

Women-Headed Households and Household Welfare in Trans Nzoia County: The Moderating Role of Access to Social Protection Support

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ABSTRACT: This study examined the effect of socio-economic characteristics of women-headed households on household welfare in Trans Nzoia County, Kenya, with access to social protection support as a moderating variable. The study was guided by five objectives: to determine the effect of women-headed household income, education, employment status and household size on household welfare, and to examine whether access to social protection support moderates these relationships. The study was anchored on New Home Economics Theory, Social Protection Theory and Human Capital Theory. An explanatory research design was adopted, and primary data were collected using structured questionnaires from 370 women-headed households. Data were analyzed using descriptive statistics, reliability and validity tests, Pearson correlation analysis, multiple regression and Hayes PROCESS Model 1 moderation analysis. Reliability results showed acceptable internal consistency, with Cronbach alpha values ranging from 0.738 to 0.961. Validity was supported by KMO values between 0.928 and 0.973 and significant Bartlett tests. Correlation results showed that household welfare was positively and significantly associated with income, education, employment status and access to social protection support, while household size had a negative bivariate association with welfare. Regression results showed that income, education, employment status and household size jointly explained 49.9% of the variation in household welfare. Education had the strongest standardized effect, followed by household size, employment status and income. When social protection support was included, the explained variance increased to 60.0%. Moderation results showed that access to social protection support significantly strengthened the relationships between each socio-economic characteristic and household welfare. The study concludes that improving welfare among women-headed households requires integrated interventions that combine income support, education support, employment creation, household-size-sensitive programming and broader access to social protection.

KEYWORDS: women-headed households, household welfare, social protection support, income, education, employment, household size, Trans Nzoia County

1. INTRODUCTION

Women-headed households have become an important category in contemporary household welfare research because they represent a growing and diverse set of family arrangements in which women carry primary responsibility for income generation, caregiving, decision-making and welfare provision. Recent cross-country evidence shows that female-headed households are not homogeneous; they differ by marital status, age, household composition, presence of dependants, migration histories and access to support networks (Saad et al., 2022). This heterogeneity is central because welfare outcomes cannot be explained by headship alone. Some women-headed households are formed through widowhood, separation, divorce, migration, non-marriage or choice, while others include adult relatives who contribute labour, income or care. Therefore, the welfare question should not be whether female headship is automatically a marker of poverty, but how the socio-economic characteristics of women household heads shape their ability to meet household needs (Brown & van de Walle, 2021; Xu, 2022).

Household welfare is multidimensional and includes income adequacy, food security, health access, education access, housing quality, water and sanitation, savings, employment stability, social participation and resilience to shocks. Current literature shows that household welfare has become more fragile in low- and middle-income economies because households are increasingly exposed to pandemics, climate shocks, food price inflation, employment instability and reductions in informal support (Kansiiame et al., 2021; Janssens et al., 2021; Nechifor et al., 2021). In East Africa, the COVID-19 period demonstrated that household income shocks can quickly translate into food insecurity, reduced dietary quality, lower schooling expenditure and weakened informal

Women-Headed Households and Household Welfare in Trans Nzoia County: The Moderating Role of Access to Social Protection Support

risk-sharing systems (Kansiime et al., 2021; Janssens et al., 2021). These findings are relevant to women-headed households because many depend on informal livelihoods, casual labour, small-scale agriculture or micro-enterprise earnings that are highly vulnerable to disruption.

Income remains a key pathway to household welfare because it determines purchasing power and the household's ability to acquire food, pay school fees, access healthcare, improve shelter, save and participate in social life. However, recent studies emphasize that income effects depend on stability, source diversity and the surrounding institutional environment (Egger et al., 2022; Strupat et al., 2025). Cash transfer evidence from Kenya shows that income support can raise consumption and assets while creating positive spillovers for non-recipient households and local enterprises (Egger et al., 2022). This implies that improving the economic resources of vulnerable households can strengthen both direct household welfare and local economic circulation. For women-headed households, income is especially important because the woman household head may be the only reliable provider for children, elderly persons and other dependants.

Education is another important determinant of household welfare because it improves employability, productivity, financial decision-making, health awareness and the ability to access public programmes. Recent research on education and poverty reduction shows that educational investment contributes to poverty reduction through human capital development, improved participation in formal financial systems and better labour-market outcomes (Shi & Qamruzzaman, 2022; Spada et al., 2023; Panduwina, 2025). In sub-Saharan Africa, evidence further shows that women's education is linked to multiple household welfare indicators, including children's schooling, child labour, female labour participation and household nutrition (Frempong & Stadelmann, 2024). In the context of women-headed households, education may improve welfare not only by increasing direct earnings potential but also by enabling household heads to understand service requirements, apply for bursaries, use health schemes, join savings groups and make informed resource-allocation decisions.

Employment status is also central to welfare because it determines the regularity and predictability of household income. The issue is not merely whether a woman works, but whether the work is stable, adequately paid and compatible with caregiving responsibilities. Female labour force participation in developing economies is shaped by education, care burdens, job quality, informality and local economic structure (Verick, 2025). Women-headed households often rely on farming, casual labour, domestic work, petty trade or informal services, many of which are affected by weather, market prices and health shocks. Evidence from household welfare and empowerment studies indicates that women's economic participation and decision-making power can affect children's education, health outcomes and household food security, although effects vary across contexts (Annan et al., 2021; Deißler et al., 2025; Frempong & Stadelmann, 2024). This makes employment status an important variable in understanding welfare outcomes in Trans Nzoia County.

