security and food security in poor agrarian economies: causal linkages and research gaps. *Global Food Security* 10, 21–28.
- Holden, S., Deininger, K., Ghebru, H., 2011. Tenure insecurity, gender, low-cost land certification and land rental market participation in Ethiopia. *J. Dev. Stud.* 47 (1), 31–47.
- International Food Policy Research Institute, 2013. *Reducing the Gender Asset Gap through Agricultural Development: A Technical Resource Guide*. <http://gaap.ifpri.info/technical-guide/>.
- Jackson, C., 2003. Gender analysis of land: beyond land rights for women? *J. Agrar. Chang.* 3 (4), 453–480. <http://dx.doi.org/10.1111/1471-0366.00062>.
- Johnson, N., Kovarik, C., Meinzen-Dick, R., Njuki, J., Quisumbing, A., 2016. Gender, assets and agricultural development: lessons from eight projects. *World Dev.* 83, 295–311. <http://dx.doi.org/10.1016/j.worlddev.2016.01.009>.
- Kieran, C., Sproule, K., Doss, C., Quisumbing, A., Kim, S.M., 2015. Examining gender inequalities in land rights indicators in Asia. *Agric. Econ.* 46, 119–138. <http://dx.doi.org/10.1111/agec.12202>.
- Kieran, C., Sproule, K., Quisumbing, A.R., Doss, C.R., 2017. Gender gaps in landownership across and within households in four Asian countries. *Land Econ.* 93 (2), 342–370. <http://dx.doi.org/10.3368/le.93.2.342>.
- Kilic, T., Palacios-López, A., Goldstein, M., 2015. Caught in a productivity trap: a distributional perspective on gender differences in Malawian agriculture. *World Dev.* 70, 416–473. <http://dx.doi.org/10.1016/j.worlddev.2014.06.017>.
- Kumar, N., Quisumbing, A.R., 2015. Policy reform toward gender equality in Ethiopia: little by little the egg begins to walk. *World Dev.* 67, 406–423. <http://dx.doi.org/10.1016/j.worlddev.2014.10.029>.
- Kumar, N., Quisumbing, A.R., 2012. Beyond Death Do Us Part?: the long-term implications of divorce perceptions on women's well-being and child schooling in rural Ethiopia. *World Dev.* 40 (12), 2478–2489. <http://dx.doi.org/10.1016/j.worlddev.2012.08.001>.
- Lastarria-Cornhiel, S., 1997. Impact of privatization on gender and property rights in Africa. *World Dev.* 25 (8), 1317–1333. [http://dx.doi.org/10.1016/S0305-750X\(97\)00030-2](http://dx.doi.org/10.1016/S0305-750X(97)00030-2).
- Lawry, S., Samii, C., Hall, R., Leopold, A., Hornby, D., Mtero, F., 2017. The impact of land property rights interventions on investment and agricultural productivity in developing countries: a systematic review. *J. Dev. Eff.* 9 (1), 61–81.
- Lovo, S., 2016. Tenure insecurity and investment in soil conservation. Evidence from Malawi. *World Dev.* 78, 219–229. <http://dx.doi.org/10.1016/j.worlddev.2015.10.023>.
- Meinzen-Dick and M. Zwarteveen, R.S., 1998. Gendered participation in water management: Issues and illustrations from water users associations in South Asia. *Agriculture and Human Values* 15 (4), 337–345.
- Meinzen-Dick, R.S., Di Gregorio, M. (Eds.), 2004. *Collective Action and Property Rights for Sustainable Development*. 2020 Focus 11. International Food Policy Research Institute, Washington, D.C. <http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/129259>.
- Meinzen-Dick, R., Johnson, N., Quisumbing, A., Njuki, J., Behrman, J., Rubin, D., Peterman, A., Waithanji, E., 2014. The gender asset gap and its implications for agricultural and rural development. In: Quisumbing, A., Meinzen-Dick, R., Raney, T., Croppenstedt, A., Behrman, J., Peterman, A. (Eds.), *Gender in Agriculture and Food Security: Closing the Knowledge Gap*. Dordrecht, The Netherlands, Springer and FAO. <http://dx.doi.org/10.1007/978-94-017-8616-4>.
