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Discriminant Effect of NEAZDP on the Livelihoods of Beneficiary Communities in Yobe State of Nigeria

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ABSTRACT

The discriminant effect of NEAZDP on the livelihoods of beneficiary communities in Yobe State, Nigeria, highlights the need to address disparities in socio-economic outcomes and structural barriers limiting the program's equitable and sustained impact. Consequently, this study examines the structural (programme) and endowment effects on the livelihood status of beneficiaries, comparing results across beneficiary, spill-over, and control groups. Further, using a multi-stage sampling technique, the study used a cross-sectional survey data elicited through a well-structured questionnaire coupled with an interview schedule from a total of 396 respondents spread across the treated and untreated communities of Nigeria's Yobe State. Moreover, strictly using inferential statistics, the goals of the study were achieved. In the short term, statistical analysis demonstrates significant improvements in the livelihoods of NEAZDP participants, with results indicating that the programme addresses specific needs and enhances economic outcomes for beneficiaries. However, long-term analysis reveals a decrease in livelihood status among beneficiaries relative to spill-over groups, suggesting potential challenges in sustaining the programme's positive effects. Through Oaxaca-Blinder decomposition, the study finds that while beneficiaries have favorable socio-economic characteristics, structural barriers within the programme limit their livelihood gains. Spill-over groups, despite non-participation, experience indirect benefits, hinting at broader community impacts. Recommendations include enhancing structural support, refining program interventions, and leveraging spill-over effects to maximize the programme's reach. This analysis underscores the need for continuous monitoring and adaptation to maintain NEAZDP's effectiveness in fostering sustained livelihood improvements among beneficiaries.

Keywords: Development; Impact; Livelihood; Programme; Sustainability; Nigeria.

INTRODUCTION

The Northeast Arid Zone Development Program (NEAZDP) is a strategic intervention aimed at improving livelihoods and fostering sustainable development in Yobe State, Nigeria, a region deeply affected by environmental challenges such as desertification and resource scarcity (Eze & Onokala, 2022). As reported by Gbahabo (2011); Abdullahi *et al*. (2020), the program is established to mitigate the socio-economic vulnerabilities of households in arid zones. The program targets enhancing agricultural productivity, bolstering food security, and promoting income diversification among rural communities. By leveraging participatory approaches, NEAZDP prioritizes the integration of local

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knowledge and capacity building to ensure long-term impact (Zemba *et al*., 2018). Furthermore, the program seeks to address structural inequalities and foster resilience against climate-induced risks, thereby improving economic outcomes for direct beneficiaries and generating positive spillover effects within the wider community (Abdullahi *et al*., 2020). These objectives align with broader efforts to achieve sustainable development and alleviate poverty in Nigeria's northeastern region, where socio-economic disparities and ecological challenges persist (Nzeadibe *et al*., 2020).

The NEAZDP programme, designed to enhance economic livelihoods in underserved communities, has shown mixed outcomes, highlighting important gaps in understanding its long-term impact. While initial assessments indicate short-term improvements in livelihoods for beneficiaries (Gadzama, 2017; Mukhtar et al., 2017), there is limited evidence on the sustainability of these impacts, particularly in comparison to non-participating groups. This underscores a **knowledge gap** regarding the factors that influence long-term program effectiveness. Additionally, while spill-over effects suggest that indirect benefits may reach non-participants, there is an **evidence gap** in quantifying and understanding the mechanisms behind these effects.

The existing literature on livelihood programs offers limited insights into the nuances of NEAZDP's impact structure. A **theoretical gap** exists regarding the influence of socio-economic endowments and structural barriers on programme outcomes, which may affect beneficiaries differently based on their initial characteristics. Further, the use of decomposition techniques such as Oaxaca-Blinder in similar studies (Abdullahi & Cheri, 2020; Eze & Onokala, 2022) is scarce, creating a **methodological gap** that limits comparative analysis across participant and non-participant groups in understanding structural impacts.

Succinctly, addressing these gaps is critical for ensuring that NEAZDP fulfills its goal of sustainable livelihood improvement. By examining both short- and long-term impacts, this study provides evidence to refine the programme for sustained effectiveness. Analyzing structural barriers and the socio-economic advantages of beneficiaries provides insights into enhancing programme targeting and tailoring interventions. Additionally, understanding spill-over effects can inform broader community engagement strategies, amplifying the programme's positive influence beyond direct participants. This research is, therefore, essential for maximizing NEAZDP's effectiveness in fostering resilient and lasting improvements in the livelihoods of both beneficiaries and their communities. Succinctly, the specific objectives of this study are to determine the short and long-run effects of NEAZDP on the livelihoods of the beneficiary communities, and to distinguish the structural/ programme effect vis-a-vis the endowment effect on the livelihoods of the beneficiary communities.

Theoretical Framework

This study is grounded in **livelihood theories** and **programme evaluation models**, which provide a basis for understanding how interventions like NEAZDP affect socio-economic outcomes. The **Sustainable Livelihoods Framework (SLF)** by Chambers and Conway (1992) provides a comprehensive perspective on how various assets—natural, human, social, financial, and physical—interact with external factors to influence livelihood outcomes. This framework underscores the importance of tailored interventions that address specific vulnerabilities and opportunities within a community.

Building on this, **Amartya Sen's Capability Approach** (1999) provides insights into how development programmes enable individuals to achieve improved well-being and agency. This approach is particularly relevant in assessing the extent to which NEAZDP enhances beneficiaries' capacity to achieve sustainable livelihoods. In contrast, critiques of programme interventions, such as **Rostow's Modernization Theory** (1960), caution against assuming linear development impacts, emphasizing the role of structural and contextual barriers. Recent scholarships, such as De Haan (2012), highlight the need to focus on resilience and adaptability within complex systems,

particularly in regions like Yobe State with fluctuating agro-climatic conditions.

Conceptual Framework

The conceptual framework for this study integrates the principles of SLF and capability theory to evaluate NEAZDP's impact on beneficiaries' livelihoods.(Fig. 1a) The framework posits that participation in NEAZDP influences livelihood outcomes through three primary pathways:

1. **Endowments (Individual and Socio-Economic Characteristics):** Factors such as age, education, and gender shape beneficiaries' capacity to utilize program resources effectively (Bebbington, 1999; Ellis, 2000).

2. **Structural Influences (Program Design and Institutional Context):** The structural support provided by NEAZDP determines the extent to which socio-economic endowments translate into livelihood gains. This aligns with findings from Sova *et al*. (2015), which stress the role of structural adjustments in improving programme efficacy.

3. **Community Spill-Over Effects:** Indirect benefits from NEAZDP may accrue to non-beneficiaries due to shared resources or improved community infrastructure, as highlighted in studies by Davis *et al.* (2009) and recent work by Sadiq *et al*.(2020).

These pathways interact dynamically, influencing short- and long-term livelihood outcomes. For instance, while socio-economic endowments can enhance initial gains, structural barriers may limit long-term sustainability, as evidenced by the findings of Nzeadibe *et al*. (2020).

Overall, the theoretical and conceptual frameworks guide the study by integrating well-established theories with context-specific insights to analyze NEAZDP's impact on livelihoods in Yobe State.

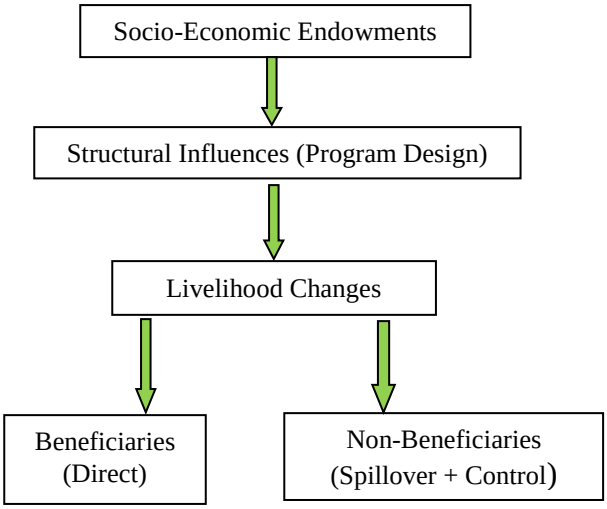

Figure 1a: Conceptual framework of the impact of NEAZDP on livelihood

RESEARCH METHODOLOGY

The study is conducted in Yobe State, located in the northeastern region of Nigeria. **Geographically,** Yobe State lies within latitude 10° and 13° North and longitude 11° and 14° East, bordered by Borno State to the east, Gombe to the south, and Jigawa to the west. The state also shares an international border with the Republic of Niger, facilitating cross-border cultural and economic exchanges.

