VALUATION OF THE CONSUMPTIVE AND PRODUCTIVE USES OF WILD AND DOMESTICATED INDIGENOUS LEAFY VEGETABLES IN SOUTHEASTERN NIGERIA

BY

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Abstract

Vegetables are grown for human consumption all over the world. Indigenous Leafy Vegetables (ILV), both wild and domesticated species make important contributions to household improvement in Nigeria. However, information on availability of these species in the market and the consumption level at household is limited. Therefore, ILV species in southeastern Nigeria were investigated in order to determine their availability and consumption level.

Multi-stage random sampling procedure was adopted for selecting three states (Imo, Anambra, Ebonyi), three agricultural zones, communal and household levels. One rural and one urban community were purposively selected from each of the three Agricultural Development Programme zones. Existence of a central market formed the main criterion for selection of an urban community. Ten households were randomly selected and one market was surveyed in each community. Information on ILV species consumed and the corresponding expenditure during the week preceding the interview were collected from the households. Also information on ILV species on sale in the markets, prices and profit margins were obtained. Data were analysed using descriptive statistics and Z-test at $p = 0.05$.

A total of 16 domesticated and 17 wild ILV species were commonly consumed (95% of the respondents) and marketed (average of 52±9.3 persons in each market surveyed) in the study area. These vegetables were consumed 2.0±0.6 times weekly with domesticated ILV accounting for 75.4% of the times. More than one vegetable species were usually used in meal preparation in the area. An average of 4.0±1.2 different species of vegetables were consumed by each household weekly with expenditures ranging between ₦182.60 and ₦227.76 in the rural areas and between ₦205.64 and ₦222.04 in the urban communities. Selling of the vegetables was a part-time occupation for majority (82.6%) of the traders in the rural, but full-time for 65.3% in the urban areas. The prices of the vegetables ranged between ₦42.43 and ₦181.22/kg in the rural and between ₦50.0 and ₦175.23/kg in urban markets except, *Gnetum africanum* which maintained an exceptionally high price that ranged between ₦498.22/kg and ₦933.33/kg in rural and between ₦222.17 and ₦929.77/kg in urban markets while remaining the most preferred wild ILV species. Each seller sold an average of 3.0±0.6 different species of vegetables with daily profit margins that ranged between ₦419.55±70.07 and ₦738.27±96.79 in rural and between ₦526.41±87.42 and ₦805.47±112.55 in urban markets. Profit margins were significantly higher ($Z = -5.4$) in urban than in rural markets. In the rural markets, profit margins of sellers of wild ILV (₦205.34±95.84) were significantly higher ($Z = 4.8$) than for sellers of domesticated ILV (₦175.96±75.89). In the urban markets, profit margins of sellers of domesticated ILV (₦231.10±62.50) were significantly higher than for sellers of wild ILV (₦ 207.64±138.09).

There was a high level of sales and consumption of indigenous leafy vegetable species in the study area. Domestication and commercialisation of *Gnetum africanum* will enhance the economic well-being of the respondents because of its high preference and market values.

Keywords: Indigenous leafy vegetables, Vegetable consumption, *Gnetum africanum*
Word Count: 481

DEDICATION

This thesis is dedicated specially to the duo of Ichie S.M. Soronnadi (Police Commissioner retired) and Bro. Ignatius Osakah for their invaluable contributions towards my success in life.

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CERTIFICATION

I certify that this work was carried out by PAULINUS CHUKWUMAUCHEYA AJU in the Department of Forest Resources Management, University of Ibadan, Nigeria.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Study background

The Nigerian forests and woodlands are replete with a wide array of non-timber forest products (NTFPs). These products make important contributions to the livelihood strategies of rural people throughout the length and breadth of the country. Local communities for instance, have historically benefited from natural ecosystems mainly through the use they make of NTFPs as sources of food, herbal medicines, fibre and other uses. Non-timber forest products are particularly essential for household food security as they are important sources of vitamins, minerals, proteins, carbohydrates fats and other elements not found in agricultural foods. Thus, a number of nutritional deficiencies associated with the monotony of the diet in many communities are avoided due to this "hidden harvests" from forest plants. Moreover, their dietary contribution is increased because they are available during most seasons, including the periods of the year when the conventional staples are scarce (Okafor, 1991; Aju, 1999; Sene, 2000). Not only do NTFPs serve as sources of food, they also play very important role in income and employment generation. They provide many low income and landless rural households with their chief and sometimes only source of cash income (FAO, 1989; Aju & Popoola, 2005). According to Sunderland *et al* (2004), NTFPs earned incomes enable farmers to meet their basic needs and those of their families like the purchase of medicinal products, construction of houses and payment of school fees as well as to finance other activities such as the purchase of pesticides.

In spite of their importance to humans in particular and the economy in general, NTFPs are often overlooked in conventional economic assessments which concentrate on resources which are traded only in urban markets. Thus forests have been assessed simply in terms of their timber values and arable lands only in terms of the major crops. This ignores the range and value of other products harvested in agricultural and forested areas (Juma, 1989). Just because many of these products are

not traded but are consumed directly by the people who collect them, or are only marketed through informal networks, conventional economic assessments fail to consider their values. Thus, their true economic significance has remained inadequately known to governments, policy makers, resource planners and the general public. As a result, NTFPs have continued to remain neglected resources.

Prominent among these NTFPs that are of immense value to the local people particularly in the southeastern parts of the country are wild indigenous leafy vegetables (WILVs) of herbaceous plants and tropical hardwood species. A wide range of such vegetables are collected from the forests and woodlands within the zone. Prominent among them are *Gnetum africanum, Pterocarpus spp, Solanum macrocarpon, Piper guineense, Gongronema latifolium* etc. These vegetables are frequently used as the bases for soups, stews and relishes which accompany carbohydrate staples like cassava, yam, rice and maize. This combination is important because in addition to increasing the nutritional value, these vegetables add flavour to otherwise bland staple diets thereby encouraging greater food consumption (FAO, 1989). Though these WILVs make important contributions to the dietary needs of the people in this zone, their dietary roles is increased because many flush during dry seasons when cultivated vegetables are scarce or are obtainable only where there are irrigation facilities (Getahun, 1975; Okafor 1991). Soups prepared with the leaves of some of these wild plants are highly cherished. For instance, the soups of *Pterocarpus sayouxii* and *G. africanum* popularly known in Igbo as ***"ofe Uha" and "ofe Ukazi"*** respectively command high customer patronage in restaurants and public eating places in the whole of southeastern Nigeria.

The most striking and obvious contributions of these WILVs to the rural economies is the income they bring particularly to the womenfolk who engage either in their collection or sales. For some of these women, income from the sale of these WILVs account for a significant proportion of their cash income, while for some others it represents their only income source. Thus, WILVs are playing very important nutritional and economic roles in the southeastern parts of the country. But just like other NTFPs, they have remained unrecognized and unappreciated and hence undervalued by the scientific and development communities. There are several reasons for this neglect .Being mainly gathered from the wild, ILVs are associated in people's minds with backwardness hence they are often considered low-status food items

particularly in the urban settings. There is a very large number of the vegetable species with many being used only locally and hence poorly known. They are difficult subjects for conventional agronomic study, often being cultivated in small patches in home gardens or growing as weeds in marginal areas within farms or wild in forest areas. The primary producers, transformers and sellers of indigenous vegetables are members of a group that has all too often been overlooked by the scientists and development workers, namely women. Also, the fact that little or nothing is known about the production, processing, distribution and marketing, and more importantly nutrition information on a large number of locally and regionally specific cultivars complicates the problem (Smith and Eyzaguirre, 2007).

This neglect is evident in the Central Bank of Nigeria's situation report on Nigeria's food and industrial crops prospects up to 1990. In that report, only oil palm (which is regarded as agricultural product) and shear oils were mentioned. No other indigenous fruit or food trees were mentioned (CBN, 1995). Also, in the formulation of land-use and forest policies and the evaluation of development projects, the impact on WILV resources and their potential role in the rural and wider economy has never been given any consideration. More importantly, whereas WILVs feature prominently and regularly in people's diets, they have never been considered when planning for increased nutritional well-being of the people in the country. Also, no consideration is given to the development of these WILVs which are consumed regularly by the rural and urban households. Also the research institutes charged with the responsibility of vegetable research did not give consideration to the inclusion of these WILVs in their programmes. Consequent upon this, their utilization has remained well below their full potentials due to low priority given to them in research and development. Worst still, their existence and continued use are today threatened by the combined onslaught of forest clearing and logging activities.

The challenge according to the FAO (1991) is to determine the role such forest resources as those of WILVs play in rural livelihoods and by so doing identify those that need domestication and further development. This will bring them into the mainstream of forest-product sub-sector planning and policy making, alongside the already well established timber products of national and international commerce while at the same time ensuring enduring benefits to local people. This effort should help in the realization of the full potential of forestry for sustainable development.

It was in the light of the above challenge that the present study was initiated. The study is specifically aimed at assessing the values of WILVs as consumptive and trade items in the southeastern parts of the country with a view to highlighting their importance in people's livelihoods and hence drawing the attention of governments and development planners to the need for their further development and utilization for the promotion of food security.

1.2 Justification for the Study.

The knowledge of the role of indigenousleafy vegetables (ILVs) particularly WILVs, in the nutritional and economic wellbeing of people would help in drawing government's attention to the need for their conservation and sustainable management. Valuation studies could help in the identification of those traditional vegetables with high economic potentials for further research, domestication and commercialization effort. And such domestication and commercialization could lead to their availability to those who need them, bring down their prices in the market place, ensure protein and other mineral elements are available to the family diet as well as bring in more revenue to the growers. More importantly, through such deliberate cultivation, those identified traditional vegetables particularly WILVs can be improved both qualitatively and quantitatively, be made more attractive to the farmers, become more marketable and so contribute to the alleviation of malnutrition and poverty in Southeastern Nigeria. Their eventual cultivation will also lead to the economic empowerment of local people by providing the means by which they can enter the lucrative market of these vegetables through supply which they have been traditionally denied because of the uncontrolled exploitation from the wild.

The study is in consonance with the current efforts by the Ghana based United Nations University Institute for Natural Resources in Africa,Rome based Bioversity International and the German based Global Crop Diversity Trust aimed at promoting the protection, cultivation and consumption of traditional and indigenous plants (htt://www.fortaf.org\strategies.htm). The study also aims at complementing the joint works of FAO/WHO on Vegetable Consumption Promotion Strategies for sub-Saharan Africa (FAO/WHO, 2004) andthose of the "*Network Vegetable Production in Africa"* (NEVEPA). The project, which is financed by the German Agency for Technical Co-operation (GTZ), is assisting African countries in setting up national Networks on

vegetable production. The main aim of these networks is the improvementof information exchange among all partners in the development of the vegetable production sectors(Lewis, 1997).

The study also draws from the generally held view that more concerted and collaborative efforts are needed to integrate NTFPs fully into poverty alleviation, food security and biological diversity strategies and forest management plans. It is also in line with current global efforts by a growing number of intergovernmental organizations, bodies and conventions, as well as national and international research and development institutions to incorporate NTFPs into their agenda. This is aimed at achieving sustainable development and improvement of the livelihoods of forest-dependent people as well as the conservation of forest biological diversity. These efforts and synergies tallies with the United Nations Millennium Development Goals (MDGs) of alleviating poverty, providing for food security and ensuring environmental sustainability (Non-wood News No 12, March, 2005)

It is also important to note that Food and Agricultural Organization (FAO) of the United Nations (UN), has recommended for policy and field programme implementation that would ensure subsistent collection and domestication of nutritionally valuable foods, for dietary diversification with an emphasis on micronutrient intake, and developing low-capital, income generating activities from forests (Non-wood News No. 12, March, 2005). As well, the "Forestry Mission" of FAO, aims to enhance the contribution of trees and forests to global human well-being (FAO, 1996), while its programme on "Promotion and Development of NTFPs" aims at enhancing the value of NTFPs and services through improved harvesting, utilization, trade and marketing as well as contribution to income generation, poverty alleviation and the enhancement of food security. The programme further includes data collection, information dissemination, training and policy advice on NTFPs.

In addition to the above, concerns are presently being expressed in many quarters regarding the identification and development of those locally utilized but officially neglected food sources as a major means of promoting food security in all Africa. For instance, a joint report by the Organization of African Unity (OAU), now African Union (AU), and FAO noted that scant effort has been made to "research, develop, multiply and utilize" the wide variety of food sources – such as those from the forests and wild lands – as an important component of food security, (Gellen,

1994).The present study is therefore aimed at addressing these concerns and or complementing the efforts.

1.3 Statement of Problems

In Southeastern Nigeria as in many other parts of the country, indigenous leafy vegetables are among the most widely consumed traditional foods. They are used in soups, stews, porridges and relishes which accompany carbohydrate staples.These vegetables are excellent sources of proteins, vitamins and minerals. For instance, *Pterocarpus spp* and *Gnetum africanum*, two of the most highly cherished ILVs in the southeastern part of the country are said to have protein contents of 32 and 30 percents of their dry matter respectively and hence can substitute for meat (MANR, 1976; Spore, 1995). Moreover, these traditional vegetables have several advantages over their exotic counterparts, including superior adaption to local environmental conditions and limited requirements for expensive external inputs such as irrigation and agrochemicals.

Unfortunately however, these nutritional and environmental roles have remained largely unrecognized and unappreciated by governments and policy makers hence there are no formal interventions that seek to encourage people to use these traditional vegetables as sources of essential nutrients. As a result, these vegetables have remained under-exploited and under-utilized. Despite the booming business on these vegetables, most are still being collected from the wild. The result is that with increasing pressure on both wild habitats and agricultural lands, due to demographic and socio-economic changes, the ecological niches of these leafy vegetables will disappear, and their genetic erosion is going to be therefore rapid (Kemei *et al*, 2009). At the same time, the cultural status of these valuable food plants has declined as official policy has given priority to growing crops that suit urban tastes, or that offer a potential for export (FAO, 1988). Furthermore, modern agricultural approaches in Nigeria as in many of the African countries often discourage farmers from growing their indigenous crops and cultivars. As a result, the genetic resource base of food security is gradually being undermined (Juma, 1989; Kabuye, 1993). In Imo State for example, one can scarcely see *Gnetum africanum* still growing on the dwindling forest and fallow lands. Indeed, traders now have to travel as far as to Cross River State in order to obtain new supplies at exorbitant costs. This scarcity and high cost are today

depriving many families of one of their cheapest protein sources as well as adversely affecting those families whose economic well being is derived from their marketing. More importantly, some of these vegetables are gaining wider utility in other parts of the country as well as entering into regional and international markets (*Gnetum spp*. for instance has been found in shops specializing in tropical products in Brussels, Lisbon, London and Paris, Tabuna, 1999). This means that even greater pressure will be put on the remaining resource base in order to satisfy the increasing demand. What this entails is that if nothing is done fast to ensure their conservation, they would soon go into extinction.

If therefore, we are not to allow these important traditional food sources go into ultimate extinction, and if we are to retain their services as vegetable sources especially during the dry and "hungry" seasons and if we are to tap the economic opportunities created by their entry into regional and international markets, it becomes necessary that conscious efforts are made to identify, domesticate and commercialize the production of those with high food and income potentials. This study is therefore necessary in order to generate such information.

Malnutrition has become a major public health problem in Nigeria today. According to the last National Demographic and Health Survey (NDHS, 2003), 29% of Nigerian children under five years are considered underweight. Today Nigeria is among the ten countries in the world with the largest number of underweight children, with an estimated 6 million children under five who are underweight. Children who are undernourished have lower resistance to infection and are more likely to die from common childhood ailments such as malaria, diarrhoeal disease or respiratory infections. In Nigeria, it is estimated that malnutrition contributes to over 50% to mortality among children aged under-five years (UNICEF, 2006).

Apart from poor feeding practices and shortfalls in food intake, micronutrient deficiency is a direct cause of child morbidity and mortality. Micronutrients such as iron, iodine, vitamin A, are necessary for the healthy development of children. Their absence in the diet cause serious disorders.Vitamin A is a crucial micronutrient for the developmentof children's immune and visual systems. According to the *Vitamin and Mineral Damage Assessment Report (2004),* 25% of the Nigerian children are growing up with lower immunity, leading to frequent ill health and poor growth due to vitamin A deficiency.

In addition to this, Nigeria is today known to have the second largest global HIV burden withmore than 3.4 million of her citizens living with the disease,while malaria remains a major public health problem in the country (The Sun June 9, 2013). Nigeria is said to contribute a quarther of malaria burden in Africa with over 90% of the country's 167 million people at risk. Malaria is also known to contribute about 30% to childhood mortality and 11% of maternal mortality in the country (Vanguard mobile edition, April 26, 2012).Report by the World Health Organisation (WHO), has also noted that Nigeria loses an estimated ₦480 billion (about $3 billion) to malaria annually(Sun News online, Tuesday, May 1, 2012). These data underscore the fact that malaria is a major public health problem with far reaching negative impact on the socio-economic development of Nigeria.

Ability to fight off such opportunistic diseases hasbeen reduced due to a severe micronutrient (vitamins and minerals) deficiency, critical to a healthy immune system (World Living Resources, 2011). Low intake of vegetables, particularly indigenous leafy vegetablesnoted for their high vitamin and mineral contents is mainly responsible for that.According to the report by World Living Resources (2011), vegetable and fruit consumption per capita in sub- Saharan Africaisone of the lowest in the world and is further declining - with only 29kg as opposed to a world average of 75kg consumed per person per year. Reliance onpredominantly introduced exotics such as cabbage that provide negligible nutrients and proteinthe report noted isthe root cause.

Therefore, promotion of the development and consumption of indigenous leafy vegetables deserves a priority attention hence the necessity for this study.

1.4 Objectives of the Study

1.4.1 Main Objective

The broad objective of this study is to investigate through local level valuation the importance of WILVs in the dietary and economic wellbeing of people in the southeastern zone of Nigeria.

1.4.2 Specific Objectives

The specific objectives are to:

i. identify the various WILV species of tropical rainforest ecosystem of Southeastern Nigeria and the domesticated ones either consumed or sold and

compare their consumption and commercialization levels between the rural and urban households and markets within the study area.

ii. determine the most commonly consumed and marketed WILVs and their domesticated counterparts as well as their level of preference within the study areas.

iii. estimate and compare household expenditure patterns on the consumed WILVs with those of domesticated indigenous leafy vegetables (DILVs).

iv. determine the sources of supply for the consumed and marketed wild and domesticated ILVs.

v. estimate the profit margins in the sale of various ILV species in rural and urban markets within the southeastern zone of the country.

vi. identify wild and domesticated ILV species with food security and commercialization potentials for further research, development and or domestication in the southeastern zone of Nigeria.

1.5 Research Questions:

The following null hypotheses were tested which guided the findings of the empirical analyses.

H_1 No significant difference exists between the percentage of people that consumed WILVs and those that consumed DILVs.

H_2 No significant difference exists between the frequency of consumption of WILVs and those of DILVs

H_3 No significant difference exists in household expenditures on vegetables between the rural and urban households.

H_4 No significant difference exists between the productive- and consumptive- use values of the vegetables

H_5 No significant difference exists between household expenditures on WILVs and those of DILVs

H_6 No significant difference exists between the preference ratings of WILVs and those of DILVs.

H_7 No significant difference exists in the prices of vegetables between the rural and urban markets.

H_8 No significant difference exists between the prices of WILVs and those of DILVs.

H_9 No significant difference exists in the profit margins obtained from the sale of various ILV species between the rural and urban markets.

H_{10} No significant difference exists between the profit margins obtained from the sale of WILVs and those of DILVs.

H_{11} No significant difference in income between the sellers of ILVs in the rural and urban markets and between the sellers of WILVs and DILVs.

H_{12} No correlation exists between the weight and prices of ILVs sold in the markets within the study area.

1.6 Scope and Limitations of the Study

Vegetables are a complex group of a wide variety of different type of plants which are either domesticated or wildly sourced. Again, vegetables are usually grouped into three main categories. These categories according to Uguru (1981) are (a) Leafy vegetables i.e. those used mainly for their leaves; (b) Fruit vegetable i.e. those used mainly for their fruit, and (c) Fruit and leafy vegetables i.e. those used mainly for both their fruit and leaves. The present study is centered mainly on those "*indigenousleafy vegetables*" of tropical hard wood tree species and herbs that are either domesticated, semi-domesticated or still growing in the wild.

Distribution of species used as vegetables may be world wide or limited to specific areas of certain regions. The present study is focused on the survey of indigenous vegetable species that are collected mainly from the forests, woodlands, fallows, farm lands and those cultivated utilized though not exclusively within the southeastern parts of the country.

CHAPTER TWO

2.0 Literature Review

2.1 Reasons for Official Neglect of Non-timberForest Products

Throughout history, the forests have been valued for the multiplicity of products and benefits that they provide both for subsistence and for trade. These products include foods, medicines, spices, resins, gums, latexes, wildlife, fuel wood andseveral timber and wood products. The literature is rich with examples of international trade in forest products, many dating back to thousands of years. In most cases, the products sought by traders were resins, oils, spices, cosmetics, food preservatives, silk and much less frequently timber (FAO, 1991, 2001). In 1992 for instance, a team of amateur archeologists discovered the *Atlantis of the sands, the city of Ubar- the fabulous city in the Sunken Arabian desert, which was linked to the trade of frankincense,* a product obtained from the sap of the trees (*Boswellia* and *Commiphora species)* found growing in the Dhufar mountains of Oman, and was traded on far-reaching routes from Rome to China (FAO 2008, Chandraskhan, 2007).

According to FAO (2009), NTFPs have been traded over long distances for many centuries, while wood products have only become major international commodities comparatively recently. The ancient Egyptians for example, imported gum Arabic from the Sudan and used it for the preparation of colours for painting and for mummifying. It was such an important article of commerce in the fourteenth century that it had a tax imposed on it. Other traded products included nature cosmetics, dyes, spices and food additives. Indeed trade patterns are historically deep rooted in Africa and have heavily influenced the economic development of the continent. The conquest of North Africa by Arab peoples in the seventh century led to the development of many trade links (Townson, 1992). These included the extensive trade routes across the Sahara and those along the East African coast, where the seasonal shifts in monsoon winds determined the movement of small sailing vessels that carried people and trade goods to and from the Persian Gulf, the Indian subcontinent and South East Asia (Iliffe, 1995).

During this period, a number of high-value products were transported from the forested regions of sub-Saharan Africa for consumption and sale in North Africa, Europe and the Persian Gulf region. For example, aside from palm oil and ivory, pepper (*Piper guineense*) and kola nuts (*Cola acuminata and C. nitida*) in particular

were traded extensively from the Guinea and Akam (Ghana) forests to the sub-Saharan Sudanic belt (Oliver 1999). Shea butter (*Vitallaria paradoxa)* was also an important commodity traded from the region since the fourteenth century (Schreckenberg, 2004). In the early mediaeval period, another forest product, melegueta pepper or 'grains of paradise' (*Aframomum melegueta)* began to be transported to Europe for spice and condiment (Van Harten, 1967). Its recorded use in Europe as early as 1214, long before direct European trade, is testament to the influence and extent of these trans-Saharan and Arabian trade routes (Schreckenberg, 2004).

During the sixteenth and seventeenth centuries, Europeans began to explore the African coast lines both east and west and, aside from their involvement in the lucrative slave trade, realized there were also considerable potentials for further "legitimate' trade (Isichei, 1997). An extensive network of trading stations was established at strategic points along the coast, and iron goods, cloth and weapons, were transported from Europe and exchanged for spices and condiments, palm oil and ivory (Oliver, 1999).

The established trading stations provided stepping-stones to colonial expansion and many European powers used their trading influences to annex considerable areas of land during the scramble for Africa from 1870 to 1910 (Packenham 1991; lliffe, 1995). The colonial period was characterized by the trade of non-timber plant resources such as tea, coffee cocoa and rubber between the continents (Hobhouse, 1999), the commercialization of which led to the conversion of large tracts of forest lands to plantation agriculture, particularly in the humid tropics, where they have become important contributors to many countries' GDP today (Sunderland *et al*, 2004)

A number of indigenous NTFPs became increasingly important during the colonial period and these included rattan cane from West and Central Africa being exported to Europe and other colonies for furniture *manufacturing (Hedin, 1929) along with large quantity of shea butter (Vitellariaparadoxa*) for the production of margarine and candles (Schreckenberg, 2004). The latter product became so valuable, that it became a principal component in the agroforestry parklands of BeninRepublic. In addition, prior to the supply of Brazil rubber (*Hevea brasiliensis)* from plantations, wild sources of rubber for tyre manufacture were highly valued and the exploitation of native African rubber (*Funtumia elastica*) from the Congo Free State led to a brutal and exploitative policy of enforced collection for the brief period the activity was

economically viable (Hochschild 1998). Similarly, commercial exploitation of the forests of Nigeria began with palm oil at the beginning of the 19th century and was followed by exploitation of wild rubber from ***Funtumia elastica*** and timber only in 1880 (Lowe, 1993). Indeed, as FAO (2001) has noted, the geopolitics of today was influenced by the past trade in NTFPs.

