

Gendered Land Ownership and Rural Household Welfare: Evidence from Indonesia

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Subject area : gender, economy

Abstract

This paper studies how land ownership is gendered within rural Indonesian households and whether women's land ownership is associated with household welfare, female labor participation, and food security. Using nationally representative SUSENAS 2018 household and individual modules, construct land ownership typologies that distinguish ownership by the male household head, the spouse, children, other members, and multiple-owner arrangements. Weighted OLS models with province fixed effects and district-clustered standard errors show that households where the spouse owns land exhibit higher per-capita expenditure than otherwise similar landowning households. Logistic models indicate that female land ownership is positively associated with women's labor participation but is not significantly linked to food insecurity, while male ownership is correlated with lower food insecurity. Interaction and split-sample tests reveal no statistically meaningful heterogeneity between Java and non-Java regions. The findings support the view that women's property rights are linked to economic resilience and agency in rural Indonesia, even though some welfare measures based on non-monetary living conditions respond differently. Policies that expand women's land titles, secure joint ownership, and complement land programs with human-capital and market access interventions are likely to yield broad welfare gains.

Keywords: land ownership; gender; rural welfare; female labor supply; food security; Indonesia; SUSENAS

Introduction

Land is a central productive asset in rural economies and also as one of the important things in poverty alleviation in rural areas (Meinzen-Dick et al., 2017; Agarwal, 1994). In agrarian settings, land provides a direct stream of income through cultivation, a buffer stock during shocks, access to credit, and social status through inheritance and local power relations (Steen, 2011; Rammohan & Pritchard, 2014). Because of these multiple roles, who owns land within a household matters for both the distribution of resources and the decisions households make (Sidik & Habibi, 2024; Habibi, 2021). A long tradition in development economics argues that intrahousehold bargaining is shaped by the control of assets rather than by income alone (Séogo,

2025). Assets are harder to hide and provide credible “fallback positions” in case of marital dissolution or conflict (Agarwal, 1994; Katz, 1995).

Across low-and middle-income countries, women are less likely than men to own land, and when they do, their plots are smaller and often held under weaker forms of tenure (Deere & Doss, 2006; Doss et al., 2014). In India, a significant link exists between the share of land owned by women and the adoption of more food-secure livelihood strategies (Savath et al., 2014). These gaps are not simply a fairness issue, other evidences from Africa, South Asia, and Latin America suggests that women’s land ownership is linked to higher productivity, stronger food security, improved child nutrition, and greater female autonomy (Allendorf, 2007; Goldstein & Udry, 2008; Quisumbing et al., 2015).

Indonesia is no exception. Landownership is a strong marker of status in Indonesian rural society, but it works as part of a broader hierarchy of class and authority rather than as a simple title-to-prestige rule. In many places, larger landowners become local elites or ruling-class actors, while smallholders may own land without gaining much social power (Sidik & Habibi, 2024; Habibi, 2021). In many rural communities, land inheritance remains patrilineal, and women’s ownership is mediated through marital status or informal claims rather than registered titles. Yet Indonesia is also diverse matrilineal inheritance exists in parts of Sumatra, and joint ownership in marriage is recognized in formal law. In Madura Island, land rights are largely awarded to male offspring, and patriarchy restricts women’s access to property and independence (Supraptiningsih et al., 2023). In rural Indonesia more broadly, women may work on land and even hold title, but formal registration is often placed in a male family member’s name, and women may be unaware of the exact ownership status (Mehraban et al., 2022; Akter et al., 2017). This variation creates a useful setting to examine how gendered property rights map into welfare outcomes.

Smallholders in rural area in Indonesia face volatile commodity prices, climate risks, and credit constraints, and women often shoulder unpaid care work while engaging in informal farm and non-farm labor (Ismail et al., 2023; Roshteko, 2017). In such a context, women’s control over land may be particularly important for stabilizing household consumption and shaping livelihood choices. If female land ownership strengthens bargaining power, it may shift spending toward nutrition, health, or children’s education. Alternatively, if female ownership is mostly nominal in patriarchal settings, its association with welfare may be limited.

A second reason to study gendered land rights in Indonesia is the country’s ongoing agrarian reform agenda. The government has expanded land titling programs and redistributed land through the Reforma Agraria and social forestry schemes. These programs are increasingly encouraged to include women as registered co-owners or individual title holders. However, empirical evidence for Indonesia is still scattered. Studies using local surveys or case studies have documented gender gaps in inheritance and tenure security, but nationally representative household-level evidence connecting women’s land ownership to welfare and labor outcomes is rare. This paper addresses that gap using the 2018 National Socio-Economic Survey (SUSENAS), which includes explicit questions on who in the household owns land.

