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Orphan crops utilization in rural household diets and factors mitigating against their cultivation among farmers in South-West Nigeria

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Abstract

Orphan crops are indigenous and underutilized crops with significant potential for improving food and nutrition security, but their cultivation has continued to decline in many parts of Nigeria. This study examined the utilization of orphan crops in rural household diets and the factors mitigating their cultivation among farmers in South-West Nigeria. A multistage sampling procedure was employed to select 540 farming households from three states (Oyo, Ogun, and Ondo). Primary data were collected using a structured questionnaire and analyzed using descriptive statistics. The findings revealed that several orphan crops, including pearl millet (97.22%), yam bean (87.78%), Bambara groundnut (85.00%), worowo (81.11%), and breadfruit (71.67%), were widely consumed by rural households. However, the cultivation of most of these crops remained relatively low, with many households depending on wild collection rather than on-farm production. The major factors mitigating their cultivation were inadequate seeds and planting materials (WMS=1.64), lack of processing equipment (WMS=1.64), lack of institutional support (WMS=1.59), and slow maturity (WMS=1.51). Conversely, pest infestation, poor knowledge of preparation, market unavailability, poor shelf life, cultural stigma, and lack of awareness were identified as minor constraints. The study concludes that orphan crops continue to play an important role in rural household diets in South-West Nigeria but remain undercultivated due to institutional and production-related constraints. It was recommended that the government should provide support through improved seed systems and the development of viable value chains to promote the cultivation and utilization of orphan crops.

Keywords: Agricultural biodiversity, Dietary diversity, Orphan crops, Rural households, Underutilized.

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Contribution of this paper to the literature
This study examined all the available orphan crops in the study rather than considering only one or some of them. It also compared the level of cultivation and consumption.

1. Introduction

Orphan crops, also known as neglected and underutilized crops (NUC), are indigenous crops that offer nutritional and ecological benefits, yet receive little or no attention in research, policy, and commercial agriculture [1]. These crops are well-adapted to local agro-ecological environments in Nigeria, having been cultivated there since ancient times [2]. They are rich in essential minerals and nutrients, resilient to harsh conditions, require fewer inputs, and are vital for enhancing food security, particularly for resource-poor farmers [3]. However, due to urbanization, shifting dietary preferences, and insufficient government support, the production and consumption of orphan crops have declined [2]. Utilizing orphan crops could significantly improve household livelihoods, especially in rural areas, addressing growing food security challenges.

In Nigeria, orphan crops constitute a vital part of traditional farming systems and rural household diets. They include indigenous cereals, legumes, vegetables, fruits, roots, and tubers that have been cultivated and consumed for generations. Examples commonly cultivated in Nigeria include African yam bean (Sphenostylis stenocarpa), Bambara groundnut (Vigna subterranea), Pigeon pea (Cajanus cajan) and African eggplant (Solanum aethiopicum). Besides serving as food, many of these crops possess medicinal properties and contribute significantly to household income, livestock feeding, and cultural heritage [4].

Additionally, orphan crops are often drought-tolerant and pest-resistant, making them suitable for cultivation in regions with poor soil quality and limited water resources [5]. This adaptability ensures food availability in areas prone to climate variability and extreme weather events. Smallholder farmers, who produce the majority of food in developing countries, often rely on orphan crops for subsistence and income generation. These crops are deeply embedded in local cultures and farming systems, requiring minimal external inputs such as fertilizers and pesticides [1]. By promoting the cultivation of orphan crops, communities can reduce their dependence on a few staple crops, thereby enhancing agricultural biodiversity and reducing the risk of crop failure [6].

