ASSESSMENT OF AWARENESS OF BAG FARMING AS AN INNOVATION FOR PROMOTING VEGETABLE OUTPUT IN ESAN WEST LOCAL GOVERNMENT AREA, EDO STATE, NIGERIA

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ABSTRACT
This study assessed farmers' awareness of bag farming as an innovation for improving vegetable output in Esan West Local Government Area, Edo State, Nigeria. Specifically, it examined awareness levels, adoption status, usage patterns, factors influencing utilization, and constraints affecting the practice. Sixty respondents were selected from six communities using a multi-stage sampling technique. Data were collected through structured questionnaires and analyzed using descriptive statistics and regression analysis. Results showed that majority (85%) of the respondents were aware of bag farming, and 80% believed it was practicable in both rural and urban settings. Adoption was moderate at 63.3%, though regular usage remained low, with only 15% reporting frequent or consistent practice. Regression analysis revealed that farm size was the only socio-economic factor significantly influencing awareness and adoption ($r = 0.148$, $p < 0.05$), with larger farm holders more likely to adopt the innovation. Age, gender, education, marital status, farming experience, and occupation showed no significant effect. Key drivers of usage included market demand for vegetables, access to water, household food security needs, income potential, and input costs. Major constraints were limited water supply, inadequate technical knowledge, high input costs, weak institutional support, and limited access to extension services. The study concludes that bag farming holds considerable promise for enhancing food production and security among smallholder farmers, but infrastructural gaps and knowledge deficits continue to limit its potential. It is recommended that extension services be strengthened, irrigation access should be improved, financial support provided, and farmer training intensified to promote wider adoption and long-term sustainability of bag farming.

Keywords: Assessment, *Bag farming; Vegetable, innovation; Awareness;*

Introduction

Agriculture remains one of the most important pillars of human life, especially in developing countries like Nigeria, where it supports food security, creates jobs, reduces poverty, and drives economic growth. Yet, this vital sector is increasingly under pressure. Rapid urban growth, rising population, changing climate conditions, and the steady loss of fertile land are making food production more difficult than ever. According to the Food and Agriculture Organization (FAO, 2023), urban expansion is placing significant pressure on available farmland and food systems worldwide.

In Nigeria, land conversion for residential and commercial purposes increases food prices, food insecurity, and import dependence significantly (FAO, 2023). Consequently, many urban and peri-urban households struggle to access affordable, nutritious food in many cities. To address this, innovative space-efficient practices like bag farming has emerged. This method grows crops in bags with soil and compost (Gallaher et al., 2015). It enables production in small spaces such as backyards and rooftops supporting vegetables with low land and water needs (Olorunnisola et al., 2019; Kaya & Bostanbudak, 2021) in practice today.

Studies had show that bag farming improves access to fresh vegetables and enables year-round production in small spaces (Adeoye et al., 2019). It enhances water efficiency, reduces erosion, supports organic waste recycling, and lowers fertilizer use (Amusa et al., 2020). It also reduces food costs, creates income, and strengthens local food systems (Gallaher et al., 2015; Oduro et al., 2021). In Nigeria, where unemployment, inflation, and rising food prices continue to affect many household, bag farming provides a practical and affordable way to improve food security and generate income.

This practice is easy to establish, requires little and can be carried out in small spaces. It is especially beneficial to women and youths who often have limited access to farmland (Akinmoladun et al., 2020). Despite these advantages, awareness and adoption remains low in many rural and semi-urban communities due to limited access to information, training, extension services and production inputs (Zhang et al., 2016). This situation is evident in Esan West, Edo State, where population growth, limited farmland, and rising food prices continue to affect agricultural productivity and food security.

Awareness plays a key role in adoption of agricultural innovations. Farmers are more likely to adopt new technologies when they understand their benefits, while access to information and extension services improves decision-making and productivity (Nahar & Ali, 2021; Maulu et al., 2021). Therefore, this study assesses awareness of bag farming as an innovation for promoting vegetable output in Esan West Local Government Area, Edo State, Nigeria.