The analysis is organized around four research questions how the structure of land ownership in rural households whether land is owned only by the male household head (KRT), only by the spouse, by children

or other members, or by multiple owners; (2) how rural landowning households with female-owned land show higher welfare, measured by log per-capita expenditure and a welfare index (w_i); (3) examines whether the patterns differ between Java and non-Java regions using interaction models and split-sample robustness. The main contribution is twofold. Substantively, the paper documents a clear gender gradient in rural land rights and quantifies its association with multiple welfare dimensions. Methodologically, it exploits the ownership module of SUSENAS and combines weighted descriptive statistics, fixed-effect OLS, logistic models, marginal effects, and heterogeneity checks that respect the survey design. The rest of the paper proceeds as follows. Section 3 describes the data, variable construction, and methodology. Section 4 presents results for each research question, followed by a longer discussion that integrates findings with literature and Indonesian context. Section 5 draws policy implications and Section 6 conclusion.

Methods

The analysis using SUSENAS 2018 data from Indonesia' nationally representative socio-economic survey conducted by Statistics Indonesia (BPS). In this section there are two modules are merged the household (RT) and the individual (IND). The household module contains information on land ownership, household expenditures, housing conditions, and food insecurity indicators, while the individual module provides demographic and labor participation information.

Table 1 Variable Description

Variable	Description
Female_own	Land ownership (1 = female ; 0 = male)
Male_own	Land ownership (0 = female ; 1 = male)
any_fwork	Women's labor participation
food_insec_any	Food security score (1 if the score is above zero)
asset_count	Non-land durable asset ownership count
Hh_size	Household size
Age	Age of household head
Edu_krt	Household head's highest education
Femhead_rt	female-headed household
Region dummies	java =1 for provinces in Java

To examine the relationship between land ownership and household welfare, weighted ordinary least squares (OLS) models are estimated using two welfare indicators: the natural logarithm of per capita expenditure and the household wealth index:

$$\ln(Y_h) = \alpha + \beta_1 \text{FemaleOwn}_h + \beta_2 \text{MaleOwn}_h + \gamma \text{Java}_h + \delta' X_h + \mu_p + \varepsilon_h \quad (1)$$

$$\text{WI}_h = \alpha + \beta_1 \text{FemaleOwn}_h + \beta_2 \text{MaleOwn}_h + \gamma \text{Java}_h + \delta' X_h + \mu_p + \varepsilon_h,$$

where h denotes households, X_h is a vector of household characteristics, μ_p represents province fixed effects, and standard errors are clustered at the district level. To assess robustness, the binary ownership indicators are replaced by mutually exclusive ownership categories (using the KRT-only ownership category as the reference group):

$$\ln(\text{ExpCap}_h) = \alpha + \sum_{k=1}^{K-1} \theta_k \mathbf{1}\{\text{OwnCat}_h = k\} + \gamma \text{Java}_h + \delta' X_h + \mu_p + \varepsilon_h$$

Next, weighted logistic regression models are estimated to examine whether female land ownership is associated with women's labour force participation and household food insecurity:

$$\Pr(Y_h = 1) = \text{logit}^{-1}(\alpha + \beta_1 \text{FemaleOwn}_h + \beta_2 \text{MaleOwn}_h + \gamma \text{Java}_h + \delta' X_h + \mu_p),$$

where Y_h denotes either women's employment (any_fwork_h) or household food insecurity (food_insec_any_h). Results are presented as average marginal effects (AMEs) to facilitate interpretation.

To investigate regional heterogeneity, two complementary approaches are employed. First, interaction models are estimated by replacing province fixed effects with a Java indicator to identify the interaction between female land ownership and geographic location

$$Y_h = \alpha + \beta_1 \text{FemaleOwn}_h + \beta_2 \text{Java}_h + \beta_3 (\text{FemaleOwn}_h \times \text{Java}_h) + \beta_4 \text{MaleOwn}_h + \delta' X_h + \varepsilon_h.$$

Second, the baseline models are re-estimated separately for Java and non-Java subsamples while retaining province fixed effects. This split-sample analysis provides a robustness check for regional heterogeneity.

Results and Discussion

The descriptive findings of this study point a clear pattern that about 80.2 percent of rural households report owning some land. Among landowning rural households, ownership is strongly skewed toward men. The share in which the spouse is recorded as an owner (female own) is 10.5 percent, while the share where the head owns land (male own) is 83.8 percent. Joint head-spouse ownership is extremely rare: only 0.7 percent of rural landowning households list both the head and spouse as owners.

