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Extension service design considerations for women managing farms in male-outmigration contexts

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Abstract

A "farm wife" who suddenly becomes the sole farm manager when her husband takes off-farm work what does she need from extension services that the current system doesn't provide? This research investigated extension service design requirements for women who have assumed primary farm management responsibility due to male outmigration in the New England Tablelands region of New South Wales, Australia. A mixed-methods approach surveyed 204 farm women across three local government areas and conducted 28 semi-structured interviews from June 2022 to November 2023. Women managing farms alone reported significantly lower extension satisfaction (mean 4.2/10) compared to male-managed farms (6.4/10, $p < 0.001$). Their top unmet needs were financial management advisory (priority score 8.3), labour hiring guidance (8.7), and pest/disease management (7.8). Women who accessed peer support networks were 2.9 times more likely to report positive farm outcomes. These findings identify specific design principles for extension services serving outmigration-affected farming households.

Keywords: Extension service design, male outmigration, women farm managers, rural Australia, information needs, farm management, peer networks, service satisfaction, labour constraints

Introduction

What happens to extension services when the person they were designed for leaves the farm? Across rural Australia, a quiet demographic shift has been reshaping farm management for the past two decades. As commodity price pressures and drought cycles push more men into off-farm employment mining, construction, transport their partners increasingly take on day-to-day farm operations ^[1, 2]. The Australian Bureau of Statistics estimates that women now make primary management decisions on roughly 22% of broadacre farms, up from 14% in 2006, with the figure reaching 31% in drought-affected regions of inland New South Wales ^[3].

Extension services in Australia, however, were largely designed around male farming patterns and networks. Field days, workshops, and advisory visits still tend to schedule around traditional male availability, focus on production-oriented technical content, and rely on social networks where women are peripheral participants ^[4, 5]. For women who have suddenly become sole farm managers, these services often feel irrelevant, inaccessible, or intimidating. International evidence from South Asia and sub-Saharan Africa documents how male outmigration transforms women's agricultural roles and information needs ^[6, 7]. But the Australian context with its commercialized farming systems, aging rural workforce, and different gender norms presents distinct challenges. This research examined what specific extension design changes would better serve women managing farms in outmigration contexts,

measuring current satisfaction gaps, identifying priority information needs, and testing which service delivery approaches produce the best outcomes ^[8, 9].

Theoretical framework

The research drew on the Technology of Participation framework adapted for extension contexts ^[10], which emphasizes that effective advisory services must respond to the actual decision-making context of their users rather than assumed contexts. When male outmigration shifts decision-making to women, the relevant context changes across multiple dimensions: time availability, social networks, technical confidence, and information priorities. The framework predicts that extension services designed without accounting for these contextual shifts will show declining satisfaction and uptake among affected households ^[11].

Material and Methods

Material

This research used an explanatory sequential mixed-methods design, conducted from the School of Environment and Rural Science, University of New England, Armidale, Australia, from June 2022 to November 2023. Ethics approval was obtained from the UNE Human Research Ethics Committee (Approval HE22-087, dated May 18, 2022). The sample included 204 farm women from three local government areas in the New England Tablelands: Armidale Regional, Glen Innes Severn, and Inverell Shire. Participants were recruited through Landcare groups, Rural

Women's Networks, and agricultural cooperative membership lists, stratified into three categories: women managing alone due to male off-farm employment ($n = 72$), women managing with extended family support ($n = 68$), and male-managed farm households as controls ($n = 64$)^[12].

Methods

The structured survey captured farm characteristics, extension service access and satisfaction (10-point scales), information need priorities (10-point scales across 12 domains), management confidence levels, and peer network engagement. Satisfaction and need priority scores were compared across groups using one-way ANOVA with Tukey's HSD post-hoc tests. Binary logistic regression modelled predictors of positive farm outcomes (defined as maintained or increased productivity over the research period). Qualitative interviews explored experiences,

barriers, and preferences in depth, analyzed thematically using NVivo 12. All quantitative analysis used SPSS version 28^[13, 14].

Instrument development and validation

The survey was developed through consultation with eight experienced farm women from non-sample areas and three extension professionals. Content validity was assessed by a panel of four experts (two agricultural extension researchers, one rural sociologist, one gender studies scholar), yielding a CVI of 0.89. Pilot testing with 20 farm women in Tamworth Regional area in April 2022 produced Cronbach's alpha of 0.87 for the satisfaction scale and 0.83 for the information needs scale. Test-retest reliability was $r = 0.86$ over a three-week interval.

