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Role of 4-H and young farmer clubs in fostering agricultural leadership and extension participation

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Abstract

While most young Nepalis are leaving agriculture, a small but committed minority stays and many of them share one thing in common: membership in 4-H or young farmer clubs. This research assessed how youth agricultural clubs foster leadership skills and encourage continued extension participation among rural youth in three districts of Nepal. A cross-sectional survey of 296 young people (ages 16–30) combined with 32 focus group discussions was conducted from August 2022 to January 2024. Club members scored significantly higher on leadership competency (mean 67.8 vs. 43.2, $p < 0.001$) and extension engagement (mean 62.4 vs. 38.1, $p < 0.001$) than non-members. Communication skills (31.4%) and decision-making (24.7%) were the most commonly developed leadership domains. Years of club participation correlated positively with extension engagement ($r = 0.71$). Club alumni were 3.4 times more likely to adopt recommended agricultural practices than non-members.

Keywords: Youth agricultural clubs, 4-H programs, young farmer clubs, leadership development, extension participation, Nepal, agricultural adoption, rural youth, communication skills

Introduction

Rural youth in South Asia are leaving agriculture in record numbers, yet the few who stay tend to become the most innovative and engaged farmers in their communities. What makes the difference? In Nepal, where agriculture employs 66% of the population but is increasingly abandoned by younger generations, youth agricultural clubs have been one of the few institutional mechanisms actively working to keep young people connected to farming ^[1, 2]. The 4-H model (Head, Heart, Hands, Health), adapted from its American origins, and locally developed young farmer clubs together serve roughly 48,000 youth across Nepal's 77 districts ^[3].

These clubs combine hands-on agricultural projects with leadership training, community service, and peer networking. The premise is straightforward: young people who develop both technical skills and leadership capacity through club activities will be more likely to stay in agriculture and engage productively with extension services throughout their careers ^[4, 5]. Evidence from the United States and parts of Africa supports this logic, showing that 4-H alumni demonstrate higher civic engagement, better problem-solving skills, and stronger community ties than matched non-participants ^[6, 7].

In Nepal's context, however, the evidence is limited. Most evaluations have focused on individual club projects rather than measuring broader impacts on leadership development and extension system engagement ^[8]. This research addressed that gap by comparing club members and non-members on leadership competency, extension engagement, and agricultural practice adoption across three

districts with active club programs ^[9, 10].

Theoretical framework

The research applied Kolb's Experiential Learning Theory ^[11] adapted for youth agricultural development contexts. The theory posits that effective learning occurs through a cycle of concrete experience, reflective observation, abstract conceptualization, and active experimentation. Youth clubs operationalize this cycle through project-based activities (experience), group reflection sessions (observation), training modules (conceptualization), and field application (experimentation). The framework predicts that longer and more intensive exposure to this learning cycle builds cumulative competency that transfers to broader agricultural engagement ^[12].

Material and Methods

Material

This research used a comparative cross-sectional design, conducted from the College of Agriculture, Tribhuvan University, Kathmandu, Nepal, from August 2022 to January 2024. Ethical approval was granted by Tribhuvan University's Research Division (Protocol TU-RD-2022-073, approved July 14, 2022). The sample included 296 rural youth ages 16–30 across three districts: Kaski, Chitwan, and Morang, selected for their active 4-H and young farmer club programs. Participants were stratified into current club members ($n = 148$) and matched non-members ($n = 148$) based on age, gender, education level, and district. Data were collected through structured surveys and 32 focus group discussions (4 per district per stratum) ^[13].

Methods

Leadership competency was measured using an adapted Youth Leadership Life Skills Development scale (0–100) covering communication, decision-making, team management, financial literacy, and conflict resolution. Extension engagement was assessed through a composite score (0–100) combining extension contact frequency, participation in field days, adoption of recommended practices, and information-seeking behavior. Data analysis used independent-samples t-tests, Pearson correlation, chi-square tests, and binary logistic regression in SPSS version 28. Focus group data were transcribed and analyzed

thematically using NVivo 12 [14, 15].

Pilot research

A pilot with 28 youth (14 members, 14 non-members) from Lalitpur district in June 2022 tested survey comprehension and facilitation guides. Cronbach's alpha was 0.85 for leadership and 0.82 for engagement scales. Minor wording adjustments were made to three ambiguous items. The 45-minute survey duration and focus groups of 6–8 participants were confirmed as appropriate.

