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Intrinsic versus extrinsic motivation factors driving farmer participation in extension training programs

¹Emmanuel Toe Kollie, ¹Comfort Yah Gonkerwon, ¹Arthur Nyanfor Johnson and ¹Bendu Fatu Sherman

¹ Department of Agricultural Extension, Faculty of Agriculture, University of Monrovia, Monrovia, Liberia

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Corresponding Author: Emmanuel Toe Kollie

Abstract

Extension researchers have long debated whether farmers attend training because they want to learn or because they want what comes with learning, such as free inputs, certificates, or cash allowances. This research examined the relative influence of intrinsic and extrinsic motivation factors on farmer participation and sustained attendance in extension training programs in three counties of Liberia. A mixed-methods design was used to survey 187 farmers enrolled across eight training programs between September 2023 and April 2024. Participants rated eight motivation factors on a ten-point scale and were classified as predominantly intrinsically or extrinsically motivated based on their top-ranked factor. Results showed that intrinsic factors, particularly desire to improve farm yields (mean 8.7) and personal interest in learning (8.3), received the highest overall ratings. However, extrinsic factors including free input distribution (7.9) and cash stipends (7.3) also scored above the midpoint. Attendance tracking across ten sessions revealed that intrinsically motivated farmers maintained a 75.3% attendance rate by session ten, compared with 42.8% for extrinsically motivated farmers. These findings suggest that while extrinsic incentives can boost initial enrollment, intrinsic motivation is a stronger predictor of sustained engagement, with implications for how extension programs design their recruitment and retention strategies.

Keywords: Intrinsic motivation, extrinsic motivation, farmer participation, extension training, attendance retention, training incentives, self-determination theory, farmer engagement, extension programs, Liberia

Introduction

Leading motivation researchers have argued for decades that the quality of engagement depends not just on whether people participate but on why they participate ^[1]. This distinction between intrinsic motivation, driven by interest, curiosity, and personal growth, and extrinsic motivation, driven by external rewards or pressures, has shaped thinking in education, health behavior, and workplace psychology, yet it has received surprisingly little systematic attention in agricultural extension ^[2].

In Liberia, where the extension system is still rebuilding after years of civil conflict, training programs routinely offer incentives such as free seeds, fertilizer packets, completion certificates, and daily cash allowances to attract farmer participation ^[3]. These incentives work: enrollment numbers rise when they are offered. But extension managers have noticed a troubling pattern in which attendance drops sharply after the first few sessions, particularly once the initial input distribution has occurred ^[4]. If farmers are showing up primarily for the incentives rather than the learning, then high enrollment figures may be masking low effective participation, and the investment in training may be producing far less behavior change than headline numbers suggest.

Self-determination theory, the dominant framework for understanding motivation quality, predicts exactly this pattern ^[1]. It distinguishes between autonomous motivation, where people act because they find the activity interesting or

personally important, and controlled motivation, where they act to obtain a reward or avoid a penalty. Autonomously motivated individuals show greater persistence, deeper engagement, and better long-term outcomes across a wide range of domains ^[5]. This research tested whether the same pattern holds for farmer participation in extension training in Liberia, comparing attendance trajectories of intrinsically and extrinsically motivated farmers across a ten-session training cycle.

Material and Methods

Material

This research was conducted through the Faculty of Agriculture at the University of Monrovia, Liberia, between September 2023 and April 2024. The University of Monrovia Research Ethics Committee approved the protocol on 21 August 2023 (reference UM-REC/2023-019). Eight extension training programs were selected from three counties: Montserrado, Margibi, and Bong. These counties represent peri-urban, transitional, and rural farming contexts, respectively, providing variation in market access and extension infrastructure ^[3]. A total of 187 farmers were enrolled across the eight programs. Programs covered improved rice production, vegetable cultivation, post-harvest handling, and soil management, each running for ten sessions over approximately four months. Written informed consent was obtained from all participants, with oral consent available for those with limited literacy.

Instrument Development

Motivation was measured using an eight-item instrument based on the self-determination theory continuum ^[1]. Three items captured intrinsic factors: personal interest in learning, desire to improve farm yields, and community respect or status gained through knowledge. Five items captured extrinsic factors: free input distribution, certificate of completion, cash stipend or allowance, peer pressure from neighbors, and access to credit programs linked to training completion. Each item was rated on a one-to-ten scale. The instrument was pilot-tested with 22 farmers in Grand Bassa County (outside the sample) and showed acceptable internal consistency (intrinsic alpha = 0.78, extrinsic alpha = 0.76). Farmers were classified as predominantly intrinsically motivated if their highest-rated factor was intrinsic, and as predominantly extrinsically motivated if it was extrinsic. Attendance was recorded by extension officers at each of the ten sessions.

Methods

Motivation ratings were analyzed descriptively and compared between groups using Mann-Whitney U tests. Attendance trajectories were plotted across sessions and compared using generalized estimating equations with a binomial link to account for repeated measures ^[6]. The interaction between motivation type and session number was tested to determine whether decline rates differed. Semi-structured interviews with 30 farmers (15 per group)

explored attendance reasons. Transcripts were coded thematically ^[7].

