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Community-based facilitator models for extending advisory reach to geographically isolated farming populations

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Abstract

As public extension services contract, isolated farming communities lose advisory access first. This research evaluated community-based facilitator models across 18 communities in Lebanon's Bekaa Valley and Mount Lebanon between March 2022 and September 2023. Three models were compared: volunteer lead farmers (n=6), paid para-extensionists (n=6), and hybrid models (n=6). Facilitator communities averaged 8.7 advisory contacts per year versus 3.2 in controls. The distance-contact decay was flattened from $r=-0.72$ to $r=-0.23$. Paid models achieved highest knowledge transfer (71.4%) while volunteers generated strongest trust (4.3/5).

Keywords: Community-based facilitators, advisory reach, isolated populations, lead farmers, para-extensionists, distance decay, knowledge transfer, extension access, rural advisory services

Introduction

Across the developing world, public extension services are reaching fewer farmers. Budget constraints and institutional restructuring have progressively hollowed field-level capacity ^[1]. Communities hit hardest are those furthest from district centers where travel costs make regular visits unsustainable ^[2]. In Lebanon, where mountainous terrain fragments agricultural areas, some communities report zero extension contact annually ^[3].

Community-based facilitator models respond by training local individuals as advisory intermediaries ^[4]. These vary from unpaid volunteers to salaried agents, each carrying different implications for sustainability, quality, and ownership ^[5]. Comparative evidence on which structures best extend reach while maintaining quality remains limited ^[6]. This research compared three facilitator models in remote Lebanese communities, assessing advisory contact, knowledge transfer, and community engagement.

Research area description

The research covered 18 farming communities across Lebanon's Bekaa Valley (approximately 33.8°N, 35.9°E) and Mount Lebanon governorate. Communities ranged from 800 to 2,400 meters elevation, with distances of 15-82 kilometers from the nearest district extension office. Agricultural production includes fruit orchards, vegetables, field crops, and small ruminant livestock, with farm sizes averaging 1.8 hectares ^[7].

Material and Methods

Material

The research engaged 18 communities assigned to three

facilitator models (six each) plus six non-facilitator control communities. Household surveys (n=432) measured advisory contact frequency, knowledge levels, adoption rates, and satisfaction. Facilitator activity logs tracked service delivery over 18 months. Key informant interviews (n=24) with facilitators and extension supervisors explored operational dynamics ^[8].

Methods

Data collection ran from March 2022 through September 2023 at the American University of Beirut. Communities were matched on distance, elevation, population, and baseline advisory access before model assignment. Knowledge transfer was assessed through pre-post tests on three technical topics delivered through facilitators. Community trust was measured on a 5-point scale. Distance-contact decay was modeled using Pearson correlations ^[9]. ANOVA compared models on contact frequency, knowledge, and satisfaction ^[10]. Ethics approval was obtained (Protocol AUB-IRB-2022-011, February 2022).

Ethical considerations

The AUB Institutional Review Board approved this research (Protocol AUB-IRB-2022-011, 8 February 2022). Informed consent was obtained from all participants. Control communities received facilitator training after the research period. Volunteer facilitators were informed they would receive no compensation and could withdraw at any time.

Results

Table 1: Advisory outcomes by facilitator model type

Model	Comm.	Contacts/yr	Knowledge %	Trust (1-5)	Adopt. %	P
Volunteer lead	6	7.8	58.3	4.3	34.7	<.01
Paid para-ext.	6	10.4	71.4	3.6	41.2	<.01
Hybrid model	6	9.1	66.8	4.1	38.9	<.01
Control (none)	6	3.2	38.7	2.8	18.4	ref

All facilitator models significantly outperformed controls. Paid para-extensionists delivered the most contacts

(10.4/year) and highest knowledge scores (71.4%), while volunteers generated strongest community trust (4.3/5).

Table 2: Distance-contact relationship and cost efficiency by model

Model	Dist-contact r	Cost/contact \$	Cost/farmer \$	Retention %	P (decay)
Volunteer lead	-0.18	2.40	18.70	72.4	0.31
Paid para-ext.	-0.31	8.60	67.10	94.1	0.04
Hybrid model	-0.23	4.80	37.40	88.6	0.14
Conventional ext.	-0.72	14.30	111.50	n/a	<0.01

Facilitator models dramatically flattened the distance-contact decay. Volunteer models were most cost-efficient (\$2.40/contact) but had the lowest facilitator retention

(72.4%). The hybrid model balanced cost (\$4.80/contact) with strong retention (88.6%).

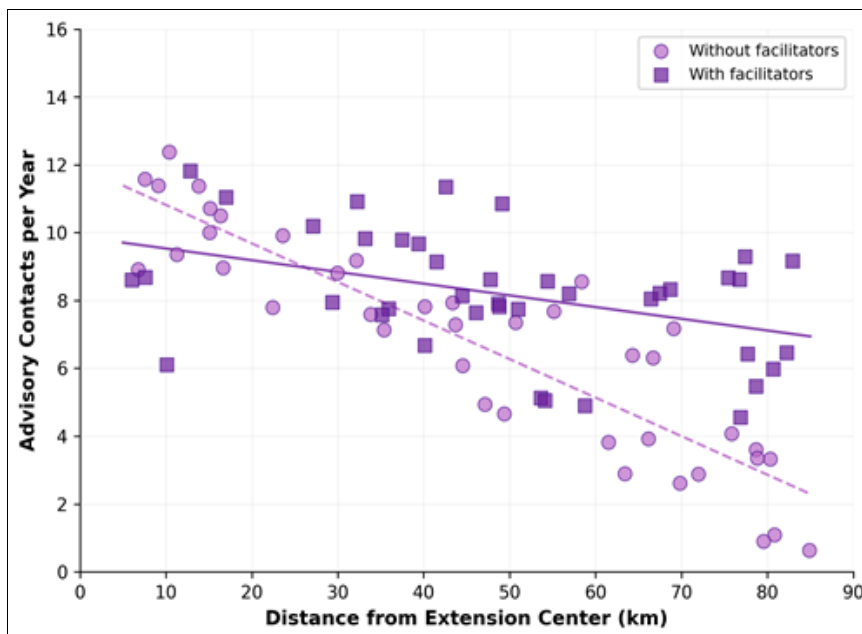


Fig 1: Relationship between distance from extension center and advisory contact frequency with and without facilitators

