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Land, Women and Development: A Systematic Review of Causal Evidence

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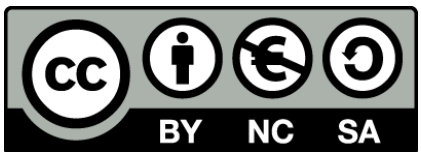

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Land, Women and Development: A Systematic Review of Causal Evidence

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Abstract

Despite a growing literature on the social, economic, and environmental impacts of women's land rights in the Global South, findings remain heterogeneous across geographic areas, development outcomes and research methods. This review assesses the causal evidence on this topic to cut through this complexity, offering a clearer direction for policy and research. Adopting the PRISMA protocol for systematic reviews, it critically assesses the breadth of existing research through multiple analytical lenses: development outcomes, geographic coverage, publications' timeline and research methods. Particular focus is placed on identifying gaps that have persisted since an earlier review, incorporating emerging outcomes of interest, and tracing recent developments in the research agenda. Overall, greater consistency of findings emerges on food security, education, and specific areas of women's empowerment, particularly in Sub-Saharan Africa and South Asia, where women's land rights are connected to robust and positive impacts. More heterogeneous or scattered findings emerge on the remaining outcomes.

Keywords: land, land rights, women, development, systematic review, prisma
JEL: O13, P48, Q15, Q24

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1. Introduction

Gender-based discrimination in land access and use rights is a well-documented issue in the empirical literature.[1] Women often have inferior rights to natural resources, even though they are frequently the primary users of those resources (Otsuka and Place, 2001). When women do hold rights to resources such as land, those rights often apply to plots that are smaller or of poorer quality than those allocated to men (FAO, 2011). This disparity arises not only from gender-based discrimination in the allocation of agricultural land but also from unequal access to essential complementary inputs such as fertilizer, pesticides and agricultural extension services (Burke et al., 2018; Burke and Jayne, 2021; Chu et al., 2023).

Further, even when land ownership is formally recognized, actual access and use often remain undermined by the limited access women have to those institutions responsible for enforcing rights and addressing violations. Challenges include the physical distance from courthouses, lack of awareness of legal provisions, financial constraints, and social norms that discourage women from seeking institutional support (Polavarapu, 2020). For poor rural women, accessing justice entails direct financial costs, as well as social opportunity costs. Women who rely heavily on family and clan networks for economic security may find particularly prohibitive challenging these structures (Polavarapu, 2020).

Challenges continue even when women manage to access formal justice institutions. Their claims are often weaker due to poor community compliance with statutory rights, low institutional enforcement (Polavarapu, 2020) and the strong incentives that drive elite-backed land dispossession (Behrman et al., 2012; Dell'Angelo et al., 2017). Further challenges stem from the presence of overlapping legal systems, statutory and customary. Customary court systems often reflect patriarchal norms that discriminate against women (Behrman et al., 2012); yet, such systems remain the most common channel for dispute resolution in low and middle-income countries. At the same time, formal court systems are also known for applying discriminatory statutory laws and for creating exceptions for customary law that exacerbate existing gender inequalities (Polavarapu, 2020). Legal discrimination against

[1] See, for instance, Agarwal (1994); Agarwal et al. (2021); Deere and León (2003); Joshi et al. (2022); Kieran et al. (2017); Nyongesa et al. (2016); Van Tran et al. (2019); Zhllima et al. (2023).

women operates at the intersection of land, marriage, and inheritance laws. Women's claims to land are often tied to their relationships with men, leaving them vulnerable when these relationships change or dissolve (FAO, 2011).

Economic theory and empirical case studies suggest that access to land can mitigate the effects of the gender asset gap, improving women's economic security and social status (Bhaumik et al., 2016). This, in turn, is expected to enable broader development outcomes for households and communities (Agarwal, 1995; Doss, 2006; Duflo and Udry, 2004; Luke and Munshi, 2011; Quisumbing and Maluccio, 2003), as well as improve climate adaptation and build more resilient societies (Laura et al., 2023). Yet, the relationship between land access, women's agency, and development appears not sufficiently understood since empirical findings remain heterogeneous across geographies, development outcomes and research methods. Claims that portray access to land as a "panacea for household welfare problems" (Bhaumik et al., 2016, p. 249) often rely on individual case studies, rather than a comprehensive appraisal of the scientific literature.

This systematic review cuts through this complexity, offering an updated account of the causal evidence within the land-women-development nexus provided by the empirical literature. First, it identifies which development outcomes related to the recognition of women's land rights have received scholarly attention, which remain overlooked, and the direction and consistency of observed effects. Second, it assesses the geographical distribution of the evidence base, noting regional gaps and variations in outcomes. Third, it traces the evolution of the research agenda over time and, fourth, it takes into account the methods used to estimate causal effects.

To our knowledge, this is the first systematic review on this topic that (1) applies a standardized protocol of analysis as the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Page et al., 2021); (2) reports on publications' geographic and time coverage, and methods; and (3) proposes preliminary distinctions of the "types" of land rights considered, analyzing their representation in the empirical literature. Further, this work substantially extends the time scope of analysis to late 2024, thus including publications beyond those identified in the well-known Meinzen-Dick et al. (2019)'s review.

The remaining of the paper is organized as follows: Section 2 provides a comprehensive overview of the main theoretical arguments for ensuring women's land rights; Section 3 describes the methodology applied in the review; Section 4 sheds light on the coverage and direction of effects actu-

ally investigated by the empirical literature and Section 5 critically discusses such evidence base. Section 6 concludes by reaffirming the positive impact of women's access to land on multiple development outcomes, as confirmed by the reviewed evidence. It also calls for broadening the geographical and sectoral scope of research, introducing macro-level and cross-country analyses, and improving data collection through standardized, gender-sensitive protocols.

2. Theoretical perspectives on securing land rights to women

Along the traditional measurement of the gender asset gap, awareness of its implications for economic development has gradually emerged. Scholars and policymakers have suggested that bridging this gap may be an important pathway to poverty alleviation (de Janvry and Sadoulet, 2016; Meinzen-Dick et al., 2019).

This idea has roots in the theoretical literature about the role of institutions, particularly property rights, in driving economic development. Well-functioning property rights are expected to provide "direct" economic benefits in terms of investment, agricultural productivity, natural resources management and access to credit. According to this view, secure property rights act as an incentive for farmers to invest in their land, knowing that their claims will be respected over time. Agricultural investment enables productivity gains and, over the long term, output and income growth (de Janvry and Sadoulet, 2016). Landholders with recognized rights can legally rent or sell their land, placing it in the hands of the most efficient users (de Soto, 2000) and generating gains from trade (Besley, 1995). Additionally, better rights make it easier to use land as a collateral, further enabling investment (de Soto, 2000; Besley, 1995). Several influential studies provide empirical evidence for these claims, particularly in the African continent (Besley, 1995; Goldstein and Udry, 2008; Ali et al., 2011; Deininger et al., 2008; Holden et al., 2007).

Although early property rights theory established a connection between land ownership and economic development, it did not incorporate an explicit gender perspective. Yet, it already suggested that "male monopoly over property" (Folbre, 1996, p.10) has implications for overall efficiency, since it restricts women's full participation in economic activities.

During the mid-2000s, policymakers' initial enthusiasm for formal, individual land titles (de Soto, 2000) shifted towards recognizing informal and

communal rights (Ostrom, 1990), seen as more effective in protecting vulnerable groups from the threat of "land grabs" (De Schutter, 2015). At the same time, many economists moved away from the unitary model of the household (Becker, 1974), which treats the family as a single utility-maximizing entity, and turned to the collective model (Chiappori, 1992), particularly intra-household bargaining models (Agarwal, 1997a). Unlike unitary models, these models recognize the existence of intra-household inequality, often shaped by gender dynamics. Family members have different preferences and unequal access to resources; these differences and inequalities, in turn, shape decision-making on household expenditure and resource allocation.

Both shifts—towards recognizing communal rights in land policy and intra-household inequality in economic modeling—reflect a broader move towards understanding and addressing power inequalities within social structures. This is the theoretical framework that informs many of the empirical studies included in this review.

Applying an intra-household bargaining framework, Agarwal (1994) presents three arguments for why women's land rights are critical to development: efficiency, empowerment and welfare.

Efficiency refers to the productive use of land. In line with property rights theory, women with secure access to land tend to invest more in productive and sustainable agricultural practices (Goldstein and Udry, 2008) and freely decide what to grow, consume or sell. This is expected to enhance food security, since women play major roles in agriculture (FAO, 2011) and they are more likely grow subsistence crops rather than cash crops (Duflo and Udry, 2004).

Empowerment involves enhancing "women's agency and voice" (Sen, 1999, p. 193), often measured by their decision-making power within the household and in the community (Sheldon and Shwachman Kaminaga, 2023). Land, as source of wealth and social status (de Janvry and Sadoulet, 2016), is expected to strengthen women's bargaining power, provide exit options, and reduce dependence on male relatives. Economic independence, in turn, can mitigate the risk of gender-based violence (Polavarapu, 2020), reduce women's need for transactional sex, and improve their ability to negotiate safer sex, which also helps prevent the spread of HIV and other sexually transmitted diseases (Conrad and Doss, 2008; Strickland, 2004).

Finally, potential benefits extend to the household and community's welfare. Land can give women a greater say in decisions around nutrition, education and healthcare (Agarwal, 1995). It can also provide the capital or collateral

to finance such expenses (Menon et al., 2014; Agarwal, 2003). As demonstrated by critics of the unitary model of the household (Ward-Batts, 2008; Lundberg et al., 1997; Armand et al., 2020; Alderman et al., 1995), family expenditure varies depending on who controls income and income-generating assets: women tend to allocate resources more equitably and with long-term perspective (Udry, 1996; Deininger et al., 2013; Burrone and Giannelli, 2023; Thomas, 1990; McElroy, 1990). This is particularly important for children's well-being and human capital development, especially for girls.

Access to land is also expected to encourage women's participation in collective action (Meinzen-Dick et al., 1997), both in their immediate communities and in the larger civil and political structures of society, potentially making institutions more inclusive and responsive to women's needs. Women's representation in the management of village commons, in particular, can strengthen social equity (Pandolfelli et al., 2008; Agarwal, 1997b) and community resilience (Ratner et al., 2013). Furthermore, since common-pool resources are often highly contested and require a high degree of collective action, women's involvement in their management can prevent resource conflict (Pandolfelli et al., 2008; Ratner et al., 2013) and deterioration into the "tragedy of the commons" (Meinzen-Dick et al., 1997).

