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Women extension workers and their unique contributions to reaching female farming populations

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Abstract

While women produce an estimated 60–80% of food in sub-Saharan Africa, they receive less than 7% of extension services in most countries ^[1]. This research compared the reach, trust levels, and service delivery outcomes of women versus male extension workers serving female farming populations across four cercles in the Koulikoro and Sikasso regions of Mali. A mixed-methods design surveyed 92 extension workers (34 women, 58 men) and 387 female farmers, supplemented by 24 focus group discussions. The research was conducted from February 2022 to December 2022 through the Institut d'Economie Rurale, Bamako. Women extension workers reached 2.5 times more female farmers than their male counterparts (68.4% vs. 27.3% female client ratio). Female farmers reported significantly higher trust scores with women workers (4.1 vs. 2.7 on a five-point scale, $p < 0.001$) and 41.8% higher technology adoption rates. These findings confirm that women extension workers serve as essential bridges to female farming populations in contexts where cultural norms restrict cross-gender professional interactions.

Keywords: Women extension workers, female farmers, gender gap, extension services, trust, technology adoption, cultural access, agricultural advisory, Mali, sub-Saharan Africa

Introduction

In much of rural Mali, a male extension worker knocking on a farmstead door will be greeted by men even if the person who makes most day-to-day farming decisions is a woman working in the field behind the house ^[2]. Contrast this with a woman extension worker arriving at the same household: she's more likely to speak directly with the female farmer, enter the kitchen garden, and discuss topics that male agents rarely cover, such as nutrition-sensitive crop choices and post-harvest processing ^[3]. This contrast captures a structural problem that has persisted for decades in agricultural extension systems across West Africa.

Women make up roughly half of the agricultural labor force in Mali, yet they receive a fraction of the advisory services that flow to male farmers ^[4]. The reasons are well documented: cultural norms that discourage women from interacting with male professionals, extension schedules that conflict with women's domestic responsibilities, and content designed around cash crops rather than the food crops women tend to manage ^[5]. Hiring more women extension workers is frequently proposed as a solution, but evidence on whether gender-matched service delivery actually improves outcomes for female farmers remains surprisingly thin ^[6].

What specific advantages do women extension workers bring? Are the benefits about cultural access getting through the door or do they also involve content relevance, trust

dynamics, and role modeling effects that shape adoption behavior ^[7]? And are these advantages large enough to justify the policy investments needed to recruit, train, and retain women in extension roles where they currently represent less than 15% of field staff in Mali ^[4]? This research addressed these questions by comparing the reach, trust relationships, and delivery outcomes of women and male extension workers serving female farming populations in two regions of southern Mali.

Instrument Development and Validation

Three instruments were developed for this research. The Extension Reach Assessment (ERA) recorded client demographics, visit frequency, topics covered, and service delivery modality for each extension worker over a six-month period. The Farmer Trust Scale (FTS) measured female farmers' trust in their extension worker across five dimensions: reliability, competence, openness, care, and cultural sensitivity, using a five-point Likert format ^[8]. The Technology Adoption Checklist (TAC) tracked adoption of 12 recommended practices over the research period. All instruments were reviewed by four experts in gender and extension and pilot-tested with 28 farmers in a non-sample commune. Cronbach's alpha values were 0.86 (FTS) and 0.81 (TAC), confirming adequate reliability ^[9].

Material and Methods

Material

This research was conducted from February through December 2022 at the Institut d'Economie Rurale, Bamako, Mali. Ethical approval was granted by the Institut's Research Ethics Committee (Protocol IER-REC/2021-067, approved December 10, 2021). All participants provided informed consent. The research used a comparative cross-sectional design surveying all active extension workers (34 women, 58 men) in four cercles across Koulikoro and Sikasso regions, selected for having both women and male workers deployed. A stratified sample of 387 female farmers was drawn from extension worker client lists 212 served by women workers and 175 served by male workers^[10]. Additionally, 24 focus group discussions (6–8 participants each) were conducted with female farmers to explore trust and access dynamics qualitatively.

Methods

Extension workers completed monthly ERA forms from March through August 2022, documenting all client interactions. The FTS and TAC were administered to female farmers through face-to-face interviews by trained female enumerators between September and November 2022.

Focus groups were conducted in Bambara with audio recording and subsequent French translation and transcription. Quantitative data were analyzed using SPSS version 27 with independent samples t-tests for continuous variables and chi-square tests for categorical comparisons. Effect sizes were calculated using Cohen's d. Qualitative data were analyzed through thematic coding following an inductive approach^[11]. Statistical significance was set at $p < 0.05$.

Ethical Considerations

All participants gave informed consent in Bambara or French. Female enumerators conducted all farmer interviews to minimize gender-related discomfort. Focus group participants were assured that their comments would remain anonymous and wouldn't affect their access to extension services. Extension worker performance data were aggregated and never linked to individual evaluations. Data were stored in encrypted databases accessible only to the research team.