However, as industrial revolution followed agricultural revolution, colonial influence expanded in various parts of the world and cheap synthetic substitutes became available, NTFPs lost their primacy and timber came into prominence and assumed such importance in human affairs that they appeared to be the only significant output of the forests (FAO, 1997). According to FAO (2008, 2009), the pre-eminence of wood (together with woodland management as against forest ecosystem management began with the opening of colonies and by the industrial revolution. Wood was used for various purposes such as ship building, packaging commercial products (e.g. tea chests), mining, infrastructural development, the establishment of wood based industries and urbanization.

This timber orientation of the forestry profession and the bias of planners in favour of large-scale enterprises had left NTFPs at a disadvantage. Production, at best was considered incidental or subsidiary to wood production and in several cases it led to the development of a dual economy in the forestry sector: extensive extractivism on the part of poor people living in and around forest areas on the one hand, and the timber-based forest economy dominated by large and rich entrepreneurs on the other. Thus, eclipsed by timber and neglected by public institutions for a long time, NTFPs remained largely of local importance (FAO, 2009). This according to Chandraskhan (2007) has resulted in NTFPs being left out of management prescriptions and preference given to comparatively easier timber management. Consequent upon these, forest essentially came to be seen as a source of one product – wood - and was so defined. FAO (1947), for instance defined the forest as essentially a wood producing unit and maintained that it's treatment must be conditioned by the technological properties of its products for their industrial utilization. And for such reasons as these, forest management came to mean *"timber management.*

2.2 **The Reawakening of Interest on NTFPs**.

The belief that the value of forest lies only on wood production in a macro-economic context has gradually been modified - in the face of overwhelming evidence to the contrary combined with a growing concern over providing sustainable benefits at both national and local levels. It is now apparent that forests provide a wide range of other products and benefits, most of which have long been known and utilized by local people, and many of which still are essential to their survival (FAO, 1991). As a result, NTFPs have re-emerged from relative obscurity while their development has gained some momentum. According to FAO (2009), this renewed interest in NTFPs began in earnest in the early 1970s.

Since th beginning of the 1990's, high-value international markets for a number of NTFPs have developed from migrations of people from Africa, such as in areas of Western Europe and North America which have dense, often prosperous, African populations. According to Clark and Sunderland (in press), these people are prepared to pay a premium for genuine African products, often paying up to 500% more than the local sales price. Such high value resources include chewsticks (*Garcinia spp*) (Blay 2004) and a wide range of other products, particularly spices, condiments and food stuffs (Tabuna 1999), including bush plum (*Dacryodes edulis)* (Adewusi, 2004).

According to Arnold (2004a), this new interest in NTFPs has been a consequence of a number of shifts in developmental focus. With the evolution in thinking about the importance of rural development and poverty alleviation has come, growing interest in how forests and forest products contribute to household food and livelihood security. Within this framework, forest product activities have begun to attract particular attention as being often one of the larger income-generating components of the non-farm part of the rural economy. This interest according to Arnold (2004a) has been reinforced in recent years by shifts in development policy and strategy towards more market driven activity within this part of the economy. In addition, the policy shifts that encourage devolution of control and management away from central governments to local institutions have drawn more attention to NTFPs as a potentially important incentive to local forest management. According to Chandraskhan (2007), their occurrence in all types of primary and secondary forests, amenability for domestication and cultivation, a role in conserving biodiversity, an ability to meet the increasing demand for organic products, and green consumerism, an

ability to sustain the chemical treasures in plants, a capacity to support poverty reduction, and improve livelihoods are attributes favouring awareness about NTFPs and their re-emergence.

Today, many organizations have started working on various aspects of NTFPs. A growing number of inter-governmental organizations, bodies and convention secretariats as well as national and international research and development institutions, are embracing the need to incorporate NTFPs into their efforts to achieve sustainable development and improve the livelihoods of forest-dependent people. According to FAO (2005), some major international forestry institutions, such as the World Conservation Union (IUCN), the Center for International Forestry Research (CIFOR), the International Center for Research in Agroforestry (ICRAF), the Convention on Biological Diversity, (CBD), the International Tropical Timber Organization (ITTO) and FAO, have integrated NTFPs into their programmes. Also a few other organizations such as the International Development Research Centre (IDRC) and the Medicinal and Aromatic Plant Programme of Asia (MAPPA) have programmes that expressly focus on non-timber forest products. International networks (e.g. the International Network on Bamboo and Rattan, the Medicinal Plant Working Groups of the Plant Conservation Alliance and the Network for Natural Gums and Resins) were formed on specific NTFP commodities or issues.

More importantly, more than 100 stakeholders representing at least 60 organizations from 25 countries expressed their concerns and identified major issues and provided recommendations to address these issues during the XII World Forestry Congress (WFC) side event on "*Strengthening Global Partnerships to Develop NTFPs"* (Quebec, 2003). It has more recently also been prompted and facilitated by international commitments to provide incentives for biodiversity conservation (such as the 2010 targets adopted by the Convention on Biological Diversity in 2002), and address global poverty (in particular, the United Nations Millennium Development Goals). It has been generally expressed that more concerted and collaborative efforts are needed to integrate NTFPs fully into poverty alleviation.

2.3 Vegetables

Vegetables are a complex group of a wide variety of different type of plants. While some species grow from year to year, others grow and die within one or two years. They have diverse forms of propagation; by seeds or vegetative parts. They may be herbaceous, viny, shrubby, or tree in growth habit (Asian Vegetable Research and Development Centre, AVRDC, 1990).

They differ in growth requirements. Many vegetables can be grown under a wide range of conditions; while some have more exacting requirements for water, there are others that can be grown only during certain times of the year. Irrigation is an absolute necessity for many species, but a few can be grown under rainfed conditions. Vegetables can grow in the wild or have to be cultivated. Distribution of species that are used as vegetables may be worldwide or limited to specific areas of certain regions. They can be produced in fields of specialized production areas, outskirts of urban areas, villages, or in gardens around the home.

Different parts of a plant may be used as a vegetable, depending on localities and culture. Because of their diverse nature, it is very difficult to come up with a single, acceptable, all encompassing definition of vegetables. Definition of the word *"vegetable"* is rather generally based on their use. Based on this, vegetables have been defined "as an edible, usually a succulent plant or a portion of it eaten with staples as main course or as supplementary food in cooked or raw form (AVRDC, 1990). On the other hand Encyclopaedia Britannica (1975), defined vegetable as the fresh edible portion of a plant consumed in either raw or cooked form. Since any definition of vegetable generally centers on its use, a plant may be a vegetable in one country but a fruit, a weed, an ornamental, or a medicinal plant in another country, depending on the crop. For example, tomato is a vegetable in Asia but a fruit in Europe.

Vegetables as a group constitute an important component in a man's diet, especially in developing countries. They constitute rich sources of essential minerals and vitamins. Due to the wide array from which to choose vegetables, they provide variety to the diet and make meals more appetizing. They give more flavour, better appearance, and zest to dishes which would otherwise look dreary or drab without them. Widespread malnutrition in many tropical countries is often partly ascribed to the insufficiency of vegetables in the diet (Tindal, 1989)

There are three types of vegetables. These according to Uguru (1981) are leafy vegetables, fruit vegetables and leafy and fruit vegetables. The present study is focused on leafy vegetables that are indigenous to south eastern Nigeria.

2.3.1 Indigenous Leafy Vegetables (ILVs)

Indigenous leafy vegetables (ILVs) can be defined as "Plants that are native or introduced whose leaves have been used over a long time hence have become part of the culture and tradition of a community" (Maundu,1997). They areusually underutilized species that are usually found growing naturally in specific locations or introduced from other areas (AVRDC, 2011). With specific reference to sub-Saharan Africa, Smith and Eyzaguirre (2007), tries to distinguish between indigenous and traditional vegetables. They regard ILVs as those vegetables that have their natural habitats on sub-Saharan Africa while the traditional leafy vegetables were introduced over a century ago and due to long use, became part of the food culture in the sub-continent.

Indigenous leafy vegetables are eaten as part of traditional diets in rural areas, and can form an important part of national cuisines. According to AVRDC (2011), many ILVs have antioxidant activities that are 10 to 100 times higher than exotic vegetables. They are also nutritionally higher in vitamin A and C, folic acid and minerals than many exotic vegetables (Swai, 2009). This is an affirmation of their traditional roles as both foods and medicines. Indigenous leafy vegetables have evolved over the years to deal with relatively harsh tropical and subtropical weather conditions, pests and diseases. These adaptations make them unique and therefore easier to propagate and manage.

For centuries, this class of vegetable has sustained rural populations in many parts of the world. Typically, they have several advantages over their exotic counterparts, including superior adaptation to local agro –ecological condition, require a minimum of cultivation, give high yields within a short period, and havelimited requirements for expensive external inputs, such as irrigation and agrochemicals.Under emergency situation, for example during periods of natural disasters, the production of indigenous vegetables becomes crucial for many families and communities since they can be produced within a short time soon after the unset of rains.

According to Lewis (2009), the use and conservation of indigenous vegetables have been neglected over the last 20 years and there is a serious threat that many species will drop out of use in some areas if no appropriate countermeasures are taken. The vegetables according to him are neglected because they have been gathered from the wild and have not been cultivated; thus the commercial value attached to them has been restricted to small rural communities, and with the increasing migration into towns and urban centres the preservation of this knowledge is in danger.While some of these ILVs have undergone domestication and are therefore deliberately cultivated, many are found growing as common weeds on cultivated fields during rainy seasons and shortly after. They are mostly found growing in degraded and abandoned lands, built-up areas, along rivers, roadsides, fallow lands and forest fringes. The Plant Resources of Tropical Africa – PROTA, reported an estimated 6,376 useful indigenous African plants of which 397 are vegetables (PROTA, 2004).

Many reseachers have of recentindicated a resurgence of interest in the African indigenous leafy vegetables during the past decade with several studies reporting on their regional availability and use (Chweya and Eyzaguirre 1999; Okeno *et al,* 2003; Opabode and Adegboye, 2005). However, in the April 2005 issue of spore, the contributor observed that African "leafy vegetables are everywhere and nowhere, in books and on the internet, there is a great deal of information on tropical green vegetables, but it is often scattered like leaves in the wind" (Spore No. 166, 2005).

For the purposes of this study, those leafy vegetables that are still collected mainly from the wild sources are termed *"Wild Indigenous Leafy Vegetables" (WILVs)* while their domesticated counterparts are termed *"Domesticated Indigenous Leafy Vegetables" (DILVs).*

2.3.2 Wild Indigenous Leafy Vegetables (WILVs)

Wild Indigenous leafy vegetables (WILVs) are among the most widely consumed forest foods. They are used frequently as the base for soups, stews, and relishes which accompany carbohydrate staples such as yam, rice, maize and cassava. Nutritionally, the values of WILVs vary a great deal. While some species provide fats, others are good sources of protein. Yet, others provide minerals and vitamins. According to FAO (1989), the nutritional role of WILVs is to increase palatability, to

provide essential minerals and vitamins, and to enhance the quality of protein in the diet.

In different localities, many tree leaves, forest herbs and "weeds" of agriculture are consumed as vegetables. Malaisse and Parent (1985) for example, found that the leaves of 50 species of trees were used as food in Upper Shaba (Zaire). Common "wild leafy vegetable" species include *Pterocarpus spp; Myrianthus arboreus, Gnetum spp; Bidens pilosa, and Adansonia digitata*.

In her own study of wild leafy plants in Lushoto, Tanzania, Fleuret (1979), found that vegetable relishes are an essential elements of the Shamba people's diet. She found that introduced cultivated vegetables were not replacing the wild leaf relishes because people preferred the taste of wild leaves and they were traditionally important. In addition, wild leaves are valued because they are cheap and accessible. Fleuret's survey covered three regions. The quantity and frequency of use of WILVs corresponded to readily accessible supply. Wild leaves were used in 32% of all meals consumed. They represented the most common ingredient (used 81% of the time compared with 17% for cash-crop vegetables) for the traditional side dish. Another point of interest discussed in the study is that wild leaves, meat and fish are viewed as consumptive substitutes for one another, whereas cultivated vegetables are viewed as a cash crop.

In their study in Swaziland, Ogle and Grivetti (1985), found that WILVs are the most frequently used wild plants. More than 50% of the adult respondents claimed to be consuming wild leaves frequently (more than twice weekly). The leaves of 48 species were consumed frequently. Wild leaves were found to be the main accompaniment to the maize staple for 39% of the meals studied. Forty-six percent of the respondents reported buying WILVs regularly at the local market, while 25% reported selling them. Wild foods were used year-round by 56% of those questioned although greater use was reported in winter months. Sixty-nine percent of those surveyed preserved wild greens for winter use. The study concludes that the dietary use of wild plants is not minor.

2.3.3: Consumption Patterns of Indigenous Leafy Vegetables

According to Vorster *et al* (2002), the role of leafy vegetables in the food consumption patterns of African households is highly variable and depends on factors such as poverty status, degree of urbanisation, distance to fresh produce markets and

time of year. They noted further that poor households tend to use these types of vegetables more than their wealthier counterparts, because they lack the financial means to purchase vegetables and the wherewithal to produce their own. The use of wild food is also known to form part of safety net that rural people use to cope with poverty, disaster and livelihood stress (Rose and Guillarmod, 1974; Rubaihayo, 1997; Shackleton *et al.*, 2000). During drought periods, or when the breadwinner in the household becomes unemployed; affected rural households intensify their collection and consumption of wild food (Shackleton, *et al*, 1999; Dovie, *et al*., 2002; Shackleton, 2003). Social disturbance can also lead to increased use of wild food. In poor rural communities consumption of wild food is particularly important for women and children (Shackleton *et al*, 2002a; Vorster and Jansen van Rensburg, 2005). Use of wild food is also enhanced by remoteness because households in remote rural areas have limited access to fresh produce markets (Jansen van Rensburg and Vorster, 2005; Hart and Vorster, 2006). Urban households use leafy vegetables collected from the wild less than rural households because they lack access to sites where these vegetable grow naturally.

The above general observations notwithstanding, information on the *per capita* consumption of African ILVs is scarce just as data on their production levels. There is a general belief that the introduction of exotic vegetable varieties contributed to the decline in the production and consumption of indigenous vegetables. However, literature reports of a steady decline in dietary intakes of these vegetables with the emergence of simplified diets are based on the assumption of declining use as a result of declining availability (Okeno *et al*, 2003; Adedoyin and Taylor, 2000). On the contrary, Maziya-Dixon et al (2004), reported that in Nigeria, leafy vegetable are relatively available and affordable particularly during the rainy seasons but were found to be among the least consumed foods. Reports from the literature also do not confirm the general belief of declining consumption of African indigenous vegetables although it is not clear from some of the studies how the consumption data were generated, what period of the year the studies were carried out and what specific vegetables were studied (Smith and Eyzaguirre, 2007).

Some earlier reports had estimated *per capita* consumption of African leafy vegetables to be 80g of fresh leaves per day during high season in Senegal and Burkina Faso, while in Mauritania estimates were 65g/day in urban areas and 16g/day in rural areas (Dalziel, 1937; Frankenbarger, 1989). In Uganda, an average consumption of 160g/person/day during the rainy season was reported while another study amongst urban

dwellers quoted in the same report estimated *per capita* consumption of 12g/day (Rubaihayo, 1997). Oguntona (1988), reported a mean intake of 65g/day in western Nigeria while in a more recent study in south eastern Nigeria, Hart *et al,* (2005), reported adult *per capita* consumption of 59-130g/day during the months of May-July, the peak season of vegetable production in the study area. Other attempts at estimating consumption patterns of ILVs used household expenditures or general survey of usage, but these estimates indicated only trends in leafy vegetable consumption (Spore, 2005; Gockowski et al., 2003; Mbwika *et al*, 2001). Indigenous leafy vegetables remain important dietary components in Cameroon, although household expenditure on these vegetables declines as total expenditure grew suggesting that consumption decreases with increasing income (Gockowski *et al.*, 2003).

At best, these reportsprovide only a glimpse into the consumption patterns of ILVs on the subcontinent but there is a limited scope for the information provided and hence should be interpreted with caution and should not be considered as baseline information for the respective countries or regions. Nevertheless, what they have done is to highlight the immense information gap on ILV consumption in sub-Saharan Africa. As Smith and Eyzaguirre (2007), have posited, a need exists for more regionally targeted studies on the *per capita* consumption of African ILVs as data from such studies provide valuable baseline information which is vital both in the development of the on-going FAO/WHO vegetable consumption promotion strategies for Sub-Saharan Africa as well as in evaluation of the effectiveness of current and future interventions.

2.3.4 Nutritional Role of Vegetables

Vegetables as a group constitute an important component in a man's diet, especially in developing countries. The food value of vegetables is comparatively low, owing to the large amount of water present - 70 to 95% (Hill, 1951). In spite of this, the nutritive value of vegetables lies in the presence in them of mineral elements, salts and vitamins. According to AVRDC (1990), vegetables along with fruits constitute the most important source of minerals. The roughage in them aids digestion (Etukudo, 2000). Okafor (1989) and Encyclopaedia Britannica (1975) confirm that vegetables contain low quantities of protein, carbohydrates, fats and oil, but high content levels of minerals particularly calcium, which are necessary for the development and proper functioning of bones and teeth, and iron which is needed to prevent anaemia. Others are phosphorous, magnesium, sulphur, sodium, chlorine, cobalt, copper, potassium and

manganese. Iron deficiency and anaemia is most common nutritional disorder worldwide. Over 244 million people (46% in Africa) are suffering from anaemia (htt:\\www.fortaf.org/key_facts.htm).

Vegetables are also excellent sources of vitamins A, C, and B complex which include vitamins B_1, B_2, B_6, $B_{12,}$ niacin, panthothemic acid, bioten and folic acid. Vitamin A is a crucial micronutrient for the development of children's immune and visual system and lack of it causes poor growth and night blindness. An estimated 53 million (49%) pre-school children in Africa are affected by vitamin A deficiency. According to the Vitamin and Mineral Damage Assessment Report (2004), 25% of Nigerian children are growing up with lower immunity, leading to frequent ill health and poor growth due to vitamin A deficiency (*http://www.unicef.org/wcaro/WCARO_Nigeria_Factsheet_Nutrition.pdf)*. The vitamin contents of vegetables vary greatly. Dark green and yellow vegetables are rich in provitamin A. Provitamin A or carotene is converted to Vitamin A in the body. Lack of vitamin C on the other hand causes skin scurvy- a disease of the gum characterized by sponginess and bleeding. Vitamin C or ascorbic acid also has other functions in the body. It increases the resistance of the body to colds, coughs, and otherrespiratory diseases. It also improves the availability of iron. The B vitamins are necessary for the utilization of carbohydrates and protein and in the prevention of anaemia. Green leafy vegetables are good sources of Vitamin C and B (AVRDC 1990). According to Serrano (2005), the leaves of many forest species are rich sources of xanthophlls which contribute to optimal eye function. Examples include leaves of *Gnetum spp* and *Adansonia digitata* (Baobab) widely eaten in sub-saharan Africa.

Apart from being source of minerals, vegetables have some medicinal value as they help to neutralize stomach acidity and aids good digestion. African indigenous and traditional vegetables in particular have long been known and reported to have health protecting properties and uses (Okeno *et al*, 2003; Ayodele, 2005). Several of these ILVs continue to be used for prophylactic and therapeutic purposes by rural communities (Ayodele, 2005). According to Smith and Eyzaguirre (2007), this indigenous knowledge of the health promoting and protecting attributes of African ILVs is clearly linked to their nutritional and non-nutritional bioactive properties. African ILVs have long been, and continue to be reported to significantly contribute to the dietary vitamin and mineral intakes of local populations (Osifo,1970; Oyejola and

Bassir, 1975; Achinewhu, 1983). More recent reports have shown that they also contain non-nutrient bioactive phytochemicals that have been linked to protection against cardiovascular and other degenerative diseases although Orech and colleagues observed that some of these phytochemicals found in some African ILVs may pose toxicity problems when consumed in large quantities over a long period of time (Orech et al, 2005). In spite of this body of evidence confirming the nutritional contribution of African ILVs to local diets, and their health maintenance and protective properties, there has been very little concerted effort towards exploiting this biodiverse nutritional and health resource to address the complex food, nutrition and health problems of the people of sub –Saharan Africa.

Vegetables also serve as sources of fiber. According to AVRDC (1990), although edible fiber is not considered a nutrient, and is not absorbed by the body, it is the component of vegetables that assist in moving food through the alimentary canal by aiding the muscular action of the intestines, thus preventing constipation. It also helps to satisfy the appetite. In addition, its large bulk and low energy value makes it useful in preventing and treating obesity while it is used to control diabetes.

It is for these multiple functions of vegetables that Olagunde et al (1992),had a reason to conclude that one of the ways the malnutrition problem in Nigeria prompted by deficiency in proteins, vitamins, iron and other minerals could be addressed is the production and supply of vegetables. It is also for the same reason that AVRDC (1990) noted that where enough vegetables are eaten, there is little chance for malnutrition to occur.

2.3.5 Economic role of Vegetables

The economy of developing countries is usually agriculture-based. The majority of the rural populace depends on farming for livelihood: and a substantial number of farmers grow vegetables as a secondary crop. The growing of vegetables therefore has the potential of improving peoples' livelihoods

Vegetable production is labour intensive. Production of vegetables creates a number of job opportunities in the rural and suburban areas and in the complementary fields of business that arise, such as marketing, processing and transportation. For instance surveys carried out by Natural Resource Institute (NRI) in Cameroon and Uganda, showed that local vegetables offer a significant opportunity for the poorest

people to earn a living as producers and or traders without requiring large capital investment. The survey also found that vegetables are important commodities for poor households because their prices are relatively affordable when compared to other food items (Schippers, 2000).

2.4 Value and Valuation

Value can be defined as the worth or cost of a product or service to an individual or a like minded group in a given context (Brown, 1984). Valuation on the other hand means placing value on something. People must constantly choose between alternative courses of action. Choosing between alternatives is greatly simplified if weight can be assigned to the alternatives. These weights may indicate the amount of usefulness or cost that the organization or group will accrue if the alternative is followed. The alternative that is most useful or least costly can be followed (Leuschner, 1984). The existence of a product or service is insufficient in itself to guarantee that it commands a value. If there is no demand for a good or service, the 'benefit' may not be realized and there may be no value (Richards *et al*, 2003). The basic reason a good or service has value is because it does something that is desired by an individual or society. It provides a certain amount of utility. This utility may be from using the good or service for personal consumption. The utility may also be from earning money with which to purchase goods and services that in turn have utility (Leuschner, 1984). The reference to *"in a given context"* in the above definition of value is of fundamental importance. Even in the 'same' situation, people with different values are likely to behave differently. They perceive the situation and organize its constituent elements in different ways (FAO 1997). As Jamieson (1987) indicated, even people with identical values do not necessarily behave identically: their values are put into operation under different sets of constraints. What this means in essence is that there is not single value but a wide variety of values for given resource and the people concerned hold these values for a variety of reasons (McCollum *et al*, 1992). Hence the result of a valuation should be attributed back only to the group that was studied (FAO, 1997).

As well, origins of values, including economic ones, are psychological and thus depend on individual human perceptions of values. Therefore they vary from individual to individual and from group to group, and they can change rapidly over

time as individual situations and perceptions change. These two points are critical to keep in mind in any practical discussion of valuation. There are thus no absolute values – other than in the perception of individuals, and these perceptions tend to be dynamic, changing as circumstances change. Valuation should always be approached as a tool to answer question, it should be done not for mere curiosity but to provide those who have to make decision with the relevant information. Therefore, knowledge of the factors that decision-makers are likely to take into account is necessary before designing the valuation (FAO, 1995).