The most recent development in the literature explores the implications of different types of rights for development outcomes. Departing from the traditional concept of "ownership", scholars increasingly refer to a "bundle of rights", a continuum of actions individuals can perform regarding land (Schlager and Ostrom, 1992).[2] These rights can either be bundled together (forming what we term "ownership") or vested in different right holders (Rao, 2016). Research highlights that women rarely enjoy a complete bundle of rights (Slavchevska et al., 2021) and that different rights in the bundle may have different implications for different outcomes.

Emerging approaches also underscore the importance of distinguishing between individual and joint rights. This distinction is increasingly recognized as a key indicator of the autonomy women can exercise over their land (Bhatla et al., 2010). Individual rights, particularly those backed by for-

[2]The reference taxonomy proposed by Schlager and Ostrom (1992) identifies five resource rights: access, withdrawal, management, exclusion and alienation. However, empirical studies often adapt this framework to fit available data or case studies. These five resource rights are often mapped into three broader categories: access, use and ownership/control (Meinzen-Dick et al., 2019).

mal titles, are typically argued to be more empowering for women (Agarwal, 2003). These rights allow women the freedom to independently manage land and its associated benefits, bypassing the need for cooperation or negotiation inherent in joint arrangements (Agarwal, 2003). However, this empowerment is not guaranteed since it also depends to what extent the ownership is culturally perceived as legitimate and appropriate (Jackson, 2003). Individual ownership can disrupt power relations within households and communities, triggering conflict and "male backlash" as predicted by the relative resource theory of domestic violence (Anderson, 1997; Atkinson et al., 2005).

3. Research aim and methods

Stemming from the main theoretical arguments described in Section 2, a growing body of empirical literature has recently tested the expected outcomes that the recognition of women's land rights can generate. However, the causal link between land rights and development from a gender perspective remains ambiguous, since outcomes differ significantly depending on geographical areas, typology of rights and methods of analysis. Cross-study comparisons are further complicated by lack of standardization in the indicators used to measure land control and outcomes, as well as levels of analysis (e.g., household-level, individual-level or plot-level).
Despite strong advocacy by development practitioners for land tenure security, there is still a limited understanding of the broader benefits these rights can deliver and the contextual factors that mediate these outcomes (Higgins et al., 2018; Lawry et al., 2017), including gender and intra-household dynamics.

We therefore propose a systematic review aimed at taking stock of the existing empirical evidence on the causal relationship between women's land rights and development outcomes. By exploring which development outcomes have been studied through a gender lens, we account for those that remain neglected. Furthermore, we aim to map which countries and regions have documented evidence and where gaps exist, as well as critically assess what methods have been used to estimate effects. A further innovative contribution of this review rests on examining the extent to which the empirical literature differentiates between (1) individual and joint rights, and (2) the concrete actions women can perform regarding land, drawing from Schlager and Ostrom (1992)'s "bundle of rights" framework.

We conducted this systematic literature review applying the PRISMA 2020 statement, renowned for setting standards in developing comprehensive, transparent and reproducible systematic reviews (Page et al., 2021).
Our review protocol incorporated strategies from seminal works (Kraus et al., 2020; Pickering and Byrne, 2014; Waddington et al., 2012) on how to conduct systematic reviews in the social sciences and was preregistered with the Open Science Framework[3], in line with PRISMA's requirements.
Recent contributions confirm the suitability of a systematic review methodology across a wide range of land-related research questions. Nevertheless, none of them apply a gender perspective, which we instead propose in this review[4].

3.1. Eligibility criteria

Eligible publications were in English, focusing on causal evidence provided by observational[5], quasi-experimental or experimental studies. Historical analyses, policy briefs and other qualitative publications were left out to maintain a focus on causal evidence.
To ensure reliability, eligible publications were peer-reviewed or published in working paper series from recognized research institutions in the field of international development (Kraus et al., 2020).
Studies needed to demonstrate a rigorous approach aimed at estimating causal effects, and provide clear details on data collection, methods and output. Further, they needed to focus on land used for agricultural and agroforestry purposes, as these uses are directly connected to livelihoods in the Global South.
Additional criteria were inspired by the Population-Intervention-Comparator-Outcome (PICO) framework (Chandler et al., 2019), recommended by PRISMA (Page et al., 2021), as follows:

[3]See DOI 10.17605/OSF.IO/9ZK4E.

[4]See for example de Jong et al. (2021) on the determinants of land-use change conflict, Higgins et al. (2018); Lawry et al. (2017) on the effects of land tenure security on development outcomes, and Murken and Gornott (2022) on the influence of land tenure systems on farmers' adaptation to climate change.

[5]In this case, at least multivariate regression analyses were required, excluding descriptive ones.

3.1.1. Population (P)

Eligible publications employed various observation units (individuals, households, villages, broader administrative areas, etc.) from low to upper-middle-income countries.[6]

Regardless of the observation unit, studies needed to clearly attribute causal impacts to *women's* rights. This could be achieved by (1) focusing explicitly on women's rights or pro-women interventions; (2) analyzing women's and men's samples separately; or (3) including interaction terms (e.g., *rights* $\times$ *gender*). Whenever studies' design allowed us to deduce the effects of gender-specific "treatment", they were considered eligible.

3.1.2. Interventions and indicators (I)

In the experimental and quasi-experimental studies included in the review, interventions were defined as those laws, policies and land-use changes affecting women's ability to benefit from land (e.g., formalization, redistribution, changes in inheritance law). "Undesirable" forms of land-use change (e.g., conflicts, displacement, large-scale land acquisitions) were also considered relevant sources of variation. In the observational studies, the comparison of outcomes based on the presence/absence of rights or varying levels of tenure security for women was used as an intervention.

Rights could be formal or informal, individual or joint, documented or undocumented; communal, customary or statutory. The aim was to capture the broadest spectrum of arrangements, since the actual conditions of land access can vary greatly, particularly for women.

3.1.3. Comparisons (C)

Given the review's focus on causal evidence, studies needed feature a baseline comparison group, situation or time period where women either lack rights or have insecure rights. Therefore, any studies that failed to disaggregate "treatment" assignment by the sex of the rights holder were deemed ineligible.

Following the approach outlined by Miller et al. (2021), acceptable comparisons included temporal (before and after interventions), spatial (different locations based on intervention exposure) and between-group (populations with varying land rights or tenure security levels).

[6]The countries' classification was based on the World Bank Country and Lending Groups taxonomy.

3.1.4. Outcomes (O)

The review adopted a broad perspective regarding development outcomes, and did not predetermine specific areas expected to be influenced by women's access to and use of land. By leaving outcomes an open question, we remained receptive to uncovering the full spectrum of impacts as they naturally emerged from the review process.

3.2. Search strategy

The searched databases are Web of Science, Scopus, ScienceDirect and EconLit, recognized for their coverage of peer-reviewed development research.
The search query included keywords and phrases around three core ideas: land, rights and women. Keywords related to specific development outcomes (e.g., "education" or "health") were avoided, in line with the strategy outlined in Section 3.1.4. Minor adjustments were made to fit the search syntax specific to each database, as shown in Table 1.

Table 1: Search strategy

Database	Search query	Limitations
EconLit	((wom*n OR gender* OR female) AND ("land rights" OR "land tenure" OR "property rights" OR "ownership rights" OR "access rights" OR "use rights" OR "tenure rights" OR "inherit* rights" OR "tenure security" OR "management rights" OR "control rights") AND land) AND (at.exact("Article") AND la.exact("ENG") AND PEER(yes))	Peer reviewed Article English
ScienceDirect	#1 Title, abstract, keywords: (women OR gender OR female) AND ("land rights" OR "property rights" OR "ownership rights" OR "access rights" OR "use rights") AND land	Research articles Economics, Econometrics and Finance
	#2 Title, abstract, keywords: (women OR gender OR female) AND ("tenure rights" OR "inherit rights" OR "tenure security" OR "management rights" OR "control rights") AND land	
Scopus	TITLE-ABS-KEY ((wom*n OR gender* OR female) AND ("land rights" OR "land tenure" OR "property rights" OR "ownership rights" OR "access rights" OR "use rights" OR "tenure rights" OR "inherit* rights" OR "tenure security" OR "management rights" OR "control rights") AND land) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (SUBJAREA , "ECON")) AND (LIMIT-TO (LANGUAGE , "English"))	Article Economics, Econometrics and Finance English
Web of Science Core Collection	(wom*n OR gender* OR female) AND ("land rights" OR "land tenure" OR "property rights" OR "ownership rights" OR "access rights" OR "use rights" OR "tenure rights" OR "inherit* rights" OR "tenure security" OR "management rights" OR "control rights") AND land (Topic) and Economics (Web of Science Categories) and English (Languages) and Article or Early Access (Document Types)	Article or Early Access Economics English

Source: Authors' elaboration.

After the initial screening, we used bibliographic snowballing to retrieve additional publications by reviewing the references in selected articles, following the PRISMA guidelines (Page et al., 2021). We also screened the references in Meinzen-Dick et al. (2019)'s review.[7] These additional articles were carefully selected to broaden the range of scholarly sources relevant to our purposes.