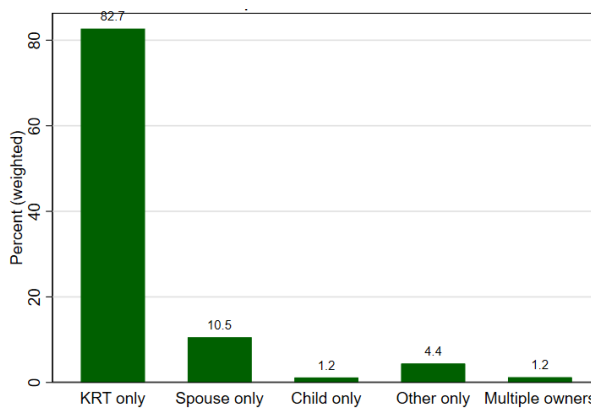


Figure 1. Ownership Structure in Rural Landowners
Source: processed by authors

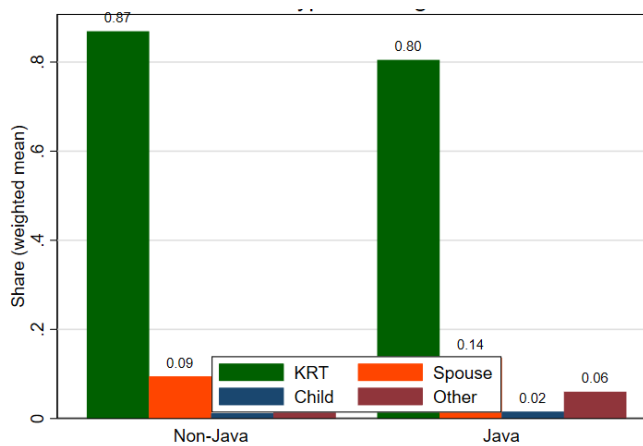


Figure 2. Land Owners Type among Rural Landowners
Source: processed by authors

Regionally, Java exhibits slightly more female involvement in land ownership than non-Java. The KRT-only category is 79.0 percent in Java versus 86.0 percent outside Java, while spouse-only ownership is 12.45 percent in Java compared to 8.83 percent in non-Java. Multiple ownership is also somewhat higher in Java (1.52 versus 0.92 percent). These differences likely reflect Java's smaller family farms, greater formalization, and more intensive land markets. Further, in figure 3 shows that household-head-only (13.56) and spouse-only (13.59) ownership show near-parity, running counter to the assumption that shifting land control toward female household members yields immediate welfare gains. This apparent homogeneity should be interpreted cautiously, however, as unconditional mean comparisons cannot account for confounders such as land size, asset composition, or household bargaining dynamics that may obscure heterogeneous effects.

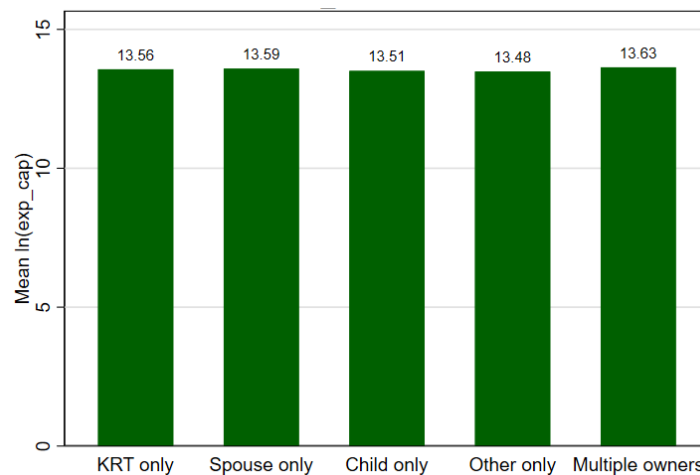


Figure 3. Mean of Expenditure by Ownership Structure
Source: processed by authors

Table 1 the OLS estimation result revealed that Female land ownership is positive and significantly associated with log per-capita expenditure. This implies that conditional on covariates and male ownership, households where the spouse owns land have about 2.7 percent higher per-capita expenditure than otherwise similar landowners. Male ownership is also positive, suggesting that head ownership matters as well, though the female coefficient is slightly larger. Further, asset holdings and head education positively associated with expenditure, household size negatively associated, and Java households showing higher expenditure levels consistent with better market access. This patterns reverse for the welfare index (wi) both female and male ownership are significantly negative, suggesting that land ownership's welfare gains operate through cash-flow channels rather than through housing quality or non-land asset accumulation captured by wi.