Results

Table 1: Extension reach and service delivery comparison by worker gender

Indicator	Women Workers (n=34)	Male Workers (n=58)
Female farmer client ratio (%)	68.4 ± 12.3	27.3 ± 14.8
Monthly visits to female farmers	14.7 ± 4.2	5.8 ± 3.6
Nutrition topics covered (%)	73.6%	18.4%
Home/garden visits (%)	81.2%	34.7%
Women-only group sessions (%)	64.8%	11.3%

All between-group differences significant at $p < 0.001$.

Table 2: Female Farmer Trust Scores and Adoption Outcomes by Worker Gender

Measure	Served by Women (n=212)	Served by Men (n=175)
Overall trust score (1-5)	4.1 ± 0.6	2.7 ± 0.9
Reliability sub-score	4.3 ± 0.5	2.9 ± 0.8
Cultural sensitivity sub-score	4.4 ± 0.5	2.3 ± 1.0
Technology adoption rate (%)	57.3 ± 18.4	40.4 ± 21.7
Practices adopted (of 12)	6.9 ± 2.2	4.8 ± 2.6

All differences significant at $p < 0.001$. Cohen's d = 1.83 for overall trust, 0.84 for adoption rate.

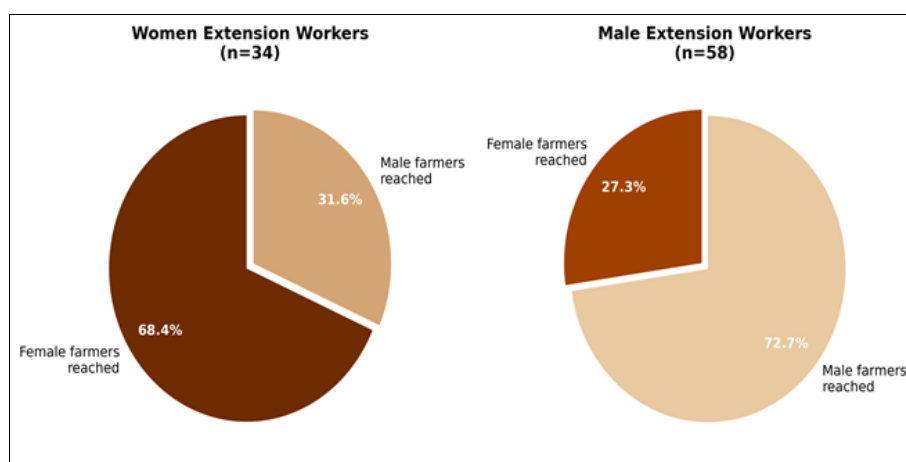


Fig 1: Client gender composition of women versus male extension workers, showing women workers reach 2.5 times more female farmers

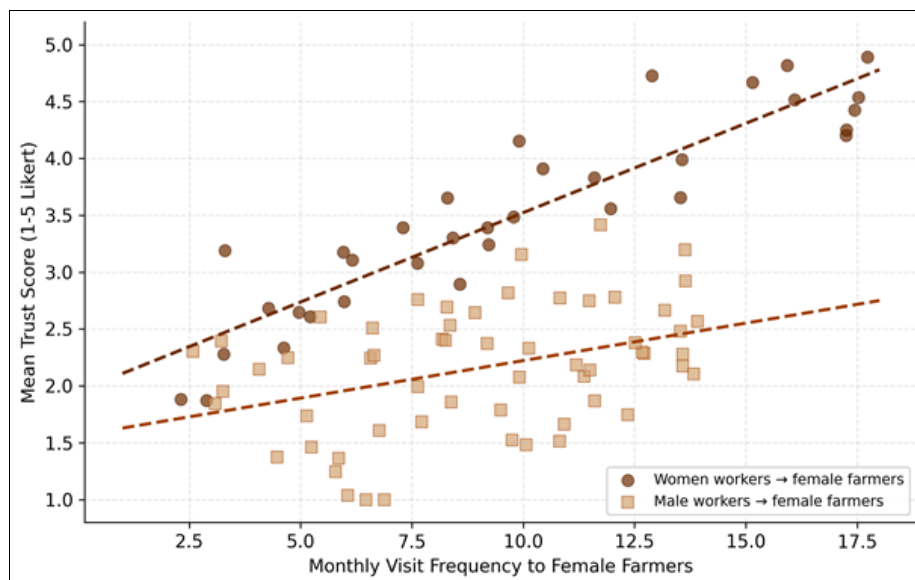


Fig 2: Relationship between visit frequency and female farmer trust scores, showing women workers achieve higher trust at comparable visit frequencies