- Mendola, M., Sintowe, F., 2015. The welfare impact of land redistribution: Evidence from a quasi-experimental initiative in Malawi. *World Dev.* 72, 53–69. <http://dx.doi.org/10.1016/j.worlddev.2015.02.010>.
- Menon, N., Rodgers, Y., Nguyen, H., 2014. Women's land rights and children's human capital in Vietnam. *World Dev.* 54, 18–31. <http://dx.doi.org/10.1016/j.worlddev.2013.07.005>.
- Mishra, K., Sam, A.G., 2016. Does women's land ownership promote their empowerment? Empirical evidence from Nepal. *World Dev.* 78, 360–371. <http://dx.doi.org/10.1016/j.worlddev.2015.10.003>.
- Moss, R.H., Schneider, S.H., 2000. Uncertainties in the IPCC TAR: recommendations to lead authors for more consistent assessment and reporting. In: Pachauri, R., Taniguchi, T., Tanaka, K. (Eds.), *Guidance Papers on the Cross Cutting Issues of the Third Assessment Report of the IPCC*. World Meteorological Organization, Geneva, pp. 33–51.
- Muchomba, F.M., Wang, J.S., Maria, L., 2014. Women's land ownership and risk of HIV infection in Kenya. *Soc. Sci. Med.* 114, 97–102. <http://dx.doi.org/10.1016/j.socscimed.2014.05.055>.
- Newman, C., Tarp, F., van den Broeck, K., 2015. Property rights and productivity: The case of joint land titling in Vietnam. *Land Econ.* 91 (1), 91–105. <http://dx.doi.org/10.3368/le.91.1.91>.

- de la O Campos, A.P.D., Covarrubias, K.A., Patron, A.P., 2016. How does the choice of the gender indicator affect the analysis of gender differences in agricultural productivity? Evidence from Uganda. *World Dev.* 77, 17–33. <http://dx.doi.org/10.1016/j.worlddev.2015.08.008>.
- Oseni, G., Corral, P., Goldstein, M., Winters, P., 2015. Explaining gender differentials in agricultural production in Nigeria. *Agric. Econ.* 46 (3), 285–310. <http://dx.doi.org/10.1111/agec.12166>.
- Owoo, N.S., Boakye-Yiadom, L., 2015. The gender dimension of the effects of land tenure security on agricultural productivity: Some evidence from two districts in Kenya. *J. Int. Dev.* 27, 917–928. <http://dx.doi.org/10.1002/jid>.
- Panda, P., Agarwal, B., 2005. Marital violence, human development and women's property status in India. *World Dev.* 33 (5), 823–850. <http://dx.doi.org/10.1016/j.worlddev.2005.01.009>.
- Persha, L., Greif, A., Huntington, H., 2017. Assessing the impact of second-level land certification in Ethiopia. In: Paper prepared for presentation at the 2017 World Bank Conference on Land and Poverty. The World Bank, Washington DC (March 20–24, 2017).
- Peterman, A., Quisumbing, A.R., Behrman, J., Nkonya, E., 2011. Understanding the complexities surrounding gender differences in agricultural productivity in Nigeria and Uganda. *J. Dev. Stud.* 47 (10), 1482–1509. <http://dx.doi.org/10.1080/00220388.2010.536222>.
- Petticrew, M., Roberts, H., 2006. How to appraise the studies: an introduction to assessing study quality. In: *Systematic Reviews in the Social Sciences: A Practical Guide*. Blackwell Publishing Ltd, Oxford, UK. <http://dx.doi.org/10.1002/9780470754887.ch5>.
- Pircher, T., Almekinders, C., Kamanga, B., 2013. Participatory trials and farmers' social realities: understanding the adoption of legume technologies in a Malawian farmer community. *Int. J. Agric. Sustain.* 11 (3), 252–263. <http://dx.doi.org/10.1080/14735903.2012.738872>.
- Place, F., 2009. Land tenure and agricultural productivity in Africa: a comparative analysis of the economics literature and recent policy strategies and reforms. *World Dev.* 37 (8), 1326–1336. <http://dx.doi.org/10.1016/j.worlddev.2008.08.020>.
- Place, F., Roth, M., Hazell, P., 1994. Land tenure security and agricultural performance in Africa: overview of research methodology. In: Bruce, J.W., Migot-Adholla, S., Bruce, J.W., Migot-Adholla, S. (Eds.), *Searching for Land Tenure Security in Africa*. World Bank, Washington, D.C.
