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GENDER DYNAMICS IN AGRIBUSINESS: HOW THE AGRIHUB NIGERIAN PROJECT ENHANCED THE LIVELIHOOD OF YOUTHS

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ABSTRACT

Despite growing recognition of agriculture's potential to absorb youth labour, evidence on how gender shapes access, participation, and outcomes within agribusiness interventions remains limited. This study addresses this gap by assessing gender-differentiated experiences, constraints, and livelihood outcomes, measured by changes in income and wellbeing, among male and female youths of the IFAD Agrihub Nigeria IAN) project. A total of 700 participants were sampled, comprising 379 males (54.1%) and 321 females (45.9%), stratified across employment and entrepreneurship tracks. Data were collected through structured surveys and 21 focus group discussions (FGDs), including both gender-mixed and gender-disaggregated sessions conducted across 11 states. Quantitative data were analyzed using descriptive statistics, independent sample t-tests, paired sample t-tests, and multiple linear regression, while qualitative data were analyzed to provide contextual depth. Findings reveal notable gender disparities as females (63.6%) recorded a higher rate of formal employment compared to males (53.3%), while more males (36.1%) than females (20.2%) were engaged in entrepreneurship. Both genders showed similarly moderate participation in poultry and egg production; however, females were more active in vegetable production. The top-ranked constraints to gendered experience were poor access to financial resources and inadequate access to land and equipment, with females reporting higher severity across most barriers. Cultural norms and restrictions on participation emerged as the largest gender gap in constraints, disproportionately limiting women's mobility, decision-making authority, and economic agency. Gender-disaggregated analysis of perceived support indicated that while gendered experiences were largely positive, males reported significantly higher perceived support, income change, and wellbeing scores compared to females, particularly within the entrepreneurship track. Regression analysis identified perceived gender support as the strongest predictor of wellbeing for both genders, though its effect was more pronounced for females ($\beta = 0.40$, $p < 0.001$) than males ($\beta = 0.29$, $p < 0.001$). Additionally, higher education, specifically postgraduate attainment, emerged as a significant positive determinant of wellbeing exclusively for females ($\beta = 6.80$, $p < 0.05$). Being unemployed negatively influenced wellbeing for males ($\beta = -1.87$, $p < 0.05$). While the project successfully doubled incomes and created substantial employment opportunities for both genders, achieving equitable outcomes, especially in entrepreneurship pathways, requires gender-responsive strategies that address differential constraints and norms.

Key words: Gender dynamics, agribusiness, youth employment, IFAD Agrihub entrepreneurship, wellbeing, gender-responsive programming

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INTRODUCTION

Sub-Saharan Africa has one of the fastest-growing youth populations in the world, with young people aged 15 to 35 years accounting for a large and rapidly increasing share of the region's labour force [1]. In Nigeria, those below age 30 make up around 70% of the population, highlighting their vital roles in sustaining agricultural productivity and contributing to the country's agricultural development. However, many of these young people remain unemployed or underemployed. The high rate of youth unemployment and underemployment is a critical policy challenge, in which millions of educated and uneducated young people lack access to decent work opportunities. According to a recent estimate by the National Bureau of Statistics, about 40% of the youth population is unemployed or underemployed. This further poses significant social and economic risk, including increased poverty, prostitution, corruption, robbery, migration, among others [2].

In the face of these challenges, the Agricultural sector, with its multi-faced and multi-functional nature, has proven as one sector with the capacity to offer a wide range of employment and entrepreneurial opportunities, youth empowerment, innovation and economic growth [3,4,5]. As access to white collar jobs becomes increasingly difficult for the teaming population of Nigerian graduates, who have struggled to get the best education. The sector presents itself as the largest employer of labour across Africa, with the growing demand for food, increasing urban markets, innovations, increasing use of mechanized tools, machines and agricultural technology, making it more attractive to youth and offering new opportunities for agribusiness. Agribusiness encompasses the entire agricultural value chain from production to processing, marketing and distribution. It provides viable solutions to mitigate youth unemployment and underemployment challenges and effects. However, despite this incredible potential, youth involvement in agribusiness has not significantly increased due to limited access to land, credit and technology, lack of adequate training, poor infrastructure and extension services [6,7]. These barriers are even more pronounced for women, who encounter structural inequalities because of prevailing cultural norms, making it important to address gender disparities while providing solutions to increase youth involvement in agriculture [8].

In Nigeria, traditional gender roles profoundly influence the participation of men and women in agribusiness. Specifically, men tend to occupy positions that involve decision-making, land cultivation, marketing and are mostly involved in commercial farming while women are often relegated to less visible, labour-intensive tasks such as weeding, fetching water, harvesting, processing, alongside their domestic responsibilities of caring for their families. Despite a gradual increase in women's involvement in agriculture, particularly in food production and post-harvest operations, gender inequality remains a pressing issue [9]. This inequality is

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manifested in access to privileges, opportunities and advancements to the advantage of males [10,11]. Some studies [9,12] have highlighted disparities in access to land, inputs, financing, technology, education, training and extension services as a major cause of low productivity among women agric-entrepeneurs. Bridging this gender gap requires gender-sensitive interventions that promote equal opportunities, resource access and capacity building for both men and women, ultimately fostering inclusive participation and growth in the agribusiness sector [13].

To effectively address these challenges, the United Nations, through its specialized agency International Fund for Agricultural Development (IFAD), introduced the Agrihub project in Nigeria, aimed at empowering African youth through the establishment of networks of youth-centered Agribusiness Hubs in Nigeria [14]. The United Nations strongly supports gender inclusion as it considers it a fundamental human right essential for creating a just and equitable world. This is evident in the UN promoting gender mainstreaming and integrating a gendered perspective into all policies, programmes and decision-making, in line with the Vision, 2030 agenda for Sustainable Development Goals SDGS 5 of achieving gender equality and empowering all women and girls. The IAN project thus prioritizes women empowerment, particularly in agriculture through access to resources, infrastructure and services, with special focus on increasing the capacity, productivity and market participation of rural people, including women. Contributing to gender equality IFAD Agrihub project seeks to provide women with opportunities to earn income and improve their livelihoods.

The project was implemented by the International Institute of Tropical Agriculture (IITA) in 5 geopolitical zones in Nigeria, which seeks to transform agriculture and also integrate production and processing on two fronts. First, by equipping youth with the essential skill set to secure employment in the agricultural sector and second, by providing youth entrepreneurs with practical skills and tools. Supported by the International Fund for Agricultural Development (IFAD) with logistical support from the International Institute of Tropical Agriculture (IITA), IAN is an employment-focused programme that aims to create livelihood opportunities for rural youth in agribusiness. The programme operates through satellite hubs located in different states, each linked to selected agricultural value chains. Beneficiaries take part through one of two tracks including wage employment, which accounts for about 70% of programme targets, and entrepreneurship, which accounts for about 30%. Support services include free training, stipends, job placement, market link-up services and personal protective equipment. The programme was not designed as a gender-transformative intervention. As the project's integrated agribusiness hubs expand in numbers and diversity, they are forming mutually beneficial networks focused on technology transfer, agricultural digitalization, market intelligence and

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policy advocacy, thus creating a platform for commercialization. Also, the hubs are increasingly recognized by investors and employers seeking trained individuals, broadening financial opportunities. This approach fosters a broad-based and inclusive rural growth while providing sustainable solutions to challenges such as unemployment, food insecurity and environmental degradation.