Table 2 OLS-weighted result

Variables	(1) ln(exp_cap)	(2) wi
Female-owned land (spouse owns) = 1	0.027*** (0.009)	-0.054*** (0.017)
Male-owned land (head owns) = 1	0.021** (0.009)	-0.045*** (0.017)
Java region (1=Java) = 1, Java	0.187*** (0.055)	-0.022 (0.117)
Asset count excl. land	0.206***	0.079***

	(0.003)	(0.003)
Hh_size	-0.142***	-0.011***
	(0.002)	(0.002)
Age of head	0.001***	0.006***
	(0.000)	(0.000)
KRT education (highest diploma code)	0.011***	0.026***
	(0.001)	(0.001)
Female-headed HH	0.000	0.092***
	(0.005)	(0.010)
North Sumatera	0.133***	0.025
	(0.034)	(0.054)
West Sumatera	0.167***	0.039
	(0.028)	(0.043)
Riau	0.154***	-0.038
	(0.034)	(0.051)
Jambi	0.001	0.076*
	(0.031)	(0.043)
South Sumatera	-0.024	0.115***
	(0.032)	(0.044)
Bengkulu	0.045	0.102*
	(0.044)	(0.053)
Lampung	-0.065**	0.190***
	(0.032)	(0.035)
Bangka Belitung Island	0.172***	-0.153
	(0.032)	(0.099)
Riau Island	0.129***	-0.327***
	(0.033)	(0.067)
West Java	-0.160***	-0.012
	(0.059)	(0.122)
Central Java	-0.284***	0.047
	(0.054)	(0.116)
Special Region of Yogyakarta	-0.325***	0.151
	(0.056)	(0.156)
East Java	-0.311***	0.084
	(0.053)	(0.117)
Banten (omitted)	-	-
Bali	0.127***	-0.031
	(0.037)	(0.055)
West Nusa Tenggara	-0.014	0.160***
	(0.056)	(0.040)
East Nusa Tenggara	0.002	0.243***
	(0.040)	(0.042)
West Kalimantan	0.082**	0.131***
	(0.038)	(0.044)
Central Kalimantan	0.157***	-0.062
	(0.048)	(0.048)
South Kalimantan	0.066	-0.013
	(0.045)	(0.042)
East Kalimantan	0.264***	-0.066
	(0.040)	(0.095)
North Kalimantan	0.244***	-0.157***
	(0.073)	(0.054)
North Sulawesi	0.106***	0.026
	(0.038)	(0.078)
Central Sulawesi	0.038	0.134**
	(0.036)	(0.053)
South Sulawesi	-0.112**	0.092***
	(0.048)	(0.034)
Southeast Sulawesi	-0.040	0.160***
	(0.043)	(0.050)
Gorontalo	-0.084*	0.177***
	(0.048)	(0.059)
West Sulawesi	-0.042	0.132***
	(0.053)	(0.048)
Maluku	0.181***	0.076
	(0.038)	(0.057)
North Maluku	0.259***	0.181***
	(0.035)	(0.068)

West Papua	0.251*** (0.056)	0.148** (0.073)
Papua	0.208*** (0.073)	0.109 (0.075)
Constant	13.655*** (0.030)	1.205*** (0.037)
Observations	124,955	124,955
R-squared	0.410	0.066

The robustness check (Table 2) shows using ownership categories (own cat) supports this findings. Spouse-only ownership shows no significant difference from head-only households in total income while only the "other only" category is significantly negative. This shows that the baseline female ownership effect is driven not by spouse-only arrangements, but by spousal ownership within broader multitype ownership structures. These results point to a welfare effect of gendered land ownership that is dimension-specific, taken up in the following section, about why land control translates into cash-flow gains without corresponding improvements in asset-based welfare, and what this divergence implies for how land rights are conceptualized and measured in rural development policy.