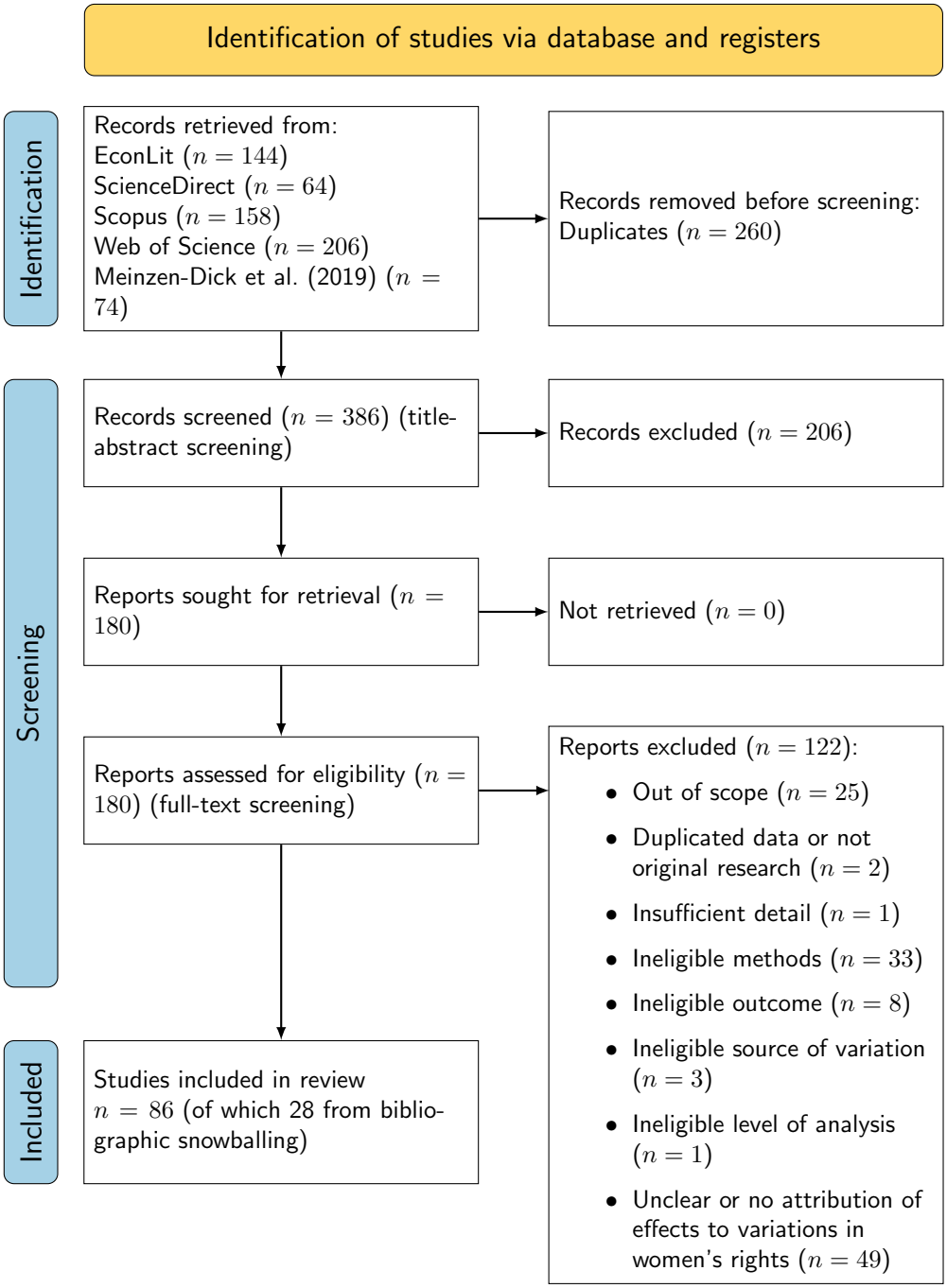
[7]Since their review applied different eligibility criteria, not all studies they cited were included. In particular, we excluded qualitative studies and those focusing on perceptions of tenure security instead of women's *actual* rights.

3.3. Study records, selection and extraction

Search results were exported in bulk from each database and then imported into Zotero, where the de-duplication tool was applied to remove duplicate records.

The PRISMA flow chart (Figure 1) illustrates the workflow of identifying, screening and selecting studies, the decisions made at every step, and their rationale, making the process fully replicable.

Figure 1: PRISMA flow diagram



Source: Authors' elaboration based on Page et al. (2021)'s template. Note: The diagram illustrates the workflow of identifying, screening and including publications in the review.

The selection of studies comprised three phases. First, the titles and abstracts from the initial search were screened against the eligibility criteria. Second, full texts were retrieved for studies that appeared to meet these criteria or when there was any uncertainty. Third, articles were assessed for final inclusion by full text screening, yielding 86 included studies (after bibliographic snowballing).

Data extraction followed a standardized approach to ensure consistency (Ogundari, 2022). However, since studies often report multiple effects across countries and outcomes, we decided to treat effects as unit of analysis rather than focusing on entire papers. Following the approach outlined by Pickering and Byrne (2014), a spreadsheet was used where each row represented an individual effect and columns represented its attributes (e.g., country, development outcome, effect direction and significance). If a study presented multiple estimates for the same effect, these were consolidated into one entry based on the reviewers' judgment. This step was necessary to manage results derived from different model specifications, robustness checks or heterogeneity analyses.

3.4. Synthesis

We analyzed the extracted data according to four main analytic coordinates: development outcomes, geographic coverage, publications' timeline, and research methods. For development outcomes, the analysis entailed three steps: (1) identification of domains where individual studies demonstrate the existence (or absence) of measurable effects; (2) consolidation of identified outcomes into outcome categories that are internally coherent; (3) analysis of the findings from each outcome category to synthesize evidence, trends and gaps.

4. Main findings of the systematic literature review

4.1. Development outcomes

The analysis identified 13 outcome categories attributable to development processes. Among these, *women's empowerment* emerged as the most investigated one. Others derived from the theoretical literature's expectations (*investment and environmental sustainability*, *agricultural productivity*, *natural resources management*, *financial inclusion* and *resilience*), scholars' attention to "mediated" impacts (*welfare*, *food security*, *health* and *education*),

and the most recent developments in this literature (*intra-household dynamics*, *social capital and collective action*, and *social stability*).
Overall, greater consistency of findings emerged from specific areas of *women's empowerment* (namely, decision-making power and economic empowerment), *food security* and *education* where women's land rights are connected to robust and positive impacts. More heterogeneous or scattered findings emerged on the remaining outcomes.

4.1.1. Women's empowerment

The review identified 43 studies on women's empowerment, making it the most explored development outcome. The empirical evidence is mostly based on observational studies (56%) and has broad country coverage, but predominantly focused on South Asia and Sub-Saharan Africa.
We identified four main dimensions of women's empowerment: decision-making power, economic empowerment, family planning and fertility, and intimate partner violence (IPV). Overall, there is a stronger agreement on land rights' ability to improve women's decision-making and economic status. Findings appear instead more mixed when it comes to IPV and family planning and fertility.

(1) Decision-making power. Decision-making is the most popular theme in this area, with most studies confirming a positive relationship. Particularly coherent findings emerged from quasi-experimental studies, where almost each intervention demonstrated a positive impact (Ajefu et al., 2024; Biswas et al., 2024; Grabe, 2015; Melesse et al., 2018; Persha et al., 2017; Santos et al., 2014; Schling and Pazos, 2024; Wiig et al., 2011).
A few observational studies, however, have found insignificant effects in specific countries (Amir-ud-Din et al., 2024; Doss et al., 2014; Kumar et al., 2020; Yokying and Lambrecht, 2020).

Decision-making power is usually measured at the *household* level, with the exception of Grabe (2015) on women's comfort and participation in community meetings. While many rely on the Demographic and Health Surveys to measure empowerment, approaches to operazionalizing it are very heterogeneous. For example, thresholds for defining a woman "empowered" vary widely, ranging from having (some) input in (key) family decisions, to full independence.

(2) Economic empowerment. Findings on "economic empowerment"[8] are largely positive. In particular, studies confirm positive impacts on women's employment and/or earnings in Sub-Saharan Africa (Ajefu et al., 2024; Peterman, 2011; Efobi et al., 2019) and Vietnam (Menon et al., 2017). Nevertheless, negative effects on employment were identified in India's patrilineal societies (Bahrami-Rad, 2021), where the combination of property inheritance and social stigma against women working outside the home reduced their economic participation, particularly in agriculture.
Women's land rights were also found to increase household expenditure/savings on healthcare, education and women's and girls' goods, and to decrease those in traditional men's goods (Brulé, 2010; Muchomba, 2017; Nguyen and Le, 2023; Quisumbing and Maluccio, 2003).

(3) Family planning and fertility. Four studies, all focused on India's inheritance reform, explore family planning and fertility outcomes, suggesting troubling implications. Specifically, Bahrami-Rad (2021) found that treated women were more likely to marry their paternal cousins (a practice used to keep property within the male lineage). In a related finding, Bose and Das (2024) observed that the reform led to increased fertility rates and stronger preference for male offspring. Corroborating this evidence, studies identified an increase in female foeticide Bhalotra et al. (2020) and child mortality (Rosenblum, 2015).
Taken together, these findings suggest that social norms can shift to safeguard traditional inheritance patterns despite pro-women land reform. In particular, households may respond by attempting to produce more sons to maintain male control over family assets.

(4) Intimate partner violence. A small evidence base explores women's experiences with IPV, with mixed findings. While in some cases, women's rights can have protective effects (Biswas et al., 2024; Muchomba et al., 2014; Panda and Agarwal, 2005; Peterman et al., 2017; Shwachman Kaminaga and Sheldon, 2022), in others increases in IPV were reported (Peterman et al., 2017; Shwachman Kaminaga and Sheldon, 2022; Ward and Harlow, 2021), particularly in South Asia (Anderson and Genicot, 2015; Murshid, 2017). Interestingly, in Pakistan, women's land rights were associated with control-

[8] In this dimension, we included studies about women's employment, entrepreneurship, influence on household expenditure, and other similar outcomes.

ling behaviors by husbands; however, when women had high decision-making power, this effect was mitigated (Murshid, 2017).

Studies have used different dependent variables, ranging from women's actual experience of physical, sexual and emotional violence, to violence intensity (Song and Dong, 2017), acceptance Shwachman Kaminaga and Sheldon (2022), and the experience of transactional sex Muchomba et al. (2014).

Given the extensive number of publications on women's empowerment, it is possible analyze the types of rights they consider more in detail (Figure 2).

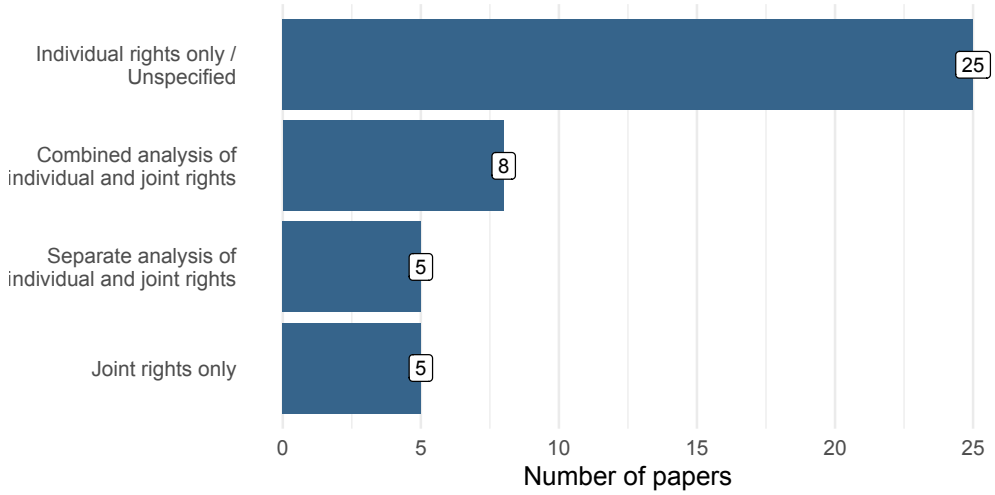


Figure 2: Distribution of papers on women's empowerment, by type of rights analyzed

Source: Authors' elaboration. Note: Each count represents a paper on women's empowerment included in the review. Each reviewed publication can include effects for multiple countries and development outcomes. When unspecified, effects are included in the first category as they are likely individual.

