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**Conceptualizing and Measuring Dimensions of Tenure Security**

**Gendered Analysis from Malawi, Bangladesh, and Nepal**

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## Abstract

Women's property rights and tenure security are recognized as critical for development policy and practice. Yet there is no consensus on how to conceptualize or measure these concepts. In this paper, we explore the relationships between perceived tenure security, as reported by survey respondents, with documentation and the bundle of rights that are often used to define property ownership. We use data from the pilot of the Women's Empowerment Metrics for National Statistics (WEMNS) in Malawi, Nepal, and Bangladesh on both agricultural land and housing. The land rights module was designed to match indicators being collected to support the Sustainable Development Goals (SDGs). Similar questions were asked regarding the dwelling. Regression results find few associations between perceived tenure security and property rights (holding individual or sole land rights, having your name on a document, and holding rights to sell and bequeath). We thus use Sankey diagrams to visualize these relationships. In Malawi, two-thirds of those without documents, both men and women, are tenure secure. In Bangladesh, over half of the respondents are landless and thus do not have tenure security. Two-thirds of Bangladeshi women respondents in landed households report that they are tenure secure, in spite of not having their own names on the documents. In Nepal, we find a high level of both property ownership (90 percent) and tenure security (80 percent). The patterns differ across contexts and between land and housing. The results confirm that the documentation of rights and having sole or joint rights are important but should not be conflated with tenure security.

**Keywords:** Tenure security, property rights, land ownership, gender, Sustainable Development Goals indicators

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For sample code to create Sankey Diagrams, please see <https://github.com/laurameinzendick/WEMNS-Sankey-Diagrams>

## Introduction

There is widespread awareness of the importance of land rights and tenure security for a range of development and environmental outcomes (Deininger and Goyal 2024; Holland et al. 2022a; Tseng et al. 2020). Women's land rights in particular are important for many of those outcomes, as well as for gender equality and women's empowerment (Meinzen-Dick et al. 2019; Strusi and Balestri 2025). Yet lack of secure rights to land and dwelling remains a problem in many countries, with women often particularly disadvantaged (Doss et al. 2015; Prindex 2024). Recognizing the importance of property rights for reducing poverty, and especially the value of women's land tenure security, the Sustainable Development Goals (SDGs) include tenure security under SDG1 (no poverty) and SDG5 (gender equality).

To strengthen tenure security, many countries have adopted land registration programs, often with specific provisions to include women's names on land documents (Deininger and Goyal 2024; Ghebru 2019). These documents may include land titles, land registration documents, or leases and rental agreements, among others. Assumptions that documentation confers security are so prevalent that many studies use having documented land rights as an indicator of tenure security (Bezabih et al. 2016; Santos et al. 2014; Newman et al. 2015; Owoo and Boakye-Yiadom 2015; Holden et al. 2011). While documents may provide tenure security in some places, especially those with strong statutory law and enforcement, tenure security is more complex than simply holding legally documented rights. SDG indicator 1.4.2 measures secure tenure rights as composed of legally recognized documentation and perception of the security of tenure. SDG indicator 5.a.1, which focuses on ownership of agricultural land and secure rights over agricultural land, uses proxy measures of legally recognized documents in the name of the individual as well as holding transfer (alienation) rights, i.e. the rights to sell and to bequeath the land (Brunelli and Gourlay 2022). In both cases, data are to be disaggregated by sex, to examine women's land rights and gender equity. Thus, the SDGs identify five indicators of tenure security to consider: ownership or use rights to land, whether the land rights are documented, whether the individuals' name is on the document, transfer rights (including the right to sell or bequeath), and perceived tenure security.

In conceptualizing and measuring property rights, it is useful to distinguish the content of property rights from the assurance of those rights, with the latter more directly related to tenure security (Sjaastad and Bromley 2000; Arnot et al. 2011). Content includes whether rights are legally documented (including whose name is on the documents) and the specific bundles of rights held, especially the rights to transfer property to others, as well as whether rights are held individually or jointly (and jointly with whom). Assurance that one will not lose property is particularly important in shaping people's wellbeing directly (through confidence or worry about losing their land or home), and indirectly (through likelihood of investment to improve the property) (Arnot et al. 2011; Awanyo 2009). Assurance is often measured empirically by asking respondents how likely they think they are to involuntarily lose their property. While such perceptions are an imperfect measure of tenure security because respondents may be unaware of certain threats, they do provide an indicator of individuals' confidence in their rights. And it may be their perception of tenure security that shapes their investment and production activities on the property.

Having data on each of these aspects of tenure for men and women is important not only for monitoring changes, but also to understand how these different aspects are associated with each other. To what extent does documentation of property rights and an individual's name on that documentation, increase their confidence that they will hold that property in the future? How does holding a more complete bundle of rights, especially transfer rights, affect perceived tenure security? Are sole or joint rights seen as more secure? And do these patterns, both levels and relationships, differ for women and men?

Much of the focus on women's tenure security is on agricultural land, given the importance of tenure security for agricultural investment and thereby income. A separate strand of literature considers tenure security regarding housing, primarily in urban areas. In some rural areas, tenure security of agricultural land and dwelling may be similar if people live on their farms. But the uses and importance of agricultural land and dwelling are quite different, particularly for women. While agricultural land provides livelihoods, dwellings may provide both a source of livelihoods and shelter. Security of tenure in housing may provide physical safety, economic opportunity, and psychological well-being (Datta 2006; Panda and Agarwal 2005). There is little discussion of whether the patterns for tenure security are similar for land and dwelling. In addition, there is little research on tenure security regarding dwellings in rural areas. Women's rights to housing may look quite different from their rights to land, and disentangling the gendered patterns of rights to each is crucial to understanding women's tenure security.

The answers to these questions are not only of academic importance, but also have policy relevance because the current assumptions guide land policy. Having empirical evidence on which aspects of tenure are strongly associated with people's confidence that they will hold the property is important, because that confidence affects their behavior, particularly in terms of investment in the land, leading to long-term productivity gains as well as environmental outcomes (Awanyo 2009; Holland et al. 2022b; Lawry et al. 2017).

In this paper, we address these questions using pilot data from the newly-developed Women's Empowerment Metric for National Statistical Systems (WEMNS) (Seymour et al. 2024). WEMNS is a streamlined module to measure women's and men's empowerment, suitable for inclusion in large multi-topic surveys. WEMNS is a counting-based, multidimensional index composed of four domains: intrinsic agency, instrumental agency, collective agency, and agency-enabling resources. WEMNS is designed to be applicable at any point in the adult life cycle, in urban and rural areas, and relevant to a variety of livelihood strategies (farming, self-employment, wage labor) across countries in different stages of structural transformation. It is designed to be administered to a randomly selected man or woman in the household, not necessarily the head of household or spouse (if only surveying one person). It can also be administered to both a man and a woman in any given household, and they should not necessarily be spouses or the primary decision-makers. Particular indicators are also aligned and consistent with SDG indicators, especially those related to property rights and information-related resources.

The WEMNS pilot data includes comparable sex-disaggregated data on the content and security of tenure for both land and dwelling, for women and men, in urban and rural areas of three countries: Malawi, Bangladesh, and Nepal. These indicators are those specifically identified for SDG monitoring. In this paper, we document correlational patterns of land rights and tenure insecurity cross-sectionally; by comparing the same analysis across countries, we show that the factors associated with tenure security differ. We also introduce a new data visualization for tenure security patterns, which can be employed to comparatively illustrate rights and relationships in other contexts when similar data is collected, particularly as WEMNS is incorporated into nationally representative surveys, as in Liberia, Sierra Leone, and Tanzania. Finally, we reflect on the WEMNS methodology regarding land rights and suggest what else is needed. We identify what is possible to learn from the WEMNS questions and what research questions would require additional information.

## Context

The three countries in which the WEMNS pilot surveys were implemented were chosen to capture a range of contexts regarding women's empowerment and women's land rights. The three countries we analyze

are similar in that they have a large share of the population dependent on smallholder agriculture (Table 1) but differ in terms of land tenure systems and women’s economic roles. The countries represent both farming systems in Africa, where women often farm their own plots of land, and in Asia where joint family farming is most common. In Malawi, much of the land is still under customary tenure systems, whereas in both Bangladesh and Nepal, most of the land is held by families and documentation is more common. Bangladesh has a large landless population who have no tenure security, while in Nepal more people are landholders and much of the land is registered. In addition, Nepal has high levels of men’s outmigration, which affects both who is holding the land and their tenure security. Thus, these countries provide both a range of experience while also providing the necessary depth on these particular issues.

In this section we provide a brief contextual overview of the countries drawing from Land Portal country summaries and World Bank Open Data but note that our samples are not necessarily nationally representative.

**Table 1:** Characteristics of study countries

<u>Indicator</u>	<u>Malawi</u>	<u>Bangladesh</u>	<u>Nepal</u>
Literacy rate, % of women	63 (2020)	77 (2022)	59 (2019)
Literacy rate, % of men	79 (2020)	81 (2022)	80 (2019)
% of households headed by women	26 (2017)	16 (2018)	33 (2022)
Poverty rate (\$3/day, 2021 PPP), % of population	75.4 (2019)	5.9 (2022)	2.4 (2022)
Arable land per person, hectares	0.19 (2023)	0.05 (2023)	0.06 (2023)
Women as a % of the labor force	49 (2024)	37 (2024)	37 (2024)
% of employed men who work in agriculture	57 (2023)	25 (2023)	54 (2023)
% of employed women who work in agriculture	67 (2023)	53 (2023)	73 (2023)
Urban population, % of population	19 (2024)	41 (2024)	22 (2024)
Population in slums, % of urban population	38 (2022)	52 (2022)	40 (2022)

**Source:** World Bank Open Data ([data.worldbank.org](https://data.worldbank.org)) accessed 11/4/2025

**Note:** Year of data given in parentheses

Malawi is one of the poorest countries in the world, with 75% of the population below the international poverty line of US\$3 per day (in 2021 purchasing power parity). About 81% live in densely populated rural areas and depend on smallholder agriculture, with over 40% having less than 0.5 hectares of agricultural land (de Satgé 2021). Over a third of urban dwellers live in slums or informal settlements. Much of the land in both rural and urbanizing areas has been under customary tenure, held and managed by descent groups. Unallocated customary land is classified as public land; private land may be customary estates, leasehold, or freehold. Patrilineal descent systems dominate in Northern Malawi, while

matrilineal systems are prevalent in much of Central and Southern Malawi (de Satgé 2021). While matrilineal systems are not necessarily controlled by women, they provide greater scope for strong women's land rights compared to patrilineal systems (Peters 2010). Our sample is drawn from regions that are heavily matrilineal. However, colonial policies and current land titling initiatives have often weakened women's status in favor of patrilineal norms. Although women now make up half of the labor force, two-thirds of women who are employed work in agriculture. In addition, literacy rates remain much lower for women than for men.

Bangladesh has experienced rapid economic growth, so despite high population densities, the poverty rate has decreased to 5.9%. Although with structural transformation, the share of men employed in agriculture has decreased to 25%, over half of employed women still work in agriculture. Currently, women are 37% of the labor force. A quarter of rural households are landless, depending on agricultural labor, sharecropping, or leasing public or private land. Forty-one percent of the population lives in urban areas, and over half of those live in slums or informal settlements. Over 90% of the population are Muslim, and under Islamic law, daughters are entitled to inherit half the share of land that sons are entitled to, but most daughters turn over their land to their brothers (Hennings and Hayward 2023). Only 16% of households are headed by women, reflecting men's continuing presence in rural households. Although there are strong patriarchal norms, there has been strong progress in women's empowerment over the last decades (Kabeer 2024).

Nepal's official poverty rate has also fallen dramatically in this century, fueled in part by male migration and remittances. Male outmigration has resulted in a third of household headed by women. Yet, agriculture remains an important source of livelihood; over half of men and 73% of women in the workforce are in agriculture. Women are 37% of the labor force. The gender gap in literacy rates is highest in Nepal of the three countries. There is limited arable land per person, and a third of the households rent or sharecrop land. Twenty-two percent of the population is urban, and 40% of those live in informal settlements. The population is predominantly Hindu, with patriarchal norms, but there are over 120 castes or ethnic groups, with a variety of gender and land-related practices. Agricultural land is customarily considered "family land" held by the male patrilineage, but government policies now give reduced land taxes and registration fees if land is registered jointly or in women's names (Hayward 2021).

## Methods

We use data from the WEMNS pilot studies to analyze patterns across the dimensions of tenure security for men and women.

## Data

The WEMNS pilot studies in Bangladesh, Malawi, and Nepal were collected in 2023 through face-to-face surveys designed to develop a measure of women's empowerment (Seymour et al. 2024). In each country, the sample includes about 800 households, from both rural and urban areas, with sampling designed to capture socioeconomic, cultural, and geographic diversity of the populations, using a two-stage cluster stratified probability sample design (see Seymour et al. 2024 for details on the sampling strategy).

Within each sampling unit, households were randomly selected, and within each household, one woman and one man aged 18 to 64 was selected randomly from the household roster. This means the respondents are not necessarily a marital couple, nor are they necessarily the primary decision makers of the household. Thus, our sample spans the full range of men and women in these households and thereby is

much more representative of the tenure security of the overall population of women and men than samples where only the head or the primary couple are interviewed.

The pilots build on previous studies targeting particular groups within each country, thus they are not nationally representative. For the previous studies using exclusively rural samples, the sampling frames were updated to include urban populations. The sample in Malawi is from urban and rural households in the (heavily matrilineal) Central and Southern regions. In Bangladesh, half of the households were rural and the other half were urban. The urban households were chosen from a sampling frame based on the 2014 Census of Slum Areas and Floating Populations. Thus, the urban sample is intentionally relatively poor. In Nepal, the sample is from two districts from Lumbini Province in the lowlands, the Terai.

To construct the WEMNS score, men and women respondents were asked a range of questions about their instrumental and collective agency and women were also asked about intrinsic agency. All respondents were asked questions on ‘agency-enhancing resources’, including property rights, information and communication technologies, use of financial services, and access to credit.

The property rights module asked respondents about ownership or use rights for land and dwellings, whether they hold formal documents for these and whether their names are on the documents, and if they have rights to sell or bequeath the property (see Appendix for full survey module). The tenure security questions ask about expectations of involuntarily losing their rights to any land or dwelling in the next five years. The questions correspond to the information needed for SDG indicators 1.4.2 and 5.a.1.

## Analytical approach

Our broad goal in this paper is to explore the gendered patterns of tenure security. To this end, we first look at the association between perceived tenure security and having any rights to land or dwellings and whether these rights are held jointly or alone. We then examine the association of tenure security with the documentation of rights as well as specific transfer rights using correlational regressions. That is, we regress for parcel type  $p$  (either land or dwelling) for individual  $i$  of sex  $s$  in country  $c$ :

$$Security_{pisc} = \beta_0 + \beta_1 Any Rights_{pisc} + \beta_2 Rights Alone_{pisc} + \lambda X_{isc} + \epsilon_{pisc}$$

And

$$Security_{pisc} = \gamma_0 + \gamma_1 Document_{pisc} + \gamma_2 Named on Document_{pisc} + \gamma_3 Sales Rights_{pisc} + \gamma_4 Bequeath Rights_{pisc} + \lambda X_{isc} + \epsilon_{pisc}$$

where *Security* is a dummy equal to one if the individual reports feeling secure in their rights to their property and zero otherwise.<sup>1</sup> *Any Rights* is a dummy equal to one if the individual owns or holds use rights to any parcel of the given type. Note that an individual can only be considered tenure secure if they own or hold use rights, so  $\beta_1$  will mechanically show a relationship. *Rights Alone* is a dummy equal to one if the individual holds ownership or use rights by themselves to the property; again, this is only asked of those who do have rights.  $X_i$  is a vector of individual controls, including age, education, employment, an asset index constructed through principal components analysis, marital status, owning a phone, having

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<sup>1</sup> That is, zero if they respond that it is “slightly likely”, “moderately likely”, “very likely”, or “extremely likely” that they will involuntarily lose ownership or use rights to the property in question. More than 70% of the sample feel it is “not at all likely” that they will lose their rights, so we collapse all other responses to a single category. This choice both facilitates interpretation (we can use a linear probability model, and therefore interpret coefficients as being changes in the probability of tenure security associated with the given variable) and improves the statistical power of our estimates.

a government-issued ID card, a series of dummies for respondent's relationship to the household head, and a dummy for being in a rural area.

In the second regression, we tease apart the conditional correlations between tenure security and documentation of rights as well as specific transfer rights in more detail. *Document* is a dummy equal to one if there exists a legal document for the property,<sup>2</sup> while *Named on Document* is a categorical variable that indicates if the respondent is named on the document, either alone or jointly with someone else. *Sales Rights* is a categorical variable for if the individual reports having the right to sell the property, either alone or jointly, and *Bequeath Rights* is the equivalent for if the individual has the right to bequeath the property. Individual-level controls are the same in all regressions.

We use a linear probability model, so coefficients can be interpreted as marginal effects on the likelihood of the individual reporting tenure security on the property, and so that we can include fixed effects in some specifications. We estimate regressions separately for men and women, to explore how the relationships differ by gender. Standard errors are clustered at the sampling cluster level, to allow for unobserved correlations between individuals in geographic proximity. Detailed regression tables are presented in the appendix, but we include coefficient plots from these regressions in the main text to facilitate comparisons between men and women.

We additionally construct Sankey diagrams as visual representations of the patterns of relationships between documentation and tenure security as well as between transfer rights and tenure security, which we discuss in more detail in the results below. These figures highlight the shortcomings of relying solely on regressions in understanding the complexities of tenure security, particularly in comparing across contexts that may have similar correlations but for very different reasons.

