



Socioeconomic and Farming Characteristics of Farmers in Kluet Tengah District, South Aceh, Indonesia

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Article History:

Submitted: 04-10-2026

Accepted: 14-10-2026

Published: 19-10-2026

Keywords:

Socioeconomic characteristics;
Farming characteristics;
Smallholder farmers; Kluet
Tengah; South Aceh

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ABSTRACT

Socioeconomic and farming characteristics provide baseline information for agricultural planning in smallholder farming areas. This study described the socioeconomic and farming characteristics of 339 farmers in Kluet Tengah District, South Aceh Regency, Indonesia. A quantitative descriptive survey was conducted in 2026 using purposive sampling and structured interviews, and the responses were summarized as frequencies and percentages. The respondents were aged 20–64 years. Male respondents accounted for 237 (69.91%). Elementary and senior high school education were equally common (96 respondents; 28.32% each), and 168 (49.56%) reported three to four dependents. Most respondents (277; 81.71%) were in the lowest household-income category, below 1.5 million Indonesian rupiah. Plantation crops were the most common principal commodity (143; 42.18%), 189 respondents (55.75%) managed less than 0.5 hectares, and the most frequently reported distance from farmland to a river or major watercourse was 100–500 meters (116; 34.22%). These distributions point to limited household resources and small-scale farming structures among the surveyed farmers. Because respondents were purposively selected, the findings describe the surveyed farmers only and are not district-wide estimates. They provide a descriptive reference for local agricultural planning and for further studies that link farm characteristics to verified hazard and spatial data.

INTRODUCTION

Agriculture supports rural livelihoods, employment, and food production (Lowder et al., 2021). Small-scale farmers often operate under resource constraints and in changing environmental conditions. Flooding, for example, may interrupt cultivation, damage crops and infrastructure, and raise the cost of farm recovery, although such effects vary with location, production system, household circumstances, and the nature of the event (Intergovernmental Panel on Climate Change [IPCC], 2022; Nofiu & Baharudin, 2024).

Socioeconomic and farming characteristics provide basic information for agricultural planning. Education, household income, and the number of dependents describe some of the resources and obligations of farming households, while commodity type and cultivated area characterize production systems. These indicators are descriptive and should not, by themselves, be treated as direct measures of adaptive capacity, vulnerability, or damage (Berrang-Ford et al., 2021; Andrista et al., 2025; Dhawale et al., 2024).

Kluet Tengah District in South Aceh Regency has agricultural areas in a setting where overflow of the Menggamat River has been reported previously. A geographic information system (GIS) study described spatial patterns in the district, including low-lying areas and locations affected by overflow (Basri & B, 2026). Such spatial characterization, however, does not describe the socioeconomic and farming circumstances of the farmers who cultivate the land. Likewise, distance from a river is not sufficient to estimate hazard, exposure, or risk, because exposure assessments integrate hazard and population information (Rentschler et al., 2022).

Respondent-level information about farmers and the spatial characterization of an area answer different questions. A profile of farmers' socioeconomic circumstances and farming practices gives agricultural extension and later studies a local starting point, including studies that combine it with independently verified hazard and spatial data.

This study aims to describe the socioeconomic and farming characteristics of surveyed farmers in Kluet Tengah District. Specifically, it summarizes sex, education, number of dependents, household income, principal commodity, land area, and the reported distance of farmland from a river or major watercourse. The study does not test associations or estimate flood risk or impacts.

LITERATURE REVIEW

Households differ in the financial, social, and informational resources they can draw on, and these differences shape how farming decisions are made. The variables examined here can be read through this livelihood-resources perspective: education and household composition relate to human capital, income to financial capital, and land area





and commodity to the productive assets of a farm household. Evidence from Indonesian small-scale farmers shows that perceived climate conditions, access to information, and institutional support are associated with how farmers respond to changing environmental conditions (Andrista et al., 2025). Education and farmer networks have likewise been linked to climate-related adaptation behavior (Prayitno et al., 2025), and social protection has been examined as a resource for coping with climate-related disasters among Indonesian farm households (Fitritia & Matsuyuki, 2023). These studies motivate documenting farmers' socioeconomic profiles, but they do not support causal claims about the present sample.