1.1. Problem Statement

Malnutrition and food insecurity are still big developmental problems for Nigeria, especially for those living in rural areas where there is persistent poverty and decreasing agricultural productivity in addition to climate variability. Although there is huge biological diversity of food crops around the world, current farming practices have increasingly come to depend on a few types of staple food crops such as maize, rice, and wheat. There is evidence suggesting that very few kinds of crop species currently make up most of the food needs of the world, and this has decreased dietary diversity and vulnerability of food systems to environmental and economic changes [7, 8]. Orphan crops, otherwise known as NUS (neglected and underutilized species), are indigenous cereals, legumes, fruits, vegetables, and root crops that have been used by Africans in various regions to secure their food and nutrition needs. These crops have many advantages, which include being highly nutritious, adapted to marginal areas, drought-tolerant, tolerant of poor soils, and not too much reliance on agricultural inputs.

In South-West Nigeria, orphan crops such as Bambara groundnut, African yam bean, pigeon pea, African breadfruit, amaranth, moringa, and fonio, once vital to rural diets and farming, are now in decline. This shift is due to a preference for major staples, limited research, poor seed systems, undeveloped markets, and changing food preferences [7, 8]. Consequently, valuable indigenous crops are disappearing from farming systems and diets, leading to reduced dietary diversity and over-reliance on a few food crops.

Despite recognized nutritional and environmental benefits, empirical data on their contribution to rural households' diets and cultivation determinants in South-West Nigeria are scarce. Existing studies primarily focus on agronomic and nutritive aspects, neglecting factors influencing farmers' cultivation practices. Factors such as market access, seed availability, and cultural preferences influence the cultivation and use of orphan crops. However, the precise correlation between these variables and farmers' decisions remains poorly understood, hindering the development of policies to promote orphan crops for food security, climate resilience, and improved farmer incomes. Given the challenges of climate change, declining agricultural diversity, and food insecurity in Nigeria, adaptive and sustainable food systems are crucial. Orphan crops, globally recognized for their adaptability and nutritional value, offer a promising solution that is currently underutilized in Nigeria.

Thus, there is a need to evaluate the utilization of orphan crops in rural household dietary practices and the factors influencing their production by farmers in southwestern Nigeria. This research is important because it will provide empirical information for developing strategies to enhance the production and consumption of orphan crops as a way to ensure food and nutrition security, conservation of agrobiodiversity, and improvement in rural livelihoods.

1.2. Objectives of the Study

The broad objective of this study is to examine Orphan Crops Utilization in Rural Households' Diets and Factors Mitigating against Their Cultivation among Farmers in South-West Nigeria.

2. Literature Review

2.1. Conceptual Framework

The concept of orphan crops is closely linked to the broader discourse on agricultural biodiversity and sustainable food systems. According to Padulosi, et al. [3], orphan crops play a critical role in maintaining agroecological balance and preserving traditional knowledge systems. They are often grown in mixed cropping systems, which enhance soil fertility, reduce pest and disease outbreaks, and improve resilience to climate change [9].

Orphan crops, also referred to as neglected or underutilized crops, are plant species that are traditionally grown in specific regions but have received limited attention from researchers, policymakers, and markets [3]. These crops are often indigenous to particular areas and are well-adapted to local agroecological conditions. Examples of orphan

crops include amaranth, bambara groundnut, African eggplant, and fonio. Despite their nutritional and agronomic potential, orphan crops have been marginalized in favor of major staple crops such as maize, rice, and wheat [9]. This marginalization has resulted in a lack of investment in research, development, and market promotion for these crops, limiting their potential to contribute to food security and rural livelihoods [10].

Orphan crops become very important in areas characterized by scarcity of resources since they do not depend on high inputs and can withstand harsh climatic conditions and also contribute to the intake of essential nutrients which staple crops lack [3]. For example, amaranth contains high protein content, vitamins, and minerals, whereas bambara groundnut contains high protein content and healthy fats [9]. However, despite all the above properties, the use of orphan crops is still low due to several reasons like the lack of knowledge about orphan crops, scarce supply of improved cultivars, and lack of access to markets [10]. Orphan crops are crucial in resource-scarce regions due to their low input requirements, resilience to harsh climates, and ability to provide essential nutrients often missing in staple crops [3]. For instance, amaranth is rich in protein, vitamins, and minerals, while bambara groundnut offers high protein and healthy fats [9]. Despite these benefits, orphan crops remain underutilized due to limited awareness, scarcity of improved varieties, and poor market access [10].