While youth-focused, government and donor-sponsored agribusiness programmes and initiatives like the IAN project, implemented at the federal and state levels, are increasingly promoted as solutions to youth unemployment, yet there is a huge gap in the literature regarding how gender influences or shapes the experiences and outcomes of such interventions. Most existing studies on agribusiness initiatives tend to focus on youth as a homogenous group with limited attention to the intersection of gender and youth in agribusiness. Without filling this gap, it will be difficult to ascertain whether male and female beneficiaries' access, participation in and benefit from these programmes are equal. Thus, the study aims to fill this gap in the literature by exploring the gender dynamics within the IAN Project, specifically focusing on how the programme enhances the livelihood of male and female youths differently. The findings of this study provide a gender-disaggregated analysis and evaluation of beneficiaries' access to the support systems within the project and provide evidence of nexus between these and their well-being indicators. The study uncovers gender-based differences in experiences and outcomes among beneficiaries. The significance of the research lies in its potential to inform the implementation of future intervention with a view to integrating additional gender-responsive approaches, as relevant. This study provides answers to each of the following research questions:

1. How do male and female participants perceive and experience the IFAD Agrihub Nigerian Project differently?
2. What specific barriers do male and female youth face in participating in and optimising benefits from the IFAD Agrihub Project?
3. How differently do gender barriers (cultural norms, societal expectations and organisational policies) influence the realisation of project benefits by male and female beneficiaries of the IFAD Agrihub Nigerian project?

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LITERATURE REVIEW

Gender and Agricultural Participation

Gender continues to shape youth engagement in agriculture across Africa. Studies show that traditional roles, stereotypes, and cultural norms significantly influence how young men and women participate in the sector. Young men are more likely to engage in production activities, especially on household farms, while women are often relegated to domestic roles or supportive tasks. notes that despite women's active contributions to farming, cultural norms frequently exclude them from decision-making roles and visibility in agribusiness. In Nigeria, women reportedly make up 75% of the farming population and produce two-thirds of food crops, yet their roles are often under-recognized or undocumented [15]. This invisibility persists despite growing evidence of women's centrality to food systems. Structural barriers such as gendered expectations and discrimination continue to limit young women's engagement in agriculture beyond subsistence roles.

Gendered Access to Agricultural Resources and Services

Women in agriculture face persistent disparities in access to productive resources. World Bank [16] indicates that women's productivity per hectare is 30% lower than men's, largely due to restricted access to land, labor, technology, education, and finance. In much of Africa, land ownership is controlled by men, with women's access mediated through marriage or paternal relationships. This exclusion hampers women's ability to use land as collateral for credit, limiting investment in their farms. Access to finance is another critical barrier. Many women smallholder farmers lack access to formal banking, loans, or grants. Botreau and Cohen [17] found that access to inputs like fertilizers, improved seeds, and extension services is also gender biased. Moreover, women are underrepresented in agricultural policymaking processes, which means their specific needs are often overlooked. The disconnect between public agricultural spending and women's participation is evident: women are least represented in the value chains receiving the most funding [18]. Awareness, location, and social barriers further reduce women's participation in training and access to vital information. These compounded disadvantages result in a measurable productivity gap—studies show that women-managed plots are significantly less productive than men's [19]. As Bambio [20] emphasizes, these gaps are not due to inefficiency, but inequitable access to resources. highlights that leveling access to inputs and technology could yield substantial social and economic gains. Mukasa, and Salami, [21] stresses that skills training and education are vital to reducing gender inequality, while Oladele [22] adds that participatory development and targeted extension services are essential to ensuring inclusive food security.

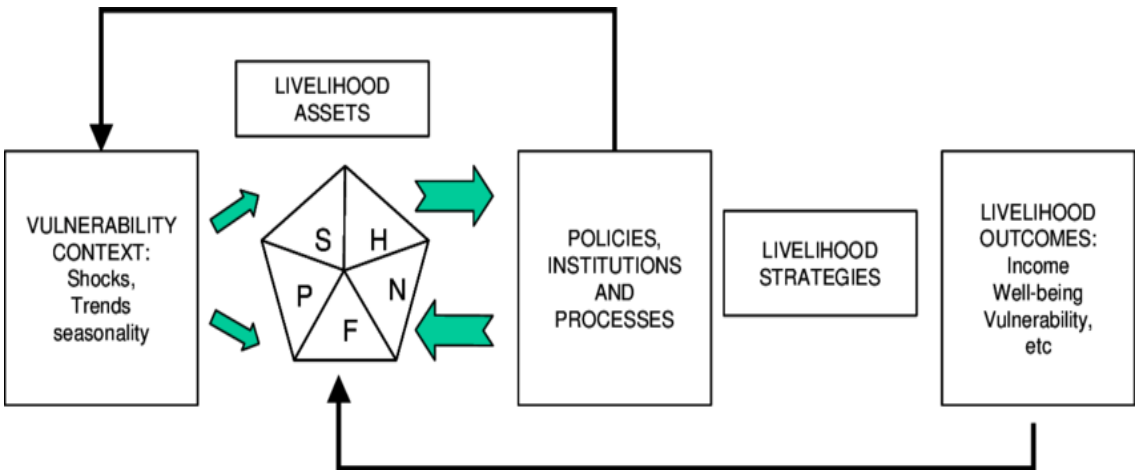
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Theoretical Framework

This study is rooted in the Sustainable Livelihoods Approach (SLA) and the Gender Framework, which together provide a comprehensive lens for examining how gender shapes youth participation in the IFAD Agrihub Nigeria Project. The SLA [24] offers a robust foundation for understanding how young men and women, starting from positions of unemployment or underemployment, are offered opportunities for training, stipends, mentorship, job linkages, among others, through the project to develop livelihood strategies aimed at improving wellbeing, the primary outcome under investigation [16,25]. These strategies include participation in agricultural value chains, business incubation, and various forms of employment. However, the SLA also underscores that access to assets alone is insufficient; broader structures - such as policies, institutional processes, and social norms also conditions the opportunities, resources, and benefits that women can access. To engage with these structures from a gender perspective, the study draws on the Gender Framework, which classifies interventions as gender-blind, sensitive, responsive, or transformative [25]. This framework helps to unpack how societal expectations, cultural norms, and organisational policies presents differentiated experiences and outcomes for male and female youth within the Agrihub context. By integrating both frameworks, the study examines how gendered relations affect access to resources, shape livelihood strategies, and influence the extent to which youth can benefit equitably from the project, ultimately determining the wellbeing of male and female beneficiaries [26].

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S = Social; H = Human; N = Natural; F=Financial; P = Physical

Figure 1: Sustainable Livelihood Model [22]

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METHODOLOGY

Study area

The study was conducted across different states of Nigeria which different states attached to different satellite hubs regions that reflect the country's diverse agricultural landscape. Nigeria's agricultural sector is a cornerstone of its economy, providing livelihoods for a significant portion of the population. The country's agricultural value chains include various crops, livestock, and ago-processing sectors, each with unique challenges and opportunities. In Abuja, the focus was on value chains such as Aquaculture, Catfish Production, and Poultry, while Imo's value chains included Garment Creation, Green Systems, Solar Energy, and Poultry. Oyo's value chains span Dairy Production, Catfish Production, Maize Production, Cashew Processing, and Vegetable Production. These agricultural hubs represent the critical nodes where interventions can significantly enhance the livelihoods and wellbeing of beneficiaries, particularly when focusing on gender-responsive strategies.