2.4.1 Economic Values and their Usefulness to Decision Makers

People value biological resources in different ways: spiritually, economically, aesthetically, culturally and scientifically. But in practice, the most widely used techniques are those of economics (WWF *et al*, 1993). Economic values are values to which we assign some monetary measures, whether derived through market transactions or through other means which economists call "**shadowpricing**". People's tastes and preferences are translated by economic valuation into monetary unit or measures. Decisions on forest use and misuse are driven by many different values only some of which can be measured in economic or monetary terms. Thus, values associated with ethical, religious and other social concerns also enter into consideration (FAO, 1995).

Economic concepts of value of natural resources begin with individual willingness to pay… all consumers have their own values and their own tastes/preferences by which to judge the relative merits of one good or service over another. Economists believe that aggregate or social values can be derived by adding individual values (Kramer *et al*, 1992).

In investment preparations, the function of valuation is to provide a basis for decision or choice among options or to find what combination of various types of activities give the best benefits. Properly done valuation can provide useful information to all who are associated with decision and choice among investments or management options and alternative uses of forests or of the land. It can show whether or not sustainable management and use of the forests has an economic value higher than the value of alternative resources which compete with it. Correctly executed, valuation can help to ensure that forestry is not considered in isolation from other

sectors; this is especially important when sustainable forest management efforts take place in environments of increasing competition for scarce resources, such as growing needs for agricultural land and for funding. Decision-making by governments, private enterprise, local communities, farmers and conservationist groups on management and utilization of the forest resources is therefore influenced by the value that each of these groups attached to the forest resources as well as the relative costs and benefits of alternatives to forest (FAO, 1997).

In the context of valuation for land use decisions, IIED (1994) noted that in practice, no alternative exists to presenting the policy-maker with a range of models and indicators. This means offering an array of options from among which final choice can be made. Thus valuation can be important tool for policy analysis e.g the valuation of native forest can assist in understanding the importance of forest vis-à-vis its conversion to other land uses. Some benefits of the forest, carbon sequestration among them, can be more important at global than at national or local levels. Valuation can contribute to setting levels of possible compensation to a country or to local community that is obliged to conserve forests beyond its own needs or to refrain from using its forest's full production potential. In the case of tropical developing countries, there are often calls for greater conservation of forests for carbon storage or for biological diversity. Such calls, if not backed by funding, imply that the developing country should carry the management costs. Yet the people who derive the satisfaction from the resource conservation may live in developed countries; they do not share the burden and they carry the cost only (and then indirectly) if and when species become extinct or ecosystem disappear (FAO, 1997). Under such conditions, where costs fall mainly to the poor and benefits are reaped largely by (possibly wealthy) outsiders, valuation could provide a rational basis for estimating the level of adequate international transfer payments to compensate countries that are conserving forests beyond their own needs for the sake of global gain (CSERGE, 1993).

Goods and services can be associated with negative monetary values (costs) or positive values (benefits). It all depends on who is looking at them. Thus, to the worker, a wage is a benefit with positive economic value; it is an income. From the perspective of the forest company hiring the worker, the wage is a cost and takes on a negative value in the company's calculations. At the same time, it should be kept in mind that valuation involves attaching positive values to goods and services. They

become cost (and take on a negative sign) when we have to give them up and vice versa (FAO, 1997).

2.4.2 Classifying the Values derived from Forest Resources

A major starting point for understanding the economic importance of forest resources is clarifying the different ways in which these resources provide value. Environmental economics has provided a useful classification system. The economic benefits of forest resources particularly those of NTFPs like WILVs derive largely from their value as a consumption good, that is the direct use that people make of them as a source of nutrition and a means of subsistence.

Besides their direct use value and like many other renewable natural resources, certain forest resources have important indirect or non-use values. For example, same species of animals including bats, birds and bees play important environmental or ecological services like their role in plant reproduction. This is an example of an indirect use value; other plants and animals are prized for their rarity by conservationists, an illustration of a non-use value. In rural subsistence situations, wild resources and natural habitat often have important cultural values, another example of a non-use value.

The summary of the categories of economic values as adapted from McNeely, 1988 are given below

2.4.3 Direct Values

- Consumptive use value (non-market value of food, firewood etc).
- Productive use value (commercial value of timber, fruits, fish etc).

2.4.3a Consumptive Use Value

This is the value placed on products that are consumed directly, without passing through a market. While relatively few detailed studies have been carried out on the consumptive use value of species in developing countries, the available information has been well summarized by Myers (1983), Oldfield (1984), Krutilla and Fisher (1975), and Fitter (1986). Of particular interest is the study by Prance et al. (1987), which presented quantitative data on the use of trees by four indigenous Amazonian Indian groups. The percentage of tree species used by the four groups

varied from 48.6 to 78.7, indicating that the rainforest of Amazonia contains an exceptionally large number of species that are useful to local people.

In many countries in Africa including Nigeria, harvested species make a considerable contribution to human welfare in the form of food for rural people, and especially to the poorest villagers living in the most remote areas. Much of this is consumed directly rather than being sold in the market place, but the value is nonetheless significant and economic values can be assigned (McNeely, 1988; Miller *et al*, 1990). In Ghana, about 75% of the population depends largely on traditional sources of protein, mainly wildlife, including fish, insects, catapillars, maggots, and snail. In Nigeria, game constitutes about 20% of the mean annual consumption of animal protein by people in rural areas while 75% of the animal protein consumed in Zaire comes from wild sources (Sale, 1981).

2.4.3b Productive Use Value

This value is assigned to products that are commercially harvested for exchange in formal markets, and is therefore often the only value of biological resources that is reflected in national income accounts. According to IUCN *et al*, (1990), productive use of such biological resource products as fuel wood, timber, fish, animal skins, musk, ivory, medicinal plants, honey, beeswax, fibers, gums, resins, rattans, construction materials, ornamentals, animals harvested for game, meat, fodder, mushrooms etc have major impacts on national economies. Estimates of such values can be made either at the production end (landed value, farm gate value, etc) or at the retail end though values at this stage are much higher because of the costs and value added through transport, processing and packaging. For example, the estimated production value of cascara (a laxative derived from tree bark) in the United States is $1 million per year, but the retail values is $75 million per year (Prescott-Allen and Prescott-Allen 1986).

2.4.4 Indirect Values

- Non-consumptive use value (Scientific research, bird watching etc).
- Option value (value of maintaining options available for the future)
- Existence value (value of ethical feelings of existence of wildlife or forest).

2.4.5 Valuation Techniques

Many authors have reported on valuation methods for the different forest goods and services. Some of these researchers include Dixon and Hujschmidt (1986); Dixon et al (1988a): Dixon *et al* (1988b); Winpenny (1991); Gregersen, (1996) and Lewis (1995). A key point is that in any given analysis, a number of different techniques may be used.

There are three main categories of value measures viz:-

a. direct market prices;

b. Indirect market prices, e.g. residual values, surrogate prices, hedonic prices and travel cost method.

c. Non-market prices e.g. contingent valuation method (CVM).

Each of these value measures are further discussed in more detail.

2.4.5a Direct Market Price Measures of Value

Market prices are the result of interaction between consumers and producers through demand and supply of goods and services. In other words, market or exchange values are established through the exchange of goods and services in the market place i.e. an interaction of producer values (supply). If a transaction is carried out using some form of commonly accepted currency, we speak of the value established in the market as the market price. If the transaction is carried by some form of barter or exchange without the use of currency, we speak of the value established in the market as a market exchange value. For example, if two fowls are exchanged for one goat, the exchange value of the fowl is one-half of the goat, and the exchange value of the goat is two fowls (FAO, 1997).

In using this method, the first step is to identify which goods and services are traded in the market. The aim is to collect the empirical data, whether based on an original survey and/or secondary sources (e.g. published economic statistics). It is important when determining market prices to take into account the seasonal variations that lead to price fluctuations due to changing supply/demand balance (FAO, 1995)

2.4.5b Indirect (Surrogate) Market Price Measures

The indirect market price valuation approach uses information about surrogate market to input or infer the value of a related non-market good or service. In other words, it attempts to draw inferences from observed market-based information. Different techniques and methods of doing this exist. They are indirect because they do not depend on people's direct responses to prices for the goods or service being valued (FAO, 1997)

2.4.5c Non-market Price Valuation Methods

In situation where there are no market prices that satisfactorily can be used as proxies or direct measures of value, economists resort to surveys and other similar tools to try to estimate consumers' willingness to pay (WTP) for goods and services or what they would be willing to accept (WTP) to give it up. The most popular of these approaches is contingency valuation method.

2.4.6 Contingent Valuation Method (CVM)

The contingent valuation (CV) method involves the use of carefully-structured questionnaires to ask individuals how much they are willing to pay (WTP), for the maintenance of non-market benefits, such as a wild life sanctuary, or their willingness to accept (WTA) compensation for loss of such a benefits (IIED, 1997). It resembles a type of market research in a situation in which there is no market. Therefore, one has to be created, for example a market for an environmental service. People, who potentially benefit from the supply of these services, are asked to '*state their preference*' for it in terms of what they would be willing to pay for it or willing to accept in compensation for losing it (hence it is more formally known as a *"stated preference method"*). It is usually used to value environmental assets or existence values, but has occasionally been used for subsistence values (Richards et al, 2003).

CV methods have been widely used to value environmental services in industrialized countries, while in recent times, a number of papers that attempt to apply CV to environmental issues in developing countries have been written. For example, CV methods were used to assess the forest benefits currently received by local forest users in proposed protected areas in Madagascar. In order to see how much they would need to be compensated for losing access to the forest, villagers were asked their willingness to accept compensation for leaving the protected areas in terms of basket

of rice (Shyamsundar and Kramer, 1996). However, according to Richard et al (2003), the use of CV methods to access forest benefits in developing countries is a controversial topic, even among economists.

2.5 Markets and Marketing.

The market is the overall demand for a product at a given price at a given place and time, under specific standards and conditions. Used as a verb, for example, to market- it means to actively promote product or market development or product sales. Demand, or the needs and wants of customers, can change for any product as circumstances change. Price is the variable that reflects these changes and insures that the supply of a product equals the demand for it. Marketing on the other hand is the process of identifying, stimulating and satisfying customer demands. According to FAO (1996), marketing requires the collection and analysis of information to identify markets and learn what consumers need and want. It also involves the physical delivery of goods to the customers. Marketing suggest to producers what to produce and directs the product development efforts of the processing industry. It informs the customer about the availability, quantity, quality, price, service and distribution of products. It makes the product and services available to customers in the most desirable and efficient way. Marketing uses products, price, promotion, and distribution channels as a basic set of instruments to reach the markets, satisfy the wants of customers and make profit. According to FAO (1996), for marketing to be successful, all participants in the process must make a profit. According to her, farmers will only grow crops beyond their immediate needs and provide goods to markets when they think they can earn a profit in doing so. It is therefore not surprising that Popoola and Oluwalana (1998) noted that the essence of marketing is to identify, anticipate and satisfy customer requirements profitably. According to them, there are some cost implications as well as benefits in marketing, the difference of which determines whether the marketer is making profit or incuring some loses.

Marketing can identify new demands and through products diversification and various services can satisfy them. Marketing tells the producer what to produce and how to make the products and services available to the consumer in the most desirable and efficient way. Through linking production with marketing, rural people can learn what adjustments they must make in the production system to better meet market

demand. Efficient use of the productive resources of land, labour and capital by a small-scale farmer or extractivist/producer is only possible if he/she has knowledge of the supply and demand situation of the product (FAO 1996).

Marketing of any produce depends on adequate information on the production, utilization and availability of that product. In other words, for a product to be successfully marketed, that produce must be in existence, there must be a deliberate promotion effort (market information) and finally, the price must be such that would allow for consumers to be willing to purchase and at the same time living a commensurate margin as their gain. These conditions according to Kumbul (2009) make up what is called the marketing mix.

With particular reference to the marketing of ILVs, they have long been regarded as minor crops and thus have attracted little marketing attention, in favour of major crops and cash crops.It has been reported that there is a risk of losing ILVs in Nigeria due to farmers replacing them with improved varieties and lack of information on their marketing. Morever, the supply of ILVs for the markets has not been exploited due to lack of knowledge on their marketing. Farmers need marketing information that will help them to make informed decisions on what to produce with assured quality, where to sell their produce (market identification) and at what price. Availability of such marketing information about ILVs would attract more people to go into their production and marketing. The marketing component of this study aims to come up with such information.

CHAPTER THREE

3.0 Methodology.

3.1 The study area.

This study was carried out in three states in southeastern Nigeria. Southeastern Nigeria lies east of the lower River Niger and South of the River Benue valley. The region is located between latitudes 4 and 7 degrees north of the equator and between longitudes 7 and 9 degrees east of Greenwich meridian. It covers about 76,358km^2. It comprises five out of the 36 States of Nigeria, namely Abia, Anambra, Ebonyi, Enugu and Imo (Figure 3.1).The area is one of the most populous regions in the country. Its population according to the 2006 population census was put at 16,395,555 of the approximately 140.4 million people nationwide (FRN, 2009). Southeastern Nigeria therefore supports about 12% of the population of Nigeria on only 3.2% of the total area of the country. The area has a population density of 214.72p/km^2. The region is inhabited by the Igbo speaking people.

3.1.1 Socio-economic activitiesof the Southeasterners

Crop farming, livestock production, fishing and petty trading are important means of livelihood among the people of the area. Like people in other parts of the country, male and female residents of Southeastern Nigeria engage in several productive and income-generating activities to ensure their household needs are met. It is not unusual for one person to engage in as many as three to five different agricultural and non-farm activities. Such activities may be seasonal and almost always on a small scale. Yam, cocoyam, cassava, rice, plantain and vegetable are the main food crops of the region, while palm produce, rubber, coconut and cocoa are the most important cash crops. Compound farms dominated by wild and

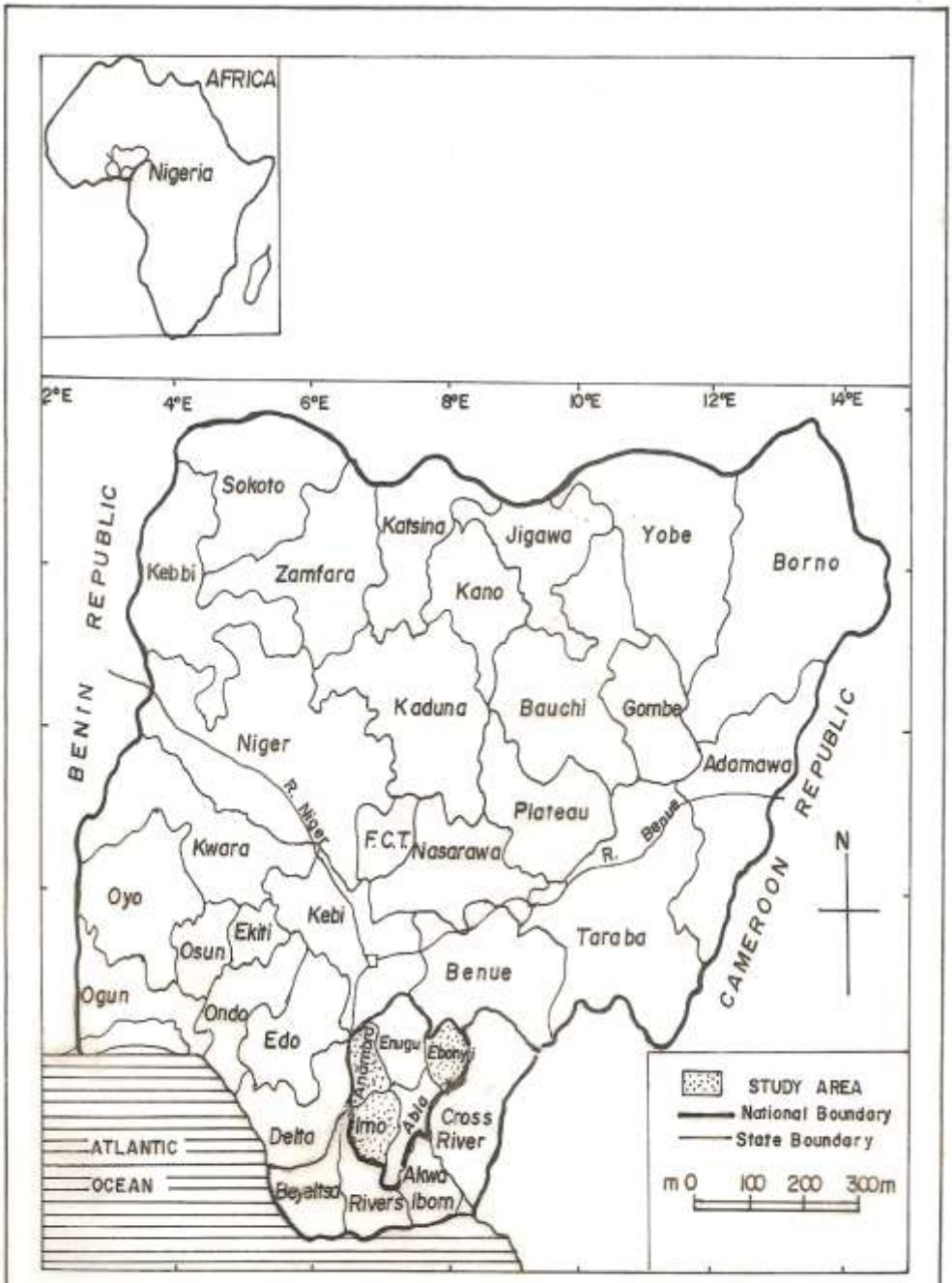

Fig. 3.1 Map of Nigeria, showing the 36 states and the Federal Capital Territory, Abuja, Southeast's Geopolitical Zone (bold outline), and the study areas Imo, Anambra and Ebonyi State.

Semi - domesticated trees such as African pear (*Dacryodes edulis*)**,** bush mango (*Irvingia gabonensis***)** oil been tree **(***Pentaclethra macrophylla*) and bread fruit tree (*Treculia africana***)** are a common feature of land use in the region. The extraction of non-timber forest products including firewood, fruits, nuts, leaves, vegetables, is an indispensable dimension of the local economic activity of the people throughout the region.

3.1.2 Climate and Vegetation

The climate of the three states is tropical and is influenced by two air masses, the North-East (NE) trade wind and the South-West (SW) rain bearing wind. The NE trade wind is a dry wind from the Sahara desert that enters Nigeria late October every year and is synonymous with the dry season in Nigeria. The South-West trade wind is a moisture laden wind that blows from the Atlantic Ocean and brings rain over the area it covers. The seasons witnessed in the three states are due to the interplay between these two prevailing wind systems.

Mean annual rainfall is 2000mm. The beginning of the rainy season is often marked by afternoon thunderstorms, accompanied by heavy showers, tailing off in prolonged steady drizzle. Temperature ranges between 25 – 35 degrees Centigrade. The three states are situated in the humid zone with humidity ranging between 51% and 84%. The lowest daily values of relative humidity are recorded in the early afternoon while the highest values are recorded in the early morning hours (FORMECU, 1999). The area has a level topography.

The vegetation types are mangrove and freshwater swamp communities, rainforest/savanna mosaic and derived savanna zone. These vegetation subtypes all belong to the forest zone.

3.2 Method of Data Collection

This study was conducted in three states namely Imo, Anambra and Ebonyi. The three states were chosen subjectively based on their time of creation. Whereas the former East Central State that now constitute the five states was originally split into two to get Anambra and Imo States in 1976, Enugu State was carved out from Anambra Statewhile Abia was carved out from Imo State. Finally, Ebonyi State was later carved out from both Enugu and Abia States. Thus, the two oldest and one

youngest states were chosen out of the five states that now make up the former East Central State of Nigeria. The three states lie within the area enclosed by longitude $6^0$35' and $8^0$10' East and latitude $4^0$45' and $6^0$17' North. The states are bounded to the Northeast and Northwest by Benue and Kogi states, to the South and Southwest by Rivers and Delta States and to the North, East and Southeast by the Cross River and Akwa Ibom States. The three states have a total population of 10,282,338 people made up of 5,158,611 males and 5,123,727 females. This population figure represents 62.71% and 7.32% of the total population of southeast and Nigerian federation respectively (Federal Republic of Nigeria, official Gazette No 2. Vol. 96, 2nd Feb. 2009).

3.2.1 Survey Method

The study covered a period of twelve (12) calendar months and was commenced in January and ended in December, 2007. The data collected were based on the rural and urban populations who responded to questions that were administersd on them. In order to assess the consumption and sale of ILVs in the various rural and urban households and markets in the three states, two types of surveys namely household and market surveys were undertaken. Each of these surveys involved the use of semi-structured questionnaires and interview schedules. Household surveys involved mainly interview of rural and urban households in order to record ILV species consumed in the household during the last one week that preceded the interview (i.e. one week memory-recall). During the survey, details of consumed ILV species in the household were noted including the number of times they were consumed during the week, their means of acquisition, sources of supply, reasons for their consumption, mode of consumption, the respondents vegetable species preferences, the percentages of family food budgets spent on vegetable purchases, monetary values or costs of the vegetables as well as supply constraints.

Market surveys on the other hand involved identification of various ILV species on sale in the markets, physical count of the number and gender of individuals involved in the sale of each species, random interview of some of the sellers so as to find out the unit prices of each vegetable species, their sources of supply, income and profit margins per seller per market day, mode of marketing of the vegetables i.e. whether the sellers were engaged on them on full-time or part-time basis as well as

marketing constraints. Samples of the vegetables were bought during each market survey for subsequent weighing in order to march their unit prices to their weights and to compare price variations among species.

Because the availability of ILVs varies with season and in order to investigate the effect of this seasonal variation on their prices and frequency of consumption, multiple-visit surveys were adopted. Each of the two surveys was repeated monthly for a period of one year.

3.2.2 Sampling Procedure

The three states involved in the study, namely Imo, Anambra and Ebonyi are each made up of three agricultural zones.This zoning arrangement formed the basis for sample selection. Under this arrangement, one rural and one urban community were selected from each agricultural zone for sampling. The existence of a well organized market where leafy vegetables were on sale formed a major criterion for the choice of a community while the rural community selected lied within 30km radius to the urban community. Thus, a total of six communities were selected per state, i.e. 18 communities for the three states**.**

Within each of the selected communities, 10 households were randomly sampled monthly for the one year period. Thus, a total of 120 household surveys were conducted per community, 240 per zone and 720 per state bringing it to a total of 2,160 household surveys for the three states. Similarly one marketidentified in each of the rural and urban communities (*Table 3.1*), were surveyed monthly for the one year period. Out of the total of 2,160 household survey questionnaires administered, 1629, or 75.42% were retrieved. It was made up of 813 or 75.28% and 816 or 75.56% of rural and urban household questionnaires respectively (*Table 3.2).*

On the other hand, 186 out of a total of 216 market surveys were conducted during the period of study representing 86.11%. Ninety-seven representing 89.81 and 89 representing 82.41% of such surveys were conducted in urban and rural markets respectively.

Table 3.1: The three rural and urban communities and markets selected from each of the three states for data collection.

Name of State	Agricultural Zone	Rural Communities		Urban Communities	
		Name of community	Name of market	Name of community	Name of market
Imo State	Owerri Orlu Okigwe	Umuagwo Umuaka Amaraku	Eke Umuagwo Afor Umuaka Orie Amaraku	Owerri Orlu Okigwe	Owerri main market Orlu main market Okigwe main market
Anambra State	Onitsha Anambra Awka	Umudioka Igbariam Ekwulobia	Afor Umudioka Eke Igbariam Eke Ekwulobia	Onitsha Otuocha Awka	Ose okwodu mkt Otuocha daily mkt Eke Awka
Ebonyi State	Ebonyi central Ebonyi North Ebonyi South	Onueke Ishieke Nkpoghoro	Eke Imeoha Ofueke Ishieke Afor Nkpoghoro	Abakaliki Nkalika Ohaisu	Meat market Nkalika market Orie Ohaisu

Source: Field survey, 2007.

Table 3.2: The number and percentage of questionnaires administered and retrieved monthly from the selected locations.