Farm size, commodity choice, and the location of cultivated plots are basic descriptors of production systems. Research in East Africa and South Asia illustrates that farmers' responses to climate risks vary with context and with the options available to them (Aryal et al., 2021). A systematic review of flooding and smallholder livelihoods identifies economic and livelihood constraints as relevant to understanding rural disruption (Nofiu & Baharudin, 2024), and recent studies of farming households in Nigeria and Nepal have examined household and farm characteristics in relation to climate and flood adaptation (Aroyehun et al., 2024; Maharjan et al., 2025). Descriptive local profiles can complement this work by documenting who the surveyed farmers are and how their farms are organized before more detailed exposure or adaptation analysis is attempted.

Taken together, these studies concern adaptation, livelihood resources, and agricultural conditions in other settings, so their analytical findings cannot be transferred directly to farmers in Kluet Tengah. This study instead provides a descriptive point of reference for context-specific investigations.

METHOD

Research Design and Study Area

This study used a quantitative descriptive survey to describe the socioeconomic and farming characteristics of farmers in Kluet Tengah District, South Aceh Regency, Aceh Province, Indonesia. Fieldwork was conducted in 2026. The district was selected because agriculture contributes to local livelihoods and because earlier GIS mapping documented spatial patterns of river overflow in the district (Basri & B, 2026). Farmland distance from a river or major watercourse was recorded as a locational characteristic of each respondent's farming; individual plots were not assigned to flood-hazard categories.

The research followed seven sequential stages, from problem identification and study-area selection to the presentation and interpretation of the results (Figure 1). Data screening confirmed that all 339 respondents met the eligibility criteria and had complete responses.

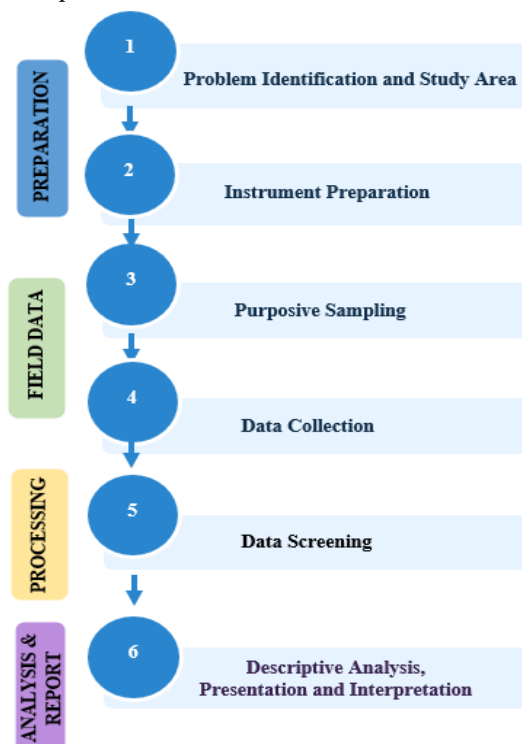


Figure 1. Flowchart of the Research Stages

Study Population and Sampling

Eligible respondents were farmers aged 20–64 years who were conducting farming activities in Kluet Tengah District. Respondents were selected by purposive sampling, a non-probability method, according to these occupation, location, and age criteria (Andrade, 2021). The final sample comprised 339 farmers who met all eligibility criteria and



were included in the descriptive analysis. This data is based on information from the Central Statistics Agency (BPS) of South Aceh Regency (2025).