Sampling procedure and sample size

To determine the appropriate sample size for this gender assessment study, we applied the standard formula for sample size calculation in finite populations, as described by Krejcie and Morgan and Cochran. Using a total population size of 4,868 eligible individuals across the three study hubs of Abuja (289), Imo (1,012), and Oyo (3,567), with a 95% confidence level, a 5% margin of error, and an assumed response distribution of 50%, the minimum recommended sample size was approximately 356 respondents. This initial estimate yielded 356 males and 338 females when stratified by gender proportions. However, to ensure balance and improve the power of gender-disaggregated analysis, we revised the sample upward to 700 respondents, aiming for a 50:50 split - 350 males and 350 females. The final sample was allocated proportionally across the three hubs based on their population sizes and further stratified by programme track (Employment and Entrepreneurship) and gender. Despite efforts to achieve an even gender distribution, the final sample consisted of 379 males (54.1%) and 321 females (45.9%). This deviation from the ideal 50:50 ratio was primarily due to a lower availability of eligible female respondents in certain categories, particularly in the Employment track. We then sampled from the value chains within each of the selected hubs. In Abuja, samples are distributed across value chains such as Aquaculture, Catfish Production, Poultry Production, and others. In Imo, we allocate samples to value chains including Garment Creation, Green System, Solar Energy, Poultry, and others. Oyo's sample is spread across Dairy Production, Catfish Production, Maize Production, Cashew Processing, Vegetable Production, and others. We determine the proportion of each of these value chains per hub and use this to draw the number of samples that

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represent each of the value chains, always maintaining the gender split within each value chain as closely as possible. The final stage involves the random selection of individual beneficiaries within each value chain and gender category to avoid bias.

Qualitative data collection

To ensure a more robust insight into the study, Qualitative data was also collected. A total of 21 Focus Group Discussions (FGDs), each comprising between 8 to 10 beneficiaries were conducted across selected states of the programme in Nigeria. The FGDs were implemented in 11 states: Kano, Kaduna, Plateau, Nassarawa, FCT, Oyo, Ogun, Lagos, Anambra, Imo, and Akwa Ibom. The selection of participants and number of hubs varied by state, with most FGDs employing a gender-disaggregated approach to ensure diverse perspectives. Specifically, gender-disaggregated FGDs were conducted in Kano (2 FGDs), Kaduna (2), Plateau (2), Yola (2), FCT (2), Ekiti (1), Imo (4), and Akwa Ibom (2). Mixed-gender FGDs were conducted in Ogun (2), Lagos (1), and Anambra (1). States such as Bauchi, Taraba, Adamawa, Ekiti, Ondo, Abia, and Cross River were included in the broader sampling frame but did not participate in FGDs. The selection and distribution of FGDs were informed by the number of hubs and state-level representation.

Measurement of variables

The first indicator of livelihood outcome - wellbeing was conceptualized as a multidimensional construct encompassing psychological functioning, life satisfaction, fulfilment, and relational wellbeing. Four validated scales were used to assess these dimensions: the Fulfilment in Life Scale (FILS), the Relationship Flourishing Scale, the Satisfaction with Life Scale (SWLS), and the Psychological Wellbeing Scale based on Ryff's model [27]. Scores from each domain were first standardized (z-scores), then summed to form a composite wellbeing index. The composite was normalized to a 0–1 range and converted to a percentage scale (0–100), allowing for easier interpretation and comparison across respondents. On the other hand, income was measured using actual reported income levels before and after participation in the IAN Agrihub project. Both variables were used to quantitatively assess livelihood outcomes. Monthly household income was collected for two time points, prior (using a mix of memory recall and existing records) to and following programme participation. This aligns with gender-sensitive rural development research which emphasizes the need to evaluate both outcome levels and equity of benefits between men and women [25,26].

Data analysis

Frequencies, percentages, means and standard deviations were used to profile respondents (Table 1). Independent-samples t-tests compared male and female beneficiaries on perceived support, constraints, wellbeing and income change.

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Paired-samples t-tests compared income before and after participation (Table 4). Weighted means ranked the Likert-type items on support and constraints (Tables 2 and 3). Two outcomes were modelled: (i) the composite wellbeing index (0–100) and (ii) the change in monthly income (₦, after minus before). For beneficiary i, the wellbeing model was estimated by ordinary least squares (OLS):

$$WB_i = \beta + \beta_1 Support_i + \beta_2 Constraints_i + X_i'\gamma + \varepsilon_i$$

where WB_i is the wellbeing index for beneficiary i, and X_i is the vector of beneficiary characteristics (age, education, marital status, household size, occupation, experience, organisation membership and value chain), with categorical variables entered as sets of dummies. The model was estimated for the pooled sample and separately for women (n = 321) and men (n = 379). The income-change model (Appendix 3) has the same structure, with ΔIncome_i as the dependent variable.

OLS is appropriate first because the dependent variable is a continuous composite index, not a binary or ordinal outcome. The objective is to estimate conditional associations between perceived gender support, structural constraints and beneficiary characteristics, and wellbeing. And OLS coefficients read directly in index points or Naira [28]. Separate male and female models let the covariate gradients differ by gender, which is the study's main question. Because the sample is programme beneficiaries only, coefficients are interpreted as associations, not causal programme effects.

Robustness and validity checks

Model validity was assessed against the classical OLS assumptions. The Breusch–Pagan test indicated mild heteroskedasticity ($\chi^2 = 42.55$, $p = 0.004$) and Ramsey's RESET test indicated possible functional-form misspecification ($F = 5.87$, $p = 0.003$); coefficients are therefore reported alongside heteroskedasticity-robust standard errors, and the functional form was re-examined but no alternative specification improved model fit materially. Multicollinearity was not a concern (maximum adjusted VIF = 1.23, mean = 1.10). Cook's distance identified 45 observations (6.4 % of the sample) exceeding the 4/n threshold, but the maximum distance was only 0.13, well below the conventional cut-off of 1, indicating no single case that was materially influential.

Stability was tested by re-estimating the wellbeing model with hub fixed effects ($R^2 = 0.131$) and a programme-track indicator ($R^2 = 0.111$), by dropping each hub in turn, and by collapsing sparsely populated educational and marital categories into broader groups. However, explained variance changed only marginally across these specifications, and most coefficients retained their sign and approximate magnitude. Two exceptions, primary education and the constraints composite, changed sign

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when a single hub was omitted and are therefore treated as unstable; the remaining coefficients, including that on perceived gender support, were noticeably unchanged. The income models were also estimated with a winsorised outcome (1st and 99th percentiles) and a specification that controls for baseline income. Explained variance was stable across the three specifications (R^2 = 0.147 for the baseline, 0.168 for the winsorised and 0.164 for the baseline-controlled model), and coefficient patterns did not change materially (Appendix 3).

Whether the effect of perceived gender support differed by sex was tested by comparing a pooled model containing a sex × perceived-support interaction against a restricted model with equal slopes ($F(1, 677) = 1.73$, $p = 0.19$), providing no evidence that the association between perceived support and wellbeing is gender-conditional. Because the wellbeing model contains twenty-one coefficients, p-values were additionally adjusted. Perceived gender support was the only wellbeing regressor to survive adjustment ($p = 4.7 \times 10^{-7}$); age and unemployed status, both significant in the unadjusted model ($p < 0.05$), did not survive adjustment ($p = 0.13$ in both cases) and are treated as suggestive only. In the income model, three coefficients survived adjustment and include membership in agricultural organisations ($p = 0.0003$), unemployed status ($p = 0.006$) and entrepreneurship ($p = 0.013$), whereas the perceived-support and constraints composites did not ($p_{BH} \geq 0.25$).

