REGULAR ARTICLE

The effect of negative human recognition on farmland access and well-being: Evidence from women farmers in Malawi

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1 | INTRODUCTION[1]

Discussions on farmland access in agrarian societies rarely include intangible forms of human development such as human recognition. Yet human recognition plays a role in the access of resources such as farmland and, thus, can be associated with development (Castleman, 2016, pp. 136–140). Castleman (2016 p. 135) defines human recognition as "[...] the extent to which an individual is acknowledged by others to be of inherent value by virtue of being a fellow human being [...]." Receipt of human recognition from others is based on positive interaction, notably acknowledgment, respect, dignity, status, empowerment, love, and sociability (Castleman, 2013, p. 1). Conversely, individuals can be deprived of human recognition through negative interaction.

Human recognition affects the recipients' well-being in many ways, which, in turn, is instrumental in supporting socio-economic development outcomes (Castleman, 2016, pp. 135–140; Maduekwe et al., 2019, pp. 1–21; Maduekwe et al., 2020, pp. 805–824). Development outcomes expand freedoms that people value and support, notably individuals' escape from poverty through access to productive resources (Alkire, 2007, p. 347). However, poverty in agrarian societies in African countries such as Malawi is more often fuelled by scarcity and unequal access to resources such as farmland. Improving farmland access for women requires appropriate institutions[2] that promote human recognition, legal and customary rights, and agency (Bhaumik et al., 2016, p. 243). Clearly, access to farmland and well-being in the sense of

increased income for women farmers are interdependent (Mabsout & van Staveren, 2010, p. 783; Malapit et al., 2015, p. 1098). However, the present gendered patterns of farmland access are heavily influenced by women's positions in social institutions such as family and community. Particularly, family members are treated as gendered individuals and resource allocation in farm households are determined by a series of implicit bargaining positions (Agarwal, 1997, p. 7; Katz, 1997, p. 26). These bargaining positions are influenced by formal and informal rules that guide property rights, employment, marriage arrangements, or social networks, including exit options. Thus, in non-cooperative family arrangements, deprivation of human recognition is a way of ensuring limited resources are kept within the principal's (resource controller's) preferences. Thus, agents (women farmers) are confined to a situation where an increase in resource access, although beneficial to short-term income generation, is detrimental to overall well-being (Agarwal, 1997, p. 7).

Despite the interdependency outlined above, there is little literature linking human recognition deprivation to farmland access and to overall well-being.[3] To this end, we propose a non-cooperative model of farmland access and human recognition deprivation for women farmers. We hypothesize that, in the absence of viable exit options, increasing access to farmland within the household for women farmers is influenced by, among others, the level of human recognition deprivation she is willing to bear. We also outline the detrimental effects of such a non-cooperative model on women's overall well-being, despite increased income through farmland access. We provide empirical support using pooled cross-sectional data from the Demographic and Health Survey (DHS) for Malawi.

2 | TOPICAL LITERATURE REVIEW—HUMAN RECOGNITION AND FARMLAND ACCESS

2.1 | Human recognition and related concepts

Castleman (2016, p. 135) prominently defines human recognition as "[...] the extent to which an individual is acknowledged by others to be of inherent value by virtue of being a fellow human being [...]." Generally, human recognition is important for economic development because of the constitutive and instrumental role it plays, notably through respect, empowerment, and social capital (Castleman, 2016, pp. 136–138). Castleman (2016, p. 140) observes that **respect** within ethnic or other social groups affects human recognition at the individual level. Similarly, Grabe, Grose, and Dutt (2015, p. 15) and Meinzen-Dick, Quisumbing, Doss, and Theis (2019, p. 73) note that women with autonomy over resources enjoy respect within their communities. Thus, acts of respect definitely acknowledge the inherent value of its recipients as humans. Human recognition is also related to dignity through social-/self-esteem and empowerment. **Empowerment** is described by Kabeer (1999, p. 437) as the ability to make strategic decisions within the context of choice. Receipt of positive human recognition empowers women, conferring them with agency and authority. Human recognition is also interconnected with **social capital** because social capital is an important determinant of access to productive resources in agrarian communities. These relationships underpin the concept of human recognition and put into perspective, women's human recognition, power relations, and resource access.

2.2 | Gendered farmland tenure in Malawi

Generally, tenure systems that govern farmland access are gendered and complex (Grabe et al., 2015, pp. 8–15; Mabsout & van Staveren, 2010, p. 783). In sub-Saharan Africa, women are less seen as economic agents, which is visible in the gender gap in access to land. Meinzen-Dick et al. (2019, p. 73) find evidence that women's land rights, bargaining power, and consumption decisions are interrelated. They broadly outline farmland rights as a bundle of potential property rights within tenure systems. Tenure systems may be statutory, customary, or operate as a hybrid of both. As argued by Schlager and Ostrom (1992, pp. 250–258), farmland use rights may be bundled together such as overall ownership rights or may be split up into, for example, use or management rights and vested in different people. Use rights refer to "[...] the ability or permission to employ an asset [...]" (Meinzen-Dick et al., 2019, p. 74). However, within farm households, farmland use rights can include management rights, that is, the right to enter a farmland property and cultivate on it; or withdrawal rights, that is, the right to remove all or part of the harvest after cultivation.

Given these varying versions of property rights, we restrict farmland access in farm households to consist of use, management, and withdrawal rights. In most sub-Saharan African countries, habitually men have authority over this bundle of rights (Meinzen-Dick et al., 2019, pp. 72–82). However, these rights could be further extended to women by virtue of marital arrangements, cohabitation, or ethnic customary practices (Kishindo, 2011, pp. 89–97). In Malawi, the vast majority of farmland is held under customary tenure and is allocated to the households by a traditional authority such as the village chief (Chamberlin & Ricker-Gilbert, 2016, p. 1509). It is important to note that sale and rental of customary farmland are restricted and have no legal basis in Malawi (Chamberlin & Ricker-Gilbert, 2016, p. 1509). However, Holden, Kaarhus, & Lunduka (2006, p. 13) observe that customary tenure rules are underpinned by the understanding that every individual is entitled to farmland in the community by virtue of being a member with transmissible access rights.

