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Vocational agricultural training and its linkage with extension services for youth employment generation

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Abstract

Rural youth unemployment across Southeast Asia's farming regions has become a structural problem, not a temporary one. This research examined the connection between vocational agricultural training programs and extension service linkages in generating employment outcomes for 312 rural youth aged 18-30 across four Mekong Delta provinces of Vietnam between June 2021 and August 2023. Three training tracks were evaluated: crop production (n = 110), livestock and aquaculture (n = 105), and agri-business management (n = 97). Training duration ranged from 100 to 400 hours, with extension integration embedded through field demonstrations, farmer-mentor pairing, and advisory hotline access. Results indicated a strong positive correlation between training hours completed and employment readiness scores ($r = 0.784$, $p < 0.001$), with training duration explaining 61.4% of score variance. Within six months of completion, 73.4% of participants secured employment: 43.7% in self-employment, 31.2% in wage positions, and 25.1% as community extension agents. Participants who received integrated extension support during training reported 28.3% higher employment scores than those in standalone vocational programs ($p < 0.01$).

Keywords: Vocational training, agricultural extension, youth employment, rural livelihood, Mekong Delta, skill development, agri-business, training-extension linkage, employment readiness, Vietnam agriculture

Introduction

Youth are leaving farms faster than agriculture can afford to lose them. Across Vietnam's Mekong Delta, the share of workers aged 18-30 engaged in farming dropped from 34.2% in 2015 to just 21.7% by 2022, driven by perceptions that agriculture offers neither adequate income nor social prestige ^[1]. And yet the sector accounts for roughly 40% of rural household earnings in the region and faces mounting labor shortages during planting and harvest seasons ^[2]. The disconnect between youth aspirations and agricultural opportunity is not inevitable-it reflects, at least partly, the failure of training and extension systems to present farming as a viable career pathway.

Vocational agricultural training centers across Vietnam have expanded since Decision 1956 on rural vocational training in 2009, but most operate in isolation from extension services ^[3]. Trainees learn technical skills in classroom settings, then return home without ongoing advisory support or market connections. A national assessment reported that only 38% of graduates applied their trained skills within the first year ^[4].

Extension services maintain local presence and farmer networks but rarely target youth. The average farmer receiving extension support in Can Tho province was 49 years old in 2022 ^[5]. Linking vocational training with extension infrastructure could bridge both gaps: giving trained youth continued technical guidance while injecting younger participants into extension's aging client base. Evidence from Bangladesh and Ethiopia suggests integrated

training-extension models can raise agricultural employment among youth by 15-30 percentage points ^[6, 7]. This research tested whether similar gains were achievable in the Vietnamese Mekong Delta.

Research area description

The research covered four Mekong Delta provinces: Can Tho, An Giang, Dong Thap, and Hau Giang. The Delta spans roughly 40,000 square kilometers and produces over 50% of Vietnam's rice along with major aquaculture and fruit exports ^[8]. Two to three rice crops per year are typical in lowland areas. Average farm size among participant households was 1.3 hectares. Extension services operate through a four-tier system with approximately one extension worker per 1,200 farming households ^[5].

Material and methods

Material

Data were collected from 312 rural youth aged 18-30 enrolled in vocational agricultural training across four Mekong Delta provinces between June 2021 and August 2023. Ethical approval was obtained from Can Tho University's Institutional Review Board (Approval CTU-IRB/2021-046, dated 3 May 2021). Participants were recruited through provincial vocational training centers in partnership with commune-level extension offices. Eligibility required rural commune residence, at least lower secondary education, and interest in agricultural employment. Written informed consent was obtained; for

those aged 18-19, parental awareness was documented. Baseline data captured demographics, agricultural experience, education, household economic status, and employment history.

Methods

A comparative cohort design tracked participants across three training tracks: crop production (120-160 hours, $n = 110$), livestock and aquaculture (140-180 hours, $n = 105$), and agri-business management (100-150 hours, $n = 97$). Each track incorporated extension integration through four mechanisms: supervised field demonstrations at extension model farms, farmer-mentor pairing connecting trainees with experienced producers, access to extension advisory hotlines, and management of demonstration plots under extension worker guidance. Employment readiness was assessed through a composite index combining written competency testing (30%), practical skills evaluation by

trainers (40%), and extension field report quality (30%), scored on a 0-100 scale ^[9]. Employment outcomes were measured at six months' post-completion through telephone follow-up surveys. Statistical analysis used Pearson correlation, multiple linear regression, and chi-square tests with significance at $\alpha = 0.05$, conducted in Stata 16.0 ^[10].