	Rural Communities			Urban Communities			Rural & Urban	
Month	**Total**	**Retrieval**	**%**	**Total**	**Retrieval**	**%**	**Retrieval**	**%**
January	90	66	73.3	90	68	75.6	134	74.4
February	90	66	73.3	90	67	74.4	133	73.9
March	90	70	77.8	90	71	78.9	141	78.3
April	90	73	81.1	90	72	80.0	145	80.6
May	90	73	81.1	90	67	74.4	140	77 .8
June	90	67	74.4	90	62	68.9	129	71.7
July	90	61	67.8	90	68	75.6	129	71.7
August	90	64	71.1	90	67	74.4	131	72.8
September	90	70	77.8	90	70	77.8	140	77.8
October	90	68	75.6	90	73	81.1	141	78.3
November	90	67	74.4	90	66	73.3	133	73.9
December	90	68	75.6	90	65	72.2	133	73.9
Total	**1080**	**813**	**903.3**	**1080**	**816**	**906.7**	**1629**	**905.0**
Mean	**90**	**67.8**	**75.3**		**68**	**75.6**	**135.8**	**75.4**

Source: Field survey, 2007

The main instrument for data collection was structured questionnaires and interview schedules (See appendix 1 for the quesstinnaire format). To validate the instrument, one rural and one urban community different from the ones selected for the purpose of the study were randomly selected from each of the three agricultural zones of Imo State. Five households each and one market were sampled from each of these six selected communities for two consecutive months. The information collected was carefully analyzed and the results were used to validate the instrument.

The researcher was directly involved in data collection with the assistance of trained enumerators/extension agents who were employees of the Agricultural Development Programmes (ADPs) of the three states involved in the study. Prior to the commencement of field work, these enumerators were trained and adequately briefed on what they were expected to do. This helped to ensure consistency in the interpretation of the questions in the local dialects and the standardization of interview techniques. Moreover, their work and conduct were properly guided throughout the duration of the survey while spot surveys were conducted on areas of jurisdiction of each enumerator on regular bases as a means of verifying their own data.

3.3 Methods of Data Analyses:

Qualitative as well as quantitative analytical techniques were used to derive inferences of this study. Simple descriptive statistics such as frequencies, percentages, means and bar charts were used to analyse quantitative biographic data.

Determination of vegetable species preferences of the respondents was done using the formular according to Franzel et al (1996). The formular is given as:

$$\text{Average rank order value} = \frac{\text{sum of rank order values of species x 100}}{\text{No. of interviews undertaken}}$$

On the other hand, the main inferential statistical tool used in the analyses of the various hypotheses were **Z – Test and Pearson Product-moment Correlation Coefficient.**

3.3.1 Z – Test.

Z–test is any statistical test for which the distribution of the test statistics under the null hypothesis can be approximated by a normal distribution. Since many test statistics are approximately normally distributed for large samples due to the central limit theorem, many statistical tests can be performed as approximate Z – tests if the sample size is not too small. In essence, the Z – test is usually adopted in testing hypothesis about the difference between two population means when the sample size is large. Generally, a sample is considered to be large if its size is equal to, or greater than 30. Otherwise, the sample is regarded as small (http:II.wikipedia.org/wiki/z-test; Okafor, 1992). In the present study the Z- test was employed in testing the differences between the population means of:

(a) Wild and Domesticated leafy vegetable related variables

(b) Vegetable consumption and marketing related variables between the rural and urban households and markets.

The model used is pecified as

$$Z = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{S^2}{n_1} + \frac{S^2}{n_2}}} \quad (df.\ n_1+n_2 - 2) \qquad \text{equation 1 (1)}$$

Where

Z = Value by which the statistical significance of the mean difference was judged.

X_1 = **(a)** Sample mean of WILV related variables:

(i) Percentage of people that consumed WILVs H_1

(ii) Frequency of consumption of WILVs H_3

(iii) Household expenditures on WILVs H_7

(iv) Preference ratings of WILVs H_8

(v) Prices of WILVs H_9

(vi) Profit margins of WILVs H_{10}

(b) Sample mean of vegetable related variables:

(i) Frequency of consumption of vegetables in the rainy season. (H_2

(ii) Household expenditure on vegetables in the rural Households. (H_4)

(iii) Vegetable prices in the rural markets (H_5

(iv). Profit margins obtained from the sale of Vegetables, in the rural markets (H_6

$\mathbf{X_2}$ = (**a**) Sample mean of DILV related variables:

(i) Percentage of people that consumed DILVs (H_1)

(ii) Frequency of consumption of DILVs (H_3)

(iii) Household expenditures on DILVs (H_7)

(iv) Preference ratings of DILVs (H_8)

(v) Prices of DILVs (H_9)

(vi) Profit margins of DILVs (H_{10})

(**b**) Sample mean of vegetable related variables:

(i) Frequency of consumption of vegetables during the dry season period (H_2)

(iv) Household expenditures on vegetables in the urban households (H_4)

(v) Vegetable prices in the urban markets (H_5)

(vii) Profit margins obtainable from the sale of vegetables in the urban markets (H_6)

S^2_1 = Variance of X_1

S^2_2 = Variance of X_2

n_1 = Sample sizes of X_1

n_2 = Sample sizes of X_2

3.3.2: Pearson Product-moment Correlation Coefficient.

In many natural systems, changes in one attribute are accompanied by changes in another attribute and that a definite relationship exists between the two. In other words, there is a correlation between the two variables. For instance, strange correlation is found to occur between several morphometric features of a tree. In such instance, an investigator may be interested in measuring the strength of the relationship. Correlation coefficients are used in statistics therefore to measure how strong a relationship is between two variables. It indicates both the direction and degree of relationship between two measurable characteristics, say, X and Y.

Several types of correlation coefficient exist among them is Pearson product-moment correlation coefficient commonly used to measure linear correlation (dependence) between two variables. It was developed by Karl Pearson from a related idea introduced by Framas Galton in the 1880 (Rodgers and Nicewander, 1988, Stigler, 1989)

Pearson correlation coefficient when applied to a sample is commonly represented by the letter r. The range of r is from –1 to +1 and does not carry any unit. When its value is zero, it means that there is no linear relationship between the variables concerned. A strong linear relationship exists when the value of r approaches – 1 or + 1. A negative value of r is an indication that an increase in the value of one variable is associated with a decrease in the value of the other. A positive value on the other hand indicates a direct relationship, i.e, an increase in the value of one variable is associated with an increase in the value of the other.

In the present study, the Pearson product-moment correlation was employed in testing the relationship existing between the weight per bundle of vegetables and their market prices.

The model used is specified as

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2][n\Sigma y^2 - (\Sigma y)^2]}} \qquad \text{equation 2}$$

Where:

r	=	correlation coefficients
n	=	No of vegetable species
X	=	weight of vegetable
Y	=	prices of vegetable
Σxy	=	sum of the products of X and Y
Σx^2	=	Sum of square of X
Σy^2	=	Sum of square of Y

CHAPTER FOUR

4.0 Results

This chapter presents the results of the analyses of data collected from household and market surveys carried out in the study area.The aimwas to determine the level of consumption and marketing of ILV species within the zone. It is divided into two main sections. While the first section presents the results of household surveys, the second section presents the results of market surveys.

4.1: Household Survey Information

This section presents the results of the analyses of data collected on the course of household surveys.

4.1.1 Socio economic characteristics of the respondents

The socio-economic characteristics considered are age, sex, level of formal education, family size and occupation. Table 4.1 contains the summary of results obtained for the socio-economic characteristics for both rural and urban respondents. Results revealed that about 22.6% of the respondents were less than 30 years; 34.3% were aged between 31- 40 years while 21.2% were aged between 41 – 50 years. 11.5% were between 51 – 60 years of age while only 0.4% of the respondents were above 70 years of age. The mean age of the respondents was found to be 36.8 years(Table 4.1). The finding also showed that approximately 80% of the respondents were females. Results also showed that literacy level was relatively high with about 25.1% having attended primary school; 23.7% having attended secondary school while 34.1% having attended higher education. It was only 14.1% that did not attend anyformaleducation.

Table 4.1: Distribution of respondents by demographic characteristics

S/N	Variables	Categories	Rural communities		Urban communities		Rural & Urban communities	
			Frequency	**Percentage**	**Frequency**	**Percentage**	**Frequency**	**Percentage**
		< 30	195	24	173	21.20	368	22.6
i.	Age (years)	31 – 40	270	33.2	288	35.3	558	34.3
		41 – 50	171	21.0	175	21.5	346	21.2
		51 – 60	93	11. 4	94	11.5	187	11.5
		61 – 70	41	5.0	25	3.1	66	4.1
		> 71	4	0.5	3	0.4	7	0.4
	No response		39	4.8	58	7.1	97	6..0
			813	100.0	816	100.0	1629	100.0
		Male	172	21.2	159	19.50	331	20.2
ii.	Sex	Female	641	78.8	657	80.5	1298	79.7
			813	100.0	816	100.0	1629	100.0
	Level of	No formal education	83	10.2	147	18.0	230	14.1
		Primary school	198	24.4	210	25.7	408	25.1
iii.	education	Secondary school	219	26.9	167	20.5	386	23.7
		Tertiary education	288	35.4	267	32.7	555	34.1
		No response	25	3.1	25	3.06	50	3.1
			813	100.0	816	100.0	1629	100
		1 – 3	160	19.7	133	16.30	293	18.0
		4 – 6	314	38.6	347	42.50	661	40.6
iv.	Household size	7 – 9	220	27.1	209	25.6	429	26.3
		10 – 12	76	9.4	42	5.2	118	7.2
		13 and above	5	0.6	5	0.6	10	0.6
		No respondent	38	4.7	80	9.8	118	7.2
			813	100.0	816	100.0	1629	100.0
		Civil/public servants	190	23.4	198	24.30	388	23.8
		Farmers	269	33.1	130	15.9	399	24.5
		Traders	150	18.5	144	17.7	294	18.1
v.	Occupation	Students	95	11.7	59	7.2	154	9.5
		Teachers	44	5.41	48	5.88	92	5.7
		Artisans	19	2.3	15	1.8	34	2.1
		Technicians	9	1.1	8	1.08	17	1.0
		Police officers	3	0.4	9	1.1	12	0.7
		Others	6	0.7	9	1.1	15	0.9
		No response	28	3.4	196	24.00	224	13.8

Results further revealed that 18.0% of the respondents had a household size of 1 - 3 persons; 26.3% had a household size of 7 – 9 persons while majority (40.6%) had a household size of 4-6 persons. It was only 0.6% of the respondents that had a household size of 13 persons and above while the mean of the respondent's household size was found to be 6 persons. Results also showed that 45.7% of the respondents were in various forms of self employment as farmers (24.5%), traders (18.1%) artisans and technicians (3.1%), while 30.2% were in the public sector either as civil/public servants (23.8%), teachers (5.7%) or police officers (0.7%). Students constituted 9.5% of the respondents.

4.1.2: Commonly consumed and marketed indigenous leafy vegetable species in the study area.

Table 4.2 contains the list of all the identified vegetable species consumed and marketed in the various households and markets within the study area. In all, 34 vegetable species belonging to 18 families were identified during the period of the survey. Out of this number, 18 species belonging to 11 families were WILVs while 16 species belonging to seven families were DILVs.

The closely related species among these vegetables were not differentiated by the respondents but were rather seen and treated as one and the same species in terms of taste, preferences and prices. Included in this category are the three *solanum* species namely *S. aethiopicum, S. melongena* and *S. macrocarpum*; the two *amaranthus* species namely *A. hybridus* and *A. caudatus*, the two *curcubita* species namely *C. pepo* and *C. moschata;* the two *corchorus* species namely *C. olitorius* and *C. tridens*; the two *pterocarpus*species, namely *P. soyauxii* and *P. mildbraedi*; the three *ocimum* species namely *O. gratissimum, O. basilicum* and *O. viride* andthe three *vernonia* species namely *V. amygdalina, V. colorata a*nd *V. calvoana*. Even though, the respondents often gave more preferences to *V. calvoana*because it was not as bitter as other *vernonia* species, but such preference did not have any effect on their prices. Due to these non differentiations, the above mentioned species are lumped togetherthroughoutthe rest of the discussion and only identified by their generic names.

This study revealed that while some of these vegetable species enjoy wide popularity and are commonly consumed throughout the three selected states, some are more popular in specific states or in certain localities within a state. For

instance,*Telfairia occidentalis* enjoys wide popularity throughout the entire study area, *Gnetum africanum, Pterocarpus soyauxii/mildbraedi, Piper guineense and Gongronema latifolium*are also commonly consumed throughout the area of study but they enjoyed more popularity in Imo state.*Vernonia, Ocimum* and *Corchorus species* are commonly consumed throughout the three states, but they enjoy more patronages in Anambra state.*P. santalinoides* though commonly consumed throughout the study area but is patronized more in Ebonyi state, while some vegetables as *S. nigrum, F. zanthoxyloides, L. cupaniodes, Ficus ovata and Vitex doniana* were specifically consumed in Ebonyi state.

4.1.3: Diversity of species of indigenous leafy vegetables consumed per household on a weekly basis

Results showed that between one to eight different species of vegetables were consumed weekly by theruraland urban households. Majority of the households were however consuming between three and six different species of vegetables weekly. In the rural communities for instance, 42.5% of the households were consuming between three and four different species of vegetables, while 47.3% were consuming between five and six different vegetable species weekly. In the urban communities, on the other hand, 47.5% of the households were consuming between three and four different species of vegetables weekly, while 44.6% were consuming between five and six different species. The average number of different species of vegetable consumed weekly in both rural and urban households was 4 (Tables 4.3 and 4.4).

Table 4.2: The local vegetable species commonly consumed and marketed within the southeastern zone of Nigeria

	Botanical name	**Family**	**Class**	***English name***	***Vernacular names***
1	*Telfairia occidentalis*	Curcubitaceae	Herb	Fluted pumpkin	Ugu/owfe
2	*Solanmun aethiopicum*	Solanaceae	Shrub	Egg plant	Anara/ewa
3	*Solanum melongena*	Solanaceae	Shrub	Egg plant	Anara/ewa
4	*Solanum macrocarpon*	Solanaceae	Shrub	Egg plant	Anara/ewa
5	*Solanum nigrum*	Solanaceae	Shrub	Black nightshade	Ogbojioroko
6	*Vernonia amgydalina*	Compositae	Shrub	Bitter leaf	Olugbu
7	*Vernonia colorata*	Compositae	Shrub	Bitter leaf	Olugbu
8	*Vernonia calvoana*	Compositae	Shrub	Bitter leaf	Olugbu
9	*Talinium triangulare*	Portulacaceae	Herb	Water leaf	Mgborodi
10	*Amaranthus hybridus*	Amaranthaceae	Herb	Green	Inine
11	*Amaranthus caudatus*	Amaranthaceae	Herb	Green	Inine
12	*Cucurbita pepo*	Curcubitaceae	Herb	Suimmer squash	Ugbogiri
13	*Cucurbita moschata*	Curcubitaceae	Herb	Sweet gourd	Ugbogiri
14	*Corchorus olitorius*	Malvaceae	Herb	Vegetable jute	Ahihara/Kerekere
15	*Corchorus tridens*	Malvaceae	Herb	Bush okra	Ahihara/Kerekere
16	*Murraya koenigii*	Labiatae	Shrub	Curry	
17	***Pterocarpus soyauxii***	**Fabaceae**	**Tree**	African padauk	Oha ocha
18	***Pterocarpus mildbraedi***	**Fabaceae**	**Tree**	White camwood	Oha ojii
19	***Pterocarpus santalinoides***	**Fabaceae**	**Tree**	Camwood	Nturukpa
20	***Gnetum africanum***	**Gnetaceae**	**Herb**	Gnetum	Okazi
21	***Piper guineense***	**Piperceae**	**Herb**	African black pepper	Uziza
22	***Gongronema latifolium***	**Asclepaidaceae**	**Herb**		Utazi/Utamazi
23	***Ocimum viride***	**Labiatae**	**Shrub**	Basil plant	Nchanwu /Ahuji
24	***Ocimum gratissimum***	**Labiatae**	**Shrub**	Basil plant	Nchanwu /Ahuji
25	***Ocimum basilicum***	**Labiatae**	**Shrub**	Basil plant	Nchanwu/Ahuji
26	***Ficus ovate***	**Moraceae**	**Tree**	Fig tree	Ogbu
27	***Ficus capensis***	**Moraceae**	**Tree**	Fig tree	Ekwu akpuru
28	***Celosia argentea***	**Amaranthaceae**	**Shrub**	Cocks comb	Sokoyokoto
29	***Colocasia antiquorum***	**Araceae**	**Herb**	Cocoyam	Ede
30	***Lecaniodiscus cupaniodes***	**Sapindaceae**	**Tree**	NA	Okpuocha
31	***Zantoxylon zantoxyloides***	**Butaceae**	**Tree**	NA	Nka
32	***Vitex doniana***	**Verbenaceae**	**Tree**	Black plum	Ichakiri
33	***Solanum gilo raddi***	**Solanaceae**	**Shrub**	NA	Ibere
34	***Pennisetum purpureum***	**Poaceae**	**Herb**	Elephant grass	Achara

Source: Field survey, 2007. *NB: All vegetables in bold outline are WILVs*

NB: *NA = Not available*

Table 4.3: Average number of vegetable species consumed by the rural households on a weekly basis

No. of vegetable	Imo		Anambra		Ebonyi		Overall	
Species consumed	No	%	No	%	No	%	No	%
1 -2	14	5.7	46	15.3	15	5.8	75	9.3
3 – 4	93	38.2	136	45.2	113	43.5	342	42.5
5 – 6	130	53.3	119	39.5	132	50.7	381	47.3
7 – 8	7	2.7	-	- -	-	-	7	0. 9
Total	**244**	**100.0**	**301**	**100.0**	**260**	**100.0**	**805**	**100.0**
Mean		**4.6**		**4.0**		**4.4**		**4.3**

Source: Field survey, 2007

Table 4.4: Average number of vegetable species consumed by the urban household on a weekly basis

No of vegetable	**Imo**		**Anambra**		**Ebonyi**		**Overall**	
Species consumed	No	%	**No**	**%**	**No**	**%**	**No**	**%**
1 -2	24	10.0	26	8.3	9	3.7	59	7.4
3 – 4	110	45.6	162	51.6	106	44.0	378	47.5
5 – 6	103	42. 7	126	40.1	126	52.3	355	44.6
7 – 8	4	1.7	-	-	-	-	4	0.5
Total	**241**	**100.0**	**314**	**100.0**	**241**	**100.0**	**796**	**100.0**
Mean		**4.2**		**4.1**		**4.5**		**4.3**

Source: Field survey, 2007

4.1.4: Consumption patterns of various indigenous leafy vegetable species.

Table 4.5shows the various ILVs consumed by the respondents and their consumption patterns in the rural households. As the table shows, *T. occidentalis* was the most widely consumed vegetable species as it was consumed by 95.6%of the rural respondents. This was followed by *Vernonia* spp. (66.2%) and *Amaranthus* species (52.9%) of the rurual respondents. The most widely consumed WILV species was *Pterocarpus spp (*consumed by *35.3%)* followed by *Ocimum spp* (22.1%) and *G. africanum* (17.7%), while the least consumed vegetables (each consumed 1.5 times) were *Corchorus, C. argentea, L. cupaniodes, S. gilo raddi*and *V. doniana* of rural respondents respectively. Each of the ILV species was consumed by an average of 18.5% of the rural households in the study area. With regard to the two vegetable categories, whereas each of the DILV species was consumed by an average of 33.0% of the rural households, each of the WILV species was consumed by only 9.3% of the rural households.

Result of test of significant difference between the percentage of rural households that consumed WILV species and those that consumed DILV species was negative and significant, with Z- value of –11.9 at 5% level of significance. This meant that the percentage of rural households that consumed DILV species was significantly higher than those that consumed WILV species (Appendix 4.1**).**

Table 4.5 showed that *T. occidentalis* was also the most frequently consumed ILVs as it was consumed 3.2 times weekly in the rural households followed by *Corchorus species* (2.8 time weekly). The most frequently consumed WILV species in the rural households was *G. africanum* (consumed 2.6 times weekly), followed by *G. latifolium* (2.3times weekly). Overeall, each of the vegetable species was consumed an average of 1.8times weekly. As regards the two vegetable groups, DILVs were consumed an average of 2.0 times weekly while those of WILVs were consumed anaverage of 1.7 times weekly. Cumulatively however, results showed that DILV species was consumed 74.0% of the times compared to 26.1% for WILVs in the rural communities.

Table 4.5: One year averages of weekly consumption and expenditure pattern of indigenous leafy vegetable species by rural households in the study area.

S/N	Vegetable Species	No of H.H that Cons.	% of H.H that Cons.	Freq. of Cons.	Mean freq/week	% of H.H that bought	Total cost (₦)	Weekly exp/H.H (₦)	% of H.H that obtained	Total Monetary value/week (₦)	Monetary value/H.H/wk (₦)
1	*T. occidentalis*	*65*	*95.6*	*205.0*	*3.2*	*49.4*	*2455.0*	*77.70*	*51.4*	*2663.33*	*83.83*
2	*Solanum spp*	*20*	*29.4*	*45.0*	*2.3*	*51.4*	*383.17*	*39.93*	*48.6*	*480.0*	*49.88*
3	*Vernonia spp.*	*45*	*66.2*	*107.8*	*2.4*	*49.8*	*1223.75*	*50.01*	*49.7*	*1195.83*	*49.85*
4	*T. triangulare*	*20*	*29.4*	*39.5*	*1.9*	*40.9*	*415.50*	*41.34*	*58.5*	*532.50*	*46.63*
5	*Amaranthus spp.*	*36*	*52.9*	*85.5*	*2.4*	*59.0*	*1078.92*	*54.37*	*39.9*	*906.25*	*60.35*
6	*Curcurbita spp*	*6*	*8.8*	*11.0*	*1.7*	*47.1*	*220.0*	*125.0*	*52.9*	*215.83*	*30.0*
7	*M. koeningii*	*7*	*10.3*	*12.8*	*2.0*	*48.1*	*88.75*	*23.72*	*51.9*	*61.67*	*16.52*
8	*C. antiquorum*	*2*	*2.9*	*2.8*	*1.2*	-----	------	-----	*100.0*	*32.0*	*13.75*
9	*Corchorus spp.*	*1*	*1.5*	*3.7*	*2.8*	*33.3*	*20.0*	*20.0*	*66.7*	*100.0*	*32.50*
10	***G. africanum***	*12*	*17.7*	*29.9*	*2.6*	*79.0*	*1025.42*	*92.69*	*21.7*	*349.17*	*107.87*
11	***P. guineense***	*4*	*5.8*	*7.6*	*1.9*	*69.0*	*122.0*	*22.80*	*31.9*	*40.0*	*23.44*
12	***G. latifolium***	*9*	*13.2*	*20.1*	*2.3*	*27.4*	*74.55*	*28.86*	*72.6*	*188.75*	*28.35*
13	***Ocimum spp.***	*15*	*22.1*	*26.8*	*1.8*	*42.7*	*210.42*	*29.97*	*56.7*	*170.42*	*21.81*
14	***Pterocarpus spp.***	*24*	*35.3*	*63.3*	*1.9*	*57.7*	*745.0*	*58.24*	*42.3*	*580.42*	*60.17*
15	***F. ovate***	*5*	*7.4*	*8.5*	*1.9*	-----	-----	-----	*100.0*	*235.0*	*40.12*
16	***P. santalinoides***	*8*	*11.8*	*10.3*	*1.3*	*30.3*	*102.22*	*38.89*	*69.2*	*235.0*	*44.31*
17	***C. argentea***	*1*	*1.5*	*1.5*	*1.5*	*100.0*	*20.0*	*20.0*	-----	-----	----
18	***F. zanthoxyloides***	*2*	*2.9*	*2.0*	*1.0*	*50.0*	*40.0*	*40.0*	*50.0*	*30.0*	*30.0*
19	***L. cupaniodes***	*1*	*1.5*	*1.0*	*1.0*	-----	------	-----	*100.0*	*20.0*	*20.0*
20	***S. nigrum***	*3*	*4.4*	*4.4*	*1.3*	*54.6*	*92.22*	*40.08*	*45.5*	*83.33*	*47.22*
21	***S. gilo raddi***	*1*	*1.5*	*1.4*	*1.0*	*35.7*	*50.0*	*30.0*	*64.3*	*50.0*	*39.0*
22	***V. doniana***	*1*	*1.5*	*2.0*	*1.7*	----	-----	-----	*100.0*	*70.0*	*47.0*
23	***F. capensis***	*2*	*2.9*	*2.0*	*1.0*	-----	-----	-----	*100.0*	*70.0*	*35.0*
	Total	**290**	**426.5**	**693.9**	**43.6**	**925.4**	**8366.92**	**833.60**	**1373.7**	**8309.50**	**927.60**
	Mean	**12.6**	**18.5**	**30.2**	**1.8**	**51.4%**	**464.83**	**46.31**	**62.4%**	**377.70**	**42.16**
	Mean for DILVs	**22.5**	**33.0**	**73.9%**	**2.2**	**42.3%**	**735.64**	**54.01**	**57.7%**	**687.49**	**42.59**
	Mean for WILVs	**6.3**	**9.3**	**26.1%**	**1.7**	**39.0%**	**248.18**	**40.15**	**61.0%**	**163.24**	**41.87**

Source: Field survey, 2007. ***NB: All vegetables in bold outlines are WILVs***

NB:

No. H.H that cons.	=	Number of households that consumed the vegetablespecies
% of H.H that cons.	=	Percentage of households that consumed the vegetable species
Freq. of cons.	=	Frequency of consumption of the vegetable species.
Mean freq./week	=	Mean frequency of consumption of the vegetable species per week
% of H.H that bought	=	Percentage of households thatobtainedthe consumed vegetables through purchase
Total cost	=	Total cost of the vegetable species consumed in all the households in a week
Weekly exp/H.H	=	Weekly expenditure of each household on the vegetable species consumed
% of H.H that obtained:	=	Percentage of households that obtained the vegetables through other sources other than purchase
Total monetary value	=	Total monetary value of the unpurchased vegetable species consumed by all the households in a week
Monetary value/H.H	=	Monetary value of the unpurchased vegetables consumed by each household per week

Z–test analysis however showed no significant difference in the consumption frequencies between those who consumed WILVs and those who consumed DILVs in the rural households (Z = 1.91 p<0.05) **(**Appendix 4.2**).**

Table 4.5also showed that there were two main methods of acquisition of the vegetables, namely purchase and collection from personal farm/forest lands and neighbours. While some of these vegetables were purchased, others were collected from personal farm/forest areas and neighbours. Whereas all *C. antiquorum, F. ovata, V. doniania and F. capensis* consumed in the rura lhousehold swere collected from farm/forest lands and neighbours, all of *C. argentea* consumed were purchased.The percentage of rural households who purchased their vegetable needs averaged 79.0% for *G. africanum,* 69.0% for *P. guineense* and 59.0% for *Amaranthus spp.* On the average, 51.4% of rural households purchased their vegetable needs while 62.4% collected theirs frompersonal farm/forest lands and from neighbours. With regard to the two vegetable categories, whereas 42.3% of rural respondents who consumed DILV purchased their requirements, only 39.0% of those who consumed WILV species did purchase theirs.