While much attention has been paid to exploring the role of individual rights, only five studies separately analyzed the outcomes of individual and joint rights and compared their effects, often due to data availability. However, researchers often admit to combining data on women with different types of rights (individual or joint) because of statistical power concerns, due, for example, to small sample sizes. Thus, even when information on rights' nature are available, most studies (61%) still chose to aggregate data providing a

combined analysis.
Within those studies that presented separated outcomes, individual rights have been found to improve decision-making compared to joint rights in Sub-Saharan Africa (Doss et al., 2014). Both "modes" of landownership were beneficial compared to landlessness; however, in India, no relationship was found for individual rights, and a negative one was found for joint rights, suggesting the existence of differentiated effects according to local socio-economic structures. In Vietnam, instead, both types of rights were found to increase women's self-employment Menon et al. (2017), while in Kenya, they both increased women's vulnerability to IPV (Ward and Harlow, 2021).
Overall, while most studies find similar effects for individual and joint rights, the evidence base is still too narrow to exclude potentially heterogeneous impacts. Thus, the hypothesis that individual rights might be more "empowering" for women (Agarwal, 2003; Bhatla et al., 2010; Panda and Agarwal, 2005) warrants further exploration.

4.1.2. Investment and environmental sustainability

The review identified 15 studies on investment and environmental sustainability[9]. Findings are mainly concentrated on Sub-Saharan Africa (80% of the identified studies) and fairly based on both observational and quasi-experimental evidence.

One experimental study—the only randomized-controlled trial included in the review—found that land formalization in Benin had a positive impact on long-term investments, with particularly strong effects among female-headed households (Goldstein et al., 2018).

Quasi-experimental studies showed mixed findings. In Rwanda, for example, land regularization promoted soil conservation investment, particularly among female-headed households (Ali et al., 2014). Similarly, in Zambia, widows' inability to inherit land was linked to reduced use of fertilizer, fallowing and intensive tillage (Dillon and Voena, 2018). In India, the inclusion of women's names on land titles promoted agricultural investment and the use of higher-quality inputs (Santos et al., 2014).
Nevertheless, other studies found no significant effects. In Nicaragua, for example, land titling alone did not promote investment, suggesting that

[9]These two outcomes were grouped because reviewed investments refer to the adoption of sustainable fuels or agriculture, often including conservation measures that preserve the land's ecological functions (e.g., fallowing).

such initiatives need complementary support targeting vulnerable populations (De La O Campos et al., 2023). Likewise, in Kenya, tenure insecurity under patrilineal inheritance systems discouraged long-term investments among male heirs in male-headed households, though this effect did not extend to women (Linkow, 2019).

Observational studies presented similarly mixed findings, though most supported a positive relation. For example, Haitian women with incomplete "bundles of rights" were less likely to invest in conservation activities on inherited land (Kelly et al., 2019), and, in Ghana, insecure land rights led women to reduce fallowing practices (Goldstein and Udry, 2008).
Also in Malawi, positive links were identified between tenure security and investment in uxorilocal communities, where women's tenure security is stronger (Benjamin, 2020; Lovo, 2016). However, such practices can reduce tenure security for *men*, discouraging their long-term investments (Lovo, 2016).

Interestingly, several studies explored how different types of rights within the "bundle" framework shape investment. For example, in Ghana, alienation rights reduced investments in female-owned plots, while other rights showed no significant effects (Aikins et al., 2021). Conversely, in Malawi, alienation rights were linked to increased investment in organic manure, whereas other rights were not (Deininger et al., 2021). Adoption of climate-smart agriculture was found to be more likely when management rights aligned with ownership and economic rights, although results varied widely across countries, rights types, and land managers' gender (Teklewold, 2023).

The mixed results across studies could be either explained by variations in how investments are defined and measured, or by the nature and timeframe of investments (e.g., short-term or long-term) which, carrying different risks, are likely to elicit different responses to varying levels of tenure security.

4.1.3. Agricultural productivity

The review identified 13 studies on agricultural productivity. Again, the empirical evidence is mainly concentrated on Sub-Saharan Africa (84% of the identified studies) and based on observational studies (61%). [10]

Through an experimental approach, Benin's land demarcation (Goldstein

[10]Geographical differences in farming practices are likely behind the focus on Sub-Saharan Africa, where men and women typically farm separate plots (Masterson, 2007). In contrast, in Latin America, gender-disaggregated data at the plot level is less available because agriculture is typically organized around the family unit.

et al., 2018) was found to increase long-term investment among female-headed households. However, the program did not improve agricultural yields in the short term, suggesting that productivity benefits may take longer to materialize.

Some quasi-experimental studies evaluated the productivity impacts of government land policies. In Ethiopia, land certification programs were found positively linked to improved agricultural output value, particularly for female-headed households (Bezabih et al., 2016; Holden and Ghebru, 2011).

Likewise, in Vietnam, Newman et al. (2015) showed that land-use certificates, both individual and jointly-held, improved plot-level rice yields.
However, Mendola and Simtowe (2015) found that land redistribution in Malawi only improved male-headed households' productivity.

The observational studies particularly show the role of women's tenure security in driving productivity. In Malawi, for instance, the fear of land loss (a common proxy for tenure insecurity) only reduced productivity for female farmers, but not for their male counterparts (Deininger et al., 2019). Similarly, in Ghana, women's lower productivity was attributed to insecurity over retaining land while it lay fallow (Goldstein and Udry, 2008). In Kenya, female farmers with land titles were found to be more productive than those without (Owoo and Boakye-Yiadom, 2015).
Further, in Nigeria, access and ownership rights were associated with higher productivity (Daudu et al., 2022), while in Rwanda, the ability to sell or guarantee land increased productivity, especially for households that acquired farmland through purchase, loans or leases (Kamande and Bahati, 2019). This aligns with findings from Ethiopia, where rental market participation drove productivity gains in female-headed households (Bezabih et al., 2016; Holden and Ghebru, 2011).

The studies reviewed employed various measures of agricultural productivity. Physical yields, such as yield per hectare or acre, were commonly used (Benjamin, 2020; Daudu et al., 2022; Mendola and Simtowe, 2015; Owoo and Boakye-Yiadom, 2015). Monetary measures, including revenue (Bezabih et al., 2016; Deininger et al., 2019; Goldstein et al., 2018; Holden and Ghebru, 2011) and profits (Goldstein and Udry, 2008; Masterson, 2007) were also frequently used.

A significant body of evidence investigates the "gender productivity gap"

in agriculture[11]. Some of these studies perform sophisticated decomposition analyses to understand what drives gender differences in agricultural productivity, but do not explicitly consider the impact of gendered rights (Meinzen-Dick et al., 2019). Although many of them suggest a link between women's tenure security and productivity, the lack of an appropriate counterfactual reduces their suitability for inclusion in this review.

4.1.4. Natural resources management

The review identified only three studies on natural resources management (NRM), and all of the available evidence focuses on Ethiopia, with one observational study and two quasi-experimental studies. These studies investigate a single aspect of NRM—land rental decisions—and provide preliminary support for the positive effects of women's land rights.

Akpalu and Bezabih (2015) show that female farmers often avoid renting out their land due to fears of losing it to male tenants. Together with findings on agricultural productivity (see Section 4.1.3), the study suggests that land markets could operate more efficiently if institutions responsible for land allocation and dispute resolution were more supportive of women's tenure security.

Quasi-experimental evidence reinforces this point. Specifically, Holden and Ghebru (2011) found that land titling increased the likelihood of female-headed households renting out their land, particularly when they received paper-based certificates. The additional provision of digitized certificates, however, had little effect (Persha et al., 2017).

Going forward, it is critical to broaden research beyond Ethiopia. Ethiopia's land law is not representative of other developing countries, or even Sub-Saharan Africa, limiting the generalizability of current findings. For instance, in this country, selling and collateralizing land is illegal; in some areas, non-residency can result in the loss of land rights (Stevens et al., 2020-03-16). Thus, pro-women land policies in more typical land markets could yield different NRM outcomes.

[11] See, for example, Agarwal and Mahesh (2023); Chankrajang and Vechbanyongratana (2021); Ali et al. (2016).

4.1.5. Financial inclusion

The review identified seven studies on financial inclusion.[12] The empirical evidence is limited but evenly distributed across regions and mostly based on quasi-experimental studies (71%).

The findings suggest a generally positive link, with four studies supporting this relationship (Balasubramanian et al., 2019; Nguyen and Le, 2023; Persha et al., 2017; Santos et al., 2014). For example, in Vietnam, land-use certificates allowed women to collateralize their land, reducing dependence on costly informal credit markets Nguyen and Le (2023). This access to credit also enabled investment in education and health, generating spill-over benefits across other development outcomes. Interestingly, this study stands out because, in the broader literature on land rights, clear impacts on financial inclusion are rare (Deininger et al., 2019).

Nevertheless, such positive effects on financial inclusion can come with important caveats. First, the benefits may depend on men's involvement. For instance, Balasubramanian et al. (2019) showed that while female landowners are more likely to have formal savings and accounts, they access credit more likely when the land is owned *jointly* with a male family member. Similarly, Santos et al. (2014) found that *joint* land titles in India improved women's participation in financial decision-making and access to credit.

Second, land interventions may not benefit women's financial inclusion as much as men's. In Ethiopia, for example, digitized land certificates increased credit-based business transactions, but the gains were smaller for female-headed households compared to to male-headed ones (Persha et al., 2017).

Not all studies observed significant effects. In Nicaragua, for example, land titling had no significant impact on credit (De La O Campos et al., 2023). In Peru, the relationship between land ownership and the Women's Empowerment in Agriculture Index's "credit resources" dimension was also insignificant (Schling and Pazos, 2024). Similarly, in Tanzania, women living in communities with stronger property and inheritance rights were no more likely to own a savings account (Peterman et al., 2017).

