



The Visibility of the Invisible: Potentials of Wrapping Leaves in the Livelihood of Rural Women of Ekiti State, Nigeria

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Abstract

The study identified plant species whose leaves are used for wrapping food and agricultural products in Ekiti State, Nigeria, and determined their economic potentials to rural women. Semi-structured questionnaire matrix was used to interview randomly selected women. The interviews were focused, conversational and two-way in communication. Nineteen indigenous food and nine agricultural products were enfolded in the study area. Wrapping leaves were obtained from seven plant species. Leaves harvestings were predatory and annihilative in two of these species- *Megaphrymium macrostachyum* and *Thaumatococcus daniellii*- that were not cultivated in the study area. Leaves from *T. daniellii* were the preferred for wrapping and has a market value. Women dominated the harvesting, products utilization, haulage and marketing of the leaves of this species. In addition, women were familiar with the habitat and ecology of the species. Thus, it offers an opportunity to rural women in order to improve their economic status.

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INTRODUCTION

Wrapping is a form of packaging, a science, art and technology of enclosing or protecting a product for distribution, storage, sale and use. Such products include food and agricultural products (Kabuo *et. al.*, 2015). Wrapping food helps retain their nutritional value and/or flavour for a longer period (Abdulummeen *et. al.*, 2012) and thus eliminate microorganisms from the food and prevent their growth. Similarly, packaging play vital role in food production, this includes physical protection, barrier protection from oxygen and water vapour, reducing security risk during shipment and creating convenience in distribution, handling sales, opening, use and re-use (Robertson , 2005). The type of packaging materials used in agricultural products help in defining the quality of the products (IFT, 1991, Muncke, 2009). Thus, packaging can be described as a coordinated system of preparing goods for transport, warehousing, logistics and sales (Fieider, 1995).

Food and agricultural products need to be protected against biodegrading agents such as pests, fungi, bacteria and nematodes. This is important in order to increase their shelf lives as pests easily infect most of them, some easily breakup and this leads to their destruction, which make them unfit for human use. Similarly, a host of environmental factors, such as heat and the presence of microorganisms

are known to act and change food stuffs in ways that may harm the food and agricultural products and make them unacceptable for consumption (Daniel, 2007). Therefore, the need for their preservation is highly imperative.

The use of plant leaves constitute a veritable aspect of the traditional packaging system, particularly in rural areas. The use of plants for wrapping over synthetic packaging materials is receiving more attention nowadays; this is because plants were found to be natural and cheaper. They are holistic in nature, easy to get and does not need the presence of skilled personnel before they could be utilized (Karthikeyan *et. al.*, 2009, Schmidt, 2017). Modern packaging preservative methods such as cellophane, nylon, foils and the use of refrigerators and freezers for preservation are often beyond the reach of resource-poor rural dwellers, even when such equipment are available, electricity to power them is not available in the rural areas. So that, a sustainable approach to improve the shelf lives of foods and agricultural products is still limited to traditional methods.

Previous assertion revealed that rural women in Nigeria maintained special relationships with their environment (Kayode, 2006). This enables them to have sound knowledge of the plant products used in household economy. The women served as the primary collectors of these products which include fodder, fuel wood, drugs, fruits and wrapping leaves (Carr,

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2008). Women are also responsible for food preparation, haulage (from farms) and sales of agricultural products (usually in towns and cities).

Recent studies revealed that wrapping leaves, like other non-wood forest products, are now important trading commodities at local, national, regional and international levels (Tieguhong and Ndoye, 2004; Endamana *et. al.* 2016; Ojea *et. al.* 2016), providing employment and income at each level (Tieguhong, *et. al.* 2009; Suleiman *et. al.*, 2017) thus they constitute a poverty trap, a safety net, or a potential resource for rural development and poverty alleviation. Unfortunately, this potential has not been exploited by rural women in Ekiti State, Nigeria, who were mostly unemployed, vulnerable and poor. Their impacts have only been felt indirectly in subsistent agriculture, and directly at the domestic domain. These women failed to take advantages in wrapping leaves in either their cultivation and / or trading. This study thus aimed to examine the economic potentials of wrapping leaves for rural women in Ekiti State, Nigeria.