Table 4.5 further revealed that rural households expended various sum of moneyon the purchase of vegetables for consumption. The expenditures ranged from N20.0 per household per week for such species as *Corchorus* and *C. argentea* to as high as ₦92.69 for *G. africanum.* The average amount expended on each vegetable species by each rural household on weekly basis was however found to be ₦46.31. Since each household was found to be consuming an average of four (4) different species of vegetables weekly (Table 4.3), total household expenditure perweek on ILV was therefore ₦185.24 (i.e. ₦46.31 x 4).This amounted to a yearly expenditure of ₦9,632.48 (46.31 x 52 weeks).

On the basis of the two vegetable groups, weekly expenditures per species per household for DILVs in the rural communities ranged from an average of ₦20.0 for *Corchorus species* to ₦77.70 for *T. occidentalis* while for the WILVs, it ranged from an average of ₦20.0 for *C. argentea* to ₦92.69 for *G. africanum*. The average weekly expenditures per species per household for WILVs and DILVs were ₦40.15 and ₦54.01 respectively. This also implied a total weekly expenditure of ₦160.60 on WILVs and ₦216.04 on DILVs. Thus, rural households expended on yearly

bases,average sums of ₦8,351.20 and ₦11,234.08 onthe consumption of WILV and DILV species respectively

Result of test of significant difference between household expenditures on WILVs and DILVs was negative and significant with Z- value of -5.66 at 5% level of significance (Appendix 4.3**).** This meant that household expenditures on DILVs were significantly higher than on WILVs in the rural communities.

Results also showed that the subsistent/direct-use values or opportunity cost of the vegetables were substantial and varied from one vegetable species to the other. It ranged from ₦20.0 per household per week for *L. cupaniodes* to as high as ₦107.87 for *G. africanum*. The direct-use values or the opportunity costs per vegetable species per household per week averaged ₦42.16 in the rural communities. This amounted to a total weekly and yearly consumption of ILVs worth ₦168.64 and ₦8,769.28 respectively. On the basis of the two vegetable groups, direct-use values per household per week for DILV ranged from ₦13.75 for *C. antiquorum* to ₦83.83 for *T. occidentalis* and for WILV species, from ₦20.0 for *L. cupaniodes* to ₦107.87 for *G. africanum* respectively. The worth of the vegetables consumed (i.e. direct-use value) per species per household per week was found to be ₦42.59 for DILVs and ₦41.87 for WILVs.This also amounted to total weekly and yearly consumption of ILVs worth ₦170.36 and ₦8,858.72 for DILVs and ₦167.48 and ₦8,708.96 for WILVs respectively.

Detailed results of the month by month survey for the one year period covered by this study are contained in appendix 2.1–2.12 while appendix2.13 – 2.15 contain summary of the results averaged for the year for each of the three states involved in the study.

Similar trends were observed in the urban communities as reflected in table 4.6.*T. occidentalis*for instance remained the most widely consumed vegetable species as it was consumed by 94.1% of the urban respondents. This was followed by *Vernonia* and *Amaranthus* species (63.2% and 54.4%) of the urban respondents respectively. Also, *Pterocarpus* remained the most widely consumed WILV species

Table 4.6: **One year averagesof weekly consumption and expenditure patterns of indigenous leafy vegetable species by urban householdsin the study area.**

S/N		No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq/week	% of H.H that bought	Total cost/week (₦)	Exp/ H.H/week (₦)	% of H.H that obtained	Total Monetary value/week (₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	*64*	*94.1*	*203.0*	*3.2*	*70.8*	*3363.89*	*95.66*	*29.7*	*1746.25*	*92.16*
2	*Solanum spp*	*19*	*27.9*	*37.0*	*2.0*	*71.6*	*608.75*	*56.88*	*27.9*	*200.0*	*36.56*
3	*Vernonia spp*	*43*	*63.2*	*101.6*	*2.4*	*66.3*	*1507.92*	*55.84*	*33.9*	*777.08*	*59.78*
4	*T. triangulare*	*19*	*27.9*	*32.0*	*1.7*	*65.2*	*591.25*	*49.73*	*35.6*	*418.33*	*53.76*
5	*Amaranthus spp*	*37*	*54.4*	*93.6*	*2.5*	*75.3*	*1696.67*	*66.93*	*24.1*	*648.33*	*70.60*
6	*Curcubita*	*2*	*2.9*	*2.6*	*1.5*	*65.6*	*48.57*	*45.0*	*34.4*	*52.50*	*36.25*
7	*M. koeningii*	*6*	*8.8*	*10.8*	*1.7*	*81.8*	*88.75*	*20.67*	*18.1*	*40.0*	*17.61*
8	*C. antiquorum*	*1*	*1.5*	*1.0*	*1.0*	---	----	----	*100.0*	*10.0*	*10.0*
9	*Corchorus spp*	*6*	*8.8*	*22.8*	*2.0*	*91.7*	*216.36*	*32.95*	*8.3*	*20.0*	*10.0*
10	***G. africanum***	*13*	*19.1*	*25.0*	*4.0*	*89.5*	*1165.83*	*100.74*	*10.2*	*193.13*	*104.12*
11	***P. guineense***	*5*	*7.4*	*11.5*	*2.2*	*54.7*	*135.83*	*45.94*	*44.1*	*25.91*	*18.82*
12	***G. latifolium***	*8*	*11.8*	*15.2*	*1.9*	*75.4*	*220.83*	*25.92*	*23.5*	*75.0*	*25.04*
13	***Ocimum spp***	*17*	*25.0*	*28.1*	*1.7*	*60.3*	*278.75*	*26.11*	*39.7*	*152.92*	*24.70*
14	***Pterocarpus spp***	*29*	*42.7*	*54.9*	*1.9*	*85.1*	*1578.89*	*73.76*	*15.2*	*202.50*	*46.39*
15	***F. ovate***	*2*	*2.9*	*2.5*	*1.7*	----	----	----	*100.0*	*45.0*	*31.25*
16	***C. argentea***	*1*	*1.5*	*1.0*	*1.0*	*66.7*	*15.0*	*15.0*	*33.3*	*10.0*	*10.0*
17	***P. santalinoides***	*5*	*7.4*	*6.0*	*1.2*	*44.2*	*130.0*	*40.78*	*55.8*	*135.56*	*51.48*
18	***S. nigrum***	*3*	*4.4*	*3.8*	*1.4*	*60.2*	*115.71*	*44.41*	*39.8*	*53.33*	*53.33*
19	***S. gilo raddi***	*1*	*1.5*	*1.0*	*1.0*	*71.4*	*38.0*	*31.0*	*28.6*	*45.0*	*45.0*
20	***V. doniana***	*2*	*2.9`*	*2.0*	*1.3*	----	----	----	*100.0*	*55.0*	*35.0*
	Total	***280.9***	***416.1***	***655.6***	***37.1***	***1195.6***	***11801.0***	***827.32***	***802.2***	***4905.84***	***831.85***
	Mean	***14.0***	***20.8***	***32.8***	***1.9***	***70.3%***	***694.18***	***48.67***	***40.1%***	***245.29***	***41.59***
	Mean for DILVs	***21.9***	***32.2***	***77.0%***	***2.2***	***65.4%***	***1015.27***	***52.96***	***34.7%***	***434.72***	***42.97***
	Mean for WILVs	***7.7***	***11.5***	***23.1%***	***1.6***	***55.2%***	***408.76***	***44.85***	***44.6%***	***90.30***	***40.47***

Source: Field survey, 2007. ***NB: All vegetables in bold outlines are WILVs***

*(*consumed by *42.1%* of the urban respondents*)* followed by *Ocimum species* (28.1%) and *G. africanum* (25.0%), while the least consumed vegetables were *C. argentea* and *V. doniana* (1.0%) of urban respondents respectively. Each of the ILV species was consumed by an average of 20.8% of the urban households in the study area. With regard to the two vegetable categories, whereas each of the DILV species was consumed by an average of 32.2% of urban households, each of the WILV species was consumed by only 11.5% of urban households.

Result of test of significant difference between the percentage of urban households that consumed WILV species and those that consumed DILV species was negative and significant, with Z- value of –9.9 at 5% level of significance. This meant that the percentage of urban households that consumed DILV species was significantly higher than those that consumed WILV species (Appendix 4.4**).**

Table 4.6 further showed that*G. africanum* was the most frequently consumed ILVs in the urban households as it was consumed 4.0 times weekly, followed by *T. occidentalis* (3.2 times weekly) and *Amaranthus spp.* (2.5 times weekly). On the average, each of the vegetable species was consumed on an average of 1.9 times weekly. With regard to the two vegetable groups, DILV species was consumed an average of 2.2 times weekly while those of their WILV counterpart averaged 1.6 times weekly. Cumulatively however, results showed that DILV species was consumed 77.0% of the times compared to 23.1% for WILVs.

Z–test however showed no significant difference in the consumption frequencies between those who consumed WILVs and those who consumed DILVs in the urban households (-0.62 $p<0.05$) (Appendix 4.5).

Table 4.6also showed that there were two main methods of acquisition of the vegetables, namely purchase andcollection from personal farm/forest lands and neighbours. While, some of these vegetables were purchased, others were collected from personal farm/forest areas and neighbours.All *C. antiquorum, F. ovata, and V. doniania* consumed in the urban communities were collected from personal farm/forest lands and neighbours. Approximately 92.0%, 90% and 85% of urban households who consumed *Corchorusspp, G. africanum* and *Pterocarpus species* respectively purchased their requirements. On the average, a greater percentage of the urban households (70.3%) acquired their vegetable needs through purchases. Differences also existed in the mode of acquisition of the two groups of vegetables.

Whereas 65.4% of urban households purchased their DILV needs, only 55.2% did purchase their WILV requirements.

Table 4.6 further revealed that urban households expended various sums of money on the purchase of the vegetables for consumption. The amount expended per household per vegetable species per week ranged from N15.0 for *C. argentea* to as much as ₦100.74 for *G. africanum.*The average amount expended on each vegetable species by each urban household on aweekly basis was N48.67. This amounted to total weekly and yearly expenditures of ₦194.68 and ₦10123.36 per household respectively. With regard to the two vegetable categories, whereas households who consumed DILV species were expending ₦52.96 per species per week, those who consumed WILV species were expending ₦44.85 within the same time scale.This also amounted to weekly and yearly expenditures of ₦211.84 and ₦11,015.00 for the DILVs and ₦179.40 and ₦9,328.80 for the WILVs respectively.

Result of test of significant difference between household expenditures on WILVs and DILVs was negative and significant with Z - value of -3.47 at 5% level of significance (Appendix 4.6). This meant that households were expending significantly higher amounts on the purchase of DILVsthan on the purchase of WILVs in the urban communities.

Result (Table 4.6) also revealed that the subsistent/direct-use values or opportunity cost of the vegetables were substantial and varied from one vegetable species to the other. For instance, it varied from ₦10.0 per species per household per week for such species as *C. antiquorum, Corchorus* and *C. argentea* to as high as ₦104.12 for *G. africanum*. On the average, the direct-use values or the opportunity costs per vegetable species per household per week was found to be ₦41.59, which amounted to total weekly and yearly direct- use values of ₦166.36 and ₦8,650.72 per household respectively.

With regard to the two vegetable groups, the direct-use valuesper species per household perweek for DILVs ranged from ₦10.0 for *C. antiquorum* to ₦92.16 for *T. occidentalis*. For WILVs, the amount also ranged from N10.0 for *C. argentea* to ₦104.12 for *G. africanum*. On the average, the direct-use value per species per household per week was ₦42.97 for DILVs and ₦40.47 for WILVs. This amounted to a total weekly and yearly household consumption of DILVs worth ₦171.88 and ₦8,937.76 and WILVs worth ₦161.88 and ₦8,417.76 respectively.

Summary of month by month survey results for the one year period covered by this studyin the urban communities are contained in appendix2.16 – 2.27 while appendix2.28 – 2.30 contain summary of the results averaged for the year for each of the three statesinvolved in the study.

4.1.5: Comparison of consumption patterns of indigenous leafy vegetables species between the rural and urban households in the study area.

Table 4.7 gives a summary of the result of ILV consumption patterns between the rural and urban households in the study area. As the table shows, each of the vegetable species was consumed by an average of 18.5% and 20.8% of the rural and urban respondents respectively. On the bases of the two vegetable groups, whereas each of the DILV species was consumed by 33.0% and 32.2% of the rural and urban households, those of the WILV species was consumed by only 9.3% and 11.5% respectively.The table also shows that each of the vegetable species was consumed 1.8 times per week in the rural and 1.9 times weekly in the urban households. The mean consumption frequencies for DILV species in both the rural and urban households was 2.2 times while those of their WILV counterparts was 1.7 times per week in the rural and 1.6 timesin the urban households respectively.

Table 4.7 also showed that differences existed in the mode of acquisition of vegetables between the rural and urban households. A greater percentage of the rural households (60.0%) acquired their vegetable needs by collecting them from personal farm/forest lands and from neighbours while in the urban communities, a greater percentage (70.3%) acquired theirs through purchses. Differences also existed in the mode of acquisition of WILV and DILV species between the rural and urban households. In the rural communities, for instance, 61.0% obtained their WILV needs free by collecting them from personal farm/forest lands and neighbours while in the urban communities, 55.2% purchased their needs. For the DILV species, whereas up

Table 4.7: Comparison of one year averages of weekly consumption and expenditure patterns of indigenous leafy vegetable species between the rural and urban households in the study area.

Mean Values	% of H.H that consumed		Freq. of consumption/wk		% of H.H that purchased		Weekly expenditure/H.H (₦)		% of H.H that obtained from wild/farms		Estimated cost/H.H (₦)	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Overall Mean	18.5	20.8	1.8	1.9	51.4	70.3	46.31	48.67	59.8	40.1	62.4	40.1
Mean for DILVs	33.0	32.2	2.2	2.2	42.3	65.4	54.01	52.96	57.7	34.7	42.59	42.97
Mean for WILVs	9.3	11.5	1.7	1.6	39.0	55.2	40.15	44.85	61.0	44.6	41.87	40.47

Source: Field survey, 2007

to 57.7% of rural household were not purchasing their requirements, 65.4% of urban households were purchasing theirs.

Table 4.7 further showed that for the purchased vegetables, rural and urban households expended various sums of money on their purchases. Average amounts expended on each vegetable species by each rural and urban household weekly were ₦46.31 and ₦48.67 respectively. It then followed that the average weekly and yearly expenditures onILVs were ₦185.24 and ₦9632.48 for rural households and N194.68 and ₦10123.36 for urban households respectively. As regards the two vegetable categories, amounts expended per vegetable species per household per week were ₦54.01 and ₦52.96 for DILVs and ₦40.15 and ₦44.85 for WILVs in the rural and urban communities respectively.

Result of test of significant difference in expenditures on vegetables between the rural and urban households was negative and significant with a Z – value of -3.68 at 5% level of significance (Appendix 4.7). This implied that urban households expended more money on vegetable purchases than rural households.

Similarly, the direct-use values or the opportunity cost per vegetable species per household per week was ₦42.16 in the rural communities and ₦41.59 in the urban communities. Therefore the worth of the vegetables consumed by each household on weekly basis was ₦168.64 and ₦166.36 in the rural and urban communities respectively.

4.1.6 Seasonal effects on vegetable consumption patterns

Table 4.8 contains the result obtained from the rural communities as summarized on seasonal basis, that is, dry and rainy seasons.Details of the results for the dry and rainy seasons are contained inappendices 2.31and2.32. The table showed that there were marked differences in the level of consumption of thevegetable species between the seasons. For instance, whereas WILV species was consumed by 12.1% of the rural households during the dry season, only 8.2% of the rural households were consuming them during the rainy season. On the other hand, DILV species were being consumed by 30.1% of the rural households during the dry season and 33.1% during the rainy season.

Table 4.8: Seasonal comparison of one year averages of weekly consumption and expenditure patterns of indigenous leafy vegetable species by the rural households in the study area.

Mean Values	% of H.H that consumed		Freq. of consumption/week		% of H.H that purchased		Weekly expenditure/H.H (₦)		% of H.H that obtained		Monetary value/H.H/week (₦)	
	Seasons		Seasons		Seasons		Seasons		Seasons		Seasons	
	Rainy	Dry	Rainy	Dry	Rainy	Dry	Rainy	Dry	Rainy	Dry	Rainy	Dry
Overall Mean	17.6	19.7	1.8	2.0	52.9	56.9	44.15	40.82	60.1	61.3	46.21	42.63
Mean for DILVs	33.2	30.1	2.3	2.5	51.4	42.5	46.47	40.64	54.2	62.7	46.86	42.37
Mean for WILVs	8.2	12.1	2.0	1.7	47.8	62.3	38.45	40.99	59.5	60.1	42.20	42.84

Source: Field survey, 2007

Table 4.9: Seasonal comparison of one year averages of weekly consumption and expenditure patterns of indigenous leafy vegetable species by the urban households in the study area.

Mean Values	% of H.H that consumed		Freq. of consumption/wk		% of H.H that purchased		Weekly expenditure/H.H (₦)		% of H.H that did not purchase		Monetary value/H.H/week (₦)	
	Seasons		Seasons		Seasons		Seasons		Seasons		Seasons	
	Rainy	Dry	Rainy	Dry	Rainy	Dry	Rainy	Dry	Rainy	Dry	Rainy	Dry
Overall Mean	20.4	20.0	1.9	1.8	69.2	72.0	52.57	42.82	43.2	40.8	42.22	43.67
Mean for DILVs	33.7	29.7	2.2	2.2	67.0	79.3	54.70	49.42	40.7	33.0	41.22	51.08
Mean for WILVs	9.6	12..0	1.7	1.5	51.6	65.3	50.67	36.96	47.6	46.4	39.10	38.28

Source: Field survey, 2007

The vegetables were consumed an average of 1.8 and 1.9 times weekly during the rainy season and 1.8 and 1.5 times weekly during the dry season inthe rural and urban households respectively. These seasonal consumption frequencies were found not to be significant at both the rural and urban households (Z = - 0.65 and 0.5, $p<0.05$) (Appendix 4.8 and 4.9).

Differences also existed in the mode of acquisition of the vegetables between the seasons. While 58.1% of the rural households produced their own vegetable needs during the dry season, the percentage was 55.7% during the rainy season. On the basis of the two vegetable categories, 62.3% of those who consumed WILV species in the rural communities during the dry season purchased the vegetables. During the rainy season, the percentage was 47.8%. For the DILV species, 42.5% of the rural householdswho consumed the vegetables purchased them during the dry season while during the rainy season, the percentage was 51.4%.

Table 4.8 further showed that households expended more on vegetable purchases during the rainy season than during the dry season. For instance, household expenditures on vegetables during the dry season averaged ₦40.82 per vegetable species per week. During the rainy season, expenditures were ₦44.15. So, household weekly and seasonal expenditures on ILVs were ₦163.28 and ₦4245.28 during the dry season and ₦176.60 and ₦4591.60 during the rainy season respectively.On the bases of the two vegetable groups, expenditures on WILVs in the rural households were ₦40.99 per species per week during the dry season and ₦38.45 during the rainy season. Thus, household weekly and seasonal expenditures on WILV species were ₦163.96 and ₦4262.96 and ₦153.80 and ₦3998.80 during the dry and rainy seasons respectively. For the DILVs on the other hand, household expenditures were ₦40.64 during the dry season and ₦46.47 during the rainy season. This also meant that households were expending ₦162.56 on DILVs weekly and ₦4226.56 for the duration of the dry season as well as ₦185.88 weekly and ₦4832.88 for the duration of the rainy season.

Table 4.9 contains the summary of the results obtained from the urban communities while details of the results for the dry and rainy seasons are contained in appendix 2.33 and 2.34.Table 4.9 showed thatthe trends witnessed in the rural communities did take place in the urban communities. Whereas WILV species was being consumed by 12.0% of the urban households during the dry season, only 9.6%

was consuming them during the rainy season. On the other hand, DILV species was being consumed by 29.7% of the urban households during the dry season and 33.2% during the rainy season. Marked differences also existed in the mode of acquisition of the vegetables between the seasons. For instance, 38.8% of the urban households produced their own vegetable needs during the dry season, while during the rainy season the percentage was 41.1%. On the basis of the two vegetable categories, 65.5% of those who consumed ILV species in the urban communities during the dry season purchased the vegetables. During the rainy season, the percentage was 51.6%. For the DILV species, 79.3% of the urban households purchased them during the dry season while during the rainy season, the percentage was 67.0%.

The tablefurther showed that households expended more on vegetable purchasess during the rainy season than they did during the dry season. Household expenditure on vegetables in the urban communities during the dry season was an average of ₦42.82 per vegetable species per week. During the rainy season, expenditure was N52.57. So, household weekly and seasonal expenditures on ILVs were ₦171.28 and ₦4453.28 during the dry season and ₦210.28 and ₦5467.28 during the rainy season respectively. On the bases of the two vegetable groups, expenditure on WILVs in the urban households was ₦36.96 per species per week during the dry season and ₦50.67 during the rainy season. Thus, household weekly and seasonal expenditures on WILV species were ₦147.84 and ₦3843.84 and ₦202.68 and ₦5269.68 during the dry and rainy seasons respectively. For the DILVs on the other hand, household expenditures per vegetable species per week was ₦49.42 during the dry season and ₦54.70 during the rainy season. This also meant that households were expending ₦197.68 on DILVs weekly and ₦5139.68 for the duration of the dry season as well as ₦218.80 weekly and ₦5688.80 for the duration of the rainy season.

4.1.7: Comparison of the productive- and consumptive-use values of the vegetables

In order to determine the weights attached to these vegetables either as items for direct consumption (i.e. their consumptive-use values) or for income generation (i.e. their productive-use values) by the various respondents, the values of the purchased vegetable and the estimated monetary values of the vegetables directly consumed were subjected to Z – test analysis. The results were positive and significant

for both the rural and urban communities with Z- values of 2.63 and 4.34 respectively (Appendix 4.10 and4.11).This implies that the values attached to the vegetables as articles of trade for income generation had higher ratings than as items for direct consumption.