2.2. Theoretical Framework

This study was based on two main theories: agricultural development theory and Maslow's Theory of Needs.

2.3. Agricultural Development Theories

Agricultural development theories provide a framework for understanding the role of agriculture in economic growth and poverty reduction. The Green Revolution model, which emphasizes the use of high-yielding varieties, chemical fertilizers, and irrigation, has been widely adopted in many developing countries [11]. However, this model has been criticized for its focus on a few staple crops, which has led to the neglect of orphan crops and other traditional crops [9]. The Sustainable Intensification approach, on the other hand, emphasizes the need to increase agricultural productivity while minimizing environmental impacts [12]. This approach recognizes the importance of diversifying agricultural systems and incorporating underutilized crops such as orphan crops to enhance resilience and sustainability.

The Green Revolution, which began in the 1960s, was instrumental in increasing agricultural productivity and reducing hunger in many parts of the world. However, its focus on a few staple crops, such as rice, wheat, and maize, has led to the neglect of other crops, including orphan crops [11]. This has resulted in a loss of agricultural biodiversity and increased vulnerability to climate change and market fluctuations [9]. The Sustainable Intensification approach seeks to address these challenges by promoting the use of diverse cropping systems, integrated pest management, and conservation agriculture [12]. This approach is particularly relevant for orphan crops, which are well-adapted to local conditions and require minimal inputs.

2.4. Maslow's Theory of Needs

Maslow [13] proposed the Hierarchy of Needs Theory in his groundbreaking work "A Theory of Human Motivation." According to this idea, there are five different levels of human needs: self-actualization, esteem, safety, love and belonging, and physiology. Maslow [13] can be related to food security; put differently, people make judgments about things like what to eat, where to live, what kind of work to pursue, what possessions and money they will acquire, and so on, based on deliberate thought and reason. This hypothesis is commonly represented as a pyramid, where the top two levels are identified as growth needs and the bottom three levels as deficiency needs.

The theory holds that people are first driven to satisfy their basic physiological requirements, which include those for food and shelter as well as security and safety. Within this framework, housing is seen as a safety need. Safety needs take precedence over other needs and have a significant impact on human behavior once people have satisfied some of their physiological, biological, or physical needs (clothing, food, etc.). For survival, safety demands are considered as important as biological necessities. Maslow gives several instances of wants related to safety and security, such as housing, financial stability, personal security, and defense against diseases and accidents and their negative effects. According to the theory, sufficient housing is essential for both positive development and security, ranking second on Maslow's hierarchy of requirements. The safety and well-being of its occupants are significantly impacted by housing by nature. People who have unfulfilled housing demands have strong incentives to look for rental accommodations. Maslow's adaptation of the need theory has been criticized for a number of reasons, including its purported individualistic and ethnocentric qualities, but it is nevertheless a useful framework for explaining the motivational elements that underlie personal decision-making.

2.5. Empirical Literature Review

Empirical studies on the utilization of orphan crops and their effect on food security have highlighted various aspects, including their nutritional benefits, adaptability to harsh climates, and economic viability for rural households. This section reviews key studies that have explored these dimensions, providing a comprehensive understanding of how orphan crops contribute to food security. The utilization of orphan crops has gained increased attention in recent years as a viable strategy to enhance food security among rural households. Orphan crops, also known as underutilized or neglected crops, are indigenous plant species that have received limited research and commercial investment despite their nutritional, economic, and environmental benefits. Several empirical studies have explored the role of orphan crops in ensuring food availability, improving dietary diversity, and enhancing rural livelihoods.