Results

Table 1: Leadership competency and extension engagement by club membership status (n = 296)

Indicator	Club members	Non-members	T-value	P-value
Leadership competency (0–100)	67.8±12.4	43.2±14.7	15.43	<0.001
Extension engagement (0–100)	62.4±13.8	38.1±15.2	14.21	<0.001
Practices adopted (count)	5.7±2.1	2.8±1.9	11.86	<0.001
Extension contacts/year	6.3±2.8	2.4±1.6	14.54	<0.001
Agricultural career intent (%)	72.3	34.5	$\chi^2=42.6$	<0.001

Club members significantly outperformed non-members on every indicator (Table 1). Leadership competency was 24.6 points higher, practices adopted doubled, and 72.3% of

members intended to continue farming versus only 34.5% of non-members.

Table 2: Logistic regression predictors of agricultural practice adoption (≥ 5 practices, n = 296)

Predictor	B	Se	Wald	Sig.	Or (95% CI)
Club membership	1.224	0.281	18.97	<0.001	3.40 (1.96–5.90)
Leadership competency	0.836	0.243	11.83	0.001	2.31 (1.43–3.72)
Extension contact frequency	0.714	0.224	10.15	0.001	2.04 (1.32–3.17)
Education level	0.428	0.167	6.57	0.010	1.53 (1.11–2.12)
Land access (ha)	0.347	0.152	5.21	0.022	1.41 (1.05–1.91)

The model ($\chi^2 = 68.47$, $df = 5$, $p < 0.001$) classified 77.4% of cases correctly (Table 2). Club membership was the

strongest predictor of high adoption (OR = 3.40), followed by leadership competency and extension contact frequency.

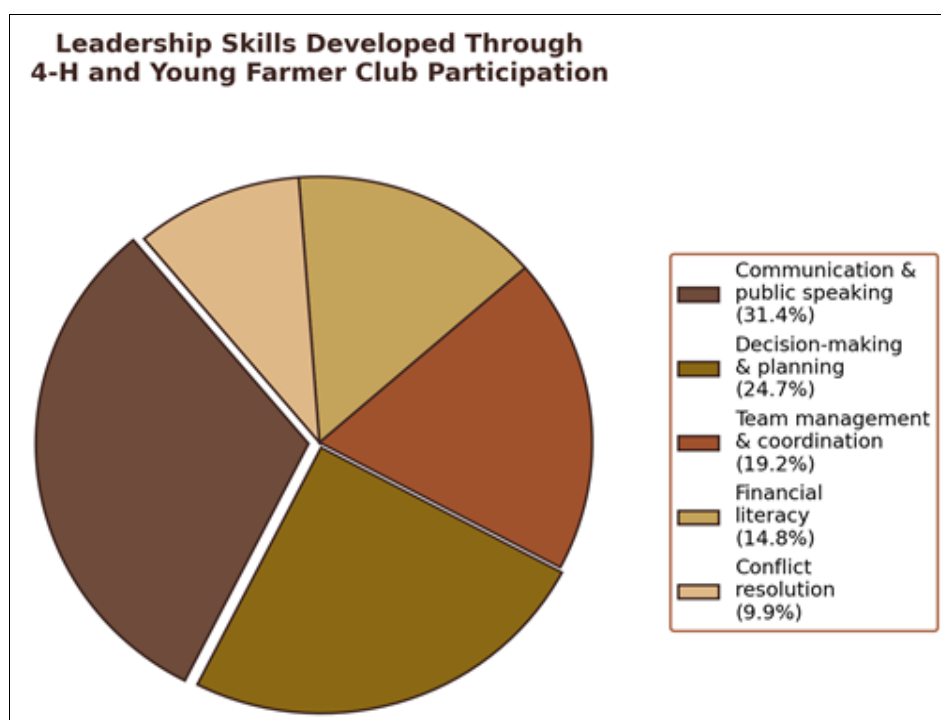


Fig 1: Distribution of leadership skill domains developed through 4-H and young farmer club participation as reported by members (n = 148)

Communication and public speaking (31.4%) was the most developed skill (Figure 1), followed by decision-making

(24.7%). Focus groups noted financial literacy and conflict resolution had the most direct farm management impact.