Objectives of the study

The broad objective of the study was to assess awareness of bag farming as an agricultural innovation in Esan West Local Government Area of Edo State. Specifically, to (i) describe the socio-economic characteristics of the respondents; (ii) ascertain the level of awareness of bag farming; (iii) examine the knowledge and understanding of bag farming techniques among vegetable farmers (iv) identify the challenges that hinder awareness and adoption of bag farming in the study area.

Methodology

This study was conducted in Esan West Local Government Area (LGA) of Edo State, Nigeria, with its headquarters in Ekpoma. The LGA covers approximately 502 km² and had a population of 125,542 according to the 2006 National Population Census (NPC, 2006). Farming is the primary occupation of residents, supported by fertile clay-loamy soils, an average annual rainfall of about 2,500 mm, and a tropical rainforest climate. These conditions favor the cultivation of crops such as cassava, yam, maize, rice, plantain, vegetables, oil palm, cocoa, and cashew. The area was purposively selected due to its agricultural importance and the growing relevance of innovative farming practices such as bag farming. A multi-stage sampling procedure was employed. First, Esan West LGA was purposively selected. Second, six communities—Ogwa, Urohi, Iruekpen, Ihumudumu, Ujemen, and Uhiele—were randomly selected. Third, 10 respondents were randomly chosen from each community, giving a total sample size of 60 respondents. Primary data were collected using a structured questionnaire covering respondents' socio-economic characteristics, awareness of bag farming, sources of information, perceived benefits, and adoption constraints. Data were analyzed using SPSS version 23. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used, while multiple regression analysis examined the relationship between respondents' socio-economic characteristics and their level of awareness of bag farming. The regression model is specified as follows:

$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \varepsilon$

Where: Y = Awareness of bag farming, X_1 = Age, X_2 = Sex, X_3 = Marital status, X_4 = Educational qualifications; β_1, β_2, β_3, β_4 = Estimated Coefficients, ε = Error term

The regression analysis was used to test the influence of socio-economic variables on respondents' awareness of bag farming, with results assessed at a 5% level of significance.

Results and Discussion

Socio-Economic Characteristics of Respondents

Table 1 shows that majority (61.7%) were males, while 38.3% were females, reflecting the relatively higher involvement of men in farming activities within the study area. The mean age was 36.2 years, with 36.7% of respondents falling within 21–30 years age bracket, indicating a predominantly young and economically active population. Table 1 also shows that most (45.0%) were single and 36.7% were married. Majority (51.7%) had attained tertiary education, suggesting a relatively literate population capable of understanding and adopting agricultural innovations. This finding contrasts with that of Govoeyi (2022), who reported that 61% of respondents had no formal education. The average farm size was 2.5 hectares, indicating that most respondents were small-scale farmers. Farming was the primary occupation most (45.0%) of respondents, while 23.3% practised it on a part-time basis. Respondents also had an average farming experience of 8.9 years, reflecting considerable practical agricultural knowledge.

Table 1: Socio-economic Characteristics of Respondents (n = 60)

Variables	Categories	Frequency (%)	Mean
Sex	Female	38.3	–
	Male	61.7	
Age (Years)	15–20	5.0	36.2
	21–30	36.7	
	31–40	20.0	
	41–50	15.0	
	Above 50	23.3	
Marital Status	Married	36.7	–
	Single	45.0	
	Divorced	10.0	
	Widowed	8.3	
Educational Level	No formal education	13.3	–
	Primary	13.3	
	Secondary	21.7	
	Tertiary	51.7	
Farm Size (ha)	≤ 1 hectare	33.3	2.5
	1–3 hectares	30.0	
	4–6 hectares	30.0	
	Above 6 hectares	6.7	
Primary Occupation	Full-time farming	45.0	–
	Part-time farming	23.3	
	Trading	8.3	
	Civil service	6.7	
	Artisan/Others	16.7	
Farming Experience (Years)	< 5	26.7	8.9
	5–10	41.7	
	11–20	21.7	
	Above 20	10.0	

Source: Survey Field (2025).