Household size is a further socio-economic characteristic that can either weaken or strengthen welfare depending on household composition and available resources. Larger households generally require more food, school expenditure, healthcare, clothing, housing space and care time. Where household income is limited, larger household size may increase dependency pressure and reduce per-capita welfare. However, household size may also provide labour, caregiving support and social support when members are of working age or when extended-family networks are functional. Recent evidence on female-headed households stresses that demographic composition matters greatly and that comparisons based only on headship can misrepresent welfare patterns because economies of scale, adult membership and dependency ratios change the meaning of household size (Saad et al., 2022; Brown & van de Walle, 2021). Therefore, household size should be examined empirically rather than assumed to have a uniform negative effect.

Social protection has become increasingly important in welfare research because it provides public or community-based support against poverty, shocks and vulnerability. Social protection may include cash transfers, school bursaries, food assistance, health subsidies, emergency relief, livelihood grants, social insurance and community support programmes. Recent studies show that social cash transfers and safety-net programmes can improve food security, consumption, assets, resilience and local economic outcomes when they are adequately designed and effectively targeted (Egger et al., 2022; Belete & Bayu, 2023; Gassmann et al., 2023; Mussa et al., 2024; Strupat et al., 2025). Evidence from Kenya also suggests that transfer systems can influence coping behaviour and welfare resilience, particularly during periods of crisis (Xu, 2022; Omondi et al., 2023). For women-headed households, social protection is not simply additional income; it can reduce the pressure of school fees, health costs and food insecurity, thereby allowing other household resources to be used more productively.

Despite the growing literature on female headship, welfare and social protection, important gaps remain. First, many studies examine women-headed households as a general category without sufficiently linking welfare outcomes to specific socio-economic characteristics such as income, education, employment status and household size (Saad et al., 2022; Brown & van de Walle, 2021). Second, much of the literature concentrates on direct effects, yet welfare outcomes may depend on whether

Women-Headed Households and Household Welfare in Trans Nzoia County: The Moderating Role of Access to Social Protection Support

households have access to social protection that strengthens or weakens the benefits of income, education and employment (Belete & Bayu, 2023; Mussa et al., 2024; Strupat et al., 2025). Third, localized evidence from counties such as Trans Nzoia remains limited, even though county-level livelihood structures influence the welfare realities of women-headed households. Trans Nzoia is largely agricultural, and many women-headed households depend on farming, casual labour, small-scale trade and informal support networks. These features create a strong need for county-specific empirical evidence.

This study therefore examines the effect of socio-economic characteristics of women-headed households on household welfare in Trans Nzoia County, with access to social protection support as a moderating variable. Specifically, the study assesses the effect of women-headed household income, education, employment status and household size on household welfare, and further determines whether access to social protection support changes the strength of each relationship. The study contributes to the literature in three ways. First, it provides empirical evidence from a county-level Kenyan context. Second, it integrates household-level socio-economic characteristics with social protection access in one explanatory framework. Third, it treats social protection support as a moderating condition rather than only a direct welfare input. The document is organized as follows: Section 1 presents the introduction; Section 2 reviews literature and develops hypotheses; Section 3 explains the research methodology; Section 4 presents findings and discussion; and Section 5 provides conclusions, implications, recommendations, limitations and areas for further research.

Recent evidence further shows that female headship should be studied through a nuanced welfare lens rather than through an automatic poverty stereotype. Studies from Africa and other developing regions indicate that women-headed households may face disadvantages in access to assets, income stability, labour opportunities, housing, climate resilience and social support, yet their welfare outcomes depend strongly on household composition, education, livelihood type and support systems (AlAzzawi & Hlasny, 2024; Brown & van de Walle, 2021; Doss et al., 2020; Muriithi & Oketch, 2025; Posel, 2023; Saad et al., 2022; Yoosefi Lebni et al., 2020). This justifies the present study's emphasis on income, education, employment status and household size rather than headship alone. In Kenya, official statistics and gender-assessment evidence also show that female-headed households remain an important group for policy attention because they are connected to questions of resource access, empowerment, poverty reduction and social protection targeting (Kenya National Bureau of Statistics, 2022, 2025; UN Women, 2020, 2024).

The welfare vulnerability of women-headed households is also linked to the broader shock environment facing households in low- and middle-income countries. Recent studies show that health crises, food-price movements, income losses, climate stress and labour-market disruptions affect household consumption, savings, nutrition and schooling decisions (Bundervoet et al., 2022; Kansime et al., 2021; Janssens et al., 2021; Mahler et al., 2022; Mahmud & Riley, 2021; Martin et al., 2020; Manyong et al., 2022; Nechifor et al., 2021). These shocks matter for Trans Nzoia County because many women-headed households depend on agriculture, casual labour and informal trade, sectors that are highly sensitive to seasonality, price changes and climate variability. Recent FAO and UNDP evidence shows that gendered livelihood vulnerability is intensified where women have weaker asset ownership, lower access to agricultural inputs, and greater unpaid care responsibilities (FAO, 2023, 2024; UNDP, 2022, 2024).

