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Assessment of training needs of smallholder farmers in shifting cultivation areas

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Abstract

Shifting cultivation, or slash-and-burn, continues to be the main livelihood system for smallholder communities in the highland districts of southwestern Ethiopia, yet declining fallow periods and soil degradation are pushing yields downward. Targeted training can help these farmers adopt improved practices, but designing effective programmes requires a clear picture of what smallholder growers actually want to learn. This research assessed the training needs of 180 smallholder farmers practising shifting cultivation in three woredas of Jimma Zone, Oromia, during January-May 2024. A structured interview schedule covering six training domains—soil management, crop diversification, pest management, post-harvest handling, marketing, and organic certification—was administered, and training need intensity was scored on a 1-5 scale. Organic certification (mean score 4.27) and marketing linkages (4.03) emerged as the most pressing needs across all age groups, while post-harvest handling ranked highest among senior farmers (>50 years). On-farm demonstrations (82.4%) and farmer-to-farmer exchanges (76.1%) were the most preferred training methods. These findings suggest that extension agencies should prioritise market-linked, practice-oriented training delivered through demonstration plots and peer networks rather than lecture-based programmes.

Keywords: Training needs, smallholder farmers, shifting cultivation, extension planning, skill development, organic certification, marketing, participatory extension, slash-and-burn farming, livelihood

Introduction

The problem is straightforward but stubborn: smallholder communities in Ethiopia's hill regions depend on shifting cultivation for food and income, yet fallow periods that once stretched 15-20 years have shrunk to 3-5 years, depleting soil fertility and depressing yields^[1]. Government programmes have long encouraged a transition to settled farming, but adoption rates remain low because the recommended practices are often poorly matched to smallholder socio-economic conditions, terrain, and cultural preferences^[2].

Training is the bridge between technology generation and field-level adoption, and its effectiveness depends on accurately identifying what farmers need to learn rather than what scientists want to teach^[3]. Training need assessment (TNA) methodology, rooted in Borich's discrepancy model, measures the gap between a farmer's current competence and the competence required for improved performance^[4]. When applied to smallholder populations, TNA must also account for literacy levels, language barriers, seasonal labour calendars, and trust in different information sources^[5].

Earlier TNA research in southwestern Ethiopia focused on wet-rice growers and horticultural farmers, but few have specifically addressed shifting cultivators in the Ethiopian highlands^[6]. This research therefore assessed training needs, preferred training methods, and information-source usage among smallholder farmers in Jimma Zone, Oromia, to generate actionable recommendations for extension programme design.

Material and Methods

Material

The research was conducted in Jimma Zone, Oromia (7°40'N, 36°50'E; altitude 1,500-2,200 m), during January-May 2024.

Three woredas—Mana, Gomma, and Gera—were selected purposively based on the prevalence of shifting cultivation among smallholder farming households. From each block, two villages were chosen at random, and 30 smallholder farmer households per village were selected by simple random sampling, giving a total sample of 180. A pre-tested structured interview schedule was the main data-collection tool, developed in Amharic and pilot-tested with 20 non-sample respondents in a neighbouring block [7].

Methods

Training needs were assessed across six domains using a modified Borich model. Respondents rated their current competence and desired competence on each domain using a 5-point Likert scale (1 = very low, 5 = very high). The mean weighted discrepancy score (MWDS) was computed as $MWDS = \Sigma[(importance \times discrepancy) / n]$. Preferred training methods and information sources were captured through multiple-response questions. Socio-demographic data (age, education, landholding, farming experience) were also recorded. Data were analysed using descriptive

statistics, Kruskal-Wallis test (for age-group comparisons), and Spearman's rank correlation in SPSS v. 26 [8].

Results

Of the 180 respondents, 34.4% were young farmers (<30 years), 41.1% were middle-aged (30-50), and 24.5% were senior (>50). Literacy was low: 42.8% had no formal schooling, 31.1% had primary education, and only 8.9% had studied beyond class 10. Average landholding under shifting cultivation was 0.87 ha per household.