The internal consistency of the six composite scales was acceptable: Cronbach's α was 0.806 for support (11 items), 0.930 for constraints (15 items), 0.879 for fulfilment (7 items), 0.844 for life satisfaction (5 items), 0.878 for psychological wellbeing (11 items) and 0.741 for relationship wellbeing (4 items), all above the 0.70 threshold. None of the eleven IFAD-support items was negatively keyed.

However, it is important to acknowledge the following limitations. First, wellbeing, perceived support and constraints were all self-reported in the same survey. Second, the sample comprises programme beneficiaries only and contains no comparison group. The coefficients should therefore not be read as causal programme effects.

RESULTS AND DISCUSSION

Socioeconomic characteristics

As indicated in Table 1, males constituted a slightly higher proportion of the sample (54.1%) compared to females (45.9%). Female participants recorded higher completion of secondary education (65.4%) than males (60.4%), aligning with findings by FAO [18], which note improving access to basic education among rural women. However, more males (30.6%) had only primary education than females (23.1%), which could reflect early school dropouts for income generation purposes. Both groups had low levels of tertiary education, with only 1.8% of males and 0.9%

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of females attaining such levels, underscoring persistent barriers to higher education in rural contexts. Marital status also revealed gendered differences, with 66.4% of female beneficiaries being single compared to 61.7% of males. More males (38.3%) were married than females (32.4%), which may influence household responsibilities and career flexibility [18]. In terms of employment, 63.6% of females reported being currently employed, compared to 53.3% of males, which could be attributed to short-term or informal work participation by women. Nevertheless, a greater share of males (36.1%) engaged in entrepreneurial ventures compared to females (20.2%), reflecting broader trends of male dominance in agribusiness enterprise ownership. Similarly, male membership in agricultural organizations (11.3%) exceeded that of females (5.3%), a disparity often linked to structural exclusion from decision-making networks.

In terms of age and experience, male participants were older (30.2 years) and more experienced (4.4 years) in agribusiness than their female counterparts (27.6 years and 2.3 years, respectively), reflecting longer exposure to commercial agriculture, which often favours male inheritance of land and assets [23]. Household sizes were comparable across sexes, with females reporting an average of 5.0 members and males 4.9. However, engagement in value chains revealed gendered preferences. Female participants were more involved in vegetable production (10.0%), poultry production (18.1%), and egg production (19.3%), confirming earlier findings that women tend to dominate small livestock and nutrition-sensitive agriculture due to lower entry barriers [25,20]. Male participants showed greater involvement in renewable energy (8.7%), crop production (9.8%), and rice production (2.1%). This signals a tendency towards more capital- and technology-intensive enterprises. Participation in aquaculture and catfish production was equal at 4.0% each across both sexes. These findings affirm that gender-responsive interventions in agribusiness must account for differing capabilities, preferences, and constraints experienced by male and female youth in agricultural systems [29].

Support services received by male and female beneficiaries

As shown in figure 1.0, support services were broadly accessible to both male and female participants, with nearly universal uptake of free training (99.0% overall), stipends (96.0%), and job placement (95.1%). However, gender-based disparities emerged in certain categories: males had greater access to personal protective equipment (8.9% vs. 5.9%) and market link-up services (90.8% vs. 81.0%) than females.

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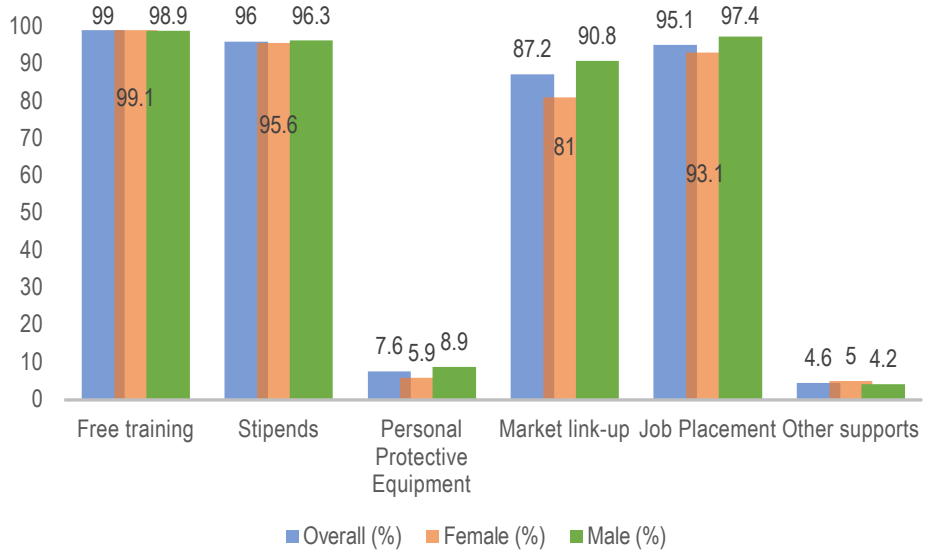


Figure1: Support services received overall and by gender

Perceived Gendered support received

As revealed in Table 2, the data reflects a generally positive perception of the gendered support provided by the IAN, though gender differences emerge in how beneficiaries experience this support. Female participants expressed the highest confidence in their ability to apply skills gained (mean = 4.022), slightly surpassing their male counterparts (mean = 3.997), indicating a strong sense of personal empowerment and readiness among women. Similarly, both male and female respondents rated their knowledge development highly (mean = 3.956 for women and 3.942 for men), suggesting that the programme has been effective in delivering technical and business competencies across genders. This can be established by the response of a Mixed gender FGD in Imo state where participants stated they both equally acquire hand-on skills they now deployed.

> *"There are some things that we were taught in school, they were all theoretical, but now we have got to understand them well as we have done the practical aspect of it. More so now able to produce some machines, such as boilers and pressers. We also handle some repairs and maintenance outside the work environment and earn some money."*
> Mixed-gender FGD, Owerri

Perceptions of gender equality within the programme were also favourable. Both groups agreed that the programme structure allows equal opportunities for men and women (female mean = 3.882; male mean = 4.029), a position echoed in the rating of gender-sensitive programming (female mean = 3.576; male = 3.749). This shows that beneficiaries broadly recognize the programme's intention and efforts to support gender-inclusive participation, although men tended to perceive these efforts more

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positively overall. However, women consistently rated practical and financial support measures, such as affordability of participation (mean = 2.583), access to supports like stipends and loans (mean = 2.196), and accessibility of programme incentives (mean = 2.679), slightly lower than men. While these ratings are not overtly negative, they suggest that women perceive programme support structures as present but perhaps less adequate or accessible, especially when compared to men. These lower ratings likely reflect not inadequacy in project design alone, but rather the reality that women carry multiple manifestations of gender inequality into the project space—domestic responsibilities for childcare, cooking, and elder care that constrain their time and mobility [23]; financial obligations to feed children under their care that may require diverting stipends meant for personal upskilling; and potential household tensions around income control that can pressure women to surrender project earnings [20].We found projects with similar gendered experiences, with female participants often experiencing lower access to resources. Understanding whether women's lower ratings stem from needing greater absolute and specific support due to their circumstances, facing higher barriers to accessing existing support, or experiencing dilution of benefits through competing household demands would require deeper investigation into how stipends and incentives are actually utilized across gender lines.