Yobe State experiences a semi-arid climate characterized by a single rainy season from June to September, followed by a prolonged dry season (Opara *et al*., 2017; Gana *et al*., 2021). Annual rainfall ranges between 500-1000 mm, with temperatures often exceeding 40°C during peak dry months (Zemba *et al*., 2018). The region's agro-climatic conditions make it suitable for drought-resistant crops, but limited rainfall poses challenges for year-round agriculture.

Ecologically, Yobe is part of the Sudan-Sahelian region, featuring sparse vegetation, savannah grasslands, and a mix of shrub and acacia trees. This ecological setting supports grazing and pastoral activities but is vulnerable to desertification, impacting agricultural productivity and local biodiversity.

The state's economy is largely agrarian, with residents engaged in farming, livestock rearing, and fishing in the state's riverine areas. Major crops include millet, sorghum, maize, and cowpea, which are adapted to the region's dry conditions. Additionally, livestock farming, particularly cattle, sheep, and goats, forms a crucial part of the economy, supporting both local livelihoods and trade within the state and across borders.

Using a multi-stage sampling technique, from three targeted populations, a total of 396 respondents were randomly selected for the study. The targeted population is treated (project participating sites), spill-over, and the control units (Figure 1b). Noteworthy, the programme is confined to the northern part of the state and covers only nine (9) Local Government Areas (LGAs), *viz.* Bade, Jakusko, Bursari, Geidam, Yunusari, Yusufari, Nguru, Karasuwa, and Machina. Firstly, to have a balance across the sampling units, of the nine (9) treated LGAs, four (4) LGAs, namely, Bade, Jakusko, Bursari, and Geidam, were randomly selected. Besides, for the spill-over and control groups respectively, four LGAs each, namely, Tarmuwa, Nangere, Fune, and Fika; and, Damaturu, Potiskum, Gujba, and Gulani, were purposively selected because the former fell within the radius of 20-50 km while the latter fell within the radius of greater than or equal to 100 km as adopted by Sadiq *et al*.(2020a). Furthermore, given the peculiarity of the treated sites, from each of the selected treated LGAs, one (1) Development Area (DA) was selected, and thereafter a random selection of three (3) clusters from each of the selected DA, thus giving a total of twelve (12) selected clusters. \Moreover, from each of the selected clusters-treated unit, spill-over, and the control units respectively, two (2) villages were randomly selected, thus giving a total of forty (40) randomly selected villages. Lastly, using a sampling frame obtained from NEAZDP coupled with a reconnaissance survey (Table 1), from each of the selected programme villages, five (5) out of a total of fifteen (15) beneficiaries were randomly selected, thus giving a total of one hundred and twenty (120) randomly selected beneficiaries. However, given the non-availability of a finite sampling frame for the non-beneficiary group, the sample size was generated using the error margin formula as proposed by Bartlett *et al.* (2002) and adopted by Sadiq *et al*. (2023); Sadiq *et al*. (2024) (Equation 1). Generally, a total of three hundred and ninety-six (396) respondents, vis-à-vis treated (120), exposed (138), and control (138) groups selected randomly constituted the sample size for this study (Table 1). Further, using an easy-route cost approach, a well-structured questionnaire complemented with an interview schedule was used by trained enumerators to elicit cross-sectional data in the year 2023. Nevertheless, the first objective was achieved using Chow F-statistics and average treatment effect, while the Oaxaca-Blinder decomposition model was used to achieve the second objective.

According to Bartlett's formula, the sample size of the unknown can be generated using the following formula:

$$N_{nb} = Z^2 * P(1-P) / e^2 \qquad \text{..... (1)}$$

Where, N_{nb} is the sample size of the non-beneficiaries, Z is the Z-statistic at 5% probability level (1.96), P is the sample proportion (10%), and e is the error gap at 5%

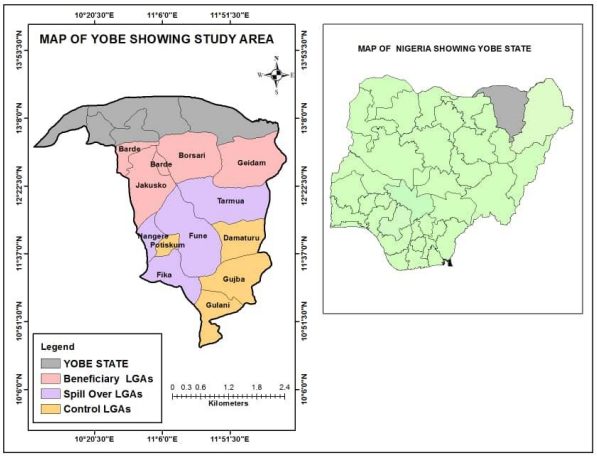

Figure 1b: Map of the study area
Source: Authors' own design, 2023

Table 1: Sampling Frame of both the beneficiaries and non-beneficiaries

9	LGAs	DAS	Cluster villages	Villages	SF	SS
Beneficiary	**Treatment**					
	Bade	Dagona	Dala	Gabarwa	15	5
				Mainiya	15	5
			Tagali	Lafiyami	15	5
				Madamuwa	15	5
			Bizi	Murza	15	5
				Misilli	15	5
	Bursari	Dumburi	Dadigar	Baya mallum	15	5
				Diga	15	5
			Gadine	Gamsa West	15	5
				Gamsa East	15	5
			Daskum	Gangawa	15	5
				Kagadama	15	5
	Geidam	Balle	Bayamari	Malango	15	5
				Kelluri	15	5
			Damaya	Mobarti	15	5
				Gallaba	15	5
			Ajiri Dapchi	Ajiri Geidam	15	5
				Matakuskum	15	5
	Jakusko	Muguram	Jaba	Dagayak	15	5
				Garin maji	15	5
			Gamjam	Nasari	15	5
				Garin Tsaiha	15	5
			Lafiya loiloi	Buduwa	15	5
				Gamya	15	5
Sub-total	**4**	**4**	**12**	**24**	**360**	**120**
Non-Beneficiary	**Spill-over**					
	Tarmuwa	-	-	Lantewa	-	17
				Biriri	-	17
	Nangere	-	-	Dawasa	-	17
				S/Gari Nangere	-	17
	Fune	-	-	Dogon Kuka	-	17
				Damagum	-	17
	Fika	-	-	Janga	-	18
				Gadaka	-	18
	4	**-**	**-**	**8**	**-**	**138**
	Control					
	Damaturu	-	-	Maisandari	-	17
				Dukumari	-	17
	Gujba	-	-	Katarko	-	17
				Kasesa	-	17
	Gulani	-	-	Bara	-	17
				Shishiwaji	-	17
	Potiskum	-	-	Mamudo	-	18
				Garin Jaji	-	18
Sub-total	**4**	**-**	**-**	**8**	**-**	**138**
Total	**12**	**4**	**12**	**40**		**396**

Source: NEAZDP report (2022) and Reconnaissance survey (2022)

Empirical Model

Chow F-statistic test

The F-statistic tests for the test for effect of project, test for homogeneity of slopes, and test for differences in intercepts are given below (Sadiq *et al*., 2020a & b; Sadiq *et al*., 2021; Sadiq *et al*., 2022a & b):

To isolate the effect of the project, the error sum of squares for livelihood of: (i) beneficiary group, (ii) non-beneficiary group, (iii) pooled data without a dummy variable, (iv) pooled data with a dummy variable (beneficiary =1, non-beneficiary =0) are as follows:

Test for the effect of Project:

$$F^{*} = \frac{[\sum \varepsilon_3^2 - (\sum \varepsilon_1^2 + \sum \varepsilon_2^2)]/[K_3 - K_1 - K_2]}{(\sum \varepsilon_1^2 + \sum \varepsilon_2^2)/K_1 + K_2} \quad \ldots\ldots\ldots\ldots\ldots (2)$$

Where $\sum \varepsilon_3^2$ and K_3 are the error sum of squares and degrees of freedom, respectively, for the pool (beneficiary and non-beneficiary), $\sum \varepsilon_1^2$ and K_1 are the error sum of squares and degrees of freedom, respectively, for the beneficiary group, and, $\sum \varepsilon_2^2$ and K_2 are the error sum of squares and degrees of freedom, respectively, for the non-beneficiary group.

