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Land access barriers and their implications for youth-targeted agricultural extension program design

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Abstract

According to leading rural development scholars, the single greatest obstacle preventing young people from engaging in agriculture is not lack of interest but lack of land. This research investigated how land access barriers affect youth participation in agricultural extension programs and what design adjustments could make extension more relevant to landless and land-poor young farmers in Yogyakarta Special Region, Indonesia. A cross-sectional survey of 224 rural youth aged 18 to 40 was conducted across Sleman, Bantul, and Gunung Kidul districts between April 2022 and June 2023. Results showed that 77.1% of youth aged 18-24 had no land access whatsoever, declining to 35.6% among those aged 35-40. Youth without land access were 3.4 times less likely to participate in extension programs than those with owned or leased land (OR = 0.29, $p < 0.001$). Among landless youth interested in agriculture, 68.3% expressed demand for extension content focused on agribusiness, value addition, and service-based agricultural livelihoods rather than production-centered training.

Keywords: Land access, youth agriculture, extension programs, program design, landless youth, agribusiness, rural youth, participation barriers, land tenure

Introduction

Leading agricultural development researchers have argued for over a decade that youth engagement in farming will not increase until the land access question is addressed [1]. The reasoning is straightforward: most extension programs are designed around production activities that require land, so young people without land find little value in attending training sessions about planting techniques, fertilizer management, or crop rotation [2]. In Indonesia, where population density on Java exceeds 1,100 people per square kilometer and intergenerational land transfer is increasingly delayed, this mismatch between extension content and youth resource realities is especially acute [3].

Yogyakarta Special Region exemplifies the challenge. Agricultural land per capita has been declining steadily due to urbanization and subdivision through inheritance, and young people report waiting until their late 30s or even 40s before gaining independent access to farmland [4]. Meanwhile, extension programs continue to target landholders, effectively excluding a large share of the rural youth population from advisory services [5]. Several researchers have called for a rethinking of extension program design to include land-independent agricultural pathways such as value chain services, agribusiness, and digital agriculture, but empirical evidence on whether such redesign would actually attract youth participation remains limited [6, 7].

This research documented the land access status of rural youth across three districts of Yogyakarta, measured how land access influences extension participation, and assessed

what kinds of extension content landless youth would find relevant enough to engage with [8].

Instrument development and validation

A structured questionnaire with 39 items was developed specifically for this research. Items were organized into four sections: demographic and land access profile, extension participation history and barriers, preferred extension content, and aspirations for agricultural livelihoods. The land access section classified respondents into three groups: land owners (holding formal title or family allocation), land leasers (renting or sharecropping), and landless (no access to agricultural land). A panel of four experts reviewed the instrument for content relevance and clarity, yielding a Content Validity Index of 0.86. A pilot test with 20 youth in neighboring Klaten Regency produced Cronbach's alpha values of 0.83 for the barrier subscale and 0.79 for the content preference subscale [9].

Materials and Methods

Materials

This research was conducted through the Faculty of Agriculture, Gadjah Mada University, Yogyakarta, Indonesia, between April 2022 and June 2023. Ethical clearance was obtained from the Gadjah Mada University Research Ethics Commission (Protocol UGM-REC-2022-FA-018, approved March 15, 2022). The target population comprised rural residents aged 18-40 in three districts of Yogyakarta Special Region: Sleman, Bantul, and Gunung Kidul. A multi-stage sampling procedure selected 6 sub-districts (2 per district) and then systematically sampled 224

youth from village population registers. Data were collected through face-to-face interviews conducted by trained enumerators between June and September 2022 ^[10].

Methods

Extension participation was measured as a binary variable (participated in any extension activity during the preceding 24 months: yes/no). Land access was categorized as owned, leased, or no access. Binary logistic regression modeled the association between land access status and extension participation, controlling for age, education, gender, distance to extension office, and agricultural income share. Content preferences were assessed using a ranked choice list

of eight extension topic areas. Chi-square tests compared preferences between land access groups. All analyses used SPSS version 28 ^[11].