Income and employment are especially important because they determine the resources available for food, school expenses, healthcare, savings and shelter. Recent empirical work has shown that cash income and labour-market participation are central pathways through which households maintain consumption and reduce vulnerability, although unstable and informal work often produces weak welfare effects (Almeida et al., 2021; Baborska et al., 2020; Egger et al., 2022; ILO, 2023, 2024; Miao et al., 2023; Verick, 2025; Xu, 2022; Zhao et al., 2025). For women household heads, employment must therefore be understood not merely as participation in work, but as the quality, stability and returns of the livelihood activity. This is important because women may work long hours in farming, care work or informal trade yet remain welfare-insecure if earnings are low, irregular or absorbed by household dependency pressure.

Education provides another welfare pathway because it improves human capital, financial literacy, health knowledge, employability and the ability to access public services. Studies conducted between 2020 and 2025 show that educational attainment reduces poverty, strengthens household welfare and improves the capacity of women to participate in household and economic decision-making (Arafat & Khan, 2022; Frempong & Stadelmann, 2024; Hofmarcher, 2021; Liu et al., 2021; Panduwina, 2025; Shi & Qamruzzaman, 2022; Spada et al., 2023). Education can also increase the ability of women-headed households to access bursaries, health services, financial products and social protection programmes. This makes education a relevant predictor of household welfare and also a possible factor that interacts with social protection access.

Social protection support has become a key instrument for reducing vulnerability, improving consumption and cushioning households from shocks. Recent studies and policy reviews show that cash transfers, food assistance, public works, school support, health subsidies and livelihood programmes can improve food security, consumption, schooling, health access and resilience among poor and vulnerable households (Aiken et al., 2021; Barca et al., 2021; Belete & Bayu, 2023; Devereux et al., 2020; Egger

Women-Headed Households and Household Welfare in Trans Nzoia County: The Moderating Role of Access to Social Protection Support

et al., 2022; Gassmann et al., 2023; Gentilini et al., 2022; Hidrobo et al., 2020; Mussa et al., 2024; Rutkowski et al., 2020; Strupat et al., 2025; World Bank, 2022, 2024). For women-headed households, social protection may be especially important because it can reduce the pressure of care responsibilities, education costs and livelihood shocks. This is why the present study treats access to social protection support not only as a direct welfare factor but also as a moderator that may strengthen the welfare effect of income, education and employment while reducing the burden associated with household size.

The gender and household-welfare literature also indicates that women's control over resources can alter household expenditure priorities, especially where support improves bargaining power, financial inclusion or access to productive assets (Annan et al., 2021; De Brauw et al., 2023; Deissler et al., 2025; Gammage et al., 2021; Grantham et al., 2021; Heise et al., 2021; Malapit et al., 2020; Quisumbing et al., 2023; Quisumbing et al., 2024; Yavorsky et al., 2021). This means that welfare analysis should consider both household resources and the institutional environment that enables women to convert those resources into improved living conditions. In the context of Trans Nzoia County, the moderation perspective is therefore appropriate because access to social protection may alter how income, education, employment status and household size translate into household welfare.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The study is anchored on three complementary theoretical perspectives: New Home Economics Theory, Human Capital Theory and Social Protection Theory. New Home Economics Theory views the household as a decision-making unit that allocates time, income and labour to maximize welfare. From this perspective, women-headed households make welfare decisions under constraints of income, labour availability, education costs, care responsibilities and household size. Human Capital Theory supports the argument that education and skills improve productivity, employment prospects, decision-making capacity and long-term welfare. Social Protection Theory adds that households do not face welfare risks only through their own resources; they are embedded in institutional arrangements that can cushion poverty, illness, unemployment, food insecurity and schooling costs. Together, these perspectives explain why income, education, employment and household size may affect welfare, and why access to social protection support may strengthen the ability of households to transform socio-economic resources into improved welfare outcomes.

Recent literature also supports the theoretical logic of the study. New Home Economics Theory is relevant because household welfare depends on how income, time, care work and labour are allocated among household members. Current welfare studies emphasize that household decision-making is shaped by bargaining power, gender norms, unpaid care responsibilities and access to institutions (Frempong & Stadelmann, 2024; Gammage et al., 2021; Grantham et al., 2021; Heise et al., 2021; UN Women, 2023). Human Capital Theory is reflected in the importance of education for productivity, income and access to opportunities (Hofmarcher, 2021; Liu et al., 2021; Panduwina, 2025; Shi & Qamruzzaman, 2022). Social Protection Theory is reflected in evidence that support systems cushion vulnerable households against risks and help them maintain welfare during shocks (Barca et al., 2021; Gentilini et al., 2022; Hidrobo et al., 2020; Strupat et al., 2025).

The literature further suggests that household size should be interpreted through dependency ratios, economies of scale and the productive contribution of household members. Larger households may experience pressure where many members are dependants, but they may also benefit from shared labour and informal support where members contribute income, childcare or farm work (Brown & van de Walle, 2021; Posel, 2023; Saad et al., 2022). This supports the inclusion of household size in the model and strengthens the rationale for testing whether social protection support changes its relationship with welfare.

2.1 Women-headed household income and household welfare

Income refers to the financial resources available to a woman who heads a household. It may be derived from wages, farming, small-scale trade, self-employment, remittances, casual labour, savings groups, social assistance or other livelihood activities. Income is expected to improve household welfare because it enables households to purchase food, pay rent, support children's education, access healthcare, save, repay debts and participate in social networks. In households headed by women, income may be particularly important because the household may lack a second adult earner or may have dependants whose needs are concentrated on one provider.

