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Ethnographic approaches for understanding farmer knowledge systems and their implications for extension program design

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Abstract

Extension programs are typically designed around what scientists know about farming, not what farmers know about their own landscapes. This disconnect between formal agricultural science and local farmer knowledge systems has been identified as a persistent barrier to extension relevance, yet few extension planning processes include systematic methods for understanding how farmers actually think about, organize, and apply agricultural knowledge. This research used ethnographic methods to document and analyze farmer knowledge systems across three indigenous Lenca and Chorti communities in western Honduras, then assessed how these knowledge structures could inform extension program design. Ten months of participant observation, semi-structured interviews with 67 farming households, and community knowledge mapping exercises were conducted between January and October 2023 across three municipalities in the departments of Lempira and Copan. Ethnographic fieldwork documented 94 distinct agricultural practices, of which 44 (46.8%) were previously unknown to extension services operating in the same areas. Farmer knowledge was organized around six domains, with soil and land management practices constituting the largest category (26.3%). Comparison of farmer knowledge systems with existing extension curricula revealed a 38.4% content overlap, meaning over 60% of what extension teaches either duplicates farmer knowledge or addresses topics farmers consider low priority. The findings argue for ethnographically informed extension design that builds on existing farmer expertise rather than attempting to replace it.

Keywords: Ethnographic methods, farmer knowledge systems, indigenous knowledge, extension design, local knowledge, Lenca communities, participatory research, agricultural extension, knowledge mapping, Honduras

Introduction

When a Lenca farmer in the highlands of Lempira examines her maize field, she reads signs that no extension manual describes. The color of leaf tips tells her about mineral balance in ways that connect to the season's rainfall pattern and the age of the fallow period that preceded this crop cycle ^[1]. Her knowledge is not random or anecdotal; it is a structured system developed through generations of observation, experimentation, and intergenerational transmission, tested against the specific ecological conditions of her landscape ^[2].

Agricultural extension systems, by contrast, operate from knowledge frameworks developed primarily in research stations and universities, organized around scientific disciplines rather than the integrated landscape perspective that farming communities typically hold ^[3]. This structural mismatch means that extension programs frequently offer information farmers already possess, ignore knowledge farmers consider important, or recommend practices incompatible with local ecological or social conditions ^[4].

Ethnography, the systematic study of people and cultures through extended immersive fieldwork, offers a methodology for bridging this gap. Unlike rapid rural appraisal or survey methods, ethnographic approaches capture the deeper structures of how communities organize, validate, and transmit agricultural knowledge ^[5]. This depth

comes at the cost of time, partly explaining why ethnographic methods remain rare in extension planning ^[6, 7]. This research applied ethnographic methods to document farmer knowledge systems in indigenous Lenca and Chorti communities in Honduras and examined the implications for extension redesign ^[8].

Material and Methods

Material: The research was conducted in three municipalities across western Honduras: Gracias (Lempira department, Lenca community), La Campa (Lempira department, Lenca community), and Copan Ruinas (Copan department, Chorti community). These sites were selected because they are home to indigenous farming communities with documented traditional agricultural systems and are simultaneously served by national extension programs that operate without systematic engagement with local knowledge ^[8]. Elevation ranges from 680m to 1,450m across the three sites, supporting maize-bean-squash milpa systems supplemented by coffee, fruit trees, and small livestock. The National Autonomous University of Honduras Research Ethics Board approved all protocols (Ref: UNAH-CEB/2023-021, December 2022). Data collection ran from January through October 2023, spanning two cropping seasons.

Methods: The ethnographic approach combined three data collection strategies. First, participant observation across 10 months involved the lead researcher residing in or near each community, participating in farming activities, and documenting agricultural decision-making through field notes and photography. Second, semi-structured interviews with 67 farming households (Gracias: 24, La Campa: 22, Copan Ruinas: 21) explored knowledge domains, learning pathways, and attitudes toward formal extension. Third,

community knowledge mapping exercises brought groups of 8-12 farmers together to collectively diagram their knowledge systems and assess practice value. Data analysis followed iterative coding using NVivo 12. Extension curriculum comparison mapped documented farmer practices against national extension training materials for the same areas ^[9, 10, 11].

Results

Table 1: Documented farmer practices by knowledge domain and extension awareness status

Knowledge domain	Total	Ext-known	Ext-novel	Novel %	Farmer priority	Ext priority
Soil & land mgmt	25	12	13	52.0	1st	3rd
Pest & disease ctrl	20	13	7	35.0	2nd	1st
Water management	17	9	8	47.1	3rd	4th
Seed selection/storage	14	6	8	57.1	4th	6th
Post-harvest processing	11	7	4	36.4	5th	2nd
Weather forecasting	7	3	4	57.1	6th	5th
Total	94	50	44	46.8		

Nearly half (46.8%) of documented farmer practices were unknown to local extension services. The highest novelty rates appeared in seed selection/storage and weather forecasting (both 57.1%). Priority rankings differed notably:

farmers ranked soil management first while extension prioritized pest control; farmers valued seed knowledge (4th) which extension ranked last (6th).