Furthermore, in Malawi, rights to farmland and other resources are determined through tracing of descendants from a common ancestor, notably through the patrilineal and the matrilineal inheritance systems (Holden et al., 2006, p. 55). However, both lineage systems hold distinct views on men's and women's authority with regards to farmland access rights. In patrilineal lineages, complete rights and authority are vested on the male members of the household, while matrilineal lineages are characterized by a gender-based separation of roles. In matrilineal households, female family members form a group called Mbumba in Chichewa-language, composed of many generations of female relatives living together. A man of matrilineal descent, for example, the brother or uncle of a woman, plays the role of her chief guardian (called Nkhoswe) and has authority over the matrilineal family (called Mwini mbumba) (Holden et al., 2006, p. 60). This male guardian often controls and allocates the resources in the matrilineal family (Djurfeldt et al., 2018, pp. 601–610).

Usually, married couples in patrilineal inheritance systems settle with the relatives of the male partner. This is known as patrilocal/virilocal residency (called Chitengwa). Uxorilocal residence (called Chikamwini) refers to post-marital residence in the wife's village. Married couples of matrilineal descent usually choose to have uxorilocal residence at the early stages of marriage but switch to patrilocal residency later (Holden et al., 2006, p. 59; Peters, 2010, pp. 179–199). Holden et al. (2006, p. 60) observe that patrilocal residence allows married matrilineal male partners to manage farmland allocation in their matrilineal home villages either as the village headman or the chief guardian (Nkhoswe) of the matrilineal group (Benjamin et al., 2021, p. 102617; Chamberlin & Ricker-Gilbert, 2016, p. 1509).

3 | NON-COOPERATIVE MODEL FOR FARMLAND ACCESS

Eswaran and Malhotra (2011, pp. 1222–1223) note that resource theory within the feminist theory context predicts women with more autonomy and bargaining power to experience more recognition with a greater chance to resource access in a cooperative bargaining model. However, Vyas and Watts (2009, pp. 577–601) argue that although women's increasing access to resources should lead to less deprivation, for example, in the form of domestic violence, this is not supported by empirical data and is often influenced by context-specific factors such as financial autonomy. Finally, Atkinson, Greenstein, and Lang (2005, pp. 1137–1148) note that women's deprived human recognition status is influenced by the degree to which prevailing norms consider it socially acceptable, outlining the influence of social norms and perceptions on bargaining outcomes (Agarwal, 1997, pp. 1–51). Thus, to capture the effects of human recognition deprivation on the heterogeneous and gendered patterns of farmland access in Malawi (see Section 2.2), we use a non-cooperative model of resource allocation to account for the social and contextual realities that exist in Malawian farm households and elsewhere (Agarwal, 1997, pp. 5–7).

Particularly, non-cooperative household models are characterized by intra- and interhousehold interactions, with elements of cooperation and conflict, as indicated by Maduekwe et al. (2019, pp. 1–21) for Malawian farm households. Agarwal (1997, pp. 5–8) notes that the winning bargaining strategy depends on a range of factors including the strength of one's exit options (fallback positions), which are very limited for Malawian women farmers. The rationale for outlining resource (i.e., farmland) allocation in the farm household as a non-cooperative model draws on three main bargaining features: information asymmetry, enforcement, and inefficiency (Agarwal, 1997, pp. 5–8; Katz, 1997, p. 34). According to Katz (1997, pp. 34–35) and Agarwal (1997, pp. 5–6), several variants of non-cooperative models are proposed in the literature. We focus on the principal-agent model, which describes the household economy as an 'employer-employee' relationship. The principal (i.e., 'employer') holds an access monopoly to resources and may only offer the agent (i.e., 'employee') equal or slightly more than the well-being threshold. Indeed, in the non-cooperative principal-agent model, power relations are not only asymmetric but women's exit options are also constrained. Katz (1997, p. 35) and Agarwal (1997, pp. 5–6) note that this model is most prevalent in farm households in sub-Saharan Africa because of norms and practices governing resource property rights and access.

We propose a model in which the likelihood of intra-household farmland access of a woman farmer is endogenous when depriving her of human recognition is a viable option available to her principal/s. We use the term principal to refer to people or a group of people who control(s) the household's farmland, specifically the husband, a traditional authority such as the village chief or the chief male guardian of a matrilineal family. We define households in line with Croft, Marshall, and Allen (2018, p. 36) as a group of people living together in the same dwelling, with one adult male and/or adult female as household head.

We define a 'landed household' as a household with farmland as a production factor.[4] As previously noted by Holden et al. (2006, p. 13), customary rules in Malawi are underpinned by the understanding that every individual is entitled to farmland in the community by virtue of being a member. Thus, we define a woman farmer's farmland access as the share of farmland entitled to her from the total household farmland endowment.

We denote the woman's farmland access and well-being functions as $A(nhr)$ and $U_w(nhr, l_{we}, z)$ respectively, where nhr represents the woman's level of human recognition deprivation, z is a vector of covariates that supports wellbeing, and l_{we} denotes the share of

farmland entitled to the woman as a household member. We show that the woman farmer's farmland access function $A(\cdots)$ is increasing in monotonicity and has curvature properties that are increasingly quasi-concave in the first order and decreasing in the last order condition. In farm households, we argue that access to farmland, A, differs and farmland allocation is overseen by a principal.

Suppose a woman farmer living in a household would like to access farmland within the household (A to A') and is willing to pay a price for it by tolerating the deprivation of her human recognition. We note that in accepting this price, her stock of human recognition decreases, that is, Δnhr where $nhr' < nhr$. The principal is modeled as a first mover in line with Eswaran and Malhotra (2011, p. 1230), on the premise that in certain partnerships or marital set-ups such as in Malawi, women will move to their partners' homes (i.e., virilocal residency) and are required to abide by rules that may promote the subjugation of their rights. This view is supported by Holden et al. (2006, p. 61) who note that in matrilineal marriages, farmland wealth and position give men relatively stronger position in bargaining, especially for post-marital residency. As for Malawi, matrilineal women in relatively weak bargaining positions are often persuaded to move to the partners' villages, where they lose access to their maternal farmlands and have little or no access to farmland from the partner family (Djurfeldt et al., 2018, pp. 601–610).