Table 3 Robustness check

Variables	(1) ln(exp cap) by own cat
Land ownership structure = 2, Spouse only	0.006 (0.007)
Land ownership structure = 3, Child only	0.031 (0.020)
Land ownership structure = 4, Other only	-0.034*** (0.010)
Land ownership structure = 5, Multiple owners	0.030 (0.022)
Java region (1=Java) = 1, Java	0.188*** (0.055)
Asset count excl. land	0.206*** (0.003)
Hh_size	-0.142*** (0.002)
Age of head	0.001** (0.000)
KRT education (highest diploma code)	0.011*** (0.001)
Female-headed HH	-0.001 (0.005)
North Sumatera	0.133*** (0.034)
West Sumatera	0.167*** (0.028)
Riau	0.154*** (0.034)
Jambi	0.002 (0.031)
South Sumatera	-0.024 (0.032)
Bengkulu	0.045 (0.044)
Lampung	-0.065** (0.032)
Bangka Belitung Island	0.172*** (0.032)
Riau Island	0.130*** (0.033)

West Java	-0.161*** (0.059)
Central Java	-0.285*** (0.054)
Special Region of Yogyakarta	-0.325*** (0.056)
East Java	-0.311*** (0.053)
Banten (omitted)	-
Bali	0.128*** (0.037)
West Nusa Tenggara	-0.014 (0.056)
East Nusa Tenggara	0.002 (0.040)
West Kalimantan	0.082** (0.038)
Central Kalimantan	0.156*** (0.048)
South Kalimantan	0.066 (0.045)
East Kalimantan	0.263*** (0.040)
North Kalimantan	0.243*** (0.073)
North Sulawesi	0.106*** (0.038)
Central Sulawesi	0.038 (0.036)
South Sulawesi	-0.112** (0.048)
Southeast Sulawesi	-0.041 (0.043)
Gorontalo	-0.084* (0.048)
West Sulawesi	-0.043 (0.053)
Maluku	0.181*** (0.038)
North Maluku	0.258*** (0.035)
West Papua	0.251*** (0.056)
	0.207*** (0.073)
	13.679*** (0.029)
Observations	124,955
R-squared	0.410
Base cat	KRT only
Sample	Rural landowners

This Table 3 revealed the determinants of female land ownership, women's work, and food insecurity. The logistic regression shows a strong positive relationship between female land ownership and women's labor participation. Male ownership is also positively associated with women working, though the magnitude is smaller. Female-headed households show much higher participation, reflecting both necessity and greater decision power. Java households display lower predicted female work, consistent with stronger male-breadwinner norms and different labor markets. In contrast, the food insecurity model yields no statistically significant association with female ownership. Male ownership, however, is significantly negative,

indicating that head-owned land is correlated with lower food insecurity. Larger asset holdings and education reduce food insecurity, while larger household size and female-headed status increase it.

Table 4 Logit Estimation

Variables	(1) Any female works	(2) Food insecurity
Female-owned land (spouse owns) = 1	0.363*** (0.040)	-0.056 (0.056)
Male-owned land (head owns) = 1	0.172*** (0.036)	-0.225*** (0.048)
Java region (1=Java) = 1, Java	-0.470*** (0.137)	0.139 (0.146)
Asset count excl. land	0.144*** (0.008)	-0.487*** (0.015)
Hh size	0.204*** (0.007)	0.110*** (0.007)
Age of head	-0.002*** (0.001)	-0.009*** (0.001)
KRT education (highest diploma code)	-0.002 (0.002)	-0.046*** (0.003)
Female-headed HH	0.688*** (0.035)	0.167*** (0.031)
North Sumatera	0.571*** (0.184)	-0.099 (0.170)
West Sumatera	0.305** (0.143)	-0.190 (0.200)
Riau	-0.316** (0.133)	-0.153 (0.201)
Jambi	0.045 (0.161)	-0.384** (0.191)
South Sumatera	0.402*** (0.155)	-0.006 (0.169)
Bengkulu	0.643*** (0.182)	-0.040 (0.238)
Lampung	0.175 (0.132)	0.101 (0.168)
Bangka Belitung Island	-0.118 (0.123)	-0.136 (0.147)
Riau Island	-0.025 (0.141)	-0.217 (0.169)
West Java	0.419*** (0.105)	-0.350** (0.155)
Central Java	1.008*** (0.100)	-1.106*** (0.100)
Special Region of Yogyakarta	1.561*** (0.127)	-1.206*** (0.163)
East Java	0.852*** (0.101)	-0.972*** (0.134)
Banten (omitted)	-	-
Bali	1.492*** (0.161)	-0.334 (0.322)
West Nusa Tenggara	0.468*** (0.125)	0.306 (0.204)
East Nusa Tenggara	0.882*** (0.161)	0.926*** (0.193)
West Kalimantan	0.646*** (0.172)	-0.159 (0.205)
Central Kalimantan	0.095 (0.150)	-0.274 (0.243)
South Kalimantan	0.449*** (0.142)	-0.707*** (0.187)
East Kalimantan	-0.545*** (0.130)	-0.372 (0.281)
North Kalimantan	-0.247 (0.234)	0.088 (0.220)