Ethical considerations

All respondents provided written informed consent. For participants aged 18-20, parental awareness was sought where culturally appropriate but was not required by the ethics protocol since all were legal adults. Interviews were conducted in Bahasa Indonesia or Javanese based on respondent preference. Participation was voluntary, and data were anonymized before analysis. No compensation was offered.

Results

Table 1: Land access status and extension participation by age group (n = 224)

Age group	Own land (%)	Lease (%)	No access (%)	Extension participation (%)	n
18-24	8.7	14.2	77.1	16.4	62
25-29	18.3	22.7	59.0	28.6	68
30-34	34.6	18.4	47.0	43.2	52
35-40	52.1	12.3	35.6	59.5	42
All youth	25.4	17.4	57.2	33.9	224

More than three-quarters of the youngest cohort (18-24) had no land access, and their extension participation rate was just 16.4%. Both land ownership and extension participation

rose steadily with age, confirming the strong association between land access and program engagement ^[12].

Table 2: Preferred extension content by land access status (% ranking topic in top 3)

Extension topic	Own land (n=57)	Lease (n=39)	No Access (n=128)
Crop production techniques	78.9	64.1	22.7
Agribusiness/marketing	33.3	48.7	68.3
Value addition/processing	28.1	43.6	61.7
Livestock management	40.4	30.8	18.8
Digital agriculture/apps	15.8	25.6	47.7
Farm financial management	22.8	38.5	42.2

Content preferences differed sharply by land access status. Landless youth overwhelmingly preferred agribusiness (68.3%), value addition (61.7%), and digital agriculture

(47.7%) topics that don't require land ownership. Landholders strongly preferred crop production techniques (78.9%) ^[13].

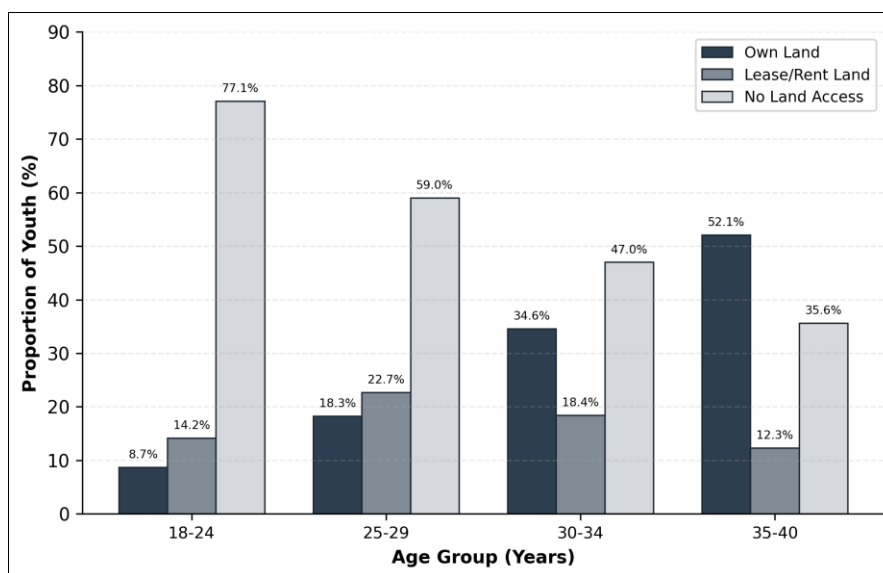


Fig 1: Land access status distribution across youth age groups in Yogyakarta Special Region

