



PERCEIVED IMPLICATION OF MANUAL FARMING ON THE LIVELIHOOD OF RURAL FARMERS IN ONDO STATE, NIGERIA

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ABSTRACT

The study examined the perceived implications of manual farming on the livelihood of rural farmers in Ondo State, Nigeria. A multi-stage random sampling technique was used to select 110 respondents from agrarian communities in Akure South and Akure North Local Government Areas. Data were collected using a well-structured questionnaire and analyzed using descriptive statistics, Chi-square, and Pearson Product Moment Correlation. The results revealed that the mean age, household size, farming experience and farm size of the respondents were 47.99 years, 6.47 persons, 13.11 years and 6.45 hectares. Majority (70%) of the farmers predominantly used manual farming methods. Key factors influencing this practice included the high cost of acquiring machinery (2.69), cultural factors (2.66), and lack of skills and access to mechanization (2.61). Farmers perceived manual farming as cost-effective for food provision on small plots but also recognized its implications, including being labor-intensive (4.40), leading to low productivity (4.19), and resulting in low income (4.00). The study concludes that manual farming is embraced for its cost-effectiveness, interventions such as subsidized mechanization, improved extension services, and targeted training are crucial to enhancing rural livelihoods and agricultural productivity.

Keywords: Manual, Farming, Livelihood, Rural, Farmers, Perception.

INTRODUCTION

The livelihood of rural farmers is a complex and interconnected system, profoundly influenced by a range of economic, social, and environmental factors. It encompasses the capabilities, assets, and activities required for farmers in rural areas to sustain their lives and support their families, primarily through agriculture and related sectors (Kapur, 2019). This livelihood is shaped by access to resources, market opportunities, social dynamics, and policy support (Adams, 2020). Agriculture forms the backbone of this existence, with farmers engaging in crop cultivation, livestock rearing, and fisheries to produce food for both consumption and sale. The success of these agricultural activities is a primary determinant of their income and overall well-being (Abebe *et al.*, 2021).

Many rural farmers employ diversification strategies to mitigate income volatility, engaging in activities like agro-processing, beekeeping, or off-farm employment (Ayele & Marisennayya, 2022). Crucial to their success is access to productive resources such as land, water, seeds, fertilizers, and credit. Secure land tenure, irrigation facilities, and financial services are enabling factors that allow farmers to enhance productivity and adapt to changing circumstances (Nahayo *et al.*, 2017). Therefore, efforts to improve rural livelihoods must focus on enhancing agricultural productivity, promoting market access, strengthening social networks, and implementing supportive policies (Kaaria *et al.*, 2023).

Manual farming, also referred to as traditional or subsistence farming, has been the cornerstone of rural agriculture for centuries. It involves the use of basic hand tools and human labor for tasks like tilling, planting, weeding, and harvesting, with minimal reliance on modern machinery. While this practice has ensured food security and survival for generations, it presents significant challenges that affect farmers' overall well-being and economic stability (Sibhatu & Qaim, 2017).



The primary benefit of manual farming is direct food provision, allowing families to meet their basic nutritional needs and reduce dependence on external sources (Hundera *et al.*, 2021). However, it is characterized by lower productivity compared to mechanized systems. This lower output, combined with limited market access, makes it difficult for manual farmers to compete, often resulting in lower incomes and an inability to secure fair prices for their produce (Akintayo *et al.*, 2022). The work is physically demanding, leading to health issues and fatigue, particularly among the elderly and women (Una *et al.*, 2016). Furthermore, the perception of farming as arduous and economically unrewarding drives youth away from agriculture, leading to an aging workforce and a potential loss of traditional knowledge (Hamadani *et al.*, 2021).

Environmentally, manual practices can contribute to soil degradation and erosion if sustainable techniques are not employed (Faridi *et al.*, 2020). While it often uses fewer chemical inputs than industrial agriculture, it can be inefficient in its use of water and time (Sumberg & Giller, 2022). Access to knowledge and technology, disseminated through extension services, is critical for overcoming these challenges and empowering farmers to adopt efficient and climate-smart practices (Loki & Mdoda, 2023).