We solve for the woman farmer's relative farmland access, optimization in the presence of human recognition deprivation and for simplicity, suppress the dependence of this optimization on the principal's utility. It is plausible that depriving women of human recognition, for example, by means of domestic violence, could have a positive effect on the partner's utility, directly and indirectly through his control of the agent's behavior (Pollak, 2004, p. 314). However, that analysis is outside the scope of our study. Thus, we can define the woman farmer's farmland access as a constrained within-household access optimization, given well-being constraints and hypothetically set the minimum reference well-being, $U_w(\cdots)_0$ as a situation without farmland access in general. For woman farmers with little or no viable exit options, we denote the well-being constraint as

$$U_w(nhr, l_{we}, z) \geq U_w(nhr, z)_0 \tag{1}$$

and assume the well-being constraint to bind that is, the woman farmer is not better off exiting the partnership. In this case, her farmland access depends on the stock of her human recognition and how much deprivation thereof she is willing to accept. The woman farmer optimizes her share of intra-household farmland access from total household farmland endowment, A, based on well-being constraints as follows:

$$\underset{nhr}{Max} \; A(nhr) \;\; s.t \;\; U_w(nhr, l_{we}, z) \geq U_w(nhr, z)_0 \tag{2}$$

In Equation (2), the woman farmer in a non-cooperative household could maximize her farmland access to the point that constitutes Pareto efficiency in a principal-agent decision model. At this level, the value of her overall well-being due to increased intra-household farmland access will be, at the minimum, equal to her threshold well-being, that is $U_w(nhr, z)_0$.

Solving Equation (2) requires setting up the Lagrangian to maximize the woman's farmland access within the household, A, as follows:

$$L = A(nhr) + \lambda \big[U_w(nhr, l_{we}, z) - U_w(nhr, z)_0 \big] \tag{3}$$

Equation (3) represents the woman farmer's evaluation of her farmland access and the contribution of this access to her overall well-being, given well-being constraints and non-viable exit options. The shadow price of the well-being constraint is denoted by λ and presents the forgone well-being, that is, the woman farmer's marginal opportunity cost of tolerating the deprivation of her human recognition. Thus, the farmland access maximizing first order partial derivatives of Equation (3) with respect to nhr and λ becomes

$$\frac{\partial L}{\partial nhr} = \frac{\partial A}{\partial nhr} + \lambda \left(\frac{\partial U_w}{\partial nhr} \frac{\partial U_w}{\partial l_{we}} \frac{\partial U_w}{\partial z} - \frac{\partial U_w}{\partial nhr} \frac{\partial U_w}{\partial z} \right) = 0 \tag{4}$$

$$\frac{\partial L}{\partial \lambda} = U_w(nhr, l_{we}, z) - U_w(nhr, z) = 0 \tag{5}$$

Solving Equation (4) for λ yields:

$$\lambda = - \left(\frac{\frac{\partial A}{\partial nhr}}{1} \times \frac{1}{\frac{\partial U_w}{\partial nhr} \frac{\partial U_w}{\partial l_{we}} \frac{\partial U_w}{\partial z} - \frac{\partial U_w}{\partial nhr} \frac{\partial U_w}{\partial z}} \right) \simeq - \left(\frac{\frac{\partial A}{\partial nhr}}{1} \times \frac{1}{\frac{\partial U_w}{\partial l_{we}}} \right) \tag{6}$$

Factorizing Equation (6) yields optimal λ^* as:

$$\lambda^* = \left(\frac{\frac{\partial A}{\partial nhr}}{\frac{\partial U_w}{\partial l_{we}}} \right) > 0 \tag{7}$$

In Equation (7), the woman farmer endogenously choses the acceptable level of human recognition deprivation in exchange for farmland access. Taking the second order derivative of λ, which is sufficient to indicate that the slope parameter is a maximum, yields

$$\frac{\partial^2 \lambda(nhr)}{\partial nhr} = \left(\frac{1}{\frac{\partial^2 U_w}{\partial^2 l_{we}}} \right) < 0 \tag{8}$$

In general, endogenous farmland access of the woman farmer and the equilibrium level of human recognition deprivation depends on the utilities of both the principal and agent (woman farmer). Thus, for a binding well-being, Equation (8) is unconditionally true, such that a higher level of human recognition deprivation raises the woman farmer's cost of accessing an increasing share of farmland from the household (and impacts her well-being) and so, will force her to economize on accepted human recognition deprivation.

The model demonstrates that in a non-cooperative household, a woman farmer's increased within-household farmland access is not accompanied by a monotonous decrease in human recognition deprivation provided by the principal in the household. The well-being model in Equation (1) is binding for a woman farmer with little or no viable exit option and thus, the

principal will maintain access in their own favor using human recognition deprivation, with resulting detrimental effects on women farmers' well-being.

4 | METHODOLOGY AND MEASURES OF INTEREST

We use pooled cross-sectional data from the Malawi DHS for 2004/05, 2010, and 2015/16. The data are representative of households within the 26 main districts in Malawi (see Figure 1). For detailed insight into the DHS sampling strategy see Croft et al. (2018). Our cross-sectional datasets are limited to households with women who indicated that they were employed or self-employed in agriculture in all three timeframes of the Malawi DHS. Going forward, we describe

FIGURE 1 Map of Malawi with districts and administrative zone. *Source*: Malawi NSO (2012, p. ii) [Colour figure can be viewed at wileyonlinelibrary.com]

the generation of our main outcome variables of interest, namely a measure of the woman farmer's farmland access within her household and a well-being measure.