MATERIALS AND METHODS**Description of the Study area**

The study was carried out in Ekiti State (Lat. 7°25' and 8°20'; Long. 5°00'-6°00'), Nigeria. The state consists of a land area of about 7000m² and over 70% of its 1.6 million inhabitants are

farmers (Kayode *et. al.*, 2016). Two climatic seasons abounds in the state, a rainy season from March to October and a dry season from November to February. The state is divided into three zones as Ekiti Central, Ekiti North and Ekiti South zones. Ekiti Central zone consists of Ado, Efon, Ekiti West, Ijero and Irepodun/Ifelodun Local Government Areas (LGAs), Ekiti North zone consists of Ido/Osi, Ilejemeje, Ikole, Oye and Moba LGAs and Ekiti South zone consists of Ekiti East, Ekiti South West, Emure, Gbonyin, Ikere and Ise/Orun LGAs.

Sampling Technique and Data Collection

A semi-structured questionnaire matrix was used to interview respondents in two selected LGAs from each of the zones. The LGAs selected were Ijero and Efon LGAs in Ekiti Central zone, Oye and Moba LGAs in Ekiti North zone, Ise/Orun and Ekiti South West LGAs in Ekiti South zone. Four rural communities were selected from each of the LGAs (Table 1). These communities were relatively far from urban influence. Though the Ekiti indigenous tribe with the same culture inhabits the State, yet sampling for this study was spread to cover the entire State.



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Table 1: List of communities sampled in Ekiti State, Nigeria

Zone	Local Government Area	Communities Used	No. of Women Interviewed
Ekiti Central	Ijero	Sakoro, Ologboodu, Kajola and Oke Oko	40
	Efon	Araromi, Aladura, odofin and Aro	40
Ekiti North	Moba	Epe, Iro, Alarasa and Osan	40
	Oye	Dakowa, Igbo-Ero, igbo-Ogbe and Oke-Otin	40
Ekiti South	Ekiti South West	Aba, Efon, Elejofi, Igunrin and Omipupa	40
	Ise/Orun	Afolu, Kajola, Obada and Ogbese	40

In each community, 10 women were selected randomly and interviewed. The interviews were focused, conversational and two-way in communication. The plant species used for wrapping as well as their abundance were identified. Species that could be seen within 20 minutes in the community were regarded as Very Abundant, those that could be seen within 40 minutes as Abundant, those that could take up to 60 minutes were regarded as Frequent while those of them that would take over 60 minutes to be seen as Rare. Respondents' indigenous knowledge on the rare but economic identified species was obtained to establish their sustainability potentials. Similarly, the economic potentials of the wrapping leaves species to women in the study area were determined. Voucher specimens of the identified wrapping species were collected and later identified and deposited to the herbarium of the Department of Plant Science and Biotechnology, Ekiti State University, Ado-Ekiti, Nigeria.

Group interviews were conducted in each community to determine group. Each group was made up of at least four rural women respondents, who had earlier participated in the individual interviews described above. Five group interviews were conducted in each LGA. Key informants, made up of wrapping leaves vendors, famers and officials of Community Development and Agriculture in the LGAs, officials of Agriculture Development Project were identified



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and interviewed. Secondary information was obtained from records, journals and internet.

RESULTS

The demographic classification of the women respondents revealed that they were mostly from working age (88%, Table 2), adherents of the two major religion in the country, illiterates (71%) and were well familiar with wrapping of foods and agricultural products. Table 3 shows that a total of 19 indigenous foods were associated with the use of wrapping leaves in the study area. These food cut across carbohydrates, proteins and fats though they were dominated by carbohydrates food.