North Sulawesi	-0.252*	0.183
	(0.145)	(0.154)
Central Sulawesi	0.301*	0.489**
	(0.156)	(0.204)
South Sulawesi	-0.108	-0.344*
	(0.148)	(0.182)
Southeast Sulawesi	0.155	0.085
	(0.141)	(0.217)
Gorontalo	0.377***	0.241
	(0.140)	(0.175)
West Sulawesi	0.161	-0.231
	(0.224)	(0.430)
Maluku	0.025	-0.056
	(0.176)	(0.269)
North Maluku	0.015	0.231
	(0.164)	(0.190)
West Papua	0.232	-0.386**
	(0.209)	(0.190)
North Sumatera	0.693***	-0.197
	(0.252)	(0.188)
Constant	-1.185***	0.365**
	(0.133)	(0.154)
Observations	124,955	124,955
Sample	Rural landowners	Rural landowners

To assess whether the welfare implications of gendered land ownership vary systematically across Indonesia's province (Table 4) interaction models incorporating a Java–non-Java distinction were estimated, first without province fixed effects to preserve cross-regional mean variation, and a split-sample framework retaining province-level controls. The heterogeneity results offer an interesting finding, where the welfare effects of gendered land ownership actually diverge in this study not across Indonesia's Java–non-Java regional divide, but across welfare dimensions. Given that customary (adat) land tenure norms vary considerably between Java and the outer islands, one might expect the welfare returns to female land ownership to be similarly variable, particularly if those returns were primarily mediated by locally specific inheritance customs or communal tenure arrangements.

Table 5 Region-heterogeneity test

Variables	(1) ln(exp cap)	(2) wi
Female-owned land (spouse owns) = 1	0.033** (0.013)	-0.075*** (0.021)
Java region (1=Java) = 1, Java	-0.100*** (0.020)	-0.064*** (0.021)
0b.female_own#0b.java	0.000 (0.000)	0.000 (0.000)
0b.female_own#1o.java	0.000 (0.000)	0.000 (0.000)
1o.female_own#0b.java	0.000 (0.000)	0.000 (0.000)
1.female_own#1.java	-0.008 (0.016)	0.033 (0.026)
Male-owned land (head owns) = 1	0.027*** (0.010)	-0.046*** (0.017)
Asset count excl. land	0.206*** (0.003)	0.071*** (0.003)
Hh_size	-0.140*** (0.003)	-0.009*** (0.003)
Age of head	0.001** (0.000)	0.006*** (0.000)

KRT education	0.011*** (0.001)	0.026*** (0.001)
Female-headed HH	-0.002 (0.006)	0.093*** (0.011)
Constant	13.686*** (0.022)	1.298*** (0.028)
Observations	124,955	124,955
R-squared	0.384	0.058
Spec	No province FE (interaction estimable)	No province FE (interaction estimable)
Weights	pw=w_fwt	pw=w_fwt
Cluster	kabu	kabu

The descriptive ownership pattern in this study confirms a structural feature of the rural land tenure system that has proven to be may persistent in various agrarian economies, namely the concentration of formal property rights in male heads of households. In the sample of this study, more than four-fifths of rural landowners listed the head of household as the sole owner, while sole ownership by a couple was only about one-tenth. This proportion is largely consistent with the gender asymmetry in land tenure that has been documented in various developing country contexts (Deere & Doss, 2006; Doss et al., 2014). Previous studies have provided external validity to these findings while strengthening broader theoretical propositions in the gender and land literature (Agarwal, 1994; Meinzen-Dick et al., 2019; Mishra & Sam, 2016; Cheryl et al., 2014). An important point to underline is the joint ownership is 0.7 percent, this figure a stark contrast to the nominal protection afforded by the marital joint property law in Indonesia. The administrative and social conventions governing land documentation still codify land as fundamentally masculine assets (Mehraban et al., 2022 Akter et al., 2017), despite the gender-neutral language in the applicable legal framework, a pattern consistent with what in the land tenure literature is referred to as the "implementation gap" between legal reform and practical reality (Agarwal, 1994; Meinzen-Dick et al., 2019).

