

# IMPACT ASSESSMENT OF NON-FARM ENTERPRISES ON POVERTY STATUS OF RURAL FARMING HOUSEHOLDS IN NIGERIA

Roseline Jumoke Kolawole<sup>1</sup>✉, Adekemi Adebisola Obisesan<sup>1</sup>

<sup>1</sup>Federal University of Technology, Nigeria

**Abstract.** This study evaluates the impact of non-farm enterprises on the poverty status of rural farming households in Nigeria. The data were obtained from General Household Survey fielded by the National Bureau of Statistics in 2010/2011 and 2015/2016. However, only 1,619 matched observations were used for analyses, using Propensity Score Matching, Double Difference, Foster-Greer-Thorbecke poverty measures and Poverty Equivalent Growth Rates (PEGRs). The results show that 53.3% of participants lived below the poverty line (poor) in 2011, while in 2016, this proportion declined to 31.94%. The poverty incidence of female participants (0.5504) decreased by 53.68% while that of male participants (0.4112) decreased by 4.81%. If female participants had not participated in non-farm enterprises, their poverty would have been reduced by only 9.7% but due to participation, it was reduced by 53.68%. The Poverty Equivalent Growth Rates are higher for all the three FGT measures than the actual growth rates for all participants, males and females with females showing higher poverty reduction; which means that growth was pro-poor, although the poverty of the poor decreased more than that of the core poor. Also, after five years there is a decline in poverty incidences of participants across the six geopolitical zones and the decline was mostly felt in the North East (NE) followed by North Central (NC) while the least percentage decline was seen in North West (NW). Since participation in non-farm activities had a significant impact on the poverty of participants, the promotion of non-farm enterprises among poor farmers should be encouraged.

**Keywords:** impact, non-farm enterprises, poverty, farming households, rural Nigeria

## INTRODUCTION

Poverty is a critical limiting factor to attaining sustainable development in developing countries (AfDB, 2014). Despite massive progress in reducing poverty in some parts of the world over the past couple of decades, about 736 million people were still living below the international poverty line of \$1.90 a day in 2016. The majority of this poor belong to southern Asia and sub-Saharan Africa. Most of the world's rural poor live in rural areas, they are often found in small fragile and conflict-affected countries (World Bank, 2017; United Nations, 2018).

In many African countries, the share of rural areas in overall poverty is around 90%. The bulk of the rural poor comprises smallholder farmers, artisans, fishermen, wage labourers, rural women, youth, indigenous peoples and ethnic minorities and the landless in sub-Saharan Africa (SSA). Seven out of ten countries with the most people living in poverty in rural areas are in sub-Saharan Africa which represents three-quarters (76 per cent) of global rural poverty (305 million people). Even though this number is expected to decline over the next decade to 245 million, Africa's share in global rural poverty is expected to increase to 85 per cent in 2030 (Kharas, Di Nucci, Hamel and Tong, 2020). Rural poverty results from lack of assets, limited economic opportunities, poor education and capabilities, as well as disadvantages rooted in social and political inequalities (International Fund for Agricultural Development (IFAD, 2011).

✉ Roseline Jumoke Kolawole, Department of Entrepreneurship, Federal University of Technology, Akure, Nigeria, e-mail: rjakinlade@futa.edu.ng/jummy120@yahoo.co.uk, <https://orcid.org/0000-0003-1042-212X?lang=en>

According to AfDB (2018), about 152 million Nigerians live on less than \$2 a day, indicating that about 80 per cent of the country's estimated 190 million population is extremely poor. The rural sector is the most affected area with farming households being the poorest. Recently, Nigeria tops the list in terms of poverty numbers in both rural and urban areas. It is projected that Nigeria's rural poverty would increase by nearly 4 million people (7 per cent) over the next 10 years (Kharas et al., 2020).

This menace of poverty has been the cause of concern to the Nigerian government for a long time. Several policies and programmes were designed and implemented to achieve the Millennium Development Goal (MDG) of halving extreme poverty by 2015, but the fact that this was not achieved necessitates the need for the Nigerian Government to join the rest of the world in pursuing the Sustainable Development Goal of eradicating extreme poverty by 2030 through targeting those living in vulnerable communities.