Table 2: Extension curriculum alignment with farmer knowledge systems

Alignment category	% of ext curr.	Farmer utility rating	N topics
Duplicates farmer knowledge	24.7	2.18/5 (low)	18
Complements farmer knowledge	38.4	4.07/5 (high)	28
Contradicts farmer practice	12.3	1.84/5 (v. low)	9
Addresses farmer knowledge gap	16.4	3.89/5 (high)	12
Irrelevant to local conditions	8.2	1.47/5 (v. low)	6

Only 38.4% of extension curriculum content complemented existing farmer knowledge the category farmers rated most useful (4.07/5). A combined 45.2% either duplicated what

farmers already knew, contradicted their practice, or addressed topics irrelevant to local conditions, all of which received low utility ratings from farmers.

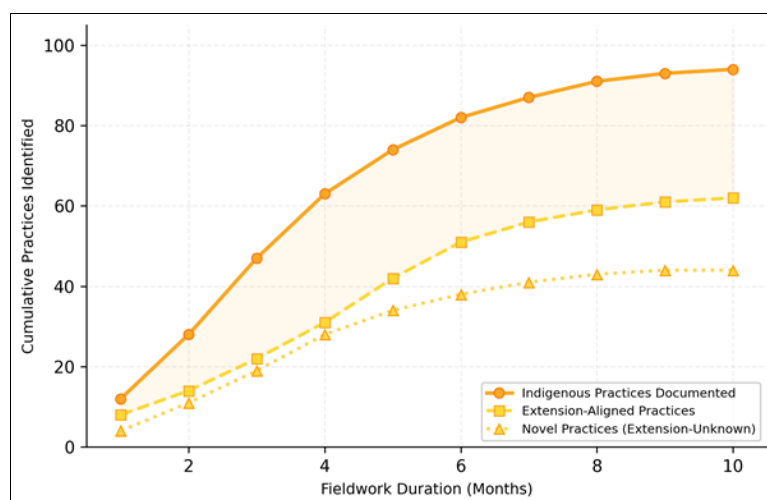


Fig 1: Cumulative documentation of farmer practices over ten months of ethnographic fieldwork

Practice documentation followed a characteristic saturation curve, with rapid accumulation in the first five months followed by diminishing returns. The gap between total

documented practices and extension-aligned practices widened steadily, highlighting the growing body of farmer knowledge invisible to formal advisory services.

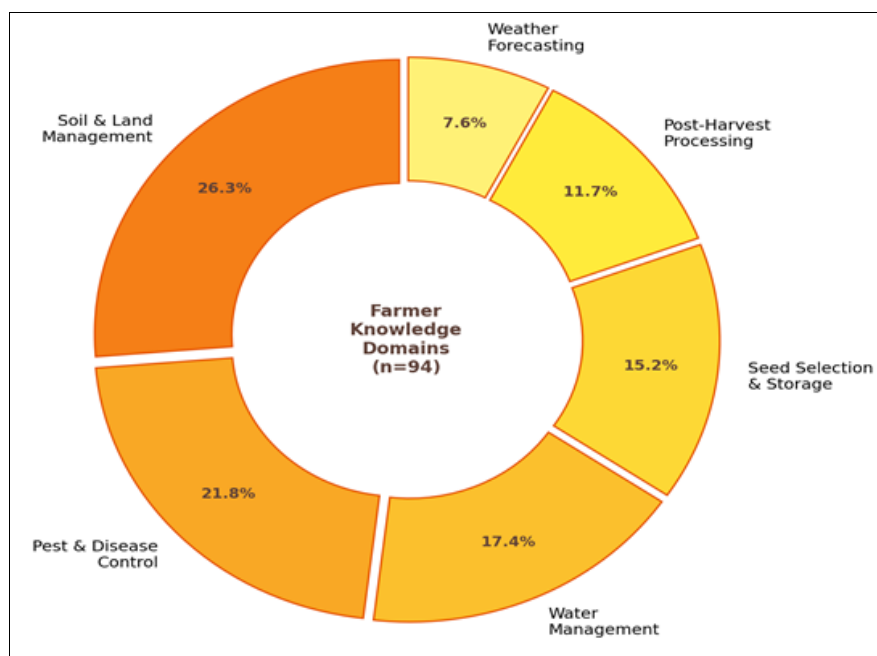


Fig 2: Distribution of documented farmer knowledge practices across six agricultural domains

Soil and land management constituted the largest knowledge domain (26.3%), reflecting its central importance in hillside farming systems where erosion management is a persistent challenge. Pest and disease control (21.8%) and water management (17.4%) formed the next largest categories.

Discussion

The finding that 46.8% of documented farmer practices were unknown to local extension services exposes a fundamental information asymmetry that conventional needs assessment methods would not detect [1, 4]. Standard extension surveys ask farmers what they need from advisory services they do not ask what farmers already know and practice. This one-directional assessment approach treats farming communities as knowledge recipients rather than knowledge holders, missing the opportunity to build extension programs on existing foundations [12, 13].