If the F-cal is greater than the F-tab, it implies that the programme has an effect on the livelihood status of the beneficiary group.

Test for homogeneity of slope

$$F^{*} = \frac{[\sum \varepsilon_4^2 - (\sum \varepsilon_1^2 + \sum \varepsilon_2^2)]/[K_4 - K_1 - K_2]}{(\sum \varepsilon_1^2 + \sum \varepsilon_2^2)/K_1 + K_2} \quad \ldots\ldots\ldots\ldots (3)$$

Where $\sum \varepsilon_4^2$ and K_4 are the error sum of squares and degrees of freedom, respectively, for the pool with a dummy variable.

If the F-calculation is greater than the F-tabulated, it implies that the program brings about a structural change or shift in the livelihood parameter.

Test for differences in intercepts:

$$F^{*} = \frac{[\sum \varepsilon_3^2 - \sum \varepsilon_4^2]/[K_3 - K_4]}{\sum \varepsilon_4^2 / K_4} \quad \ldots\ldots\ldots\ldots\ldots (4)$$

If the F-calculation is greater than the F-tab, it implies that the livelihood status of the beneficiary group differs from that of the non-beneficiary group.

Average treatment effect (ATE)

According to Sadiq *et al*.(2020 a & b); Sadiq *et al*.(2021); Sadiq *et al*.(2022 a & b), the ATE equation is as follows:

The livelihood index of the beneficiaries is given by:

$$E(y_{1i} \mid I = 1; X) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

The livelihood index of the non-beneficiaries is given by:

$$E(y_{2i} \mid I = 0; X) \quad \ldots\ldots\ldots\ldots (6)$$

The livelihood index of the beneficiary group if they had not benefited is denoted by:

$$E(y_{2i} \mid I = 1; X) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

The livelihood index of the non-beneficiary group if they have benefited is denoted by:

$$E(y_{1i} \mid I = 0; X) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (8)$$

Where:

$E(.)$ = Expectation operator

y_{1i} = Livelihood index of beneficiaries (dependent variable)

y_{2i} = Livelihood index of the non-beneficiaries (dependent variable)

I = Dummy variable (1 = beneficiary, 0 = non-beneficiary)

X = Explanatory variables that is common to both beneficiary and non-beneficiary households.

$$ATT = E(y_{1i} \mid I = 1; X) - E(y_{2i} \mid I = 1: X) \quad \ldots\ldots\ldots\ldots\ldots (9)$$

$$ATU = E(y_{1i} \mid I = 1; X) - E(y_{2i} \mid I = 1: X) \quad \ldots\ldots\ldots\ldots\ldots\ldots (10)$$

ATT=Average treatment effect on treated

ATU=Average treatment effect on untreated

Equations (9) and (10) were further simplified as:

$$ATT = \frac{1}{N_1} \sum_{i=1}^{N^1} [p(y_{1i} \mid I = 1: X) - p(y_{2i} \mid I = 1: X)] \quad \ldots\ldots\ldots\ldots\ldots (11)$$

$$ATU = \frac{1}{N_2} \sum_{i=1}^{N^2} [p(y_{2i} \mid I = 1: X) - p(y_{1i} \mid I = 0: X)] \quad \ldots\ldots\ldots\ldots (12)$$

Where, N_1 and N_2 are the number of beneficiaries and non-beneficiary, respectively, and p= probability.

Oaxaca-Blinder decomposition model

Using the standard Oaxaca-Blinder technique (Oaxaca 1973; Blinder 1973), the degree to which livelihood disparity between the beneficiary and non-beneficiary groups can be explained by differences in observed human capital characteristics is investigated (Sadiq *et al*., 2020a & b; Sadiq *et al*., 2021; Sadiq *et al*., 2022a & b). The following are the livelihood index functions:

$$\ln \overline{Y}_P = \beta_0 + \beta_i \sum_{i=1}^{i} X_i + \varepsilon_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (13)$$

$$\ln \overline{Y}_{NP} = \beta_0 + \beta_i \sum_{i=1}^{i} X_i + \varepsilon_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (14)$$

Where, $\overline{Y}_P$ = average diversification index of participating farmers; $\overline{Y}_F$ = average diversification index of non-participating farmers; X_{i-n} = explanatory variables; β_0 = intercept; β_{i-n} =parameter estimates; and, ε_i = error term.

Endogenous switching regression model:

Y_i = Livelihood index; X_1 = Age (year); X_2 = Gender (male = 1, otherwise = 0); X_3 = Marital status (married =1, otherwise=0); X_4 = Education of the primary household head (year); X_5 = Household size (number); X_6 = Extension contact (yes=1, otherwise=0); X_7 =Access to credit (yes=1, otherwise=0); X_8 = Co-operative membership (yes =1, no =0); X_9 = Agricultural holding (hectare); X_{10} = Income (₦); β_0 = Intercept; β_{1-10} = Regression coefficient; and, ε_i = Stochastic.

The total difference can be explained by,

$$\Delta \ln Y = \ln \overline{Y}_P - \ln \overline{Y}_{NP} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (15)$$

The Oaxaca-Blinder decomposition equation is,

$$\Delta \ln Y = (\overline{X}_P \hat{\beta}_P - \overline{X}_{NP} \hat{\beta}_{NP}) + (\overline{X}_{NP} \hat{\beta}_P - \overline{X}_{NP} \hat{\beta}_P) \quad \ldots\ldots\ldots\ldots (16)$$

If there is only discrimination against the non-beneficiary group, the formula becomes:

$$\Delta \ln Y = (\overline{X}_P - \overline{X}_{NP}) \hat{\beta}_P + (\hat{\beta}_P - \hat{\beta}_{NP}) \overline{X}_{NP} + (\overline{X}_P - \overline{X}_{NP})(\hat{\beta}_P - \hat{\beta}_{NP}) \quad \ldots\ldots\ldots\ldots (17)$$

If the non-project group has project group's coefficient, then the formula becomes:

$$\Delta \ln Y = (\overline{X}_P - \overline{X}_{NP}) \hat{\beta}_{NP} + (\hat{\beta}_P - \hat{\beta}_{NP}) \overline{X}_{NP} + (\overline{X}_P - \overline{X}_{NP})(\hat{\beta}_P - \hat{\beta}_{NP}) \quad \ldots\ldots\ldots (18)$$

Thus, Equations (17) & (18) have a 'threefold' decomposition, i.e. the outcome difference is divided into three components. The first, second and third components respectively are endowment effect; discrimination effect and interaction effect.

The idea that there is a non-discriminatory coefficient vector that should be utilized to determine the contribution of the variations in the predictors leads to an alternative decomposition that is popular in the discrimination research. Let β^* be a non-discriminatory coefficient vector of this type. Following Jann (2008), the outcome difference can then be written as:

$$\Delta \ln Y = (\overline{X}_P - \overline{X}_{NP}) \beta^* + \{(\overline{X}_P)(\hat{\beta}_P - \beta^*) + (\overline{X}_{NP})(\beta^* - \hat{\beta}_{NP}) \quad \ldots\ldots (19)$$

Therefore, Equations (19) has a 'twofold' decomposition, i.e. the outcome difference is divided into two components. The first and second are quantity effect and unexplained effect respectively. The latter is frequently attributed to discrimination, but it's vital to remember that it also includes all of the possible effects of unobserved variables.