- Prosterman, R.L., Mitchell, R., Hanstad, T. (Eds.), 2009. *One Billion Rising: Law, Land and the Alleviation of Global Poverty*. Leiden University Press, Leiden, The Netherlands.
- Quisumbing, A.R., Kumar, N., 2014. Land Rights Knowledge and Conservation in Rural Ethiopia: Mind the Gender Gap. IFPRI Discussion Paper. International Food Policy Research Institute, Washington, D.C.
- Quisumbing, A.R., Maluccio, J., 2003. Resources at marriage and intrahousehold allocation: evidence from Bangladesh, Ethiopia, Indonesia, and South Africa. *Oxf. Bull. Econ. Stat.* 65 (3), 283–327. <http://dx.doi.org/10.1111/1468-0084.t01-i-00052>.
- Quisumbing, A.R., Otsuka, K., 2001. Land inheritance and schooling in matrilineal societies: evidence from Sumatra. *World Dev.* 29 (12), 2093–2110. [http://dx.doi.org/10.1016/S0305-750X\(01\)00086-9](http://dx.doi.org/10.1016/S0305-750X(01)00086-9).
- Quisumbing, A.R., Estudillo, J.P., Otsuka, K., 2004. Land and Schooling: Transferring Wealth across Generations. International Food Policy Research Institute and Johns Hopkins University Press, Washington D.C. and Baltimore, Maryland.
- Quisumbing, A., Kumar, N., Behrman, J.A., 2017. Do shocks affect men's and women's assets differently? Evidence from Bangladesh and Uganda. *Dev. Policy Rev.* 1–32. <http://dx.doi.org/10.1111/dpr.12235>.
- Roy, S., 2015. Empowering women? Inheritance rights, female education and dowry payments in India. *J. Dev. Econ.* 114, 233–251. <http://dx.doi.org/10.1016/j.jdeveco.2014.12.010>.
- Santos, F., Fletschner, D., Savath, V., Peterman, A., 2014. Can government-allocated land contribute to food security? Intrahousehold analysis of West Bengal's microplot allocation program. *World Dev.* 64, 860–872. <http://dx.doi.org/10.1016/j.worlddev.2014.07.017>.
- Schlager, E., Ostrom, E., 1992. Property-rights regimes and natural resources: a conceptual analysis. *Land Econ.* 68 (3), 249–262.
- Schultz, T.P., 2001. Women's roles in the agricultural household: bargaining and human capital investments. In: *Handbook of Agricultural Economics, Volume 1A: Agricultural Production*. Elsevier, Amsterdam.
- Selhausen, F., 2015. What determines women's participation in collective action? Evidence from a western Ugandan coffee cooperative. *Fem. Econ.* 22, 130–157. <http://dx.doi.org/10.1080/13545701.2015.1088960>.
- Slavchevska, V., 2015. Gender differences in agricultural productivity: the case of Tanzania. *Agric. Econ.* 46 (3), 335–355. <http://dx.doi.org/10.1111/agec.12168>.
- Swaminathan, H., Lahoti, R., Suchitra, J.Y., 2012. Women's Property, Mobility, and Decisionmaking. IFPRI Discussion Paper. International Food Policy Research Institute, Washington, D.C.
- Tumlinson, K., Thomas, J.C., Reynolds, H.W., 2015. The effect of women's property rights on HIV: a search for quantitative evidence. *AIDS Care* 27 (1), 112–122. <http://dx.doi.org/10.1080/09540121.2014.947236>.
- Waddington, H., White, H., Snilstveit, B., Hombrados, J.C., Vojtkova, M., Davies, P., Bhavsar, A., Evers, J., Koehlmoos, T.P., Petticrew, M., Valentine, J.C., Tugwell, P., 2012. How to do a good systematic review of effects in international development: A tool kit. *J. Dev. Eff.* 4 (3), 359–387.
- Wiig, H., 2013. Joint titling in rural Peru: impact on women's participation in household decision-making. *World Dev.* 52, 104–119. <http://dx.doi.org/10.1016/j.worlddev.2013.06.005>.

Further reading

- Peterman, A. (2011). Women's property rights and gendered policies: Implications for women's long-term welfare in rural Tanzania. *Journal of Development Studies*, 47(1), 1–30.