The studies reviewed employed diverse indicators of financial inclusion, ranging from access to formal credit to the ownership of current/savings accounts and reliance on informal loans. However, some critical aspects of

[12]Financial inclusion is defined as the "access to and use of affordable financial services by [...] households" (Perrin and Hyland, 2023, p. 2).

financial inclusion remain underexplored, such as access to digital payment services, remittances or (crop) insurance.

4.1.6. Resilience

The review identified only one study on resilience to climate shocks. Despite the growing relevance of this issue due to climate change, no additional studies beyond those highlighted in Meinzen-Dick et al. (2019)'s review were identified. Therefore, current empirical evidence is limited to Malawi.

The quasi-experimental study by Asfaw and Maggio (2018) found that temperature shocks during the growing season had a more severe negative impact on household consumption when women solely managed the land. However, these effects were less pronounced in matrilineal districts, where women's stronger tenure security and greater investment in agricultural technologies helped buffer the impact of these shocks.

4.1.7. Welfare

The review identified seven studies on welfare.[13] The evidence is primarily concentrated in Sub-Saharan Africa (70%) and based on observational studies (57%). The results are mixed: while most studies report positive effects, some highlight negative impacts under specific conditions.

Quasi-experimental studies consistently demonstrate that targeted land policies can improve welfare indicators for both women and men. For instance, in Ethiopia, Holden and Ghebru (2011) found that the longer families held land certificates, the higher their consumption, with particularly notable benefits for female-headed households. Similarly, land redistribution in Malawi boosted wealth and welfare metrics, especially in matrilineal communities Mendola and Simtowe (2015), and in Vietnam, individual certificates for women increased household expenditures and reduced poverty incidence, while joint ones primarily influenced poverty reduction Menon et al. (2017).

Findings from observational studies are more ambiguous. For example, in Tanzania, women in communities with strong property and inheritance rights were found to enjoy significantly higher expenditures and savings Peterman (2011). Similarly, in Burkina Faso, Montcho et al. (2023) reported a link between women's land ownership and income for livestock-keepers.
However, where women lack access to markets, complementary inputs, or

[13] While these studies focus on income, consumption and savings, their authors generally use these variables as proxies for welfare.

where their property rights are only *de jure* rather than effectively enforced, the land-welfare nexus is less clear. In this situation, "welfare [...] may ironically be better served if men are de facto allowed to own (or control) significant amounts of these assets" (Bhaumik et al., 2016, p. 250). For example, Bhaumik et al. (2016)'s study in Malawi found that a higher share of income from high-value agriculture was negatively associated with women's land ownership. This aligns with de Janvry and Sadoulet (2016)'s argument that tenure security alone cannot drive socio-economic development without institutional support and access to complementary inputs. Similarly, Deere et al. (2004) observed that women's land rights often benefit off-farm income more than farm income.

Researches have used very different proxies for welfare, including income (farm/off-farm), expenditure, asset value, poverty lines and savings. The prevalent approach, therefore, has focused on material wealth, understanding welfare as access to material goods—as is traditional in economics. Future studies could employ alternative measures that capture people's life satisfaction and relative deprivation, such as subjective well-being, experienced preferences, and the various indexes inspired by Sen (2008)'s "capability approach".[14]

4.1.8. Food security and nutrition

The review identified 15 studies on food security and nutrition.[15] The studies are evenly distributed between Sub-Saharan Africa and South Asia and between quasi-experimental and observational methods. The findings strongly suggest that women's land rights improve food security and nutritional outcomes, particularly for children.

Several quasi-experimental studies directly connect women's land rights to improved child nutrition. For example, in Nigeria, joint land ownership improved women's caloric intake and children's anthropometric scores, reducing stunting and underweight rates (Aderemi, 2021). In India and Kenya, reforms enhancing women's inheritance rights led to better child nutrition

[14]See, for example, the Human Development Index and the well-being indexes developed by international organizations and governments, such as the OECD's Better Life Index.

[15]Food security "exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life" (FAO, 2002). It rests upon three pillars: food availability, access and use.

(Ajefu et al., 2022, 2024) through improved education and household bargaining power (Ajefu et al., 2022).
However, not all studies found direct effects. In India, Kumar et al. (2020) observed that land ownership alone was insufficient to improve child nutrition; instead, women's education and overall household wealth played more critical roles.

When women can independently choose what to grow, they prioritize crops that improve food availability and the completeness of diets. For example, in Rwanda, female land ownership (individual or joint) improved food security and nutritional diversity (Kamande and Bahati, 2019), but the effect of joint ownership alone was inconclusive.

Women's income and decision-making power are important mediators: observational studies from Ghana (Doss, 2006) and India (Rehman et al., 2019), for instance, showed that when women hold a greater share of household assets, expenditures are more likely to be directed toward food, while in Nepal, women landowners were more involved in household decision-making, which correlated with better child nutrition (Allendorf, 2007). Similarly, in Pakistan, "women's empowerment in agriculture" reduced overall household food insecurity (Aziz et al., 2021).

The studies varied in their observation units—with most focused on household or child-level outcomes, and only one study (Aderemi, 2021) also examining impacts on women themselves—and measures of food security—with most studies using anthropometric scores or caloric intake, and only two (Kamande and Bahati, 2019; Burrone and Giannelli, 2023) measuring nutritional diversity.

4.1.9. Health

The review identified only two studies on health.[16] One study is quasi-experimental and based in Vietnam, while the other one is observational and based in Kenya. Both suggest positive effects of women's land rights on health outcomes and a reduction in vulnerability to HIV.
First, women's land rights can improve child health by shifting household resources toward health expenditure, as predicted by intra-household bargaining theory (see Section 2). In Vietnam, female-only land-use rights were associated with a larger reduction in child illness rates and a greater increase

[16]Studies measuring health through nutritional status are discussed in Section 4.1.8.

in health insurance coverage compared to land-use rights held by men or jointly between spouses (Menon et al., 2014).
Second, women's land rights can reduce vulnerability to HIV by improving women's economic security and providing alternatives to risky sexual behaviors. In Kenya, Muchomba et al. (2014) showed that individual land ownership by women significantly reduced HIV infection rates among those most likely to engage in survival sex.

4.1.10. Education

The review identified seven studies on education, mainly concentrated on India (57%) and mostly based on quasi-experimental methods.

This evidence consistently shows that women's land rights improve educational outcomes, especially for women and girls. For example, in Vietnam, women's land-use certificates were linked to higher school enrollment rates for children of both genders (Menon et al., 2014). In India and the Philippines, pro-women inheritance reform was associated with higher educational attainment for treated women (Bose and Das, 2017) and their daughters (Deininger et al., 2013; Roy, 2015; Quisumbing et al., 2003).

In line with intra-household bargaining theory, women's land rights can influence education indirectly through household expenditure. In rural Ghana, Doss (2006) found that when women owned a larger share of farmland, households allocated a greater portion of their budgets to education.

Interestingly, while women's land rights tend to improve educational outcomes for girls, they can affect boys' education in unexpected ways. For example, in India, Bose and Das (2017) observed a decline in boys' educational attainment. Meanwhile, Deininger et al. (2013) (on the same Indian reform) and Quisumbing et al. (2003) (on the Philippines) did not identify any effect on boys' education, but only positive effects for girls.

4.1.11. Intra-household dynamics

The review identified only one quasi-experimental study on intra-household dynamics.[17] As a result, the current empirical evidence is limited to India.

Family conflict is often modeled through intra-household bargaining models that include separation or divorce as potential exit strategies. Extending

[17]By "intra-household dynamics," we refer to the ways in which women's land rights affect family relationships, fostering either cooperation or conflict, particularly between spouses (see Section 2).

this framework, Anderson and Genicot (2015) considered suicide as an additional, extreme exit option. Their findings revealed that pro-women inheritance reform led to an increase in suicide rates for both men and women, with marital conflict identified as the primary mechanism driving these outcomes.

Despite the robust causal design of this study, its context limits out ability to generalize findings. In fact, in India, divorce and separation are socially taboo and therefore "extremely rare" (Anderson and Genicot, 2015, p. 65). In settings where marriage dissolution is a more accessible exit option, the outcomes could differ significantly, and women's land rights may be associated with either conflict or cooperation.

4.1.12. Social capital and collective action

The review identified three studies on social capital and collective action[18], mainly concentrated in Sub-Saharan Africa.

Despite the small number of studies, the findings indicate a positive link. In Uganda, a quasi-experimental study (Meier Zu Selhausen, 2016) found that land rights promoted women's participation in coffee cooperatives and their involvement in collective marketing. Participation was stronger for gender-equal households and households with joint ownership. Similarly, in Vietnam, women's share of family land increased participation in both production-related and non-production-related groups, as well as attendance at social events Nguyen and Le (2023).

By contrast, the observational study in Ghana (Yokying and Lambrecht, 2020) found no significant differences in agricultural group membership between landed and landless women.

Since social capital and collective action cannot be directly measured (Meinzen-Dick et al., 2004), researchers have relied on proxies, such as participation in organizations or social events. Of note, Nguyen and Le (2023) expanded these indicators by including family involvement in social activities as an additional measure of social capital.

[18]Collective action, in this context, refers to coordinated efforts to manage land resources, whether through common property regimes or collaboration across individual farms (Meinzen-Dick et al., 2004). Social capital is instrumental to collective action, and empirical research typically incorporates both concepts (Krishna, 2004; Meinzen-Dick et al., 2004).

4.1.13. Social stability

The review identified only one quasi-experimental study on social stability, leaving the evidence base limited to Ethiopia. The study found that digitized certificates had no significant effect on either the duration or likelihood of land disputes about boundaries or encroachment (Persha et al., 2017).

Two important considerations contextualize this finding. First, the study focused on the *marginal* benefits of digitized certificates over paper-based ones, rather than assessing the overall impact of certification. Second, the low incidence of disputes in the study area reduced the statistical power of the analysis (Persha et al., 2017).

4.2. Geographic coverage

The review uncovered effects across 45 countries, plus one multi-country study.[19] However, evidence availability varies considerably across and within regions, as shown in Figure 3.

[19]Balasubramanian et al. (2019)'s study aggregates data from multiple developing economies into a single estimate.