Moreover, the majority of rural households in Nigeria do not limit labour allocation to agriculture, but also operate and work in non-farm enterprises owing to the seasonality of agriculture (Reardon et al., 2006; Nagler and Naude, 2017). Rural non-farm activities are an important part of complex income strategies of rural households (World Bank, 2017). Non-farm activities include all economic activities in rural areas except crop cultivation, livestock rearing, fishing and hunting. These activities have implications for poverty reduction (Brunton et al., 2013).

A number of studies (Anyanwu, 2010; Awoyemi, 2011; Abbott et al., 2012; Scharf and Rahut, 2014; Katsushi et al., 2015; Oladimeji et al., 2015; Adjognon et al., 2017; Lambon-Quayefio, 2017; Nagler and Naude, 2017; Iqgal et al., 2018; Megbowon and Mushunje, 2018; Kinuthia et al., 2019) have been carried out on non-farm enterprises as National livelihood strategy but none assessed their effect on rural farming households in Nigeria using panel data with the use of a counterfactual framework. This study evaluates the impact of non-farm enterprises on the poverty of rural farming households in Nigeria. Therefore, the following research questions were answered by this study:

- (1) How does income from non-farm activities affect the poverty status of rural farming households?
- (2) Is income growth from non-farm activities pro-poor?

## RESEARCH METHODS

### Area of study

Nigeria is a country in West Africa that has a population of about 195.88 million with an average population growth rate of about 2.7%. It has an area of 923,768 square kilometres situated between the longitude of 3° and 15° east and the latitude of 4° and 14° north. The country is bounded on the west by the Republic of Benin; on the east by the Republic of Cameroon; on the north by the Republics of Niger and Chad and on the south by a vast coastline of the Atlantic Ocean. The 1999 Federal constitution decentralized and distributed power among the federal government, 36 states and 774 local governments. Rural living and agriculture-dependent livelihoods are strongly associated with poverty in Nigeria. While oil dominates the Nigerian economy (generating 70% of fiscal revenues and earnings at 90% of its foreign exchange), the agriculture sector employs the vast majority (over 70%) of the Nigerian workforce. Farms are the main livelihood asset.

### Sources of data

Secondary data was used in this study. General Household Survey (GHS-Panel) fielded by the National Bureau of Statistics in 2010/2011 and 2015/2016. The panel component (GHS-Panel) applies to 5,000 households of the GHS collecting additional data on multiple agricultural activities, community and household consumption. The survey covered all 36 states and the Federal Capital Territory (FCT), Abuja. Both urban and rural enumeration areas (EAs) were covered. However, in this study, only 1,619 matched observations for rural farming households were used.

### Analytical techniques

The analytical techniques used in this study include: Descriptive statistics, Propensity Score Matching (PSM), Difference in Difference Estimator (Double Difference), Foster-Greer-Thorbecke (FGT) poverty measures and Poverty Equivalent Growth Rate (PEGR)

### Estimating the impact

The data were matched using Propensity Score Matching (PSM). PSM aims to find a comparison group from a sample of non-participants that is closest to the sample of participants so as to obtain the impact of micro-enterprises on the participants.

The propensity scores were computed using the Binary Probit Regression model given as:

$$P(X) \equiv Pr\{D = 1/X\} = E\{D/X\} \quad (1)$$

where  $D = \{0, 1\}$  is the indicator of exposure to treatment characteristics (dependent variable), that is,  $D = 1$ , if participating in micro-enterprises and  $D = 0$  if not participating in micro-enterprises;  $X$  is the multidimensional vector of explanatory variables which are expected to jointly determine the probability to participate in micro-enterprises and the outcome. These variables include zone, state, gender, household size, age, marital status, farm income, father's education, father's occupation, mother's education and mother's occupation. Since the match has been tested for good quality, the study used the matched sample for analysis.