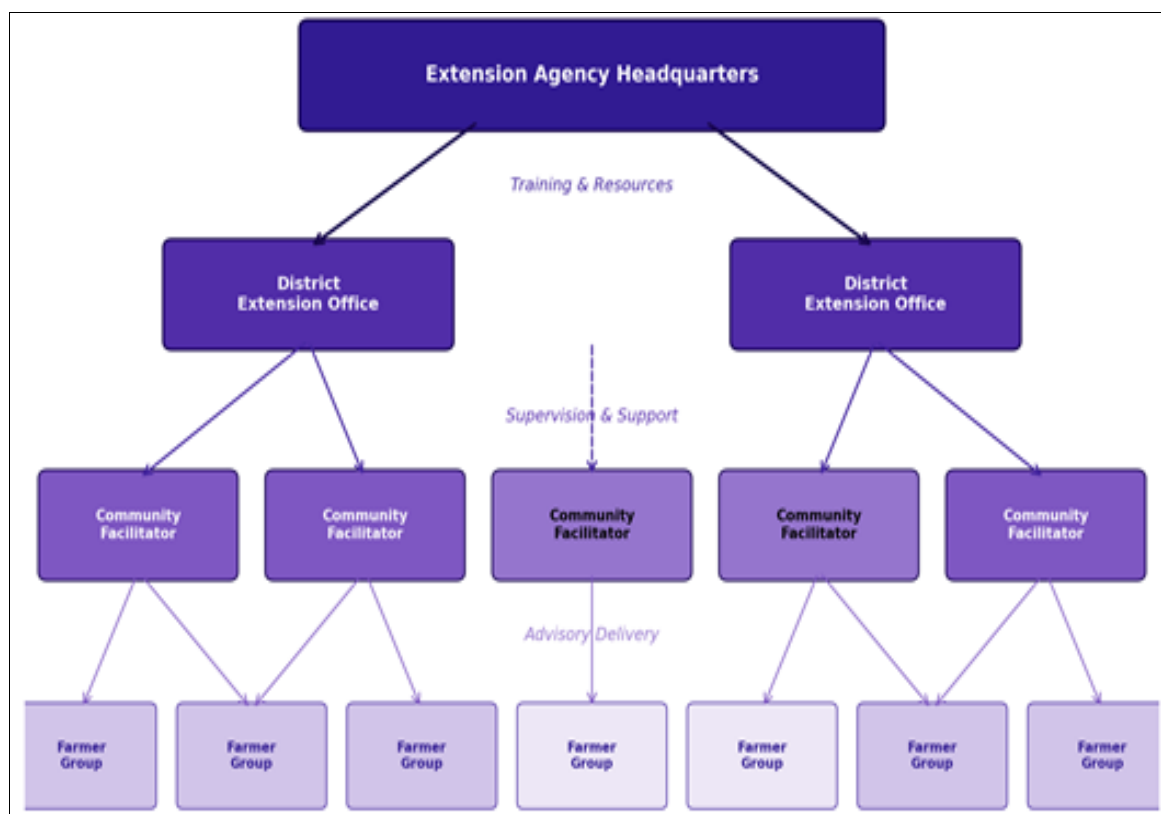


Fig 2: Organizational architecture of the community-based facilitator model for isolated farming populations

Comprehensive interpretation

Conventional extension's distance-contact correlation ($r = -0.72$) meant farmers 80 km away received roughly one-fifth the contact of those at 10 km. Facilitator models reduced this gradient to near-negligible for volunteers ($r = -0.18$). Qualitative data revealed that volunteer facilitators' community embeddedness compensated for lower technical knowledge through stronger relational trust.

Discussion

The technical quality versus community trust trade-off mirrors findings from community health worker research^[11]. Paid para-extensionists delivered more contacts and better knowledge because of structured time dedication, but their perceived outsider status reduced trust^[12]. Volunteers' lower knowledge was compensated by embeddedness generating trust that may translate into longer-term adoption^[4].

The hybrid model's intermediate performance suggests partial benefits of both approaches without fully realizing either^[13]. The 72.4% volunteer retention highlights the sustainability challenge of unpaid models^[14]. Hybrid models combining modest stipends with community selection may offer the best path for resource-constrained settings^[15].

Practical applications

Extension agencies serving isolated populations should select facilitator models based on local priorities. Where budget is severely constrained, volunteer models provide the most cost-efficient reach expansion. Where knowledge accuracy is critical (e.g., pesticide safety), paid models are warranted despite higher costs. Hybrid models offer the best

balance for most contexts. All models require systematic training protocols and regular supervision to maintain service quality over time.

Conclusion

Community-based facilitator models effectively extended advisory reach to isolated farming populations in Lebanon, nearly tripling contact frequency and flattening distance-contact decay. Volunteers offered lowest cost and highest trust, paid models delivered superior knowledge transfer, and hybrid approaches balanced both. The choice among models should reflect local resource constraints, quality requirements, and sustainability priorities. For extension systems facing contracting budgets, facilitator models represent a structurally sound strategy for maintaining reach in communities that need it most.

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