4.1.8: Meals for which the vegetables were used in their preparation.

The various meals for which the vegetables were used in their preparation ranged from soup, stew, salad, porridge and pepper soup to boiling and adding to sauces (Fig. 4.1 and appendix 2.35 and 2.36). As shown in figure 2, soup was the dominant meal for which the vegetables were used in its preparation. Not only did all the respondents indicate using the various vegetables in soup preparation, 72.5% and 59.7% of food prepared in the rural and urban communities respectively with these vegetables were soup. This was followed by porridge, which constituted about 11.8% and 19.9%; stew, 6.7% and 10.6% and salad 3.8% and 3.3% of the meals prepared using these vegetables in the rural and urban households respectively. The number of respondents who indicated the use of the vegetable species for soup preparation ranged from 5.1% and 8.2% for *M. koeningii* in the rural and urban households respectively to 100% for *Corchorus spp, C. argentea, F. zanthoxyloides L. cupaniodes and C. antiquorum etc.*

The major use for *M. koeningii* was in the preparation of stews as indicated by 81.0% and 78.1% of the respondents in the rural and urban communities respectively while porridge was the major use for *Amaranthus sp.* as indicated by 57.3% and 52.7% of the rural and urban respondents.

With regard to the two vegetable categories, 72.5% and 59.8% of the rural and urban respondents who consumed WILV species were utilizing them in soup preparation while 61.9% and 59.5% of those who consumed DILV species in the rural and urban communities were using them for the same purpose. Also, 3.4% and 5.1% of the rural and urban consumers of WILV species respectively were using them in

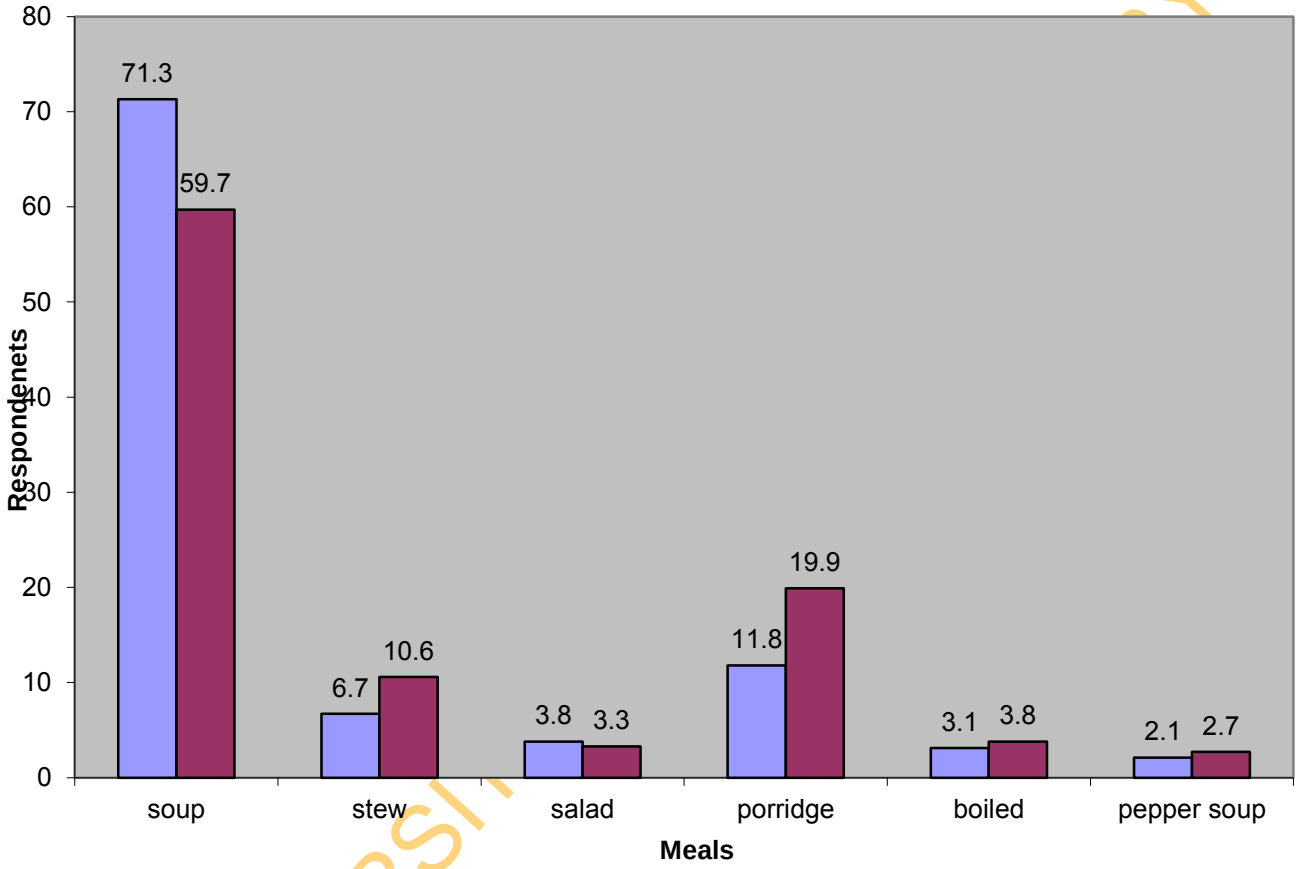

Fig 4.1 The meals for which the vegetable species were used for by the rural and urban respondents in the study area

pepper soup preparation, none of the rural and urban consumers of DILV species claimed to be using them for this purpose.

4.1.9 Sources of leafy vegetables

Figure 4.2 and appendices 2.37and 2.38show the major sources of thevegetable species consumed in both the rural and urban communities. The two main sources of the vegetables were collection from around compound farms and purchases. In the rural communities, collection from within and around compound farms was the main source as indicated by 45.3% of the respondents. This was followed closely by purchase as indicated by 38.6% of the respondents. The opposite was the case in the urban communities where the majority (63.0%) of the respondents,were sourcing their vegetable requirements from the market, only 26.3% were obtaining their vegetable needs from within and around compound farms. Other sources of the vegetables were collection from other farm areas as indicated by 6.5% and 4.4%and collection from nearby forest lands as indicated by 5.9% and 2.3% of the rural and urban respondents, respectively.

In the rural communities, 46.8% and 42.9% of the WILVs and DILVs were collected from within and around compound farms, only 21.9% and 31.2% respectively were acquired through that source in the urban communities. Also, only 35.0% and 44.5% of wild and domesticated ILV species respectively were acquired through purchases in the rural communities, 64.5% and 61.3% were acquired through purchases in the urban communities.In addition, whereas 8.7% and 3.2% of WILVs were collected from nearby forest lands in rural and urban communities respectively, only 1.3% and 1.4% of the DILVs were acquired in that way from the two community types.

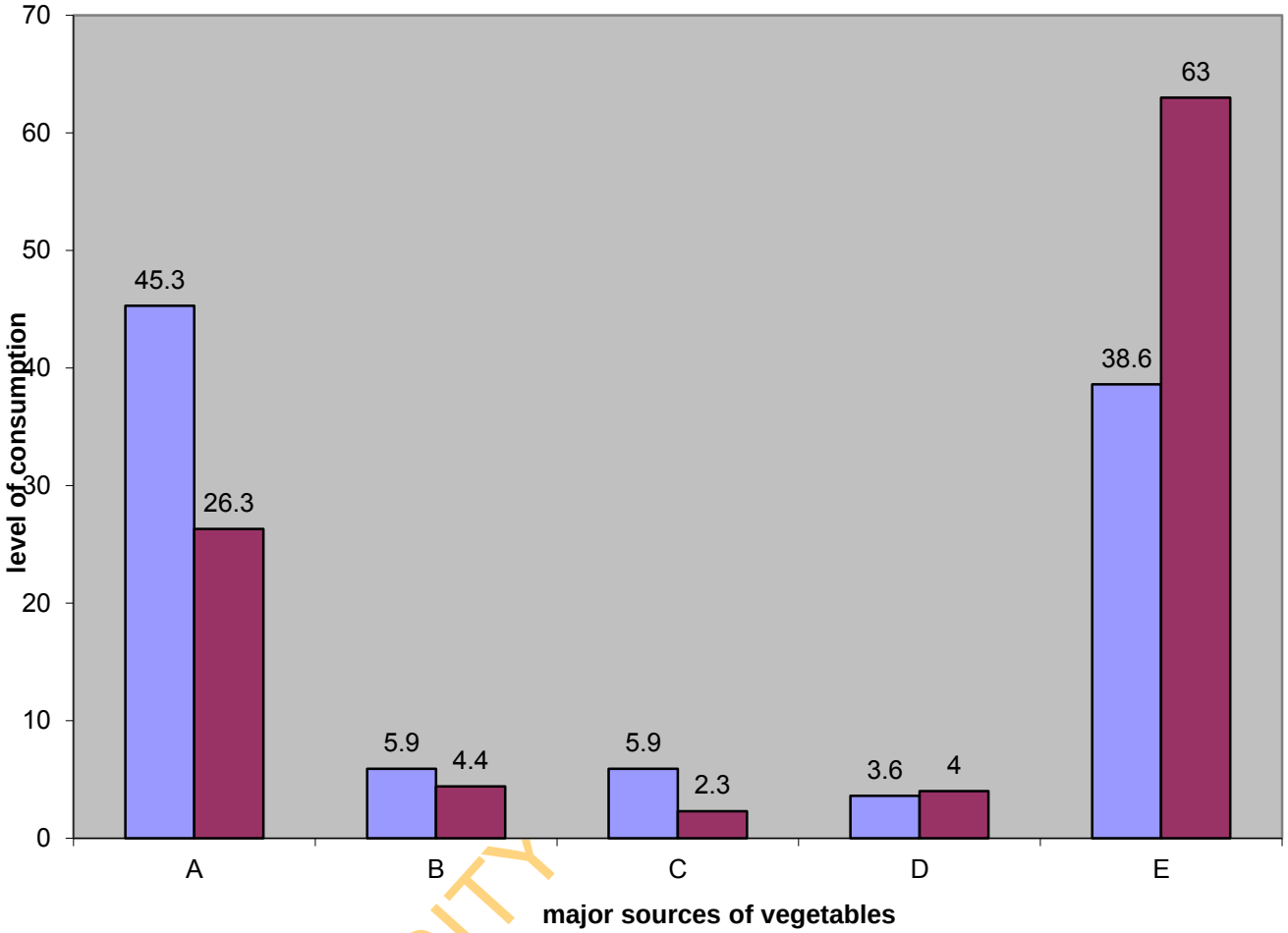

Fig 4.2 The major sources of the vegetable species consumed in the rural and urban households

N.B.

A	=	Collected from around compound form
B	=	Collected from other farm areas
C	=	Collected from near by forest land
D	=	Obtained from neighbours / friends
E	=	Bought from the mark

4.1.10: Reasons for consumption of the various indigenous leafy vegetable species

Figure 4.3 and appendices 2.39 and 2.40show the major reasons adduced by the rural and urban respondents for consumption of the various vegetable species. The most important reason was their belief in the high nutritive value of the vegetables asindicated by 21.9% and 27.2% of the rural and urban respondents respectively. High percentages (19.3% and 17.0% of the rural and urban respondents respectively) were consuming these vegetables because of the good flavour and taste they usually give to their meals. Other reasons adduced for the consumption of vegetables were due to family preferences (14.7% and 20.3%); type of meal for which they were used (13.2% and 14.1%) and due to readily availability of the vegetables (15.5% and 7.6%) of the rural and urban respondents respectively. A few of the respondents (1.7% and 1.5% of the rural and urban respondents respectively) claimed to be consuming the vegetables, especially the WILVs because of their medicinal roles.

No significant difference was found to exist in the adduced reasons for the consumption of the vegetables between the rural and urban households (0.74 $p<0.05$) (Appendix 4.12).

With regard to the two vegetable categories, themost important reasons adduced for the consumption of WILVs in the rural communities in descending order were due to the fact that they are readily available (21.2%); belief in their high nutritive values (20.6%), better flavour and taste (18.7%) and family preferences (16.0%). The reasons given by the residents in the urban communities were family preferences (25.0%); belief in their high nutritive values (24.7%); better flavour and taste (16.6%) and meal for which they were used (14.5%). For the DILVs, the most important adduced reasons for their consumption in the rural communities were belief in their high nutritive values (24.0%), better flavour and taste (20.2%), type of meals for which they were used (20.1%), and family preferences (14.9%). In the urban areas on the other hand, the reasons were better flavour and taste (16.5%), family preferences (15.7%), type of meals for which they were used (15.3%), because of their relative cheapness (15.0%) and belief in their high nutritive value (13.3%).

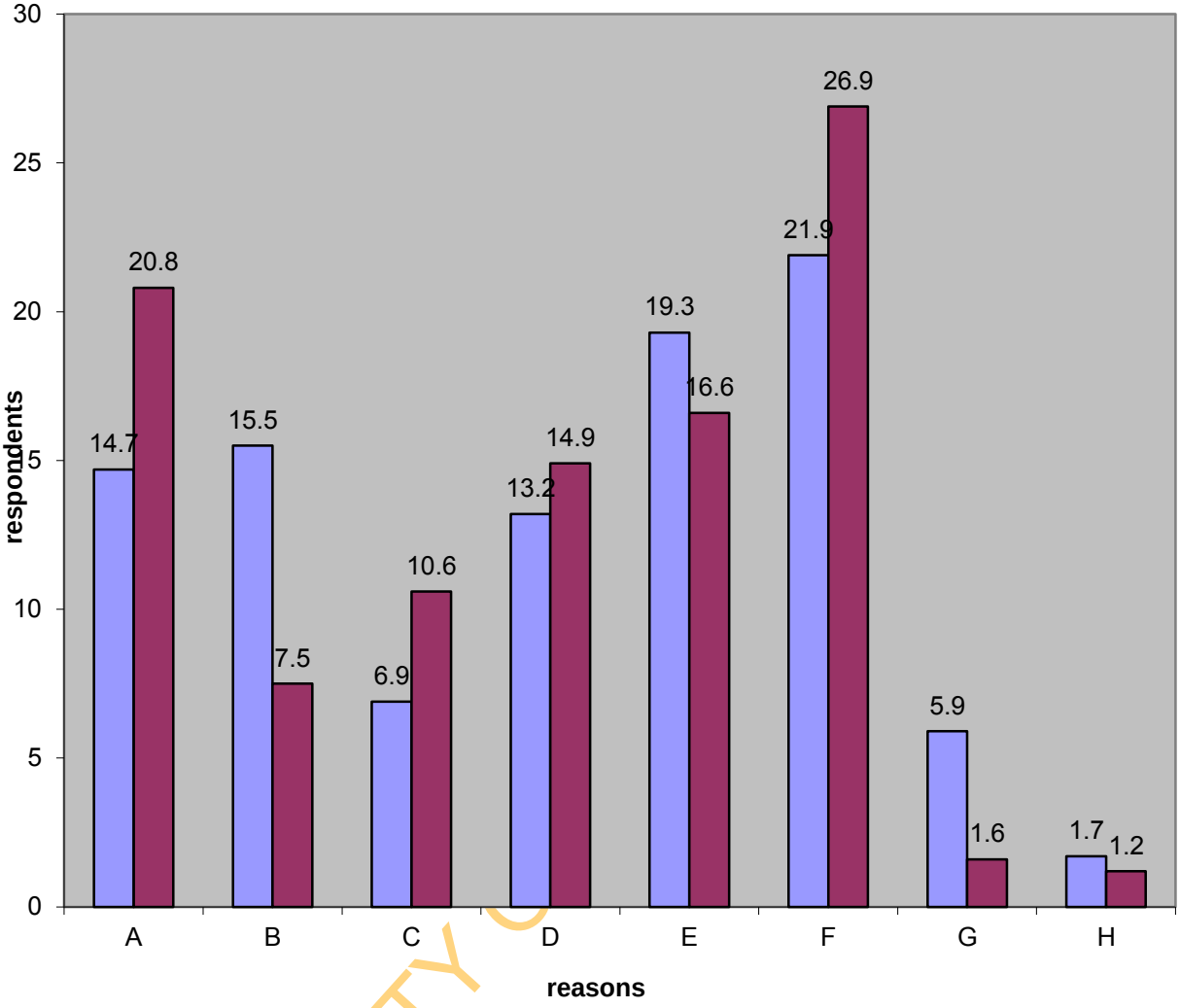

Fig 4.3 The reasons adduced by the rural and urban respondents for the consumption of the vegetable species in the study area

The reasons adduced for the consumption of the two vegetable categories i.e., wild and domesticated ILVswere found to be significant both in the rural and urban households with Z- values of 31.20 and 5.90 at 5% level respectively (Appendix 4.13 and 4.14)..

4.1.11 Household preference ratings of the vegetable species:

The result showed that *T. occidentalis* was the most prefered vegetable species in the rural communities as indicated by 79.0% of therespondents. This was followed by *Vernonia spp*. as indicated by 24.2%, *Amaranthus spp*. 11.5% and *Pterocarpus spp*. 9.1% of therespondents respectively. Fifth and Sixth positions in preference ratings were occupied by *Solanum spp.* And *G. africanum. T. triangulare* occupied the 7th position (Figs. 4.4).

In the urban communities, the result also showed that *T. occidentalis* was the most prefered vegetable species as indicated by 76.4% of the respondents. This was also followed by *Vernonia spp*. as indicatedby 25.7%, *Amaranthus spp*. 10.4% and *Pterocarpus spp*. 9.4% of the respondents respectively. Fifth and Sixth positions in preference ratings were occupied by *G. africanum* and *Solanum spp*. while *T. triangulare*occupied the 7th position (Fig. 4.5).

The higher preferences given to the domesticated than the wild leafy vegetable species were evident from the two figures and test of significant differences in preference ratings between the two vegetable groups (See appendix 4.15 and 4.16)

4.1.12: Percentage of familys' budget for food spent on vegetable purchases:

Table 4.10 shows that the majority of the households were spending between 1-10% of their family food budget on vegetable purchases as indicated by 71.8% of rural and 66.6% of the urban respondents. Approximately 17.0% of the rural and urban respondents claimed that between 11-20% of their familys' budgeton food went into vegetable purchases while 5.4% of the rural and 9.5% of urban respondents claimed that the percentages of family food budget spent on vegetable purchases lied between 21-30%. The mean percentage family food budget that went into vegetable purchases was found to be 10.4% for the rural and 11.5% for the urban communities respectively.

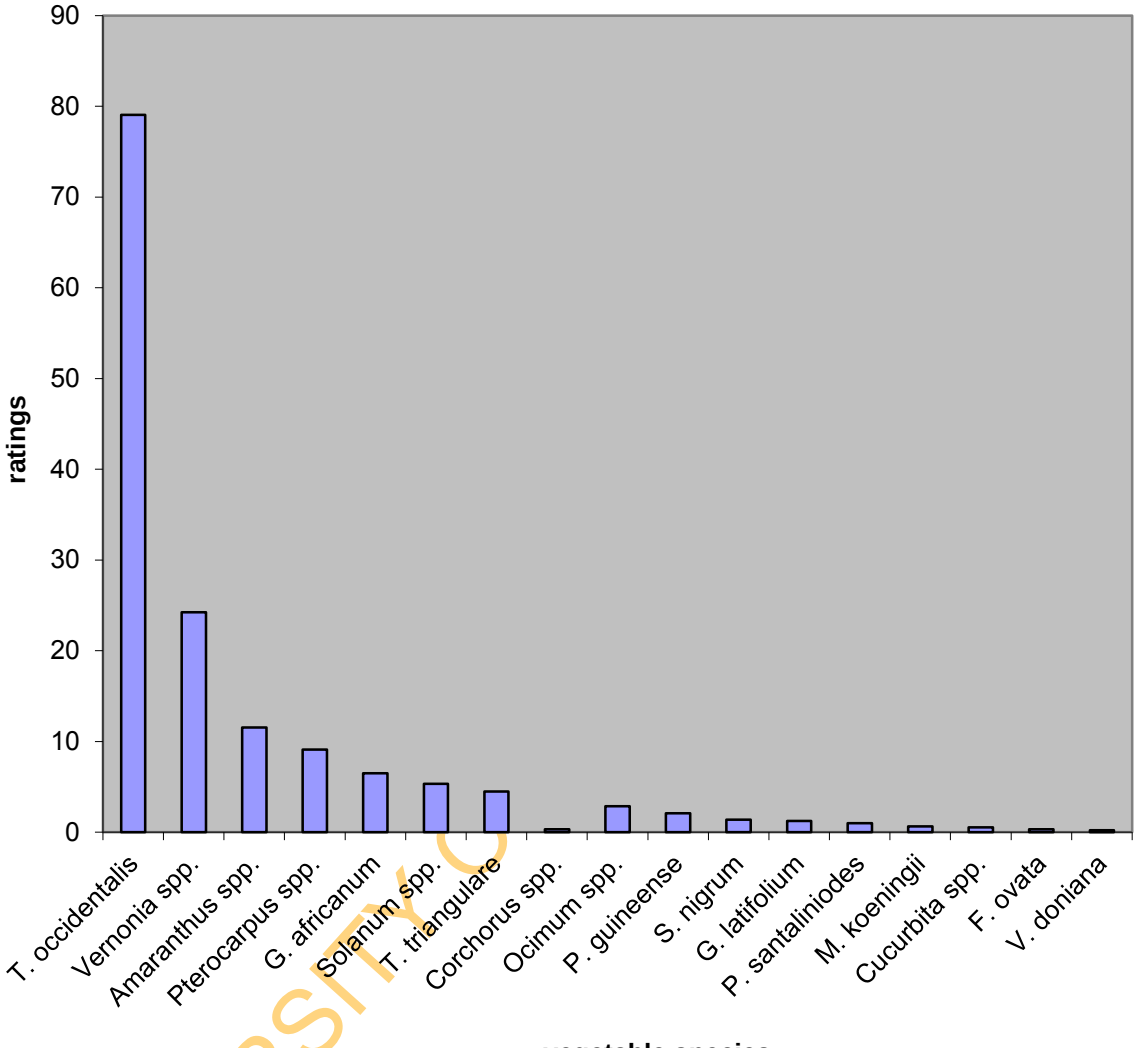

Fig 4.4 Percentage preference ratings of the vegetable species in rural communities of the study area

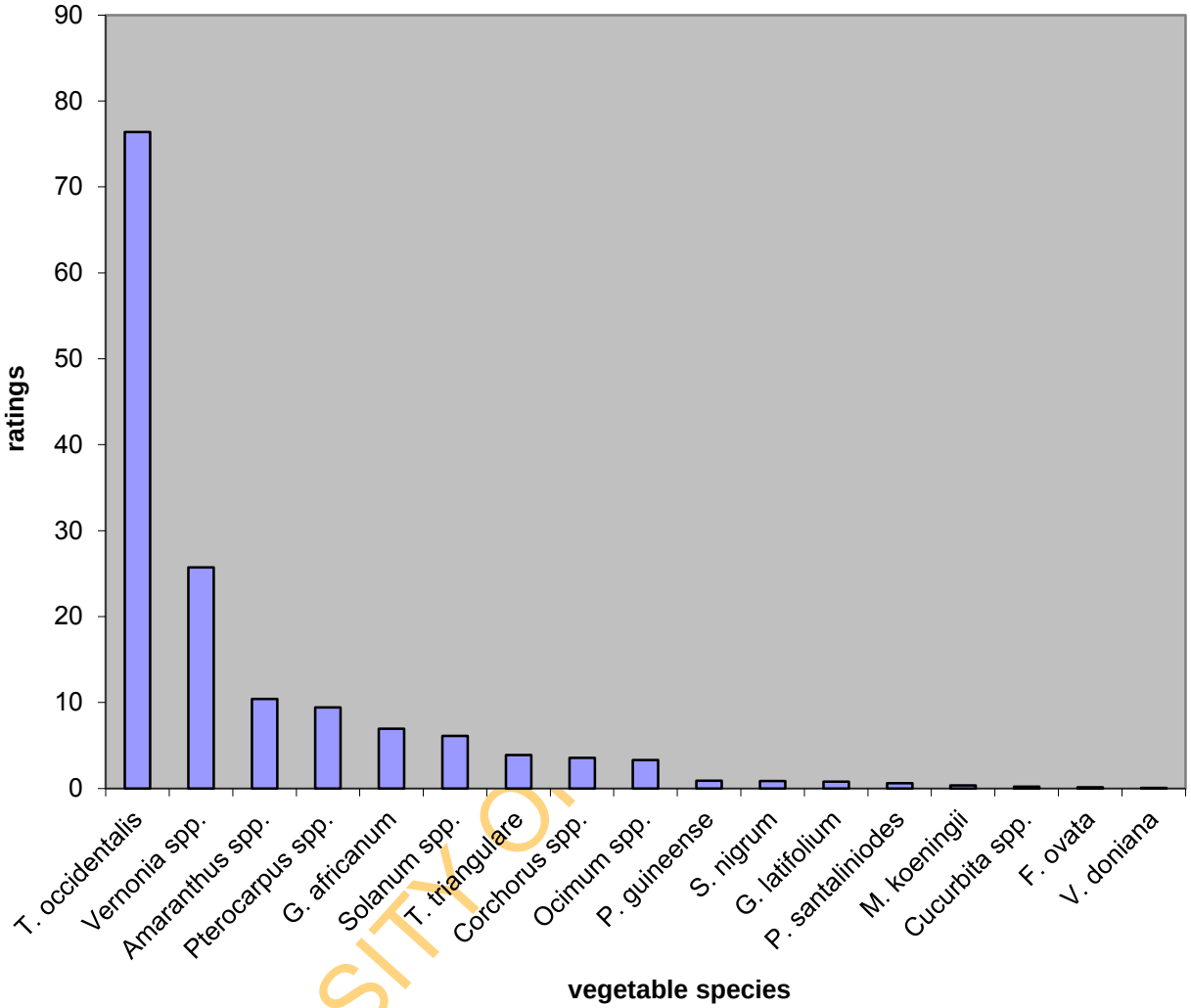

Fig 4.5 Percentage preference ratings of the vegetable species in the urban communities of the study area

Table 4.10: Percentage of households' budgets on food spent on vegetable purchases weekly in both rural and urban communities

% of household food budget	Rural Communities		Urban Communities		Rural and Urban Communities	
	Frequency	Percentage	Frequency	Percentage	Frequency	%
1 – 10	488	71.8	482	66.6	970	69.1
11 – 20	116	17.1	122	16.9	238	17.0
21 -30	37	5.4	69	9.5	106	7.6
31 -40	19	2.8	37	5.1	56	4.0
41 – 50	14	2.1	10	1.4	24	1.7
51 – 60	6	0.9	4	0.6	10	0.7
Total	**680**	**100.0**	**724**	**100.0**	**1404**	**100.0**
Mean		**10.4**		**11.5**		**10.9**

Source: Field survey, 2007

4.1.13 Problems associated with vegetable consumption:

Results showed that the greatest problems militating against vegetable consumption in the study areas were high cost as indicated by 34.1% and 34.3% and non-availability of vegetables as indicated by 18.6% and 18.9% of the rural and urban respondents respectively. Others were pest problems (3.3% and 1.8%), and storage problems (1.5% and 1.6%), while 13.8% of the rural and 19.7% of the urban rerspondents claimed that vegetable consumption was not associated with any problem (Table4.11)

4.1.14 Suggested measures aimed at ensuring regular and increased supply of the vegetables.

A wide range of measures (14 in all) were recommended for ensuring regular and increased supply of the vegetables by the respondents. The majority of the respondents suggested the provision of irrigation facilities for dry season production (24.2% and 26.0%); provision of incentives through input subsidies (13.7% and 15.6%); establishment of backyard/compound vegetable gardens by every household (15.3% and 12.5%); provision of adequate storage/preservation facilities (8.8% and 14.4%) and provision of farm inputs to the farmers (11.7% and 7.2%) of the rural and urban respondents respectively (Table 4.12).