Data Collection and Research Ethics

Primary data were collected through structured interviews using a questionnaire covering respondents' sex, highest educational attainment, number of household dependents, reported household income category, principal cultivated commodity, area of farmland managed, and distance from farmland to a river or major watercourse. Sex and education describe the individual respondent, whereas dependents and income refer to the respondent's household. The instrument did not record whether distance was measured or estimated by the respondent, so it is treated as a reported distance. Responses were grouped into the categories shown in Table 1 for descriptive tabulation. Secondary demographic context was taken from BPS-Statistics Aceh Selatan Regency (2025) and from published research related to the study area. Respondents were informed of the purpose of the research before the interviews, and the information collected was treated confidentially.

Variables and Measurement

Table 1. Study Variables and Recorded Categories

Variable	Categories or indicator
Sex	Male; female
Educational attainment	No formal schooling; elementary school; junior high school; senior high school; college
Household dependents	1–2; 3–4; 5–6; >6 persons
Reported household income category	< IDR 1.5 million; IDR 1.5–3 million; IDR 3–5 million; > IDR 5 million
Principal commodity	Rice; secondary food crops; plantation crops; other
Cultivated land area	<0.5 ha; 0.5–1 ha; >1 ha
Distance from river / water source	<100 m; 100–500 m; 500 m–1 km; >1 km

Data Analysis

The data were screened for eligibility and completeness before tabulation. All 339 records met the age criterion and had one response in every categorical study variable, so no records were excluded and no missing data had to be handled. Frequencies (f) and percentages, calculated as $(f/339) \times 100$, were used to summarize each variable. Percentages are rounded to two decimal places and may not sum exactly to 100% because of rounding. No hypothesis tests, regression analyses, or estimates of flood hazard, impact, or vulnerability were performed.

RESULTS

The study included 339 respondents aged 20–64 years. Table 2 summarizes sex, highest educational attainment, number of household dependents, and reported income category. Table 3 summarizes the principal commodity, the area of farmland managed, and the reported distance of farmland from the nearest river or main watercourse. The total for each variable is 339.

Table 2. Socioeconomic Characteristics of Farmer Respondents in Kluet Tengah District

Variable	Category	n	%
Sex	Male	237	69.91
	Female	102	30.09
Education	No formal schooling	47	13.86
	Elementary school	96	28.32
	Junior high school	81	23.89
	Senior high school	96	28.32
	College	19	5.60
Dependents	1–2 persons	113	33.33
	3–4 persons	168	49.56
	5–6 persons	47	13.86
	>6 persons	11	3.24
Income	< IDR 1.5 million	277	81.71
	IDR 1.5–3 million	45	13.27
	IDR 3–5 million	14	4.13
	> IDR 5 million	3	0.88

Most respondents were male (237; 69.91%). Education was spread across levels: elementary and senior high school were each reported by 96 respondents (28.32%), followed by junior high school (81; 23.89%), no formal schooling (47; 13.86%), and college (19; 5.60%). Households with 3–4 dependents were the largest group (168;





49.56%), followed by those with 1–2 dependents (113; 33.33%). Income was concentrated in the lowest category: 277 respondents (81.71%) reported household income below IDR 1.5 million, whereas only 3 (0.88%) reported more than IDR 5 million. Figure 2 presents these distributions graphically.