Results and Discussion

Effect of NEAZDP on the Livelihood Status of the Beneficiaries

Presented in Table 2a are the results of the short-run effect of the programme on the livelihood status of the beneficiaries. Herein are the results of the statistical tests for the structural shift in the livelihood status function and differences in the parameter structure. In the short-run, the results of the chow's f- statistic for the test of livelihood status between beneficiary against the spill-over and control groups were significant at 1% probability level. Thus, confirmed that participation in NEAZDP brought about a significant difference in the livelihood status of the beneficiary group against that of the spill-over and control groups. Further, for the homogeneity test of slopes between the beneficiary against the spill-over and control groups, the significant of the chow's f-statistic at 1% error gap confirmed heterogeneity of slopes or that the programme birthed a significant difference between the livelihood status of the households that participated in the NEAZDP against the households in both the spill-over and control groups, i.e., non-beneficiary households. Noteworthy, heterogeneity of slopes implied that the livelihood functions are idiosyncratic-biased.

Nevertheless, for test of differences in intercept between the beneficiary against the spill-over and control groups, the significant of the chow's f-statistic at 1% probability level. Thus, confirmed heterogeneity of intercepts between the beneficiary against the spill-over and control groups. Succinctly, the significant differences in slopes and intercepts indicate that the program uniquely benefits participants, reflecting their stronger preference and capacity for improved livelihoods, i.e., reflecting tailored benefits. This suggests that NEAZDP effectively addresses their specific needs and enhances their economic outcomes.

Moreover, the positive coefficients of the programme dummy (the preliminary results of estimate not presented here) for the beneficiary against the spill-over and control groups can be interpreted that the beneficiary group showed more preference for better livelihood compared to the spill-over and control groups. Consequently, this suggests that the beneficiaries are more inclined to pursue better livelihoods, reinforcing the programme's role in fostering economic aspirations.

Generally, it can be inferred that the programme had significant effect on the livelihood status of the beneficiary group in the short-run Fig. (2). Overall, these findings highlight the programme's substantial impact on enhancing the livelihoods of NEAZDP beneficiaries.

Table2a. Short-run effect of NEAZDP on livelihood of beneficiaries

Items	**ESS**	**DF**	**Test**	**F-stat**
	Beneficiary group vs. Spill-over group			
Beneficiary	3.604256	106		
Spill-over	5.640964	123	I	6.920^{***}
Pooled	13.15652	243	II	1.997^{**}
Pooled with dummy	10.29315	242	III	67.320^{***}
	Beneficiary vs. Control group			
Beneficiary	3.604256	106		
Control	3.396578	124	I	5.048^{***}
Pooled	9.305472	245	II	1.639^{NS}
Pooled with dummy	7.699448	244	III	50.896^{***}

Source: Field survey, 2023

Note**:** *** ** * & NS means significant at 1%, 5%, 10% & Non-significant, respectively.

Note**:** ESS, DF, I, II & III mean Error sum of square, Degree of freedom, Test for effect of the programme, Test for Homogeneity of slope and Test for differences in intercepts, respectively.

Furthermore, in the long-run, between the beneficiary and spill-over groups, the negative and significant of the ATE coefficients of both regression adjustment and nearest-neighbor matching at less than 10% probability level, implied that the programme had a negative significant impact on the livelihood of the beneficiary group (Table 2b). Consequently, the livelihood status of the beneficiary group was below that of the spill-over group by 7.37 and 9.34% respectively, as evident by the ATE coefficients for regression adjustment (-0.0737) and nearest-neighbor matching (-0.0934). Besides, within the beneficiary group, despite participation in the programme, it lost 13.84 and 14.81% respectively of its livelihood status, as evident by the negative-significant of the ATET coefficients for regression adjustment (-0.1384) and nearest-neighbor matching (-0.1481) at less than 10% probability level. Conversely, within the spill-over group, despite non-participation in the programme, because of spill-over effect, it gained 1.70 and 3.99% respectively in its livelihood status, as evident by the significant of the ATEU coefficients for regression adjustment (0.01699) and nearest-neighbor matching (0.03985) at less than 10% probability level. Generally, it can be inferred that the slight improvements in livelihood status seen by the spillover group despite not participating in the programme, suggests indirect benefits from the programme's implementation. In other words, the gains in livelihood status experienced by the spillover even without programme participation, suggests indirect benefits that arise from the programme's broader community impacts. Overall, these findings raise questions about the effectiveness of NEAZDP in improving beneficiary livelihoods and highlight the need for reassessment and adjustment of the program to better meet its goals.

Nevertheless, between the beneficiary and control groups, the ATE coefficients of both the regression adjustment and nearest-neighbor matching were positive and significant at less than 10% error gap respectively,

thus implied that the programme had a positive significant impact on the livelihood status of the beneficiary group compared to that of the control group (Table 2b). The ATE coefficients of regression adjustment (0.1966) and nearest-neighbor matching (0.1725) respectively, implied that the livelihood status of the beneficiary group is higher than that of the control group by 19.66 and 17.25%. Besides, within the beneficiary group, participation in the programme made it to gain 12.67 and 11.27% respectively in its livelihood status as indicated by the significant of the ATET coefficients for regression adjustment (0.1267) and nearest-neighbor matching (0.1127) at less than 10% degree of freedom. Conversely, within the control group, non-participation in the programme made it to lost 25.69 and 22.42% respectively of its livelihood status as evident by the significant of its ATEU coefficients for both regression adjustment (0.2569) and nearest-neighbor matching (0.2242) at less than 10% acceptable margin.

Overall, these findings affirm that NEAZDP positively influences beneficiaries' livelihoods while illustrating the risks associated with non-participation. In other word, NEAZDP is effective in improving beneficiaries' livelihoods, demonstrating the importance of programme involvement for economic well-being.

Table 2b: Long-run effect of NEAZDP on the livelihoods of beneficiaries

Items	Regression Adjustment		Nearest-neighbor matching	
	Beneficiary vs. Spill-over groups			
ATE	-0.0737 (0.0337)	-2.19**	-0.0934(0.0394)	-2.29**
ATET	-0.1384(0.0396)	-3.49***	-0.1481(0.0371)	-3.99**
ATEU	0.0169(0.0501)	0.34NS	0.0399(.05178)	0.77NS
Treated (mean)	0.7440(0.0302)	53.03***		
Untreated(mean)	0.8177(0.0154)	24.61***		
Beneficiary vs. Control groups				
ATE	0.1966(0.0403)	4.87***	0.1725(0.0712)	2.42**
ATET	0.1267(0.0411)	3.08***	0.1127(0.0448)	2.51**
ATEU	0.2569(0.0573)	4.48***	0.2242(0.1164)	1.93*
Treated (mean)	0.7542(0.0355)	21.26***		
Untreated(mean)	0.5577(0.0191)	29.20***		

Source: Field survey, 2023

Note: ATE and ATET mean Average treatment effect and Average treatment effect on treated, respectively.

Note: *** ** * & NS mean significant at 1, 5, 10%, & Non-significant, respectively; the figure in ( ) is standard error.

Discriminate Effect of NEAZDP on livelihood Status of the Beneficiaries

In delineating the impact of the programme on the livelihoods of the beneficiary vis-à-vis the spill-over and control groups, the regression based Oaxaca-Blinder (OB) decomposition indicates the mean livelihoods for beneficiary, spill-over and control groups respectively to be 70.68, 79.36 and 53.83%, thus leaving a difference of -8.69 and 16.84% for the former and latter to be explained by OB decomposition (Tables 3a & 4a). Further, between the livelihood status of the beneficiary and spill-over groups (Table 3b), the threefold decomposition results showed that, of the -8.69% livelihood difference, approximately 4.09% is significantly attributed to group differences in endowment (i.e., socio-economic attributes- age, gender, education etc.), -1.05% is due to structural difference, and the remaining -11.73% is significantly attributed to interaction effect. Succinctly, it is misleading to presume that the programme intervention had significant impact on beneficiary livelihood against the spillover group as indicated by the short and long-run impacts results. Noteworthy, the endowment and structural (discrimination) effects are of opposite signs; however, unlike the former that was statistically significant at 10% probability level, the former was not statistical significant. Relative to the spill-over group, the

positive sign of the endowment effect implied that on the average, the beneficiary group had more characteristics (socio-economic) that are associated to better livelihood status. This suggests that beneficiaries start from a relatively advantageous position in terms of individual characteristics. Conversely, the negative sign associated with the structural effect implied the beneficiary group didn't have a clear structural advantage (i.e., programme intervention) over the spillover group. This suggests that external factors or institutional barriers may still limit their livelihood improvements, meaning the programme's impact may not be fully realized in practice. Also, the negative interaction effect highlights the complexity of the programme's impact, suggesting that simply having better characteristics does not translate into improved livelihoods due to structural barriers.

