



## DETERMINATION OF THE PERCEIVED EFFECT OF AGROFORESTRY PRACTICES ON THE WELFARE STATUS OF THE RURAL FARMERS IN EBONYI STATE, NIGERIA

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### ABSTRACT

This study determined the perceived effect of agroforestry practices on the welfare of rural farmers in Ebonyi State, Nigeria. Agroforestry practices have the potentials to improve the environment and welfare status of the farmers. Hence the study ascertained the benefits derivable from agroforestry practices, the perceived welfare status of the rural farmers, and determined the perceived effects of agroforestry practices on the welfare of rural farmers. The hypothesis tested is; agroforestry practices have no significant perceived effect on the welfare status of the rural farmers. Multistage sampling technique was used in the selection of agroforestry farmers. A total of 351 farmers were sampled using structured questionnaire. Data obtained were analyzed using descriptive and inferential statistics. The result showed that taungya farming (76.9%) and home garden (72.1%) were the dominant agroforestry systems practiced. The result on the benefits of agroforestry practices showed that the entire agroforestry farmers (100.0%) agreed that they use agroforestry for environmental protection and soil conservation, 99.7% indicated that it provided fodder for the livestock and 99.4% agreed that it provided them with fuel wood (firewood). Become independent ( $\bar{X} = 3.2$ ), have sufficient income to meet household needs ( $\bar{X} = 3.2$ ), and ability to afford three-square meal in a day ( $\bar{X} = 3.3$ ) were the dominant perceived welfare status of the agroforestry farmers. The bivariate regression result showed that agroforestry practices (x) had significant effect on the welfare status of the farmers. In conclusion, the practices of agroforestry was perceived to have imparted positively on the welfare of the farmers. The study therefore, recommended that the farmers should be encouraged to continue to practice agroforestry and even expand their farms since by doing so, their welfare status is enhanced.

### KEYWORDS

agroforestry practices, rural farmers, Perceived effect, Welfare.



## Introduction

Agroforestry as a practice is recognized worldwide. Often called a new name for a set of old practices, agroforestry is viewed as a promising land-use technology and an interface between agriculture and forestry, especially in developing countries of the tropics and sub-tropics (International Centre for Research in Agroforestry, ICRAF, 1997). The term agroforestry for social scientists represents a combination and inter-relationships between people, domestic animals, crops and trees, designed to rehabilitate land or to sustain and increase production of certain desired social benefits (Amonum *et al.*, 2015). Thus, agroforestry concerns the structure and functioning of human ecosystem and not merely biophysical system (Khot, 1999). According to Bakengesa (2001), it was recognized in the late 1970's as a sustainable land use system although existing for years as a traditional land use practice.

It is viewed as a system of land management that integrates trees and shrub plantings with crops or livestock in order to generate economic, environmental and social benefits (Rancane *et al.*, 2014). Agroforestry integrates trees with crops /or animals with the main objectives of reducing risk and increasing total productivity (De Baets *et al.*, 2007). In their ideal form, agroforestry systems have been both sustainable and stable. It has greater diversity than monoculture practices and can distribute production over a longer period of time (Amonum *et al.*, 2015).

Welfare is simply defined as the availability of resources and presence of conditions required for reasonably comfortable, healthy and secure living ([www.businessdictionary.com/definition/welfare.html](http://www.businessdictionary.com/definition/welfare.html)). In its broadest sense, welfare refers to well-being or what is good for people. It can be taken to be the provision of social services – principally healthcare, housing, social security, education and social work. Welfare can be related to the individual and to the collective and involves material, as well as immaterial needs (Greeve, 2008). Thus, farmers' welfare are improved vis-a-vis meeting their income, nutrition, wellbeing and aspirations. It is in this regard that Gross-Camp (2017) stated that forest plays a significant role in the wellbeing of the rural poor through the provision of goods (food, medicine, fuel wood) and services. Thondhlana and Muchaponda (2014) opined that dependence on forest products reduces rural poverty via increased earning and equalized income among households.

Rural farmers are by location disadvantaged and constrained to participate in certain livelihood activities as their urban counterparts, such as those in white collar jobs, tourism business and marketing activities occasioned by the absence of corporate institutions and organizations in the area. To make-up for the resulting poverty situations, agroforestry resources are harnessed by farmers as economic leverage to attain other higher goals. That is to say, agroforestry practices have the potentials to improve and sustain the livelihood of rural farmers towards living a fulfilled life. Therefore, the study was carried out to;

- ascertain the agroforestry practices engaged in by the rural farmers
- ascertain the benefits derivable from agroforestry practices and;
- ascertain the perceived welfare status of the rural farmers

## The hypothesis of the study

The study hypothesized that Agroforestry practices have no significant effect on the perceived welfare status of the rural farmers.