Recent literature shows that income shocks reduce welfare quickly among low-income households. Kansiime et al. (2021) found that the COVID-19 pandemic reduced household income and worsened food security in Kenya and Uganda. Janssens et al. (2021) also showed that low-income households in rural Kenya experienced immediate income losses and reduced social support during the pandemic period. These findings suggest that when income is unstable, welfare outcomes such as food access, school support and healthcare become vulnerable. Conversely, income support can strengthen household welfare. Egger et al. (2022) showed

Women-Headed Households and Household Welfare in Trans Nzoia County: The Moderating Role of Access to Social Protection Support

that large unconditional cash transfers in rural Kenya increased consumption and assets for recipients and created spillover benefits for local economies. Thus, income is expected to be a positive determinant of welfare among women-headed households. However, the relationship between income and welfare may not always be linear. Income can be consumed by urgent needs such as food, medical bills, school fees and debt, leaving limited resources for long-term welfare improvement. Its effect may therefore depend on whether households receive additional support that reduces welfare pressure. Even so, from a direct-effects perspective, women-headed household income is expected to improve welfare by increasing the resources available for daily and developmental needs. The study therefore tested the following hypothesis:

H01: Women-headed household income has no significant effect on household welfare in Trans Nzoia County.

2.2 Women-headed household education and household welfare

Education refers to the education-related capacity of women-headed households, including the educational attainment of the woman household head, the ability to support children's schooling, access to learning materials and the capacity to navigate education-related opportunities. Education is expected to improve welfare because it increases knowledge, employability, productivity, financial literacy, health awareness and institutional access. Women household heads with stronger education may be better positioned to secure better employment, run businesses, keep household records, access government services and support children's schooling.

Recent research supports the welfare importance of education. Shi and Qamruzzaman (2022) found that education and financial inclusion contribute to poverty reduction in lower- and lower-middle-income countries. Spada et al. (2023) also showed that education is associated with poverty reduction, while Panduwina (2025) emphasized the centrality of education in building human resources and improving access to economic opportunities. In sub-Saharan Africa, Frempong and Stadelmann (2024) found that education contributes directly to several welfare indicators, including school enrollment, child labour, fertility, household food expenditure and nutrition. These findings imply that women's education can contribute to household welfare both directly through better income opportunities and indirectly through improved decision-making.

In women-headed households, education may also enhance the ability to access social protection programmes. Households with better educational capacity may be more likely to understand eligibility requirements, complete forms, maintain records, follow application procedures, attend public meetings and claim available benefits. Education may therefore strengthen welfare through knowledge and agency. Based on this reasoning, the study tested the following hypothesis:

H02: Women-headed household education has no significant effect on household welfare in Trans Nzoia County.

2.3 Women-headed household employment status and household welfare

Employment status refers to whether the woman household head is in formal employment, self-employment, farming, informal trade, casual labour, temporary work or unemployment. It also reflects the stability, adequacy and predictability of the employment arrangement. Employment is expected to improve welfare because it provides income, strengthens purchasing power and enables households to meet recurrent needs. Stable employment can support food security, education continuity, healthcare access, savings and housing improvement.

The employment-welfare relationship is particularly important among women-headed households because women often combine income generation with unpaid care responsibilities. Work that is irregular, low-paying or seasonal may not provide adequate welfare security even when the woman is economically active. Female labour market participation in developing economies is influenced by education, job quality, sectoral structure, social norms and care burdens (Verick, 2025). Annan et al. (2021) also show that women's decision-making power and empowerment are connected to household well-being outcomes across sub-Saharan Africa. Deißler et al. (2025) demonstrate that income control and women's empowerment matter for household welfare in Kenyan agricultural value chains. These studies suggest that employment status matters not only as a source of money but also as a pathway to agency and household stability.

Employment can also affect household welfare through social networks, access to information and participation in savings or producer groups. Women household heads who work in stable businesses or formal employment may have greater access to market information, credit, training and support. Conversely, unemployment or unstable casual labour can increase dependence on relatives, debt or emergency assistance. The study therefore tested the following hypothesis:

H03: Women-headed household employment status has no significant effect on household welfare in Trans Nzoia County.

2.4 Women-headed household size and household welfare

Household size refers to the number of people living in a household headed by a woman. It includes children, elderly persons, relatives and other dependants. Household size affects welfare through both resource demand and potential household labour supply. Larger households require more food, school fees, healthcare, clothing, shelter and care time. When resources are scarce,

Women-Headed Households and Household Welfare in Trans Nzoia County: The Moderating Role of Access to Social Protection Support

larger household size can reduce per-capita welfare and increase dependency pressure. This is especially important where the woman household head relies on irregular income or limited land resources.

However, recent literature cautions against treating household size only as a burden. Saad et al. (2022) show that female-headed households vary widely in composition, and this composition affects vulnerability and welfare interpretation. Brown and van de Walle (2021) similarly argue that welfare comparisons between female- and male-headed households require attention to demographic composition and economies of scale. A larger household with working-age members may contribute labour, childcare, security and social support. Therefore, household size may have different effects depending on the age structure of members, income sources, employment conditions and access to support.

In Trans Nzoia County, where many households are linked to agriculture and informal livelihoods, household members can be both consumers and contributors. Larger households may increase food and education pressure, but they may also provide farm labour, small-business help and caregiving support. Because the direction of the relationship is theoretically ambiguous, the study empirically tested the following hypothesis:

H04: Women-headed household size has no significant effect on household welfare in Trans Nzoia County.