Awareness of Bag Farming and Perception of Its Suitability in Rural and Urban Areas

The findings indicate a high level of awareness of bag farming among respondents in the study area. A large majority (85.0%) reported that they had heard of bag farming, while only 15.0% were unaware of the practice. This suggests that information about bag farming has reached a significant proportion of the population, creating a favorable environment for its adoption. The study further revealed that 80.0% of respondents believed that bag farming can be successfully practised in both rural and urban areas. In contrast, 18.3% disagreed, while 1.7% did not provide a response. The positive perception of bag farming reflects farmers' appreciation of its flexibility and suitability for areas with limited access to farmland. Its ability to support food production in both rural and urban settings makes it a valuable tool for improving household food security. However, some respondents are still unaware of the practice, highlighting the need for sustained awareness campaigns, extension services, training, and field demonstrations. Greater access to information could encourage wider adoption, improve productivity, and enhance livelihoods. This finding agrees with Kwabena et al. (2019), who identified sack farming as an effective means of promoting year-round food production.

Tables 2: Awareness of Bag Farming and Perception of Its Suitability in Rural and Urban Areas (n = 60)

Variables	Categories	Frequency	Percentage (%)
Awareness of bag farming	Yes	51	85.0
	No	9	15.0
	Total	60	100.0
Bag farming suitability in rural and urban areas	Yes	48	80.0
	No	11	18.3
	Missing response	1	1.7

Source: Survey Field (2025).

Factors Influencing adoption of Bag Farming among Respondents

Table 3 reveals that market demand for vegetables was the most (mean = 2.58) important factor influencing adoption of bag farming among respondents. This was closely followed by access to water supply (Mean = 2.55) and household food security needs (Mean = 2.45). These findings indicate that economic benefits and household welfare are the major drivers of bag farming adoption and utilization. Other important factors included the cost of materials, income potential from vegetable sales, and environmental benefits, each with a mean of 2.40. Government and NGO support, access to affordable credit, the perception of bag farming as an innovative practice, access to training and extension services, and land availability were also identified as significant influences factors. In contrast, peer influence (Mean = 1.88) and support from cooperative groups or farmer associations (Mean = 1.95) were not considered significant factors. The findings suggest that farmers are primarily motivated by the economic and food security benefits associated with bag farming. To encourage wider adoption of bag farming, promotion efforts should highlight its profitability, ability to improve household food supply, and potential to generate income. The importance of water availability and affordable inputs points to the need for better irrigation facilities and input support programmes. In addition, access to extension services, training, credit, and institutional support remains essential. Creating a supportive environment through improved access to resources, markets, and financial assistance will enhance bag farming adoption, boost agricultural productivity, strengthen food security, and improve household livelihoods in Esan West Local Government Area.

Table 3: Factors Influencing adoption of Bag Farming among Respondents (N = 60)

Variables	Mean Score	Decision
Availability of land	2.00	Important
Access to training/extension services	2.02	Important
Cost of materials (sacks, compost, seeds)	2.40	Important
Access to water supply	2.55	Important
Income potential from vegetables	2.40	Important
Peer/farmers' influence	1.88	Not Important
Government/NGO support	2.18	Important
Availability of affordable credit/loans	2.18	Important
Market demand for vegetables	2.58	Important
Perception of bag farming as modern/innovative	2.18	Important
Environmental benefits (e.g., reduced erosion, recycling materials)	2.40	Important
Household food security needs	2.45	Important
Support from cooperative groups/farmer associations	1.95	Not Important

Decision Rule: Mean ≥ 2.00 = Important; Mean < 2.00 = Not Important. Source: Survey Field (2025).