## Methodology

This study was conducted in Ebonyi State, Nigeria. It lies within longitudes 7°30'E and 8° 30'E and latitudes 5° 40'N and 6° 45'N (Nigerian Metrological Agency; NIMET 2017). The State has a population of about 4,339,136 people, and a land area of about 6,400 kilometer square (National Population Commission (NPC), 2006; National Bureau of Statistics (NBS 2016).

The state enjoys luxuriant vegetation with high forest zone (rain forest) in the south and sub-savannah forest in the northern fringe (<https://www.cometonigeria.com/region/south-east/ebonyi-state/>). Farming is the predominant occupation of the people of Ebonyi State.

The population of the study comprised all farmers that practice agroforestry in Ebonyi State, Nigeria. Multi-stage sampling technique was used for the selection of the farmers. The first stage involved purposive selection of the three agricultural zones to achieve a well representative sample.

In the second stage, three Local government Areas (LGAs) from each of the zones, namely; Ezza South, Ezza North and Ikwo (Ebonyi Central), Ohaukwu, Izzi and Ebonyi (Ebonyi North), Afikpo North, Ohaozara and Afikpo South (Ebonyi South) were purposively selected based on the dominance of agroforestry practice in the LGAs and their representation of the three agricultural zones. The third stage involved the selection of two (2) communities from each of the selected LGAs, using purposive sampling technique to give a total of eighteen (18) communities. At the community level, the community heads provided list of households practicing agroforestry in the area. The list from the various community heads was merged to form the sampling frame of 630. From the list, 20 households practicing agroforestry were selected from each of the eighteen communities using simple random sampling technique to give the sample size. In all, a total of 360 agroforestry farmers were used as the sample size for the study.

Data for the study was generated from primary source. This was achieved with the aid of a structured questionnaire, and complemented by Focus Group Discussion (FGD).

Descriptive and inferential statistical tools were used to analyse data for the study. Specifically, the objectives were achieved using frequency count, percentages and Likert-type rating scale.

The null hypothesis ( $H_0$ ) was tested using bivariate regression model analysis which is implicitly expressed as follows;

$$Y = f(X_1, e)$$

**Where:**

Y = perceived welfare status (Total rating score)

$X_1$  = Agroforestry practices (Number of different agroforestry practices)

e = error term

## RESULTS AND DISCUSSION

### Agroforestry systems practiced by the farmers

Table 1 result revealed that the farmers practiced diverse agroforestry systems. The dominant systems practiced included taungya farming (76.9%), which involves production of combination of food crops and trees, home garden (72.1%) which involves the combination of trees, arable crops and rearing of animals, alley farming (59.0%) which involves the combination of hedge row cropping and forage crop, and alley cropping (54.7%) which involves arable intercropping between tree crops. However, the least preferred system was apiculture (19.9%) which involves production of bees for honey. The result implies that the farmers practiced diverse agroforestry systems.

The implication of the farmers' practice of diverse agroforestry systems is as a result of their perceived benefits and suitability to the farmers' environment. Also, the practice of several agroforestry systems by the farmers might be due to the various purposes agroforestry serves. This result conforms to the findings of Mbowet *al.* (2013) who reported that many smallholder farmers in Africa practiced several agroforestry systems, in spite of the various attempts to perpetuate monoculture.

Further, different agroforestry practices can be relevant for different agro-ecological zones, and many systems with a range of different compositions can be fulfilled on landscapes. The findings of Amonum *et al.* (2015) that agroforestry makes little use of resources and offers numerous benefits corroborates this finding. They reported that many agroforestry systems are practiced in Nigeria and the common ones included; taungya farming, integrated taungya, home garden, alley cropping and alley farming.

**Table 1: Distribution of farmers according to agroforestry systems practiced**

Agroforestry systems practiced	Frequency* (f)	Percentage (%)	Ranking
Taungya farming (food crops with trees)	270	76.9	1 <sup>st</sup>
Home garden (trees/crops/animals)	253	72.1	2 <sup>nd</sup>
Alley farming (hedgerow intercropped with forage crop)	207	59.0	3 <sup>rd</sup>
Alley cropping (arable intercrop between trees)	192	54.7	4 <sup>th</sup>
Windbreaks (protection of farmlands with trees)	185	52.7	5 <sup>th</sup>
Integrated taungya farming (arable food crops interplanted with trees at onset)	105	29.9	6 <sup>th</sup>
Aquaforestry (aquaculture )	88	25.1	7 <sup>th</sup>
Apiculture (bees for honey)	70	19.9	8 <sup>th</sup>

**\*Multiple responses recorded**

*Source: Field Survey Data, 2020*

### Uses/benefits of agroforestry

Table 2 result shows that there are many benefits derivable from agroforestry practices. The entire agroforestry farmers (100.0%) agreed that they use agroforestry for environmental protection and soil conservation, (this means that agroforestry is an environmentally friendly farming practice), 99.7% indicated that it provided fodder for the livestock and 99.4% agreed that it provided them with fuel wood (firewood). The least ranked important use is the provision of oil extracts (70.1%).