2.5 Access to social protection support as a moderator

Access to social protection support refers to the extent to which women-headed households receive formal or informal assistance intended to reduce poverty, vulnerability and welfare risk. Support may come from government, county government, non-governmental organizations, faith-based organizations, community groups, savings groups or family networks. It may include cash transfers, food support, school bursaries, health subsidies, emergency assistance, livelihood grants or training support. Social protection is expected to strengthen household welfare by reducing immediate pressure on income and by allowing households to invest in food, education, health and productive activities.

Recent evidence suggests that social protection can have both direct and interaction effects. Egger et al. (2022) show that cash transfers in Kenya improved consumption, assets and local economic activity. Belete and Bayu (2023) found that Ethiopia's Productive Safety Net Program improved food security among female-headed farm households. Mussa et al. (2024) found that combining social protection interventions can improve food security among female-headed households, while Strupat et al. (2025) showed that shock-responsive cash transfers can protect vulnerable households during crises. These studies support the argument that social protection can strengthen the effect of household-level resources.

In the current study, access to social protection support is treated as a moderator because it may change the relationship between socio-economic characteristics and welfare. For income, social protection may reduce the portion of income used for urgent needs, enabling income to improve welfare more effectively. For education, support may help educated women access bursaries, training and services more effectively. For employment, support may reduce vulnerability during job interruptions and support livelihood expansion. For household size, support may reduce the burden of dependants by supplementing food, schooling and health costs. Therefore, the study tested the following moderation hypothesis:

H05: Access to social protection support has no significant moderating effect on the relationship between women-headed household income, education, employment status and household size, and household welfare in Trans Nzoia County.

3. RESEARCH METHODOLOGY

3.1 Sample size and data

The study adopted an explanatory research design because it sought to determine the effect of socio-economic characteristics of women-headed households on household welfare and to test the moderating role of access to social protection support. The explanatory design was appropriate because the study involved hypothesis testing and estimation of relationships among measurable variables. The target population comprised 83,000 women-headed households in Trans Nzoia County. The county was selected because it is an agricultural and mixed-livelihood setting where many women-headed households depend on farming, casual labour, informal trade and social support networks. The study covered the five constituencies of Kiminini, Saboti, Kwanza, Endebess and Cherangany.

A sample of 398 households was selected from the target population using a probability-based approach. The sample was proportionately distributed across the five constituencies to ensure that areas with larger numbers of women-headed households contributed more respondents. Structured questionnaires were administered to the selected respondents. Out of the 398 questionnaires issued, 370 were returned and usable, giving a response rate of 92.96%. This response rate was sufficient for regression and moderation analysis because it provided adequate observations for estimating the specified models and testing the study hypotheses.

Women-Headed Households and Household Welfare in Trans Nzoia County: The Moderating Role of Access to Social Protection Support

Table 1: Target population and sample distribution

Constituency	Target population	Sample size
Kimini	20,351	98
Saboti	16,961	81
Kwanza	13,988	67
Endebess	9,814	47
Cherangany	21,886	105
Total	83,000	398

Source: Field data (2026).

3.2 Measurement of variables

The dependent variable was household welfare. It was measured using indicators such as ability to meet basic needs, access to education, healthcare, decent housing, sanitation, clean water, savings, food security, employment stability, social participation and access to financial services. The independent variables were women-headed household income, education, employment status and household size. Income was measured through income sufficiency, stability, diversity and ability to meet recurrent needs. Education was measured through education-related capacity, support for children's schooling, access to learning materials and ability to afford schooling. Employment status captured stability, reliability and adequacy of work or livelihood engagement. Household size captured the number of household members and the pressure or support associated with household composition. The moderating variable was access to social protection support, measured through access to cash support, food assistance, school support, health support, emergency support, livelihood support and community-based assistance.

All constructs were measured using a five-point Likert scale where 1 represented strongly disagree and 5 represented strongly agree. Composite scores were computed for each construct by averaging the relevant items. Reliability was tested using Cronbach alpha. Construct validity was assessed using Kaiser-Meyer-Olkin measures and Bartlett's tests of sphericity. Correlation analysis was used to assess bivariate relationships, while multiple regression tested the direct effects of income, education, employment status and household size on household welfare. Hayes PROCESS Model 1 was used to test moderation, where access to social protection support interacted with each independent variable in predicting household welfare.

3.3 Analytical models

The study first used a multiple regression model to test the direct effect of women-headed household income, women-headed household education, women-headed household employment status and women-headed household size on household welfare. The direct effect model was specified as follows:

$$HW = \beta_0 + \beta_1WHI + \beta_2WHE + \beta_3WHES + \beta_4WHS + \varepsilon$$

To test the moderating effect of access to social protection support, the study introduced the moderator and interaction terms into the regression model. The general moderated regression model was specified as follows:

$$HW = \beta_0 + \beta_1X + \beta_2SPS + \beta_3(X \times SPS) + \varepsilon$$

Where HW represents household welfare; X represents each independent variable, namely WHI, WHE, WHES or WHS; SPS represents access to social protection support; $X \times SPS$ represents the interaction between the independent variable and access to social protection support; β_3 represents the moderating effect coefficient; and ε represents the error term.