Ethical Considerations

Given the sensitivity of asking farmers about incentive-driven participation, several safeguards were adopted. Farmers were assured that their responses would not affect their access to training benefits or future extension services. The motivation questionnaire was administered privately to reduce social desirability bias. Farmers who disclosed attending primarily for incentives were not treated differently. All data were stored in encrypted files at the university, and identifiers were removed before analysis.

Results

Participant Characteristics

The 187 participants had a mean age of 39.4 years (range 21-63). Women comprised 44.9% of the sample. Mean farm size was 1.3 hectares, and 81.3% identified farming as their primary income source. Based on their highest-rated factor, 98 farmers (52.4%) were classified as predominantly intrinsically motivated and 89 (47.6%) as predominantly extrinsically motivated. The two groups did not differ significantly in age ($p = 0.34$), gender ($p = 0.51$), or farm size ($p = 0.28$), suggesting classification was not confounded by demographics.

Table 1 presents mean motivation ratings for each factor across the full sample and by group.

Table 1: Mean motivation factor ratings by full sample and motivation group (1-10 scale)

Motivation Factor	Type	Full Sample	Intrinsic Group	Extrinsic Group	p-value
Personal interest in learning	Intrinsic	8.3	9.1	7.4	< 0.001
Desire to improve farm yields	Intrinsic	8.7	9.3	8.0	< 0.001
Community respect/status	Intrinsic	6.4	7.1	5.6	0.003
Free input distribution	Extrinsic	7.9	6.8	9.1	< 0.001
Certificate of completion	Extrinsic	6.8	5.9	7.8	< 0.001
Cash stipend or allowance	Extrinsic	7.3	6.1	8.7	< 0.001
Peer pressure from neighbors	Extrinsic	5.1	4.3	6.0	0.001
Access to credit programs	Extrinsic	6.6	5.8	7.5	< 0.001

Mann-Whitney U test between intrinsic and extrinsic groups

Desire to improve farm yields received the highest overall rating (8.7), followed by personal interest in learning (8.3) and free input distribution (7.9). All eight factors scored above the midpoint, indicating that both motivation types contributed to participation decisions. Group differences were significant for all factors, confirming that the classification successfully separated distinct motivation

profiles.

The butterfly chart displays intrinsic factors extending left and extrinsic factors extending right. Desire to improve farm yields was the single highest-rated factor, while peer pressure was the lowest. Intrinsic factors clustered at the higher end of the scale, while extrinsic factors showed more variation.

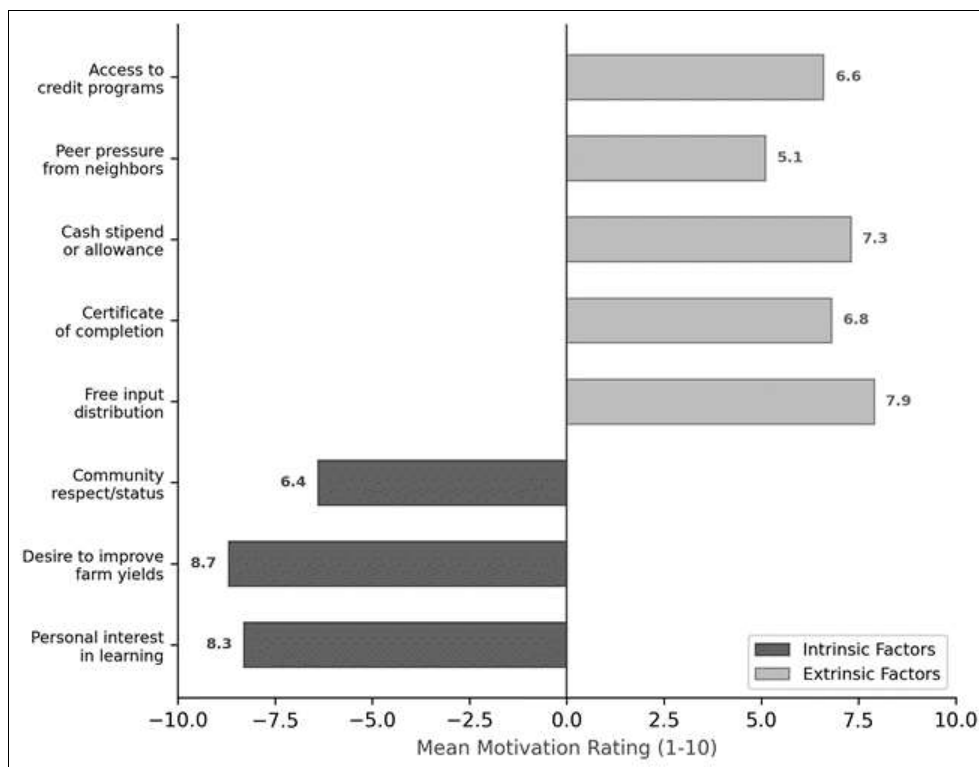


Fig 1: Mean motivation ratings for intrinsic and extrinsic factors across the full sample