However, since PSM is subject to the problem of 'selection on unobservables', that is the participant and control groups may differ in unobservable characteristics, even though they are matched in terms of observable characteristics. Therefore the Double Difference (DD) estimator was used to compliment Propensity Score Matching (PSM) in order to address the problem of selection on unobservables. The DD estimator compares changes in outcome measures (i.e. changes from periods 2011 and 2016) between participants and non-participants. The advantage of this is that it nets out the effect on outcome indicator (Ravallion, 2005).

Explicit exploration of Difference in difference estimator is presented below

$$\begin{aligned} \text{Difference in Difference Estimator} = \\ = E[(Y_{p1} - Y_{p0}) - (Y_{np1} - Y_{np0})] \end{aligned} \quad (2)$$

where:

- $Y_{p1}$  – income of participants in period 2016
- $Y_{p0}$  – income of participants in period 2011
- $Y_{np1}$  – income of non-participants in period 2016
- $Y_{np0}$  – income of non-participants in period 2011
- $E$  – expected value.

**Measurement of Poverty:** poverty status of participants and non-participants achieved by using the Foster-Greer-Thorbecke (1984) class of poverty measures (FGT) including the Headcount Index ( $P_0$ ), the Poverty Gap Index ( $P_1$ ), and the severity of Poverty Index ( $P_2$ ).

The FGT is presented thus;

$$P_\alpha = \frac{1}{n} \sum_{i=1}^q \left[ \frac{Z - y_i}{Z} \right]^\alpha \quad (3)$$

### Poverty equivalent growth rate (pegr)

The PEGR ( $\hat{\gamma}^*$ ) can be written as:

$$\hat{\gamma}^* = (\hat{\sigma} / \hat{\eta})\hat{\gamma} = \hat{\phi}\hat{\gamma} \quad (4)$$

where:

- $\hat{\sigma}$  – the estimate of total poverty elasticity
- $\hat{\gamma}$  – an estimate of the growth rate of mean income
- $\hat{\phi}$  – the pro-poor index developed by Kakwani and Pernia (2000)
- $\hat{\eta}$  – an estimate of the growth elasticity of poverty

Equation (6) implies that growth is pro-poor (anti-poor) if  $\hat{\gamma}^*$  is greater (lower) than  $\hat{\gamma}$ . The higher the PEGR ( $\hat{\gamma}^*$ ) the greater the percentage reduction in poverty between the two periods; If PEGR is greater than the actual growth rate then the growth is said to be pro-poor but if PEGR is equal to or lower than the actual growth rate then the growth is said to be anti-poor.

## RESULTS AND DISCUSSION

### Contributions of income from non-farm enterprises to poverty reduction by gender

Per capita consumption expenditure was used as the proxy for annual household income. The poverty lines were computed for respondents using the two-thirds mean per capita household expenditure for 2016. The poverty line was N57,552.85 per annum for the year 2016. Based on the above, 53.3% of participants lived below the poverty line (poor) in the year 2011 while in 2016, this proportion declined to 31.94%. In the year 2011, the proportion of the poor who participated in non-farm enterprises was slightly higher than that of the non-poor, which is an indication that the majority of the participants are necessity entrepreneurs. This finding corroborates that of Oladimeji et al. (2015) which concluded that poverty is a major determinant of participation in nonfarm enterprises. Also, the fact that the proportion of poor participants was reduced in the year 2016 shows that participation in non-farm enterprises has great potential to reduce poverty. Table 1 also reveals that the poverty incidence of female participants was higher than that of the male participants in the year 2011. This finding is in line with that of Anyanwu (2010) revealing that poverty was higher in female-headed households in all the six zones in Nigeria. The poverty incidence of female participants (0.5504) decreased by 53.68% while that of male participants (0.4112) decreased by 4.81% in the year 2016. This shows that poverty incidences of female

**Table 1.** Poverty incidence of respondents by type and gender

Type of respondents/gender	Poverty 2011	Poverty 2016	Impact (%)
Participants	0.5331	0.3194	-20.82
Female	0.5504	0.2243	-53.68
Male	0.4112	0.3329	-4.81
Non-Participants	0.5831	0.4908	
Female	0.5143	0.4643	
Male	0.5487	0.4968	
Mean per capita expenditure		86,329.28	
Poverty Line		57,552.85	

Source: general household survey, 2011–2016.

and male participants have declined and the decline has been deeper in females compared with males. This finding implies that if female participants had not participated in non-farm enterprises their poverty would have been reduced by only 9.7% but due to participation, it was reduced by 53.68% (Table 1). It is also implicit in these findings that poverty was more common among the non-participants than the participants which is an indication that non-farm enterprises are poverty-reducing. This finding is in line with that of Katsushi et al. (2015) stating that rural non-farm employment reduces poverty.