## Results

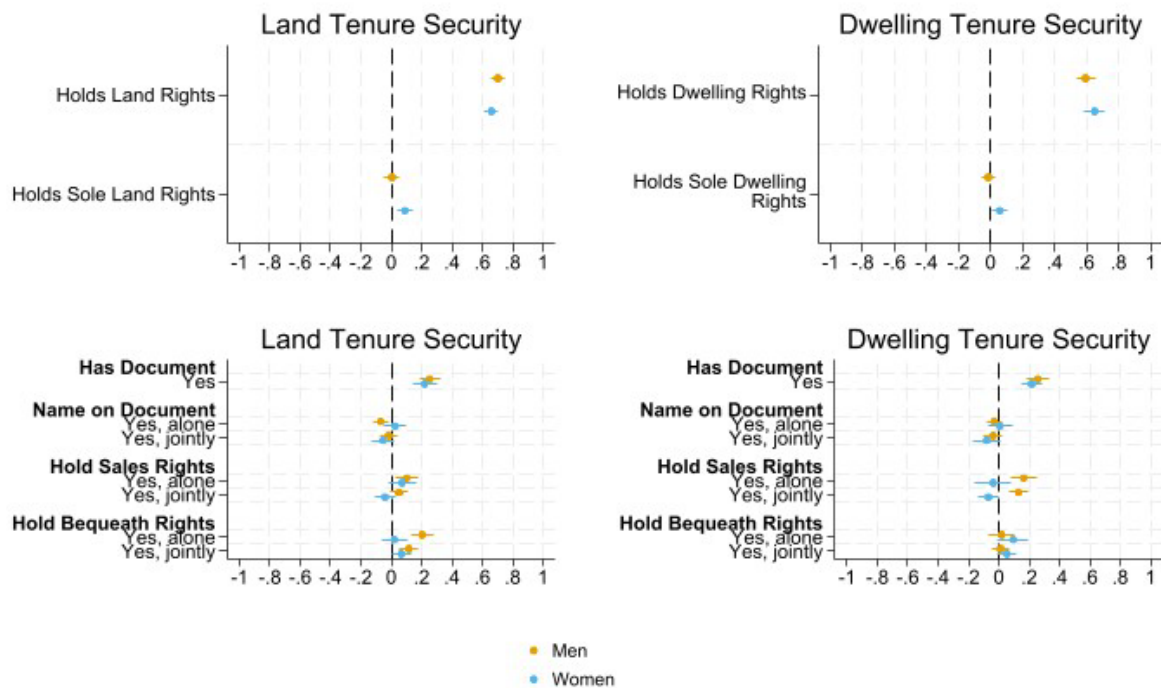
We begin by pooling data from all three countries, running regressions separately for men and women with country fixed effects. These results can be seen in figure 1, with full regression results in the appendix. In the top two plots, we see results from the regressions of perceived tenure security on land (left) or dwellings (right) on holding rights at all (jointly or solely) as well as holding those rights alone, with separate models for men (in orange) and women (in blue). Due to the structure of the questionnaire, where questions on tenure security are only asked for those who have rights, we find a strong mechanical relationship between having rights and security; this correlation is similar for men and women. Interestingly, holding sole rights to either land or dwelling, when also controlling for whether the respondent holds property rights, whether individually or jointly, does not appear to be significantly correlated with tenure security for men, but there is a small, statistically significant positive correlation for women. Thus, women owning property solely is correlated with them being more tenure secure.

In the lower two plots, we report results from the regression of tenure security on documentation and transfer rights, again for land on the left and dwellings on the right. Here, we find a strong correlation between having a document and tenure security; this relationship holds for both land and dwellings and is remarkably similar for men and women. Patterns are harder to distinguish for being named on a document

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<sup>2</sup> A legal document is defined in question H05 in the survey module. We focus on the existence of any document, rather than differentiating between types of documents delineated in question H05a, given low response rates in our pilot survey data (only around 25% of those saying they did have a document in H05 answered question H05a about what type of document) which leaves us underpowered. Exploring the relationship between specific documents and the rights held, for example rental agreements and transfer rights, would be an interesting dimension for further research in larger studies.

or specific transfer rights. Note that to analyze these, we need not only the SDG monitoring data collected in the WEMNS, but also information on dwelling tenure security, individual transfer rights, and the additional covariates we control for.



**Figure 1:** Tenure Security Regressions for Pooled Data. OLS results of a dummy equal to one if the respondent reports feeling tenure secure on their land and zero otherwise regressed on having rights (top row) or documentation and transfer rights held (bottom row). All regressions control for dummy variables representing 3 age categories, 4 occupation categories, 3 education categories, a PCA asset index, marital status, 3 phone ownership categories, having a government-issued ID, 16 relationship to household head categories, and a dummy for being in a rural area, as well as country fixed effect. Standard errors are clustered at the sampling cluster level. Models in yellow restrict the sample to male respondents, and in blue restrict to female respondents.

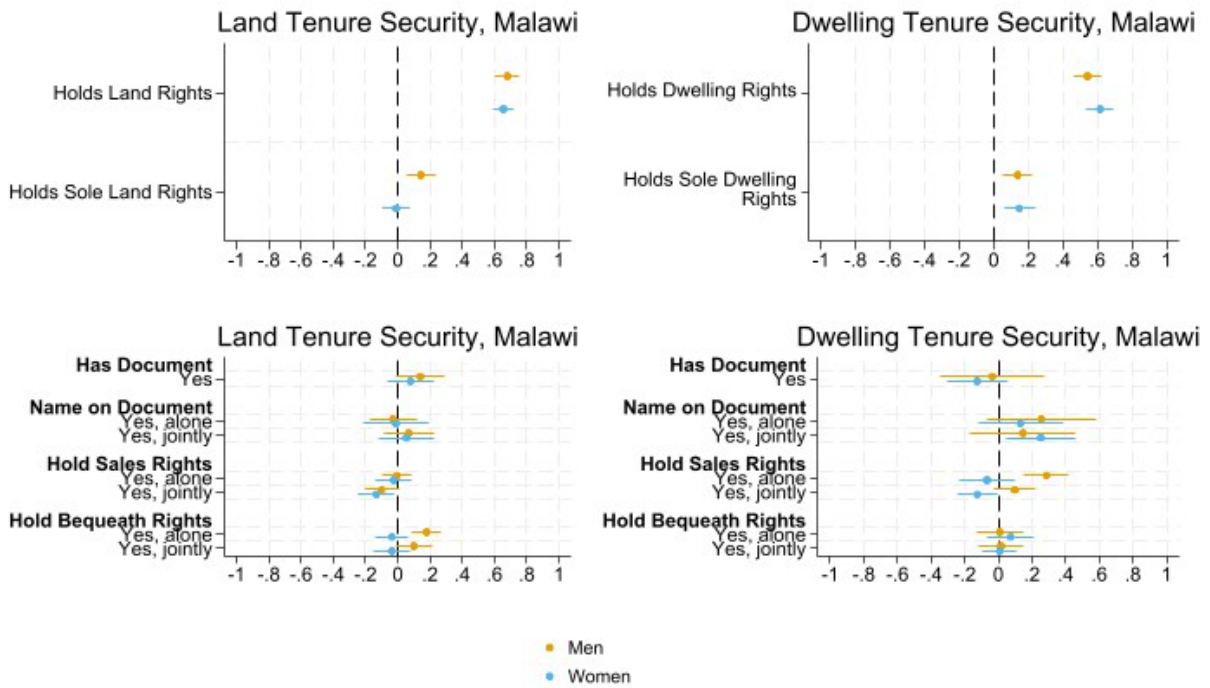
**Source:** Authors’ calculations using WEMNS pilot data.

Importantly, these results may be obscuring substantial heterogeneity in the relationships by country: the value of comparable data across contexts is not solely in increasing the sample size, but also in allowing for parallel analysis across countries to see how the patterns differ.

## Malawi

We focus our analysis first on Malawi. Figure 2 presents results from the same set of regressions as Figure 1, restricting the sample to respondents in Malawi. Once again, in the top plots, we see that (by construction) having rights to land or dwelling is strongly related to tenure security. More interestingly, holding those rights alone (as opposed to jointly) does have an additional positive correlation with tenure security (conditional on having rights at all): for men, on both land and dwellings, but for women, only on dwellings. Turning to the lower set of plots, documentation is broadly uncorrelated with tenure security, for both men and women on both land and dwelling. Customary tenure plays a large role in the Malawian

context, so it may be that tenure security relies more on customary rights which are undocumented rather than formal documentation (although we cannot show this empirically with the data we have).



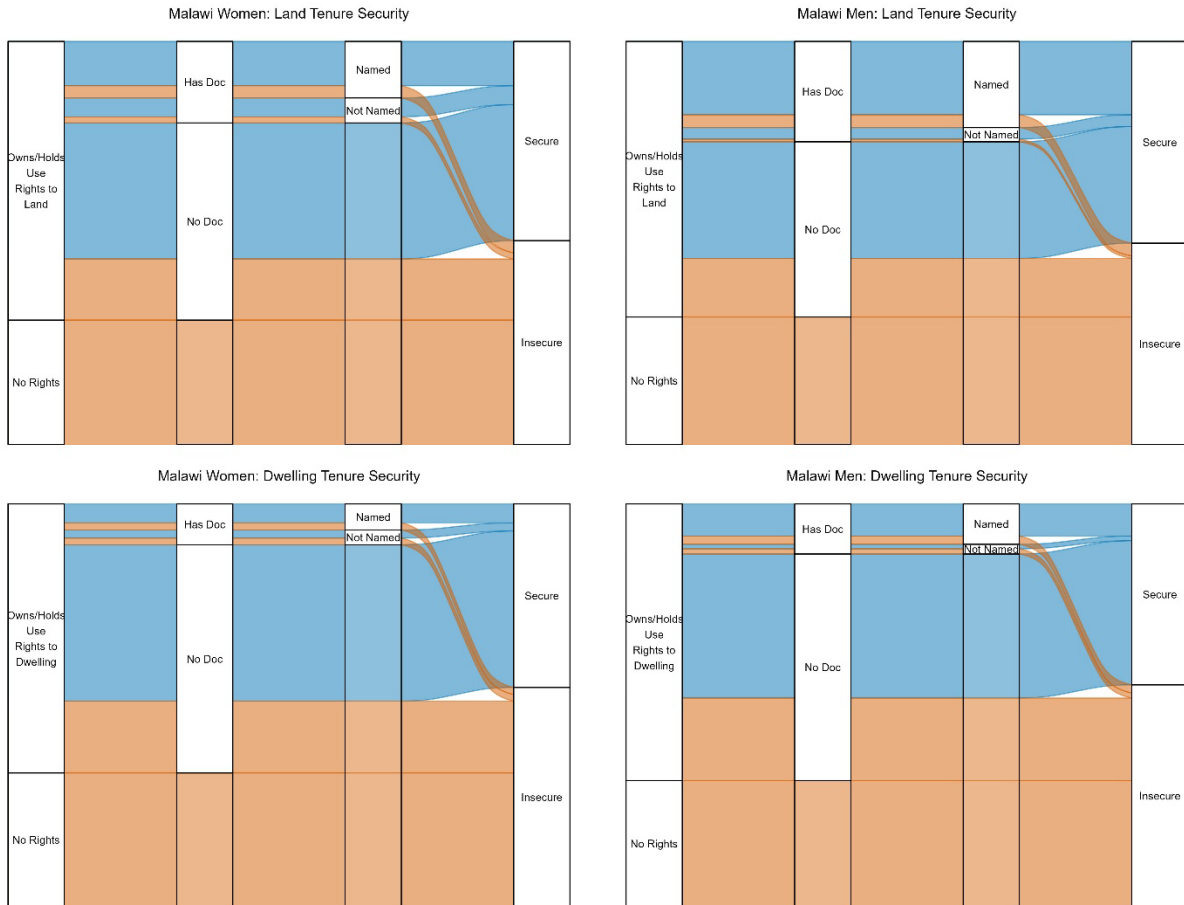
**Figure 2:** Tenure Security Regressions for Malawi. OLS results of a dummy equal to one if the respondent reports feeling tenure secure on their land and zero otherwise regressed on having rights (top row) or documentation and transfer rights held (bottom row). All regressions control for dummy variables representing 3 age categories, 4 occupation categories, 3 education categories, a PCA asset index, marital status, 3 phone ownership categories, having a government-issued ID, 16 relationship to household head categories, and a dummy for being in a rural area. Standard errors are clustered at the sampling cluster level. Models in yellow restrict the sample to male respondents, and in blue restrict to female respondents. **Source:** Authors’ calculations using WEMNS pilot data.

In the lower plots, where we include more detail on the documentation and transfer rights held by the individual, there are relatively few statistically significant relationships. The exceptions are holding rights to bequeath (either jointly or alone) on land, or rights to sell (jointly) for dwellings – but only for men.<sup>3</sup> Relying only on these regressions, one might be disappointed in our ability to understand tenure security, as few theoretically relevant factors seem to be empirically correlated in this data.

We therefore employ Sankey diagrams to visualize patterns of tenure security (Figures 3 and 4). Focus first on the upper-left hand plot of Figure 3, which presents the relationship between documentation and tenure security on land for women in Malawi. The height of the plot represents the total sample of women respondents, and on the left-hand side, they are divided by whether or not they own or have use rights to land; 69% of women report having ownership or use rights to land. Of those with rights to land, they are then asked if a document exists for their land; moving rightwards, that conditional share is shown in the

<sup>3</sup> This could be an artifact of the sample being from predominately matrilineal areas where men do not, by default, have transfer rights. Thus, those who have these rights may be relatively tenure secure for other reasons, such as that the means of acquisition was purchase. Additional data would be needed to confirm this.

next set of white boxes, with 29% reporting having a document. Those who do have a document are asked if they are named on the document; that conditional share is depicted further to the right, with 69% of those with a document being named on the document. And finally, on the right-hand side, all women are categorized as either tenure secure or insecure (this status is also indicated by color, with blue paths representing those who are tenure secure and orange representing the tenure insecure). Out of the full sample of women respondents, 49% feel tenure secure; 51% are categorized as tenure insecure but of those, 61% are tenure insecure because they do not hold rights to land.



**Figure 3:** Tenure Security and Documentation Sankey Diagrams for Malawi. Flows in blue represent respondents who report feeling tenure secure; all other respondents are represented by flows in orange. **Source:** Authors’ calculations using WEMNS pilot data.

Continuing to focus on the upper left plot of Figure 3, several important features are evident. First, the way in which questions are asked in the WEMNS survey assumes that documentation follows a cascading pattern: if a woman does not have rights to land, she is not asked about documentation and is automatically categorized as tenure insecure. Similarly, if she does not have a document, although she is asked whether she feels tenure secure, she is not asked who is named on documents. More substantively, it becomes immediately apparent from this figure that the majority of women in Malawi who are tenure insecure are tenure insecure because they say they have no ownership or use rights land; those who say they have ownership or use rights to land are likely to feel tenure secure, regardless of whether they have

any documentation. Indeed, the majority of those women without a document for their land are tenure secure, and going the other direction, the majority of women who are tenure secure in Malawi do not have any document for their land. In Malawi, the majority of women who have a document are themselves named on the document. At the same time, the Sankey diagram highlights that this is no guarantee of tenure security, as can be seen by the orange area emerging from the “has document” box.

Sankey diagrams are a useful way of summarizing multiple degrees of conditional and unconditional correlations, as well as illustrating the levels of multiple variables to indicate what are the prevailing features of a context. Given that our samples are not representative of the country as a whole, we do not focus on the specific shares along each pathway, but these can easily be constructed from the data.

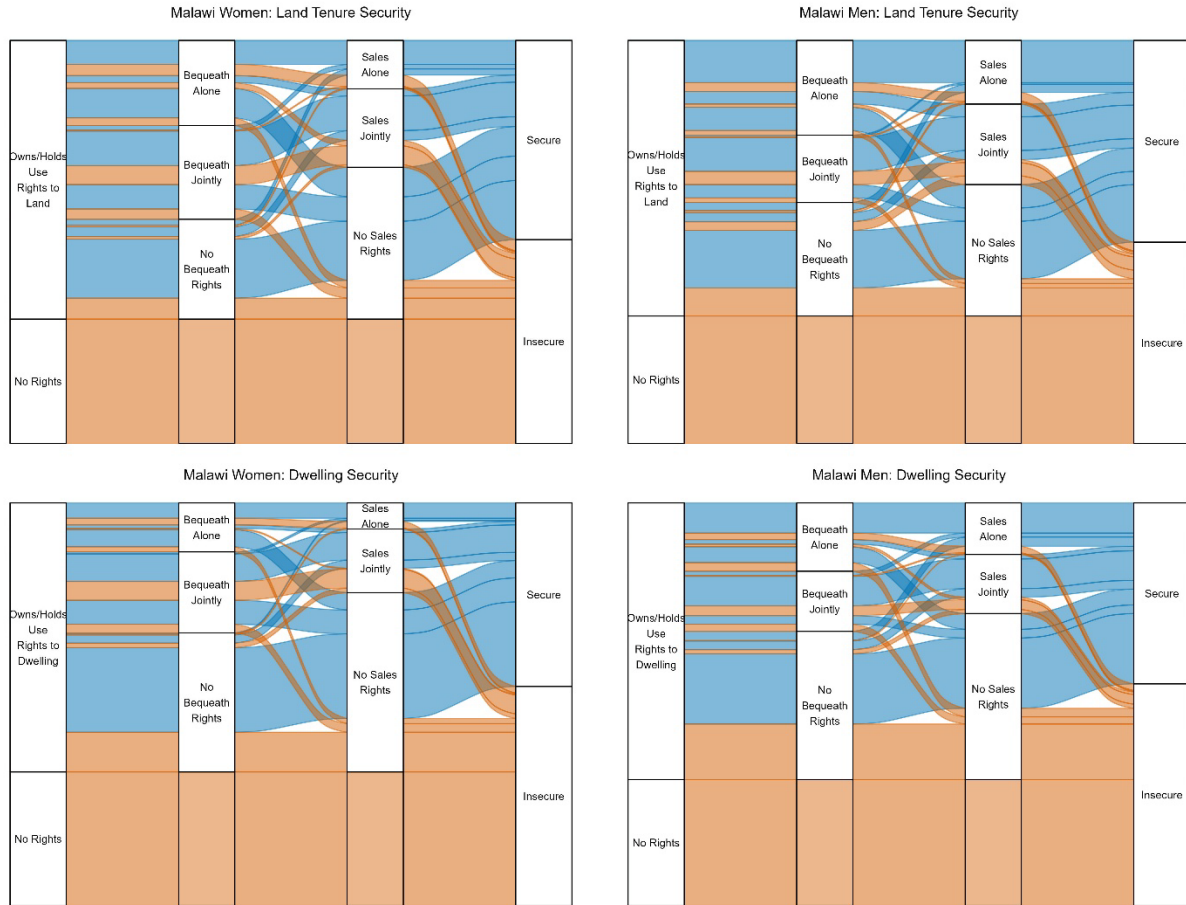
The Sankey diagrams also allow for comparisons: between women and men, looking across the row, or between land and dwellings, looking down a column. In Figure 3, comparing women and men’s land rights in the top row, we see relatively similar shares of both groups that have rights to land, as well as similar shares that feel secure, on the endpoints of each plot. However, a smaller share of women than men report having a document, and of those who report having a document, almost all men report being named on the document while the share of women with a document who are named is somewhat smaller. These differences, though, are largely irrelevant for tenure security. As in Malawi, people without documents by and large feel tenure secure. In the bottom row, which focuses on dwellings, documentation is less common than on land for both men and women, but the drop is more dramatic for women than for men.