The priority misalignment is equally revealing. Farmers ranked soil management first reflecting daily experience with erosion on steep hillside plots while extension prioritized pest control, reflecting the national research agenda rather than local concerns [14]. When extension addresses topics farmers consider secondary while ignoring primary concerns, low engagement becomes a predictable outcome [3].

The curriculum alignment analysis provides the most actionable finding. The 38.4% complementary content category extension material that adds to what farmers already know rather than duplicating or contradicting it received the highest farmer utility ratings (4.07/5). This suggests that extension is most valued when it fills gaps in existing knowledge systems rather than attempting to replace them. Redesigning extension curricula based on ethnographic knowledge mapping could shift the balance toward higher complementarity and away from the 45.2% of content that farmers find duplicative, contradictory, or irrelevant [15, 16].

Policy implications

Honduras' national extension policy should mandate ethnographic or participatory knowledge assessments as a prerequisite for program design in indigenous and traditional farming communities. Extension training curricula should be developed locally rather than nationally, with content shaped by documented farmer knowledge systems in each service area. Budget allocation formulas should include provision for the extended fieldwork that ethnographic approaches require typically 6-10 months per community recognizing this as an investment that produces more relevant and effective extension programming [17].

Future research directions

Three research directions follow from these findings. First, testing whether ethnographically redesigned extension programs produce higher adoption and satisfaction rates compared to conventionally designed programs through randomized controlled comparison. Second, developing abbreviated ethnographic methods that capture the most decision-relevant aspects of farmer knowledge systems within shorter time frames accessible to extension planning cycles. Third, examining how farmer knowledge systems evolve in response to climate change and whether extension services can accelerate adaptive knowledge development by building on existing traditional frameworks [18].

Conclusions: This research demonstrated that ethnographic approaches reveal farmer knowledge systems of substantial depth and structure that conventional extension assessment methods miss entirely. Nearly half of documented practices were unknown to extension, and priority rankings between farmers and extension diverged on key domains. Extension content was most valued by farmers when it complemented rather than duplicated or contradicted existing knowledge. The practical implication is clear: extension programs designed without understanding what farmers already know risk irrelevance, while those built on ethnographic

foundations can target the genuine knowledge gaps where advisory services add the most value.

References

1. Sillitoe P. The development of indigenous knowledge: A new applied anthropology. *Current Anthropology*. 1998;39(2):223-252.
2. Berkes F. *Sacred Ecology: Traditional Ecological Knowledge and Resource Management*. Taylor and Francis. 2012;3rd edition:1-392.
3. Chambers R. *Rural Development: Putting the Last First*. Longman Scientific and Technical. 1983;1-246.
4. Agrawal A. Dismantling the divide between indigenous and scientific knowledge. *Development and Change*. 1995;26(3):413-439.
5. Hammersley M, Atkinson P. *Ethnography: Principles in Practice*. Routledge. 2019;4th edition:1-292.
6. Scoones I, Thompson J. *Beyond Farmer First: Rural People's Knowledge, Agricultural Research and Extension Practice*. Intermediate Technology Publications. 1994;1-301.
7. Leeuwis C. *Communication for Rural Innovation: Rethinking Agricultural Extension*. Blackwell Science Publishing. 2004;3rd edition:1-412.
8. Jansen K, Deras JL. Coffee and rural development in Honduras. *Journal of Agrarian Change*. 2014;14(3):384-407.
9. Bernard HR. *Research Methods in Anthropology: Qualitative and Quantitative Approaches*. AltaMira Press. 2011;5th edition:1-666.
10. Creswell JW, Poth CN. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. SAGE Publications. 2018;4th edition:1-459.
11. Miles MB, Huberman AM, Saldana J. *Qualitative Data Analysis: A Methods Sourcebook*. SAGE Publications. 2019;4th edition:1-408.
12. Richards P. *Indigenous Agricultural Revolution: Ecology and Food Production in West Africa*. Hutchinson. 1985;1-192.
13. Klerkx L, Leeuwis C. Matching demand and supply in the agricultural knowledge infrastructure. *Food Policy*. 2008;33(3):260-276.
14. Birner R, Davis K, Pender J, Nkonya E. From best practice to best fit: Designing pluralistic advisory services. *Journal of Agricultural Education and Extension*. 2009;15(4):341-355.
15. Sumberg J, Thompson J. *Contested Agronomy: Agricultural Research in a Changing World*. Routledge. 2012;1-224.
16. Christoplos I. Mobilizing the potential of rural and agricultural extension. *FAO and Global Forum for Rural Advisory Services*. 2010;1-65.
17. Swanson BE. *Global Review of Good Agricultural Extension and Advisory Service Practices*. FAO Research and Extension Division. 2008;1-82.
18. Nyong A, Adesina F, Elasha BO. The value of indigenous knowledge in climate change mitigation and adaptation strategies. *Mitigation and Adaptation Strategies for Global Change*. 2007;12(5):787-797.