4.1 | Women's farmland access

In line with Chamberlin (2008, pp. 6–7), we limit our farm household sample to reflect the size of total household farmland from 19 ha (*ha*) and below to capture small, medium, and large farm households. This farmland threshold captures about 95% of the farm households in the dataset, dropping 5% of the observations, which are farm estates.

Similar to Amarasinghe, Samad, and Anputhas (2005, p. 505), we derive a proxy for women's farmland access from total household endowment. The proxy is needed because the Malawi DHS does not report the extent to which farmland is controlled by individual household members. We take the following steps: First, we plausibly assume that in households where the woman is the sole farmer, the reported total household farmland is exclusive to her use. In households where the woman is not the sole farmer, total household farmland is split evenly among both partners based on the customary tenure rules in Malawi (Holden et al., 2006, p. 60). The intra-household farmland size entitled to the woman farmer is then calculated by dividing total household farmland endowment by a count value that observes if one or both partners are farmers:

$$\text{Farmland entitled per farmer (ha)} = \frac{\text{Total household farmland}\,(ha)}{\text{Count value of household farmers}} \quad (9)$$

Next, we estimate the national average farmland entitlement per farmer as 2.7 *ha* (SE = 0.03). Because the Malawi DHS is representative, we can argue that the value of the average farmland entitlement per farmer is a representative estimate of the share of intra-household farmland for each Malawian women farmer.

We use the national average household farmland entitled per farmer to generate a dummy measure of the woman's farmland access as one if the share of farmland in her household is greater than the national average farmland entitlement (2.7 *ha*) and 0 if otherwise:

$$\text{Women's farmland access} = \begin{cases} 1 & \text{if household farmland entitled to the woman farmer} \\ & > \text{national mean farmland entitlement}\,(ha) \\ 0 & \text{if otherwise} \end{cases} \quad (10)$$

The Malawi DHS recorded only the occupational status of the respondents (women) and partners. There is no record detailing the true number of farmers (male or female) in the households. As a result, one may argue that other household members exist who work in agriculture and thus influence the size of the farmland entitled to the woman farmer. We control for this scenario by including the number of household members aged 18 years and above who may be entitled to household farmland and thus, may demand a cut from the total household farmland endowment.

It is important to note that our calculation of the access variable (Equation 10) is limited due to lack of information on the amount of farmland used for farming purposes by sex in the DHS dataset for Malawi. However, we strongly argue that our assumptions that farmland

access, in the best-case scenario could be evenly split within farm households, is supported by the understanding that every individual is entitled to farmland in the community by virtue of membership in the customary sense as practiced in Malawi. Please see Holden et al. (2006) and Djurfeldt et al. (2018) for detailed insights on farmland inheritance/use in Malawi.

4.2 | Depriving women of human recognition

Using our restricted sample of women farmers only, we generate a measure (*nhr*) to reflect whether, and to what degree, women are deprived of human recognition, as illustrated in the model above. We cluster indicators of violence, humiliation, dehumanization, and autonomy within three domains of interaction, namely, self, household, and community from the Conflict Tactics Scale (CTS) module. See Table 1 of the Supplementary Materials for domains and domain indicators. For details on the calculation of the deprivation score of human recognition, refer to Castleman (2016, pp. 135–142) and Maduekwe et al. (2020, pp. 805–824; 2019, pp. 1–21). Using the Alkire–Foster method of multidimensional deprivation counting, we generate the human recognition raw score. It ranges between 0 and 10, with 0 indicating no deprivation of human recognition and 10 being the highest level of deprivation. We also establish a binary value of human recognition deprivation (1 if deprived in 33% of indicators, 0 if otherwise) for each woman farmer. Table 1 presents the distribution of human recognition deprivation, with special attention to the matrilineal system of inheritance in Malawi (Maduekwe et al., 2020, pp. 805–824). See Alkire (2007, pp. 347–359) for detailed insights on the methodology of multi-dimensional deprivation counting and the Supplementary Material for the domains of human recognition and indicators.

TABLE 1 Negative human recognition scores for farm women: Two-sample *t*-test

	Observations	Negative human recognition		Difference
		Mean	SD	
Full sample				
Only woman is a farmer	2,504	3.053	1.121	
Both partners are farmers	4,564	3.182	1.117	−0.130 (0.028)***
All	7,068	3.136	1.121	
Matrilineal sample (Yao & Chewa ethnicities)				
Only woman is a farmer	1,029	3.041	1.160	
Both partners are farmers	2,117	3.210	1.130	−0.1696 (0.044)***
All	3,146	3.155	1.143	
Patrilineal sample (other ethnic groups)				
Only woman is a farmer	1,475	3.061	1.093	
Both partners are farmers	2,447	3.159	1.045	−0.098 (0.036)**
All	3,922	3.122	1.101	

Note: Negative human recognition scores 0–10. Standard errors in parentheses for difference in means; *SD* standard deviation; Significance level: ** at 5%, *** at 1%.

4.3 | Women's overall well-being

We generate a measure of the woman farmer's well-being using a host of indicators from the Malawi DHS. The indicators signaling well-being are summarized in Table 2.[5] The binary child dietary diversity (DD) measure is based on data from the 7-day and 24-hr recall of food groups eaten by children within the household,[6] accounting for the spatial nature of dietary diversity in Malawi. For detailed explanations on the findings from the Malawi DHS see NSO and ICF (2005), NSO and ICF (2011), and NSO and ICF (2017).

We combine the well-being indicators from Table 3 to generate a principal component analysis (PCA) score for each woman farmer in the dataset. Finally, and similar to the farmland access model, we generate a binary variable of overall well-being, which is 1 if the farm woman's wellbeing PCA score is greater than the national wellbeing average and 0 if otherwise. Figure 2 show the distribution of the well-being PCA scores of the Malawian women farmers in the dataset.