We also construct Sankey diagrams for transfer rights, shown in Figure 4. Here, the visual patterns are much more complex, which stems from the structure of the survey: those who have rights are asked whether they have sales rights (either jointly or alone) and transfer rights (again, jointly or alone), regardless of whether or not they have the other form of transfer right. The WEMNS survey diverges from some scholarly work which implicitly or explicitly considers different rights in the “bundle of rights” to be hierarchical (Bambio and Bouayad Agha 2018).<sup>4</sup> Indeed, the patterns we see in the Sankey diagrams in Figure 4 highlight why a hierarchical understanding of rights does not capture the complexities of (especially) a customary tenure environment: a not insignificant proportion of men (and women, to a lesser extent) have rights to sell but not to bequeath.

Figure 4 also illustrates several other features of the customary tenure environment. First, a large proportion of people who say they have ownership or rights to land or dwellings do not report holding any transfer rights, either jointly or alone. Secondly, the share of both men and women who report holding transfer rights jointly is substantial, although the survey does not allow us to recover whether rights are held jointly with a spouse, someone else within the household, or someone outside the household like a chief or lineage elder (Berge et al. 2014). Although the share of respondents who have rights is similar across land and dwellings, both men and women report being less likely to hold transfer rights (especially rights to bequeath) over their dwellings than their land.

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<sup>4</sup> Bambio and Bouayad Agha describe these hierarchical rights as “decreasing order of land rights: (i) Selling; (ii) Renting out for cash; (iii) Giving out of family; (iv) Lending traditionally; (v) Planting trees; and (vi) Giving as inheritance” in the context of Burkina Faso(2018).



**Figure 4:** Tenure Security and Transfer Rights Sankey Diagrams for Malawi. Flows in blue represent respondents who report feeling tenure secure; all other respondents are represented by flows in orange. **Source:** Authors’ calculations using WEMNS pilot data.

## Bangladesh and Nepal

Comparing the results from neighboring South Asian countries Bangladesh and Nepal shows the importance of analyzing by country and the value of the Sankey diagrams.

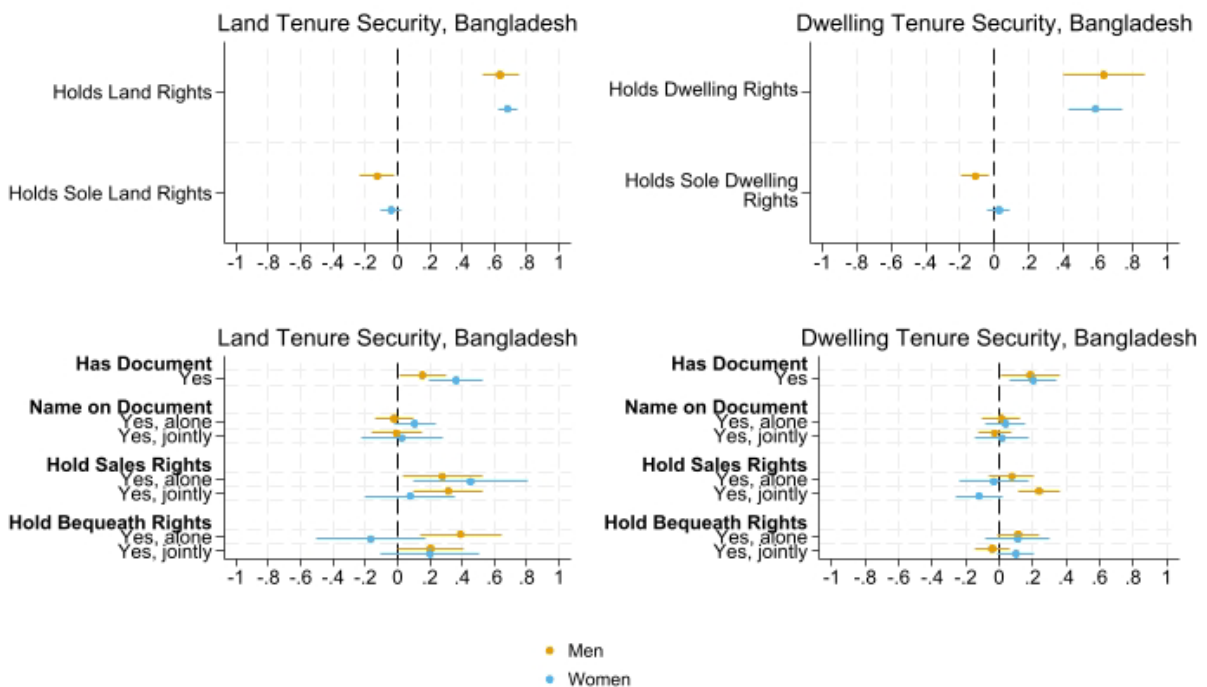
Looking first at the regression results for Bangladesh (Figure 4) and Nepal (Figure 5), we see very similar patterns: holding property rights has a significant positive relationship with tenure security, however having sole property rights has a significant negative relationship with security for men in Bangladesh,<sup>5</sup> but a significant small positive effect for sole land rights for women in Nepal. These differences were masked by the pooled country regressions. Note also that holding land rights has a much higher coefficient for men than for women in Nepal, consistent with overall higher tenure security for men than for women.

<sup>5</sup> The data does not ask who the joint rights are held with. We don’t know whether the joint rights are held across generations or with a spouse, which may have very different implications for tenure security.

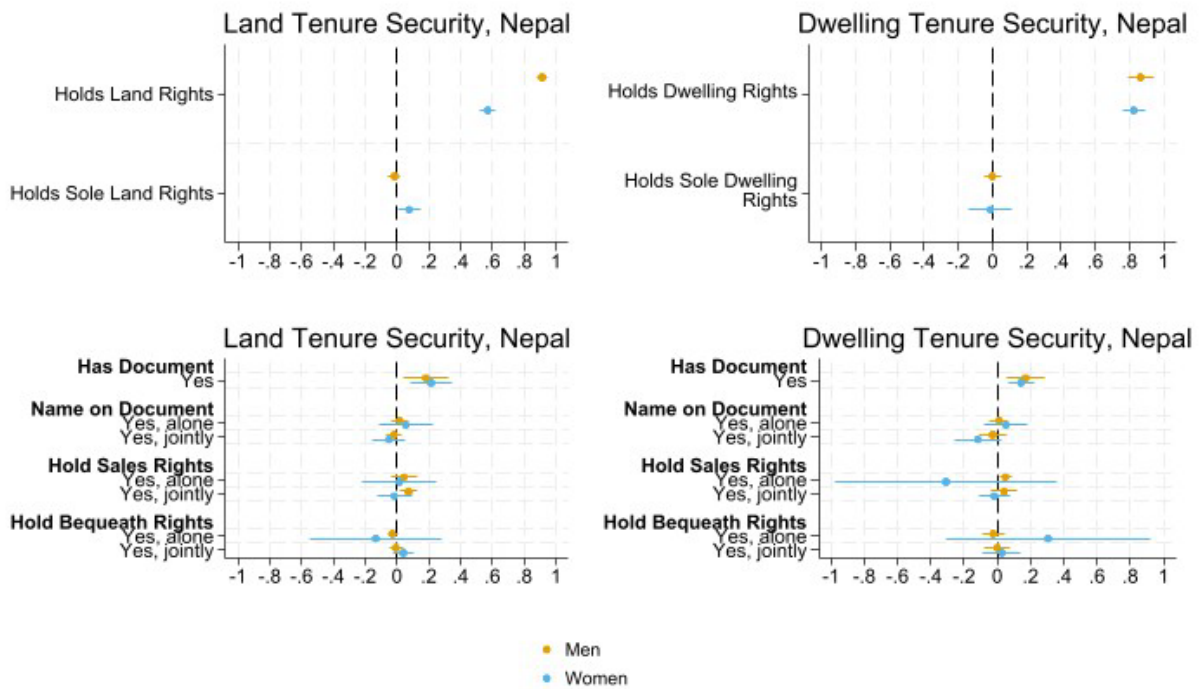
Having documents is significantly positively associated with security for land and dwelling in both countries, but having one's name on the document is not significant for men or women in either country, for either type of property.

The pattern for transfer rights is more mixed. For men in Bangladesh, holding sales rights to land alone or joint sales rights for dwelling are significantly associated with land tenure security. For women, only sole sales rights to land are significantly associated with tenure security. We do not find clear associations between transfer rights and reported security for men or women in Nepal.

Overall, we thus see that documentation makes a difference in both countries, but names on documents and transfer rights are not as tightly associated with tenure security as policymakers often assume (Valkonen 2021).



**Figure 5:** Tenure Security Regressions for Bangladesh. OLS results of a dummy equal to one if the respondent reports feeling tenure secure on their land and zero otherwise regressed on having rights (top row) or documentation and transfer rights held (bottom row). All regressions control for dummy variables representing 3 age categories, 4 occupation categories, 3 education categories, a PCA asset index, marital status, 3 phone ownership categories, having a government-issued ID, 16 relationship to household head categories, and a dummy for being in a rural area. Standard errors are clustered at the sampling cluster level. Models in yellow restrict the sample to male respondents, and in blue restrict to female respondents. **Source:** Authors' calculations using WEMNS pilot data.



**Figure 6:** Tenure Security Regressions for Nepal. OLS results of a dummy equal to one if the respondent reports feeling tenure secure on their land and zero otherwise regressed on having rights (top row) or documentation and transfer rights held (bottom row). All regressions control for dummy variables representing 3 age categories, 4 occupation categories, 3 education categories, a PCA asset index, marital status, 3 phone ownership categories, having a government-issued ID, 16 relationship to household head categories, and a dummy for being in a rural area. Standard errors are clustered at the sampling cluster level. Models in yellow restrict the sample to male respondents, and in blue restrict to female respondents. **Source:** Authors' calculations using WEMNS pilot data.

The Sankey diagrams reveal substantial differences between the countries, genders, and types of resources, which are masked in the regression results.

The first striking things in Bangladesh (Figure 7) are the very high proportion of women who report having no rights to land and the proportion of those who do have land rights who are insecure. The proportion of landless and tenure insecure men is also high, but not as high as for women. Most women with land rights report that the rights are documented, but few women have their names on the documents. The majority of women with documented land rights are secure, especially those named on documents. Nearly half of men with land rights are tenure insecure; this includes many men whose names are on a document. This may be because the documents are rental documents, in which case economic insecurity and concerns about the ability to pay rent can translate into tenure insecurity.

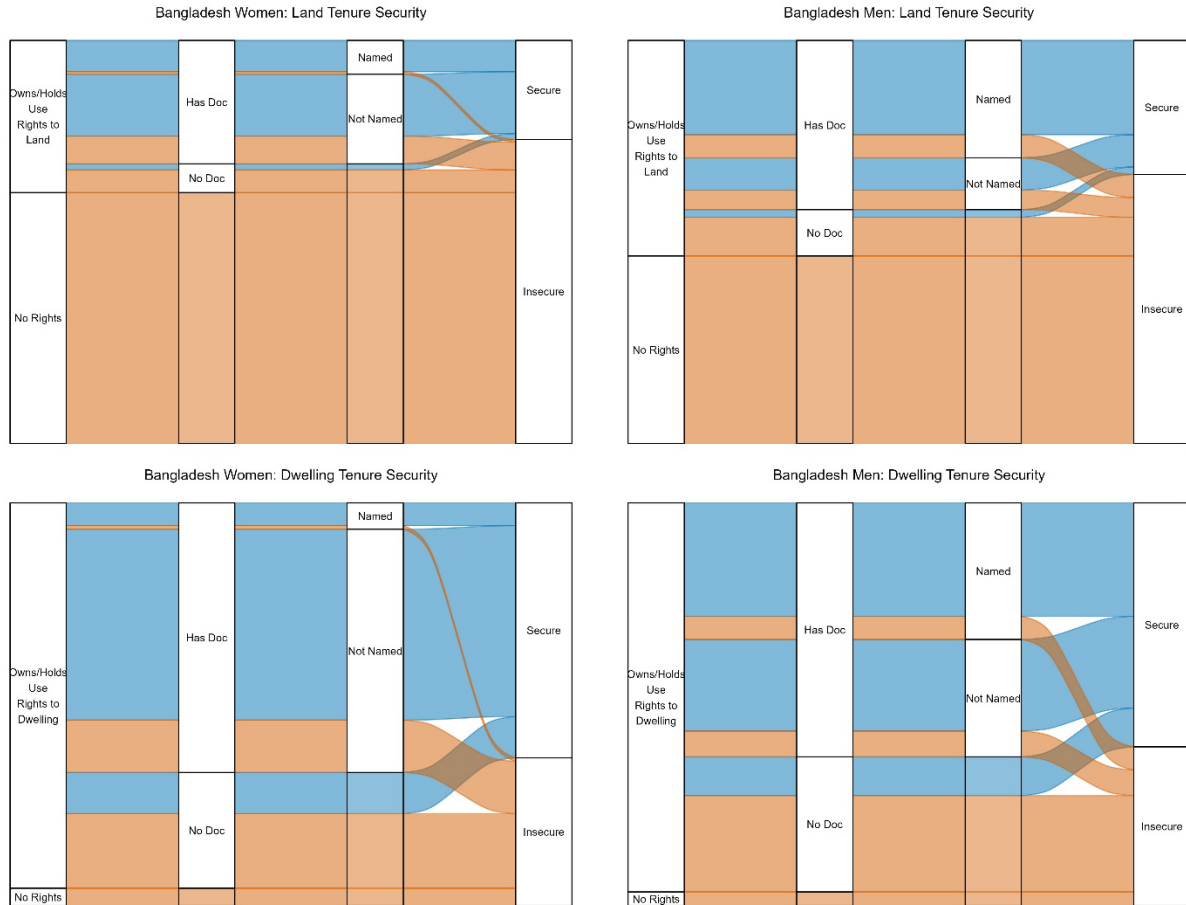
Turning to dwellings in Bangladesh, a very low proportion of women or men (about 4%) report having no rights to dwelling. However, when we look at documentation, distinct patterns emerge for men and women. Of those who have rights to their dwelling, more women than men report that there is a legal document for the dwelling. This is somewhat surprising for men and women interviewed from the same

households; women are more likely to believe they have a document than men.<sup>6</sup> More strikingly, though, over half of those men who have a document are named on the document, while less than 10% of women are named. This substantial difference is not reflected in perceived tenure security, though: a similar proportion of women and men report being tenure secure. In the regressions, the coefficient linking having a document to security was similar for men and women. But this masks the fact that women are much less likely to be named on documents. But although men are more likely to be named on the document, having their name on the document has a weaker association with tenure security than it does for women. These differences could easily be missed without seeing the whole pathway as in Figure 7. In the Sankey diagrams, the crossing of the blue and orange lines shows that documentation does not necessarily equate to security: many without documents are secure, and many with documents are insecure.

These results also suggest that despite women being much less often named on formal documents for their dwellings in Bangladesh, their perceived tenure security for those dwellings may not depend on being named. Men may rely more on formal documentation than women do for their tenure security. Although the data cannot address why this is the pattern, it may be that women see less value in being named on legal documents if they do not have access to the courts, but put more weight on social relationships for their tenure security (Lawry et al. 2023; Valkonen 2021). Or it may be that women are primarily concerned about threats from outside the household, in which case it is tenure security at the household level which is most important (Ghebru 2019).