It could be inferred from the result that agroforestry has various uses in the study area which points at its benefits to the farmers that practice it. The implication is that it will promote the practice of several systems of agroforestry since every practice undertaken by the farmers is beneficial and improves their welfare. This result is in agreement with findings of Soboola and Amadi (2015) who reported that agroforestry has several advantages via the provision of food and other basic needs such as fuelwood, staking materials, fibres, medical concentrates, oils, fruits and fodder for animals for a large proportion of the rural population.

**Table 2: Distribution of farmers according to their use of agroforestry**

Uses of agroforestry	Frequency (f)	Percentage (%)	Ranking
Environmental protection/soil conservation	351	100.0	1 <sup>st</sup>
Control of runoff and soil erosion	349	99.4	3 <sup>rd</sup>
Improves soil fertility	344	98.0	4 <sup>th</sup>
Climate change mitigation and adaptation	335	74.1	8 <sup>th</sup>
Production of electric poles/timber woods	260	95.4	7 <sup>th</sup>
For boundary demarcation	344	98.0	4 <sup>th</sup>
As windbreaks	343	97.7	5 <sup>th</sup>
For medicinal purposes	343	97.7	5 <sup>th</sup>
Fodder for livestock	350	99.7	2 <sup>nd</sup>
Provision of fuel wood	349	99.4	3 <sup>rd</sup>
Provision of oil extracts	246	70.1	9 <sup>th</sup>

Provision of wild fruits and food	260	74.1	8 <sup>th</sup>
Provision of honey	336	95.7	6 <sup>th</sup>

\* Multiple Response recorded

Source: Field Survey Data, 2020

### Perceived welfare status of the farmers

Table 3 result revealed that the agroforestry farmers agreed that their perceived welfare status has been enhanced by the farming practice. This was measured by certain perceived welfare parameters.

The parameters were rated in a four-point Likert-type scale of questions and farmers' response was recorded. The result shows that the farmers have positive welfare status. Out of the eight welfare status indicators used in the study, the agroforestry farmers indicated that they met all. This was further supported by the grand mean,  $\bar{X} = 3.0$  which is greater than the discriminating index of 2.5.

This result is consistent with Ravallion (2002), who opined that welfare is often described using improved access to education, healthcare, housing and clean water. The finding of Brucks (2003) that identified households' mean level of education as having a significant positive effect on welfare corroborates this finding. Similarly, Amareet *al.*, (2011) agreed that Improved/diverse agricultural production is expected to improve farmers' welfare by increasing productivity, profitability, employment and sustainability. It is also likely to increase households' level of human capital and physical assets.

**Table 3: Distribution of farmers according to perceived welfare status**

Perceived Welfare status	S.A	A	D	SD	Total	Mean ( $\bar{X}$ )	Ranking
Live in a well-furnished house (modern house )	79	215	37	20	351	3.0	Accept
Can afford three-square meal in a day	90	260	1	0	351	3.3	Accept
Have access to clean and portable water	50	180	65	56	351	2.6	Accept
Have access to electricity	55	161	70	65	351	2.6	Accept
Have sufficient income to meet household needs	160	120	38	33	351	3.2	Accept
Become independent	150	150	31	20	351	3.2	Accept
Educated (Higher education for family members)	70	226	40	15	351	3.0	Accept
Have access to quality health care facilities	64	242	30	15	351	3.0	Accept
<b>Total</b>	<b>718</b>	<b>1554</b>	<b>312</b>	<b>224</b>	<b>2808</b>	<b>3.0</b>	<b>Accept</b>

Discriminating index  $\bar{X} = 2.5$

Grand  $\bar{X} = 3.0^*$

Source: Field Survey Data, 2020

S.A: Strongly Agreed, A: Agreed, D: Disagreed, S.D: Strongly Disagree

### Effect of agroforestry practices on the perceived welfare status of the rural farmers

Table 4 shows the estimated simple regression model of the effect of agroforestry practices on the perceived welfare status of the rural farmers. This was demonstrated by the use of bivariate regression model relating agroforestry practices to perceived welfare status of the farmer.

The results show that agroforestry practices (x) had significant effect on the welfare status of the farmers. In other words, it influenced the welfare of the farmers tremendously. Also the practice of agroforestry was positively related to welfare, indicating that as the number of type of agroforestry a farmer practiced and frequency of practice increased, the welfare status of the farmers increased.