5 | ESTIMATION RESULTS: EFFECTS OF HUMAN RECOGNITION DEPRIVATION ON WOMEN's FARMLAND ACCESS AND OVERALL WELL-BEING

We demonstrate that in farm households with a principal-agent bargaining model, women farmers are willing to tolerate the deprivation of their human recognition for more intra-

TABLE 2 Well-being indicators

Indicator group	Indicators
Exposure to mass media	Frequency of reading newspaper or magazine
	Frequency of listening to radio
	Frequency of watching television
Reproduction	Total number of sons and daughters living at home
	Total number of sons and daughters living away from home
	Total number of sons and daughters who have died
	Total number of births in the last 5 years
	Current contraceptive method
	Ideal family size
	Whether the respondent ever had a pregnancy that did not result in a live birth
Household access and use of insecticide treated nets for malaria prevention	Respondent's household has bed net for sleeping
	Respondent slept under bed net
Nutrition of children and women	Respondent's body mass index (BMI)
	Child dietary diversity
Adult mortality	Sibling death (respondent has one or more siblings whom have died)

Note: No of indicators = 18; Indicators are derived from the Malawi DHS.

TABLE 3 Probit estimates for within-household farmland access of women farmers in Malawi

Dependent variable: Woman's farmland access	All			
	Probit	Marginal effects	IV-Probit	IV-Marginal effects
Negative human recognition scores (0–10, 0 = no negative human recognition)	0.041**	0.013**	0.519***	0.160**
	(0.015)	(0.005)	(0.119)	(0.046)
Exogeneity: Wald test (*p*-value)			0.017	
Pseudo R²	0.167			
IV-Probit first stage regression: Dependent variable is ***negative human recognition***				
Difference from the district median value:				
Height of woman			−0.001***	
			(0.000)	
19 individual/household, 2 time, and 9 ethnicity controls	Yes		Yes	
Observations	7,068		7,068	
Degrees of freedom	30		30	

Note: Dependent dummy variable is woman's farmland access, which is 1 if the woman's farmland access (*ha*) within the household is larger than the overall national average and 0 if otherwise. Robust standard errors in parentheses. Significance level: * at 10%, ** at 5%, *** at 1%.

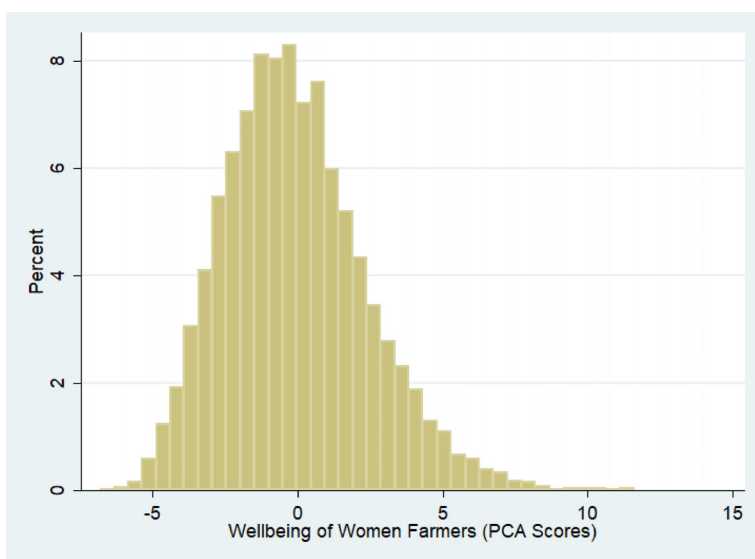**FIGURE 2** Distribution of well-being PCA scores of women farmers in Malawi [Colour figure can be viewed at wileyonlinelibrary.com]

household farmland access. Overall, this has detrimental effects on women's general well-being, despite potential higher incomes from farming.

We acknowledge the possible endogenous nature of human recognition deprivation such as self-selection. We deal with the potential source of endogeneity using the instrumental variable

(IV) approach: the difference from the district median measures of women's height. According to Eswaran and Malhotra (2011, p. 1245), a woman's (agent) height is determined before marriage and is exogenous, that is, cannot be influenced by the partner (principal). In addition, a partner appears to be more likely to engage in violence, which further deprives the woman's human recognition, if he perceives physical superiority. We use the variation in height (difference from the district-level median height) and ague that it is related to intra-household farmland access through human recognition only. A counter argument is that women who grew up in a poor matrilineal farm household are likely to have their stunting linked to the small farmland size in her natal household and thus, linked to her current and available supply of farmland. However, we argue that this does not hold in patrilineal households, in which the available supply of farmland is influenced by the nature of the patrilineage. As for matrilineal households, farmland resources are pooled, and allocation is carried out by the maternal male guardian, who takes the marital status of women in the household into account (Djurfeldt et al., 2018, pp. 601–610). Similar to Eswaran and Malhotra (2011, p. 1247), we reason that assortative matching in the marriage market exist, matrilineal households, and overall, in the form that women and men are also married into families with similar income level, thus, equalizing natal income effects. We, however, include a control variable for household wealth.

We take into account the two systems of inheritance practiced in Malawi with varying farmland access patterns by estimating two separate models: a matrilineal model for women farmers who come from the two largest matrilineal ethnic groups in Malawi, the Chewa and Yao (Bhaumik et al., 2016, p. 243) and a patrilineal model for women farmers from patrilineal ethnic groups.

We first estimate the probability that a woman's farmland access is large in the presence of deprived human recognition. Next, we examine the extent to which deprived recognition impacts on well-being. Finally, we instrument for the endogenous nature of human recognition by estimating the IV-Probit models for both binary outcome variables.

5.1 | Trading human recognition for farmland access

We present the key findings for within-household farmland access of women farmers in Malawi. A complete list of the control variables, summary statistics, and comprehensive model results are available in the Supplementary Material. The key results on women's farmland access, overall and with different exit options, as well as patrilineal and matrilineal inheritance lineages, are presented below.

The Probit estimates from Table 3 show that an increase in being deprived of human recognition raises the likelihood by 1% that a woman farmer's farmland access within her household is more than average. Taking the endogeneity of human recognition into account, the coefficient on human recognition deprivation from the IV-Probit model remains positive and significant. As expected, an increase in deprivation, as measured by the human recognition score (0–10 with 0 implying no deprivation), increases the likelihood that the woman farmer has more within-household farmland access by 8%.