Furthermore, presented in Figure 2a are the estimation results of each variable coupled with error bars that indicate 95% confidence interval. In the endowment section, all the variables had insignificant influence. Likewise, except household size variable, all the remaining variables in the coefficient (discrimination) component were statistically insignificant. As the difference in the household size (2.9633) between the beneficiary and spill-over groups showed, the livelihood status for an additional person to a household is greater for the spill-over group by 2.96%. Thus, as seen in Figure 2a, differences in the regression coefficients on household size variable account for the decisive portion in the livelihood gap.

Generally, the findings caution against assuming that the programme has a straightforward positive impact on beneficiaries compared to spillover groups. The analysis indicates that while beneficiaries have advantageous characteristics, the lack of structural benefits complicates the overall impact assessment. In other words, the finding caution against assuming significant programme effectiveness based solely on short- and long-term impacts, as the overall livelihood difference indicates underlying challenges. Consequently, to enhance the livelihoods of beneficiaries, it is essential to address structural inequalities and barriers that prevent the effective utilization of their socio-economic advantages. Likewise, it is imperative to enhance the effectiveness of programme interventions. Simply having favorable socio-economic characteristics is not enough if structural inequalities persist. In summary, while NEAZDP beneficiaries have favorable attributes, the programme's structural shortcomings must be addressed to achieve meaningful livelihood improvements.

Nevertheless, between the livelihood status of the beneficiary and control groups (Table 4b), the results of threefold decomposition suggests that, of the 16.84% livelihood gap, 5.37% was due to significant differences in the endowment (i.e., age, gender, marital status etc.), 17.29% was due to significant differences in coefficients, i.e., discrimination (programme intervention) effect, while the remaining -5.82% was due to interaction effect. Noteworthy, both the endowment and discrimination coefficients were positively signed, thus implied that both endowment and structural advantages favour the beneficiary group over the control group. In other words, the positive sign of the endowment coefficient means that the beneficiary group had more characteristics associated with better livelihood status compared to the control group. In the same vein, the positive sign of the discrimination coefficient means that the beneficiary group had structural advantage in its livelihood status over the control group due to its participation in the programme. Besides, as evident from Figure 2b all the predictors in the endowment component had insignificant influence whereas in the coefficient component with the sole exception of household size variable all the remaining variables appeared to have a statistical insignificant influence. Similarly, the difference in the household size between the beneficiary and control groups (4.50) showed that, for an additional person to a household, the livelihood status of the beneficiary group is better (greater) than that of the control group by 4.50%. Succinctly, differences in the regression coefficients on household size are responsible for the decisive portion of livelihood gap. Interestingly, to quantify the magnitude of the livelihood differential due to programme discrimination, the difference between the structural gap

for beneficiary versus spillover groups (1.05%) and the structural gap for beneficiary versus control groups (17.29%) was calculated. The difference between these two gaps is -16.24%. Given that the spillover group suffered from both programme discrimination and spillover effect, whereas the control group was only affected by the programme intervention; the negative difference-in-difference is quite unexpected. However, in a different study by Tsu-Yu and Andrew (2010) in a study on decomposition of the black-white wage differential in the physician market, a similar scenario of negative difference-in-difference was established.

Generally, the implications of these results for NEAZDP beneficiaries are that their participation in the programme significantly enhances their livelihood status. Beneficiaries not only possess favorable socio-economic characteristics but also benefit from structural advantages provided by the programme. This dual benefit leads to a marked improvement in their overall livelihoods compared to the control group.

On the other hand, for the twofold decomposition, the two negative weights is an indication that the reference coefficients emanated from the pooled regressions either without (-1) or with (-2) the group indicator variable included as a covariate. This is in line with previous works done by Sadiq *et al*, (2022b) and Neumark (2018). At weight (-1), for the beneficiary versus spillover groups (Table 3c), the overall twofold decomposition results showed that of the -8.69% livelihood gap, endowment (explained) effect accounted for -4.06% whereas the discrimination (unexplained) effect significantly accounted for -4.63%. Interestingly, the negative sign associated with endowment effect implied that on the average the spillover group had more characteristics associated with higher livelihood status over the beneficiary group. Similarly, the negative sign associated with discrimination effect means that the structural advantage (programme intervention) didn't favour the beneficiary group over the spillover group. Further, given that the unexplained component of the livelihood gap occurred due to programme discrimination, and the pooled regression coefficients were non-discriminatory, the OB decomposition indicates that the significant -2.47% of the unexplained part originated from discrimination against the beneficiary group (component "unexplained A") while the significant -2.16% came from discrimination in favour of the spillover group (component "unexplained B"). In addition, the results of variable-to-variable twofold decomposition presented in Figure 2c are consistent with the threefold decomposition (Figure 2a) as the livelihood gap is driven by household size.

Similarly, at weight (-1), the results of overall twofold decomposition indicated that the 16.84% livelihood gap between the beneficiary and control groups (weight (-1)) can be decomposed into 8.07% that is explained by group differences in the explanatory variables and 8.78% that is unexplained (Table 4c). Noteworthy, the positive sign associated with both the endowment and discrimination effects implied that the beneficiary group benefits more from endowments and have a clear structural advantage respectively over the control group. Further, since the unexplained component of the livelihood gap occurred due to programme discrimination, and the pooled regression coefficients were non-discriminatory, the OB decomposition indicated that the significant 4.71% of the unexplained part originated from discrimination in favour of the beneficiary group (component "unexplained A"), while the significant 4.07% emanated from discrimination against the control group. In addition, the results of variable-to-variable twofold decomposition presented in Figure 2d are consistent with the threefold decomposition (Figure 2b) as the livelihood gap is driven by household size. Interestingly, in quantifying the magnitude of livelihood differential due to programme discrimination, the difference between the unexplained gaps (beneficiary against spillover and control groups) is -4.15%. Since the spillover group suffered from both programme discrimination and spillover effect, while the control group was only affected by programme discrimination; the negative difference-in-difference is quite unexpected.

Furthermore, at weight (-2), the livelihood gap of -8.69% for beneficiary versus spillover groups can be

decomposed into -1.47% that is explained by group differences in the explanatory variables and the significant -7.22% that is unexplained (Table 3c). With respect to the negative sign associated with both explained and unexplained effects, the scenario is the same with what unfold at weight (-1). Besides, since the unexplained component of the livelihood gap happened due to programme intervention, and the pooled regression coefficients were non-discriminatory, the OB decomposition showed that -2.80e-14% of the unexplained part originated from discrimination against the beneficiary group (component "unexplained A") while the significant -7.22% came from discrimination in favour of the spillover group (component "unexplained B"). In addition, the results of variable-to-variable twofold decomposition presented in Figure 6e are consistent with the threefold decomposition (Figure 2a) as the livelihood gap is driven by household size.

Similarly, at weight (-2), the livelihood gap of 16.84% for beneficiary versus control groups can be delineated into 3.33% that owed to explained effect and 13.52% that owed to unexplained effect (Weight (-2)) (Table 4c). Succinctly, the positive sign of both the explained and unexplained coefficients respectively implied that beneficiary group is better endowed and have a clear structural advantage over the control group. Besides, given that the pooled regression coefficients were non-discriminatory and the unexplained component of the livelihood differential occurred due to programme intervention, the OB decomposition revealed that -6.75e-14% of the unexplained effect emanated from discrimination against the beneficiary group (component "unexplained A") whereas the significant 13.52% originated from discrimination against the control group (component "unexplained B"). In addition, the results of variable-to-variable twofold decomposition presented in Figure 2f are consistent with the threefold decomposition (Figure 2b) as the livelihood gap is driven by household size. Noteworthy, in quantifying the magnitude of livelihood differential due to programme discrimination, the difference between the unexplained gaps (beneficiary vis-à-vis the spillover and control groups) is -6.3%. Since the control group was only affected by programme discrimination, while the spillover group suffered from both programme discrimination and spillover effect; quietly, the negative difference-in-difference is still unexpected.