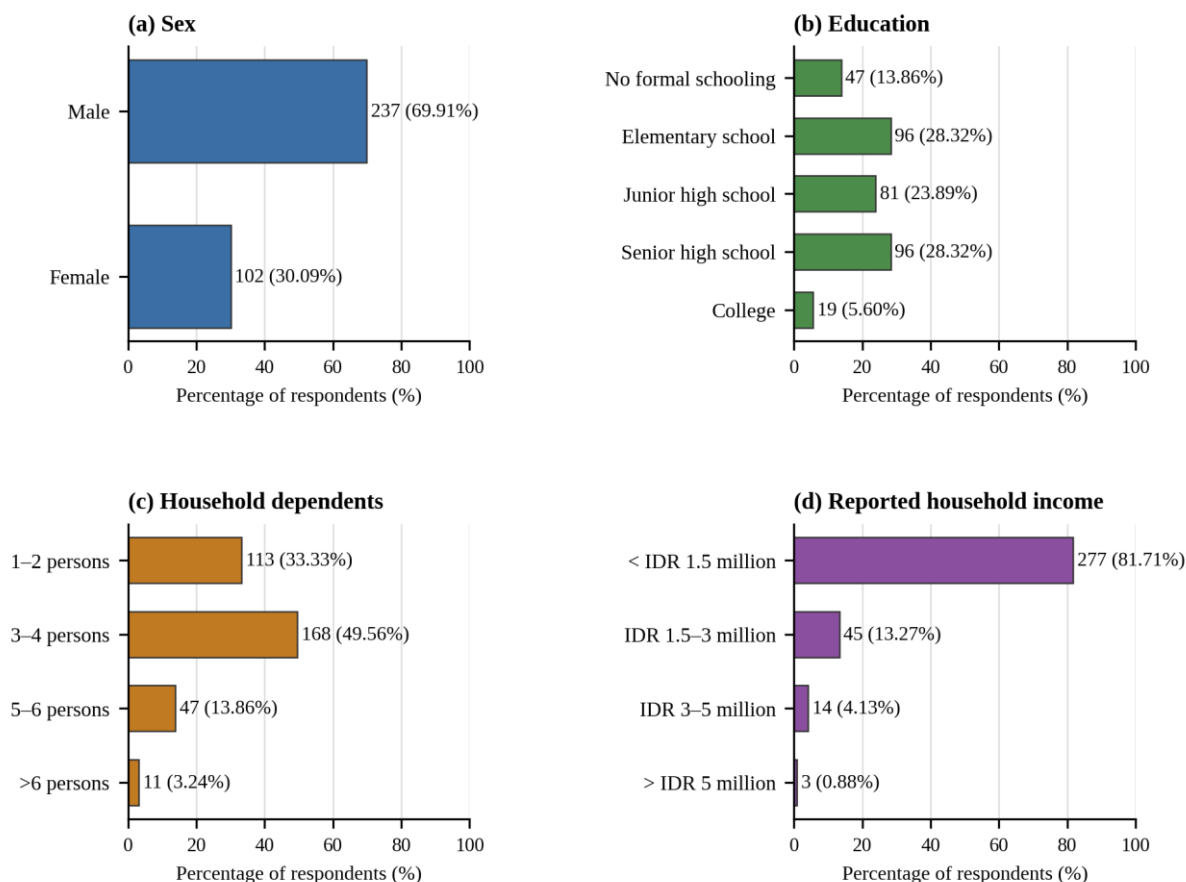


Figure 2. Graphical Representation of the Socioeconomic Characteristics of Farmer Respondents

Table 3. Farming Characteristics of Farmer Respondents

Variable	Category	n	%
Principal commodity	Rice	86	25.37
	Secondary food crops	11	3.24
	Plantation crops	143	42.18
	Other	99	29.20
Land area	< 0.5 ha	189	55.75
	0.5–1 ha	119	35.10
	> 1 ha	31	9.14
Distance	< 100 m	91	26.84
	100–500 m	116	34.22
	500 m–1 km	111	32.74
	> 1 km	21	6.19

Plantation crops were the most frequently reported principal commodity (143; 42.18%), followed by other commodities (99; 29.20%), rice (86; 25.37%), and secondary food crops (11; 3.24%). Farm holdings were small: 189 respondents (55.75%) managed less than 0.5 ha and 119 (35.10%) managed 0.5–1 ha, while 31 (9.14%) managed more than 1 ha. The reported distance from farmland to a river or main watercourse was most often 100–500 m (116; 34.22%), followed by 500 m–1 km (111; 32.74%), below 100 m (91; 26.84%), and above 1 km (21; 6.19%). Figure 3 presents these distributions graphically.