5.2 | Impact on woman's farmland access given exit options

As previously outlined, the winning strategy in non-cooperative household models may depend on a range of factors including a woman farmer's exit options (Agarwal, 1997, p. 7). To account

for the woman's exit options in the farmland access model, we constrain our sample to reflect women's illiteracy as a non-viable exit option (Vyas & Watts, 2009, pp. 577–602), the presence of natal male siblings as a viable exit option, and finally, the presence of natal female siblings as a non-viable exit option (Holden et al., 2006, pp. 59–61). Estimates from Table 4 show that women farmers with lower education have a higher likelihood of being deprived of human recognition and are in farm households with more household farmland access (18% and 16% [IV-Probit], respectively).

Holden et al. (2006, pp. 65–67) note that older women in matrilineal households prefer uxorilocal residency after marriage, allowing them to have access to their male siblings or relatives with guardian status who could defend their resource rights overall. After divorce, women may also be allowed by their brothers or uncles to return and access their natal farmland resources. However, with recourse to the resource dilution theory, other scholars (Keister, 2003, pp. 521–542; Post, 2016, p. 473) suggest that sibship size and parental birth order may have an impact on within-family resource competition and thus, may hinder this access. Mace (1996, pp. 75–81) notes the competitive effects of sibship size and sex on parental investment for same-sex siblings only. That is, men with more male siblings are more likely to have smaller household sizes as a result of a smaller initial parental inheritance. Similarly, women with more female siblings seem to receive lower dowries. Late-born or father-less daughters may be reliant on uncles or brothers to provide their dowries and as such, may find themselves competing with the uncles'/brothers' daughters (Mace, 1996, p. 79). Therefore, we account for natal sibship as a form of exit option because male relatives could act as protection in the event of conflict or marital breakdown. In the full sample, we observe the average number of siblings in the natal family to be about three. We restrict the sample to households with women farmers who have more than the average number of male/female siblings in their natal family. We separate the analysis by gender of siblings in the natal family to account for the influence of more male or female siblings on the woman's farmland access in her present household and control for the birth order of the woman farmer in her natal family. As anticipated, our estimates show a significant marginal effect of human recognition deprivation on women's farmland access if they have >3 male siblings. However, our hypothesis does not hold for women farmers with more male siblings. In other words, the presence of male relatives in the woman farmer's natal family does not deter the deprivation of human recognition by her current partner (principal). For women farmers with >3 male siblings, a unit increase in human recognition deprivation increases the likelihood that she is in a household with more farmland access by 2% and 21% after accounting for endogeneity (see Table 5 below), respectively.

5.3 | Impact on women's farmland access in patrilineal and matrilineal households

Accounting for patrilineal and matrilineal farmland inheritance patterns in Malawi, we also find significant results for human recognition deprivation and woman's farmland access. Controlling for endogeneity, the likelihood that a woman farmer is facing increasing deprivation is growing and is significantly associated with more within-household farmland access for women, by 12% and 20% in matrilineal and patrilineal households, respectively (see Table 6). This is in line with Bhaumik et al. (2016, p. 243), who find evidence of increasing conflict in matrilineal settings where farmland access may be contested by maternal uncles or brothers.

TABLE 4 Probit estimates for within-household farmland access of women farmers in Malawi: literacy and education gap (non-viable exit options)

Dependent variable: **Women's farmland access**	Woman farmer is semi or illiterate				Farm women are equal or less educated than partners			
	Probit	Marginal effects	IV-Probit	IV-Marginal effects	Probit	Marginal effects	IV-Probit	IV-Marginal effects
Negative human recognition scores (0–10, 0 = no negative human recognition)	0.048**	0.015**	0.575***	0.176***	0.052***	0.017***	0.540**	0.164**
	(0.021)	(0.007)	(0.153)	(0.043)	(0.017)	(0.005)	(0.152)	(0.043)
Exogeneity: Wald test (*p*-value)			0.010				0.012	
Pseudo R²	0.149				0.177			
IV-Probit first stage regression: Dependent variable is *negative human recognition*								
Difference from the district median value:								
Height of woman			0.001***				0.001**	
			(0.000)				(0.000)	
19 individual/household, 2 time and 9 ethnicity controls	Yes		Yes		Yes		Yes	
Observations	3,625		3,625		5,487		5,487	
Degrees of freedom	30		30		30		30	

Note: Dependent dummy variable is woman's farmland access, which is one if the woman's farmland access (*ha*) within the household is larger than the overall national average and 0 if otherwise. Illiterate or semi-literate means women farmers who cannot read at all or are able to read only parts of sentences, respectively. Robust standard errors in parentheses. Significance level: * at 10%, ** at 5%, *** at 1%.

TABLE 5 Probit estimates for within-household farmland access of women farmers in Malawi: Siblings

Dependent variable: Women's farmland access	Woman farmer has 3 or more male siblings				Woman farmer has 3 or more female siblings			
	Probit	Marginal effects	IV-Probit	IV-marginal effects	Probit	Marginal effects	IV-Probit	IV-Marginal effects
Negative human recognition scores (0–10, 0 = no negative human recognition)	0.046* (0.027)	0.015* (0.009)	0.687*** (0.220)	0.207*** (0.060)	0.056** (0.027)	0.018*** (0.009)	0.471 (0.311)	0.147 (0.90)
Exogeneity: Wald test (p-value)			0.074				0.259	
Pseudo R^2	0.167				0.166			
IV-Probit first stage regression: Dependent variable is *negative human recognition*								
Difference from the district median value:								
Height of woman			0.001** (0.000)				0.001*** (0.000)	
19 individual/household, 2 time and 9 ethnicity controls	Yes		Yes		Yes		Yes	
Observations	2,294		2,294		2,274		2,274	
Degrees of freedom	31		31		31		31	

Note: Dependent dummy variable is woman's farmland access, which is 1 if the woman's farmland access (ha) within the household is larger than the overall national average and 0 if otherwise. Robust standard errors in parentheses. Significance level: * at 10%, ** at 5%, *** at 1%.