Gotor, et al. [14] conducted a case study in Nigeria and discovered that promoting the cultivation of neglected crops such as Fonio, amaranth, and Bambara groundnut significantly reduced household food shortages. They emphasized the need for policy interventions to support farmers in growing these crops through access to improved seeds, credit, and market linkages.

The economic implications of orphan crop utilization have also been explored in various empirical studies. Massawe, et al. [15] conducted an economic analysis of orphan crops and found that while these crops require lower

input costs, their limited market access hampers their widespread adoption. The study highlighted the need for policy interventions that improve market structures and enhance the commercial viability of orphan crops. Fischer and Hajdu [16] examined the role of agricultural value chains in orphan crop commercialization. Their findings revealed that the establishment of processing industries and cooperatives facilitated market access, leading to higher adoption and utilization rates among rural farmers.

One of the primary advantages of orphan crops is their adaptability to harsh environmental conditions. A study by Food and Agriculture Organization [17] found that drought-tolerant crops such as millet and pigeon pea played a crucial role in mitigating the adverse effects of climate change on food production in rural areas. These crops demonstrated resilience against erratic rainfall patterns, making them essential for sustainable agriculture. Furthermore, Nwajiuba [18] explored the contributions of orphan crops to agricultural sustainability in Nigeria. His findings suggested that integrating orphan crops into traditional farming systems reduced reliance on monoculture practices, thereby promoting biodiversity and ecological balance. The study also emphasized the need for agronomic research to enhance the productivity of these crops through improved breeding techniques.

The role of government policies and institutional support in promoting orphan crops has been examined in various empirical studies. Mwema, et al. [19] evaluated policy interventions aimed at increasing the adoption of orphan crops and found that inadequate extension services and lack of research funding were major impediments. The study recommended stronger government involvement in facilitating farmer education, providing input subsidies, and investing in post-harvest processing infrastructure. Additionally, Khan, et al. [20] assessed the contributions of non-governmental organizations (NGOs) to orphan crop promotion. Their study found that community-based programs led by NGOs played a significant role in encouraging rural households to adopt these crops by providing technical training, access to microfinance, and market linkages. For example, a study by Oluwatayo [21] found that households that cultivate orphan crops in Oyo State, Nigeria, have higher levels of food security compared to those that do not.

Despite their numerous benefits, several challenges hinder the widespread adoption of orphan crops. According to Eboh [22], limited awareness among farmers, inadequate research and development, and weak institutional support remain significant barriers. Moreover, post-harvest losses due to poor storage and processing facilities further discourage farmers from cultivating these crops. In a study conducted by Okoye, et al. [23], it was found that negative consumer perceptions and preferences for conventional staples reduced the demand for orphan crops in local markets. Addressing these issues requires targeted interventions such as public awareness campaigns, improved extension services, and investments in agribusiness infrastructure. Similarly, Adebooye, et al. [10] reported that orphan crops are an important component of traditional farming systems in Nigeria, where they are used to supplement staple crops and improve dietary diversity. However, the utilization of these crops remains limited due to a lack of awareness, inadequate research, and poor market linkages [3].

3. Methodology

3.1. The Study Area

The research was carried out in South-Western Nigeria. South-Western Nigeria has six states: Ogun, Ondo, Osun, Ekiti, Lagos, and Oyo. It is identified as the South-West geographical zone of Nigeria. It is mainly a Yoruba-speaking region, though other dialects are available even within the same state. The area lies between longitudes 20°31′ and 60°01′ East, and latitudes 60°21′ and 80°37′ North. The total population of the area is 28,767,752 [24], with a total area of 77,818 km2. South-Western Nigeria is bounded in the north by Kwara and Kogi States, in the east by Edo and Delta States, in the south by the Gulf of Guinea, and in the west by the Republic of Benin. The climatic condition of South-Western Nigeria is tropical in nature, and it is characterized by dry and wet seasons. The weather conditions consist of two distinct seasons in Nigeria: the dry season (November–February) and the rainy season (March–November). The dry season is also the giver of the Harmattan dust; cold, dry winds from the northern region blow into the southern regions around this time. The temperature ranges between 21°C and 34°C, and annual rainfall ranges between 1,500 mm and 3,000 mm.