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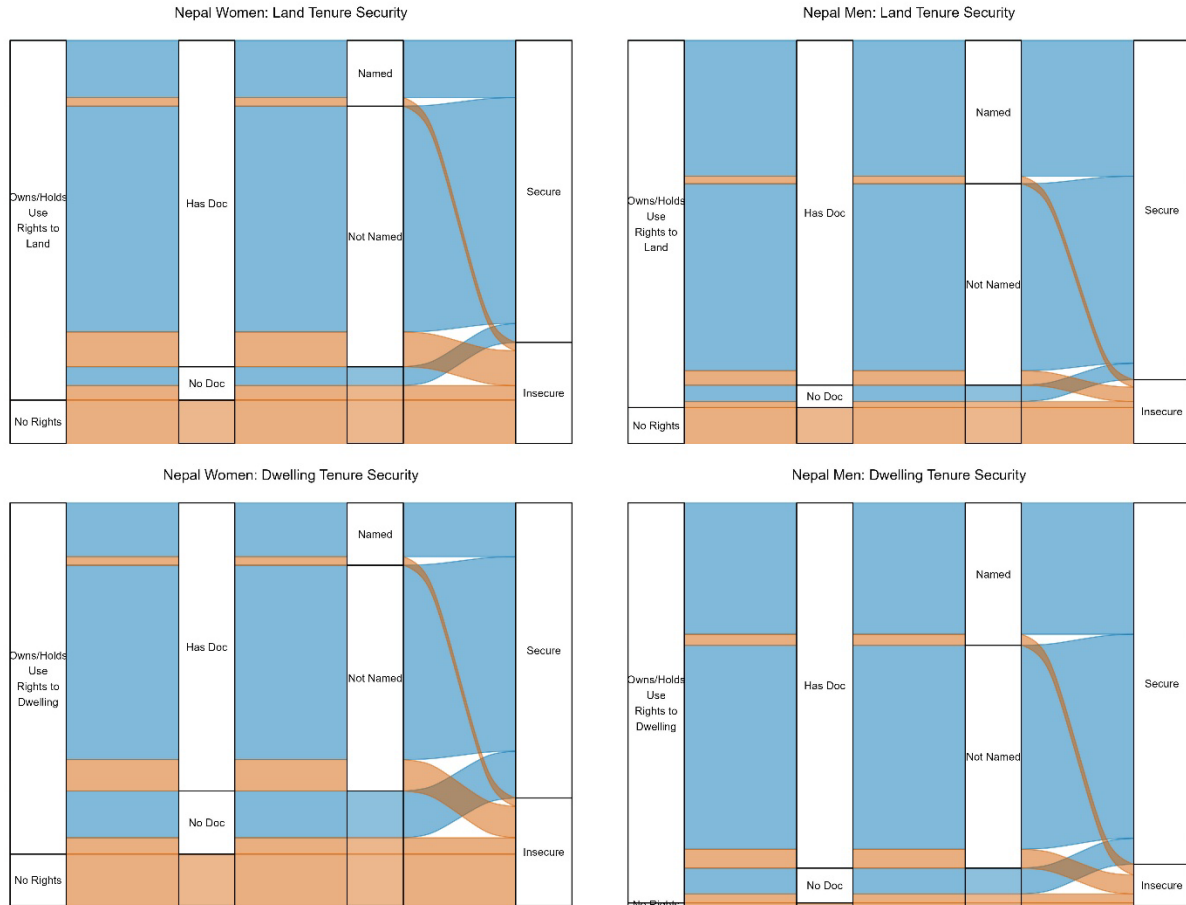
<sup>6</sup> Respondents could indicate they did not know whether they had a document, although this was very rare in the data.



**Figure 7:** Tenure Security and Documentation Sankey Diagrams for Bangladesh. Flows in blue represent respondents who report feeling tenure secure; all other respondents are represented by flows in orange. **Source:** Authors’ calculations using WEMNS pilot data.

Shifting from Bangladesh to Nepal in Figure 8, the Sankey diagrams reveal another marked contrast in the overall proportions of landlessness and tenure insecurity: the proportion of blue and orange is almost reversed between the countries. Most women and men in Nepal report having land rights, and documentation of those rights. While men are more likely than women to have their names on land documents, and women are more likely to report tenure insecurity than men, most women and men with land rights are secure, even without documents.

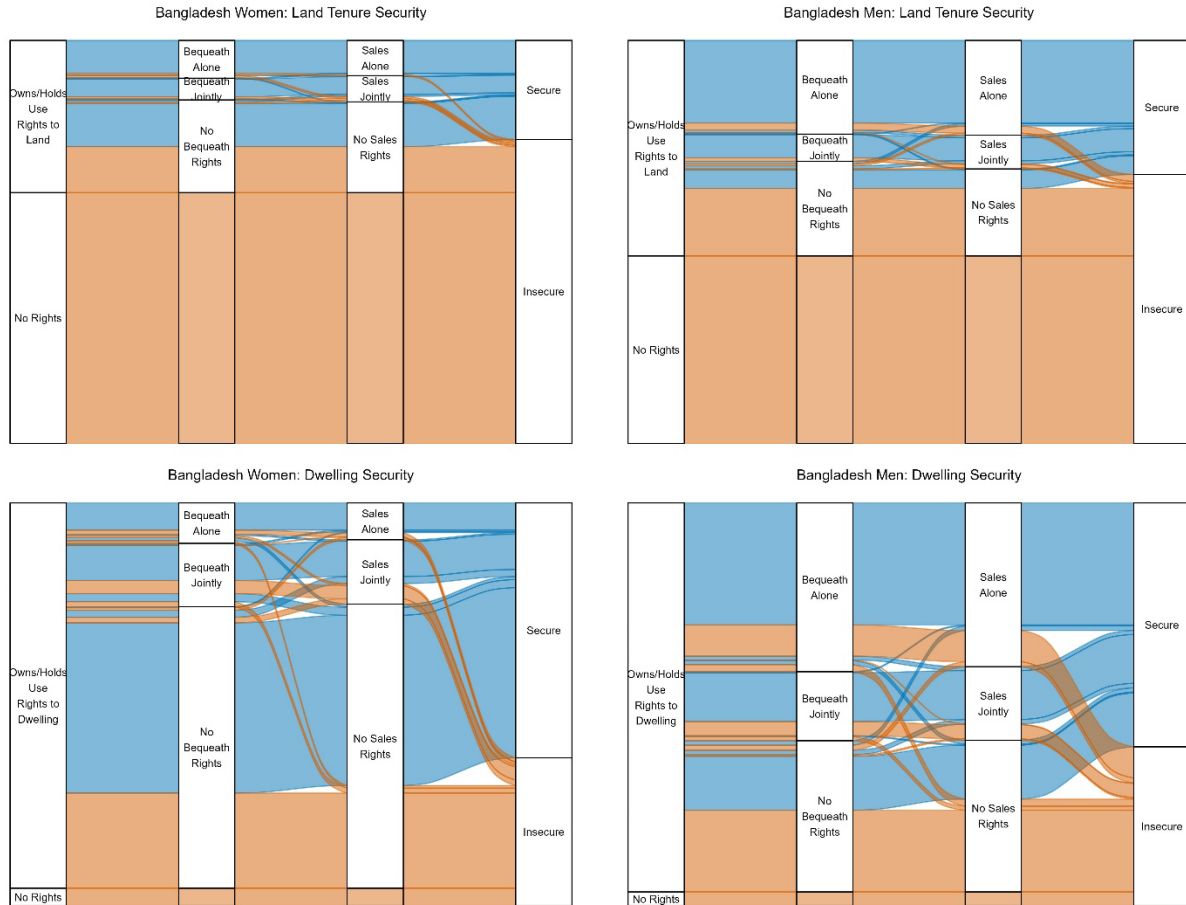
The picture for land and dwelling rights is similar for women in our Nepal sample (though somewhat surprisingly, more women report having no rights to dwelling than to land). Very few men report having no rights to dwelling; most also report documentation of their dwelling rights, though that does not necessarily translate into tenure security for women, especially if they are not named on the document. Overall, the proportion of men who are insecure in their dwelling tenure is low, even for those without documentation.



**Figure 8:** Tenure Security and Documentation Sankey Diagrams for Nepal. Flows in blue represent respondents who report feeling tenure secure; all other respondents are represented by flows in orange. **Source:** Authors’ calculations using WEMNS pilot data.

The Sankey diagrams for transfer rights in Bangladesh (Figure 9) show that a high proportion of both men and women with land rights do not have rights to sell or bequeath the land, consistent with some form of rental or sharecropping, or joint family holdings where an individual cannot sell property without agreement from other family members. Most of those men or women reporting rights to bequeath also report rights to sell. A substantial proportion report being secure, whether or not they have sale or transfer rights.

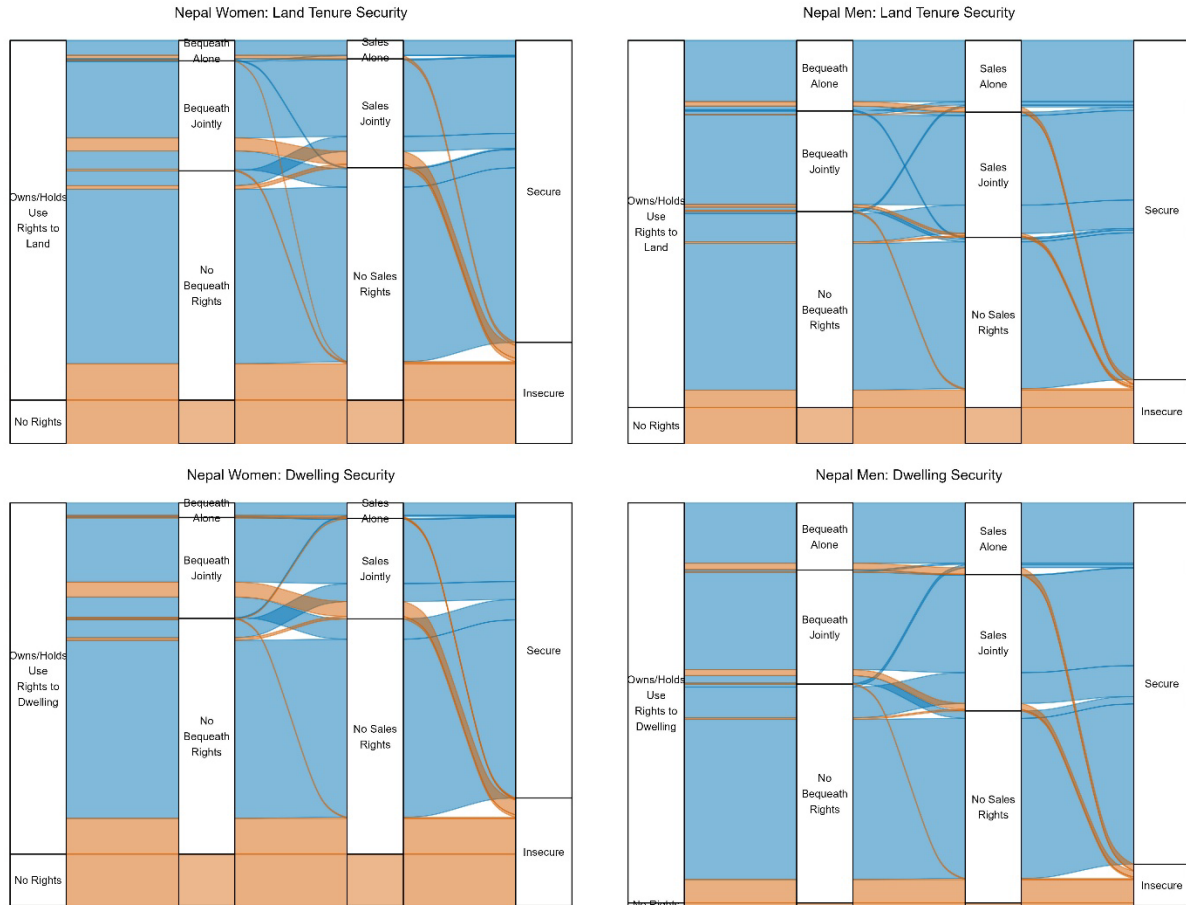
The picture on transfer rights to dwelling is much more mixed. Very few women report having any transfer rights, whereas most men with dwelling rights report having both bequeath and sales rights. The majority of women with transfer rights report holding them jointly, whereas the majority of men with transfer rights report holding them individually. The crossing of the blue and orange lines shows that, while rights to bequeath and sell may be associated, these do not necessarily align with security. The majority of women with no transfer rights report being secure, while some with joint transfer rights are insecure. For men, the majority who report they are secure also have transfer rights.



**Figure 9:** Tenure Security and Transfer Rights Sankey Diagrams for Bangladesh. Flows in blue represent respondents who report feeling tenure secure; all other respondents are represented by flows in orange. **Source:** Authors' calculations using WEMNS pilot data.

In Nepal, a high proportion of women with land rights report no transfer rights (Figure 10). The proportion of men with no rights to bequeath is somewhat lower than for women, and the proportion with no sales rights is even lower. Few women report transfer rights alone, and even the majority of men with transfer rights report having them jointly, which is consistent with Nepali traditions of family land.<sup>7</sup> The patterns for dwellings are very similar to those for agricultural land. Very few men with transfer rights to land or dwelling report being insecure, while a slightly higher portion of women with transfer rights report insecurity.

<sup>7</sup> The WEMNS data does not collect information on other ethnic or cultural factors that could shape patterns of land rights, such as exogamy or endogamy, patterns of postmarital residence, inheritance patterns, or religion. However, future work could use Sankey diagrams to explore their relationships with tenure security.



**Figure 10:** Tenure Security and Transfer Rights Sankey Diagrams for Nepal. Flows in blue represent respondents who report feeling tenure secure; all other respondents are represented by flows in orange. **Source:** Authors’ calculations using WEMNS pilot data.

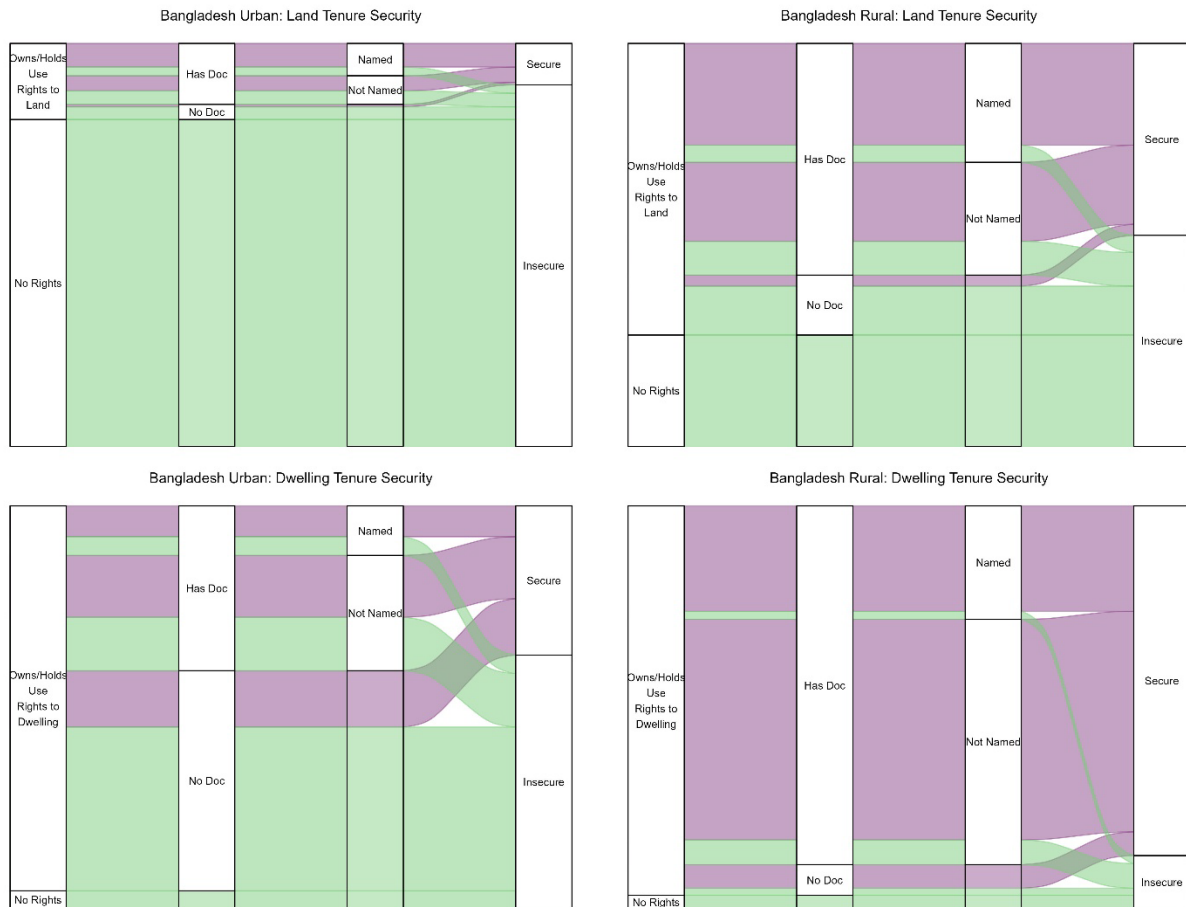
## Extensions

While our focus in this paper is on gender differences, the Sankey visualizations can be revealing for comparative analysis across any subgroups, such as urban and rural locations, age, or position within the household. In the following subsection we illustrate this by comparison of urban and rural households, using Bangladesh as an example given the sampling strategy that equally weighted urban and rural areas. For simplicity and because of sample size limitations, we combine women and men, but further disaggregation would be possible.

The Sankey diagrams for urban and rural land and dwelling in Bangladesh (Figure 11) show that urban respondents are much more likely than rural respondents to be landless and insecure in their land tenure.<sup>8</sup> This is consistent with the urban sample drawn from the Census of Slum Areas and Floating Populations. In both urban and rural areas, most respondents report having rights to a dwelling. However, while over half of urban residents have no document for their dwelling, most rural respondents report having a

<sup>8</sup> We unfortunately do not have any information about the location of land parcels respondents are reporting, whether these parcels are also in urban areas or perhaps land owned in rural areas, including by temporary migrants.