Table 3a: Summary of variables in the Oaxaca-blinder decomposition model for beneficiary vs. spillover

Items	**Beta A**	**Beta B**	**Beta diff**	**Reg. A**	**Reg.B**	**Reg.pool1**	**Reg.pool2**	**Mean A**	**Mean B**	**Diff.**
Intercept	118.8382	64.21355	54.62466	118.8	64.21	111.1	98.82	1	1	0
A	-1.283599	-0.003039	-1.280561	-1.284	-0.00303	-1.084	-0.9125	50.025	48.59124	1.433759
G	-11.94569	14.56452	-26.51021	-11.95	14.56	3.128	2.884	0.816667	0.781022	0.0356448
M	-7.882345	-4.305698	-3.576647	-7.882	-4.306	-7.017	-7.045	0.891667	0.883212	0.0084550
EP	0.9123453	0.1696692	0.7426761	0.9123	0.1697	0.2038	0.3964	8.258333	6.489051	1.769282
HS	3.120083	0.1567578	2.963325	3.120	0.1568	1.919	1.513	12.46667	13.87591	-1.409246
EX	4.411735	-0.460654	4.872389	4.412	-0.4607	1.368	0.6223	0.291667	0.328467	-0.036801
CR	-9.225426	-3.428293	-5.797133	-9.225	-3.428	-7.430	-8.302	0.2	0.350365	-0.150365
CP	-2.926991	4.253685	-7.180676	-2.927	4.254	-0.1344	0.01467	0.558333	0.532847	0.0254866
AG	-3.124582	2.807130	-5.931712	-3.125	2.807	-1.018	-0.09756	5.116667	3.788321	1.328345
IN	0.0000199	-0.00003437	0.0000542	0.00001985	-0.00003444	0.000003255	0.000005462	230872.1	206613.1	24258.94
Class/mean								**70.6757**	**79.36223**	**-8.686523**

Source: Field survey, 2023

Note: Diff. =Difference; Reg. =Regression; A = Age; G = Gender; M = Marital status; EP = Education of primary household head; HS = Household size; EX = Extension service; CR = Credit facilities; CP = Cooperative membership; AG = Agricultural holdings; IN = Income

Table 3b: Gap due to discrimination of participation (Threefold Decomposition)

Items	Endowment effect			Coefficient effect			Interaction effect		
	Coeff.	**SE**	**t-stat**	**Coeff.**	**SE**	**t-stat**	**Coeff.**	**SE**	**t-stat**
Intercept	0.000	0.000	0.000^{NS}	54.624658	46.347802	1.179^{NS}	0.000	0.000	0.000^{NS}
A	-0.00436	0.774327	-0.006^{NS}	-62.22403	45.158501	-1.378^{NS}	-1.836016	1.4781541	-1.242^{NS}
G	0.51915	0.716805	0.724^{NS}	-20.70506	8.402123	-2.464**	-0.944950	1.3666545	-0.691^{NS}
M	-0.03640	0.469218	-0.078^{NS}	-3.158937	15.231434	-0.207^{NS}	-0.030241	0.8724531	-0.035^{NS}
EP	0.30019	0.672951	0.446^{NS}	4.819263	5.129685	0.939^{NS}	1.314004	1.6024811	0.820^{NS}
HS	-0.22091	0.619473	-0.357^{NS}	41.11884	12.400584	3.316***	-4.176053	1.8907270	-2.209**
EX	0.01695	0.170803	0.099^{NS}	1.600420	2.562605	0.625^{NS}	-0.179306	0.4591398	-0.391^{NS}
CR	0.51550	0.792607	0.650^{NS}	-2.031112	3.057370	-0.664^{NS}	0.871686	1.3031406	0.669^{NS}
CP	0.10841	0.446384	0.243^{NS}	-3.826200	3.758974	-1.018^{NS}	-0.183011	0.7110278	-0.257^{NS}
AG	3.72884	1.747102	2.134**	-22.471230	9.273853	-2.423**	-7.879363	4.0865386	-1.928*
IN	-0.83370	0.789198	-1.056^{NS}	11.201274	7.511744	1.491^{NS}	1.315169	1.3659688	0.963^{NS}
Effect	4.093671	2.447764	1.672*	-1.052112	5.144649	-0.205^{NS}	-11.728082	5.908395	-1.985*
WD	78.31012			78.31012					
% of Disc.				-1.326					

Source: Field survey, 2023

Note: Coeff. = Coefficient; SE = Standard error; WD = without discrimination (mean value of livelihood status for spillover plus discrimination coefficient); Disc. = Discrimination (discrimination value divided by the mean value of livelihood status for spillover)

Table 3c: Gap due to discrimination of participation (Twofold decomposition)

Items	Explained			Unexplained		
	Coeff.	**SE**	**t-stat**	**Coeff.**	**SE**	**t-stat**
0	4.093671	2.447764	1.67*	-12.780194	4.291312	-2.978***
1	-7.634411	5.177308	-1.475^{NS}	-1.052112	5.144649	-0.205^{NS}
0.5	-1.770370	2.769611	-0.642^{NS}	-6.916153	3.703256	-1.868*
0.46	-1.382476	2.897810	-0.477^{NS}	-7.304047	3.744143	-1.951*
-1	-4.056044	2.679614	-1.514^{NS}	-4.630479	1.859181	-2.491**
-2	-1.467327	2.782855	-0.527^{NS}	-7.219196	2.904167	-2.486***
WD (-1)	74.73174^			74.73174^^		
WD (-2)	72.14303^			72.14303^^		
% of Disc. (-1)						
% of Disc. (-2)						
	Unexplained A			**Unexplained B**		
	Coeff.	**SE**	**t-stat**	**Coeff.**	**SE**	**t-stat**
0	-12.78019	4.291312	-2.978***	0	0	0.000^{NS}
1	0	0	0.000^{NS}	-1.0521118	5.1446489	-0.205^{NS}
0.5	-6.390097	2.145656	-2.978***	-0.5260559	2.5723245	-0.205^{NS}
0.46	-6.812788	2.003726	-3.400***	-0.4912584	2.7424782	-0.179^{NS}
-1	-2.468388	0.9957417	-2.479**	-2.1620913	0.8877375	-2.436**
-2	-2.797762E-14	1.145431e-13	-2.443**	-7.2191958	2.9041670	-2.486**

Source: Field survey, 2023

Note: A= Beneficiary group; B= Non-beneficiary group (spill-over); WD = without discrimination; ^ = mean livelihood status of beneficiary minus endowment coefficient (-1/-2); ^^ = mean livelihood status of spill-over group plus discrimination coefficient (-1/-2)

Table 4a: Summary of variables in the Oaxaca-blinder decomposition model for beneficiary vs. control

Items	Beta A	Beta B	Beta diff	Reg. A	Reg.B	Reg.pool 1	Reg.pool2	Mean A	Mean B	Diff.
Intercept	118.8382	62.51825	56.31996	118.8	62.52	72.44	82.05	1	1	0
A	-1.283599	0.4262763	-1.709876	-1.284	0.4263	0.1391	0.03442	50.025	47.4964	2.528597
G	-11.94569	-5.867957	-6.077735	-11.95	-5.868	-13.75	-13.6	0.816667	0.8633094	-0.04664
M	-7.882345	-6.931972	-0.950374	-7.882	-6.932	-5.217	-6.338	0.891667	0.8992806	-0.00761
EP	0.912345	-0.377710	1.290056	0.9123	-0.378	0.211	0.3205	8.258333	10.20863	-1.95030
HS	3.120083	-1.381739	4.501822	3.120	-1.382	-0.1796	-0.03878	12.46667	12.36691	0.099760
EX	4.411735	-2.937905	7.349639	4.412	-2.938	-3.714	-0.2321	0.291667	0.7697842	-0.47812
CR	-9.225426	-4.526016	-4.699410	-9.225	-4.526	-9.006	-5.309	0.2	0.647482	-0.44748
CP	-2.926991	7.649239	-10.57623	-2.927	7.649	6.030	5.414	0.558333	0.5035971	0.054736
AG	-3.124582	1.035691	-4.160273	-3.125	1.036	-0.3666	-0.3149	5.116667	5.258993	-0.14233
IN	0.00001985	-0.00000488	0.0000247	0.0000199	-0.00000488	0.0000188	0.000005295	230872.1	162975.9	67896.22
Class/ mean								**70.6757**	**53.8313**	**16.8444**