Gendered constraints faced by beneficiaries

Among the most pressing gendered constraints faced by beneficiaries, as reveled in table 3, cultural norms and restrictions on participation stand out as the most significant (weighted mean = 1.084), particularly affecting women (weighted mean = 1.414) more than men (weighted mean = 0.805). These cultural norms often confine women to subordinate or domestic roles, thereby marginalizing them from decision-making spaces and formal economic activities, this agrees with [30] The second key constraint, difficulty in balancing work and family life (weighted mean = 1.404 overall; 1.673 for women), echoes that caregiving burdens disproportionately fall on women, reducing their productivity and participation in development programmes. This constraint is compounded by the lack of adequate childcare support (weighted mean = 1.136 overall), again impacting women more heavily (weighted mean = 1.455 vs. 0.865). Studies such as those underline how the absence of social support systems and institutional flexibility entrenches women's time poverty and limits their mobility. These interlinked constraints not only restrict women's economic advancement but also contribute to persistent gender gaps in agricultural productivity and programme access [18,31].

These findings align with prior studies [32], which emphasize how traditional gender roles and societal expectations systematically limit women's engagement in agriculture and enterprise. Cultural norms and restrictions on participation, difficulty

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balancing work and family life, and inadequate childcare support emerged as the top three gendered constraints faced by beneficiaries, especially women, within agricultural programmes. These findings reflect longstanding structural barriers. Social expectations and patriarchal norms restrict women's participation in decision-making and productive agricultural roles [20,23]. The dual burden of productive and reproductive responsibilities also disproportionately affects women, limiting their ability to participate fully in agricultural training and income-generating activities [25,33]. Furthermore, the lack of accessible childcare services compounds this burden, reducing women's mobility and engagement in market-facing or time-bound programmes [34]. As such, interventions that fail to consider these interrelated gender barriers risk exacerbating inequalities. Item 10, with women scoring higher (2.056 versus 1.913 for men), points to a potential information lag affecting female beneficiaries. This suggests that women may be receiving programme updates and critical information later than their male counterparts, or through less effective channels. Women's higher rating for item 14 suggests they may have less consistent or affordable internet access, limiting their ability to engage with digital platforms for market information, online training modules, or virtual networking opportunities that the project may increasingly rely upon.

Test of gendered difference across perceived gender support, constraints, income change and wellbeing indicators

Table 4 shows that the programme was associated with a substantial rise in beneficiaries' income. Across the 700 respondents, mean monthly income rose from ₦53,832.96 before the programme to ₦103,185.81 afterwards, a gain of ₦49,352.86 (t = 13.314, p = 0.000). Both genders recorded statistically significant gains. Males increased from ₦67,385.33 to ₦125,459.21 (change = ₦58,073.88, t = 10.797, p = 0.000), while females increased from ₦37,831.87 to ₦76,887.94 (change = ₦39,056.07, t = 7.892, p = 0.000). However, the gain was significantly larger for men, by ₦19,017.80 (t = -2.602, df = 698, p = 0.0095). Women started from a lower base, so the gap in absolute gains partly reflects the existing gap in baseline income. This is consistent with the account of a female FGD participant in Kano State, who described how the programme improved her earnings:

> *"Before the training, I used to make around 50,000 Naira each month. But now, since participating in the programme, my income has grown significantly—I currently earn about 80,000 Naira monthly. This change has really helped improve my household's finances.* "— Female FGD Participant, Kano State

The results further reveal in Table 5 that while both male and female beneficiaries broadly recognize the support provided, women report slightly lower levels of perceived support (35.01 vs. 36.50, p = 0.0006) across all indicators. This pattern

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persists within both employment and entrepreneurship tracks. This aligns with global evidence suggesting that women in agriculture often face systemic barriers to achieving comparable economic outcomes [35,36]. Gender disparities in access to productive resources such as land, training, and credit result often results in lower agricultural productivity and earnings for women [37,38,39,40].

Interestingly, despite these disparities in perceived support, no significant gender differences were observed in the sense of fulfillment or life satisfaction across the whole sample (Table 5). This is also corroborated by one of the Mixed FGD participants in Ogun state who affirmed that the benefit of the programme outweighs whatever challenges they faced in the programme.

> *"After observing the enormous benefits, we gained from the training and how it has helped us improve our skill that we now use on our present job placement in the hospitality business, the challenges count for nothing, we will come for the training again and again".* Mixed-gender FGD, Ogun state.

The exception to this is among entrepreneurship track beneficiaries however is where men report higher satisfaction (p = 0.001). These findings point to a gendered experience within the project where women face more barriers but remain resilient, maintaining similar wellbeing levels as their male counterparts. Gendered experience in the context of this project is coated by the experiences in the project as it relates to other aspects of their lives. This confirms one of the comments of the female participant of Kaduna state who was ready to endure any possible barriers so far she is convinced of the associated benefits:

> *"Even if there was any kind of cultural and social barriers, we would keep it by our side because this is what would benefit us. So even if there is any barrier, we will endure it and allow ourselves to participate and benefit maximally from the project.*"- Female FGD, Kaduna.

This result agrees with of youth involvement in agribusiness, which showed higher level of resilience exhibited by female participants. However, the lower perceived support and higher reported constraints among women may pose risks for sustained participation and success, especially within entrepreneurship where life satisfaction gaps are emerging. The results suggest a need for targeted gender-responsive strategies that go beyond equal access to actively addressing the subtle structural barriers women encounter, specifically, the information lags that delay their awareness of opportunities, the mobility constraints that limit their reach to employment sites and input markets, the childcare gaps that force them to decline otherwise viable opportunities, the digital connectivity deficits that exclude them from virtual platforms, and the network disadvantages that reduce their access to

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employer referrals and professional connections. Strengthening mechanisms for gender-sensitive support could enhance women's outcomes.

Gendered predictors of well-being among the IAN beneficiaries

The gender-disaggregated analysis of predictors of wellbeing among beneficiaries of the IAN project as indicated in table 6 reveals significant differences in how key variables influence male and female respondents' wellbeing. To highlight the positive impact of the project, Perceived gender support consistently emerges as the strongest predictor of wellbeing for both genders, with coefficients showing that it plays a particularly vital role for women ($B = 0.40$, $p < 0.001$) compared to men ($B = 0.29$, $p < 0.001$). Because both genders affirmed confidence in their ability to apply the skills gained through the IFAD Agrihub as their most perceived support of the programme, this indicates the positive impact of effective skill acquisition of beneficiaries from the project system transforming to their wellbeing the most. This is supported by Bello et al. [23] that affirm a heathy positive correlation between skill acquisition through training and sustainable empowerment. This finding also supports the broader body of research that emphasizes the importance of gender-responsive interventions in improving wellbeing outcomes [32]. The positive association of higher education, particularly postgraduate attainment ($B = 6.80$, $p < 0.05$), with female wellbeing aligns with studies highlighting how higher education can empower women in agribusiness settings, particularly in regions with significant gender disparities [20]. Meanwhile, the negative association between age and wellbeing ($B = -0.12$, $p < 0.05$) in the overall sample, which loses significance when disaggregated by gender, suggests a potential interaction effect, as found in other studies that note complex, gendered dynamics of aging and wellbeing. It further establishes that the gender gap is shaped by differences in social roles, expectations, social networks, and household structures. This implies that while women benefit from improved social and economic conditions in later life, men may struggle with loss of professional identity and social support as they are aging.