This result strongly aligned with the findings of Ravallion (2002) who found that welfare is often described using improve access to education, healthcare, housing and clean water. In addition, Tiwari *et al.* (2017) opined that agroforestry practices contributes to welfare security in terms of food security, poverty reduction and income generation.

**Table 4: Simple linear regression result of the effect of agroforestry practices on the perceived welfare status of the rural farmers**

Variables	Coefficient	t-value	R <sup>2</sup>	F-ratio	Significant
X	0.507	14.265	0.368	203.5	0.000

*Source: Field survey, 2020*

### Conclusion and Recommendations

The most practiced agroforestry systems are taungya farming and home garden. The practice of agroforestry is perceived to have impacted positively on the welfare status of the farmers. This is because it is perceived that the practice has enabled them to live in well-furnished houses, eat three square meal a day, increased ownership of assets, yielded enough income for the household, among others.

The study recommended that the farmers should be encouraged to continue to practice agroforestry and even expand their farms since by doing so, their welfare status is enhanced.

## REFERENCES

- Amare, M., Cisse, J.D., Jensen, N.D. & Shiferaw, B. (2011). The impact of agricultural productivity on welfare growth on farm households in Nigeria: a panel data analysis.
- Amonum, J.I., Babalolo, F.D., & Agera, S.I.N. (2015). *Agroforestry systems in Nigeria: review of concepts practices*. Retrieved 24<sup>th</sup> November, 2018, from <https://www.researchgate.net/publications/282152011>.
- Bakengesa, S.S. (2001). Influence of national policies on tree planting and conservation: The case of agroforestry technologies in Shinyanga, Tanzania. In: the proceedings of the Regional Agroforestry Centre on Agroforestry Impacts on Livelihoods in Southern Africa: Putting Research into Practice.
- Brucks, T. (2003). Household cropping choice and the determinants of income and consumption in post war rural Mozambique. A paper submitted at the European Economic Association Annual Meeting in Stockholm.
- De Baets, N., Garipey, S., & Vezina, A. (2007). *Portrait of agroforestry in Quebec*. Government of Canada. <https://scholar.google.com/scholar?hl=en&as-sdt=0%2c5/as-vis=1&q=de+baets>
- Greeve, B. (2008). What is welfare? *Central European Journal of Public Policy*, 2(1), 51 – 72.
- Gross-Camp, N. (2017). Tanzania's community forests: their impact on human well-being and persistence in spite of the lack of benefit. *Ecology and Society*, 22(1), 37pp.
- ICRAF, (1997). International Centre for Research on Agroforestry. Medium Term Plan 1998 – 2000, 1 -5p.
- Khot, S. (1999). *Socioeconomic aspects of agroforestry adopted by BAIF*. Unpublished electronic version. BAIF Development Research Foundation.
- Mbow, C., Noordwijk, M.V., Luedeling, E., Neufeldt, H., Minang, P.A., & Kowero, G. (2013). Agroforestry solutions to address food security and climate change challenges in Africa. *Environmental Sustainability*, 61 – 67.
- National Bureau of Statistics (NBS), (2016). Annual Abstracts of Statistics Volume 1. Pp. 37. <https://www.nigerianstat.gov.ng>
- National Population Commission (NPC), (2006). Landmass Compiled from NPC Report 1991 and Field Reports; *Nigerian Agricultural Magazine*, 4(3), 22pp. August/September, 2000.
- Nigerian Metrological Agency (NIMET), (2017). Evidence of climate change. *Climate Change Review Bulletin* 2017, pp.2-12. Nigeria Metrological Agency (NiMet), Abuja.
- Rancane, S., Makovskis, K., Ladzina, D., Daugaviete, M., Gutmane, I., & Berzins, R. (2014). Analysis of economic, social and environmental aspects of agroforestry systems of trees and perennial herbaceous plants. *Agronomy Research*, 12, 589 – 602.
- Ravallion, M. (2002). Measuring aggregate welfare in developing countries. how well do National Accounts and Surveys agree? World Bank Working Group, Washington, D.C, pp. 2665.
- Soboola, O.O., & Amadi, D. (2015). The role of agroforestry in environmental sustainability. *IOSR Journal of Agriculture and Veterinary Science*, 8(5), 20 – 25.
- Thondhlana, G., & Muchapondwa, E. (2014). Dependence on environmental resources and implications for household welfare: Evidence from the Kalahari Drylands, South Africa. *Journal Ecological Economics* 108, 59-67
- Tiwari, P., Kumar, R., Thakur, L., & Salve, A. (2017). Agroforestry for sustainable rural livelihood: a review. *International Journal of Pure and Applied Bioscience*, 5(1), 299 – 309.