Source: Field survey, 2023

Table 4b: Gap due to discrimination of participation (Threefold Decomposition)

Items	Endowment effect			Coefficient effect			Interaction effect		
	Coeff.	SE	t-stat	Coeff.	SE	t-stat	Coeff.	SE	t-stat
Intercept	0.000	0.000	0.000^{NS}	56.3199588	28.241397	2.811^{***}	0.000	0.000	0.000^{NS}
A	1.0778811	0.6486954	1.66^{*}	-81.212950	28.443781	-2.855^{***}	-4.3235870	2.4164220	-1.789^{*}
G	0.2736973	0.3089808	0.886^{NS}	-5.2469656	10.359244	-0.507^{NS}	0.2834818	0.7840787	0.362^{NS}
M	0.0527794	0.3585284	0.147^{NS}	-0.8546526	10.400016	-0.082^{NS}	0.0072361	0.3894232	0.019^{NS}
EP	0.7366484	0.7997587	0.921^{NS}	13.1697048	8.921882	1.476^{NS}	-2.5159952	2.1479915	-1.171^{NS}
HS	-0.137843	0.6713755	-0.205^{NS}	55.6736155	12.019640	4.632^{***}	0.44910266	1.8713449	0.240^{NS}
EX	1.4046637	2.0548505	0.684^{NS}	5.6576361	5.457595	1.037^{NS}	-3.5139913	3.3560550	-0.047^{NS}
CR	2.0253108	1.8750223	1.080^{NS}	-3.0427832	4.917052	-0.619^{NS}	2.10290130	3.4174283	0.615^{NS}
CP	0.4186904	0.5014657	0.835^{NS}	-5.3261589	2.828510	-1.88^{*}	-0.5789028	0.5479915	-1.056^{NS}
AG	-0.147406	0.2654868	-0.555^{NS}	-21.878845	11.599311	-1.886^{*}	0.59211558	1.1712152	0.506^{NS}
IN	-0.331990	1.7807919	-0.186^{NS}	4.0315084	4.933031	0.817^{NS}	1.67953818	2.2474289	0.747^{NS}
Effect	5.372433	2.321539	2.314^{**}	17.290068	5.777820	2.992^{***}	-5.818101	5.775609	-1.007^{NS}
WD	71.121368			71.121368					
% of Disc.				32.12					

Source: Field survey, 2023

Note: Coeff. = Coefficient; SE = Standard error; WD = without discrimination; Disc. = Discrimination

Table 4c: Gap due to discrimination of participation (Twofold decomposition)

Items	Explained			Unexplained		
	Coeff.	SE	t-stat	Coeff.	SE	t-stat
0	5.372433	2.321539	2.314^{**}	11.471967	4.240630	2.705^{***}
1	-0.445668	4.537782	-0.098^{NS}	17.290068	5.777820	2.992^{***}
0.5	2.463382	2.156639	1.142^{NS}	14.381018	4.164572	3.453^{***}
0.46	2.676787	2.292067	1.168^{NS}	14.167612	4.237146	3.344^{***}
-1	8.068098	1.382830	3.930^{***}	8.776301	2.480836	3.538^{***}
-2	3.328051	2.052944	1.621^{NS}	13.516349	4.079987	3.313^{***}

WD (-1)	62.60760^			62.60760^^		
WD (-2)	67.34765^			67.34765^^		
% of Disc. (-1)						
% of Disc. (-2)						
	Unexplained A			**Unexplained B**		
	Coeff.	**SE**	**t-stat**	**Coeff.**	**SE**	**t-stat**
0	11.47197	4.240630	2.705***	0.00	0.00	0.00NS
1	0.00	0.00	0.000NS	17.290068	5.777820	2099**
0.5	5.735984	2.120315	2.705***	8.645034	2.888910	2.992***
0.46	6.156770	1.964770	3.334***	8.010842	3.100838	2.583***
-1	4.710061	1.418166	3.321***	4.066240	1.108526	3.668***
-2	-6.750156E-14	9.145407E-14	-0.738NS	13.516349	4.079987	3.313***

Source: Field survey, 2023

Note: A= Beneficiary group; B= Non-beneficiary group (control); WD = without discrimination; ^ = mean livelihood status of beneficiary group minus endowment coefficient; ^^ = mean livelihood status of control group plus discrimination coefficient

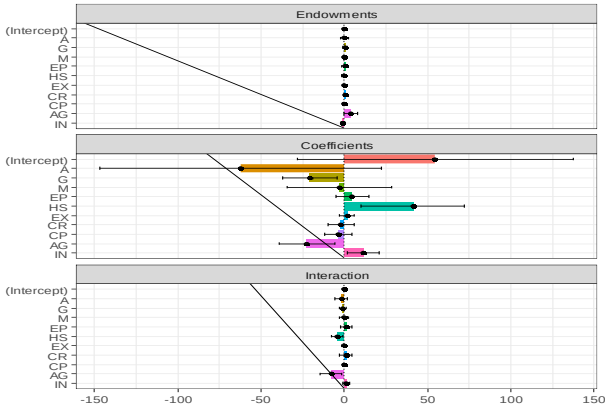

Figure 2ai: Three fold decomposition-Beneficiary vs. Spillover

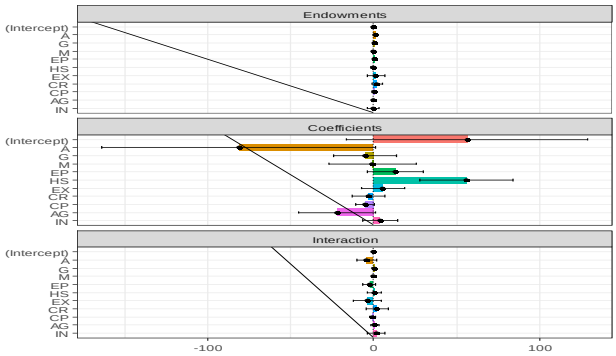

Figure 2bi: Three fold decomposition-Beneficiary vs. Control

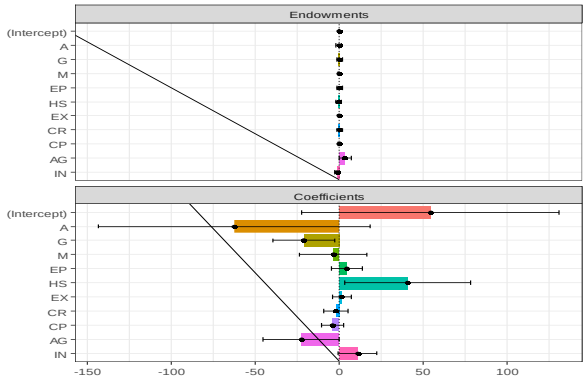

Figure 2aii: Three fold decomposition-Beneficiary vs. Spillover

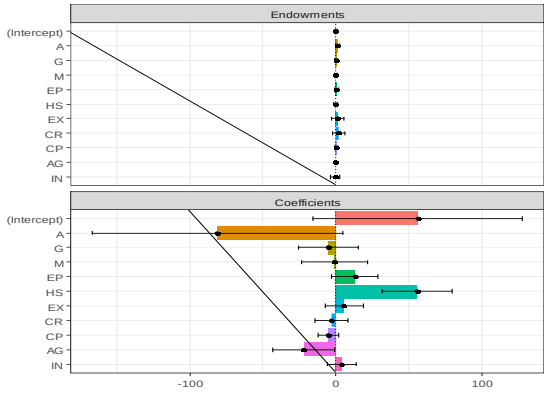

Figure 2bii: Three fold decomposition-Beneficiary vs. Control

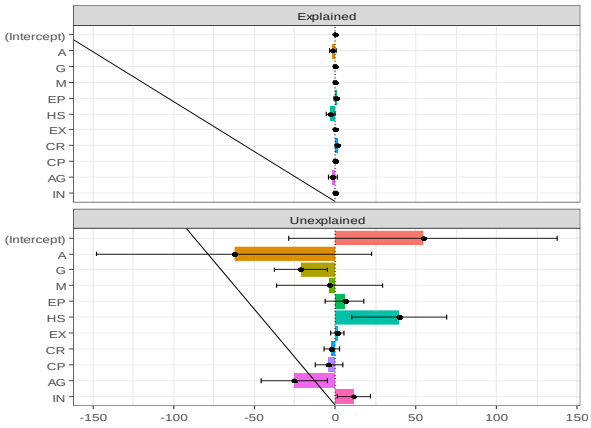

Figure 2c: Twofold- Beneficiary vs. Spillover (-1)