For male beneficiaries, the negative effect of unemployment ($B = -1.87$) on wellbeing resonates with a well-established body of literature linking joblessness to poorer mental and physical health, particularly among men [37], and specifically due to its impact on identity and social standing. The positive trend for membership in agricultural organizations among women ($B = 2.10$) supports findings that collective engagement in agricultural groups can enhance women's wellbeing by providing access to resources [41], social capital, and empowerment, though the effect is not statistically significant in this model [23]. Additionally, women involved in animal processing and crop processing exhibit positive coefficients ($B = 2.10$ and $B = 1.65$, respectively), while crop processing negatively affects male wellbeing ($B = -2.07$), suggesting that women may experience greater benefits from certain agribusiness

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activities. These findings align with gendered differences in how women and men interact with the agricultural value chain, with women often facing unique challenges that require tailored interventions [41].

These findings highlight the centrality of gender-responsive social and institutional support systems in improving subjective wellbeing among youth in agribusiness. The consistent, positive effect of perceived gender support points to the value of embedding gender equity messaging, training, and role modeling into programme delivery. This result aligns with evidence from the Food and Agriculture Organization [20], which emphasizes that perceptions of fairness, inclusivity, and respect are critical to gendered wellbeing outcomes. For women, the added influence of postgraduate education reinforces the need to facilitate access to higher education and leadership training as a pathway to empowerment and improved life outcomes. This gendered disparity underpins the notion that educational attainment can yield higher marginal returns for women in agribusiness, often by strengthening decision-making autonomy and improving resilience [26]. The limited impact of incentives on wellbeing suggests that material support must be paired with enabling environments, such as recognition, voice, and fair access to opportunities. Finally, promoting active engagement in productive agribusiness activities, particularly crop production, may contribute to well-being, though future programme should prioritize value-adding and capacity-building components over one-off supports.

CONCLUSION AND RECOMMENDATIONS FOR DEVELOPMENT

The findings of this study highlight both the achievements and gendered dynamics within the IFAD Nigerian Agrihub Project. It is important to contextualize these findings within the project's design parameters: the Agrihub was not conceived as a gender-transformative intervention but rather as an employment-focused programme aimed at creating livelihood opportunities for rural youth. Against this backdrop and considering the pervasive levels of inequality that women face across all dimensions of life in Nigeria, from educational attainment to asset ownership, mobility, decision-making authority, and access to financial services, the project's outcomes merit careful assessment.

The project achieved notable success in its primary focus area of wage employment, which constituted 70% of programme targets. Both male and female beneficiaries experienced substantial and statistically significant improvements in income, with both genders approximately doubling their earnings from baseline. Employment rates increased significantly for both groups, and satisfaction levels with the programme were high across genders. These outcomes demonstrate that the project effectively created pathways to formal employment opportunities in agribusiness value chains, benefiting young women and men. Female participants showed resilience and motivation, with their comparable levels of fulfillment and life

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satisfaction, as captured in both quantitative measures and focus group discussions, indicating that women recognized and seized the value the programme offered despite facing greater structural constraints than their male counterparts. Where gender gaps become more pronounced is within the entrepreneurship track (30% of project targets), where systemic barriers proved more difficult to overcome. Male participants in self-employment reported greater average income gains and higher levels of perceived programme support, while female entrepreneurs faced more severe constraints (although only by composites), particularly regarding access to land, finance, agricultural inputs and equipment, and professional networks. These outcomes reflect well-documented structural disadvantages: women's limited land ownership and tenure security, weaker collateral positions for accessing credit, restricted mobility for market engagement and input procurement, and heavier domestic responsibilities that constrain time and resources available for business development.

It is important to note that women's lower support ratings in the entrepreneurship pathway may reflect not a categorical failure of project performance, but rather the reality that gender inequality cuts across multiple dimensions of women's lives, from household responsibilities to mobility restrictions to asset ownership, creating a constraint load that extends beyond what a non-gender-transformative employment project was designed or resourced to address. The project successfully delivered its core services; however, the differential outcomes reveal that equal delivery of services does not automatically translate to equal outcomes when beneficiaries start from vastly unequal positions and navigate different cultural and societal realities. Despite not being designed as a gender-transformative intervention, the project's success in wage employment demonstrates that significant gains for women are achievable when structural barriers are partially mediated by formal employment arrangements (employer-provided transportation, fixed work locations, guaranteed wages). The challenge lies in extending similar success to entrepreneurship pathways, where women bear the full weight of structural disadvantages without the buffering effects of employer-mediated support. Without intentional, gender-responsive strategies that specifically target the barriers women face, information lags, mobility constraints, childcare gaps, financial access limitations, and network deficits, future programming risks perpetuating the outcome disparities observed in self-employment tracks, even as it successfully creates opportunities. Hence the following recommendations are important:

1. Subsequent interventions or a scale-up should make provisions for collateral-free financing or group guarantee schemes for women without land titles, subsidized input delivery systems that accommodate women's mobility constraints, gender-sensitive mentorship pairing women with successful female

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role models, and structured childcare support during training and business activities.

2. The notable gender gaps in access to timely programme information and digital connectivity require targeted communication strategies. Gender-disaggregated SMS alerts for opportunities, women-only information sessions at accessible times and locations, provision of data bundles, and offline alternatives for those with limited internet access. Closing these information lags is important for ensuring women can compete for opportunities on equal footing.
3. The project should move beyond gender targeting to embed a gender-responsive monitoring and evaluation framework that systematically tracks gender-disaggregated indicators on participation, support received, outcomes, and constraints. Regular quarterly analysis would enable timely identification of disparities and inform adaptive programming adjustments, with qualitative feedback mechanisms capturing nuances beyond quantitative data.
4. Subsequent interventions should proactively engage traditional, religious, and community leaders to promote inclusive narratives around women's participation in agribusiness, showcasing successful female beneficiaries as community ambassadors and fostering supportive environments that legitimize women's economic engagement beyond the household.
5. The project should partner with agribusiness employers to establish family-friendly workplace policies including workplace crèches, flexible scheduling, proximity-based placements, and employer-provided transportation. These partnerships would help sustain women's participation in wage employment where the project demonstrated its greatest success.

CONFLICT OF INTEREST

The authors declare no conflict of interest. No financial or personal relationships existed that could have inappropriately influenced the work reported in this paper.