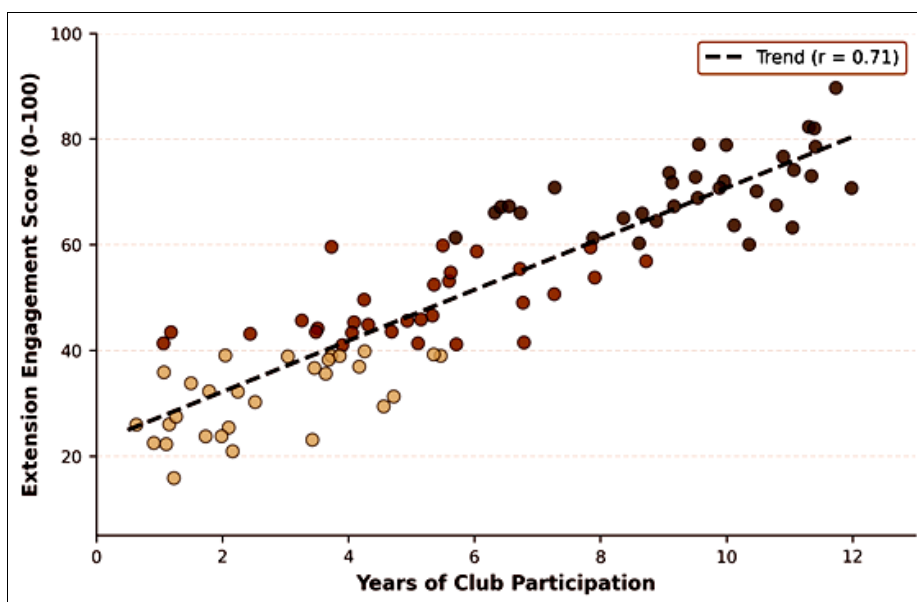


Fig 2: Relationship between years of club participation and extension engagement score among youth club members ($r = 0.71$, $p < 0.001$)

Figure 2 shows a positive linear relationship between participation duration and engagement. Youth with 6+ years of membership consistently scored above 50 on the

engagement scale, suggesting a threshold effect where sustained participation builds lasting extension connections.

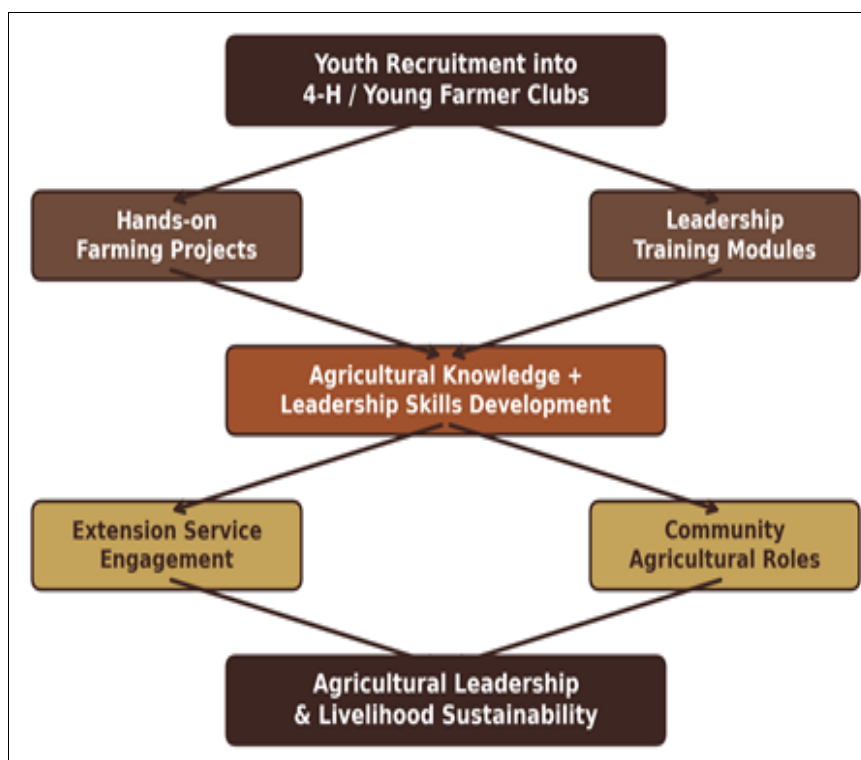


Fig 3: Youth agricultural leadership development pathway from club recruitment through skill building to sustained extension engagement and career commitment

The pathway model (Figure 3) traces how club recruitment leads to parallel hands-on projects and leadership training, which converge in combined skill development, branching into extension engagement and community roles that ultimately support agricultural careers.

Discussion

The results confirm that youth clubs in Nepal function as effective incubators for agricultural leadership and extension engagement. The 24.6-point leadership gap is consistent with American 4-H evaluations ^[6], and the

participation-engagement correlation ($r = 0.71$) supports experiential learning theory^[11]. Perhaps most importantly, 72.3% of club members intend to stay in agriculture versus 34.5% of non-members, suggesting these programs actively counteract the youth farming exodus. Focus groups revealed clubs create a peer identity that makes agriculture seem like a viable, modern career^[3, 8].

Conclusion

Youth agricultural clubs serve as effective vehicles for developing agricultural leadership and sustaining extension participation among rural youth in Nepal. Club members showed significantly higher leadership competency, extension engagement, practice adoption, and agricultural career intent. Scaling these programs requires investment in trained facilitators, project-based curricula aligned with local farming systems, and stronger linkages between clubs and formal extension services to ensure that leadership development translates into productive agricultural careers.

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