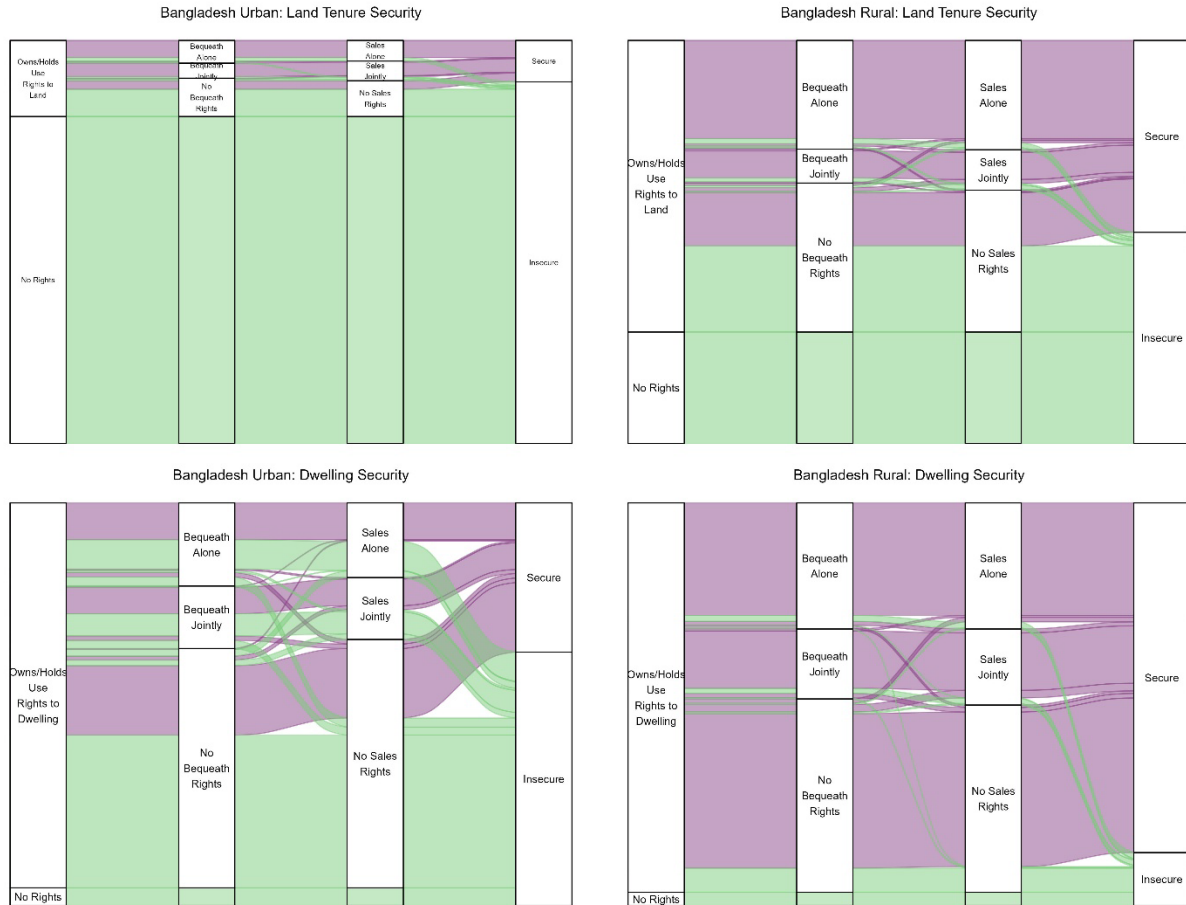
document, though most who report having a document say they are not named on the document. Overall, security of dwelling is much higher for rural than urban respondents.



**Figure 11:** Tenure Security and Documentation for Rural and Urban Respondents, Bangladesh. Flows in purple represent respondents who report feeling tenure secure; all other respondents are represented by flows in green.

**Source:** Authors' calculations using WEMNS pilot data.

Examining transfer rights to land (Figure 12), we see that a substantial portion of both urban and rural respondents with land rights report having no transfer rights, but most with transfer rights are secure. Dwelling provides a much more mixed picture, especially in urban areas; the majority of rights holders have no transfer rights to dwelling, but many of the urban respondents with transfer rights are insecure, whereas most rural respondents are secure in their rights to dwelling, even without transfer rights.



**Figure 12:** Tenure Security and Transfer Rights Sankey Diagrams for Rural and Urban Respondents, Bangladesh. Flows in purple represent respondents who report feeling tenure secure; all other respondents are represented by flows in green.

**Source:** Authors’ calculations using WEMNS pilot data.

A similar exercise is possible, distinguishing respondents by generation (household head/spouse versus their adult children or children-in-law; or household head/spouse and their parents), given the fact that the WEMNS pilot data randomly selected individuals within the household rather than only interviewing the primary couple. However, in Bangladesh, 83% of our sample is either the household head or their spouse, and only 13% their children’s generation, making disaggregation on this generational basis difficult.<sup>9</sup> Nevertheless, larger data sets employing a similar sampling strategy may find it illustrative to use this tool to examine generational differences both within and across households. This is particularly relevant as the SDG indicators of tenure security use individuals as the unit of analysis. This is particularly relevant as the SDG indicators of tenure security use individuals as the unit of analysis (Brunelli and Gourlay 2022).

<sup>9</sup> The proportions in Malawi are quite similar, with 83% of the household head generation and 12% their children’s generation; in Nepal, 60% of respondents are either the head or spouse and 35% are their children’s generation.

## Discussion

In this paper, we lay out a methodology for identifying the extent to which the content of property rights are associated with people's perception of their tenure security, and particularly the extent to which documentation is correlated with security. Our key findings use pilot data from three countries to provide insights on patterns of tenure insecurity. We find that looking at conventional regressions on the factors affecting tenure security often masks important patterns that are much more visible in Sankey diagrams. The Sankey diagrams show that there are people who tenure insecure despite there being a document with their name on it. But the number of people in this situation differs by country, gender of respondent, and whether the property is land or a dwelling. Similarly, the content of property rights in terms of transfer rights— the right to bequeath or the right to sell – does not consistently correspond with tenure security.

### Findings from pilot data

Because our data is pilot data and not representative of each of the countries, we must be cautious in drawing conclusions about the patterns of tenure in each of these countries. While the patterns should not be generalized to the national level in any of the countries, they provide important insights into how we need to be thinking about tenure security.

The gendered patterns of tenure security vary considerably by country. In Malawi, we see similar patterns for men and women for land and dwelling, both in terms of the share who own or hold use rights to property and in terms of those who are tenure secure. In Nepal and Bangladesh, men are more likely to have ownership or use rights of property. In addition, considerably more women are tenure insecure; in Nepal, even women with property rights are more likely to be insecure than men.

When we examine women's tenure security, it is important to consider two aspects. The first is whether the household is tenure secure; is the household facing threats from outside the household, such as land appropriation or the inability to make rental or other payments? The second is tenure security within the household; do individuals face risks of losing tenure in the event of divorce or the death of their spouse or the dissolution of the household? While men also face the first type of risk, they face less of the second type of risk (Ghebru 2019).

Across the countries, but particularly in Bangladesh, we see women whose households have a document report that they are tenure secure even though their names are not on the document. It is worth noting that relatively few women's names are on documents in these contexts and thus, there are fewer examples of how having one's own name on the document may be beneficial. Thus, this should not be interpreted as implying it is unimportant to include women's names on documents when property is being titled, as those who report being secure may not be aware of risks which documented rights in their name might protect against.

Overall, the three countries have different patterns of property ownership/use and tenure security, which the Sankey diagrams reveal more clearly than the regressions. The Nepal sample has the highest rates of land ownership and access and the highest tenure security levels across the three countries. Bangladesh has the lowest rates of land ownership or use rights for land (related, in part, to the highly urban sample), but Malawi has the lowest rates for dwellings.

The Malawi sample has a relatively high share of owners/holders who do not have a document, compared to Nepal and Bangladesh. This reflects the large amount of land in Malawi that is under customary tenure. Yet most of the respondents in Malawi who don't have a document say that they are tenure secure. This is true for both men and women and for both land and dwelling. In Nepal, most of those with rights to land

have document; even so, the majority of those without documents are tenure secure. The sample in Bangladesh has high landlessness. Even though the majority of those with land rights report having documentation, many with documents are also insecure.

In all three countries, the majority of people who are themselves named on the document are tenure secure; but there are people named on the document who are tenure insecure as well. Thus, having a document, even having your own name on it, does not guarantee that you are tenure secure.

While there is some overlap in the various dimensions of land rights that we consider, including reported land rights, documentation, the abilities to bequeath or sell it, and tenure security, there is not complete overlap. In all three countries, we see some crossing of the blue and orange lines (Figures 4, 9, and 10). We see the least crossing for men in Nepal, in part because the vast majority of men have all of the rights and are tenure secure. In Malawi, the blue and orange lines cross much more often; there is much less correlation among the various rights and of the rights with tenure security. Interestingly, the share of respondents who report holding transfer rights is much lower for dwellings than land in Malawi.

## Methodological issues

A number of methodological issues are raised by this work. Many of these are broadly relevant to any analysis of land rights and tenure security, but we discuss them particularly in the context of the approach used in the WEMNS data collection and the SDG indicators.

First is the question of who is interviewed. Many surveys continue to ask one household member to report on asset ownership and rights for all household members. Some evidence suggests that individuals within the households will provide different answers to these questions (Ambler et al. 2021, 2022; Kilic and Moylan 2016). Interviewing a single individual therefore introduces one form of potential bias. But more importantly, it is not possible to ask one person whether other household members perceive themselves as tenure secure. This is a question that people must respond to themselves. If we are concerned that women may be tenure insecure due to the dissolution of the household, it is important to ask the women themselves about their tenure security. The WEMNS data asks individuals about their own tenure security.

Some surveys, such as the Women's Empowerment in Agriculture Index (WEAI) surveys<sup>10</sup>, interview the two members of the principal couple in the household, sometimes referred to as the male head and the female head. This allows for some gender analysis, but only for men and women who are members of the principal couple. It potentially ignores both an older generation, such as the parents of the head who may reside with them, or a younger generation such as the adult children of the head and their spouses. Interviewing the principal couple does not generate a representative sample of men and women.

The WEMNS data randomly chooses one man and one woman in each household to interview, providing a broader range of ages and social positions, including those who are not part of the principal couple in the household. This is particularly important for understanding issues of tenure security, because widows and younger unmarried people may have very different patterns of tenure security than the principal couple in the household (Dillon and Voena 2018; Holden and Ghebru 2016; Yeboah et al. 2019). While the WEMNS approach provides a more comprehensive picture of tenure security, it does not necessarily lend itself well to intrahousehold analyses. We might expect that the bargaining between, for example, a man and his elderly mother, or a woman and her adult son, or indeed between a household head and his daughter in law, would be quite different from the bargaining that occurs between spouses. Unless the

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<sup>10</sup> This is a family of indices with corresponding sets of survey questions needed to obtain the necessary data. See <https://weai.ifpri.info/>

sample size was very large, it would be unlikely that it would include enough of these various types of pairs to separately analyze these relationships.

In addition, in the WEMNS data, while we have two people in the household each reporting on their tenure security, it is not possible to tell whether or not they are talking about the same parcel of land. The survey asks about whether the rights are individual or joint, but, for the sake of brevity, does not ask who the rights are joint with. Thus, seemingly contradictory responses may be simply that they are discussing different properties. Such data cannot be used to ask whether people within the household provide different information to the same questions, since the frame of reference will differ across respondents.

Tenure security is often modeled as the (actual) probability of losing a property in the future. This theoretical construct is impossible to empirically measure *ex ante*: neither researchers nor respondents know whether they will lose the property in the future. In this paper, we use the respondent's perception of their tenure security: although imperfect, it is a valuable measure because these perceptions also affect decisions they make, both regarding how much to invest in the property as well as how to invest in other livelihood activities and human capital. The policy relevance of perceived tenure security is better than other proxies that have been used related to the content of rights, such as whether the property has an ownership document, whether the respondent is named on the document, or whether the respondent holds transfer rights: our analysis shows that documentation and transfer rights are often not aligned with perceived tenure security. Exploring the reasons for this misalignment is beyond the scope of our data but would be useful in guiding policy.

Closer examination of the data collection protocol also raises questions of whether not having tenure security is the same as being tenure insecure. In the WEMNS protocol, only those with use or ownership rights are asked further questions about the content and security of those rights; the rest are coded as not having documentation, transfer rights, or secure rights. Thus, a large source of the tenure insecurity that we find regarding land in Bangladesh is among people who are landless. This is a different form of insecurity than those who have land but are worried that they will lose it. Thus, we may not want to aggregate these two forms of insecurity for analytical purposes.

While many may not have any land rights, for dwelling it is less clear. Some people do not claim that they have use or ownership of a dwelling. Yet, everyone in our sample lives somewhere. An individual may live with extended family and have no claims on the dwelling, but may be tenure secure in the sense that they expect to be able to live in the family home indefinitely, which may be considered "tolerated use" (Meinzen-Dick and Pradhan 2002). If we want to understand tenure insecurity more broadly with regard to dwellings, we may need to ask everyone whether they expect to lose their access to a dwelling, regardless of whether or not they say they own or use a dwelling. Since everyone needs a place to live, it is important to understand whether they have tenure security with regard to their dwelling, regardless of whether or not they own it or claim to have use rights.

The opening question about whether the respondent has "use or ownership" rights may thus have to be disaggregated, because the sources and meaning of insecurity are different for those with ownership claims to land or dwelling and those who rent or otherwise obtain use of the property. In particular, rental requires continuous payments, and other ways of obtaining use rights depend on maintaining relationships with the "owner", which may provide different sources of insecurity.

The WEMNS data on land rights and tenure security is very useful for understanding broad patterns. It will be useful for monitoring progress towards greater equality in land rights and in promoting tenure security for all. But because WEMNS follows the methodology used for SDG indicators 1.4.2 and 5.a.1, it is also important to spell out what cannot be done with this data alone. With just the WEMNS data, it is

not possible to identify the sources of insecurity or why particular patterns hold. Analysis of the cross-country patterns can help identify some of the factors that may promote or inhibit women's land rights, when combined with other country level data for this type of cross-country analysis. If the WEMNS data is collected as part of a larger survey, as in the 50x2030 initiative (Brunelli and Gourlay 2022), then there may be additional socioeconomic information on the respondents to identify characteristics of those who are and those who are not tenure secure.

Finally, the questions are structured so that we know whether the respondent has rights to bequeath or sell individually or jointly, but we don't know who the rights are held with. Holding property jointly with a spouse may have very different implications from holding it jointly with an adult child or with people outside the household, such as with a chief or community members under customary tenure.

The SDG indicators are only for land, not for dwelling. We have shown that there are important differences in some contexts between the patterns of tenure security for land and dwellings. While land continues to be an important source of livelihoods for many of the world's poor, with increasing urbanization and livelihood diversification, dwellings are becoming relatively more important.

The questions on land rights in the WEMNS are very brief, designed simply to provide information to construct the SDG indicator while keeping overall survey length short. The advantage is that they can be easily incorporated into large sample household surveys. But, by construction, they leave out a lot of detail. Some surveys have collected much more detail, asking about each parcel of land or dwelling held by anyone in the household. Collecting information on the various parcels of land and dwellings could help identify characteristics of properties that may be more or less tenure secure.

The Gender Asset Gap Project identified four different indicators of gaps in asset ownership relevant to land and dwelling ownership (Deere et al. 2011; Doss et al. 2014; Doss et al. 2015). The two that use individuals as the unit of analysis can be calculated with the WEMNS data. The gender asset gap or the incidence gap is the proportion of women (or men) who have ownership (or other specified rights) to the property. This can be calculated with the WEMNS if it specifies whether the respondent owns the land. The share of owners who are women can also be calculated. The other two indicators require information on each parcel of land or dwelling that a respondent owns. These include the distribution of property by form of ownership, which categorizes the property by whether it is owned individually or jointly and by whom. The gender wealth gap calculates the value of the properties owned by men and women. The WEMNS data does not allow for the calculation of these measures.

To enable intrahousehold analysis, we would need to be able to identify the relationship between the various respondents. While often a household roster will identify the relationship of the respondent to the household head, this does not always allow us to identify the relationship among the respondents. For instance, we wouldn't know which son the woman identified as a daughter-in-law is married to. In agricultural surveys that distinguish different parcels of land, it would be relatively easy to determine whether or not the respondents were talking about the same parcel of land. This would allow for analysis of how the different patterns of ownership, particularly who owns them jointly, affects perceived tenure security. For example, do you feel more secure if you own the property jointly with your spouse than with your brother?

## Conclusions

While there is much literature and policy attention on tenure security, it is not always clear what is meant by this term. Our examination of the details of measuring this concept and comparisons between men and women in different countries shows the need for closer attention to the meaning of tenure security in different contexts. As noted by Slavchevska et al. (2021), consistent measures of women’s and men’s land rights are fundamental to guide development policies, but the indicators used are substantively different, and should not be used interchangeably. Using the pilot data from the Women’s Empowerment Metric for National Statistical Systems (WEMNS), our study shows that perceived tenure security is not always aligned with the content of property rights, especially holding legal documentation or transfer rights—which have often been used as indicators of tenure security (Arnot et al. 2011; Valkonen 2021). The importance of documentation of rights, being named on documents, and having sole or joint rights should be regarded as variables to be understood, rather than as necessary components of tenure security. Because each of these aspects of tenure are important, it is valuable to collect data on each, but not to conflate them.

This paper also shows how Sankey diagrams can provide a means to visualize how the various dimensions of tenure security do or do not align. It also provides a visual contrast to show differences both in levels and correlations of tenure security by gender, by type of property, urbanicity, status within the household, and by country, which may be masked in conventional regressions.

The lack of relationship in regressions between the content of property rights and security may be because a high proportion are secure (as in Nepal), a high proportion are landless or insecure (as in Bangladesh), or because the factors are orthogonal. Distinguishing among these is important for policy and practice. In particular, what insecurity means for those who don’t have property is different from those who are afraid of losing property. Losing land as an economic asset also has different implications from losing one’s dwelling, and dwelling security (including in rural areas) merits more attention. If documentation and being named on documents does not increase confidence that women (or men) will not lose their land, it does not mean that gender-equitable documentation is not important but should prompt closer examination of why. For example, is the state not seen as a major source of tenure security, or are respondents not aware of what protections documented rights could provide? Further disaggregating insecurity of tenure for owners versus renters could help to identify whether (and for whom) economic insecurity is a source of tenure insecurity.

Based on our analysis, we recommend the inclusion, at a minimum, of measures of land rights that include tenure security, documentation, and transfer rights in surveys to create the SDG indicators and other large-sample multi-purpose surveys. They provide important information and are useful for reporting on gender gaps and overall progress on tenure security for men and women.

Yet, these minimal measures alone can only tell us that the gaps exist. To understand why the gaps exist, more information is needed. Some of this information, such as socio-economic or demographic information on the respondents may be included in the roster, and embedding WEMNS in large-sample multi-purpose surveys can provide other valuable correlates. We have noted through the paper a variety of instances where additional information, such as ethnicity, religion, or relations among household members, may allow richer analysis. While individuals’ confidence that they will not involuntarily lose property rights has a direct value for wellbeing and can contribute to further investment, this may not account for all future threats. It is useful to conduct smaller sample and more in-depth analyses of tenure security, using both detailed surveys, and qualitative and administrative data, e.g. on loss of land rights. Piecing these together can help to understand the “why” and can be designed to focus on specific groups

of people, such as women, indigenous peoples, or those living in particular areas, to inform policies and interventions to strengthen tenure security.