Constraints to adoption of Bag Farming among Respondents

The findings revealed that all identified factors constituted significant constraints to the adoptions bag farming, as their mean scores exceeded the benchmark value of 2.00. The most severe constraint was limited access to a reliable water supply (Mean = 2.70), highlighting the critical role of water availability in successful bag farming. This was followed by lack of adequate information and awareness (Mean = 2.58) and poor technical knowledge and skills (Mean = 2.57), indicating that many respondents lack the necessary knowledge and competence to effectively practice bag farming. Other major constraints included the high cost of inputs such as bags, soil, compost, and seeds (Mean = 2.50), as well as challenges related to pest and disease management (Mean = 2.48). Respondents also identified lack of institutional or government support (Mean = 2.45), difficulty accessing quality seeds and seedlings (Mean = 2.38), inadequate post-harvest storage facilities (Mean = 2.35), and the labour-intensive nature of bag farming (Mean = 2.35) as important barriers. Limited availability of extension officers (Mean = 2.18) and uncertainty about profitability (Mean = 2.15) were also reported as constraints, although they were less severe. These findings show that bag farming in Esan West faces technical, financial, and institutional challenges. Improving access to water, training, extension services, affordable inputs, and institutional support will encourage wider adoption, increase productivity, strengthen food security, and improve rural livelihoods.

Table 5: Constraints to adoption of Bag Farming among Respondents (N = 60)

Variables	Mean Score	Decision
Lack of adequate information and awareness	2.58	Significant
High cost of inputs (bags, soil, compost, seeds)	2.50	Significant
Limited access to reliable water supply	2.70	Significant
Poor technical knowledge and skills	2.57	Significant

Lack of institutional/government support	2.45	Significant
Limited availability of extension officers	2.18	Significant
Uncertainty about profitability	2.15	Significant
Pest and disease management difficulties	2.48	Significant
Difficulty accessing quality seeds and seedlings	2.38	Significant
Lack of storage facilities for harvested produce	2.35	Significant
Labour intensity involved in setting up and maintaining bag farms	2.35	Significant

Decision Rule: Mean ≥ 2.00 = Constraint. Source: Survey Field (2025).

Source: Survey Field (2025).

Conclusion and Recommendations

Conclusion

This study assessed farmers' awareness of bag farming, the extent of its adoption, the benefits associated with it, and the factors constraining its consistent use in Esan West Local Government Area of Edo State. Findings show a mixed but generally positive outcome. Awareness of bag farming was high, with most respondents familiar with the practice, while adoption was moderate; however, consistent and sustained use was still limited. Farmers viewed bag farming as a low-cost and flexible technology suitable for areas with limited land, making it attractive to both rural and urban households. Regression analysis established that farm size was the only socioeconomic characteristic with a statistically significant influence on awareness and adoption. Variables including age, gender, education, marital status, and farming experience did not significantly affect whether respondents were aware of or had adopted the practice. The primary motivators for use were market demand for vegetables, water availability, and household food security needs. The main barriers were limited water access, insufficient technical knowledge, high input costs, and weak institutional support. The overall assessment is of a promising innovation that has not yet reached its full potential — not because of a lack of farmer interest, but because the enabling conditions for consistent practice are not yet in place. Bag farming demonstrates genuine strengths as a climate-smart, livelihood-enhancing agricultural approach, but infrastructural and institutional gaps continue to constrain its impact.

Recommendations

Based on the findings of this study, several recommendations were made:-

i. Government agencies and agricultural stakeholders should strengthen extension services through regular training programmes and practical field demonstrations to improve farmers' skills and confidence.
ii. Access to water should be enhanced by promoting affordable irrigation systems and rainwater harvesting technologies.
iii. Financial challenges can be reduced through subsidies, input support packages, and accessible credit facilities for smallholder farmers.
iv. Capacity-building initiatives should focus on practical and hands-on learning.
v. Bag farming should be incorporated into agricultural development policies and youth empowerment programmes to provide stronger institutional support and
vi. . The formation and strengthening of farmer cooperatives should also be encouraged to facilitate knowledge sharing, improve access to inputs, strengthen market linkages, and promote wider adoption of the technology.

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