Agricultural activity is the major occupation of people in the zone. They produce food crops such as: Cereal (maize, millet, sorghum, rice), Tuber (yam, cassava) and Legume (cowpea, soybean), while the cash crops are: oil palm, kolanut, cocoa, plantain, Banana, cashew, citrus and timber. The animal productions such as fishery, poultry, piggery, goat, sheep and cattle rearing are present (www.mydestination.com/nigeria/regionalinfo/6182976/south-west-region).

3.2. Population of the Study

The population of this study was made up of farming households in the South-Western region of Nigeria.

3.3. Sampling Techniques and Sample Size

A multi-stage sampling procedure was adopted.

Stage 1: Three States in the South-west, Nigeria, were purposively selected (which are Oyo, Ogun and Ondo States).

Stage 2: Three local governments were purposely selected from each of the states; a total of nine (9) local government areas.

Stage 3: 60 respondents were randomly selected from each local government area; a total of (60 X 9) 540 respondents.

3.4. Type of Data and Instrument used for Data Collection

In this research work, primary data were used. Data were gathered by the use of well-structured questionnaires. The questionnaires will be framed in a manner to attain the aims of the research. The questionnaire will contain some useful information such as socio-economic characteristics of the respondents, List of orphan crops, utilization of orphan crops, constraints to orphan crop utilization, and food consumption.

3.5. Methods of Data Analysis

Data were analysed by the use of descriptive statistics such as frequency, percentage, mean and weighted mean score (WMS).

4. Result and Discussion

4.1. Availability, Cultivation and Utilization of Orphan Crops

Table 1 revealed the distribution of the respondents based on the presence of the orphan crops, the cultivation, acquisition, and consumption of the orphan crops in the study area. The findings show considerable differences in the presence and use of the orphan crops in different classes of crops such as roots/tubers, cereals, legumes, leafy vegetables, and fruit/tree crops.

Roots/Tubers: In regard to roots and tubers, 92.22% of the people surveyed claimed the most common crop was yam bean (Pachyrhizus erosus) and was commonly eaten (87.78%), but was also mostly gotten from the wild (53.33% of the surveyed population). On the other hand, Livingstone potato (Plectranthus esculentus) was the least available root crop, being found in 21.11% of the respondents and utilized by the same number of households. Aerial yam (Isu ijapa) was utilized by 50.56% of the households surveyed. Also, 25.56% of the households utilized air potato (Dioscorea bulbifera).

Cereals/Grain: In the case of cereal and grain crops, pearl millet (Pennisetum glaucum) was available for everyone, as shown by 100.00 percent availability of the crop. It was also consumed extensively by the local communities (97.22%), but it was cultivated by few households (33.33%). On the other hand, fonio (18.33 percent) and finger millet (17.22 percent) had low availability and cultivation. Only about 16% of respondents included both fonio and finger millet in their diets.

Legumes/Pulses: Regarding legumes and pulses, the following legumes had high availability in the study area: African yam bean (98.89%), Bambara groundnut (98.33%), Jack bean (98.33%), and velvet bean (98.34%). The highest consumption rate of one of these legumes is Bambara groundnut (85.00%), and it is cultivated by only 30.56% of the respondents. Also, pigeon pea was highly available (85.00%) and consumed by 76.67% of the respondents. Other orphan legumes were also consumed at varying percentages. The least utilized legume was velvet bean (5.56%), though it was readily available in the study area.