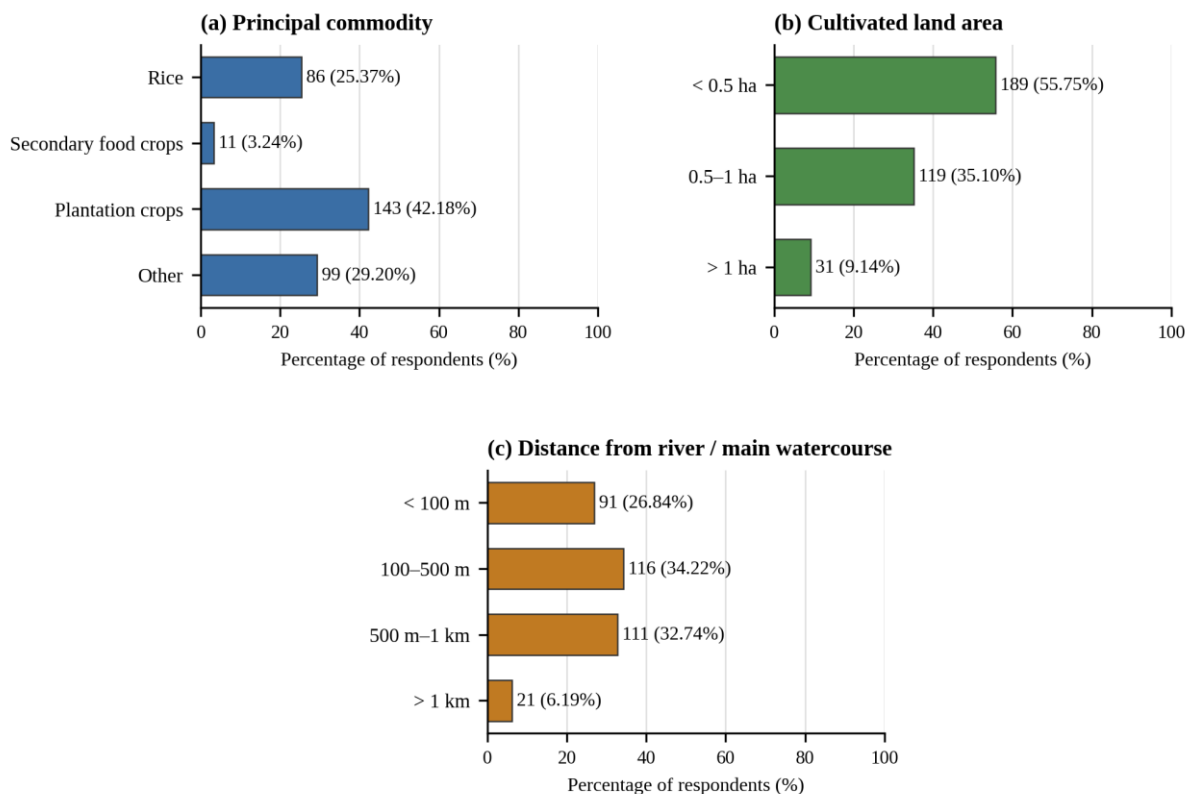


Figure 3. Graphical Representation of the Farming Characteristics of Farmer Respondents

DISCUSSION

The surveyed farmers were predominantly male, mostly educated to junior high school level or below, and largely in the lowest household-income category. They worked small plots, mainly in plantation crops or rice, and 61.06% reported farmland within 500 m of a river or major watercourse. The sections below discuss each group of characteristics, what it can and cannot indicate, and what it suggests for extension planning and later research.

Sex and Education of Respondents

Male respondents made up 237 of the 339 farmers (69.91%) and female respondents 102 (30.09%). This shows who was interviewed, not who does the agricultural work, owns land, or makes decisions. Women may contribute to cultivation, post-harvest work, and household finances without being the principal respondent, and the questionnaire did not measure these roles. Studies in Indonesia and other smallholder settings show why women's participation needs to be examined beyond respondent counts (Qanti et al., 2022; Clark et al., 2023), and Andrista et al. (2025) found that gender, information access, and government support were relevant to adaptation practices across six Indonesian districts. The present survey did not examine adaptation or gender roles, but its sex composition suggests that extension activities should be designed to reach women as well as men. Because respondents were purposively selected, the male majority should not be read as the sex ratio of farmers in the district.