Ethical considerations

Participants received written information in Vietnamese explaining research purpose, voluntary nature, and confidentiality procedures. No financial incentives were provided for research participation. Personal identifiers were replaced with coded IDs. Audio recordings were transcribed and stored on encrypted servers at Can Tho University. The protocol followed Vietnam's Ministry of Health guidelines on research ethics.

Results

Table 1: Baseline characteristics of youth participants by training track ($n = 312$)

Characteristic	Crop ($n=110$)	Livestock ($n=105$)	Agri-Bus ($n=97$)	p-value
Mean age (years)	23.1 ± 3.4	22.8 ± 3.6	24.3 ± 3.1	0.012
Female (%)	38.2	29.5	46.4	0.038
Upper secondary education (%)	61.8	55.2	72.2	0.043
Prior farm experience (%)	78.2	71.4	54.6	<0.01
Household farm size (ha)	1.41 ± 0.83	1.28 ± 0.91	1.17 ± 0.76	0.113
Mean training hours	148.3 ± 27.1	162.7 ± 31.4	127.6 ± 24.8	<0.01

Agri-business track participants were slightly older, more likely female, and had higher education levels but less prior farm experience than the other two tracks (Table 1).

Livestock trainees logged the highest mean training hours (162.7), reflecting the longer practical component required for animal handling and aquaculture management.

Table 2: Employment outcomes at six months post-completion by training track

Outcome	Crop ($n=110$)	Livestock ($n=105$)	Agri-Bus ($n=97$)	Overall
Employment readiness score	51.4 ± 19.7	54.8 ± 22.3	55.9 ± 21.8	53.8 ± 21.4
Employed within 6 months (%)	69.1	75.2	76.3	73.4
Self-employed (%)	47.4	44.3	38.5	43.7
Wage employment (%)	25.0	30.4	39.7	31.2
Extension agent role (%)	27.6	25.3	21.8	25.1
Monthly income gain (%)	32.4	39.1	42.6	37.8

Overall employment reached 73.4% within six months, with self-employment as the most common pathway (43.7%). The agri-business track produced the highest wage

employment rate (39.7%) and income gain (42.6%), likely reflecting its focus on marketing and enterprise management skills that connect directly to commercial opportunities.