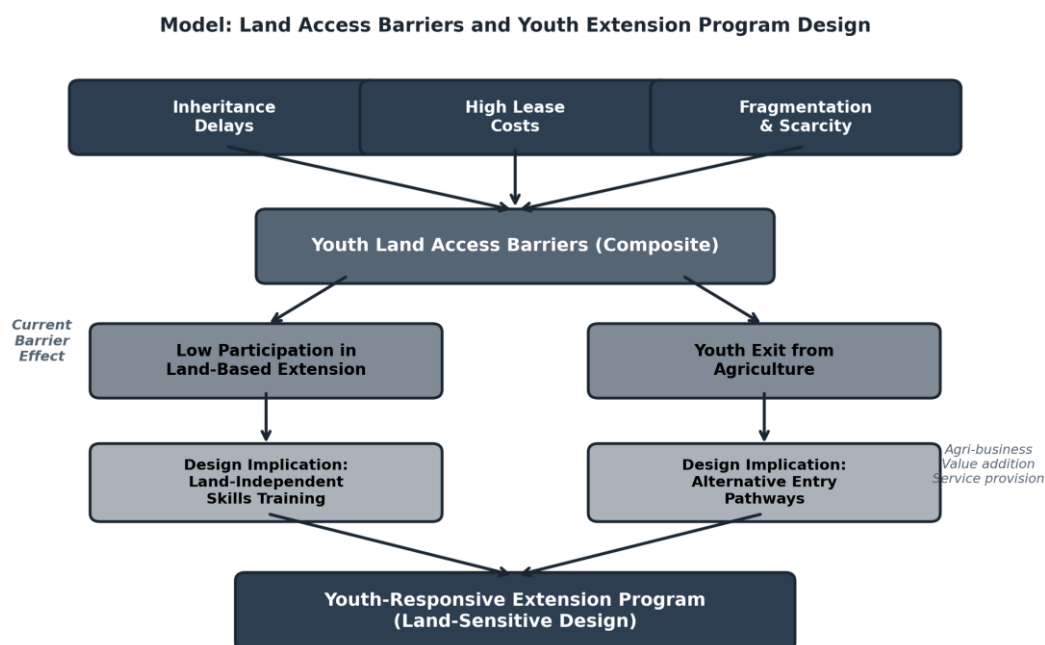


Fig 2: Conceptual model linking land access barriers to youth extension program design implications

Comprehensive interpretation

The evidence paints a clear picture: most rural youth in Yogyakarta lack land access, and this exclusion translates directly into non-participation in extension programs designed around land-based farming. But the content preference data suggest that landless youth aren't uninterested in agriculture they're interested in different parts of the agricultural system. The model in Figure 2 illustrates how current land barriers can inform a redesigned extension approach that includes land-independent entry pathways such as agribusiness, processing, and digital services.

Discussion

The 77.1% landlessness rate among 18-24-year-olds is striking and reflects broader demographic pressures across Java, where farm subdivision has reduced average holding sizes below economic viability thresholds for many households [3, 4]. The finding that landless youth were 3.4 times less likely to participate in extension confirms that the current production-focused extension model effectively self-selects for landholders, creating a participation bias that reinforces existing inequalities [2].

The strong preference for agribusiness and value addition content among landless youth aligns with emerging evidence from sub-Saharan Africa where youth-focused agricultural programs that emphasize entrepreneurship over production have achieved higher engagement rates [6]. Digital agriculture interest (47.7% among landless youth) suggests that mobile-based advisory platforms could serve as both a content delivery mechanism and a livelihood pathway for tech-comfortable young people [7]. That said, extension systems will need to develop new competencies in business mentoring and market facilitation that go beyond their traditional agronomic advisory role [14].

Limitations

The research was conducted in Yogyakarta Special Region, one of Indonesia's most densely populated areas, and the

severity of land constraints may not apply to less populated provinces. Self-reported preferences for extension content may not translate into actual participation if programs were offered. The cross-sectional design captures a single time point and cannot track how land access and extension preferences evolve as youth age. The 18-40 age range for "youth" follows Indonesian government definitions but is broader than some international frameworks.

Conclusion

Land access is the dominant barrier preventing youth participation in agricultural extension programs in Yogyakarta, with over three-quarters of the youngest cohort lacking any farmland access. Current production-focused extension programming systematically excludes landless youth, but these young people express strong interest in land-independent agricultural livelihoods including agribusiness, value addition, and digital agriculture. Redesigning extension programs to include these pathways alongside rather than replacing production training could substantially expand youth engagement. Extension agencies should develop dual-track programming that serves both landed and landless youth, invest in business mentoring capabilities, and pilot digital advisory platforms that match the technological comfort of younger target groups.

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