TABLE 6 Probit estimates for within-household farmland access of women farmers in Malawi: Household type

Dependent variable: Women's farmland access	Matrilineal				Patrilineal			
	Probit	Marginal effects	IV-Probit	IV-Marginal effects	Probit	Marginal effects	IV-Probit	IV-Marginal effects
Negative human recognition scores (0–10, 0 = no negative human recognition)	0.052**	0.016**	0.396*	0.121**	0.034*	0.011*	0.644***	0.198***
	(0.023)	(0.007)	(0.208)	(0.061)	(0.020)	(0.007)	(0.237)	(0.064)
Exogeneity: Wald test (*p*-value)			0.140				0.092	
Pseudo R²	0.197				0.143			
IV-Probit first stage regression: Dependent variable is ***negative human recognition***								
Difference from the district median value:								
Height of woman			0.001***				0.001*	
			(0.000)				(0.000)	
19 individual/household and 2 time controls	Yes		Yes		Yes		Yes	
Observations	3,146		3,146		3,922		3,922	
Degrees of freedom	21		21		21		21	

Note: Dependent dummy variable is woman's farmland access, which is 1 if the woman's farmland access (*ha*) within the household is larger than the overall national average and 0 if otherwise. Robust standard errors in parentheses. Significance level: * at 10%, ** at 5%, *** at 1%.

TABLE 7 Probit model estimates for well-being of women farmers in Malawi

Dependent variable: Well-being	Probit	Marginal effects	IV-Probit	IV-Marginal effects
Negative human recognition scores (0–10, 0 = no negative human recognition)	0.041***	0.012***	−0.461***	−0.461***
	(0.016)	(0.005)	(0.176)	(0.176)
Larger farm women land access	−0.006	−0.002	0.041	0.041
	(0.039)	(0.011)	(0.040)	(0.040)
Education in single years	0.020***	0.006***	0.012*	0.012*
	(0.006)	(0.002)	(0.007)	(0.007)
Married woman farmer	−0.171**	−0.050**	−0.136**	−0.136**
	(0.067)	(0.019)	(0.066)	(0.066)
Livestock ownership	0.069*	0.020*	0.062*	0.062*
	(0.038)	(0.011)	(0.036)	(0.036)
Exogeneity: Wald test (*p*-value)			0.022	
Pseudo R²	0.248			
IV-Probit first stage regression: Dependent variable is ***negative human recognition***				
Difference from the district median value:				
Height of woman			−0.001***	
			(0.000)	
19 individual/household, 2 time and 9 ethnicity controls	Yes		Yes	
Observations	7,068		7,068	
Degrees of freedom	32		32	

Note: Dependent dummy variable is woman's farmland access, which is 1 if the woman's farmland access (*ha*) within the household is larger than the overall national average and 0 if otherwise. Significance level: * at 10%, ** at 5%, *** at 1%.

TABLE 8 Stratified propensity score matching: average treatment effect on the treated (ATT) of negative human recognition on women's farmland access within the household

Variables	No of treated observations	No of control observations	ATT	t/*p*-value
Women's entitled farmland in the household (*ha*)	3,063	4,004	0.135**	2.024
			(0.062)	{0.043}**

Note: Total observations = 7,068. Bootstrapped standard errors in parentheses (1,000 replications). *p*-Value in curly parenthesis. Significance level: * at 10%, ** at 5%, *** at 1%.

5.4 | Human recognition and women's overall well-being

As hypothesized, in a non-cooperative household model, more intra-household farmland access for women is not accompanied by a monotonous decrease in human recognition deprivation provided by the principal, especially when well-being utility is binding. We demonstrate that this situation has a significant and negative influence on well-being. Finally, we estimate a

Probit and IV-Probit model to assess the impact of human recognition deprivation on women farmers' well-being.

Table 7 presents the effect of human recognition deprivation on women farmers' well-being. Controlling for endogeneity, we find that an increase in the deprivation score significantly lowers the likelihood that the woman farmer is well off by 46%. We note that an increase in livestock ownership significantly and positively contributes to the well-being of women. However, this small gain does not offset the overall detrimental effects of human recognition deprivation on well-being.

5.5 | Accounting for self-selection into households with human recognition deprivation

We use stratified propensity score matching[7] as a robustness check for examining the possibility that the observed distribution of human recognition deprivation of women farmers in Malawi is non-random. For instance, women farmers may observe an incidence of human recognition deprivation in households and still choose to enter into marital or social arrangements with a member of these households.

We focus on the average treatment effect on the treated (ATT) and estimate a propensity score matching model to account for the observational nature of our dataset and the possible self-selection of farm women into human recognition deprived households. The probability of human recognition deprivation is estimated based on all control variables in the farmland access model. We then match farm women who are human recognition deprived using the binary measure of deprived women (=1 if deprived in 33% of all indicators, 0 if otherwise) to those who are not, but show very similar propensity scores as the treated and untreated sets, respectively. ATT estimates derived from Table 8 suggest that women farmers who experience human recognition deprivation are 14% more likely to be in households where a larger share of household farmland is entitled to them, relative to similar women who are not deprived of human recognition. The estimates are significant at the 5% level.

In summary, the results support our hypothesis that farm households in Malawi operate under a principal-agent bargaining model and women farmers appear to be willing to tolerate a deprivation of human recognition for more intra-household farmland access, although this deprivation is detrimental to overall household well-being.

6 | DISCUSSION AND CONCLUSION

We explore the effect of human recognition deprivation on women's land access and well-being in Malawian farm households. First, we describe the instrumental role of human recognition in supporting human development outcomes. Then, we highlight the detrimental effect of human recognition deprivation on the well-being of its recipients. Finally, we assess the gendered patterns of farmland access, heavily influenced by women's positions in social institutions, with significant effects on their power relations. We note that unequal power relations may ultimately support a non-cooperative bargaining model, with a detrimental impact on well-being.