In Nigeria, many farmers focus primarily on meeting their subsistence needs, leaving little room for generating substantial profit. This struggle with poverty and financial instability hinders their ability to invest in other areas of their livelihoods. Therefore, assessing the perceived implications of manual farming is essential for designing effective interventions. This study on the perceived implications of manual farming on the livelihood of rural farmers in Ondo State, Nigeria, is designed to achieve the following objectives;

- i. examine the socio-economic characteristics of rural farmers in the study area;
- ii. identify the farming activities carried out using manual methods;
- iii. assess the perception of rural farmers towards the use of manual farming;
- iv. determine the perceived implications of manual farming on farmers' livelihoods; and
- v. Analyze the factors influencing the use of manual farming;

METHODOLOGY

Study Area

The study was conducted in Ondo State, Nigeria, specifically in the Akure South and Akure North Local Government Areas (LGAs). Founded on February 3, 1976, Ondo State is located in the South-Western zone of Nigeria and is bounded by Ekiti/Kogi, Edo, Oyo, and Ogun States, with the Atlantic Ocean to the south. The state covers a land area of 14,788.723 square kilometers and features a tropical climate with luxuriant vegetation, ranging from rainforest in the south to sub- savannah in the north. It is the largest producer of cocoa in Nigeria and also grows cash crops like rubber, cashew, kola nut, and palm oil. The selected LGAs are predominantly agrarian with a large population of subsistence farmers, making them ideal for this study.

Sampling Technique and Sample Size

The target population consisted of manual farmers in Akure South and Akure North LGAs. A multi-stage random sampling procedure was employed. First, the two LGAs were randomly selected from the 18 in Ondo State. Second, four communities were randomly selected from each LGA, resulting in a total of eight communities. In the third stage, fifteen (15) farmers were randomly selected from each community, giving a total sample size of 120 farmers. However, 110 questionnaires were fully completed and used for the analysis.

Data Collection and Measurement

Primary data were collected through a well-structured and pre-tested interview schedule/questionnaire containing both open and closed-ended questions. The questionnaire was designed to measure the study's variables:

Dependent Variable: Perceived implication of manual farming on livelihood (measured on a 5- point Likert scale).



Independent Variables: Socio-economic characteristics including age, gender, marital status, education level, household size, religion, occupation, farm size, farming experience, extension contact, and farming method. Specific scales were used for each (e.g., education level was ordinal from 1=No Formal Education to 6=Postgraduate).

Data Analysis

Data were coded and analyzed using descriptive statistics (frequencies, percentages, means, and charts) which were used to analyze the socio-economic characteristics. Inferential statistics were used to test the two hypotheses: Chi-square was used to test the association between socio-economic characteristics and manual farming activities (H_{01}), and Pearson Product Moment Correlation (PPMC) was used to test the relationship between perception and perceived implications (H_{02}).

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Respondents

The results in Table 1 showed that the mean age of respondents was 47.99 years, with 34.5% of the respondents falling between 51-60 years, indicating a cohort of experienced, economically active individuals. Majority (69.1%) were male, and 60.9% were married. For education, 29.1% had a tertiary education (HND/BSc), suggesting a reasonable level of literacy. The mean household size was 6.47 persons, which aligns with the communal nature of manual farming. Majority (75.5%) of the respondents were Christians, and farming was the primary occupation for 55.5%. The average farm size was 6.45 hectares, with 79.4% farming on 1-10 hectares, classifying them as smallholders. The average farming experience was 13.11 years, indicating substantial indigenous knowledge. Crucially, 70% of respondents relied primarily on manual farming methods (Table 2, Figure 1).



Table 1: Socio-economic Characteristics of Respondents (n=110)

Socio-economic characteristics	Frequency	Percentage (%)	Mean
Age			
21-30	14	12.7	47.99
31-40	24	21.8	
41-50	16	14.5	
51-60	38	34.5	
61-70	17	15.5	
71-80	1	0.9	
Gender			
Male	76	69.1	
Female	34	30.9	
Marital Status			
Single	28	25.5	
Married	67	60.9	
Divorced	3	2.7	
Widowed	12	10.9	
Level of Education			
No formal education	9	8.2	
Primary education	21	19.1	
Secondary education	26	23.6	
NCE/OND	14	12.7	
HND/BSC	32	29.1	
Postgraduate studies	8	7.3	
Household Size			
1-10	96	87.3	6
11-20	14	12.7	
Religion			
Christian	83	75.5	
Islam	24	21.8	
Traditional	3	2.7	
Major Occupation			
Farmer	61	55.5	
Artisan	9	8.2	
Civil servant	16	14.5	
Trader	24	21.8	
Farm Size			
1-10	85	79.4	6.45
11-20	18	16.8	
21-30	4	3.7	
Farming experience			
1-10	58	52.7	13.11
11-20	36	32.7	
21-30	6	5.5	
31-40	10	9.1	

Source: Field Survey, 2023.