The specific moderation models were specified as follows:

$$HW = \beta_0 + \beta_1WHI + \beta_2SPS + \beta_3(WHI \times SPS) + \varepsilon$$

$$HW = \beta_0 + \beta_1WHE + \beta_2SPS + \beta_3(WHE \times SPS) + \varepsilon$$

$$HW = \beta_0 + \beta_1WHES + \beta_2SPS + \beta_3(WHES \times SPS) + \varepsilon$$

$$HW = \beta_0 + \beta_1WHS + \beta_2SPS + \beta_3(WHS \times SPS) + \varepsilon$$

The interaction coefficient β_3 was used to determine whether access to social protection support significantly moderated the relationship between each independent variable and household welfare. A significant interaction term indicated the presence of a moderation effect. The study used Hayes PROCESS Model 1 because it is suitable for testing simple moderation effects in regression-based analysis (Hayes, 2022).

Women-Headed Households and Household Welfare in Trans Nzoia County: The Moderating Role of Access to Social Protection Support

4. DATA FINDINGS AND ANALYSIS

4.1 Response rate, descriptive statistics, reliability and validity

The study issued 398 questionnaires and obtained 370 usable responses. This represented a response rate of 92.96%, which was adequate for statistical analysis. The descriptive results showed that the composite mean scores of the study constructs clustered around the midpoint of the five-point scale. Household welfare recorded a mean of 3.0035 and a standard deviation of 1.11766. Women-headed household income recorded a mean of 3.0077, education recorded a mean of 2.9932, employment status recorded a mean of 2.9964, household size recorded a mean of 2.9892 and access to social protection support recorded a mean of 3.0100. These results suggest that respondents reported moderate levels of welfare and socio-economic conditions, with substantial variation across households.

Table 2: Summary descriptive statistics

Construct	N	Mean	Std. deviation
Household welfare	370	3.0035	1.11766
Women-headed household income	370	3.0077	1.11801
Women-headed household education	370	2.9932	0.79833
Women-headed household employment status	370	2.9964	0.77632
Women-headed household size	370	2.9892	0.46094
Access to social protection support	370	3.0100	0.90520

Source: Field data (2026).

Reliability analysis showed that the constructs were internally consistent. Household welfare had the highest Cronbach alpha at 0.961, followed by women-headed household income at 0.926 and access to social protection support at 0.937. Education and employment status also met the acceptable reliability threshold. Validity results supported factorability and sampling adequacy. KMO values ranged from 0.928 to 0.973, and Bartlett's tests were significant at $p < 0.001$ for all constructs. These results indicate that the questionnaire items were sufficiently correlated and suitable for construct-level analysis.

Table 3: Reliability and validity results

Construct	Items	Cronbach alpha	KMO	Bartlett sig.
Household welfare	10	0.961	0.973	0.000
Women-headed household income	6	0.926	0.929	0.000
Women-headed household education	6	0.738	0.928	0.000
Women-headed household employment status	6	0.773	0.947	0.000
Women-headed household size	6	0.838	0.952	0.000
Access to social protection support	10	0.937	0.957	0.000

Source: Field data (2026).

4.2 Correlation analysis

Pearson correlation analysis was conducted to determine the direction and strength of association among the variables. Household welfare had a positive and significant correlation with women-headed household income ($r = 0.542$, $p < 0.01$),

Women-Headed Households and Household Welfare in Trans Nzoia County: The Moderating Role of Access to Social Protection Support

education ($r = 0.544$, $p < 0.01$), employment status ($r = 0.419$, $p < 0.01$) and access to social protection support ($r = 0.458$, $p < 0.01$). Household size had a negative and significant bivariate relationship with household welfare ($r = -0.263$, $p < 0.01$). These results indicate that higher income, stronger education conditions, better employment status and better access to social protection support were associated with improved welfare, while larger household size was associated with lower welfare before controlling for other variables.

Table 4: Pearson correlation coefficients

Variable	HW	WHI	WHE	WHES	WHS	SPS
HW	1					
WHI	.542**	1				
WHE	.544**	.249**	1			
WHES	.419**	.223**	.212**	1		
WHS	-.263**	-.244**	-.101	-.156**	1	
SPS	.458**	.193**	.242**	.182**	-.114*	1

Source: Field data (2026).

Note: ** correlation is significant at the 0.01 level; * correlation is significant at the 0.05 level.

4.3 Direct regression effects

The direct-effect regression model tested whether income, education, employment status and household size predicted household welfare. The model was statistically significant, $F(4, 365) = 90.753$, $p < 0.001$. The model recorded $R = 0.706$, $R^2 = 0.499$ and adjusted $R^2 = 0.493$. This means that the four socio-economic characteristics jointly explained 49.9% of the variation in household welfare. The Durbin-Watson statistic was 1.868, indicating that the independence of errors assumption was acceptable. The VIF values ranged from 1.030 to 1.049, showing that multicollinearity was not a concern.

Women-headed household income had a positive and significant effect on household welfare, $B = 0.242$, $\beta = 0.251$, $t = 6.669$, $p < 0.001$. This means that an increase in income-related conditions was associated with higher household welfare, holding other factors constant. Education had the strongest standardized effect, $B = 0.344$, $\beta = 0.341$, $t = 8.995$, $p < 0.001$. This suggests that education-related capacity is a powerful welfare-enhancing factor among women-headed households. Employment status also had a positive and significant effect, $B = 0.315$, $\beta = 0.316$, $t = 8.394$, $p < 0.001$. Household size recorded a positive coefficient in the regression model, $B = 0.314$, $\beta = 0.318$, $t = 8.383$, $p < 0.001$, despite having a negative bivariate correlation with welfare. This indicates that the effect of household size is complex and changes when income, education and employment are controlled.