Leaf vegetables: the commonly available leaf vegetable (98.33%) and consumed (81.11%) was worowo (Solanecio biafrae). The same case was with Ebolo (Crassocephalum spp.), which was available to 90.56% of households while 70.56% consumed it. Wild lettuce (Launaea taraxacifolia) was also another common leaf vegetable that was available (78.89%) and consumed (58.51%) by the community members. African basil (Ocimum gratissimum) and African eggplant leaf (Solanum macrocarpon) were available and consumed, although not so much compared to other vegetable types. A significant number of these vegetables were obtained in the wild, indicating natural availability. It was discovered that only a few households cultivated these vegetables, but a large number included them in their diet.

Fruit and tree crops: The most available (81.67%) and consumed (71.67%) of the fruit and tree crops was breadfruit (Treculia africana). Bush mango (Irvingia gabonensis) was available to 67.22% of the respondents and consumed by 59.45% of households. The least available was wild guava (Psidium guineense) (48.33%), but it was consumed (39.44%) and was not cultivated by any respondents.

This result revealed that orphan crops like pearl millet, Bambara groundnut, African yam bean, worowo, ebolo, breadfruit, and yam bean are widely distributed and consumed in the study area. However, their cultivation is low despite their availability and consumption. Many individuals gather these crops from the wild rather than cultivating them, indicating their status as naturally occurring or semi-domesticated plants. This presents a significant opportunity to promote their cultivation, commercialization, and utilization to enhance local nutrition and food security. While orphan crops are widely used in rural areas, their cultivation by farmers is insufficient, with most being wild-gathered or purchased. Therefore, there is a considerable opportunity to boost the domestication and production of these nutritious but underutilized crops.

Table 1. Distribution of the respondents based on available orphan crops (540).

Orphan crops	Available in the area	Cultivated by farmers	Buy from market	Gathered from wild	Consumed by Households
Roots/Tubers					
Aerial yam (Isu ijapa)	288(53.33)	27(5.00)	45(8.33)	90(16.67)	273(50.56)
Livingstone potato (Plectranthus esculentus) Eso Igbale	114(21.11)	3(0.56)	6(1.11)	81(15.00)	114(21.11)
Yam bean (Pachyrhizus erosus)	498(92.22)	12(2.22)	93(17.22)	288(53.33)	474(87.78)
Air potato (Dioscorea bulbifera)	138(25.56)	12(2.22)	15(2.78)	39(7.20)	138(25.56)
Cereals/Grain					
Fonio (Digitaria iburua)	99(18.33)	3(0.56)	39(7.20)	48(8.89)	90(16.67)
Finger millet (Eleusine coracana) okara kekere	93(17.22)	12(2.22)	3(0.56)	48(8.89)	87(16.11)
Pearl millet (Pennisetum glaucum) Okababa	540(100.00)	180(33.33)	63(11.67)	192(35.55)	525(97.22)
Legumes/Pulses					
Bambara groundnut (Vigna subterranea) Okapa	531(98.33)	165(30.56)	147(27.22)	336(62.22)	459(85.00)
Lablab bean (Lablab purpureus) Papapa	288(53.33)	3(0.56)	3(0.56)	24(4.44)	30(5.56)
African yam bean (Sphenostylis stenocarpa) Sese	534(98.89)	24(4.45)	66(12.22)	107(19.82)	135(25.00)
Hyacinth bean (Dolichos lablab) Papapa	441(81.67)	6(1.11)	48(8.89)	93(17.22)	106(19.63)
Pigeon pea (Cajanus cajan) Fopo	459(85.00)	14(2.60)	18(3.33)	368(68.15)	414(76.67)
Jack bean (Canavalia ensiformis) Epa gbigbona	531(98.33)	23(4.26)	111(20.56)	207(38.33)	231(42.78)
Winged bean (Psophocarpus tetragonolobus) Ewe alakan	246(45.56)	12(2.22)	19(3.52)	147(27.22)	198(36.67)
Sword bean (Canavalia gladiata)	120(22.22)	0(0.00)	0(0.00)	105(19.44)	105(19.44)
Velvet bean (Mucuna pruriens) Werepe	531(98.34)	0(0.00)	0(0.00)	30(5.56)	30(5.56)