Finally, to further buttress the poverty reduction of participants and to know if the growth between the periods under review has been pro-poor, Poverty Equivalent Growth Rate (PEGR) was used. A higher PEGR relative to the actual growth rate indicates that growth has been pro-poor, also the higher the PEGR the higher the poverty reduction. As presented in Table 2, the Poverty

Equivalent Growth Rate of participants for poverty incidence was higher than the actual growth rate of 33.97%. This implies that the growth was for the poor but not for the very poor (core poor). Also, among males poverty incidence alone was higher than the actual growth rate of 35.44%. In the same vein, for females, poverty incidence and gap were higher than the actual growth rate of 25.23%. This implies that the poverty of the core poor is reduced among females. The result also shows the impact of participation on poverty reduction. The PEGRs for all the three FGT measures are higher than the actual growth rates for all participants, males and females, with females showing higher poverty reduction (Table 2). This implies that the growth was pro-poor, although the poverty of the poor declined more than the core poor. Also, the growth rate of male poverty was higher than that of female poverty but the poverty of females was reduced more than that of males. This is an indication that growth

**Table 2.** Poverty equivalent growth rate of respondents by type and gender

Respondents	PEGR (2011–2016)				Impact			
	growth rate	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	growth rate	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>
Participants	0.3397	0.3956	0.2959	0.2772	0.1467	0.2328	0.1781	0.1726
Male	0.3544	0.3954	0.2992	0.2842	0.1339	0.2101	0.1627	0.1652
Female	0.2524	0.4589	0.2830	0.2338	0.1573	0.3756	0.2423	0.1852
Nonparticipants	0.1930	0.1628	0.1179	0.1047				
Male	0.2206	0.1853	0.1365	0.1190				
Female	0.0951	0.0832	0.0406	0.0486				

Source: general household survey, 2011–2016.

alone cannot bring about poverty reduction but with high reduction in inequality which could be the reason for higher reduction of poverty in female participants.

### Contributions of Income from Non-Farm Enterprises to Poverty Reduction by Geopolitical Zones

Table 3 presents the poverty status of respondents across geopolitical zones. About 57.4%, 78.1%, 56.9%, 40.2%, 26.5% and 33.9% of the participants were poor in the North Central (NC), North East (NE), North West (NW), South East (SE), South-South (SS) and South West (SW) zones respectively in the year 2011. Table 3 also indicates that the poverty incidence of participants across the six geopolitical zones has all declined. This decline was mostly felt in the NE, followed by the NC zone, and the least percentage decline was noted in the NW zone after five years. On average, the FGT poverty indices of participants declined by 64.06%, 35.74%, 26.62%, 23.05%, 3.32% and 1.98% in NE, NC, SS, SE, SW and NW zones respectively.

Table 4 shows the impact of participation on poverty using PEGR. Across the six zones, poverty was reduced considerably both among the poor and the core

**Table 3.** Poverty incidence of respondents across geopolitical zones

Type of respondents	Zone	Poverty 2011	Poverty 2016	% Impact
Participants	NC	0.5744	0.1631	-35.74
	NE	0.7806	0.2064	-64.06
	NW	0.5698	0.5448	-1.98
	SE	0.4015	0.3106	-23.05
	SS	0.2653	0.2143	-26.62
	SW	0.3392	0.1071	-3.32
Non participants	NC	0.5714	0.3643	
	NE	0.6363	0.4697	
	NW	0.6315	0.6190	
	SE	0.5592	0.5972	
	SS	0.3434	0.3838	
	SW	0.5517	0.3379	

Source: general household survey, 2011–2016.