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# Appendix

## WEMNS Property Rights Survey Module

	<b>INTERVIEWER, READ ALOUD:</b> Now I am going to ask you about your ownership or right to use land and dwellings	
<b>H01</b>	Do you own or hold use rights to <i>any parcels of land</i> , either alone or jointly with someone else?	Yes, alone ..... 1 Yes, jointly ..... 2 Yes, both alone and jointly ..... 3 No ..... 4 >>H08 DO NOT READ: Don't know ..... 97 >>H08 DO NOT READ: Refused ..... 98 >>H08 DO NOT READ: Not applicable ..... 99 >>H08
<b>H02</b>	Do you own or hold use rights to agricultural land, non-agricultural land, or both?	Agricultural land only ..... 1 Non-agricultural land only ..... 2 Both agricultural and non-agricultural land ..... 3 DO NOT READ: Don't know ..... 97 DO NOT READ: Refused ..... 98 DO NOT READ: Not applicable ..... 99
<b>H03</b>	Do you have the right, either alone or jointly with someone else, to sell <i>any parcels of land</i> you own, or hold use rights to?	Yes, alone ..... 1 Yes, jointly ..... 2 Yes, both alone and jointly ..... 3 No ..... 4 DO NOT READ: Don't know ..... 97 DO NOT READ: Refused ..... 98 DO NOT READ: Not applicable ..... 99
<b>H04</b>	Do you have the right, either alone or jointly with someone else, to give any parcels of land you own, or hold use rights to, by oral or written will, to other persons after your death?	Yes, alone ..... 1 Yes, jointly ..... 2 Yes, both alone and jointly ..... 3 No ..... 4 DO NOT READ: Don't know ..... 97 DO NOT READ: Refused ..... 98 DO NOT READ: Not applicable ..... 99
<b>H05</b>	Is there a document for any parcels of land you own, or hold use rights to that is issued by or registered at the Land Registry/ Cadastral Agency, such as a title deed, certificate of ownership, certificate of hereditary acquisition, lease or rental contract??  <b>NOTE TO RESPONDENT:</b> <i>Examples in Malawi: The document can be application for customary estate, offer of customary estate, acceptance of offer of customary estate, certificate of customary estate, freehold title, land certificate, certificate of official research, rental contract, lease contract.</i> <i>Examples in Bangladesh: The document can be Barga contract, non-agricultural Khas land lease form, endorsement of certificate of registration, lease, occupation, verifying the current Khatian (record of rights).</i> <i>Examples in Nepal: The document can be title deeds (Lalpurja), receipts showing tax or rent has been paid, contract or agreements, and wills or approval documents.</i>	Yes ..... 1 No ..... 2 >>H07 DO NOT READ: Don't know ..... 97 >>H07 DO NOT READ: Refused ..... 98 >>H07 DO NOT READ: Not applicable ..... 99 >>H07

	<b>INTERVIEWER, READ ALOUD:</b> Now I am going to ask you about your ownership or right to use land and dwellings	
<b>H05a</b>	What type of documents are there for parcels of land you own, or hold use rights to? [SELECT ALL THAT APPLY]	TITLE DEED.....1 CERTIFICATE OF CUSTOMARY OWNERSHIP.....2 CERTIFICATE OF OCCUPANCY.....3 CERTIFICATE OF HEREDITARY.....4 ACQUISITION LISTED IN REGISTRY.....5 SURVEY PLAN.....6 RENTAL CONTRACT, REGISTERED.....7 LEASE, REGISTERED.....8 OTHER (SPECIFY).....96
<b>H06</b>	Is your name listed on any of these documents as an owner or use right holder, either alone or jointly with someone else?	Yes, alone..... 1 Yes, jointly ..... 2 Yes, both alone and jointly ..... 3 No ..... 4 DO NOT READ: Don't know ..... 97 DO NOT READ: Refused ..... 98 DO NOT READ: Not applicable..... 99
<b>H07</b>	How likely are you to involuntarily lose ownership or use rights to any land you own, or hold use rights to in the next 5 years? <b>READ RESPONSE OPTIONS</b>	Not all likely.....1 Slightly likely.....2 Moderately likely.....3 Very likely.....4 Extremely likely.....5 DO NOT READ: Don't know ..... 97 DO NOT READ: Refused ..... 98 DO NOT READ: Not applicable..... 99
A dwelling is defined as a room or suite of rooms in a permanent building or structurally separated part of a building (e.g., a unit in an apartment building), that is used for private habitation by one or more households.		
<b>H08</b>	Do you own or hold use rights to the dwelling in which you live, either alone or jointly with someone else?	Yes, alone..... 1 Yes, jointly ..... 2 Yes, both alone and jointly ..... 3 No ..... 4 DO NOT READ: Don't know ..... 97 DO NOT READ: Refused ..... 98 DO NOT READ: Not applicable..... 99
<b>H09</b>	Do you have the right, either alone or jointly with someone else, to sell the dwelling in which you live? CAPI PROGRAMMING NOTE: THIS QUESTION IS ENABLED ONLY IF H08==1, or 2, or 3	Yes, alone..... 1 Yes, jointly ..... 2 Yes, both alone and jointly ..... 3 No ..... 4 DO NOT READ: Don't know ..... 97 DO NOT READ: Refused ..... 98 DO NOT READ: Not applicable..... 99
<b>H10</b>	Do you have the right, either alone or jointly with someone else, to give your residential dwelling, by oral or written will, to other persons after your death? CAPI PROGRAMMING NOTE: THIS QUESTION IS ENABLED ONLY IF H08==1, or 2, or 3	Yes, alone..... 1 Yes, jointly ..... 2 Yes, both alone and jointly ..... 3 No ..... 4 DO NOT READ: Don't know ..... 97 DO NOT READ: Refused ..... 98 DO NOT READ: Not applicable..... 99

	<b>INTERVIEWER, READ ALOUD:</b> Now I am going to ask you about your ownership or right to use land and dwellings	
<b>H11</b>	<p>Is there a document for the residential dwelling you own, or hold use rights to that is issued by or registered at a government agency, such as a title deed, certificate of ownership, certificate of hereditary acquisition, lease or rental contract?</p> <p><i>Examples in Malawi: The document can be application for customary estate, offer of customary estate, acceptance of offer of customary estate, certificate of customary estate, freehold title, land certificate, certificate of official research, rental contract, lease contract</i></p> <p><i>Examples in Bangladesh: The document can be Barga contract, non-agricultural Khas land lease form, endorsement of certificate of registration, lease, occupation, verifying the current Khatian (record of rights).</i></p> <p><i>Examples in Nepal: The document can be title deeds (Lalpurja), receipts showing tax or rent has been paid, contract or agreements, and wills or approval documents.</i></p> <p><b>CAPI PROGRAMMING NOTE:</b> THIS QUESTION IS ENABLED ONLY IF H08==1, or 2, or 3</p>	<p>Yes ..... 1</p> <p>No ..... 2 &gt;&gt;H14</p> <p>DO NOT READ: Don't know ..... 97 &gt;&gt;H14</p> <p>DO NOT READ: Refused ..... 98 &gt;&gt;H14</p> <p>DO NOT READ: Not applicable..... 99 &gt;&gt;H14</p>
<b>H11a</b>	<p>What type of documents are there for the residential dwelling you own, or hold use rights to? [SELECT ALL THAT APPLY]</p>	<p>TITLE</p> <p>DEED.....1</p> <p>CERTIFICATE OF CUSTOMARY OWNERSHIP.....2</p> <p>CERTIFICATE OF OCCUPANCY.....3</p> <p>CERTIFICATE OF HEREDITARY .....4</p> <p>ACQUISITION LISTED IN REGISTRY.....5</p> <p>SURVEY PLAN.....6</p> <p>RENTAL CONTRACT, REGISTERED.....7</p> <p>LEASE, REGISTERED.....8</p> <p>OTHER (SPECIFY).....96</p>
<b>H12</b>	<p>Is your name listed on any of these documents as an owner or use right holder, either alone or jointly with someone else?</p> <p><b>NOTE TO RESPONDENT:</b> The document can be [TO BE COMPLETED FOR COUNTRY-SPECIFIC CONTEXT]</p> <p><b>CAPI PROGRAMMING NOTE:</b> THIS QUESTION IS ENABLED ONLY IF H11==1</p>	<p>Yes, alone ..... 1</p> <p>Yes, jointly ..... 2</p> <p>Yes, both alone and jointly ..... 3</p> <p>No ..... 4</p> <p>DO NOT READ: Don't know ..... 97</p> <p>DO NOT READ: Refused ..... 98</p> <p>DO NOT READ: Not applicable..... 99</p>
<b>H13</b>	<p>How likely are you to involuntarily lose ownership to the residential dwelling you own, or hold use rights to in the next 5 years?</p> <p><b>READ RESPONSE OPTIONS</b></p> <p><b>CAPI PROGRAMMING NOTE:</b> THIS QUESTION IS ENABLED ONLY IF H08==1, or 2, or 3</p>	<p>Not all likely.....1</p> <p>Slightly likely.....2</p> <p>Moderately likely.....3</p> <p>Very likely.....4</p> <p>Extremely likely.....5</p> <p>DO NOT READ: Don't know ..... 97</p> <p>DO NOT READ: Refused ..... 98</p> <p>DO NOT READ: Not applicable..... 99</p>
<b>H14</b>	<p>Do you own or hold use rights to any <u>other</u> dwelling, either alone or jointly with someone else?</p>	<p>Yes, alone .....1</p> <p>Yes, jointly .....2</p> <p>Yes, both alone and jointly .....3</p> <p>No .....4</p> <p>DO NOT READ: Don't know .....97</p> <p>DO NOT READ: Refused .....98</p> <p>DO NOT READ: Not applicable .....99</p>

<b>H15</b>	Do you have the right, either alone or jointly with someone else, to sell any <u>other</u> dwellings you own? CAPI PROGRAMMING NOTE: THIS QUESTION IS ENABLED ONLY IF H14==1, or 2, or 3	Yes, alone .....1 Yes, jointly .....2 Yes, both alone and jointly .....3 No .....4 DO NOT READ: Don't know .....97 DO NOT READ: Refused .....98 DO NOT READ: Not applicable .....99
<b>H16</b>	Do you have the right, either alone or jointly with someone else, to give any <u>other</u> dwellings you own, by oral or written will, to other persons after your death? CAPI PROGRAMMING NOTE: THIS QUESTION IS ENABLED ONLY IF H14==1, or 2, or 3	Yes, alone .....1 Yes, jointly .....2 Yes, both alone and jointly .....3 No .....4 DO NOT READ: Don't know .....97 DO NOT READ: Refused .....98 DO NOT READ: Not applicable .....99
<b>H17</b>	Is there a document for any <u>other</u> dwellings you own, or hold use rights to that is issued by or registered at a government agency, such as a title deed, certificate of ownership, certificate of hereditary acquisition, lease or rental contract? <i>Examples in Malawi: The document can be application for customary estate, offer of customary estate, acceptance of offer of customary estate, certificate of customary estate, freehold title, land certificate, certificate of official research, rental contract, lease contract</i> <i>Examples in Bangladesh: The document can be Barga contract, non-agricultural Khas land lease form, endorsement of certificate of registration, lease, occupation, verifying the current Khatian (record of rights).</i> <i>Examples in Nepal: The document can be title deeds (Lalpurja), receipts showing tax or rent has been paid, contract or agreements, and wills or approval documents.</i> CAPI PROGRAMMING NOTE: THIS QUESTION IS ENABLED ONLY IF H14==1, or 2, or 3	Yes .....1 No .....2 >>H14 DO NOT READ: Don't know .....97 >>H14 DO NOT READ: Refused .....98 >>H14 DO NOT READ: Not applicable .....99 >>H14
<b>H17a</b>	What type of documents are there for any <u>other</u> dwellings you own, or hold use rights to? [SELECT ALL THAT APPLY]	TITLE DEED .....1 CERTIFICATE OF CUSTOMARY OWNERSHIP .....2 CERTIFICATE OF OCCUPANCY .....3 CERTIFICATE OF HEREDITARY .....4 ACQUISITION LISTED IN REGISTRY .....5 SURVEY PLAN .....6 RENTAL CONTRACT, REGISTERED .....7 LEASE, REGISTERED .....8 OTHER (SPECIFY) .....96
<b>H18</b>	Is your name listed on any of these documents as an owner or use right holder, either alone or jointly with someone else? <b>NOTE TO RESPONDENT:</b> The document can be [TO BE COMPLETED FOR COUNTRY-SPECIFIC CONTEXT]  CAPI PROGRAMMING NOTE: THIS QUESTION IS ENABLED ONLY IF H17==1	Yes, alone .....1 Yes, jointly .....2 Yes, both alone and jointly .....3 No .....4 DO NOT READ: Don't know .....97 DO NOT READ: Refused .....98 DO NOT READ: Not applicable .....99

<b>H19</b>	How likely are you to involuntarily lose ownership to any of the <u>other</u> dwellings you own, or hold use rights to in the next 5 years? <b>READ RESPONSE OPTIONS</b>  <b>CAPI PROGRAMMING NOTE:</b> THIS QUESTION IS ENABLED ONLY IF H14==1, or 2, or 3	Not all likely.....	1
		Slightly likely.....	2
		Moderately likely.....	3
		Very likely.....	4
		Extremely likely.....	5
		DO NOT READ: Don't know .....	.97
		DO NOT READ: Refused .....	.98
		DO NOT READ: Not applicable .....	.99

## Tenure Security Regressions

**Table A1:** Pooled Tenure Security Regressions for Land

VARIABLES	(1) Land Security	(2) Land Security	(3) Land Security	(4) Land Security
Holds Land Rights	0.703*** (0.0256)	0.661*** (0.0230)		
Holds Sole Land Rights	0.00371 (0.0251)	0.0908*** (0.0278)		
Is there a legal document, land parcels Named on document for land alone			0.254*** (0.0333)	0.220*** (0.0395)
Named on document for land jointly			-0.0168 (0.0309)	-0.0548 (0.0387)
Right to sell land alone			0.102*** (0.0390)	0.0706 (0.0463)
Right to sell land jointly			0.0521* (0.0311)	-0.0419 (0.0362)
Right to bequeath alone			0.205*** (0.0391)	0.0201 (0.0438)
Right to bequeath jointly			0.116*** (0.0331)	0.0677** (0.0331)
Has Government ID	0.0129 (0.0361)	0.0684** (0.0282)	0.00704 (0.0540)	0.0712* (0.0368)
Has Access to Phone	0.0137 (0.0482)	0.0423 (0.0326)	-0.0408 (0.0658)	0.0703 (0.0482)
Owns Phone	0.0145 (0.0452)	0.0408 (0.0338)	-0.0502 (0.0619)	0.0445 (0.0507)
Married	-0.00342 (0.0220)	-0.00354 (0.0338)	-0.0112 (0.0306)	-0.0189 (0.0470)
Completed Primary Education	0.0196 (0.0172)	0.0398** (0.0153)	0.00279 (0.0214)	0.0402 (0.0249)
Secondary or Higher Education	0.0445 (0.0275)	0.0552** (0.0255)	0.0218 (0.0308)	0.0509 (0.0419)

VARIABLES	(1) Land Security	(2) Land Security	(3) Land Security	(4) Land Security
Asset Index, PCA	0.0590 (0.0362)	0.00826* (0.00480)	-0.00813 (0.0401)	0.00474* (0.00285)
Rural area	-0.00122 (0.0208)	0.00633 (0.0240)	0.0307 (0.0233)	0.0550* (0.0332)
Malawi	0.0672** (0.0273)	0.0343 (0.0244)	0.215*** (0.0389)	0.223*** (0.0521)
Nepal	0.233*** (0.0266)	0.166*** (0.0298)	0.315*** (0.0308)	0.223*** (0.0428)
Constant	-0.109* (0.0616)	-0.183*** (0.0633)	0.364*** (0.0906)	0.229** (0.108)
Observations	2,400	2,399	1,684	1,542
R-squared	0.563	0.550	0.276	0.117
Country	Pooled	Pooled	Pooled	Pooled
Sex	Male	Female	Male	Female
Cluster SE	Cluster	Cluster	Cluster	Cluster

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Source:** Authors' calculations using WEMNS pilot data.

**Note:** OLS results of a dummy equal to one if the respondent reports feeling tenure secure on their land and zero otherwise regressed on having land rights (in columns (1) – (2)) or documentation and transfer rights held (columns (3) – (4)). All regressions control for dummy variables representing 3 age categories, 4 occupation categories, 3 education categories, a PCA asset index, marital status, 3 phone ownership categories, having a government-issued ID, 16 relationship to household head categories, and a dummy for being in a rural area, as well as country fixed effect. Standard errors are clustered at the sampling cluster level (reported in parentheses). Columns (1) and (3) restrict the sample to male respondents, and (2) and (4) restrict to female respondents.