Table 1: Mean training need intensity scores across six domains (1-5 scale)

Domain	<30 yr	30-50	>50 yr	Overall	Rank	p*
Soil management	3.8	3.2	2.8	3.28	5	0.02
Crop diversification	4.2	3.7	2.9	3.64	3	0.01
Pest management	3.6	3.4	3.1	3.38	4	0.18
Post-harvest handling	3.1	3.5	3.8	3.46	4	0.04
Marketing linkages	4.4	4.1	3.6	4.03	2	0.03
Organic certification	4.6	4.3	3.9	4.27	1	0.01

* Kruskal-Wallis test across age groups.

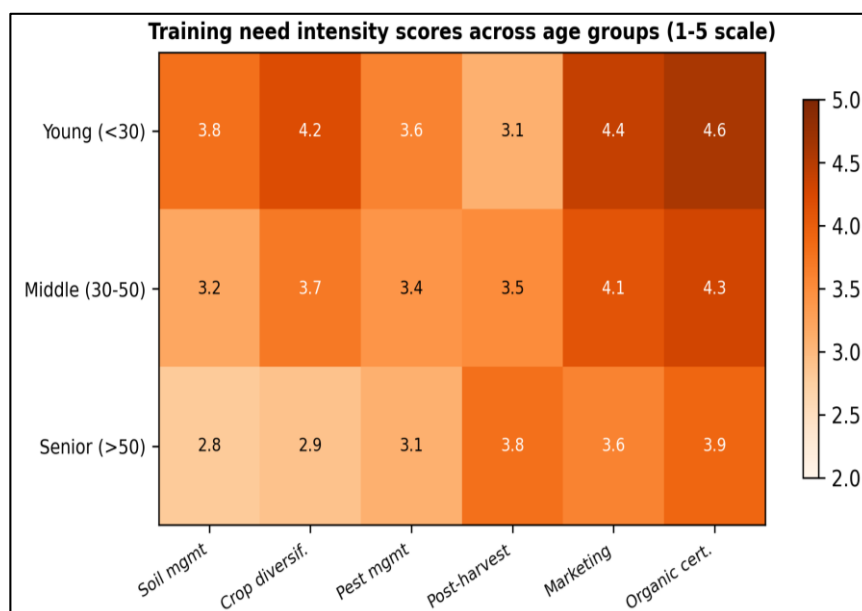


Fig 1: Heatmap of training need intensity across age groups and domains

Table 2: Socio-demographic profile of respondent smallholder farmers (n = 180)

Characteristic	Category	% (n)
Age group	<30 / 30-50 / >50	34.4 / 41.1 / 24.5
Education	Illiterate / Primary / Middle+	42.8 / 31.1 / 26.1
Landholding (ha)	<0.5 / 0.5-1.0 / >1.0	28.3 / 46.7 / 25.0
Farming experience (yr)	<10 / 10-20 / >20	31.7 / 38.3 / 30.0

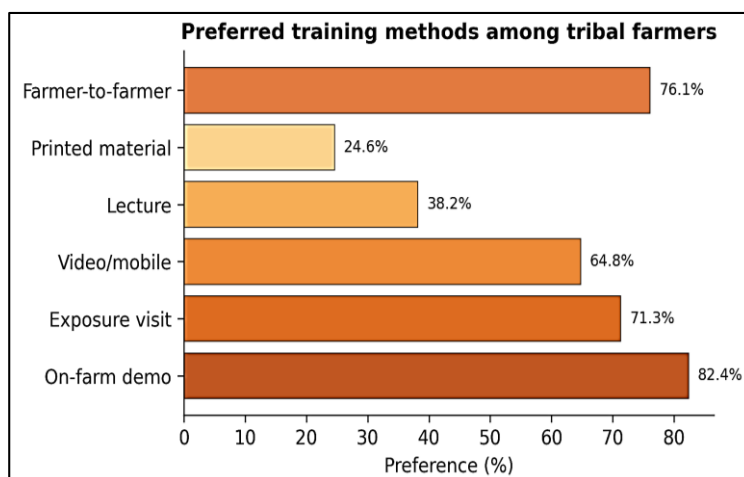


Fig 2: Preferred training methods among smallholder farmers (% of respondents)