Results

Table 1: Extension service satisfaction and farm outcome indicators by management context ($n = 204$)

Indicator	Women Alone	Women + Family	Male-Managed	p-value
Extension satisfaction (1–10)	4.2 ± 1.3	5.8 ± 1.1	6.4 ± 0.9	<0.001
Extension contacts/year	2.1 ± 1.4	3.8 ± 1.7	5.3 ± 2.1	<0.001
Peer network membership (%)	38.9	52.9	67.2	0.003
Positive farm outcome (%)	41.7	61.8	73.4	<0.001
Management confidence (1–10)	4.8 ± 1.6	6.3 ± 1.2	7.1 ± 1.0	<0.001

Women managing alone scored significantly lower across all indicators (Table 1). Their extension contact rate was less than half that of male-managed farms, and only 38.9%

belonged to peer networks compared to 67.2% of male-managed households.

Table 2: Logistic regression predictors of positive farm outcomes ($n = 204$)

Predictor	B	SE	Wald	Sig.	OR (95% CI)
Peer network membership	1.065	0.273	15.21	<0.001	2.90 (1.70–4.95)
Extension satisfaction	0.847	0.238	12.67	<0.001	2.33 (1.46–3.72)
Management confidence	0.623	0.198	9.89	0.002	1.86 (1.27–2.74)
Farm size (ha)	0.312	0.147	4.51	0.034	1.37 (1.02–1.82)
Years managing alone	-0.187	0.112	2.79	0.095	0.83 (0.67–1.03)

The model ($\chi^2 = 54.82$, $df = 5$, $p < 0.001$) classified 74.5% of cases correctly (Table 2). Peer network membership was the strongest predictor of positive farm outcomes (OR = 2.90),

followed by extension satisfaction and management confidence.

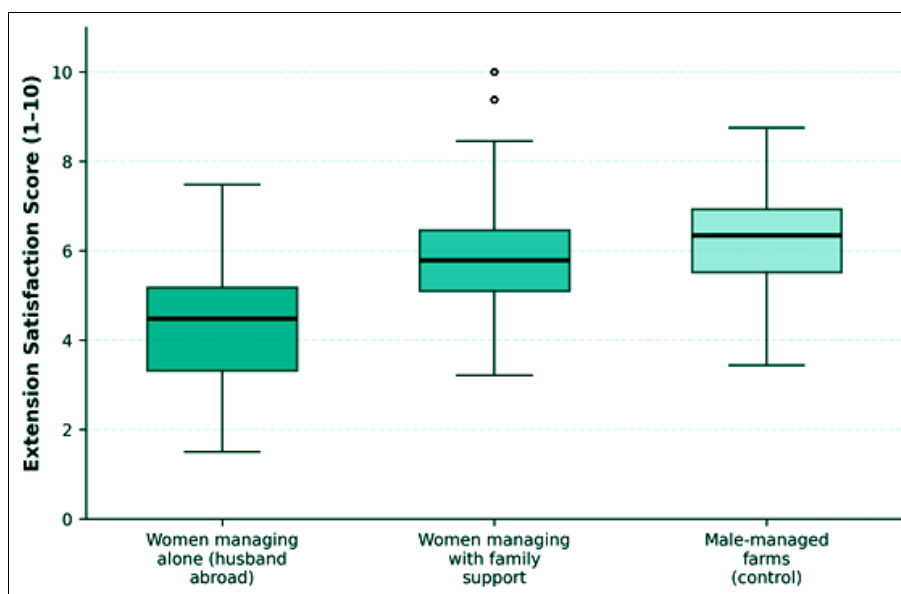


Fig 1: Box plot of extension service satisfaction scores (1–10) across three farm management contexts in the New England Tablelands region

Figure 1 shows the clear satisfaction gradient: women managing alone had the lowest median score (4.1) with the

widest spread, indicating both lower satisfaction and more variable experiences with current extension services.