**Table A2:** Pooled Tenure Security Regressions for Dwellings

VARIABLES	(1) Dwelling Security	(2) Dwelling Security	(3) Dwelling Security	(4) Dwelling Security
Holds Dwelling Rights	0.595*** (0.0308)	0.651*** (0.0323)		
Holds Sole Dwelling Rights	-0.0154 (0.0229)	0.0573** (0.0272)		
Is there a legal document, residential dwelling			0.257*** (0.0382)	0.217*** (0.0355)
Named on document for dwelling alone			-0.0298 (0.0280)	0.00667 (0.0405)
Named on document for dwelling jointly			-0.0371 (0.0312)	-0.0792* (0.0439)
Right to sell dwelling alone			0.165*** (0.0446)	-0.0362 (0.0602)

VARIABLES	(1) Dwelling Security	(2) Dwelling Security	(3) Dwelling Security	(4) Dwelling Security
Right to sell dwelling jointly			0.130*** (0.0297)	-0.0677* (0.0351)
Right to bequeath dwelling alone			0.0181 (0.0448)	0.0950* (0.0519)
Right to bequeath dwelling jointly			0.0128 (0.0296)	0.0531* (0.0315)
Has Government ID	0.0134 (0.0343)	0.0238 (0.0290)	0.0254 (0.0419)	0.0379 (0.0417)
Has Access to Phone	-0.000297 (0.0613)	-0.0156 (0.0339)	-0.0372 (0.0707)	-0.0377 (0.0475)
Owns Phone	0.0656 (0.0521)	0.00615 (0.0330)	0.00485 (0.0591)	-0.0199 (0.0467)
Married	-0.0267 (0.0321)	0.0783* (0.0405)	-0.0259 (0.0316)	0.0888* (0.0504)
Completed Primary Education	0.0229 (0.0183)	0.0406* (0.0217)	0.00800 (0.0167)	0.0127 (0.0247)
Secondary or Higher Education	0.0635** (0.0266)	0.0919*** (0.0300)	0.0219 (0.0269)	0.0563* (0.0335)
Asset Index, PCA	0.0724** (0.0355)	0.00643 (0.00640)	0.0305 (0.0389)	0.00495 (0.00422)
Rural area	0.225*** (0.0400)	0.157*** (0.0458)	0.207*** (0.0352)	0.149*** (0.0414)
Malawi	0.0212 (0.0417)	0.0218 (0.0468)	0.165*** (0.0426)	0.141** (0.0550)
Nepal	0.242*** (0.0376)	0.168*** (0.0480)	0.235*** (0.0320)	0.191*** (0.0433)
Constant	-0.190** (0.0778)	-0.202** (0.0801)	0.271*** (0.0887)	0.332*** (0.110)
Observations	2,400	2,399	2,083	1,957
R-squared	0.392	0.373	0.315	0.157
Country	Pooled	Pooled	Pooled	Pooled
Sex	Male	Female	Male	Female
Cluster SE	Cluster	Cluster	Cluster	Cluster

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Source:** Authors' calculations using WEMNS pilot data.

**Note:** OLS results of a dummy equal to one if the respondent reports feeling tenure secure on their dwelling and zero otherwise regressed on having dwelling rights (in columns (1) – (2)) or documentation and transfer rights held (columns (3) – (4)). All regressions control for dummy variables representing 3 age categories, 4 occupation categories, 3 education categories, a PCA asset index, marital status, 3 phone ownership categories, having a government-issued ID, 16 relationship to household head categories, and a dummy for being in a rural area, as well as country fixed effect. Standard errors are clustered at the sampling cluster level (reported in parentheses). Columns (1) and (3) restrict the sample to male respondents, and (2) and (4) restrict to female respondents.

**Table A3: Tenure Security Regressions for Land, Malawi**

VARIABLES	(1) Land Security	(2) Land Security	(3) Land Security	(4) Land Security
Holds Land Rights	0.679*** (0.0386)	0.654*** (0.0328)		
Holds Sole Land Rights	0.144*** (0.0455)	-0.0104 (0.0436)		
Is there a legal document, land parcels			0.140* (0.0754)	0.0797 (0.0708)
Named on document for land alone			-0.0300 (0.0732)	-0.0117 (0.104)
Named on document for land jointly			0.0689 (0.0761)	0.0532 (0.0866)
Right to sell land alone			-0.00410 (0.0455)	-0.0268 (0.0577)
Right to sell land jointly			-0.101* (0.0535)	-0.133** (0.0573)
Right to bequeath land alone			0.177*** (0.0449)	-0.0366 (0.0524)
Right to bequeath land jointly			0.100* (0.0572)	-0.0371 (0.0545)
Has Government ID	0.0241 (0.0443)	0.0964** (0.0386)	0.0380 (0.0787)	0.101 (0.0627)
Has Access to Phone	0.0459 (0.0579)	0.107*** (0.0356)	-0.0128 (0.0813)	0.126** (0.0598)
Owns Phone	0.0120 (0.0533)	0.0900** (0.0345)	-0.0407 (0.0760)	0.0488 (0.0662)
Married	-0.119 (0.145)	0.0103 (0.0323)	-0.0527 (0.174)	0.0286 (0.0997)
Completed Primary Education	-0.00398 (0.0326)	-0.00524 (0.0136)	0.00623 (0.0489)	0.0889* (0.0515)
Secondary or Higher Education	-0.0205 (0.0455)	-0.00534 (0.0274)	-0.0611 (0.0686)	0.102 (0.0736)
Asset Index, PCA	0.00268 (0.0712)	0.00220 (0.00184)	-0.0357 (0.0871)	-0.0130 (0.111)
Rural area	-0.110** (0.0440)	-0.0157 (0.0249)	-0.120* (0.0641)	0.0466 (0.0563)
Constant	0.0855 (0.159)	-0.185*** (0.0679)	0.700*** (0.204)	0.609*** (0.123)
Observations	791	2,365	538	539
R-squared	0.491	0.538	0.104	0.070
Country	Malawi	Malawi	Malawi	Malawi
Sex	Male	Female	Male	Female
Cluster SE	Cluster	Cluster	Cluster	Cluster

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**Source:** Authors' calculations using WEMNS pilot data.

**Note:** OLS results of a dummy equal to one if the respondent reports feeling tenure secure on their land and zero otherwise regressed on having land rights (in columns (1) – (2)) or documentation and transfer rights held (columns (3) – (4)). All regressions control for dummy variables representing 3 age categories, 4 occupation categories, 3 education categories, a PCA asset index, marital status, 3 phone ownership categories, having a government-issued ID, 16 relationship to household head categories, and a dummy for being in a rural area. Standard errors are clustered at the sampling cluster level (reported in parentheses). Columns (1) and (3) restrict the sample to male respondents, and (2) and (4) restrict to female respondents.

**Table A4:** Tenure Security Regressions for Dwellings in Malawi

VARIABLES	(1) Dwelling Security	(2) Dwelling Security	(3) Dwelling Security	(4) Dwelling Security
Holds Dwelling Rights	0.543*** (0.0382)	0.616*** (0.0401)		
Holds Sole Dwelling Rights	0.138*** (0.0430)	0.149*** (0.0458)		
Is there a legal document, residential dwelling			-0.0345 (0.154)	-0.126 (0.0890)
Named on document for dwelling alone			0.256 (0.163)	0.131 (0.128)
Named on document for dwelling jointly			0.147 (0.157)	0.252** (0.105)
Right to sell dwelling alone			0.286*** (0.0661)	-0.0668 (0.0834)
Right to sell dwelling jointly			0.0990 (0.0610)	-0.124** (0.0602)
Right to bequeath dwelling alone			0.00994 (0.0701)	0.0734 (0.0690)
Right to bequeath dwelling jointly			0.0165 (0.0680)	0.00895 (0.0520)
Has Government ID	0.0352 (0.0360)	0.0616 (0.0415)	0.0458 (0.0534)	0.133 (0.0806)
Has Access to Phone	-0.0277 (0.0751)	-0.0201 (0.0408)	-0.0488 (0.0913)	-0.0107 (0.0616)
Owens Phone	0.0541 (0.0526)	-0.0458 (0.0394)	0.0387 (0.0610)	-0.0698 (0.0584)
Married	0.0465 (0.0821)	0.0669 (0.0745)	0.313** (0.126)	0.0735 (0.136)
Completed Primary Education	-0.0308 (0.0300)	0.0133 (0.0444)	-0.0280 (0.0408)	-0.0165 (0.0636)
Secondary or Higher Education	-0.0532 (0.0376)	0.0489 (0.0481)	-0.101 (0.0613)	0.0798 (0.0840)
Asset Index, PCA	0.0523 (0.0617)	0.0435 (0.0740)	0.0287 (0.0992)	0.0286 (0.113)
Rural area	0.124** (0.0525)	-0.0672 (0.0497)	0.199*** (0.0698)	-0.138* (0.0789)
Constant	-0.171	-0.0634	0.0731	0.618***

VARIABLES	(1) Dwelling Security	(2) Dwelling Security	(3) Dwelling Security	(4) Dwelling Security
	(0.109)	(0.0833)	(0.126)	(0.150)
Observations	791	791	537	514
R-squared	0.427	0.445	0.181	0.069
Country	Malawi	Malawi	Malawi	Malawi
Sex	Male	Female	Male	Female
Cluster SE	Cluster	Cluster	Cluster	Cluster

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Source:** Authors' calculations using WEMNS pilot data.

**Note:** OLS results of a dummy equal to one if the respondent reports feeling tenure secure on their dwelling and zero otherwise regressed on having land rights (in columns (1) – (2)) or documentation and transfer rights held (columns (3) – (4)). All regressions control for dummy variables representing 3 age categories, 4 occupation categories, 3 education categories, a PCA asset index, marital status, 3 phone ownership categories, having a government-issued ID, 16 relationship to household head categories, and a dummy for being in a rural area. Standard errors are clustered at the sampling cluster level (reported in parentheses). Columns (1) and (3) restrict the sample to male respondents, and (2) and (4) restrict to female respondents.

**Table A5:** Tenure Security Regressions for Land in Bangladesh

VARIABLES	(1) Land Security	(2) Land Security	(3) Land Security	(4) Land Security
Holds Land Rights	0.636*** (0.0561)	0.682*** (0.0300)		
Holds Sole Land Rights	-0.126** (0.0542)	-0.0387 (0.0324)		
Is there a legal document, land parcels			0.154** (0.0728)	0.361*** (0.0841)
Named on document for land alone			-0.0219 (0.0570)	0.106 (0.0644)
Named on document for land jointly			-0.00729 (0.0761)	0.0271 (0.123)
Right to sell land alone			0.277** (0.121)	0.453** (0.176)
Right to sell land jointly			0.315*** (0.107)	0.0788 (0.137)
Right to bequeath land alone			0.390*** (0.123)	-0.165 (0.165)
Right to bequeath land jointly			0.203* (0.101)	0.201 (0.149)
Has Government ID	-0.136 (0.163)	0.0815*** (0.0290)	-0.553*** (0.125)	
Has Access to Phone	0.136 (0.154)	0.103*** (0.0281)	0.202** (0.0981)	-0.319* (0.180)

VARIABLES	(1) Land Security	(2) Land Security	(3) Land Security	(4) Land Security
Owens Phone	0.149 (0.124)	0.0636** (0.0293)	0.142*** (0.0507)	-0.325* (0.180)
Married	-0.0177 (0.0430)	0.00368 (0.0326)	-0.150 (0.106)	0.0513 (0.120)
Completed Primary Education	0.0619* (0.0356)	0.00651 (0.0166)	0.0601 (0.0416)	0.00335 (0.0660)
Secondary or Higher Education	0.186*** (0.0461)	-0.0132 (0.0263)	0.0920** (0.0430)	-0.0155 (0.104)
Asset Index, PCA	0.110 (0.108)	0.00198 (0.00153)	0.0966 (0.106)	0.179* (0.103)
Rural area	0.0846 (0.0526)	-0.0364 (0.0293)	0.0825 (0.0502)	0.109 (0.0664)
Constant	-0.0534 (0.227)	-0.102* (0.0594)	0.671*** (0.175)	0.506* (0.270)
Observations	800	2,356	428	302
R-squared	0.483	0.482	0.572	0.357
Country	Bangladesh	Bangladesh	Bangladesh	Bangladesh
Sex	Male	Female	Male	Female
Cluster SE	Cluster	Cluster	Cluster	Cluster

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Source:** Authors' calculations using WEMNS pilot data.

**Note:** OLS results of a dummy equal to one if the respondent reports feeling tenure secure on their land and zero otherwise regressed on having land rights (in columns (1) – (2)) or documentation and transfer rights held (columns (3) – (4)). All regressions control for dummy variables representing 3 age categories, 4 occupation categories, 3 education categories, a PCA asset index, marital status, 3 phone ownership categories, having a government-issued ID, 16 relationship to household head categories, and a dummy for being in a rural area. Standard errors are clustered at the sampling cluster level (reported in parentheses). Columns (1) and (3) restrict the sample to male respondents, and (2) and (4) restrict to female respondents.

**Table A6:** Tenure Security Regressions for Dwellings in Bangladesh

VARIABLES	(1) Dwelling Security	(2) Dwelling Security	(3) Dwelling Security	(4) Dwelling Security
Holds Dwelling Rights	0.636*** (0.118)	0.587*** (0.0792)		
Holds Sole Dwelling Rights	-0.111*** (0.0407)	0.0258 (0.0316)		
Is there a legal document, residential dwelling			0.187** (0.0850)	0.203*** (0.0689)
Named on document for dwelling alone			0.0154 (0.0561)	0.0383 (0.0597)

VARIABLES	(1) Dwelling Security	(2) Dwelling Security	(3) Dwelling Security	(4) Dwelling Security
Named on document for dwelling jointly			-0.0255 (0.0504)	0.0173 (0.0800)
Right to sell dwelling alone			0.0773 (0.0665)	-0.0312 (0.104)
Right to sell dwelling jointly			0.239*** (0.0604)	-0.119 (0.0709)
Right to bequeath dwelling alone			0.114* (0.0599)	0.112 (0.0944)
Right to bequeath dwelling jointly			-0.0391 (0.0524)	0.101* (0.0540)
Has Government ID	0.168 (0.146)	0.292*** (0.0901)	0.0626 (0.114)	0.301*** (0.0678)
Has Access to Phone	-0.157 (0.152)	0.0994 (0.131)	-0.0795 (0.171)	0.0670 (0.151)
Owns Phone	-0.0628 (0.158)	0.140 (0.131)	-0.0441 (0.172)	0.100 (0.151)
Married	-0.0457 (0.0693)	0.0263 (0.0867)	-0.0309 (0.0643)	0.0271 (0.0891)
Completed Primary Education	0.0483 (0.0306)	0.0197 (0.0359)	0.0552* (0.0327)	0.00114 (0.0372)
Secondary or Higher Education	0.171*** (0.0509)	0.0685 (0.0666)	0.132*** (0.0451)	0.0318 (0.0588)
Asset Index, PCA	0.136 (0.113)	0.125 (0.0954)	0.0859 (0.113)	0.113 (0.0909)
Rural area	0.486*** (0.0633)	0.423*** (0.0554)	0.398*** (0.0793)	0.349*** (0.0717)
Constant	-0.366** (0.178)	-0.717*** (0.209)	0.132 (0.186)	-0.130 (0.212)
Observations	800	800	771	765
R-squared	0.389	0.339	0.437	0.326
Country	Bangladesh	Bangladesh	Bangladesh	Bangladesh
Sex	Male	Female	Male	Female
Cluster SE	Cluster	Cluster	Cluster	Cluster

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Source:** Authors' calculations using WEMNS pilot data.

**Note:** OLS results of a dummy equal to one if the respondent reports feeling tenure secure on their land and zero otherwise regressed on having land rights (in columns (1) – (2)) or documentation and transfer rights held (columns (3) – (4)). All regressions control for dummy variables representing 3 age categories, 4 occupation categories, 3 education categories, a PCA asset index, marital status, 3 phone ownership categories, having a government-issued ID, 16 relationship to household head categories, and a dummy for being in a rural area. Standard errors are clustered at the sampling cluster level (reported in parentheses). Columns (1) and (3) restrict the sample to male respondents, and (2) and (4) restrict to female respondents.

**Table A7: Tenure Security Regressions for Land in Nepal**

VARIABLES	(1) Land Security	(2) Land Security	(3) Land Security	(4) Land Security
Holds Land Rights	0.913*** (0.0148)	0.571*** (0.0248)		
Holds Sole Land Rights	-0.0147 (0.0166)	0.0770** (0.0364)		
Is there a legal document, land parcels			0.182** (0.0600)	0.215*** (0.0572)
Named on document for land alone			0.0167 (0.0248)	0.0557 (0.0720)
Named on document for land jointly			-0.0175 (0.0198)	-0.0501 (0.0460)
Right to sell land alone			0.0439 (0.0351)	0.0167 (0.102)
Right to sell land jointly			0.0728*** (0.0215)	-0.0165 (0.0481)
Right to bequeath land alone			-0.0291* (0.0145)	-0.132 (0.178)
Right to bequeath land jointly			-0.00689 (0.0194)	0.0387 (0.0279)
Has Government ID	0.0411 (0.0840)	0.0791** (0.0331)	0.0261 (0.0802)	0.0506 (0.0281)
Has Access to Phone	0.0745 (0.110)	0.0701** (0.0281)	-0.0161 (0.0269)	0.0741 (0.174)
Owns Phone	0.0872 (0.115)	0.0393 (0.0254)	-0.00755 (0.0192)	0.0736 (0.188)
Married	-0.0258 (0.0292)	0.0140 (0.0299)	-0.0255 (0.0219)	-0.0157 (0.0717)
Completed Primary Education	-0.0187 (0.0195)	0.0356** (0.0157)	-0.0423** (0.0154)	0.0108 (0.0361)
Secondary or Higher Education	-0.0539 (0.0350)	0.0359 (0.0234)	-0.0337 (0.0324)	0.0146 (0.0736)
Asset Index, PCA	0.0779** (0.0258)	0.000545 (0.000722)	0.0459** (0.0158)	0.00244 (0.00222)
Rural area	0.0493* (0.0216)	-0.00945 (0.0194)	0.0365* (0.0184)	0.0370 (0.0487)
Constant	-0.130 (0.175)	-0.0567 (0.0467)	0.764*** (0.113)	0.389 (0.216)
Observations	809	2,348	718	701
R-squared	0.543	0.474	0.110	0.091
Country	Nepal	Nepal	Nepal	Nepal
Sex	Male	Female	Male	Female
Cluster SE	Cluster	Cluster	Cluster	Cluster

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**Source:** Authors' calculations using WEMNS pilot data.

**Note:** OLS results of a dummy equal to one if the respondent reports feeling tenure secure on their land and zero otherwise regressed on having land rights (in columns (1) – (2)) or documentation and transfer rights held (columns (3) – (4)). All regressions control for dummy variables representing 3 age categories, 4 occupation categories, 3 education categories, a PCA asset index, marital status, 3 phone ownership categories, having a government-issued ID, 16 relationship to household head categories, and a dummy for being in a rural area. Standard errors are clustered at the sampling cluster level (reported in parentheses). Columns (1) and (3) restrict the sample to male respondents, and (2) and (4) restrict to female respondents.