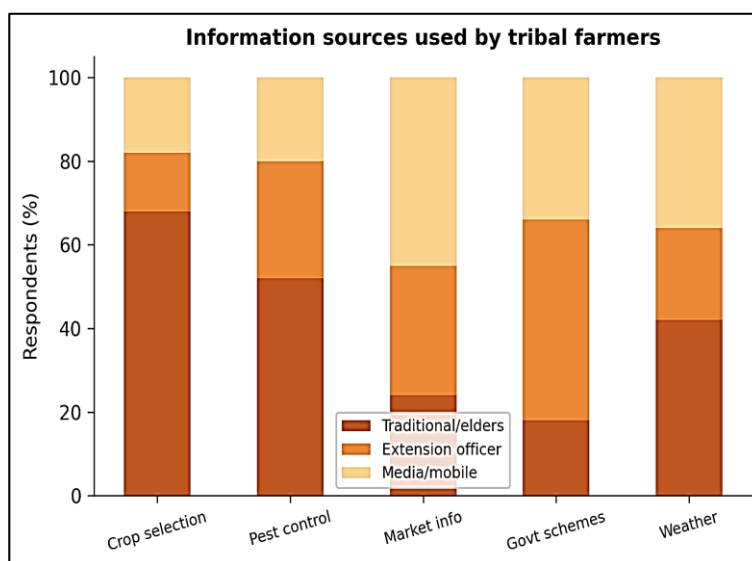


Fig 3: Information sources used by smallholder farmers across different decision areas

Comprehensive Interpretation

Organic certification and marketing linkages topped the training need ranking because smallholder farmers already practise low-input agriculture by default; what they lack is the knowledge to formalise this as ‘organic’ and connect to premium markets. Young farmers expressed the strongest need in these market-oriented domains, while senior farmers prioritised post-harvest handling—reflecting their concern over storage losses in a terrain where transport delays are common.

Discussion

The dominance of organic certification as a training need is a relatively recent phenomenon. A decade ago, TNA research among hill farmers rarely identified certification as a priority [6]. The shift appears driven by the entry of aggregator companies and NGOs offering price premiums for certified organic produce in Oromia, raising awareness among younger, more connected farmers [9]. This finding supports Singh and Burman’s [10] observation that market signals, not extension advice alone, shape training demand in smallholder areas.

On-farm demonstrations were the most preferred method (82.4%), followed by farmer-to-farmer exchange (76.1%). Lecture-based methods ranked poorly (38.2%), consistent with low literacy and a strong oral knowledge tradition.

Analogous preferences were reported by Das and Borua [5] in Assam and by Lyngdoh and Patel [11] in Meghalaya. For extension agencies, this means shifting budgets from classroom training towards experiential, field-based methods—a transition that requires more field staff time but yields better adoption rates [12].

Traditional elders remained the primary source for crop-selection decisions (68%), but mobile-based media had overtaken extension officers for market information (45% vs 31%). This digital shift, though partial, signals an opportunity for mobile-delivered training content in local dialects [13].

Conclusion

The main contribution of this research is a disaggregated, age-specific training need profile for smallholder shifting cultivators in the Ethiopian highlands. Organic certification and marketing linkages emerged as the top-priority domains, indicating that smallholder farmers are increasingly market-aware and need training that connects production to value chains. Hands-on, field-based training methods were overwhelmingly preferred over classroom lectures. Extension agencies serving smallholder areas should redesign their programmes around demonstration plots, peer learning networks, and mobile content delivered in local languages. Questions that remain open include whether

similar priorities hold in other shifting cultivation zones, how digital literacy moderates training preferences, and what institutional models best deliver certified-organic market access to remote smallholder villages.

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