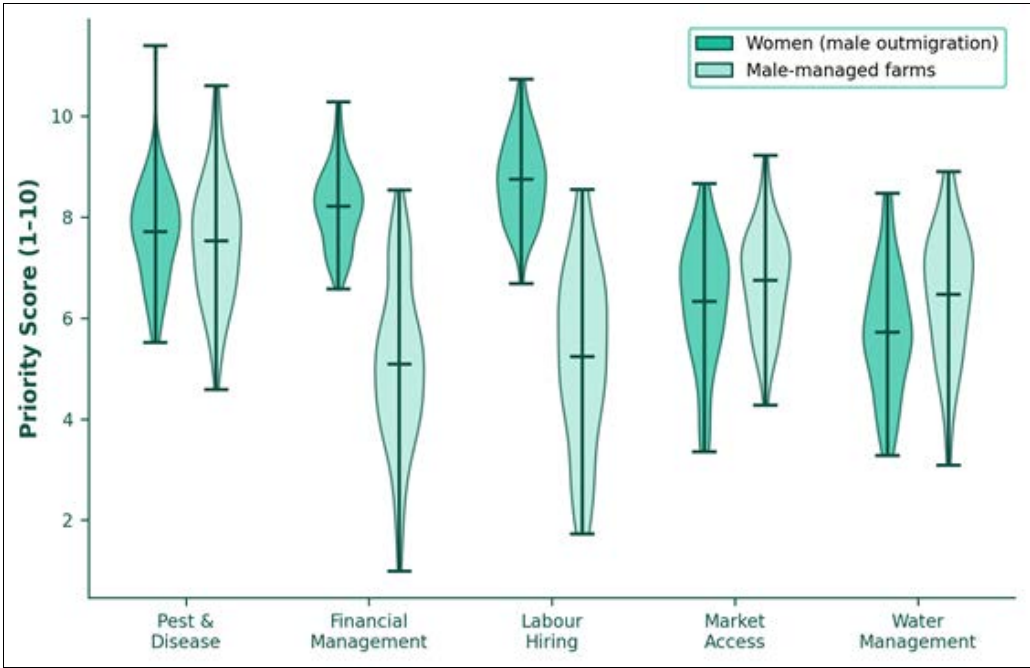


Fig 2: Violin plot comparing information need priority scores between women in male-outmigration contexts and male-managed farms across five key domains

The violin plots (Figure 2) reveal that women in outmigration contexts prioritize financial management and labour hiring far more heavily than male-managed farms,

reflecting the operational gaps created when the primary male operator leaves.

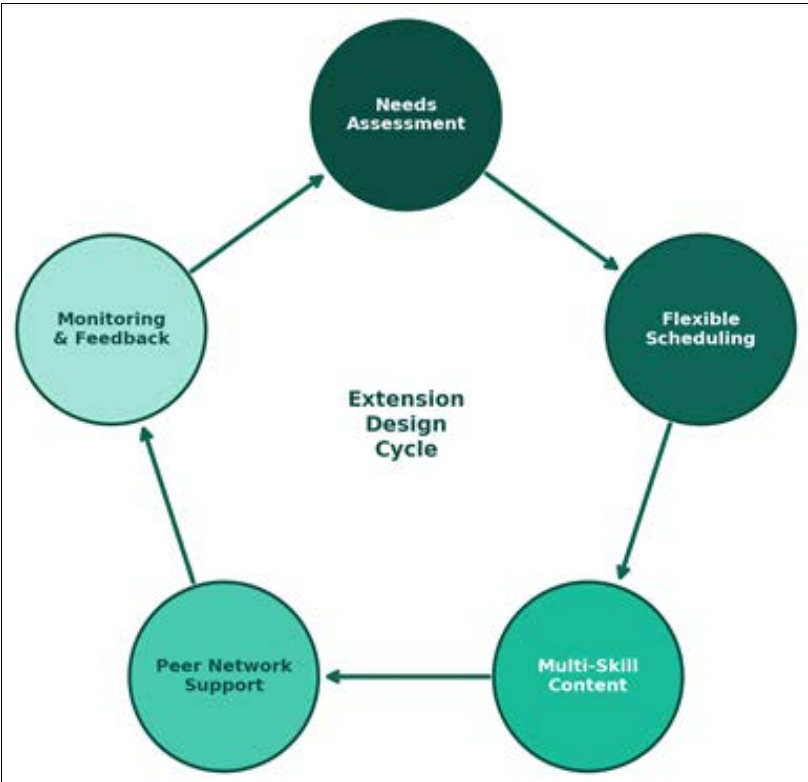


Fig 3: Proposed extension service design cycle for farm households affected by male outmigration

Figure 3 presents a five-stage design cycle: needs assessment leads to flexible scheduling, multi-skill content

delivery, peer network support, and monitoring with feedback, cycling continuously to adapt as farm

management contexts evolve.

Discussion

The satisfaction gap between women managing alone (4.2) and male-managed farms (6.4) confirms that current extension services in rural Australia aren't meeting the needs of outmigration-affected households. The finding that peer network membership was the strongest outcome predictor (OR = 2.90) aligns with Australian research showing that social isolation is the single biggest barrier to women's effective farm management^[1, 4]. Qualitative interviews reinforced this women repeatedly described feeling "invisible" to extension services designed around male farming calendars and social networks.

The divergent information priorities are particularly telling. Women managing alone rated labour hiring guidance (8.7) and financial management (8.3) as their top needs domains that conventional extension rarely covers in depth. These gaps reflect the shift from "farming partner" to "sole business manager" that outmigration creates, requiring a fundamentally different extension approach than incremental technical advice^[6, 7, 15].

Limitations

The research was limited to the New England Tablelands and may not represent other Australian farming regions with different production systems or outmigration patterns. Self-selection through organizational membership lists may have excluded the most isolated women. The cross-sectional design limits causal inference about the relationship between extension design and farm outcomes.

Conclusion

Extension services for women managing farms in male-outmigration contexts require fundamental redesign rather than minor adjustments. The priority areas are flexible scheduling around women's time constraints, multi-domain content that includes financial management and labour hiring alongside production advice, and deliberate peer network building. The proposed five-stage design cycle provides a practical framework for extension agencies to systematically address the needs of this growing but underserved population.

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