Table 2: Type of Farming Method Used

Farming Method	Frequency	Percentage
Manual	77	70
Mechanized	33	30

Source: Field Survey, 2023.

Farming Activities Utilizing Manual Methods

Respondents identified numerous farming activities performed manually (Table 3). The most common were broadcasting of seeds (mean=1.85), land preparation and staking (mean=1.84), and



tilling/fertilizer application (mean=1.82). These could lead to high labour intensity, inconsistent application quality and low operational efficiency which could in turn lead to reduced yields. This prevalence of manual labor across the agricultural value chain underscores the deep reliance on human effort and basic tools, consistent with the description of manual farming by Nag and Gite (2020).

Table 3: Farming Activities that Require Manual Farming

Manual farming operations	Yes (%)	No (%)	Mean	Rank
Broadcasting of seeds	94 (85.5)	16 (14.5)	1.85	1 st
Staking plants	92 (83.6)	18 (16.4)	1.84	2 nd
Land preparation	92 (83.6)	18 (16.4)	1.84	2 nd
Fertilizer application	90 (81.8)	20 (18.2)	1.82	3 rd
Tilling the soil	90 (81.8)	20 (18.2)	1.82	3 rd
Storage	87 (79.1)	23 (20.1)	1.79	4 th
Pesticide application	85 (77.3)	25 (22.7)	1.77	5 th
Removal of weeds	84 (76.4)	26 (23.6)	1.76	6 th
Harvesting	80 (72.7)	30 (27.3)	1.73	7 th
Harrowing	68 (61.8)	42 (38.2)	1.62	8 th
Ploughing	66 (60)	44 (40)	1.60	9 th

Source: Field Survey, 2023.

Perception on the Use of Manual Farming

Farmers' perceptions were mixed, reflecting both the benefits and drawbacks as shown in Table 4. The respondents strongly agreed that manual farming provides food for their families with a mean score of 4.62 and is suitable for small plots (mean=4.23). They perceived it as cost-effective, saving money on machinery (mean=3.97) and allowing them to run other businesses (mean=3.95). However, they also acknowledged significant downsides, including the adverse effect on their health (mean=3.96), the difficulty of large-scale cultivation (mean=4.12), and the reality of gaining very little from sales (mean=3.45). This duality captures the essence of subsistence farming: it ensures survival but limits prosperity (Sibhatu & Qaim, 2017)

Table 4: Perception on the Use of Manual Farming (5-point Likert Scale)

Statement	Mean	Rank
Creates an avenue to provide food for my family	4.62	1 st
I can practice on small plots of land	4.23	2 nd
It is not easy to cultivate on a large scale	4.12	3 rd
I can easily gain access to tools for production	4.02	4 th
It saves me the cost of acquiring farm machines	3.97	5 th
My health is affected because of manual power	3.96	6 th
It allows me to run other businesses	3.95	7 th
I can easily employ family labor	3.71	8 th
I can easily manage weeds and pests	3.59	9 th
It saves me the cost of acquiring fertilizers	3.50	10 th
I gain very little from crops sold	3.45	11 th
I do not get enough farm produce to market	3.35	12 th
I do not need access to hired labor	3.19	13 th

Perceived Implications of Manual Farming on Livelihood

The perceived implications (Table 5) directly reflect the challenges of manual farming. The top implications were its labor-intensive nature (mean=4.40) and its association with low farm



productivity (mean=4.19) and low income (mean=4.00). Farmers also recognized positive implications, such as the ability to produce locally-suited crops (mean=4.13) and the ease of using transferred traditional knowledge (mean=4.12). Negative implications like limited market access (mean=3.73), limited use of mechanization (mean=3.72), and increased vulnerability to climate change (mean=3.33) were also noted, aligning with the findings of Warra and Prasad (2020).