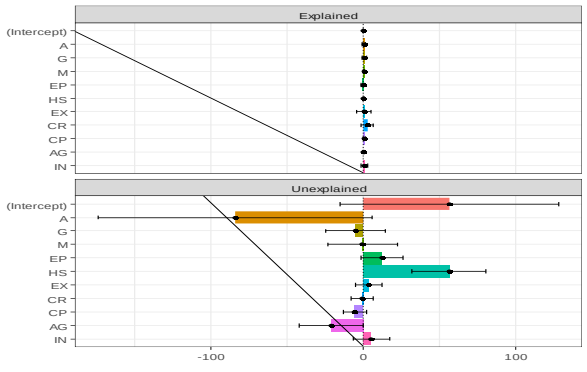

Figure 2e: Twofold- Beneficiary vs. Spillover (-2)

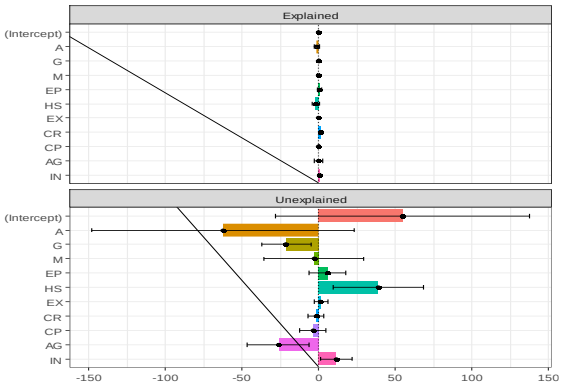

Figure 2d: Twofold- Beneficiary vs. Control (-1)

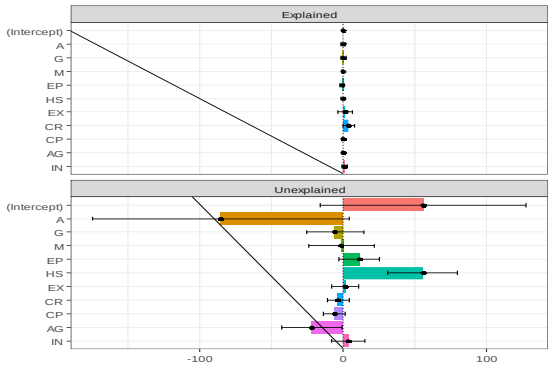

Figure 2f: Twofold- Beneficiary vs. Control (-2)

CONCLUSION AND RECOMMENDATION

The NEAZDP significantly impacts beneficiaries' livelihood status both positively and negatively, highlighting areas of success and limitations. In the short run, NEAZDP participants experienced notable livelihood improvements over both spill-over and control groups, as indicated by differences in slopes and intercepts. These gains reflect a targeted impact that aligns with beneficiaries' preferences and needs. However, in the long run, the programme's benefits diminished; the livelihood of beneficiaries falls below the spill-over group, suggesting potential shortcomings in sustaining impact. Spill-over effects indicate that the programme indirectly benefits non-participants, enhancing community-wide economic outcomes. The Oaxaca-Blinder decomposition reveals that beneficiary groups possess favorable socio-economic characteristics compared to control and spill-over groups, but these advantages do not fully translate into livelihood improvements due to structural barriers within the programme. Consequently, the following recommendations are proffered:

1. To improve the NEAZDP's long-term effectiveness, programme modifications should focus on addressing structural barriers that currently limits the full realization of livelihood improvements for beneficiaries. Implementing ongoing support mechanisms, skill development, and community resources could help ensure

that gains in livelihood status are sustained beyond initial programme phases.

2. Since structural inequalities persist despite socio-economic advantages, NEAZDP should work to eliminate these barriers, potentially by advocating for supportive policies or partnerships with other agencies to tackle external factors affecting beneficiary livelihoods.

3. Given the influence of household size on livelihood outcomes, NEAZDP should tailor interventions to household characteristics and composition. Policies that recognize the needs of larger households or provide targeted support based on family dynamics could enhance programme impact.

4. The indirect benefits observed in the spill-over group indicate that expanding NEAZDP's reach to include a broader range of community members could amplify positive outcomes. Developing community-based initiatives or providing access to programme resources for non-participants could strengthen the overall socio-economic impact.

5. To maximize its benefits, NEAZDP should establish a regular evaluation process that includes both quantitative and qualitative assessments of impact. These assessments could inform iterative adjustments to the programme design, ensuring that it continues to meet the evolving needs of its participants and addresses unforeseen challenges.

Through these strategies, NEAZDP can improve its efficacy, ensuring both immediate and enduring positive impacts on beneficiaries' livelihoods.

Conflict of Interest

The Authors declare no conflict of interest.

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التأثير التمييزي لبرنامج NEAZDP على سبل عيش المجتمعات المستفيدة في ولاية يوبي النيجيرية

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ملخص

يُبرز التأثير التمييزي لبرنامج NEAZDP على سبل عيش المجتمعات المستفيدة في ولاية يوبي النيجيرية ضرورة معالجة التفاوتات في النتائج الاجتماعية والاقتصادية والعوائق الهيكلية التي تحد من تأثير البرنامج العادل والمستدام. وبناءً على ذلك، تدرس هذه الدراسة الآثار الهيكلية (البرنامجية) والتمويلية على وضع المستفيدين المعيشي، بمقارنة النتائج عبر مجموعات المستفيدين، والمجموعات غير المستفيدة، ومجموعات الضبط. وباستخدام أسلوب أخذ العينات متعدد المراحل، اعتمدت الدراسة على بيانات مسح مقطعي تم الحصول عليها من خلال استبيان مُهيكل جيدًا، إلى جانب جدول مقابلات، شملت 396 مشاركًا موزعين على المجتمعات المُعالجة وغير المُعالجة في ولاية يوبي النيجيرية. كما حققت الدراسة أهدافها باستخدام الإحصاءات الاستدلالية بدقة. على المدى القصير، يُظهر التحليل الإحصائي تحسنًا ملحوظًا في سبل عيش المشاركين في برنامجNEAZDP ، حيث تشير النتائج إلى أن البرنامج يُلبي احتياجات محددة ويُعزز النتائج الاقتصادية للمستفيدين. ومع ذلك، يكشف التحليل طويل المدى عن انخفاض في مستوى معيشة المستفيدين مقارنةً بالفئات غير المستفيدة، مما يُشير إلى تحديات محتملة في استدامة الآثار الإيجابية للبرنامج. من خلال تحليل أواكساكا–بليندر، توصلت الدراسة إلى أنه على الرغم من تمتع المستفيدين بخصائص اجتماعية واقتصادية مواتية، إلا أن العوائق الهيكلية داخل البرنامج تحد من مكاسبهم في سبل عيشهم. وتتمتع الفئات غير المستفيدة، على الرغم من عدم مشاركتها، بفوائد غير مباشرة، مما يُشير إلى آثار مجتمعية أوسع. تشمل التوصيات تعزيز الدعم الهيكلي، وتحسين تدخلات البرنامج، والاستفادة من الآثار غير المستفيدة لتعظيم نطاق البرنامج. ويُؤكد هذا التحليل على الحاجة إلى الرصد والتكيف المستمرين للحفاظ على فعالية برنامج NEAZDP في تعزيز التحسينات المستدامة في سبل عيش المستفيدين.

الكلمات الدالة: التنمية؛ الأثر؛ سبل العيش؛ البرنامج؛ الاستدامة؛ نيجيريا.

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