The pattern of dominance of male ownership here is not spatially homogeneous. Cross-regional comparisons show a moderate but identifiable increase in joint ownership by women in Java compared to outside Java, a difference that allows for at least two interpretations and is not mutually exclusive. One possibility is that Java's relatively more mature and formalized land market with clearer registration infrastructure and more codified inheritance practices results in a systematically higher rate of recording of joint ownership of spouses. The finding that land ownership by male is also positively associated with well-being. This not surprising given the role of land as a major income-generating asset in the agricultural context (Nguyen & Le, 2023). More analytically significant is the observation that the coefficient of women's ownership is slightly greater than that of men's, although women's ownership is much less frequent in the sample. In ownership asymmetry context, the estimation of welfare benefits from women's land ownership acquires its own analytical significance. The identified expenditure premium of 2.7 percent is indeed moderate in absolute terms, but its robustness to various alternative specifications, combined with the suitability of direction and magnitude with previous evidence on women's property rights and household welfare (Allendorf, 2007; Quisumbing et al., 2015), provide an adequate level of external credibility in the estimate. Two theory-based mechanisms could reasonably underlie this association, although the available data do not allow for a

formal decomposition of the two. The first mechanism operates through intra-household bargaining, where land ownership reinforces women's fallback positions within the Nash bargaining framework or the collective household model (Chiappori, 1997; Sen, 1989), thus shifting the allocation of household resources towards consumption patterns that are reflected in measurable spending. The second mechanism operates through productivity channels, where secure land rights strengthen women's incentives to provide labor or adopt inputs that increase crop yields, thereby indirectly increasing household incomes. Because SUSENAS does not record data on output or input use at the farm level, this study cannot empirically separate the two mechanisms; Nevertheless, both remain theoretically plausible and empirically consistent with the wider literature, and the breakdown of both is a valuable direction of follow-up research using data related to production.

This interpretation is further reinforced by the strong positive association between women's land ownership and women's labor force participation (Kieran et al., 2015; Nguyen & Le, 2023). The estimated average marginal effect of an increase of 8.2 percentage points relative to the basic participation rate of 54.5 percent is substantively large and gives significant weight to the explanation based on the theory of bargaining, where asset ownership expands women's authority over farm management decisions and the allocation of labor outside agriculture. These results are consistent with the broader empirical literature that links asset ownership to the expansion of women's economic agency (Kieran et al., 2015; Nguyen & Le, 2023). In the institutional context, especially in rural Indonesia, the expansion of this agency can be implemented through several channels, namely greater involvement of women in the cultivation of their land, more active participation in the marketing of agricultural products, or involvement in non-agricultural business activities financed through land-based collateral. Nonetheless, the motive for caution is important because the observed associations may partly reflect selection based on unobserved household characteristics. In particular, households that give land ownership to women may already be systematically more egalitarian in underlying gender norms. However, the persistence of these associations after controlling for female head of household status, education levels, and provincial fixed effects indicates that selection alone may not fully explain the observed relationship, thus reinforcing the allegation that there is a genuine empowerment mechanism that operates independently of selection at the household level.

Finally, the heterogeneity analysis indicates that both the welfare premium of women's land ownership to expenditure, as well as the association of women's land ownership with labor participation (Kieran et al., 2015; Nguyen & Le, 2023), show substantial consistency between Java and outside Java. Given the considerable heterogeneity between Indonesian regions in land tenure institutions, agroecological conditions, and customary inheritance norms, this level of national consistency is a non-trivial empirical result. These findings indicate that the mechanisms underlying the relationship between women's land ownership and welfare benefits may not be narrowly dependent on specific institutional or cultural conditions in a particular region, and may instead reflect structurally embedded and reasonably generalizable pathways operating across Indonesia's diverse agrarian landscape.

Table 6 Non Java interaction result

Variables	(1) Java: ln(exp_cap)	(2) Java: wi	(3) Non-Java: ln(exp_cap)	(4) Non-Java: wi
Female-owned land (spouse owns) = 1	0.030** (0.013)	-0.042* (0.024)	0.026** (0.012)	-0.069*** (0.023)
Male-owned land (head owns) = 1	0.027** (0.013)	-0.047* (0.024)	0.019* (0.010)	-0.046** (0.021)
Asset count excl. land	0.227*** (0.004)	0.065*** (0.006)	0.188*** (0.003)	0.091*** (0.003)
Hh_size	-0.142*** (0.004)	-0.006 (0.004)	-0.142*** (0.002)	-0.013*** (0.003)
Age of head	-0.001*** (0.000)	0.007*** (0.000)	0.002*** (0.000)	0.005*** (0.000)
KRT education (highest diploma code)	0.010*** (0.001)	0.031*** (0.002)	0.012*** (0.001)	0.022*** (0.001)
Female-headed HH	0.005 (0.009)	0.124*** (0.017)	-0.010 (0.006)	0.067*** (0.012)
North Sumatera			0.124*** (0.034)	0.029 (0.054)
West Sumatera			0.165*** (0.029)	0.041 (0.042)
Riau			0.163*** (0.035)	-0.049 (0.051)
Jambi			0.008 (0.032)	0.066 (0.043)
South Sumatera			-0.024 (0.033)	0.106** (0.044)
Bengkulu			0.046 (0.045)	0.095* (0.054)
Lampung			-0.070** (0.032)	0.185*** (0.034)
Bangka Belitung Island			0.192*** (0.032)	-0.176* (0.099)
Riau Island			0.137*** (0.031)	-0.340*** (0.066)
West Java			0.127*** (0.038)	-0.038 (0.055)
Central Java			-0.018 (0.057)	0.158*** (0.040)
Special Region of Yogyakarta			-0.019 (0.040)	0.251*** (0.042)
East Java			0.085** (0.038)	0.120*** (0.045)
Banten (omitted)			0.165***	-0.074