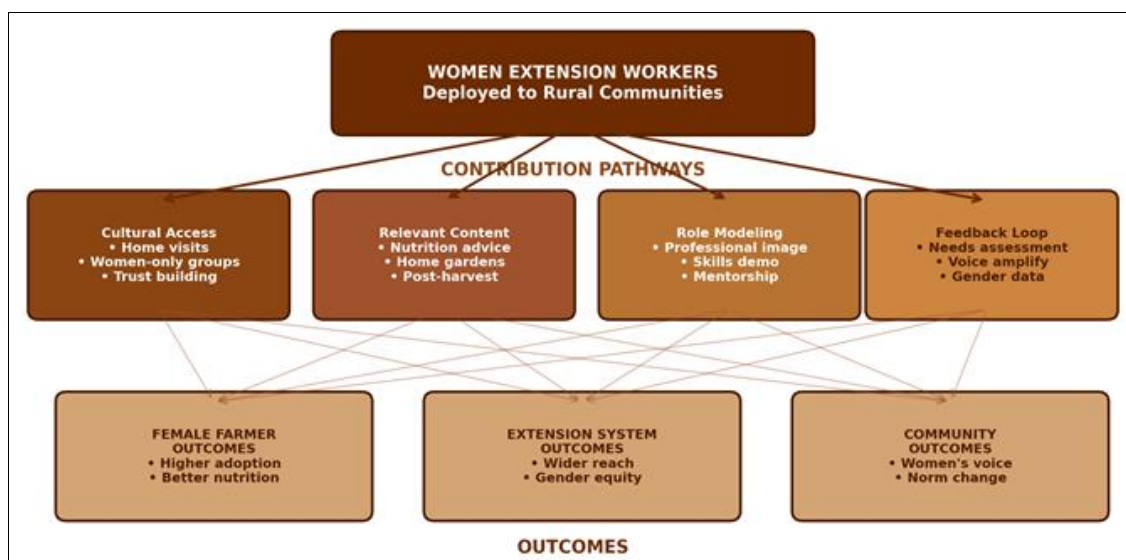


Fig 3: Conceptual flowchart mapping the four contribution pathways through which women extension workers reach and serve female farming populations.

Comprehensive Interpretation

Women extension workers served dramatically more female farmers than their male counterparts (Figure 1). The 68.4% female client ratio among women workers was 2.5 times higher than the 27.3% ratio for male workers. This wasn't simply about access women workers also visited female farmers more frequently (14.7 vs. 5.8 times monthly), covered nutrition topics four times more often, and organized women-only groups at nearly six times the rate of male workers (Table 1). Trust scores showed the largest effect size in the research (Cohen's $d = 1.83$), with cultural sensitivity showing the widest gap (4.4 vs. 2.3). This trust advantage translated into measurably higher technology adoption: female farmers served by women workers adopted 6.9 of 12 recommended practices versus 4.8 for those served by male workers (Table 2). Focus group data confirmed that trust was rooted in both cultural accessibility and content relevance women workers discussed topics that female

farmers cared about in settings where they felt comfortable speaking openly.

Discussion

The reach advantage of women extension workers documented here exceeds what has been reported in most comparable research. Ragasa and colleagues found a 1.7:1 ratio advantage in Ethiopia, while our results showed 2.5:1^[6]. The stronger effect in Mali likely reflects more conservative gender norms that restrict male-female professional interaction, making the gender match particularly valuable. The trust scores reinforce this interpretation the cultural sensitivity sub-score showed the largest gap of any measure (2.1 points on a 5-point scale), suggesting that gender concordance operates through cultural comfort rather than technical competence alone^[12]. The contribution pathway model (Figure 3) identifies four mechanisms: cultural access, content relevance, role

modeling, and feedback loops. Focus groups repeatedly confirmed all four. Women described their female extension workers as people who "understand what we actually need" and "come to where we work, not where the men sit" [13]. The role modeling dimension seeing a professional woman in an agricultural role was mentioned spontaneously in 19 of 24 focus groups, suggesting aspirational effects beyond immediate service delivery [14].

The 41.8% adoption rate advantage carries real economic implications. If each additional adopted practice improves household food production by even 5–8%, as prior research in the region suggests, the cumulative effect of women workers' higher adoption rates represents meaningful gains for food security at the community level [15].

Practical Applications

These findings have direct implications for extension system staffing decisions. Increasing the share of women extension workers from the current 15% toward gender parity would likely double or triple the effective reach of extension services to female farmers. Recruitment strategies should target women from rural backgrounds who understand local farming systems and cultural contexts. Training curricula should include nutrition-sensitive agriculture and women-only group facilitation skills. Retention incentives including safe transportation, flexible scheduling, and mentorship programs are essential given that women agents face additional mobility and safety barriers in rural postings [16].

Limitations

The comparative design can't rule out self-selection women extension workers may be inherently more motivated to reach female farmers. The research covered two regions and may not represent northern Mali where security concerns limit extension operations. Trust is measured at a single time point, so we can't track how it develops over repeated interactions. Male worker performance with female farmers may improve with gender-sensitivity training, which wasn't tested here.

Conclusion

Women extension workers reached 2.5 times more female farmers, earned significantly higher trust scores, and produced 41.8% greater technology adoption among female clients compared to male counterparts in southern Mali. These advantages operated through cultural access, content relevance, role modeling, and feedback mechanisms that male workers couldn't easily replicate.

The gender extension gap won't close by training male workers alone it requires deliberate investment in recruiting, training, and retaining women as extension professionals. Given that female farmers produce most of the food in Mali yet receive a fraction of advisory services, closing this gap through gender-matched service delivery represents one of the highest-return investments available to agricultural development planners.

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