Agricultural products usually wrapped with leaves are stated in Table 4. Nine products were observed. These products were usually of subsistence use rather than commercial. In addition, field observation revealed that they were being wrapped to enhance their transportation from farms. A total of 7 plant species, whose leaves were widely used for wrapping, were identified in the study area (Table 5). Five of these species were widely cultivated, though for purposes other than wrapping, in the study area. These species were *C. esculenta*, *M. paradisiaca*, *M. sapientum*, *T. cacao* and *T. grandis*. *C. esculenta*, *M. paradisiaca* and *M. sapientum* were cultivated for food, *T. cacao* for economic purpose

and *T. grandis* cultivated mostly in government lands for industrial utilization. Leaf harvesting from *M. macrostachyum* and *T. daniellii* was obtained from their species growing in the wild. Information from key informants revealed that *T. daniellii* was being cultivated in commercial quantity in three locations in the state. *T. daniellii* ranked the highest on the scale of preference (Table 6) of preferred wrapping leaves by the respondents and it is the only species with marketable value.

Consequently, the gender specific roles on *T. daniellii* was determined. Women were observed to have dominated the issues involved on this species (Table 7). These include harvesting, products utilization, haulage and marketing. Marketing channels were observed to include producers (harvester), wholesalers (who buy directly from the producers), retailers (vendors who buy from the wholesalers) and the consumers (who buy directly from the vendors). Field observation revealed the existence of ready market for the leaves of *T. daniellii* in the urban areas.

Information from key informants revealed that wholesalers buy a medium-sized *T. daniellii*'s leaf at an average cost of 0.5Naira and sell to the vendors at 3 Naira. Vendors sell at 5 Naira per leaf to the consumer (Table 8). Thus the table revealed that both the wholesalers and vendors make profits far in excess of the official monthly minimum wage in Nigeria.



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Table 9 revealed that the women respondents were familiar with the habit and ecology of this plant. Field observation revealed that though the rural women were conscious of the economic opportunity offered by investment in wrapping leaves, they were constrained by commitment to marriage, as they served as helping hands in farms to their husbands and numerous hindrances to convey the leaves to the urban areas for sale.

DISCUSSION

This study revealed that all women respondents were conscious of the use of leaves for wrapping food and agricultural products. Their socio-economic classifications were not prerequisites to this consciousness. A variety of wrapping materials now flourish in the study area. These, in addition to leaves, included nylon, paper and aluminous foil. Indeed a study conducted in rural areas of Ghana revealed that the use of polythene nylon bags is fast replacing the traditional act of using leaves for wrapping food and packaging of agricultural products (Facciola, 1998). However, the indigenous residents' preference is still skewed to the use of leaves, which is regarded as culturally acceptable and medicinal. Recent initiative contends that the use of nylon and papers for wrapping foods have harmful health effects on humans as they contained substances that are harmful when ingested with food (Annon. 2014). Apart from the fact that

the costs of these alternative wrapping materials were often beyond the reach of the resource-poor rural women, they were not even available for purchase in the rural areas of the state, The women are primarily saddled with food preparations, and hence they are well familiar with issues involving wrapping food with leaves. The leaf is an important non-timber forest product (NTFP). Studies have expressed that women are experts about NTFPs (Facciola, 1998). In the present study, a total of 19 indigenous food and 9 agricultural products were usually wrapped with leaves from 7 different plant species (Tables 3, 4 and 5). Two of these species, *M. macrostachyum* and *T. daniellii*, were presently rare and were not cultivated in the study area. Dependence on these species had been limited to those growing in the wild. However, *T. daniellii* was recognised as the species with market value (Table 6) thus confirming the previous description of the plant as an economic plant with versatile uses in Southern Nigeria (Shalom *et. al.*, 2014).

The gender specificity test conducted on *T. daniellii* identified women as primarily responsible for harvesting leaves, utilizing of these products obtainable from the plant, transport of the products from farms and forest, and marketing of the products. All these tend to suggest that women possess the key into economic advantages that rely on this species. The examination of the market value



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of the species revealed that the species could offer considerable income in excess of the existing national monthly minimum wage in the country (Table 8). An examination of the women indigenous knowledge on the species revealed that the women were experienced on the habitat, ecology and propagation of the species, and hence inferred that women could cultivate this plant because it possesses economy of labour, suitable for cultivation in the study area, offer diverse economic advantages and easy for women to cultivate. The species was earlier observed to be perennial, monocotyledonous herb that propagates itself by rhizomes and forms an undergrowth of trees in its natural habitat. It has long, slender stalks that can grow up to two or three meters high, each bearing a single tough, ovoid shaped leaf of varying sizes depending on the plant's age and habitat (Makinde and Taiwo 2004). The plant grows throughout the hot, humid tropical rain forest and coastal zone of West Africa (Mansfeld 1986). Thus, the rural women possessed the knowledge required for the cultivation of this species, harvesting and marketing.