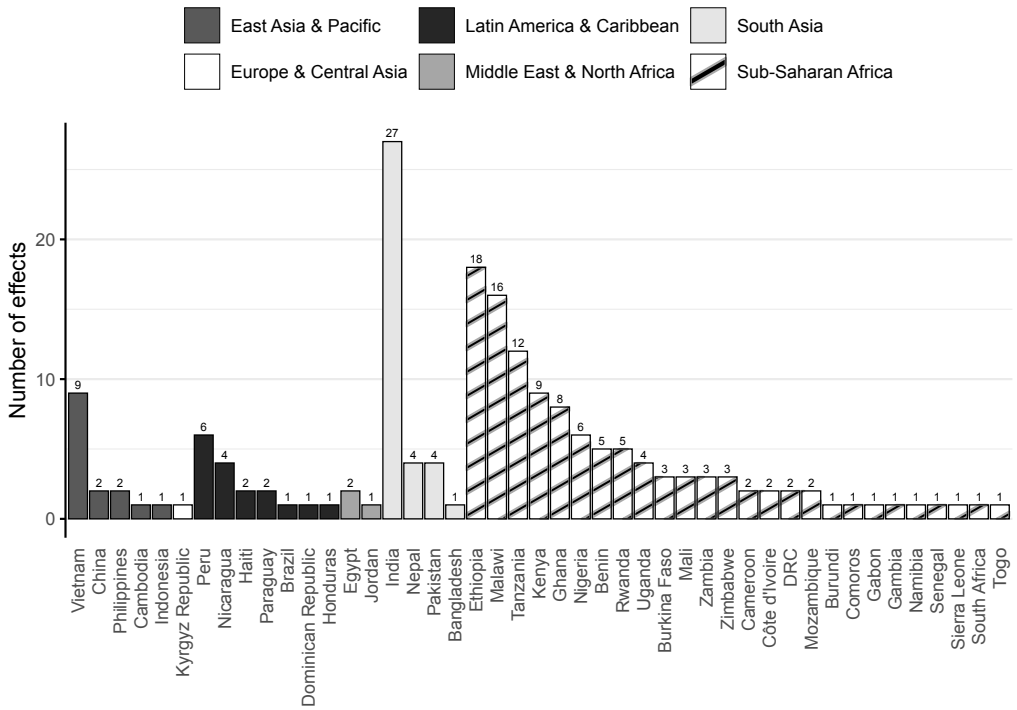


Figure 3: Distribution of effects, by country of analysis

Source: Authors' elaboration. Note: Each count represents an effect from women's land rights recorded in the review. Each reviewed publication can include effects for multiple countries and development outcomes. One study has been excluded since it aggregates data from multiple countries in a single effect.

At the regional level, the largest concentration of recorded effects comes from Sub-Saharan Africa (112 effects from 47 papers) and South Asia (36 effects from 26 papers). Such predominant regional focus is reasonable since these regions still show concerning levels of rural poverty (Castañeda et al., 2018), and understanding the impacts of women's access to land are potentially more substantial for policy and practice. However, some areas of the world are critically underrepresented, notably Europe & Central Asia (one effect) and the Middle East & North Africa (three effects from two papers). Other areas have an extremely scattered evidence base, insufficient to generalize findings even at the regional level. This is the case of East Asia & Pacific (15 effects from nine papers) and Latin America & the Caribbean (17 effects from ten papers).

Even within regions that have been extensively covered, research has concentrated on specific countries, neglecting others. Research in Sub-Saharan Africa has mostly focused on Tanzania, Ethiopia and Malawi, while research in South Asia appears overwhelmingly clustered on India.

This trend in selecting case studies appears influenced by data availability and the possibility of exploiting natural experiments. Countries undergoing significant legal or policy changes tend to attract more scholarly interest since they provide unique opportunities to identify generalizable effects. Notable instances include Ethiopia's land certification program and India's inheritance reforms, subjects of multiple papers in this review.[20] Such programs are often accompanied by targeted data collection initiatives—particularly those incorporating monitoring, evaluation and learning frameworks—which further contribute to the concentration of research in beneficiary regions.

[20]See, for instance, Melesse et al. (2018); Muchomba et al. (2014); Persha et al. (2017); Bezabih et al. (2016); Ghebru and Holden (2013); Holden et al. (2007, 2011); Holden and Ghebru (2011) on Ethiopia's land certification program (1998) and Anderson and Genicot (2015); Ajefu et al. (2022); Bhalotra et al. (2020); Bose and Das (2024); Brulé (2010); Deininger et al. (2013) on the Hindu Succession Act (1956) and the Hindu Succession (Amendment) Act (2005).

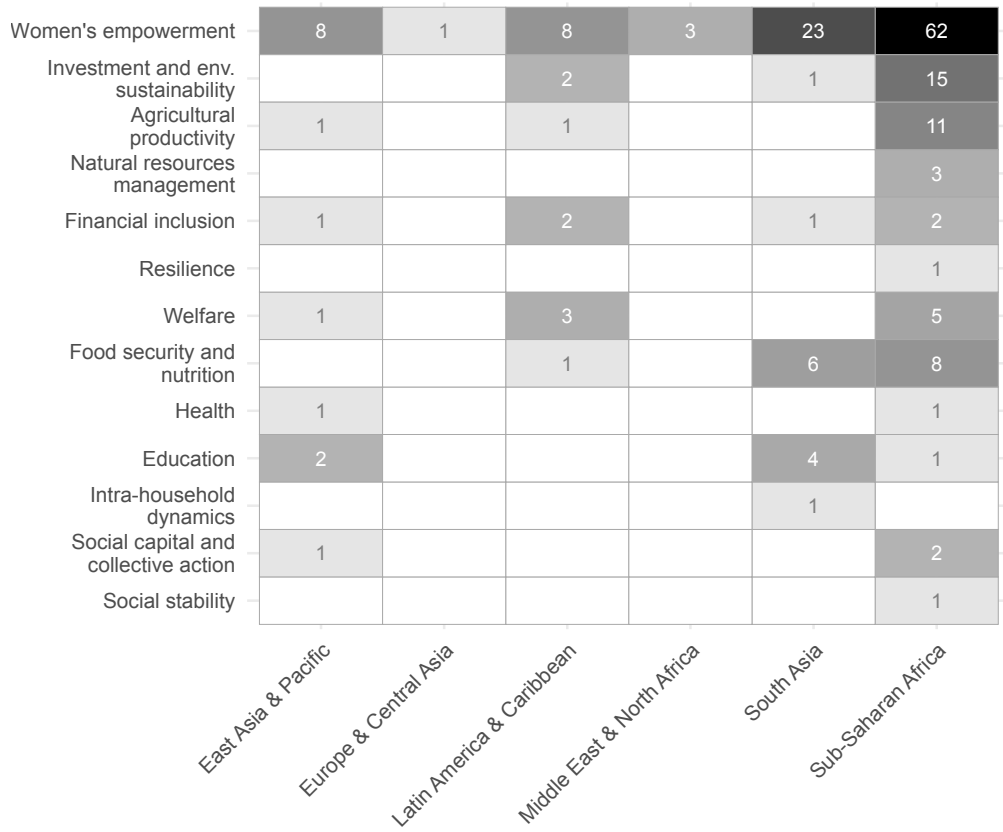


Figure 4: Distribution of effects, by region and development outcome

Source: Authors' elaboration. Note: Each count represents an effect from women's land rights recorded in the review. Each reviewed publication can include effects for multiple countries and development outcomes. One study has been excluded since it aggregates data from multiple countries in a single effect.

The analysis paints a very modest picture of development outcomes' coverage in regions outside the two focal areas (Figure 4). Research on *women's empowerment* is present across all regions but is most heavily concentrated in Sub-Saharan Africa; likewise, the majority of studies on *investment and environmental sustainability*, as well as *agricultural productivity*, are also focused on this region. South Asia, despite ranking second in terms of geographic coverage and extensively relying on traditional agricultural practices, holds a very limited evidence on *environmental sustainability* and *agricultural productivity*. On the other hand, *food security* is well-represented in both focal

areas, while receiving no attention in other regions.

4.3. Publications' timeline

While this review did not exclude studies based on publication year, no article published before 2003 satisfied all the eligibility criteria (see Section 3.1). This suggests not only an increase in researchers' interest for women's land rights, but also that gender-disaggregated data and causal methods (as reflected in the eligibility criteria) have become more widespread over the last two decades.

After 2008, scholarly and policy engagement with land tenure issues increased substantially, due to intensifying global pressures on farmland and the recognition of tenure security's role in protecting local communities (De Schutter, 2011; Borras Jr. et al., 2011; Zoomers, 2010). As shown in Figure 5, this trend also applies to research on *women's* access to land, reflecting growing concerns for vulnerable groups.

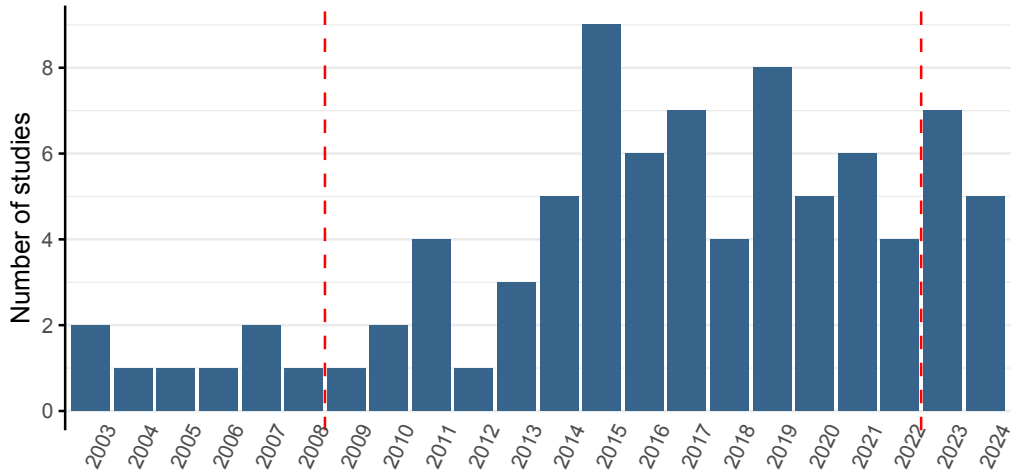


Figure 5: Distribution of studies, by publication year

Source: Authors' elaboration. Note: The dashed lines mark the start of two significant global events that intensified land pressures in the Global South: the surge in transnational large-scale land acquisitions (2008) and the Russian invasion of Ukraine (2022).

The surge in studies observed around 2023 may instead be linked to Russia's invasion of Ukraine, which also fueled global concerns about resource availability and food security. By disrupting grain and fertilizer supply chains,

the conflict has contributed to rising prices of food, energy and agricultural inputs (Dell'Angelo et al., 2023), intensifying strategic concerns among high-income countries regarding their future access to productive land (Mustafa, 2022; Abay et al., 2023).