Orphan crops	Available in the area	Cultivated by farmers	Buy from market	Gathered from wild	Consumed by Households
Kersting's groundnut (Macrotyloma geocarpum) Epa ile kekere	393(72.78)	3(0.56)	21(3.89)	114(21.11)	192(35.56)
Leaf vegetables					
Wild lettuce (Launaea taraxacifolia) Yanrin	468(86.67)	9(1.67)	177(32.78)	306(56.67)	316(58.51)
African basil (Ocimum gratissimum) Efirin	429(79.44)	111(20.56)	183(33.89)	321(59.44)	330(61.11)
African eggplant leaf (Solanum macrocarpon) igba	378(70.00)	168(31.11)	215(39.81)	270(50.00)	291(52.89)
Worowo (Solanecio biafrae)	531(98.33)	54(10.00)	180(33.33)	312(57.78)	438(81.11)
Ebolo (Crassocephalum spp)	496(91.85)	15(2.78)	177(32.78)	328(60.74)	381(70.56)
Roselle (Hibiscus sabdariffa) Isapa	486(90.00)	73(13.52)	114(21.11)	339(62.78)	378(70.00)
Sesame (Sesamum indicum) Ekuku	351(65.00)	96(17.78)	144(26.67)	127(23.52)	207(38.33)
Fruit and Tree crops					
Bush mango (Irvingia gabonensis) Apon	363(67.22)	27(5.00)	138(25.56)	180(33.33)	321(59.45)
Breadfruit (Treculia africana) Gberefutu	441(81.67)	87(16.11)	105(19.44)	117(21.67)	387(71.67)
Wild guava (Psidium guineense) Guafa igbo	261(48.33)	0(0.00)	21(3.89)	183(33.89)	213(39.44)

Note: Values in parentheses are percentages.
Source: Field Survey, 2025.

4.2. Factors Mitigating against Cultivation of Orphan Crops

Table 2 shows the distribution of the respondents in terms of the factors that were mitigating against the cultivation of orphan crops. The factors were analyzed using the Weighted Mean Score (WMS) and scores from 1.5 to 2.0 represented major factors, scores from 0.5 to 1.4 represented minor factors, while scores from 0.0 to 0.4 represented not a factor.

Major factors: From the analysis of data collected, it was found that lack of institutional support emerged as the most major factor that was mitigating against the cultivation of Orphan crops in the study area, with WMS = 1.59 and position 1. The majority of the respondents (70.56%) rated it as a major factor, while 17.78% regarded it as a minor factor. This implies that there is no proper government policy, extension service, research and financial facilities in place to support orphan crop production. Inadequate seeds/planting materials and lack of processing equipment emerged equally as the second most important factor with WMS of 1.64. About 68.89% and 68.33% of the respondents regarded these constraints as major factors. Slow maturity ranked fourth (WMS = 1.51), with over half (59.44%) of participants identifying it as a major constraint, suggesting that orphan crops are not usually mature early.

Minor factors: Pest and disease infestation came fifth with a WMS = 1.39. Even though only 45.00% of the respondents considered it a major factor, about half of them (49.44%) affirmed it to be a minor one. This implies that pest and disease infestation is not a constraint to orphan crop cultivation because the crops have already adapted to the environment. The study further showed that poor knowledge of preparation methods was a minor factor, with a WMS of 0.94, and ranked 6th. While 27.22% identified it as a major problem, a larger proportion (40.00%) perceived it as a minor challenge. Similarly, market unavailability (WMS = 0.64) and poor shelf life (WMS = 0.57) were ranked 7th and 8th, respectively, and were classified as minor factors. This implies that although these factors affect cultivation and utilization, they are not the most critical constraints faced by respondents.