	(1)	(2)	(3)	(4)
Bali			(0.050) 0.072 (0.046)	(0.050) -0.024 (0.043)
West Nusa Tenggara			0.275*** (0.040)	-0.078 (0.096)
East Nusa Tenggara			0.260*** (0.070)	-0.171*** (0.054)
West Kalimantan			0.096** (0.038)	0.028 (0.078)
Central Kalimantan			0.031 (0.036)	0.132** (0.052)
South Kalimantan			-0.107** (0.048)	0.086** (0.034)
East Kalimantan			-0.042 (0.044)	0.158*** (0.050)
North Kalimantan			-0.091* (0.048)	0.171*** (0.059)
North Sulawesi			-0.046 (0.055)	0.129*** (0.048)
Central Sulawesi			0.164*** (0.039)	0.086 (0.057)
South Sulawesi			0.247*** (0.036)	0.185*** (0.068)
Southeast Sulawesi			0.255*** (0.054)	0.147** (0.072)
Gorontalo			0.199*** (0.073)	0.112 (0.075)
West Sulawesi	-0.126*** (0.040)	0.058 (0.049)		
Maluku	-0.164*** (0.041)	0.154 (0.118)		
North Maluku	-0.153*** (0.039)	0.096* (0.050)		
West Papua	0.156*** (0.056)	0.013 (0.122)		
Constant	13.737*** (0.046)	1.080*** (0.057)	13.607*** (0.029)	1.278*** (0.039)
Observations	28,704	28,704	96,251	96,251
R-squared	0.372	0.061	0.447	0.069
Spec	Province FE within Java	Province FE within Java	Province FE within Non- Java	Province FE within Non- Java
Weights	pw=w_fwt	pw=w_fwt	pw=w_fwt	pw=w_fwt
Cluster	kabu	kabu	kabu	kabu

The relatively weaker association of welfare index (wi) observed in Java may be due to differences in housing standards or the composition of non-land asset ownership that are more common in these more urban areas; However, because these regional differentials do not reach the level of conventional statistical significance, they should be interpreted as indicative, not conclusive, and require further exploration in future studies with a larger, regionally stratified sample.

Conclusion

This paper used SUSENAS 2018 data to explain gendered land ownership in rural Indonesia and to examine its association with welfare, women's labor participation, and food insecurity. Three key findings figured out, first, land ownership remains strongly male-dominated 83 percent of landowners list only the household head, and joint ownership is rare. Female land ownership is positively associated with monetary welfare and with women's labor participation, consistent with bargaining and empowerment channels. Last, female ownership does not significantly correlate with food insecurity, whereas male ownership does. Regional heterogeneity between Java and non-Java is limited. The policy recommendation settings to increase Indonesian agrarian and gender agenda are given that spouse-only and joint head-spouse ownership remain rare (11 percent and under 1 percent, respectively), land certification programs should adopt joint titling as the default rather than optional arrangement for married couples, supported by mobile registration, simplified documentation, and village-level legal aid to lower the transaction costs that disproportionately exclude rural women. Because female land ownership correlates with higher expenditure and labor participation but not with improved food security, titling programs should be paired with complementary livelihood support extension services, input access, and market linkages to translate ownership into food resilience. Particular attention is warranted for female-headed households, which combine higher female labor participation with greater food insecurity, suggesting that land rights alone may be insufficient without accompanying social protection and credit access.

Limitations

The models are associative and do not claim strict causality. Land ownership may be endogenous to unobserved wealth, social status, or inheritance patterns that also influence welfare. Province FE and a rich control set reduce but do not eliminate this concern. Reverse causality is possible if wealthier households are more likely to register land to women. Therefore interpretation estimates as conditional correlations and focus on plausibility and consistency across outcomes.

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