**Table A8:** Tenure Security Regressions for Dwellings in Nepal

VARIABLES	(1) Dwelling Security	(2) Dwelling Security	(3) Dwelling Security	(4) Dwelling Security
Holds Dwelling Rights	0.866*** (0.0321)	0.827*** (0.0275)		
Holds Sole Dwelling Rights	-0.00111 (0.0224)	-0.0133 (0.0565)		
Is there a legal document, residential dwelling			0.170** (0.0510)	0.142*** (0.0333)
Named on document for dwelling alone			0.0112 (0.0247)	0.0515 (0.0583)
Named on document for dwelling jointly			-0.0271 (0.0382)	-0.116* (0.0591)
Right to sell dwelling alone			0.0488** (0.0148)	-0.307 (0.290)
Right to sell dwelling jointly			0.0408 (0.0359)	-0.0187 (0.0397)
Right to bequeath dwelling alone			-0.0249 (0.0287)	0.305 (0.268)
Right to bequeath dwelling jointly			-0.000179 (0.0354)	0.0290 (0.0503)
Has Government ID	-0.0281 (0.0899)	-0.00246 (0.0257)	-0.0163 (0.0796)	0.00821 (0.0445)
Has Access to Phone	0.108 (0.104)	-0.118*** (0.0261)	0.140 (0.109)	-0.101 (0.0906)
Owns Phone	0.156 (0.0933)	-0.0689** (0.0295)	0.157 (0.112)	-0.0744 (0.107)
Married	0.0148 (0.0473)	0.0297 (0.0456)	-0.0128 (0.0289)	0.0820 (0.0721)
Completed Primary Education	0.0127 (0.0265)	-0.00571 (0.0261)	-0.00326 (0.0181)	-0.00578 (0.0347)
Secondary or Higher Education	-0.00900 (0.0430)	-0.00745 (0.0458)	0.00558 (0.0472)	-0.0266 (0.0403)
Asset Index, PCA	0.0379 (0.0454)	0.00576* (0.00308)	-0.00768 (0.0291)	0.00615* (0.00300)
Rural area	0.0328 (0.0206)	-0.0388 (0.0453)	0.0307** (0.0109)	-0.0277 (0.0346)
Constant	-0.163	0.0618	0.609***	0.819***

VARIABLES	(1) Dwelling Security	(2) Dwelling Security	(3) Dwelling Security	(4) Dwelling Security
	(0.125)	(0.0867)	(0.156)	(0.151)
Observations	809	808	775	678
R-squared	0.100	0.429	0.095	0.063
Country	Nepal	Nepal	Nepal	Nepal
Sex	Male	Female	Male	Female
Cluster SE	Cluster	Cluster	Cluster	Cluster

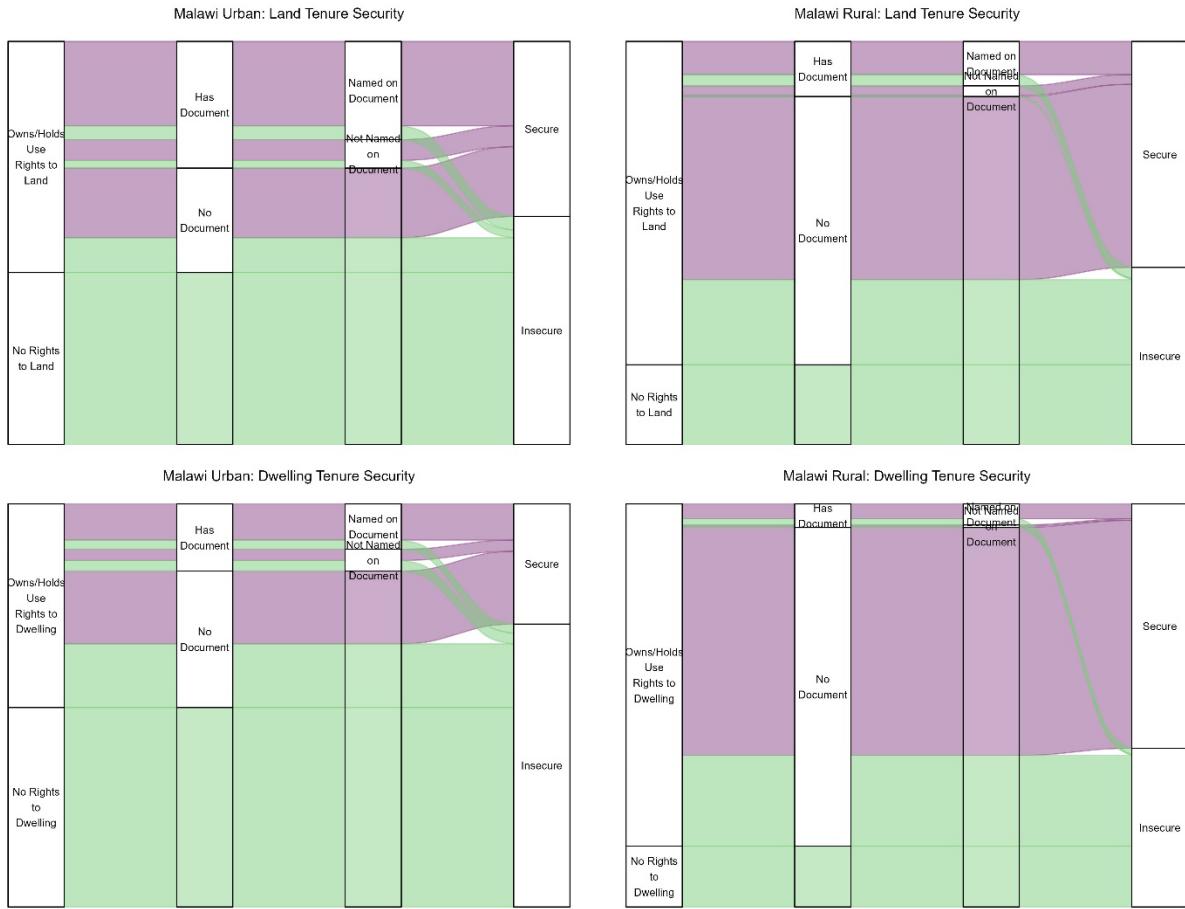
Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Source:** Authors' calculations using WEMNS pilot data.

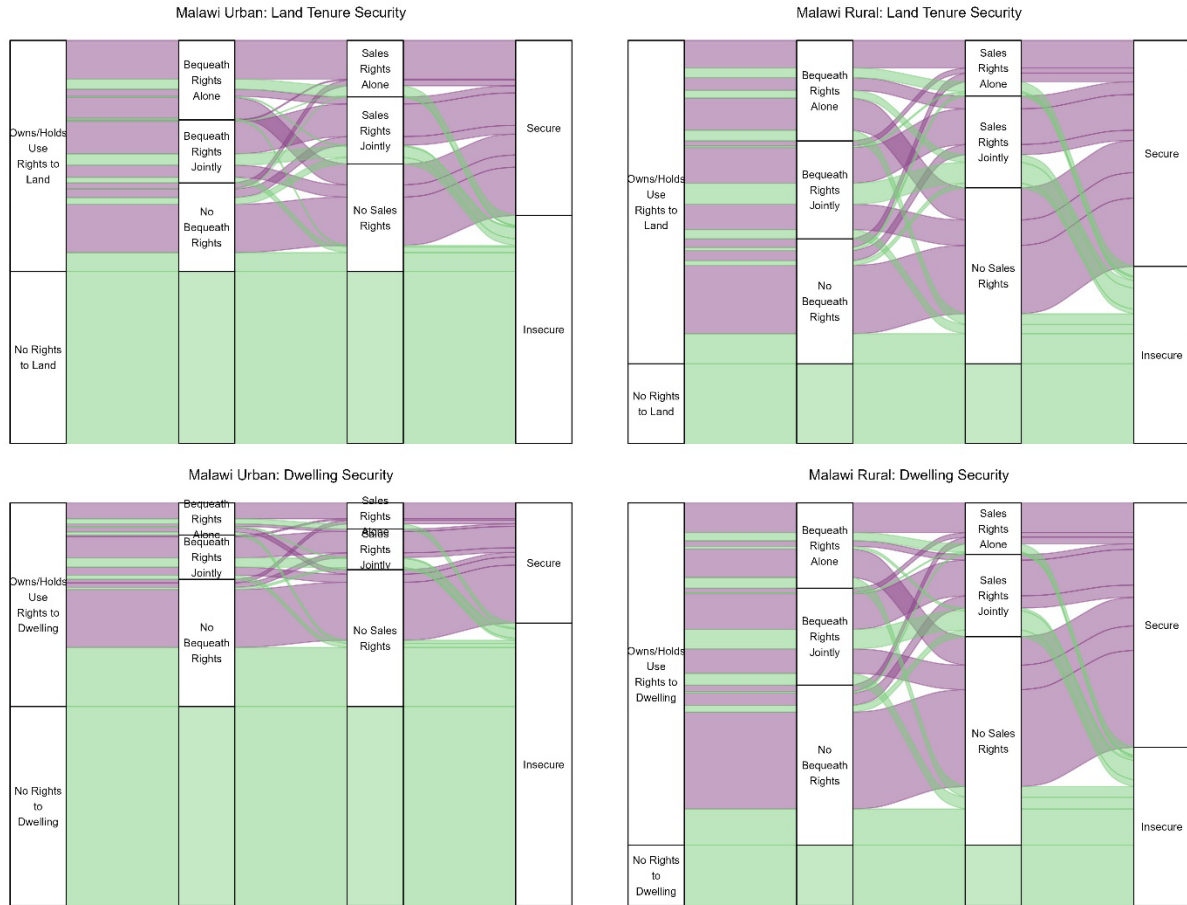
**Note:** OLS results of a dummy equal to one if the respondent reports feeling tenure secure on their dwelling and zero otherwise regressed on having land rights (in columns (1) – (2)) or documentation and transfer rights held (columns (3) – (4)). All regressions control for dummy variables representing 3 age categories, 4 occupation categories, 3 education categories, a PCA asset index, marital status, 3 phone ownership categories, having a government-issued ID, 16 relationship to household head categories, and a dummy for being in a rural area. Standard errors are clustered at the sampling cluster level (reported in parentheses). Columns (1) and (3) restrict the sample to male respondents, and (2) and (4) restrict to female respondents.

# Sankeys for Urban/Rural



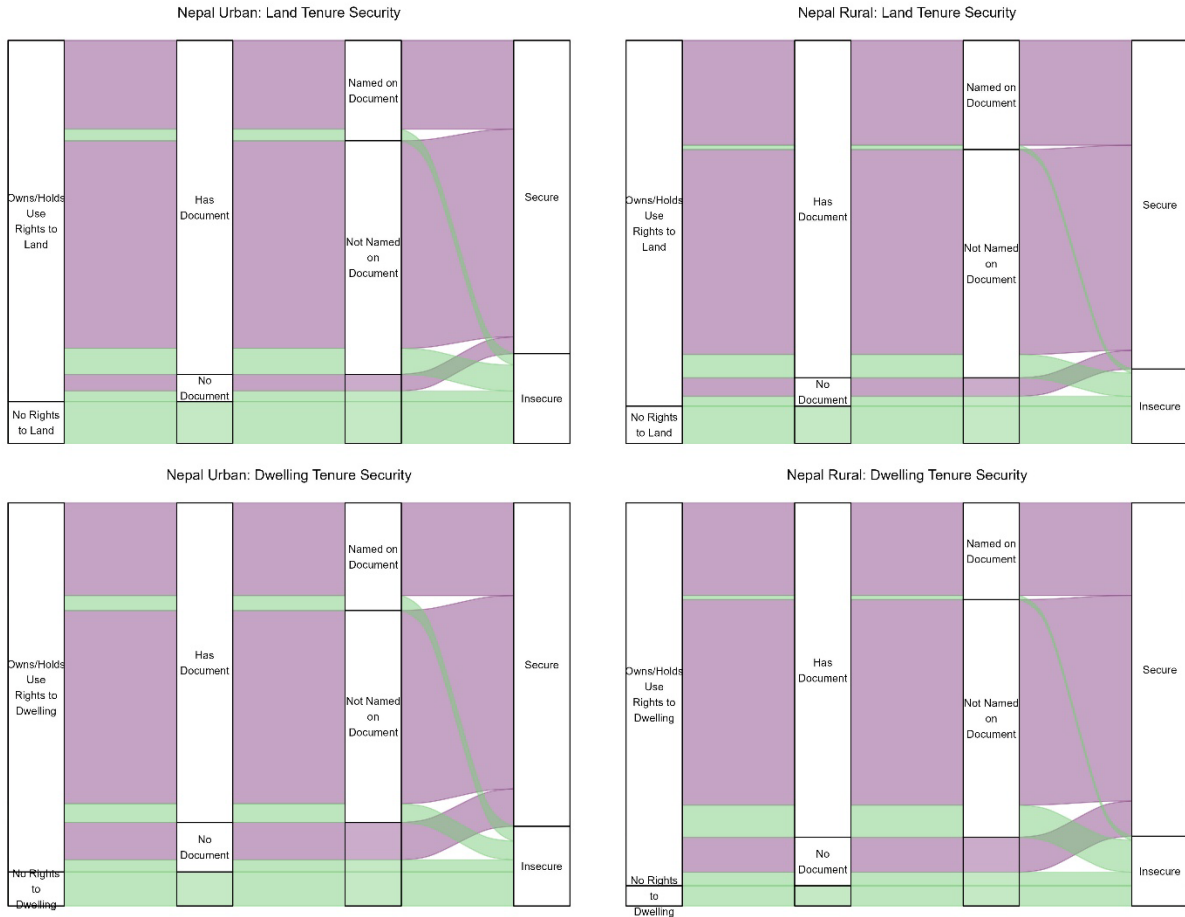
**Figure A1:** Tenure Security and Documentation for Rural and Urban Respondents, Malawi. Flows in purple represent respondents who report feeling tenure secure; all other respondents are represented by flows in green.

**Source:** Authors' calculations using WEMNS pilot data.



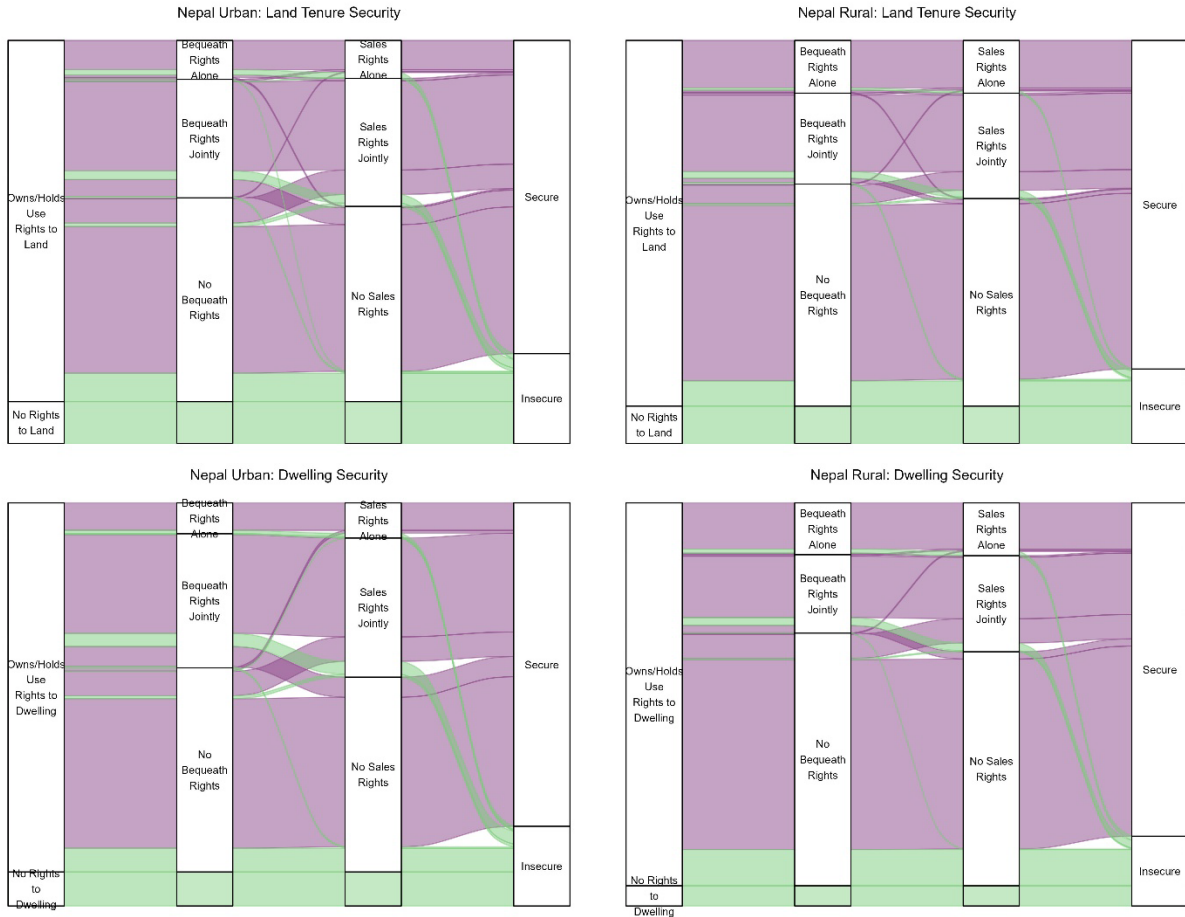
**Figure A2:** Tenure Security and Transfer Rights Sankey Diagrams for Rural and Urban Respondents, Malawi. Flows in purple represent respondents who report feeling tenure secure; all other respondents are represented by flows in green.

**Source:** Authors' calculations using WEMNS pilot data.



**Figure A3:** Tenure Security and Documentation for Rural and Urban Respondents, Nepal. Flows in purple represent respondents who report feeling tenure secure; all other respondents are represented by flows in green.

**Source:** Authors' calculations using WEMNS pilot data.



**Figure A4:** Tenure Security and Documentation for Rural and Urban Respondents, Nepal. Flows in purple represent respondents who report feeling tenure secure; all other respondents are represented by flows in green.

**Source:** Authors' calculations using WEMNS pilot data.

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