Table 5: Direct effect regression coefficients

Predictor	B	Std. error	Beta	t	p	VIF
Constant	-0.690	0.197		-3.502	0.001	
WHI	0.242	0.036	0.251	6.669	0.000	1.033
WHE	0.344	0.038	0.341	8.995	0.000	1.046
WHES	0.315	0.038	0.316	8.394	0.000	1.030
WHS	0.314	0.038	0.318	8.383	0.000	1.049

Source: Field data (2026).

4.4 Model including access to social protection support

When access to social protection support was introduced into the model, the explanatory power increased considerably. The model recorded $R = 0.775$, $R^2 = 0.600$ and adjusted $R^2 = 0.595$, while the standard error of estimate declined to 0.71148. The model was statistically significant, $F(5, 364) = 109.321$, $p < 0.001$. The increase in R^2 from 0.499 to 0.600 indicates that access to social protection support improved the model's explanatory power by 10.1 percentage points. Access to social protection support had a positive and significant coefficient, $B = 0.323$, $\beta = 0.262$, $t = 7.526$, $p < 0.001$. This result confirms that households with better access to support programmes reported better welfare outcomes.

The inclusion of social protection support also changed the effect of household size from positive in the direct model to negative in the expanded model, $B = -0.201$, $\beta = -0.083$, $p = 0.016$. This indicates that when the support environment is explicitly controlled, larger household size is more clearly associated with welfare pressure. The finding is substantively meaningful because

Women-Headed Households and Household Welfare in Trans Nzoia County: The Moderating Role of Access to Social Protection Support

larger households require more resources for food, schooling, healthcare and housing. Social protection may therefore be especially important for larger women-headed households because it can reduce dependency pressure and prevent welfare deterioration.

4.5 Moderating effect of access to social protection support

Moderation analysis was conducted using Hayes PROCESS Model 1. The results showed that access to social protection support significantly moderated all four relationships. The interaction between income and social protection support was positive and significant, $B = 0.1245$, $p = 0.0001$, $\Delta R^2 = 0.0213$. Conditional effects showed that income had a negative significant effect on welfare at low social protection support, a weak non-significant effect at medium support and a positive significant effect at high support. This means that income improves welfare more strongly where women-headed households have better access to support programmes. Social protection appears to reduce immediate welfare pressure and allows income to be converted into broader welfare gains.

The interaction between education and social protection support was also positive and significant, $B = 0.1266$, $p = 0.0001$, $\Delta R^2 = 0.0196$. Education had almost no effect at low social protection support but became positive and significant at medium and high support levels. This suggests that education-related capacity is more welfare-enhancing when households can access bursaries, health support, food support, training or other forms of assistance. Social protection may help educated household heads use information and opportunities more effectively.

The interaction between employment status and social protection support was positive and significant, $B = 0.1259$, $p = 0.0001$, $\Delta R^2 = 0.0212$. Employment status was not beneficial at low support but became positive and significant at medium and high support. This indicates that employment may not fully improve welfare when households face heavy costs and shocks without support. However, when social protection reduces vulnerability, employment gains translate more strongly into welfare improvement. Similarly, the interaction between household size and social protection support was positive and significant, $B = 0.1182$, $p = 0.0001$, $\Delta R^2 = 0.0191$. At low support, household size had no meaningful welfare benefit, but at medium and high support, the relationship became positive and significant. This shows that larger households can become more manageable where support systems reduce consumption and schooling pressure.

Table 6: Summary of moderation results

Interaction	Coeff.	p-value	Delta R2	Conditional pattern	Decision
WHI x SPS	0.1245	0.0001	0.0213	Negative at low SPS; positive and significant at high SPS	Enhancing moderation
WHE x SPS	0.1266	0.0001	0.0196	Near zero at low SPS; positive and significant at medium and high SPS	Enhancing moderation
WHES x SPS	0.1259	0.0001	0.0212	Negative/non-significant at low SPS; positive and significant at medium and high SPS	Enhancing moderation
WHS x SPS	0.1182	0.0001	0.0191	Negative/non-significant at low SPS; positive and significant at medium and high SPS	Enhancing moderation

Source: Field data (2026).

Women-Headed Households and Household Welfare in Trans Nzoia County: The Moderating Role of Access to Social Protection Support

4.6 Discussion of findings

The findings demonstrate that household welfare among women-headed households in Trans Nzoia County is shaped by both household-level socio-economic characteristics and access to support systems. Income had a positive and significant effect on welfare, confirming that financial resources remain central to the ability of households to meet basic needs and make developmental investments. This result is consistent with evidence that income shocks reduce food security and consumption among households in East Africa (Kansiime et al., 2021; Janssens et al., 2021). The finding also aligns with cash transfer evidence from Kenya showing that resource injections can raise consumption and assets (Egger et al., 2022). For policy, income interventions should therefore include livelihood support, market access, women enterprise financing and agricultural input support.