Not a factor: It was revealed that the cultural stigma or taboo surrounding orphan crops had a WMS of 0.43, ranking ninth among all the factors. The majority (66.11%) of the respondents stated that it was not a factor, which shows that cultural perceptions do not have much impact on the cultivation of orphan crops in the study area. Also, lack of awareness turned out to be the least significant factor, obtaining a WMS of 0.34 and ranking tenth. Almost 77.78% of the respondents stated that it was not a factor at all.

It is evident from the findings of this research that the main factors limiting the cultivation of orphan crops include poor institutional support, poor availability of good seeds and planting material, lack of processing facilities, and slow growth or late maturity. Poor awareness and cultural stigma were not considered important factors limiting the cultivation of the crops. Hence, measures to improve institutional support and provide adequate processing facilities will help increase the use of these orphan crops.

Table 2. Distribution of respondents by Factors Mitigating against Cultivation of orphan crops in the study area (N=540).

Challenges	Major factor	Minor factor	Not a factor	WMS	Rank
Lack of institutional support	381(70.56)	96(17.78)	63(11.67)	1.59	1st
Inadequate seeds/planting material	372(68.89)	144(26.67)	24(4.44)	1.64	2nd
Lack of processing equipment	369(68.33)	149(27.22)	24(4.44)	1.64	2nd
Slow maturity	321(59.44)	171(31.67)	48(8.89)	1.51	4th
Pest and disease	243(45.00)	267(49.44)	30(5.56)	1.39	5th
Poor knowledge of preparation methods	147(27.22)	216(40.00)	177(32.78)	0.94	6th
Market unavailability	117(21.67)	111(20.56)	312(57.78)	0.64	7th
Poor shelf life	123(22.78)	60(11.11)	357(66.11)	0.57	8th
Cultural stigma/taboo	51(9.44)	132(24.44)	357(66.11)	0.43	9th
Lack of awareness	63(11.67)	57(10.56)	420(77.78)	0.34	10th

Note: Values in parentheses are percentages.
WMS = Weighted Mean Score.
If WMS =1.5-2 Major factor.
WMS =0.5-1.4 Minor factor.
WMS =0.0-0.4 Not a factor.
Source: Field Survey, 2025.

5. Conclusion and Recommendation

The study concluded that several orphan crops, including pearl millet, Bambara groundnut, African yam bean, pigeon pea, Worowo, Ebolo, and breadfruit, remain widely available and are commonly consumed by rural households. Despite their high level of utilization, the cultivation of most of these crops remains low, with many

households relying on wild collection or market purchases rather than on-farm production. It was also established that the major factors limiting the cultivation of orphan crops are institutional in nature. Lack of government and institutional support, inadequate access to quality seeds and planting materials, lack of processing equipment, and the slow maturity of some orphan crops were identified as the most critical factors discouraging farmers from cultivating these crops. Conversely, cultural stigma and lack of awareness were found to be relatively insignificant constraints, suggesting that farmers are generally knowledgeable about the existence and benefits of orphan crops but are hindered by production and market-related challenges. Overall, the study demonstrates that orphan crops possess enormous potential to strengthen household food and nutrition security, improve agricultural biodiversity, enhance climate resilience, and diversify rural livelihoods in South-West Nigeria.

The study recommended that government support should be strengthened through the formulation of policies that recognize orphan crops as strategic food-security crops. Increased public investment in research, extension services, and production incentives will encourage farmers to cultivate these crops. Agricultural research institutions should intensify breeding programmes to develop improved, high-yielding, early-maturing, pest-resistant, and climate-resilient varieties of orphan crops while ensuring that quality seeds and planting materials are readily available to farmers. Farmer cooperatives and community-based organizations should be encouraged to engage in collective production, seed multiplication, processing, and marketing activities to reduce production costs and improve access to markets.

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