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Table 1: Socioeconomic Characteristics of Respondents

Variable	Overall	Female	Male
Sex (%)			
Male	54.1	—	—
Female	45.9	—	—
Education (%)			
No formal education	6.9	8.4	5.5
Primary	27.1	23.1	30.6
Secondary	62.7	65.4	60.4
Tertiary	1.4	0.9	1.8
Postgraduate	1.9	2.2	1.6
Marital status (%)			
Single	63.9	66.4	61.7
Married	35.6	32.4	38.3
Divorced	0.3	0.6	0.0
Widowed	0.3	0.6	0.0
Employment status (%)			
Employed	58.0	63.6	53.3
Entrepreneur	28.9	20.2	36.1
Unemployed	13.1	16.2	10.6
Agricultural organization member (%)	8.6	5.3	11.3
Continuous variables, M (SD)			
Age (years)	28.99 (6.49)	27.60 (6.05)	30.16 (6.63)
Household size	4.95 (4.32)	5.00 (2.48)	4.91 (5.41)
Experience in agribusiness (years)	3.44 (3.88)	2.26 (2.53)	4.44 (4.50)
Value chain (%)			
Vegetable production	7.6	10.0	5.5

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Variable	Overall	Female	Male
Olericulture	2.1	3.1	1.3
Dairy production	4.0	4.4	3.7
Poultry production	17.0	18.1	16.1
Aquaculture	4.0	4.0	4.0
Cassava production	2.7	2.8	2.6
Groundnut production	0.4	0.0	0.8
Renewable energy	6.0	2.8	8.7
Crop production	8.0	5.9	9.8
Fish processing	4.3	4.4	4.2
Rice production	1.1	0.0	2.1
Biogas production	5.4	4.0	6.6
Mushroom farming	0.4	0.0	0.8
Small ruminant production	2.4	3.1	1.8
Catfish production	4.0	4.4	3.7
Crop processing	3.0	2.8	3.2
Palm-oil production	2.3	1.6	2.9
Egg production	16.6	19.3	14.2
Maize production	2.3	2.5	2.1
Soybean production	3.9	3.1	4.5
Others	2.4	3.7	1.3

Note. Values are column percentages for categorical variables and *M* (*SD*) for continuous variables. Percentages may not sum to 100 because of rounding. Value chain categories are mutually exclusive. Sample sizes: overall = 700, female = 321, male = 379. Source: Author's fieldwork

Source: Author's fieldwork

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Table 2: Perceived Gendered support received by Beneficiaries

SN	Items	Female	Rank	Male	Rank	Overall	Rank
1	I have developed sufficient knowledge to succeed in my chosen track	3.956	2	3.942	3	3.949	3
2	I feel confident in my ability to apply the skills gained through the IFAD Agrihub program	4.022	1	3.997	2	4.009	1
3	The incentives provided by the IFAD Agrihub program (e job placement support) are easily accessible to me.	2.679	8	2.815	10	2.753	9
4	The location of training sessions and other program activities is convenient for my participation, regardless of my track.	2.891	7	3.069	6	2.987	7
5	The timing of program activities fits well with my other responsibilities	2.925	6	3.140	7	3.041	6
6	The cultural context of the IFAD Agrihub programme is sensitive to my needs as a woman/man	3.639	4	3.744	4	3.696	4
7	The program's structure allows equal opportunities for men and women to participate	3.882	3	4.029	1	3.961	2
8	The IFAD Agrihub program addresses gender-specific challenges I face	3.576	5	3.749	4	3.670	5
9	I can afford the costs associated with participating in the IFAD Agrihub program (e.g., transport, materials, fees)	2.583	10	2.937	8	2.774	10
10	The financial requirements of the program do not place a strain on my resources, regardless of the track I am pursuing	2.657	9	2.847	9	2.760	8
11	I have access to support (e.g., loans, stipends, or subsidies) to help me sustain my participation in the IFAD Agrihub program	2.196	11	2.232	11	2.216	11
	GRAND MEAN	3.182		3.318		3.256	

Source: Author's fieldwork

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Table 3: Weighted means ranking of gendered constraints faced by beneficiaries

SN	Item	Overall	Female	Male
1	Cultural norms/restrictions on participation	1.084	1.414	0.805
2	Difficulty in balancing work and family life	1.404	1.673	1.177
3	Lack of/inadequate childcare support	1.136	1.455	0.865
4	Poor access to financial resources	2.293	2.455	2.156
5	Poor access to agricultural inputs, tools, or equipment	2.349	2.477	2.240
6	Lack of access to transportation/mobility	1.996	2.181	1.839
7	Program schedules/timing conflicts	1.616	1.751	1.501
8	Organisational policies not accounting for needs	1.331	1.452	1.230
9	Inability to build professional networks/partnerships	1.707	1.847	1.588
10	Lack of access to timely and relevant programme information	1.979	2.056	1.913
11	Unavailability of gender-friendly mentorship/guidance	1.089	1.221	0.976
12	Difficulty in business registration or employment	1.676	1.791	1.578
13	Physical/mental stress from activities	1.543	1.745	1.372
14	Inadequate access to digital tools (e.g., computers, internet)	1.983	2.131	1.858
15	Lack of proficiency in using technology for business	1.810	1.947	1.694

Source: Author's fieldwork

Table 4: Gender analysis in income and income change

Group	N	Before	After	Change	t_value	P_Value
Overall	700	53832.96	103185.81	49352.86	13.314	0.000
Males	379	67385.33	125459.21	58073.88	10.7969	0.000
Females	321	37831.87	76887.94	39056.07	7.892	0.000
Test	N	Males	Females	Difference	T(df)	P_Value
Gender Difference in Income Change	700	58073.88	39056.07	19017.8	-2.602(698)	0.0095

Source: Author's fieldwork

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Table 5: Gendered difference across support received, constraints and well-being indicators

Variables	Female (Mean)	Male (Mean)	Df	T	p_value
Gender support					
Overall	35.006	36.501	697.115	-3.441	0.0006
Employment	34.745	35.881	395.374	-1.984	0.0480
Entrepreneurship	35.543	37.151	257.99	-2.426	0.0160
Constraints					
Overall	27.595	22.792	677.910	4.581	0.000
Employment	29.370	25.314	400.338	3.140	0.002
Entrepreneurship	23.943	20.146	200.666	2.113	0.036
Sense of fulfilment					
Overall	29.505	30.747	437.368	-0.934	0.351
Employment	30.139	31.954	208.737	-0.798	0.426
Entrepreneurship	28.200	29.481	257.401	-0.969	0.334
Psychological wellbeing					
Overall	61.916	63.509	640.285	-2.442	0.015
Employment	62.472	63.423	407.963	-1.225	0.221
Entrepreneurship	60.771	63.600	181.478	-2.350	0.020
Relationship					
Overall	22.277	22.873	641.304	-2.346	0.019
Employment	22.259	22.701	405.812	-1.408	0.160
Entrepreneurship	22.314	23.054	170.255	-1.597	0.112
Life satisfaction					
Overall	21.483	22.087	666.649	-1.230	0.219
Employment	22.713	22.299	401.451	0.696	0.487
Entrepreneurship	18.952	21.865	198.718	-3.413	0.001
Wellbeing composite					
Overall	40.517	41.942	681.187	-2.438	0.015
Employment	41.333	42.068	382.216	-0.980	0.327
Entrepreneurship	38.840	41.810	186.752	-2.933	0.004

Source: Author's fieldwork

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Table 6: Gender-disaggregated predictors of wellbeing

	Overall		Female		Male	
Variable	**Est**	**Sig**	**Est**	**Sig**	**Est**	**Sig**
(Intercept)	31.8937	***	27.7396	***	32.7802	***
Age`	-0.1156	*	-0.1185		-0.0984	
Postgraduate	2.5488		6.8004	*	-1.036	
Primary	0.4331		-3.7654		0.8354	
Secondary	3.5098		6.0296		1.8725	
Tertiary	3.7275		6.0327		2.1365	
Single	-1.7424		-1.0903		-1.2319	
Household size`	-0.0391		-0.2046		-0.0013	
Occupation/Employed in Entrepreneurs	-0.8332		-1.9144		-0.4225	
Unemployed	-2.0997	**	-2.0515		-1.8745	
Years of Experience in Agribusiness`	0.0719		-0.1152		0.092	
Membership in Agricultural Organization	0.7868		2.0973		0.2483	
Perceived gender support	0.3197	***	0.399	***	0.2911	***
Constraints composite	-0.0081		-0.0395		0.0303	
Crop production	0.743		1.1008		0.4391	
Crop processing	-0.6138		1.6469		-2.0683	
Animal production	-0.9571		-0.7112		-1.0671	
Animal processing	0.6277		2.0988		-0.0659	
R-squared	0.1002		0.162		0.0823	
Adjusted R-squared	0.075		0.1092		0.039	
F-statistic	3.9847		3.0636		1.9034	
p-value	0.000		0.000		0.0167	
RMSE	7.3345		7.0109		7.4086	
Sample size	700		321		379	