**Table 4.** Poverty equivalent growth rate of respondents across geopolitical zones

Respondents	PEGR (2011–2016)				Impact			
	growth rate	P0	P1	P2	growth rate	P0	P1	P2
Participants								
NC	0.6977	0.8430	0.6833	0.6627	0.3391	0.4578	0.3694	0.3833
NE	0.7915	0.9652	0.8343	0.8026	0.6127	0.6790	0.6186	0.6196
NW	0.0682	0.1241	0.1025	0.1181	0.1211	0.1533	0.0065	0.0307
SE	0.0291	0.0699	0.0942	0.0766	0.0413	0.1022	0.1774	0.1544
SS	0.1115	0.1394	0.1651	0.1430	0.0053	0.2455	0.1623	0.1242
SW	0.5994	0.7643	0.6538	0.6648	0.0832	0.4732	0.3311	0.448
Non-participants								
NC	0.3586	0.3851	0.3139	0.2793				
NE	0.1788	0.2863	0.2157	0.1829				
NW	-0.0529	-0.0292	0.0960	0.0874				
SE	-0.0121	-0.0324	-0.0832	-0.0779				
SS	0.1062	-0.1062	0.0029	0.0188				
SW	0.5162	0.2911	0.3227	0.2168				

Source: general household survey, 2011–2016.

poor. The impact of non-farm on poverty reduction was highest in the North East zone. This is an indication that income growth due to participation in non-farm enterprises reduced the poverty of the participants. Also, in SE and SS, non-participants' poverty status increased, this is an indication that if participants in SE and SS had not participated in non-farm enterprises, their poverty level would have increased instead of decreasing in 2016. Non-poor households increased in SE and SS due to participation in non-farm enterprises.

## CONCLUSION AND RECOMMENDATIONS

This study assessed the impact of non-farm enterprises on the poverty status of rural farming households in Nigeria. Based on the empirical evidence emanating from this study, non-farm enterprises contributed significantly to the poverty reduction of the participants nationwide and across the six geopolitical zones. Non-farm enterprises also contributed to the reduction of poverty of both females and males, with females having the highest percentage reduction. This is an indication that non-farm enterprises are poverty-reducing. Income growth from non-farm enterprises between 2011 and 2016 was pro-poor. This implies that income growth due to participation in non-farm enterprises reduced the poverty of the participants, especially the poorest ones.

### Recommendations

Based on the findings of this study and the conclusion drawn, the following are recommended:

1. Since participation in non-farm activities had a significant impact on the poverty level of the participants, the promotion of non-farm enterprises among poor farmers should be encouraged.
2. Although poverty incidence of female and male participants has declined after five years and the decline has been deeper in female counterparts compared with male counterparts. Therefore, there is a need to encourage more female participation by providing equal access to economic resources to both genders as well as focusing on gender-based poverty intervention.
3. Also, the growth was pro-poor but not for the core poor, hence the need to build awareness and mobilize the very poor to engage in non-farm enterprises in order to meet the SDG target of no poverty in 2030.

4. Government can boost their efforts in reducing poverty by making financial capital, physical infrastructure and technological innovation available to rural households.