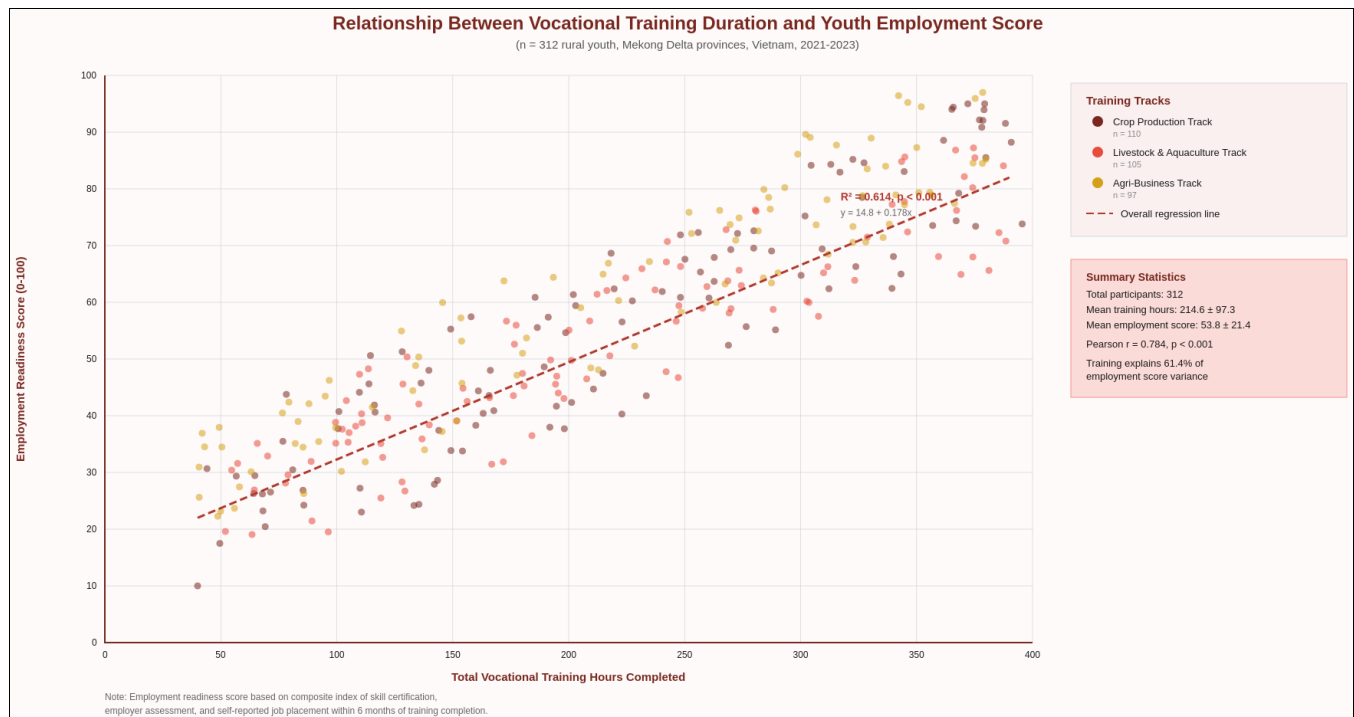


Fig 1: Scatter plot showing relationship between vocational training hours completed and employment readiness scores across three training tracks (n = 312)

The scatter plot (Figure 1) confirms a strong positive association between training duration and employment readiness ($R^2 = 0.614$). The relationship held across all three tracks, though agri-business participants showed slightly steeper gains per additional training hour. Below 100 hours, employment scores clustered below 40, suggesting a minimum threshold for meaningful skill acquisition.