In conclusion, the goals of community development is to enrich and improve the quality of individuals and family life and assist in the economic sustainability of the family, particularly in situations where women, an important stakeholder in family issues, are employed in the

informal sector and in the non-skilled areas. Thus, wrapping leaves offer greater opportunities for rural women in the informal sector to further support the economy of the family. Consequently, following recommendations were made:

- a) Governments and non-governmental organisations should enlighten women on the economic opportunity offered by wrapping leaves.
- b) Women involvement in commercial cultivation of *T. daniellii* should be encouraged.
- c) Efforts should be made to eliminate the activities of the middle women-wholesalers- from *T. daniellii* supply chain. These might include the organisation of rural women into co-operative groups that could be saddled with the provision of necessary haulage facilities that would convey the wrapping leaves to the urban areas for sale. This will further increase the income derivable by the rural women.
- d) The Nigerian government should pay more attentions to the infrastructural development of the rural areas particularly through provision of rural roads.

CONFLICT OF INTEREST

The authors wish to state that there were no conflict of interest associated with this paper.



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Table 2: Demographic Classification of Respondents in the study

Features	Description	Proportion (%) of Respondents*			Average Total
		EC	EN	ES	
Age (Yrs)	20-60	82	96	87	88
	> 60	18	4	13	12
Religion	Christianity	67	54	62	74
	Islam	33	46	38	26
Literacy status	Literate	35	22	30	29
	Illiterates	65	88	70	71

* % calculated to the nearest whole numbers

Table 3: Foods wrapped with leaves in the sampled area of Ekiti State, Nigeria

Food	Description
<i>Aadun</i>	This is prepared from maize. The maize is roasted and then ground into powder with little pepper and mixed with palm oil. It is then wrapped in leaves.
<i>Abari</i>	This is prepared from grinded maize that is wrapped in leaves and steamed.
<i>Adalu</i>	This is a mixture of cooked maize and beans, then wrapped in leaves
<i>Agbado-Egbo</i>	This is made of cooked maize and wrapped in leaves
<i>Amala</i>	This is made from powdered form of plantain or yam or cassava and then wrapped in leaves.
<i>Eba</i>	This is made from fermented, powdered form of cassava and then wrapped in leaves.
<i>Epa-kooko</i>	This is prepared from cooked cocoyam, sliced and sundried, it is then wrapped in leaves and re-cook after which palm-oil is added.
<i>Egute</i>	This is prepared from maize. The maize is roasted and then ground into powder with little pepper and mixed with palm oil. It is then wrapped in leaves.
<i>Eko</i>	This is solid pap that is wrapped in leaves
<i>Ekuru</i>	This is prepared by removing the seeds coats of beans, then the seeds are grinded, wrapped in leaves and then steamed.
<i>Ewa</i>	This is made up of cooked beans and then wrapped in leaves
<i>Fufu</i>	This is made from fermented cassava, grinded and cooked. It is later



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	wrapped in leaves
<i>Iresi</i>	This is cooked rice that is later wrapped in leaves
<i>Iru</i>	This is a soup condiment made from fermented seeds of Locust Bean
<i>Isu</i>	This is made up of cooked or roasted yam and later wrapped in leaves
<i>Iyan</i>	This is made by pounding yam and later wrapped with leaves
<i>Moinmoin</i>	This is prepared by removing the seeds coats of beans, then the seeds are grinded, missed with palm oil, wrapped in leaves and then steamed.
<i>Monmon</i>	This is prepared by grinding plantain, wrapped in leaves and steamed
<i>Ogiri</i>	This is a soup condiment made from melon

Table 4: Agricultural products wrapped with leaves in the sampled area of Ekiti State, Nigeria