Table 4.11: Problems associated with vegetable consumption in the various rural and urban communities surveyed

Problems	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
i. High cost of vegetables	277	34.1	280	34.3	557	34.2
ii. Non – availability	151	18.6	154	18.9	305	18.7
iii. Pest problems	27	3.3	15	1.8	42	2.6
iv. Storage problem	12	1.5	13	1.6	25	1.5
v. Water scarcity	4	0.5	-	-	4	0.3
vi. Seasonality in their production	3	0.4	-	-	3	0.2
vii. Lack of fertilizer	2	0.3	2	0.3	4	0.3
viii. Product scarcity	1	0.1	4	0.5	5	0.3
ix. Lack of finance	1	0.1	-	-	1	0.1
x. No problem	112	13.8	161	19.7	273	16.8
xi. No response	223	27.4	187	22.9	410	25.2
	813	**100.0**	**816**	**100.0**	**1629**	**100.0**

Table 4.12 Suggested measures required to ensure regular and increased supply of the vegetables

	Suggested measures	Rural Communities		Urban Communities		Urban & Rural	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1	Provision of Irrigation facilities for dry season/year round production	149	24.2	146	25.0	295	24.6
2	Provision of farm input/incentives by government	156	25.4	133	22.7	289	24.1
3	Establishment of backyard/vegetable garden by every household	94	15.3	73	12.5	167	13.9
4	Provision of adequate storage/preservation facilities	54	8.8	84	14.4	138	11.5
5	Provision of credit facilities to the growers	32	5.2	46	7.9	78	6.5
6	Construction of feeder roads for easy evacuation of vegetables	69	11.2	5	0.9	74	6.2
7	Regulation of the activities of middlemen / market unions	1	0.2	48	8.2	49	4.2
8	Commercial/mass production of the vegetables	26	4.2	16	2.7	42	3.5
9	Provision of pest control measures	28	4.6	11	1.9	39	3.3
10	Devotion of more land to vegetable production	1	0.2	10	1.7	11	0.9
11	Domestication of the wild leafy vegetable species	3	0.5	4	0.7	7	0.6
12	Provision of improved varieties of planting stocks	2	0.3	4	0.7	6	0.5
13	Farmer education on importance of vegetable production	---	----	2	0.3	2	0.2
14	Formation of farmer's co-operative for easy access to credit	---	----	3	0.5	3	0.3
		615	**100.0**	**585**	**100.0**	**1200**	**100.0**

Source: Field survey, 200

4.2 Market Survey Information:

The results of the market and marketing of both categories of the vegetables in the three states within the Southeastern zone of the country are presented in this section.

4.2.1. Average number of vegetable sellers/vegetable species sold per seller per market

Table 4.13 containsthe names of the rural markets surveyed in each of the three states, average number of ILV sellers and vegetable species sold per seller per market. As shown in the table, the number of persons involved in the marketing of ILVs ranged from a minimum of 10 persons in *"Oye Nise"* market in Anambra State to a maximum of 115 persons in *"Afor Umuaka"* market in Imo State.The average number of traders involved in the marketing of ILVs in the rural markets was 42.With regard to the number of sellers per vegetable species per market, it ranged from a minimum of 36 to a maximum of 275 persons in *"Oye Nise"* and *"Afor Umuaka"* rural markets. Number of sellers per vegetable species per market averaged 98 persons.

In terms of the number of ILV species sold per trader per rural market, resultshowed they ranged between 1.5 species in *"Eke Umuagwo"* in Imo State to 3.8 species in *"Onueke market"* in Ebonyi State.The average number of ILV species sold per seller permarket was found to be 2.7. This amounts to therefore, an average of three (3) ILV species marketed by each seller in each rural market.

Table 4.14 contains similar information as obtained from the urban markets. As the table shows, the number of persons involved in the marketing of ILVs ranged from a minimum of 35 persons in *"Awka main market"* in Anambra State to a maximum of 102 persons in *"Ose Okwodu"*market, Onitsha, also in Anambra State.The number of traders involved in the marketing of ILVs in the urban markets averaged 61.8.With regard to the number of sellers per vegetable species per market, it ranged from a minimum of 119 to a maximum of 184 persons in *"Ohaisu"* and Ose Okwodu markets respectively.

Table 4.13: Average number of indigenous leafy vegetable species sold per seller per market surveyed in the rural communities

State	Community	No. of vegetable sellers/market	Total No. of sellers/vegetable sp/mkt	Mean no of Sellers/vegetable sp/ market
Imo	Afor Umuaka	115	275	2.4
	Eke Umuagwo	74	107	1.5
	Orie Amaraku	35	100	2.9
Anambra	Oye Nise	10	36	3.6
	Eke Igbariam	14	41	2.9
	Eke Ekwulobia	43	95	2.2
Ebonyi	Amana mkt	40	100	2.5
	Ofoeke Ishieke	24	56	2.3
	Eke Imeoha	20	75	3.8
	Onueke			
Total		375	885	24.0
Mean		**41.7**	**98.3**	**2.7**

Source: Field survey, 2007

Table 4.14: Average number of indigenous leafy vegetable species sold per seller per market surveyed in the urban communities.

State	Community	No of vegetable sellers/market	Total No. of sellers/vegetable sp./mkt	Mean no of Sellers/vegetable sp./market
Imo	Orlu main mkt	69	130	1.9
	Owerri main mkt	63	122	1. 9
	Okigwe main mkt	45	102	2.3
	Otuocha mkt	43	127	3.0
Anambra	Ose Okwodu	102	184	1.8
	Awka main mkt	35	123	3.5
	Amido mkt	94	170	1.8
	Nkalika mkt	35	149	4.3
Ebonyi	Ohaisu mkt	70	119	1.7
Total		**556**	**1226**	**22.1**
Mean		**61.8**	**136.2**	**2.5**

Source: Field survey, 2007

4.2.2: Marketing patterns of the various indigenous leafy vegetable species in the various rural and urban markets.

The summary of the results of theone year survey carried out to identify the various ILV species marketed in the various rural and urban markets within the study area and their marketing patterns are contained in tables 4.15 and 4.16 respectively.The details of these results on month-by-month basis for the one year period are contained in appendix 3.1– 3.24. While appendix 3.1–3.12 contain month-by-month survey results obtained in respect of the rural communities, 3.13–3.24 contain the results as obtained from the urban communities.Table 4.17 contains the comparison of the mean values of theone year resultin respect ofthe rural and urban communities, while tables 4.18 and 4.19 contain the comparison of mean values of these results on seasonal basis, that is, rainy and dry seasons respectively. Finally, appendix 3.25 and 3.26 and 3.27 and 3.28 contain the detailed summary of these results on seasonal basis, i.e., rainy and dry seasons for the rural and urban communities respectively.

Each of the tables and appendices contain the names of the identified vegetable species on sale in the various markets including information on themean number and percentage of sellers of each vegetable species in the markets. The tables also have information onthe mean unit weights and prices per bundle and per kilogramme of each vegetable species sold in the markets.

Table 4.15 showed that the number and percentage of persons involved inthe marketing of the various ILV species in the rural markets followed similar trends as observed for the consumption patterns. Just as *T. occidentalis* was the vegetable species demanded most by the consumers, it also predominated the vegetable markets attracting the highest number and percentage of sellers. On the average, 22 persons or 17.6% of all individuals engaged in the marketing of ILV species in each of the rural markets were selling *T. accidentalis.* Following in that order in terms of number and percentage of individuals engaged in vegetable marketing are *Vernonia* (18 persons or

Table 4.15: A year's averagesof the number of sellers,unit weights and prices of indigenous leafy vegetable species, in the selected rural markets in the study area.

S/N	Vegetable species	Mean no of Sellers/ species/ market	% of sellers/species/ Market	Mean unit weight/ bundle (G)	Mean price/ bundle (₦)	Mean price/Kg (₦)
1	T. occidentalis	22	17.6	288.03	17.08	59.30
2	*Solanum spp*	13	10.4	89.7	16.25	181.16
3	*Vernonia spp*	18	14.4	119.2	10.83	90.86
4	*T. triangulare*	6	4.8	233.0	10.23	43.91
5	*Amaranthus spp*	6	4.8	316.3	17.27	54.60
6	*Cucurbita spp*	3	2.4	196.7	11.67	59.33
7	*M. koeningii*	6	4.8	69.4	10.46	150.72
8	*Corchorus spp*	2	1.6	165.0	10.0	60.60
9	***P. santoliniodes***	*1*	*0.8*	*235.7*	*10.0*	*42.43*
10	***G. africanum***	*6*	*4.8*	*68.5*	*48.33*	*705.55*
11	***P. guineense***	*9*	*7.2*	*59.9*	*10.0*	*166.94*
12	***G. latifolium***	*6*	*4.8*	*74.4*	*10.42*	*140.05*
13	***Ocimum spp***	*5*	*4.0*	*118.5*	*10.0*	*84.39*
14	***Pterocarpus spp***	*16*	*12.8*	*146.9*	*15.28*	*104.02*
15	***S. nigrum***	*2*	*1.6*	*174.3*	*10.0*	*57.37*
16	***C. argentea***	*1*	*0.8*	*270.1*	*10.0*	*37.02*
17	***F. ovate***	*1*	*0.8*	*180.0*	*10.0*	*55.56*
18	***S. gilo raddi***	*2*	*1.6*	*175.0*	*10.0*	*57.14*
	Total	***125***	***100***	***2967.1***	***247.82***	***2150.95***
	Mean	***7.0***	***5.6***	***164.8***	***13.77***	***119.50***
	DILVs	***10***	***7.6***	***183.0***	***12.97***	***87.56***
	WILVs	***5***	***3.9***	***150.3***	***14.40***	***145.05***

Source: Field survey, 2007 NB: All vegetables in bold outlines are WILVs

14.4%) and *Pterocarpus species* (16 persons or 12.8%). On the average however, each of the vegetable species was being marketed by 7 persons or 5.6% of sellers of ILVs in each rural market.

With regard to the two vegetable groups, DILV species had more number and percentage of persons engaged in their marketing in the rural markets. Each DILV species was being sold by an average of 10 persons or 7.6% whereas those of WILVs were being marketed by 5 persons or 3.9% in each rural market. Gender wise, all the vegetable sellers were women and their children.

Table 4.15 further showed that the vegetables were sold in bundles with no standardized unit of measurement. The sizes or weights of the bundles varied within and among species, sellers, markets and their locations. The mean unit weights of the vegetables in the rural markets ranged from 59.9g for *P. guineense* to 288.0g for *T. occidentalis*. Their unit weights averaged 164.8g in the rural markets. Their unit weights also varied between the two vegetable groups with the WILV species generally having lower unit weights than DILVs. The average unit weight was 150.3g for WILV species and 183.0g for DILV species.

Just as there were differences in the unit weights of the various ILV species, so also were variations in their unit prices. Their mean unit prices varied from a minimum of ₦10.0 for most of the species to as much as N48.33 for *G. africanum*.The average price per bundle of the vegetables was found to be ₦13.77 in the rural markets. With particular reference to the two vegetable categories, WILV species generally had higher unit prices than DILV species. Their mean unit price was ₦13.43 compared to ₦11.88 for DILV species in the rural markets (Tables 4.15).

The price/kg of the various ILV species was discovered to also vary with species as shown in table 4.14. Their mean prices ranged from ₦37.02/kg for *C. argentea* to ₦705.55/kg for *G. africanum*.The average price of the vegetables in the rural markets was₦119.50/kg. With regard to the two vegetable categories, the mean prices per kilogrammeof WILVs were higher than those of DILVs. The average price per kilogramme was ₦145.05 for the WILVs and ₦87.56 for the DILVs. Result of test of significant difference between the prices of WILVs and those of DILVs in the rural markets was positive and significant with Z- value of 11.44 at 5% level of significance (Appendix 4.17)**.** This meant that the prices of WILV species were significantly higher than those of DILV species in the rural markets.

In order to determine the type of relationship that existed between the weights and prices of the vegetables in the rural markets, they were subjected to a *Pearson Correlation analysis*. The result was negative and significant witha correlation coefficient (r) of – 1 at 5% level of significance (Appendix 4.18). This implied that a strong linear relationship existed between the weights of the vegetables and their prices. The relationship was negative implying that as the weight of the vegetables decreases, their price increases.

The results in the urban markets followed similar trends as obtained in the rural markets. As table 4.16 shows, *T. occidentals* still pre-dominated the ILV markets attracting the highest number and percentage of sellers. On the average, 22 persons or 16.7% of all individuals engaged in the marketing of ILVspecies in each of the urban markest were selling *T. accidentalis.* Following in that order in terms of number and percentage of individuals engaged in vegetable marketing are *Vernonia* (16 or 12.1%) and *Pterocarpus* species (12 or 9.1%). On the average, each of the vegetable species was being marketed by 5 persons or 6.6% of sellers in each urban market.

With regard to the two vegetable groups, DILV species had more number and percentage of persons engaged in their marketing in the urban markets. Each DILV species was being sold by an average of 6 persons or 7.1% whereas those of WILVs were being marketed by an average of 4.0 persons or 3.7% in each market. Gender wise, all the vegetable sellers were women and their children.

Table 4.16also showed that the vegetables were sold in bundles, the sizes of which varied within and among species, sellers and markets. The mean unit weights of the vegetables ranged from 42.7g for *G. africanum* to 301.1g for *C. argentea.* Their mean unit weights averaged 149.9g. Their unit weights also varied between the two vegetable groups with the WILV species generally having lower unit weights than DILVs. The average unit weight was 139.3g for WILV species and 141.5g for DILV species.

Just as there were differences in the unit weights of the various ILV species, so also were variations in their unit prices. Their mean unit prices varied from a

Table 4.16: A year's averages of the number of sellers, unit weights and prices of indigenous leafy vegetable species in the selected urban markets in the study area.

S/N	Vegetable species	Mean no of sellers/ species/ market	% of sellers/ market	Mean unit weight/ bundle (G)	Mean price/ bundle (₦)	Mean price/kg (₦)
1	*T. occidentalis*	22	16.7	231.0	17.18	74.37
2	*Solanum spp*	9	6.8	113.8	16.48	144.82
3	*Vernonia spp*	16	12.1	120.5	11.40	94.61
4	*T. triangulare*	8	6.1	250.8	15.26	60.85
5	*Amaranthus spp*	9	6.8	226.5	17.16	75.76
6	*Cucurbita spp*	1	0.8	165.6	10.0	60.39
7	*Corchorus spp*	2	1.5	158.8	12.69	79.91
8	*M. koeningii*	7	5.3	53.1	8.92	167.98
9	***P. guineense***	*9*	*6.8*	*57.2*	*10.03*	*175.35*
10	***G. latifolium***	*8*	*6.1*	*60.8*	*10.32*	*169.74*
11	***Ocimum spp***	*11*	*8.3*	*74.4*	*9.84*	*132.26*
12	***Pterocarpus spp***	*12*	*9.1*	*179.4*	*26.16*	*145.82*
13	***P. santaliniodes***	*2*	*1.5*	*192.1*	*10.0*	*52.06*
14	***S. nigrum***	*3*	*2.3*	*139.3*	*11.0*	*78.97*
15	***G. africanum***	*4*	*3.0*	*42.7*	*23.75*	*556.21*
16	***C. argentea***	*1*	*0.8*	*301.2*	*10.0*	*33.20*
17	***F. ovata***	*3*	*2.3*	*155.0*	*10.0*	*64.52*
18	***P. purpureum***	*1*	*0.8*	*200.0*	*10.0*	*50.0*
19	***S. gilo raddi***	*2*	*1.5*	*124.0*	*10.0*	*80.65*
20	***L. cupaniodes***	*2*	*1.5*	*145.0*	*10.0*	*68.97*
	Total	***132***	***100***	***2944.7***	***267.99***	***2366.44***
	Mean	***5.0***	***6.6***	***149.9***	***13.40***	***118.32***
	Mean for DILVs	***6.3***	***7.0***	***141.5***	***11.88***	***94.84***
	Mean for WILVs	***3.6***	***3.7***	***139.3***	***13.43***	***133.98***

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are WILVs***

minimum of ₦10.0 for most of the species to a maximum of ₦23.75 for *G. africanum.* Average price per bundle of the vegetables was found to be ₦13.40 in the urban markets.

The unit prices of WILV species were generally higher than those of DILV species. Their mean unit price was ₦14.40 compared to ₦12.97 for DILV species (Table 4.16). The unit price/kg of the various ILV species was discovered to also vary with species. Their mean prices ranged from ₦33.20/kg for *C. argentea* to ₦555.21/kg for *G. africanum*. The average price of the vegetables in the urban markets was ₦118.32/kg. With regard to the two vegetable categories, theprices per kilogramme of the WILVs were higher than those of DILVs in the urban markets.

The average price per kilogramme for the WILVs was N133.98 while it was N94.84 for the DILVs.

The result of test of significant difference between the prices of WILVs and those of DILVs in the urban markets was positive and significant with Z- values of 13.63 at 5% level of significance (Appendix4.19).This means that the prices of WILV species were significantly higher than those of DILV species.

The correlation between the weights and prices of the vegetables was also negative and significant with a Correlation Coefficient (r) of - 1 at 5% level of significance (Appendix 4.20). This also implied that a strong linear relationship existed between the weights of the vegetables and their prices. The relationship was negative implying that as the weight of the vegetables decreases, their price increases at equal proportion.

4.2.3: Comparison ofthe marketing patterns ofindigenous leafy vegetable species between the rural and urban markets.

Table 4.17 gives the summary of the result of marketing patterns of ILV species between the rural and urban communities in the study area. As the table shows, each of the vegetable species was being marketed by an average of 7 persons or 5.6% and 5 persons or 6.6% of sellers in each rural and urban market respectively. With regard to the two vegetable groups, DILV species had more number and percentage of persons engaged in their marketing in both the rural and urban markets. Each DILV species was being sold by an average of 10 persons or 7.6% and 6 persons or 7.0% whereas

Table 4.17: Comparison of a year's average of the number of sellers, unit weights and price of indigenous leafy vegetable speciesbetween the selected rural and urban markets in the study area.

	Mean no. of Sellers/sp./mkt		% of Sellers/species/ Market		Mean unit Weight/bundle		Mean price/bundle (₦)		Mean price/Kg (₦)	
	Rural	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**
Mean	5.0	5.0	5.6	6.6	164.8	149.9	13.77	13.40	119.58	121.99
Mean for DILVs	10.0	6.0	7.6	7.0	183.0	141.5	12.97	11.88	87.73	94.99
Mean for WILVs	5.0	4.0	3.9	3.7	150.3	139.3	14.40	13.43	145.05	131.48

Source: Field survey, 2007

those of WILVs were being marketed by 5 persons or 3.9% and 4 persons or 3.7% in each rural and urban markets respectively.

Noticeable differences existed in the mean unit weights of the various vegetable species between the rural and urban markets. Their unit weights were generally lower in the urban than in the rural markets. Table 4.17 shows that their unit weights averaged 164.8g in the rural markets and 149.9g in the urban markets. The unit weights of the WILV species were 150.3g in the rural markets and 139.3g in the urban markets. For the DILV species, their mean unit weight was 183.0g in the rural and 141.5g in the urban markets.

The prices of the vegetables also varied between the rural and urban markets. The average price per bundle of the vegetables was found to be ₦13.77 in the rural markets and N13.40 in the urban markets. Similarly, their prices per kilogramme averaged ₦119.50 in the rural and ₦118.32 in the urban markets. The situation was however different with reference to the two vegetable categories. Their prices were generally lower in the rural (₦13.43 and ₦11.88) than in the urban markets (₦14.40 and ₦12.97) for WILV and DILV species respectively. This price differential of vegetables in the rural and urban markets was however found not to be significant with a Z – value of – 0.6 at 5% level of significance (Appendix 4.21)

4.2.4: Seasonal influences on the marketing patterns of indigenous leafy vegetables species in the study area.

There was no noticeable difference in the percentage of persons engaged in the marketing of the various ILV species between the seasons in the rural markets, but differences was noticed between the two vegetable groups. For WILVs, higher percentage of individuals (4.9%) was engaged in their marketing during the dry season while the percentage was 3.4% during the rainy season. For the DILVs on the other hand, an average of 7.3% of the sellers in the rural marketswas engaged in their marketing during the dry season while during the rainy season, the percentage was 8.7% (Table4.18).Table 4.18 further showed that the average unit weights of the vegetables were generally higher in the rainy season than in the dry season. Their average unit weights were 167.8g in the rainy season and 155.5g during the dry season. Similar trend was also observed with respect to the two vegetable categories.

Table 4.18: Seasonal comparison of a year's averages of the number of sellers, unit weights and price of indigenous leafy vegetable species in the selected rural markets in the study area.