6.1 | Discussion of major findings

The general notion that more access to farmland should improve human recognition for women farmers in Malawi is not supported by the analysis of our empirical data. In line with Katz (1997, p. 34), we find that resource allocation in most farm households is non-cooperative. Consequently, within-household farmland access is unequal, with the woman farmer (agent) being more likely to access less farmland than her partner (principal), even though customary farmland tenure would suggest equal access, and thus, the woman may need to bargain for more. Particularly, we find that the extent of human recognition deprivation grows if the "entitled" access to farmland within a woman's household increases. Our findings are also supported by Doss (2001, p. 2085), who outlines that in non-cooperative households, individuals maintain a Pareto inefficient allocation status to ensure that they retain long-run control of household resources. Thus, allocating household resources such as farmland efficiently may, in the long run, not be beneficial to the principal if the agent (the woman) can lay a solid claim on that resource. Further economic constraints may force women to take actions that conform to demands and expectations within their households, especially if they have no exit options. Having no exit options may, thus, make women more willing to bear being deprived of human recognition. Accounting for the lineage types in Malawi, we find that more intra-household farmland access is linked to increasing scores of human recognition deprivation in both matrilineal and patrilineal farm households, with higher effects observed in patrilineal farm households.

We explore the influence of non-viable exit options such as the lack of literacy and education gap. We find that in households with semi-literate or illiterate women farmers, intra-household farmland access is positively linked to deprived human recognition by up to 18%. However, the marginal effect for literate (better educated) women is negligible and insignificant (results are available on request). We explore a second set of exit options, alternating between the siblings' sex of women farmers. Our assumption, which is that deprivation of human recognition plays a role in intra-household farmland access for women with more male siblings as opposed to female siblings is supported empirically. This is in line with the resource dilution theory, which assumes that sibship size has an impact on within-family resource competition (Keister, 2003, pp. 521–542; Post, 2016, p. 473).

Finally, we find support for the notion that human recognition deprivation is detrimental to well-being. Results suggest that household well-being declines with increasing deprivation for women farmers controlling for endogeneity.

Overall, the effects of human recognition deprivation on farmland access and well-being are significant. The increasing likelihood of deprivation in farm households, in which women have a larger share of entitled farmland indicates a failure to reach Pareto efficiency. Non-cooperative households use gendered institutions to produce harmful equilibriums that support inefficient allocation of farmland resources and human recognition deprivation for women farmers.

6.2 | Limitations to the study

It is important to consider the limitations of this analysis given the nature of the Malawi DHS datasets used. First, even though we use representative, pooled cross-sectional data from Malawi's DHS (2005, 2011, 2017), the magnitude, intensity, and spread of human recognition deprivation are conspicuously missing and would be better captured with panel data collection. Second, due to the nature of the data collection for the Conflict Tactics Scale (CTS) module and the non-granularity of the farmland variable, it may be difficult to control for certain unobserved household factors.

6.3 | Policy recommendations

In spite of these limitations, our findings imply important policy recommendations. Malapit et al. (2015, pp. 1097–1,120) note that well-being factors are credible threat points for women in consumption choices and thus, can be improved by bettering women's power relations. We suggest that policies that improve women's exit options would strengthen their resource bargaining position. However, this alone will not eliminate the use of human recognition deprivation by principals in aligning preferences if it is not accompanied by enforceable rights to resource access. These policy measures should include efforts to improve women's exit options, such as closing the education and literacy gap or by enhancing farmland access outside of the household (e.g., farmland rentals). In line with Mabsout and van Staveren (2010, pp. 783–794), reversing gendered institutions to farmland access has a large potential in raising well-being and human recognition levels. Changing institutions that influence property rights within customary land tenure systems could improve women farmers' overall access rights and provide security of property rights, allowing them to move from agents to principals, thus becoming "owners" of bundled property rights. From the household perspective, farmland access enforcement policies targeting the main providers of human recognition deprivation would reduce the benefits derived from these policies. Improving human recognition of women farmers would promote overall wellbeing in Malawian farm households.

CONFLICTS OF INTEREST
The author(s) declare that they have no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

DATA AVAILABILITY STATEMENT
Datasets used are subject to third party restrictions: The datasets that support the findings of this study are available from the USAID DHS Program. Datasets are available at https://dhsprogram.com/data/available-datasets.cfm with the permission of USAID DHS Program. The data that support the findings of this study are available on request from the first author.

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ENDNOTES
[1] We thank the anonymous reviewers for the careful reading of our manuscript and the insightful comments and suggestions. All errors are ours.

[2] We refer to North's (1991, p. 97) famous definition of institutions: Institutions "[...] are the humanly devised constraints [rules] that structure political, economic, and social interactions [...]."

[3] Notable exceptions are Castleman (2012, pp. 1–68) exploring human recognition among human immunodeficiency virus (HIV)-infected Kenyan adults, Castleman (2016, pp. 135–151) discussing human recognition in the context of development, or Maduekwe et al. (2019, pp. 1–21) identifying human recognition deprived women in Malawi and Peru.

[4] It is important to note that farmland ownership compasses different bundles of rights. Depending on the legal and customary framework, farmland rental or sales markets may not exist. Ownership here means the rights to use, management, and withdrawal from the said farmland. This does not include rented farmlands.

[5] The number of deaths is the number of siblings (brothers or sisters) reported as having died within the specified period. This indicator takes a value of 1 if the respondent has one or more siblings who have died and 0 if otherwise.

[6] The eight-point dietary diversity measure is classified as follows: A: Cereal; B: Root and tubers; C: Vegetables; D: Fruits, E, F, G: Meat, poultry, offal, eggs, fish, and seafood; H: Pulses/legumes/nuts; I: Milk and milk products; and J: Oil/fats.

[7] Propensity score matching allows us to analyze the probability of treatment (human recognition deprivation) conditional on observed population characteristics. According to Austin (2011, p. 407), creating propensity score strata can eliminate up to 90% of confounding bias when estimating treatment effects.

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