Agricultural products	Description
<i>Ata</i>	These are the fruits of pepper used mostly for culinary purposes
<i>Efo</i>	These are vegetables used for soup preparations
<i>Eyin</i>	These are the seeds of palm oil used for culinary purposes
<i>Ikan</i>	These are fruits of some vegetables used for culinary purposes
<i>Ila</i>	These are fruits of okra crop
<i>Obi</i>	These are seeds of Kola used as stimulant
<i>Orogbo</i>	These are seeds of Bitter Kola used as stimulant
<i>Osun</i>	Mushrooms used for culinary purposes
<i>Tomanti</i>	Tomatoes fruits

Table 5: Identified plant species whose leaves are used for wrapping in the sampled area of Ekiti State, Nigeria

Botanical Name	Plant Species		Type	Wrapping Value	
	Vernacular Name			Foods	Agric. Product
<i>Colocasia esculenta</i>	Kooko		Fresh	Ata, Efo, Eyin, Ikan, Ila	None
<i>Megaphrymium macrostachyum</i>	Gbodogi		Fresh	All foods in Table 3	All products in Table 4
<i>Musa paradisiaca</i>	Ogede-Agbagba		Fresh	All foods in Table 3	All products in Table 4
	Dried and moistened			All foods in Table 3	All products in Table 4
<i>Musa sapientum</i>	Ogede-Wewe		Fresh	All foods in Table 3	All products in Table 4
	Dried and moistened			All foods in Table 3	All products in Table 4
<i>Tectonia grandis</i>	Tiiki		Fresh	None	All products in Table 4



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<i>Thaumatococcus daniellii</i>	Eran	Fresh	All foods in Table 3	All products in Table 4
<i>Theobroma cacao</i>	Koko	Dried	Ata, Ikan, Ila	Aadun, Iru, Ogiri

Table 6: Determination of rare but economic wrapping leaves in the sampled area of Ekiti State, Nigeria

Feature	Description	Species
Cultivation status	Cultivated	<i>C. esculenta</i> , <i>M. paradisiaca</i> , <i>M. sapientum</i> , <i>T. grandis</i> , <i>T. cacao</i>
Abundance	Not-cultivated	<i>M. macrostachyum</i> , <i>T. daniellii</i>
	Very Abundant	<i>M. paradisiaca</i> , <i>M. sapientum</i>
	Abundant	<i>C. esculenta</i> , <i>T. cacao</i>
	Frequent	<i>T. grandis</i>
Scale of preference	Rare	<i>M. macrostachyum</i> , <i>T. daniellii</i>
		1. <i>T. daniellii</i> (100%), 2. <i>M. paradisiaca</i> and <i>M. sapientum</i> (94%)
Marketable leaf species		<i>T. daniellii</i>

Table 7: Gender specificity in *T. daniellii* in the sampled area of Ekiti State, Nigeria

Roles	Description	Dominating Gender
Harvesting		Female
Products	Leaf (For wrapping)	Female
	Stalks (For mat making)	Female
Haulage		Female
Marketing	Wholesale	Female
	Retail	Female
Cultivation	Mostly wildlings	

Table 8: Economic potential of *T. daniellii*'s leaf in the sampled area of Ekiti State, Nigeria

Description*	
Average cost of medium-sized leaf	0.5 Naira
Average cost of medium-sized leaf to Vendor	3.5 Naira
Average cost of medium-sized leaf to Consumer (in the State capital)	5.0 Naira
Average number of leaf sold per day /Vendor (in Main Market)	850 Pieces
Average income generated / day/ Vendor	1275 Naira
Average income generated /28 days/ Vendor	35700 Naira
Minimum wage in Nigeria /Month (at July 2018)	18000 Naira

*1Naira = 0.0028 US Dollar (As at July 2018)


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Table 9: Indigenous knowledge (IK) of women respondents on *T. danielli* in the sampled area of Ekiti State, Nigeria

Respondents' IK	Observation	Inference
It is a herb plant	The women are used to tending herbs	Women could cultivate this
It is perennial	Capable of yielding dividend continuously	Economy of labour abounds in cultivating this plant
Thrive in forest	Study area is located in forest vegetation	Suitable for cultivation in study area
Propagated from stem	Planting materials are available	Planting the species is easy for woman to carry out
Withstand fire annually	Underground part brings forth new individuals after fire	Ensures economic returns