Education had the strongest direct standardized effect on household welfare. This finding supports human capital reasoning that education improves productivity, information access, financial decision-making and institutional navigation. It also reflects the fact that educated household heads may be better able to support children's schooling, apply for support programmes, access financial services and make informed household decisions. The result is consistent with studies showing that education contributes to poverty reduction and household welfare across low-income and sub-Saharan African contexts (Shi & Qamruzzaman, 2022; Frempong & Stadelmann, 2024; Spada et al., 2023). In Trans Nzoia County, education support should therefore target both women household heads and children within women-headed households.

Employment status had a positive and significant effect on welfare. This result highlights the importance of stable and productive work among women household heads. Employment provides regular income, but it also creates access to networks, information and economic identity. Where women depend on unstable casual labour, household welfare remains vulnerable even when they are economically active. The finding supports recent work emphasizing the importance of job quality and women's labour market participation for development outcomes (Verick, 2025). It also supports the view that women's empowerment and control over income can influence household welfare (Annan et al., 2021; Deißler et al., 2025). County-level employment interventions should therefore focus on skills development, value-chain participation, market linkages and childcare-sensitive livelihood support.

Household size produced a complex pattern. It was negatively correlated with welfare at the bivariate level, but positive in the direct regression model and negative again when social protection support was added. This pattern indicates that household size cannot be interpreted in isolation. Larger households increase consumption and care needs, but they may also provide labour and social support. Once social protection is included, the burden aspect becomes more visible, suggesting that larger households require additional support to prevent welfare pressure. This interpretation is consistent with Saad et al. (2022) and Brown and van de Walle (2021), who argue that household composition and economies of scale are essential in interpreting female headship and welfare.

The moderation findings are the strongest contribution of the study. Access to social protection support strengthened the effect of income, education, employment status and household size on welfare. This means that social protection is not merely an independent welfare resource; it changes how household characteristics operate. Income becomes more welfare-enhancing when social protection absorbs some education, health or food costs. Education becomes more useful when households have support systems that make it possible to access services and opportunities. Employment becomes more productive when support reduces vulnerability during shocks. Household size becomes more manageable when social protection reduces dependency pressure. This supports recent evidence that social protection can improve food security, resilience and welfare among vulnerable households (Belete & Bayu, 2023; Mussa et al., 2024; Strupat et al., 2025).

5. CONCLUSION AND RECOMMENDATIONS

This study examined the effect of socio-economic characteristics of women-headed households on household welfare in Trans Nzoia County, with access to social protection support as a moderating variable. The study concludes that income, education, employment status and household size are significant determinants of household welfare among women-headed households. Income improves welfare by increasing household purchasing power and the ability to meet recurrent needs. Education improves welfare by enhancing decision-making, employability, access to information and support for children's schooling. Employment status improves welfare by providing income stability and reducing dependence. Household size has a more complex effect because it can represent both welfare pressure and potential household support depending on the household's resources and access to assistance.

The study further concludes that access to social protection support is a critical strengthening factor. Social protection significantly moderated all relationships tested in the study. This means that women-headed households do not benefit equally from income, education, employment or household resources when support access differs. Households with stronger access to social protection

Women-Headed Households and Household Welfare in Trans Nzoia County: The Moderating Role of Access to Social Protection Support

are better able to convert their socio-economic characteristics into improved welfare outcomes. Therefore, social protection should be understood as a welfare-enhancing platform that strengthens the effects of other household resources rather than as a separate or residual intervention.

The findings have theoretical, practical and policy implications. Theoretically, the study contributes to household welfare literature by integrating household-level socio-economic characteristics with access to social protection support in a moderation framework. It supports New Home Economics reasoning by showing that welfare is shaped by household resources and allocation constraints. It supports Human Capital Theory by showing the strong effect of education on welfare. It supports Social Protection Theory by demonstrating that access to support strengthens welfare pathways. Methodologically, the study extends county-level welfare research by testing moderation using Hayes PROCESS Model 1.

For practice, the findings suggest that development actors should design integrated programmes for women-headed households. Income-generating support should be linked to training, savings groups, market access and social protection enrollment. Education support should include bursaries, adult education opportunities, school materials and information on application procedures. Employment interventions should include vocational training, entrepreneurship support, childcare-sensitive work opportunities and linkages to value chains. Larger women-headed households should receive targeted support because they face greater pressure for food, school fees, healthcare and housing.

For policy, the study recommends strengthening county and national social protection systems in ways that are accessible to women-headed households. First, programme targeting should consider household composition, income instability and caregiving responsibilities. Second, registration and access procedures should be simplified because some vulnerable households may fail to benefit due to information barriers. Third, social protection should be linked to productive inclusion programmes such as agricultural input support, business training, women enterprise funding and vocational skills development. Fourth, education support should be prioritized because education recorded the strongest direct effect on household welfare. Fifth, county governments and development partners should build reliable databases of women-headed households to improve targeting, monitoring and evaluation.

The study had limitations. It used cross-sectional data, meaning that causal relationships should be interpreted cautiously. The study was also limited to Trans Nzoia County, so findings may not fully represent other counties with different livelihood systems. Data were collected using self-reported questionnaire responses, which may be affected by perception and recall bias. Future studies should use longitudinal designs to examine welfare changes over time, compare women-headed and male-headed households, include qualitative interviews to explain lived experiences and examine additional moderators such as land ownership, financial inclusion, remittances and community support. Future research may also assess whether specific forms of social protection, such as cash transfers, bursaries or health subsidies, have different moderating effects on household welfare.

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