Educational attainment was varied. Elementary and senior high school were each reported by 96 respondents (28.32%), 47 (13.86%) had no formal schooling, and 19 (5.60%) had attended college, so 224 respondents (66.08%) had junior high school education or less. These figures do not measure agricultural knowledge, literacy, or technical skills, but they indicate that information for farmers should be communicated in ways that suit different educational backgrounds. Field demonstrations, visual materials, simple record-keeping tools, and repeated mentoring could be explored alongside written guidance. Prayitno et al. (2025) found human and social capital to be associated with climate adaptation among farmers in East Java. That finding cannot be transferred to Kluet Tengah, but it gives a reason to examine training opportunities and farmer networks in later local studies.

Household Dependents and Income

Households with 3–4 dependents formed the largest group (168; 49.56%), followed by those with 1–2 dependents (113; 33.33%). The number of dependents indicates consumption needs but not the farm labor available, because the number of household members working on the farm was not asked. Most respondents (277; 81.71%) were in the lowest income category, below IDR 1.5 million, which suggests that limited financial resources deserve attention in planning extension and agricultural support. These categories cannot, however, be used to classify poverty or household welfare, since household size, expenditure, assets, nonfarm income, and the reference period of the reported





income were not assessed. Nofiu and Baharudin (2024) emphasize livelihood resources and coping strategies in research on smallholder farmers affected by flooding, and Fitriunitia and Matsuyuki (2023) show that social protection is relevant to household coping with climate-related disasters in Indonesia; neither was measured here. Follow-up needs assessments should separate seasonal farm earnings from broader household resources.

Commodity Choice and Landholding Structure

Plantation crops were the largest principal-commodity category (143; 42.18%), followed by other commodities (99; 29.20%), rice (86; 25.37%), and secondary food crops (11; 3.24%). Because only the main commodity was recorded, the distribution cannot show how many crops each household grows, the degree of diversification, or the sensitivity of particular commodities to hazards. The large “other” category (29.20%) and the broad “plantation crops” group further limit crop-specific interpretation, and a commodity-level inventory of both would be useful. Aryal et al. (2021) show that climate-related risks and adaptation choices differ across farming settings in East Africa and South Asia, and Aroyehun et al. (2024) examined farm characteristics in relation to adaptation decisions among farmers in Nigeria. These studies give a reason to investigate commodity-specific needs in Kluet Tengah, but they do not indicate which responses apply to the farmers surveyed here.

Landholdings were mostly small: 189 respondents (55.75%) managed less than 0.5 ha and 119 (35.10%) managed 0.5–1 ha, so 308 respondents (90.86%) managed no more than 1 ha, while 31 (9.14%) managed more. The surveyed farming profile is therefore characterized mainly by limited land area. Land area alone cannot establish productivity, income adequacy, food security, or vulnerability, which also depend on crops, production costs, land quality, irrigation, technology, tenure security, and markets. Lowder et al. (2021) also caution that small farms should not automatically be equated with family farms. Because the variable recorded farmland area managed, the results describe the scale of farming operations rather than legal land ownership.

Farmland Distance from Rivers

Farmland was most often reported at 100–500 m from the nearest river or main watercourse (116; 34.22%). A further 91 respondents (26.84%) reported distances below 100 m, so 207 respondents (61.06%) were within 500 m, while 111 (32.74%) reported 500 m–1 km and 21 (6.19%) more than 1 km. Proximity to a watercourse can matter for access to water as well as for exposure to river processes. Distance alone, however, is not a valid measure of flood probability, depth, duration, or agricultural loss, and the instrument did not record whether distance was measured or estimated by respondents. Studies of flood exposure and multidimensional vulnerability draw on much broader hazard and socioeconomic information (Rentschler et al., 2022; Dhawale et al., 2024). The distance categories are therefore reported locational characteristics, not graded levels of flood risk.