## REFERENCES

- Abbott, P., Murenzi, I., Musana, S. (2012). The role of non-farm households enterprises in poverty reduction, employment creation and economic growth in Rwanda. *Rwanda J.*, 26, 68–92.
- Adjognon, G.S., Liverpool-Tasie, S.L., De La Fuente, A., Benfica, R. (2017). Rural Non- Farm Employment and household welfare: Evidence from Malawi. Policy Research working paper, No. WPS8096. Washington, D. C., World Bank Group.
- AfDB (Africa Development Bank). (2014). Africa Economic Outlook 2014: Global Value Chains and Africa's Industrialisation. Retrieved from: [www.africaneconomicoutlook.org/en](http://www.africaneconomicoutlook.org/en)
- AfDB (Africa Development Bank). (2018). Nigeria Economic Outlook report. Retrieved from: [www.africaneconomicoutlook.org/en](http://www.africaneconomicoutlook.org/en)
- Aighokhan, B.E. (1997). Poverty Alleviation in Nigeria: Some Macro- economic issues. NES Annual Conference Proceeding (pp. 181–209).
- Anyanwu, J.C. (2010). Poverty in Nigeria: A Gender Analysis. *Afr. Stat. J.*, 11, 38–61.
- Awoyemi, T.T. (2011). Rural Non-farm incomes and Poverty reduction in Nigeria. AERC Research Paper 224. African Economic Research Consortium, Nairobi.
- Bruton, G.D., Ketchen, D.J., Ireland, R.D. (2013). Entrepreneurship as a solution to poverty. *J. Bus. Vent.*, 28(6), 683–689.
- Diao, X., Magalhaes, E., Mcmillian, M. (2018). Understanding the role of rural non-farm enterprises in Africa's economic transformation: Evidence from Tanzania. *J. Dev. Stud.*, 54(5), 1–23.
- IFAD (International Fund for Agricultural Development). (2011). Rural Poverty Report: Enabling Poor Rural People to Overcome Poverty. Retrieved from: [www.ifad.org/rural/index.htm](http://www.ifad.org/rural/index.htm)
- Iqbal, M.A., Abbas, A., Ullah, R., Ahmed, U.I., Sher, A., Akhtar, S. (2018). Effect of Non-farm income on poverty and income inequality: Farm Households from Punjab Province Pakistan. *Sarhad J. Agric.*, 34(2), 233–239.
- Kakwani, N., Pernia, E.M. (2000). What is pro-poor growth? *Asian Dev. Rev.*, 16(1), 1–22.
- Katsushi, S.I., Raghav, G., Ganesh, T. (2015). Does no-farm sector employment reduce rural poverty and vulnerability?

- Evidence from Vietnam and India. *J. Asian Econ.*, 36, 47–61.
- Kharas, H., Di Nucci, C., Hamel, K., Tong, B. (2020). To move the needle on ending extreme poverty, focus on rural areas. *Future Development*. Retrieved from: <https://www.brookings.edu/blog/future-development/2020/02/21/to-move-the-needle-on-ending-extreme-poverty-focus-on-rural-areas/>
- Kinuthia, B., Araar, A., Lalampaa, L. Maende, S., Mariera, F. (2019). Off-farm participation, agricultural production and farmers' welfare in Tanzania and Uganda. *Partnership for Economic Policy working Paper No. 2019-01*
- Lambon-Quayefio, M. (2017). Non-farm enterprises and the rural youth employment challenge in Ghana. *IDS Bulletin Trans. Dev. Knowl.*, 48(3). Retrieved from: <https://bulletin.ids.ac.uk/index.php/idsbo/article/view/2873/ONLINE%20ARTICLE>
- Megbowon, E., Mushunje, A. (2018). Livelihood diversification and its effect on household poverty in Eastern Cape Province, South Africa. *J. Dev. Area.*, 52(1), 235–249.
- Nagler, P., Naude, W. (2017). Non-Farm Entrepreneurship in Ruralsub-Saharan Africa: New Empirical Evidence. *Food Policy*, 67, 175–191.
- Oladimeji, Y.U., Abdulsalam, Z., Abdullahi, A.N. (2015). Determinants of participation of rural farm households in no-farm activities in Kwara State, Nigeria: A paradigm of poverty alleviation. *Ethiop. J. Env. Stud. Manag.*, 8(6), 635–649.
- Reardon, T., Berdegue, J., Barrett, C., Stamoulis, K. (2006). *Household Income Diversification into Rural Non-Farm Activities*. Baltimore: Johns Hopkins University Press.
- Scharf, M.M., Rahut, D.B. (2014). Nonfarm employment and rural welfare: evidence from the Himalayas. *Am. J. Agric. Econ.*, 96(4), 1183–1197.
- United Nations (2018). Sustainable development goals. 17 goals to transform our world. Retrieved from: <https://www.un.org/sustainabledevelopment/>
- World Bank (2017). Growing the rural non-farm economy to alleviate poverty. An Independent Evaluation Group. Retrieved from: [ieg.worldbankgroup.org](http://ieg.worldbankgroup.org)