Table 5: Perceived Implications of Manual Farming on Livelihood (5-Point Likert Scale)

Implication	Mean	Rank
It is labor-intensive	4.40	1st
Low farm productivity	4.19	2nd
Produce plants suited to local environment	4.13	3rd
Easy usage of traditional knowledge	4.12	4th
Fluctuation of market prices	4.01	5th
Low level of income	4.00	6th
Access to the use of family labor	3.97	7th
Farm size not enough for credit collateral	3.97	7th
Adverse health risks for farmers	3.97	7th
Helps to conserve rural farm practices	3.88	8th
Limited access to the market	3.73	9th
Limited use of mechanization	3.72	10th
Reduces use of harmful chemicals	3.65	11th
Increases vulnerability to climate change	3.33	12th
Easily leads to loss of biodiversity	3.28	13th

Source: Field Survey, 2023.

Factors Influencing the Use of Manual Farming

Economic and access barriers were the most significant factors as shown in Table 6. The high cost of acquiring machinery was the paramount factor (mean=2.69), followed by cultural factors (mean=2.66) and the cost of hired labor for mechanized operations (mean=2.65). A lack of sufficient skills and training (mean=2.62) and lack of access to mechanization itself (mean=2.61) were also critical barriers. According to Van Loon *et al* (2020), persistence of manual farming is less a choice and more a result of constrained options.



Table 6: Factors Influencing the Use of Manual Farming (3-Point Scale)

Factor	Mean	Rank
Cost of acquiring farm machinery	2.69	1 st
Cultural factors	2.66	2 nd
Cost of hired labor	2.65	3 rd
Lack of sufficient skills and training	2.62	4 th
Lack of access to mechanization	2.61	5 th
Availability of labor	2.59	6 th
Type of crops produced	2.55	7 th
Access to agricultural extension services	2.55	7 th
Small farm size	2.49	8 th
Absence of government policies (subsidies)	2.49	8 th
Access to credit	2.45	9 th
Access to market for machines	2.34	10 th
Concerns about environmental impacts	2.33	11 th

Source: Field Survey, 2023.

CONCLUSION AND RECOMMENDATIONS

This study concludes that manual farming remains the dominant practice among rural farmers in study area, driven not by preference but by necessity due to significant constraints. The high cost of machinery, deeply ingrained cultural practices, and a critical lack of access to training, credit, and extension services are the primary barriers to mechanization. Farmers perceive manual farming as a double-edged sword: it is a cost-effective method for ensuring family food security on small plots and allows for the preservation of traditional knowledge. However, they are acutely aware of its severe drawbacks, including its labor-intensive nature, low productivity, consequent low income, and adverse health effects. The significant relationship between socio-economic factors and farming activities, and the strong correlation between perception and livelihood implications, underscores that the choice to farm manually is deeply embedded in the farmers' socio-economic reality. Therefore, while manual farming is resilient and adapted to current constraints, it perpetuates a cycle of subsistence living, limiting the potential for improved livelihoods and agricultural growth.

Based on the findings, the following recommendations are proposed:

- i. Subsidized Mechanization Programs:** The government and development agencies should establish and promote tangible subsidy programs to make farm machinery (e.g., small-scale tractors, planters, harvesters) affordable and accessible to smallholder farmers. This could include group ownership models or low-cost rental services.
- ii. Enhanced Agricultural Extension Services:** There is an urgent need to revitalize extension services by increasing the agent-to-farmer ratio and providing regular training for agents on modern, climate-smart farming technologies. Extension programs should actively demonstrate the economic and ergonomic benefits of mechanization.
- iii. Targeted Training and Capacity Building:** Government and NGOs should organize hands-on training programs for farmers on the operation, maintenance, and economic management of small-scale farm machinery. This will build confidence and reduce resistance to adoption.
- iv. Improved Access to Credit:** Financial institutions should develop and promote accessible agricultural loan products with low-interest rates and flexible collateral requirements tailored to the needs of smallholder farmers, enabling them to invest in productivity-enhancing technologies.
- v. Policy Formulation for Agricultural Development:** Policymakers should formulate and implement policies specifically aimed at supporting the mechanization of smallholder agriculture, including import duty waivers on agricultural machinery, grants for local fabrication, and support for rural infrastructure like roads and storage facilities to improve market access.



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