Over time, the research focus broadened including a growing interest in *food security* and *environmental sustainability*, whereas *resilience* to climate shocks still remains a marginal topic.

Rights indicators have also broadened to test recent hypotheses from economic theory (see Section 2). In particular, recent studies explore the heterogeneous impacts of individual and joint rights[21] and break down women's claims into a "bundle of rights"[22].

4.4. Research methods and data

Most reviewed studies adopt observational methods (126 effects from 47 papers) or quasi-experimental methods (56 effects from 36 papers) (Figure 6). Only two studies (three effects) are based on experimental methods.

[21]See, for example, Burrone and Giannelli (2023); Teklewold (2023); Kamande and Bahati (2019); Balasubramanian et al. (2019).

[22]See, for example, Teklewold (2023); Deininger et al. (2021); Aikins et al. (2021).

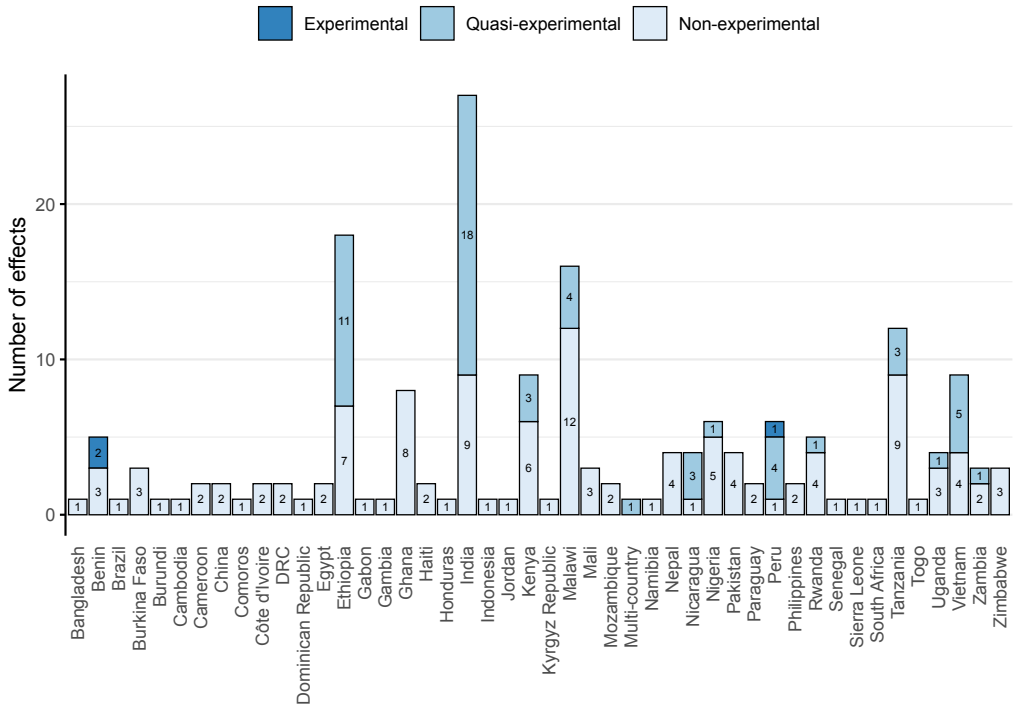


Figure 6: Distribution of effects, by country of analysis and study design

Source: Authors' elaboration. Note: Each count represents an effect from women's land rights recorded in the review. Each reviewed publication can include effects for multiple countries and development outcomes.

Among these, only one study (Goldstein et al., 2018) involves a randomized-controlled trial, considered the "gold-standard" among causal inference methodologies (Banerjee and Duflo, 2011; Higgins et al., 2018).
In quasi-experimental studies, the most common identification strategies include instrumental variables, differences-in-differences, and the combination of differences-in-differences with matching methods (e.g., propensity score matching, coarsened exact matching). Matching methods, along with inverse probability weighting, are also common in observational studies seeking to address confounding bias.

Most reviewed studies rely on cross-sectional data, either single or repeated (141 effects from 61 studies), representing the 76% of the evidence base. In contrast, only a small number of studies leverages panel data (44 effects from 26 studies). In fact, longitudinal studies are only available for In-

dia, Vietnam and selected countries in Sub-Saharan Africa (Benin, Ethiopia, Ghana, Malawi, Nigeria, Rwanda and Tanzania).

Longitudinal data offer several advantages to studies on the impact of women's land rights. First, many expected outcomes take time to realize and are thus better observed over the long run (e.g., *agricultural productivity* or *education*). Second, panel data supports the use of fixed-effects estimators, which help control for time-invariant characteristics and thus improve the internal validity of the findings. Third, they enable the study of dynamic processes, such as lagged effects and outcomes that depend on prolonged exposure. Yet, relatively few countries undertake large-scale panel data collection initiatives. Even when they do, such efforts rarely include land-specific modules or collect data at the individual level.

Regardless of the data type, individual and plot-level analyses are becoming increasingly common in the empirical literature, as already noted by Meinzen-Dick et al. (2019). This trend allows for the precise estimation of local effects with high internal validity. However, it has also implied a relative lack of attention to "macro" and cross-country analyses. Furthermore, few studies differentiate outcomes by women's characteristics (such as age or marital status) beyond those examining specific family and inheritance law reforms.

5. Discussion of the main findings and research gaps

5.1. Evidence on women's land rights effect on development outcomes

The amount of empirical evidence remains uneven, both across development outcomes and geographies. It is largest in the area of *women's empowerment* and, to a smaller extent, *agricultural productivity*, *food security* and *investment*, whereas other outcomes warrant increased focus.

Once it comes to the direction and coherence of identified effects (Figure 7), the strongest evidence of positive effects—with high levels of coherence across studies—emerge from specific areas of *women's empowerment*. Studies consistently show that land rights improve women's decision-making and economic status; however, they have been also found to either reduce or exacerbate IPV, and to reduce women's agency in family planning and fertility, particularly in South Asia.

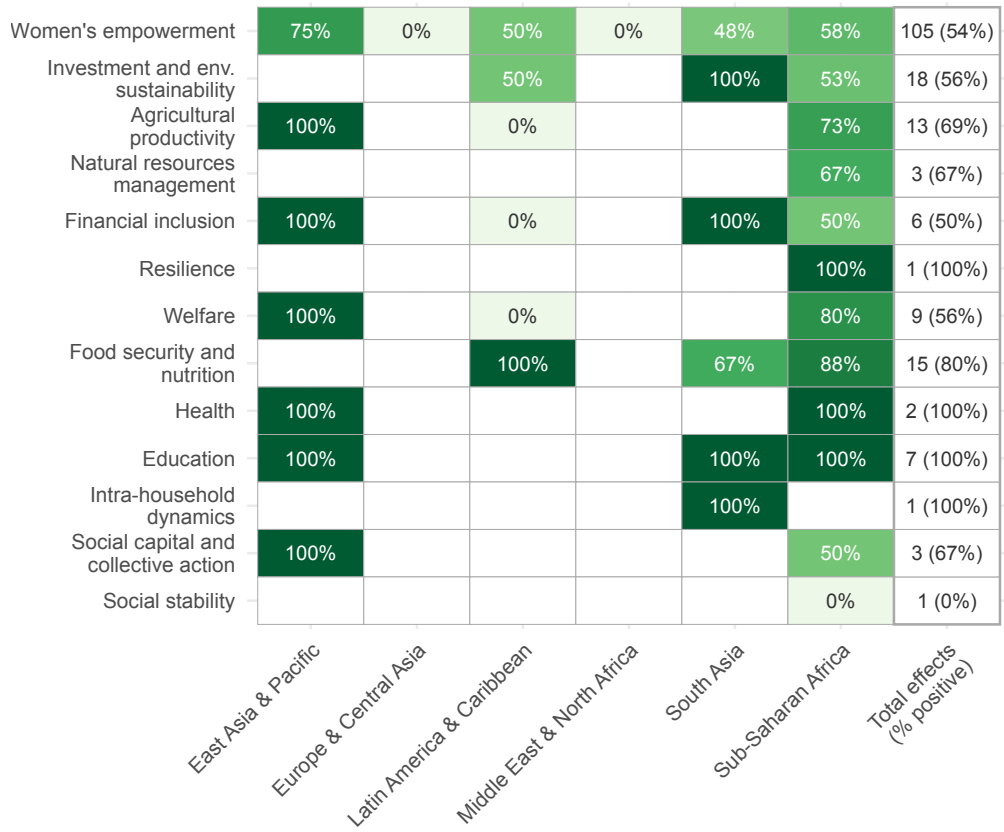


Figure 7: Proportion of positive effects, by region and development outcome

Source: Authors' elaboration. Note: Darker shades correspond to a higher proportion of positive and statistically significant outcomes. Each count in the "Total effects" column represents an effect from women's land rights recorded in the review. Each reviewed publication can include effects for multiple countries and development outcomes.

Similarly to Meinzen-Dick et al. (2019), we note a high level of agreement (namely, high coherence among findings), albeit not extensive evidence, on the positive impact of women's rights and *agricultural productivity*, *financial inclusion*, and *social capital and collective action*.
Although still limited in terms of amount of publications, the evidence on *education*, *food security*, and *health* is definitely positive and unambiguous. To broaden the evidence base, future research could explore potential long-term, intergenerational benefits of women's land rights, such as whether children of landed women grow into healthier and more productive adults, contribut-

ing to poverty reduction over time. Furthermore, greater attention should be placed on nutritional diversity—a key dimension of food security (FAO, 1996) but underexplored in relation to women's land rights.

We observed a moderate amount of evidence, but a low level of agreement, on *investment* and *welfare*. These outcomes showed inconsistent findings across and within studies, with several publications reporting negative effects. This stands partly in contrast with Meinzen-Dick et al. (2019), who noted a high level of agreement on "technology adoption" (a category that encompasses investment in agricultural production technology).[23]

Finally, the evidence on *intra-household dynamics*, *NRM*, *resilience* and *social stability* is insufficient to draw definitive conclusions. These areas appear worthy of future research. For example, further studies are needed to explore how women's land rights influence resilience in different climatic and institutional contexts. Expanding this research agenda is critical to understanding how land rights can contribute to climate adaptation and resilience globally. Further, the existing evidence on *NRM* is narrowly focused on a single outcome: the decision to rent out land. Many other practices that matter for economic efficiency (e.g., decisions about how land is used; participation in land markets through sales, purchases or gifting) warrant future attention.

As far as regards the geographic coverage, even within relatively well-covered sectors, research is still highly clustered on Sub-Saharan Africa and, to a lesser degree, South Asia. The representation of other regions of the world and development outcomes appears modest, signaling a notable lack of focus.