Earlier GIS-based research in the district documented areas affected by overflow of the Menggamat River (Basri & B, 2026). The present household and farming profile has not been linked to that evidence, but it could complement it. Future work should georeference farm plots and overlay them with validated elevation, flood-frequency, inundation, and land-use data, and should record crop damage, disrupted cultivation, and recovery costs, so that exposure and vulnerability can be assessed on firmer ground. Research on flood adaptation among farming households in Nepal shows how spatial, household, and institutional factors can be assessed together (Maharjan et al., 2025). Without such linkage, it would be unsupported to claim that respondents in one distance category were affected more severely than those in another.

Implications and Limitations

Taken together, the distributions of education, principal commodity, and land area point to topics for participatory follow-up assessment rather than to statistically established relationships. The large share of respondents in the lowest income category, the predominance of holdings below 0.5 ha, and the range of educational backgrounds suggest that local agricultural agencies could consider accessible extension formats, examine financial and production constraints, and check whether different commodity groups need different forms of assistance. Farmer organizations could help identify needs and share information. These suggestions are planning hypotheses, not demonstrated effects, and any program based on them would need to be evaluated with additional data; as Berrang-Ford et al. (2021) note, documenting adaptation actions is not the same as demonstrating risk reduction.

This study has several limitations. First, the descriptive design, without association tests, comparison groups, or longitudinal observation, cannot identify determinants of adaptation, socioeconomic outcomes, or flood damage. Second, respondents were selected by non-probability purposive sampling without a complete farmer sampling frame, so selection bias cannot be ruled out and the findings should not be generalized statistically to all farmers in Kluet Tengah (Andrade, 2021). The BPS count of 4,961 residents aged 20–64 years is not a farmer population and cannot support a sampling-error calculation. Third, the eligibility range of 20–64 years excludes older farmers, and age was used only as an eligibility criterion and was not analyzed. Fourth, several variables were recorded in broad categories: crops in the “other” group were not itemized, and detailed measurement protocols for land area and river distance were not available. Fifth, sex and education describe individual respondents, whereas dependents and income describe households. Future research should document recruitment procedures, georeference farm plots, and combine flood





histories with more detailed household, production, and livelihood data.

CONCLUSION

This quantitative descriptive survey analyzed 339 purposively selected farmers aged 20–64 years in Kluet Tengah District, South Aceh Regency. Most respondents were male (237; 69.91%), and elementary and senior high school were equally frequent education levels (96 each; 28.32%). The largest dependents category was 3–4 persons (168; 49.56%), and 277 respondents (81.71%) reported household income below IDR 1.5 million. Plantation crops were the most frequently reported principal commodity (143; 42.18%), 189 respondents (55.75%) managed less than 0.5 ha, and the most common reported distance from farmland to a river or main watercourse was 100–500 m (116; 34.22%). These results give a descriptive profile of the surveyed farmers that local agricultural stakeholders and later studies can use as a point of reference. Because the sample was non-probability and the design descriptive, the results do not establish district-wide prevalence, flood hazard, impacts, vulnerability, or causality; these would require documented recruitment and more detailed spatial and household data.

ACKNOWLEDGMENT

The authors acknowledge the Direktorat Penelitian dan Pengabdian kepada Masyarakat (DPPM), Kementerian Pendidikan Tinggi, Sains, dan Teknologi Republik Indonesia for funding support through the 2026 Competitive Grant Program. The authors also thank the Lembaga Penelitian dan Pengabdian kepada Masyarakat (LPPM) Sekolah Tinggi Ilmu Kehutanan Pante Kulu for institutional assistance during the research.

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