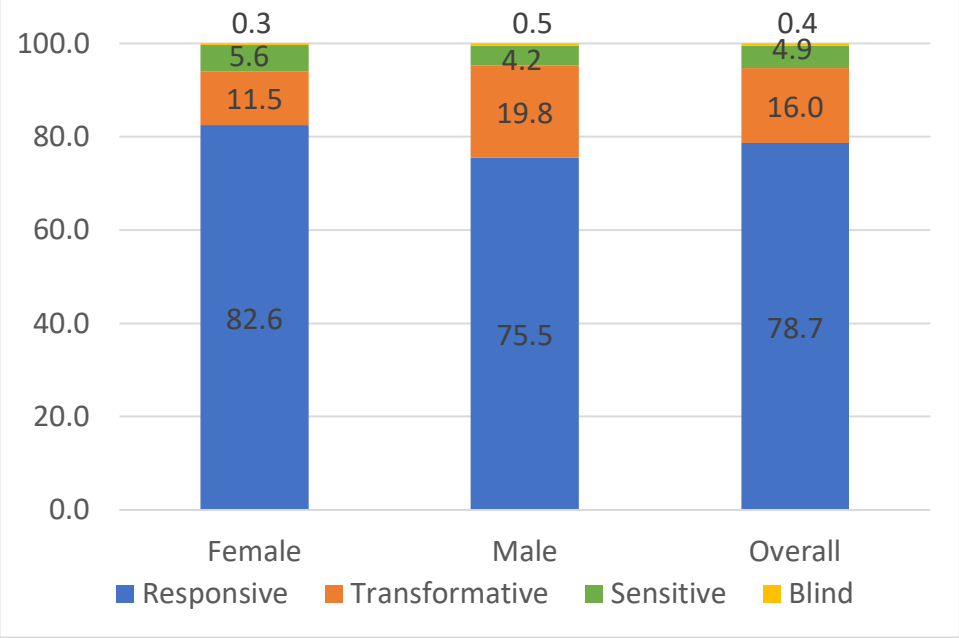
Significance levels: * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: Author's fieldwork

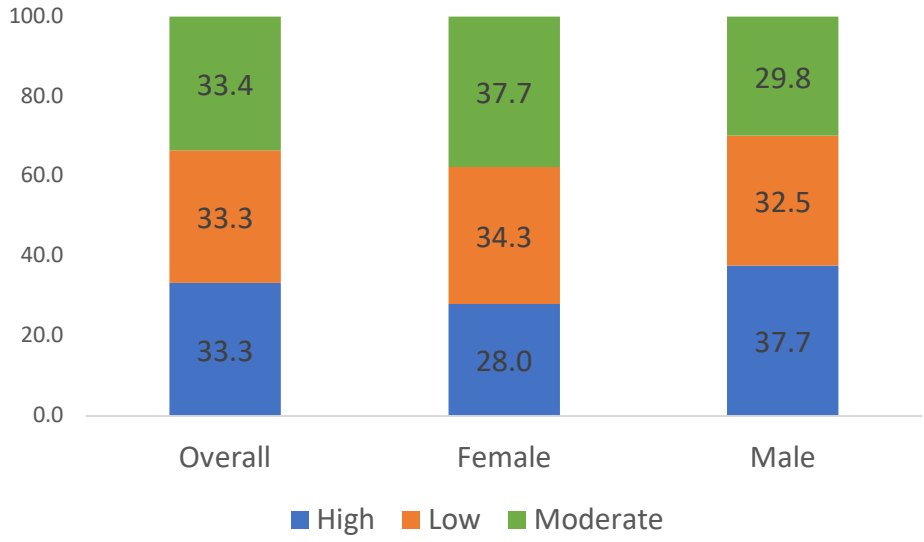
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Appendix 1: Gendered categorization of beneficiaries based on gendered experience



Appendix 2: Gendered categorization of beneficiaries using wellbeing composites



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Appendix 3: Variable table

Variable	Measurement	Notes
Wellbeing (dependent)	Sum of z-scores from FILS, Relationship Flourishing, SWLS and Ryff scales, min–max normalised to 0–100	Higher = better wellbeing
Income change (dependent, Appendix 3)	Monthly household income after minus before participation (₦)	Before value from recall and records
Age	Years	Continuous
Education	No formal (reference), primary, secondary, tertiary, postgraduate	Dummies
Marital status	Married = 1; single/other = 0	Dummy (married =1 1)
Household size	Number of members	Continuous
Occupation	Employed (reference), entrepreneur, unemployed	Dummies
Experience	Years in agribusiness	Continuous
Agricultural organisation membership	Member = 1	Dummy
Perceived gender support	Sum of 11 five-point Likert items (Table 2), range 11–55	Continuous (Higher = greater)
Constraints composite	Sum or mean of the 15 items in Table 3; state the scale	Continuous (Higher = greater constraint)
Value chain	Crop production, crop processing, animal production, animal processing	Dummy variable

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Appendix 4: Gendered Predictors of income change among male and female IAN beneficiaries

Variable	Overall		Female		Male	
Variable	Est	Sig	Est	Sig	Est	Sig
(Intercept)	58332.7378		22609.232		18062.9473	
Age`	307.6464		1078.9561		-39.7018	
Postgraduate	14703.641		10547.6322		31325.0694	
Primary	3162.9113		-31463.1333		29041.714	
Secondary	7957.9012		17321.0553		8272.0907	
Tertiary	5256.1567		5672.3324		13325.0521	
Single	-59784.3998		-60781.3096		-5340.7484	
Household size`	-1160.2518		-2513.7587		-1063.1221	
Employed in	27881.6416	**	49794.4379	***	10590.0382	
Entrepreneurs	37792.2841	***	19681.7261		58970.4545	***
Unemployed	276.8165		-1350.4111		819.0189	
Years of Experience in Agribusiness`	56675.5877	***	80073.0369	***	46332.1744	**
Membership in Agricultural Organization	1410.3573	*	1398.5138		1603.0433	
Perceived_gender_support	-606.4299	*	-363.5187		-761.0572	
Constraints_composite	-2026.934		13752.7113		-14193.1626	
Crop Production	1558.3248		41407.5274		-29967.6945	
Crop processing	-2368.5728		6167.9586		-8696.666	
Animal production	-20706.1688		-16172.1228		-24270.2559	
R-squared	0.1438		0.1918		0.1333	
Adjusted R-squared	0.1199		0.1408		0.0925	
F-statistic	6.0108		3.7592		3.267	
p-value	0.000		0.000		0.000	
RMSE	90683.9976		79586.7476		97354.2165	
Sample size	700		321		379	

Significance levels: * p < 0.05, ** p < 0.01, *** p < 0.001.

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