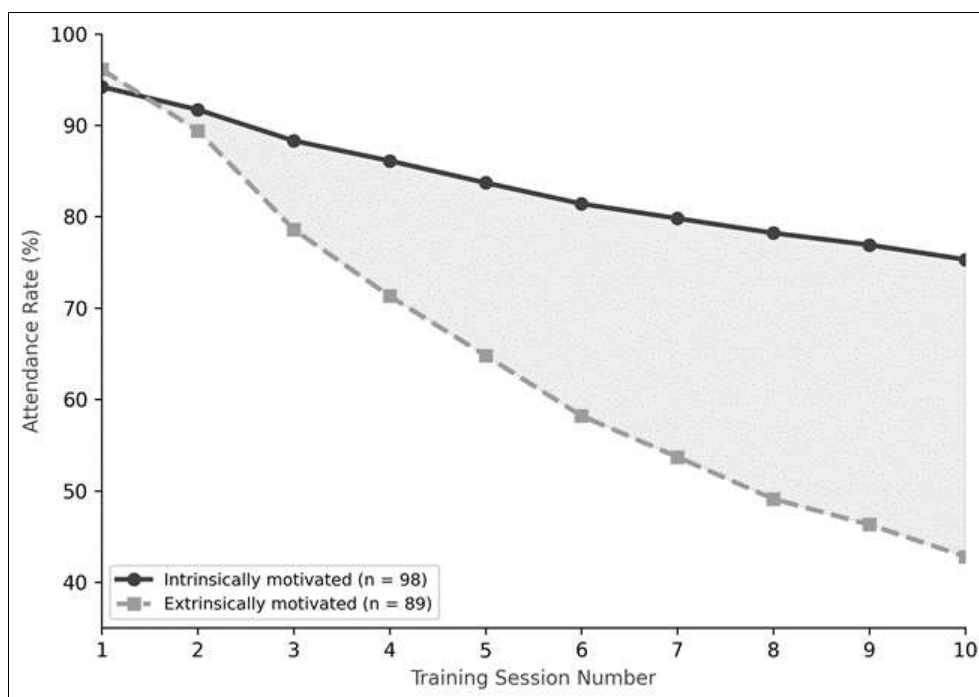


Fig 2: Attendance rate trajectories across ten training sessions by motivation group

Both groups started above 94%, but diverged sharply from session three onward. The intrinsically motivated group declined gradually from 94.2% to 75.3%, retaining nearly 80% of initial attendance. The extrinsically motivated group dropped steeply to 42.8% by session ten, losing more than half its initial attendance. The generalized estimating equation confirmed a significant interaction between motivation type and session number ($p < 0.001$), meaning the decline was significantly steeper for the extrinsic group.

Discussion

The attendance divergence is the central finding and aligns closely with self-determination theory predictions^[1]. Intrinsically motivated farmers persisted because the training itself met their needs for competence and learning, whereas extrinsically motivated farmers lost their reason to attend once initial input distribution and cash allowance novelty wore off. This pattern has been documented in educational and workplace settings but is demonstrated here for the first time in a West African extension context^[5].

The practical implication is not that extension programs should eliminate incentives. Free inputs and stipends clearly help with initial recruitment, and in a post-conflict context like Liberia, withholding support would be ethically questionable [3]. Rather, programs should layer intrinsic engagement strategies on top of incentive-based recruitment. Making training content directly relevant to pressing yield problems, allowing farmers to choose topics, and building in hands-on field practice can strengthen autonomous motivation without removing external rewards [8].

The high ratings for both motivation types, with all eight factors above 5.0, indicate that the intrinsic-extrinsic distinction is not binary for individual farmers. Most participants valued both learning and incentives; the question is which motive dominates engagement. Programs that shift the balance toward intrinsic engagement may see better retention even when incentive budgets are reduced, a finding directly relevant for resource-constrained extension systems [9].

Limitations

Classification into motivation groups was based on a single survey and may not capture how motivation evolves during training. Self-reported motivation is subject to social desirability bias, though private administration was designed to mitigate this. The eight programs differed in topic, facilitator quality, and incentive levels, introducing variability the sample size could not fully control. The research tracked attendance but not learning outcomes or adoption, so it remains unclear whether higher attendance by intrinsically motivated farmers translated into greater on-farm behavior change.

Conclusion

This research found that intrinsic motivation factors, particularly the desire to improve farm yields and personal interest in learning, predicted substantially higher sustained attendance in extension training programs in Liberia compared with extrinsic factors. Extrinsic incentives boosted initial enrollment but could not prevent sharp attendance declines across the training cycle. These results argue for designing extension programs that combine incentive-based recruitment with content and delivery strategies that foster intrinsic engagement. Future work should test specific design changes such as farmer-led topic selection and experiential learning activities to determine whether they can shift the motivation balance and improve retention in incentive-dependent extension systems.

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