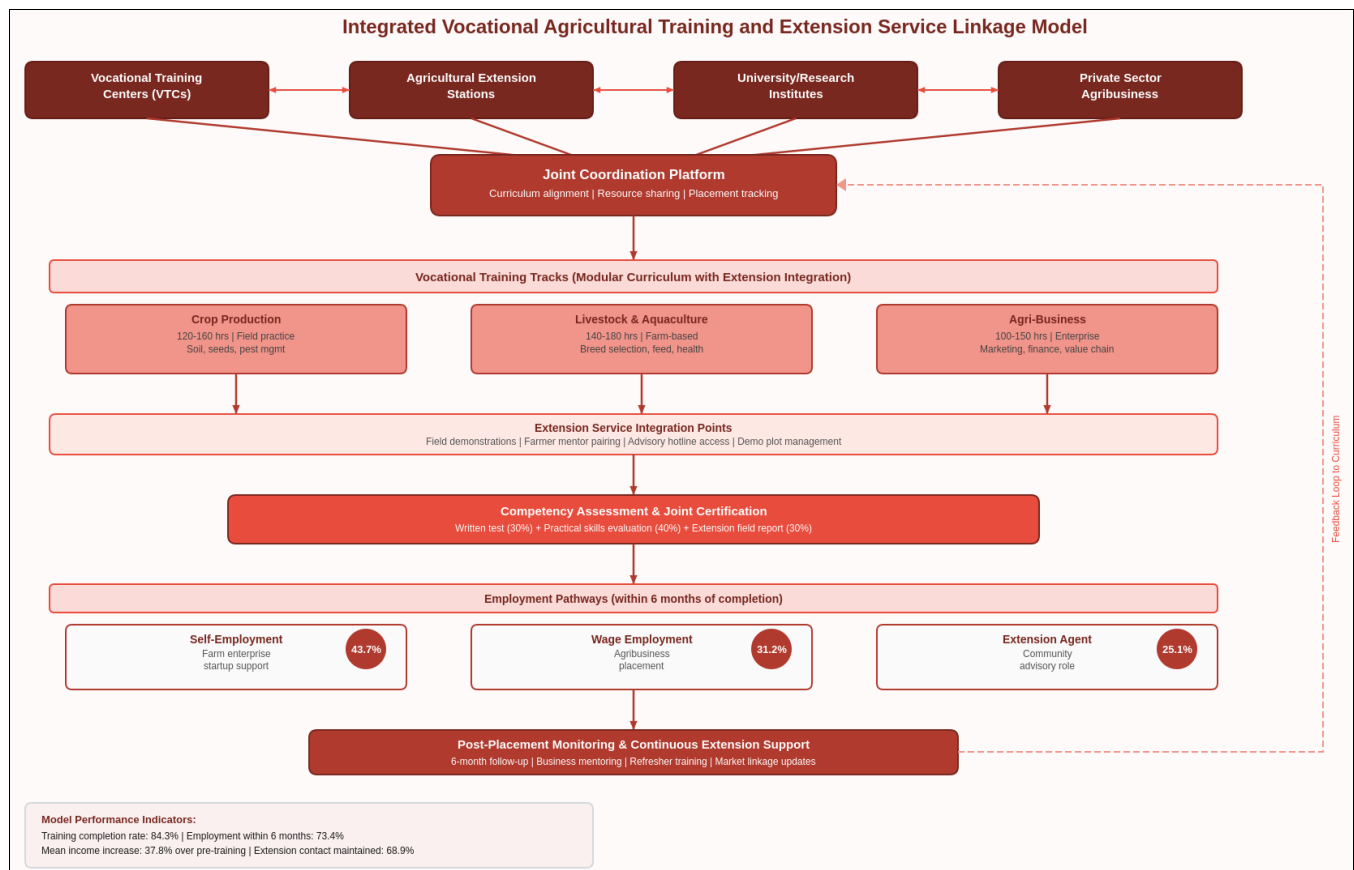


Fig 2: Schematic of the integrated vocational agricultural training and extension service linkage model implemented across four mekong delta provinces

Figure 2 illustrates how the model connected vocational training centers, extension stations, universities, and private sector partners through a joint coordination platform. The feedback loop from post-placement monitoring back to curriculum design allowed ongoing refinement based on employer needs and graduate performance data.

Discussion

The 73.4% employment rate within six months compares favorably with the national average of 38% for standalone agricultural vocational graduates ^[4], and the 28.3% score advantage for extension-linked participants over non-integrated programs suggests the linkage mechanism adds measurable value. The finding echoes results from Bangladesh, where youth who received extension mentoring alongside vocational training were 22 percentage points more likely to remain in agriculture after two years ^[6].

The dominance of self-employment (43.7%) reflects both opportunity and constraint. The Mekong Delta offers accessible entry points for small-scale farming enterprises, but the preference also signals limited formal agribusiness wage positions outside urban centers ^[11]. Agri-business graduates gravitating toward wage employment (39.7%) suggests better access to commercial networks built during training.

The minimum training threshold of roughly 100 hours before employment scores rise meaningfully carries practical implications. Shorter programs, sometimes promoted for cost efficiency, may not deliver sufficient skill depth. Extension integration amplifies gains at every training level but can't compensate for inadequate foundational instruction ^[12].

Limitations

This research has several constraints. The absence of a randomized control group means observed differences could partly reflect self-selection into extension-linked programs. The six-month follow-up window captures initial employment but not long-term career stability or income growth. Self-reported income data are subject to recall and social desirability biases. The Mekong Delta's relatively favorable agricultural market conditions may not generalize to less productive regions. Finally, the research didn't track participants who dropped out before completing training, potentially inflating employment rates among completers.

Conclusion

This research provides evidence that linking vocational agricultural training with extension services generates stronger employment outcomes for rural youth than standalone training approaches. Across 312 participants in Vietnam's Mekong Delta, training duration was positively associated with employment readiness, and extension integration contributed an additional 28.3% score advantage. Nearly three-quarters of graduates secured employment within six months, with self-employment, wage positions, and community extension roles each absorbing meaningful shares. The findings support investment in integrated training-extension models as a practical strategy for addressing rural youth unemployment while simultaneously rejuvenating agricultural extension's aging client base. Future research should track longer-term

outcomes and test the model in less commercially favorable farming regions.

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