In particular, the absence of studies on Small Island Developing States misses a chance to explore whether women's land rights can improve climate resilience in uniquely vulnerable contexts. The Middle East & North Africa—the "most [tenure-]insecure region in the world" (Prindex)—also stands out as a critical gap.

5.2. Operazionalizing the "bundle of rights"

As mentioned in Section 2, contemporary economic theory (Schlager and Ostrom, 1992) recognizes the importance of the concrete actions women can

[23]Beyond the inclusion of additional studies, the reasons for this discrepancy appear twofold. First, Meinzen-Dick et al. (2019)'s review also included qualitative and mixed-methods research with no multivariate regression analysis. Secondly, they also included studies using women's *awareness* of land rights as an explanatory variable.

perform in relation to the land. To verify if the empirical literature mirrors this intuition, we propose a preliminary classification of the rights that are explicitly mentioned as explanatory variables in the reviewed studies (Figure 8).

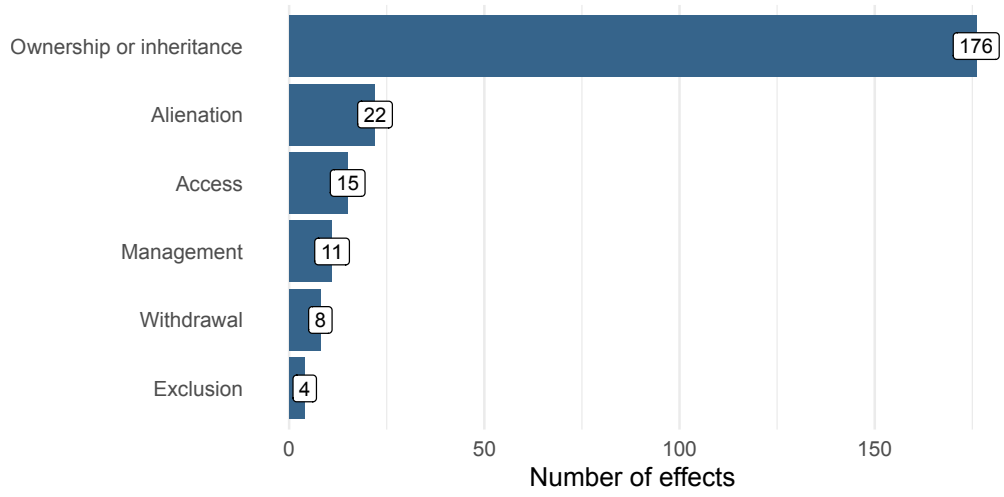


Figure 8: Distribution of rights mentioned as explanatory variables

Source: Authors' elaboration. Note: The figure shows the distribution of effects associated with different rights in Schlager and Ostrom (1992)'s "bundle of rights", as mentioned in the reviewed studies. Since each effect may be associated to multiple types of rights, the total count exceeds the number of effects reported in the review.

Most effects (176) are explicitly associated with ownership or inheritance rights. Ownership is typically self-reported or documented via a land title. However, authors frequently provide no details about what specific claims ownership and inheritance entail, or how they were verified in surveys.
The use of the "ownership" category can be problematic. We might assume that women who claim ownership rights possess the complete "bundle of rights". However, ownership or even titling does not necessarily imply that a woman can exercise any or all rights in the "bundle" (Schlager and Ostrom, 1992). Shwachman Kaminaga and Sheldon (2022) observe that "[t]he interplay between *de facto* and *de jure* legal systems in different regions and communities plays a role in whether a title (physical or assumed) is recognized in practice". In other words, if ownership simply reflects *de jure* rights, our understanding of *de facto* rights (and their heterogeneous impacts on de-

velopment) is impaired. Further, even when studies consider different rights in the "bundle", they do not necessarily examine each impact separately: most authors combine different rights into a single explanatory variable.
The representation of the other rights in the "bundle" appears limited. The second most represented right is alienation, but only in 22 effects. Access rights are present in 15 effects (coded based on mentions of women's actual ability to access and use the land or when they possessed land-use certificates). Management and withdrawal rights are evaluated in only 11 and eight effects, respectively. No studies explicitly mentioned exclusion rights; however, we included four cases where women reported an inability to maintain exclusive access to their land, such as the fear of land loss noted by Deininger et al. (2019). The absence of explicit discussion about exclusion rights represents a significant gap in the empirical literature, as economic theory suggests that individual rights of exclusion promote investment and productivity (Schlager and Ostrom, 1992).

5.3. Progress with respect to previous reviews

While our taxonomy of outcomes does not straightforwardly map into Meinzen-Dick et al. (2019)'s, several key points are worth mentioning.

First, by extending the timeframe of the analysis, this review includes more than 30 new scientific contributions, encompassing the increase in relevant studies after the surge in transnational large-scale land acquisitions and the Russian invasion of Ukraine, as both caused escalating pressures over land in the Global South (Dell'Angelo et al., 2023).

Second, such broader timeframe allowed to include further development outcomes (e.g., *education*, *health*, *intra-household dynamics*, *social stability*). While Meinzen-Dick et al. (2019) had already recognized potential impacts on "women's bargaining power and decision-making regarding consumption, human capital investments and intergenerational transfers", this review assesses impacts on these "mediated" outcomes themselves, rather than on women's bargaining power in these domains. This review also broadens the traditional "credit" category to examine impacts on further indicators of financial inclusion (e.g., ownership of a bank account, insurance).
The review indicates no progress in the critical area of *resilience*, and very little progress in outcomes beyond *agricultural productivity*, *food security* and *investment*.

Third, this review proposes two preliminary classifications of property rights typologies considered in the empirical literature. The first one, drawing

from Schlager and Ostrom (1992)'s taxonomy, reveals an almost exclusive focus on ownership and inheritance rights. The second one, focused on the distinction between individual and joint rights, demonstrates a predominant focus on either individual rights, or a combined analysis of individual and joint rights. Therefore, despite theoretical expectations (Agarwal, 2003), studies of heterogeneous impacts from different rights typologies are still lacking.

5.4. Further considerations

Beyond our taxonomy of outcomes, we did not to identify eligible studies on several potential outcomes, despite suggestions from economic theory (Stevens et al., 2020-03-16) and qualitative studies (Meinzen-Dick et al., 2019). Examples include extension services, democracy and governance, government services and infrastructure, human development, inequality, post-conflict recovery, poverty reduction, sustainable landscapes and biodiversity conservation.

In particular, domains that are better observed at the "macro" level (e.g., democracy and governance, human development, inequality) are virtually absent from the empirical literature. This omission could reflect researchers' commitment to identifying local effects with strong internal validity. Nevertheless, institutions, along with shaping individual experiences, structure the broader socio-economic system. In other words, if gendered property rights affect women and their immediate communities, it is also reasonable to expect impacts on broader, national-level indicators. Therefore, future research should give greater attention to "macro" outcomes, to verify if women's land rights recognition can have systemic effects.

The trends and gaps we observe appear to be mainly driven by data availability and the heterogeneous opportunity of exploiting natural experiments in different parts of the world. These have led to the over-representation of certain countries, outcomes and policy/legal interventions, as well as to a lack of studies on different rights typologies. In particular, the intuitive relationship between property rights and agency has enriched the literature on women's empowerment, but also overshadowed outcomes that are not directly or traditionally related to gender equality.

6. Conclusion

Despite the recent expansion of the empirical literature on the land-women-development nexus, the evidence remains highly heterogeneous across geographies, development outcomes and research methods.
This diversity of results motivated this review, which drew from Meinzen-Dick et al. (2019)'s work to advance the state of the art in both methods and scope. By "recomposing" a scattered evidence base, this review offers clearer direction for development practitioners and policymakers, and identifies opportunities for future applied research.

From an initial pool of 414 identified articles, we rigorously selected and analyzed causal evidence from 47 countries, 86 publications, and 186 effects of women's land rights on socio-economic development. Based on the outcomes considered in these publications, this review (1) codifies the direction and significance of effects, (2) proposes an original taxonomy of 13 development outcomes related to women's land rights recognition, and (3) critically synthesizes the existing empirical evidence, taking stock of key findings by outcome, country and region.
Beyond providing an updated account of the state of the art, this review also introduces three innovative coordinates of analysis: publications' geographic coverage, timeline, methods and data, whose systematic analysis was lacking in previous research works.

Findings indicate a predominant focus of research on specific areas related to women's empowerment, and little advancement in other critical domains such as climate resilience. While the amount of publications has surged since the start of the "global land rush", the focus remains on Sub-Saharan Africa and South Asia, particularly countries where legal reforms and policy interventions have provided convenient natural experiments.
Based on our findings, governments and policymakers should promote access to land as a means to empower women through improved decision-making and economic status. In doing so, they can expect positive spill-overs in several other, non-gender-specific domains, according to a small but growing evidence base. However, pro-women land policies should be accompanied by complementary protections to prevent unintended backlash against gender-equalizing reform, manifesting as increased intimate partner violence and intra-household conflict.

In light of the identified gaps, we argue that future research should broaden both the geographical and sectoral scope, moving beyond (1) the

direct impacts of women's land rights on decision-making power, and (2) individual ownership rights, acknowledging that different "ways" of accessing land may be relevant for specific settings and development outcomes.

To address these gaps, scholars should prioritize the collection of data on women's land rights at different levels, based on gender-sensitive, standardized protocols. Individual-level data should include the mode of land acquisition (e.g., inheritance, gift, purchase), the type of rights (individual or joint), the socio-economic characteristics of women, and the specific rights in the "bundle" (Schlager and Ostrom, 1992) that pertain to those women. The collection of micro-level data should be complemented by the creation and refinement of "macro" indicators focused on women's land rights and the institutional barriers they face. Such indicators should enable comparison across at different administrative levels (e.g., districts, regions, countries) and capture the presence of formal and informal, individual and collective tenure systems.

Together, both "micro" and "macro" perspectives would improve our understanding of "what works where", and enable the formulation of policies tailored to different women across different institutional settings. By overcoming the limitations highlighted in this review, we can uncover women's role in supporting climate change adaptation, fostering resilient societies, and driving sustainable development—both locally and systemically.

CRediT authorship contribution statement

Valeria Strusi: Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Sara Balestri**: Writing – review and editing, Methodology, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

The systematic review protocol, together with the list of included publications and the corresponding development outcomes, is accessible at 10.17605/OSF.IO/9ZK4E. The classification of effects is also available upon request.

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