	Mean no. of Sellers/sp./mkt		% of Sellers/species /Market		Mean unit Weight/bundle (G)		Mean price/bundle (₦)		Mean price/Kg (₦)	
	Seasons		Seasons		Seasons		Seasons		Seasons	
	Rainy	Dry	Rainy	Dry	Rainy	Dry	Rainy	Dry	Rainy	Dry
Mean	7.0	7.0	5.9	5.9	167.8	155.5	13.37	14.87	127.49	126.24
Mean for DILVs	11.0	9.0	8.7	7.4	190.3	167.9	13.20	12.75	91.61	89.87
Mean for WILVs	4.0	6.0	3.4	4.8	147.7	146.7	13.51	16.35	159.37	151.69

Source: Field survey, 2007

Table 4.19: Seasonal comparison of a year's averages of the number of sellers, unit weights and price of indigenous leafy vegetable speciesin the selected urban markets in the study area.

	Mean no. of Sellers/sp./ mkt		% of Sellers/ species/ Market		Mean unit Weight/bundle (G)		Mean price/bundle (₦)		Mean price/Kg (₦)	
	Seasons		Seasons		Seasons		Seasons		Seasons	
	Rainy	Dry	Rainy	Dry	Rainy	Dry	Rainy	Dry	Rainy	Dry
Mean	7.0	7.0	5.3	5.6	158.1	142.6	13.79	14.62	1119.70	147.00
Mean for DILVs	10.0	9.0	7.4	7.0	182.2	158.6	13.16	14.13	82.35	109.71
Mean for WILVs	5.0	5.0	3.7	4.4	140.6	129.7	14.26	15.01	146.87	176.84

The mean unit weights of WILVs were 147.7g and 146.7g while those of DILVs were 190.3g and 167.9g during the rainy and dry seasons respectively.

Table 4.18 also showed that the unit prices of the vegetables in the rural markets were generally higher in the dry season than in the rainy season. Their mean unit price was ₦13.37 during the rainy season and ₦14.87 during the dry season. Similar trend was also obtainable with respect to the two vegetable groups. The unit price of WILVs was ₦13.51 during the rainy season and ₦16.35 during the dry season. Forthe DILVs, their mean unit price was ₦13.51 during the rainy season and ₦12.75 during the dry season. Details of these results for the dry and rainy seasons are contained in appendix 3.25 and 3.26.

Similarly in the urban markets, no differences were noticed in the percentage of persons engaged in the marketing of the various ILV species between the seasons, but differences occurred between the two vegetable groups. Higher percentage of individuals (4.3%) was engaged in the marketing of WILVs during the dry season compared to 3.7% during the rainy season. The situation was slightly different for the DILVs. An average of 7.1% of ILV sellers was engaged in their marketing during the dry season while during the rainy season the percentage was 7.5 (Table 4.19).

Table 4.19 also showed that average unit weights of the vegetables were generally higher in the rainy season than in the dry season. Their average unit weight was 158.0g in the rainy season and 142.6g during the dry season. The two vegetable Categoriesalso followed similar trends. The mean unit weight of WILVs was 140.6g during the rainy season and 129.7g during the dry season. For the DILVs, their mean unit weights were 182.2g and 158.6g during the rainy and dry seasons respectively.

Table 4.19, further revealed that the vegetables generally had higher unit prices in the dryseasonthan in the rainy season. Their mean unit price was ₦13.79 during the rainy season and ₦14.62 during the dry season. With regard to the two vegetable categories, WILVs had mean unit price of₦14.26 during the rainy season and ₦15.01 during the dry seasons. The DILV species on the other hand had mean unit price of₦13.16 during the rainy season and ₦14.13 during the dry season. Details of these results for the dry and rainy seasons are contained in appendix 3.27 and 3.28 respectively

4.2.5: Sources of the various indigenous leafy vegetable species sold in the various rural and urban markets.

There were three main sources of the ILV species sold in the rural and urban markets. The sources were personal farms, forest areas and purchase from other vendors. Whereas in the rural markets, majority of those selling these vegetables (60.3%), obtained them from their personalfarms, in the urban markets majority (77.8%) claimed to be purchasingthem from other vendors/middlemen. Also, in the rural markets, 15.2% of the sellers were getting their supply from forest areas, only about 2.8% were obtaining theirs from this source in the urban market (Figure 4.6 and appendix 3.29 and 3.30).

With reference to the marketing of the two vegetable categories, whereas 56.6% of the sellers of WILV species in the rural markets were getting their supplies from their personal farms, 22.5% were buying from other vendors/middlemen while 20.9% were collecting from the forest. For the DILV species, 65.0% were getting their supplies from their farms, 27.0% were buying from other vendors/middlemen while only 8.0% were collecting from the forest (Appendix 3.29). In the urban markets, 76.3% of the sellers of WILV species were buying from other vendors/middlemen, 18.7% were collecting from personal farms while only 4.9% were sourcing them from forest areas. For the DILV species, 79.7% were buying from other vendors/middlemen, 20.3% were collecting from personal farmlands and none was collecting from the forest (Appendix 3.30).

4.2.6: Incomes generated from the sale of various indigenous leafy vegetable species.

Table 4.20 shows that daily incomestraders obtained from the sale of the ILVs varied according to the species. It varied between a mimimum of ₦100.84 for *Corchorus species* to a maximum of ₦1791.67 for *G. africanum* in the rural markets and between a minimum of N133.50 for *P. guineense* to a maximum of ₦1960.00 for *G. africanum* in the urban markets. Daily mean income per species per seller was N348.47 in the rural markets and N443.61 in the urban markets. Since each seller was engaged in the marketing of at least three (3) different species of vegetables

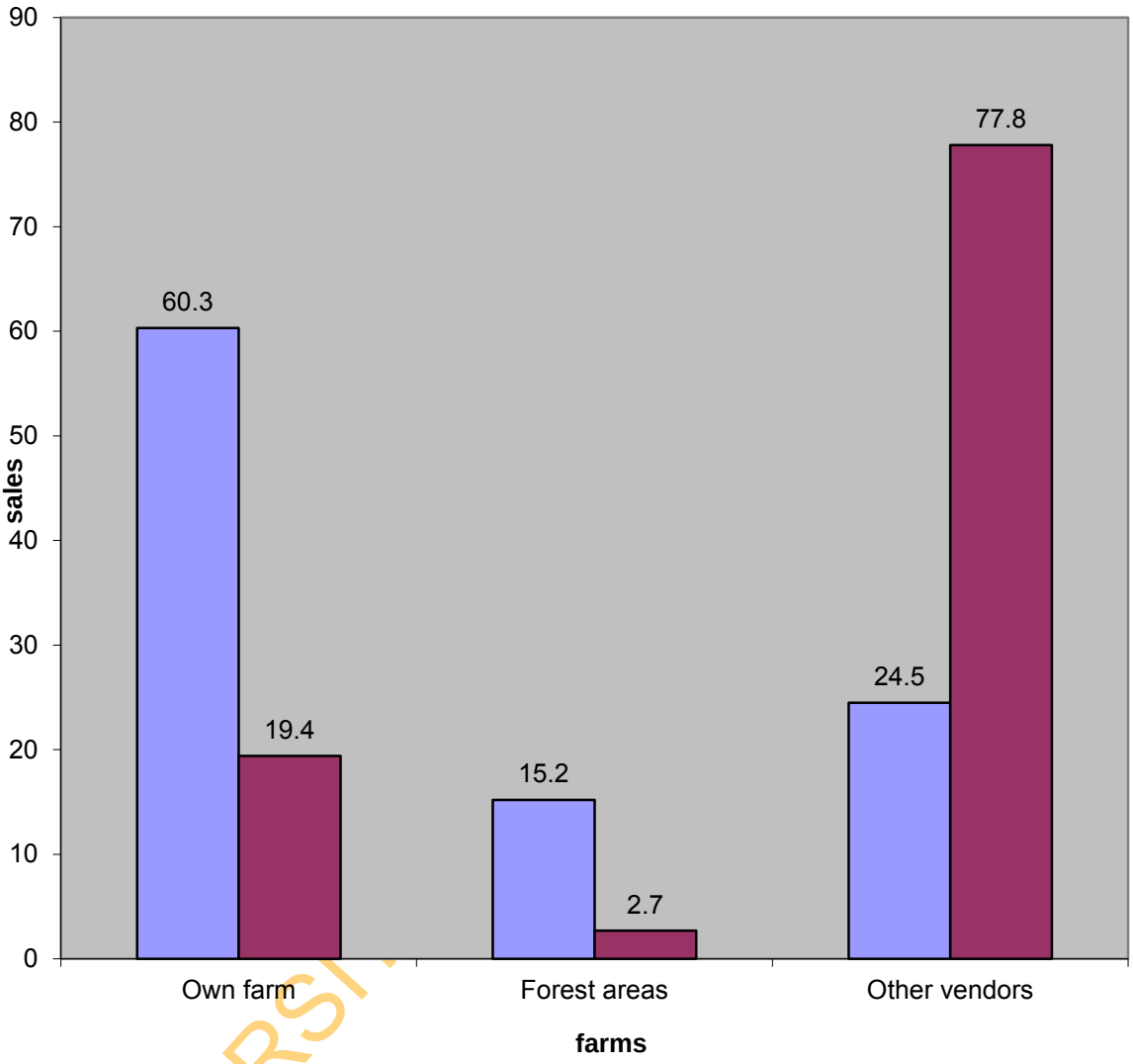

Fig 4.6 The main sources of the vegetables on sale in the rural and urban markets within the study area

Table 4.20: Mean daily incomes obtained from the sale of indigenous leafy vegetable species in the selected rural and urban markets in the study areas.

	Vegetable species	Rural markets	Urban markets
		Income Range (₦)	Income Range (₦)
1	*T. occidentalis*	578.98	840.16
2	*Solanum spp.*	2I4.58	372.88
3	*Vernonia spp.*	390.59	550.47
4	*T. triangulare*	260.60	274.28
5	*Amaranthus spp.*	361.75	307.27
6	*Curcubita spp.*	150.00	295.00
7	*M. koeningii*	117.50	227.05
*8	*Corchorus spp.*	100.84	260.28
9	***G. africanum***	*1791.67*	*1960.00*
10	***P. guineense***	*119.38*	*133.50*
11	***G. latifolium***	*296.20*	*267.92*
12	***Ocimum spp.***	*141.49*	*250.60*
13	***Pterocarpus spp.***	*449.63*	*507.18*
14	***P. santaliniodes***	*380.56*	*369.44*
15	***F. ovate***	*341.67*	------- ------
16	***C. argentea***	*157.56*	*279.17*
17	***S. nigrum***	*337.50*	*345.00*
18	***S. gilo raddi***	*292.86*	*296.11*
19	***F. zanthoxyloides***	----- -----	*279.16*
20	***V. doniana***	*137.50*	----- ------
	Total	**6620.81**	**7984.96**
	Mean	**348.47**	**443.61**
	Mean for DILVs	**271.85**	**412.10**
	Mean for WILVs	**404.19**	**468.81**

Source: Field survey, 2007 N.B: All vegetables in bold outline are WILVs

(Table 4.13 and 4.14), income obtained per seller per day was therefore ₦1045.41 in the rural markets and ₦1330.83 in the urban markets. This result showed that the sale of vegetables in urban markets was associated with higher ranges of income than their sale in the rural markets.These income differentials between the rural and urban markets were foundto be significant with Z- value of -14.89 at 5% level of significance (Appendix 4.22). This meant that the incomes obtained from the sale of the vegetables in the urban markets were significantly higher than those of rural markets.

With particular reference to the two vegetable categories, WILV species was associated with higherincome than the DILV species. The income from WILV was ₦404.19 per species in the rural markets and ₦468.81 in the urban markets. For the DILV species, the daily income was ₦271.85 per species in the rural markets and ₦412.10 in the urban markets. It then followed that individuals engaged in the marketing of only WILV species were realizing daily incomesof ₦ 1212.57in the rural markets and ₦1406.43 in the urban markets. Those who engaged in the marketing of only DILV species were realizing daily incomes of ₦815.55 in the rural markets and ₦1236.30 in the urban markets. Results of test of significant differences in incomes obtained from the sale of DILV and WILV species positive and significant at both rural and urban markets with Z- values of 17.05 and 11.40 at 5% level of significance (Appendix 4.23 and 4.24). This implied that the incomes obtained from the sale of WILVs were significantly higher than from the sale of DILVs in both the rural and urban markets.

4.2.7: Margins of profit obtained from the sale of various indigenous leafy vegetable species

Profit margins obtained from the sale of various ILVs varied between species. It varied from a minimumof ₦74.79 for *Corchorus spp*. to a maximum of ₦416.67 for G. *africanum* and from ₦116.88 for *P. guineense* to ₦479.17 for *G. africanum* in the rural and urban markets respectively. Similar to the daily income, the profit margins obtained from the sale of vegetables were higher in the urban than in the rural markets.For all the species, daily profit margin per vegetable species was ₦192.97 in the rural markets and ₦221.98 in the urban markets (Table 4.21). Since every marketerwas involved in the marketing of an average of three different species of vegetable, the profit margin per seller per market day therefore was ₦578.91 in the

Table 4.21: Daily profit margins obtained from the sale of indigenous leafy vegetable species in selected rural and urban markets in the study area.

	Vegetable species	Rural Markets	Urban Markets
		Profit margins (₦)	Profit margins (₦)
1	*T. occidentalis*	320.21	380.78
2	*Solanum spp.*	151.57	261.50
3	*Vernonia spp.*	225.73	318.26
4	*T. triangulare*	144.17	169.32
5	*Amaranthus spp.*	242.07	281.17
6	*Curcubita spp.*	150.00	145.08
7	*M. koeningii*	99.11	165.44
*8	*Corchorus spp.*	74.79	183.27
9	**G. africanum**	416.67	479.17
10	***P. guineense***	*95.43*	*116.88*
11	***G. latifolum***	*148.88*	*147.85*
12	***Ocimum spp.***	*108.57*	*154.86*
13	***Pterocarpus spp.***	*319.89*	*303.69*
14	***P. santoliniodes***	*315.28*	*248.61*
15	***F. ovata***	*131.48*	------ ------
16	***C. argentea***	*200.00*	*145.00*
17	***S. nigrum***	*150.00*	------ ------
18	***S. gilo raddi***	*250.00*	*119.99*
19	***F. zanthoxyloides***	–--- ------	*152.76*
20	***V. doniana***	*122.50*	---------- ----------
	Total	**3666.34**	**4186.92**
	Mean	**192.97**	**221.98**
	Mean for DILVs	**175.96**	**238.10**
	Mean for WILVs	**205.33**	**207.64**

Source: Field survey, 2007 **N.B:** ***All vegetables in bold outline are WILVs***

rural markets and ₦665.94 in the urban markets. It therefore followed that those who were engaged in the business on a full-time bases were making a yearly profits of ₦166726.08 in the rural markets and ₦191790.72 in the urban markets respectively.

A test of significant difference in the profit margins obtainable from the sale of vegetables between the rural and urban markets was negative and significant with a Z-value of -6.64 at 5% level of significance. This implied that margins of profit obtained from the sale of vegetables were significantly higher in the urban than in the rural markets (Appendix 4.25).

With respect to the two vegetable groups, profit margin was ₦205.33 and ₦207.64 per WILV species and ₦175.96 and ₦238.10 per DILV species in the rural and urban markets respectively (Table 4.21). Therefore, sellers whowere engaged in the marketing of only WILV species were making daily profits that amounted to ₦615.99 in the rural markets and ₦622.92 in the urban Markets; for those engaged in the marketing of only DILV species, their daily profit margin was ₦527.88 in the rural markets and ₦714.3 in the urban markets. Yearly therefore, profit margins per the sellers of WILVs were ₦177405.12 and ₦179400.96 and ₦152029.44 and ₦205718.40 per the sellers of DILVs in the rural and urban markets respectively.

Test of significant difference in the profit margins obtained between the sale of WILVs and DILVs was positive and significant with respect to the rural markets and negative but also significant with respect to the urban markets with Z- values of 6.80 and -7.03 at 5% level of significance (Appendix 4.26 and 4.27). This implied that the profit margins obtained from the sale of WILV species were significantly higher than those obtained from the sale of DILV species in the rural markets. In the urban markets on the other hand, profit margins obtained from the sale of DILV species were significantly higher than those obtained from the sale of WILV species.

4.2.8: Mode of marketing of the various indigenous leafy vegetable species and their marketing constraints

While some of the vegetable sellers were engaged in the business on part-time basis, others were engaged in it as a full-time business. Majority in the rural markets (82.6%) were in the business on part-time basis while in the urban markets, the opposite was the case i.e. majority of the sellers (65.3%) operated the business on full-time basis (Table 4.22).

Table 4.22: Mode of marketing of vegetable species in the various rural and urban markets in the study area.

		Rural markets				Urban markets				Rural & Urban markets			
	Vegetable species	Full	Time	Part	Time	Full	Time	Part	Time	Full	Time	Part	Time
		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
1	*T. occidentalis*	25	32.9	51	67.1	49	75.4	16	24.6	74	52.5	67	47.5
2	*Solanum spp*	15	25.9	43	74.1	27	65.9	14	34.2	42	42.4	57	57.6
3	*Vernonia spp*	22	34.9	41	65.1	52	91.2	5	8.8	74	61.7	46	38.3
4	*T. triangulare*	8	19.5	33	80.5	44	77.2	13	22.8	52	53.1	46	46.9
5	*Amaranthus spp*	16	26.7	44	73.3	48	81.4	11	18.6	64	53.8	55	46.2
6	*Curcubita spp*	-	-	12	100.0	3	25.0	9	75.0	3	12.5	21	87.5
7	*M. koenigii*	7	16.7	35	83.3	15	68.2	7	31.8	22	34.4	42	65.1
8	*Corchorus spp*	3	21.4	11	78.6	16	88.9	2	11.1	19	59.4	13	40.6
9	***Pterocarpus spp***	16	34.8	30	65.2	35	72.9	13	27.1	51	54.3	43	45.7
10	***P. santaliniodes***	5	27.8	13	72.2	7	35.0	13	65.0	12	31.6	26	68.4
11	***G. africanum***	4	30.8	9	69.2	10	62.5	6	37.5	14	48.3	15	51.7
12	***P. guineense***	2	20.0	8	80.0	13	86.7	2	12.3	15	60.0	10	40.0
13	***G. latifolium***	3	9.7	28	90.3	25	73.5	9	26.5	28	43.1	37	56.9
14	***Ocimum spp***	8	16.0	42	84.0	43	75.4	14	24.6	51	47.7	56	52.3
15	***F. ovate***	-	-	6	100.0	-	-	-	-	-	-	6	100.0
16	***C. argentea***	-	-	4	100.0	5	100.0	-	-	5	55.6	4	44.4
17	***S. nigrum***	2	13.3	13	86.7	3	18.8	13	81.3	8	23.5	26	76.5
18	***V. doniana***	-	-	5	100.0	-	-	-	-	-	-	5	100.0
19	***S. gilo raddi***	-	-	11	100.0	2	11.8	15	88.2	2	7.1	26	92.9
	Total		**330.3**		**1569.71**		**1109.7**		**590.4**		**740.8**		**1159.3**
	Mean		**17.4**		**82.6**		**65.3**		**34.7**		**39.0**		**61.0**
	WILVs		**13.9**		**86.2**		**48.8**		**33.0**		**33.7**		**66.3**
	DILVs		**22.2**		**77.8**		**60.5**		**25.2**		**46.2**		**53.8**

Table 4.23 on the other hand shows that storage/preservation problems were the major constraints that were militating against vegetable marketing as indicated by 35.5% and 25.0% of rural and urban respondents respectively followed by extortion by market agencies/unions as indicated by 13.6% and 28.8% of the rural and urban respondents. Other constraints inorder of magnitude were haulage (20.65% and 19.02%), declining availabilty of vegetables (8.4% and 14.7%) and low prices/demands (12.3% and 5.4%) of the rural and urban respondents respectively

Table 4.23: Constraints militating against the marketing of indigenous leafy vegetables in the various rural and urban markets in the study area.

Marketing constraints	Rural Market		Urban Markets		Rural & Urban	
	Freq	%	Freq	%	Freq	%
Storage/ preservation problem	55	35.5	46	25.0	101	29.8
Extortion by market agencies / union	21	13.6	53	28.8	74	21.8
Haulage problem	32	20.7	35	19.0	67	19.3
Declining availability	13	8.4	27	14.7	40	11.8
Low prices / demand	19	12.3	10	5.4	29	8.6
Financial constraints / high cost	15	9.7	11	6.0	26	7.7
Problems of theft	-	-	2	1.1	2	0.6
	155	**100**	**184**	**100**	**339**	**100**

Source: Field survey, 2007

CHAPTER FIVE

5.0: DISCUSSION

5.1: Household Survey information

5.1.1: Consumption patterns of various indigenous leafy vegetable species.

Traditional vegetables offer variety and have been noted to contribute to broadening the food base of African people (Okigbo, 1977). This study has clearly revealed that a wide range of ILV species both domesticated and wild ones (34 in all) are in regular consumption in the various rural and urban communities surveyed in the three states within the Southeastern Nigeria. Edwin-Wosu *et al* (2012), in their own survey in Ogoja and Calabar in Cross River State recorded 30 species of indigenous plants that are commonly consumed as leafy vegetables in the areas. A similar survey carried out in Niger Republic identified 22 plant species used as leafy vegetables (Abasse *et al*, 2007), while the number of such species identified in Swaziland was 48 (Ogle and Grivetti,1985).

The result of this study however, does not support the earlier views expressed by Schippers thatthe production and consumption of indigenous and indigenised African vegetables is expanding on the African continent (Schippers, 2000; 2002; 2006). Consumption levels rather seem to be diminishing judging from thevery low percentage of the respondents (18.5% and 20.8% of the rural and urban respondents) found to be consuming the vegetables on weekly basis.The situation was even more precarious for the WILV species as only 9.3% and 11.5% of the rural and urban respondents households were found to be consuming the vegetables on weekly bases compared to 33% and 32.2% for DILV species. The result seems to confirm the findings of Maziya-Dixon *et al* (2004), who noted that even though indigenous leafy vegetables were relatively available and affordable in Nigeria, but they remain among the least consumed food.The findings however concur with those of Waudo *et al* (2005), who reported low intake of traditional vegetables by women and children in the wetlands of Lake Victoria region and Kimiywe *et al* (2007), who reported their low intake in the urban and peri-urban areas of Nairobi, Kenya. According to Lewis (1997), it is not mainly environmental disturbance or loss of habitats that are causing

genetic erosion or loss of biodiversity of Africa's traditional vegetables. When they are threatened, it is because they are falling into disuse, perharps owning to their inability to compete with exotic vegetables (that are sometimes less nutritious), or because they are considered low-status food items.This seemed to be the case in the present study as market surveys indicated their relative availability. It is however necessary to point out that some individual species like *T. occidentalis, Vernonia sp., Amaranthus spp., Solanium spp., Pterocarpus spp.* and *G. africanum* enjoyed relatively high level of patronages by the consumers.

According to Reids and Miller (1989), the size of the untapped store of locally important food species that may play significant roles on wider scale in the future is suggested by the number of wild species that only indigenous people eat. The findings of this study gave credence to this assertion. This is because consumption of most of the WILV species is locale-specific because they are only known and consumed in certain localities within a state. Examples include *P. purpureum* consumed only in some localities in Imo State, *C.antiquorum* only consumed in some localities in AnambraState, and *S. nigrum, F. ovata, F. capensis and V. doniana* only consumed in some localities in Ebonyi State.This findingalso goes to confirm the assertion by Lyatuu and Lebotse (2010) that demand and consumption of ILVs is highly region specific. According to the Asian Vegetable Research and Development Corporation (AVRDC) (1990), distribution of species used as vegetables may be worldwide or limited to specific areas of certain regions.

This study revealed that even though the vegetables were consumed all year round, but WILVs were consumed more during the dry season in contrast to the DILVs that were consumed more during the rainy season. According to Getahun (1975) and Okafor (1991), most WILV species flush during the dry season when cultivated vegetable species are scarce hence provide vegetables during this period of scarcity. For instance, *Pterocarpus species, Gnetum africanum and Ficus species* flush during the dry season. It is, therefore, not surprising that they enjoy more patronage during this period of the year. Domesticated ILV species on the other hand enjoy more patronage during the rainy season because environmental conditions favour their growth hence many people embark on their cultivation during the rainy season.

The vegetables were found to be on regular consumption by the respondents. Theirconsumption on an average of 2.2 times weekly agreed with similar study

conducted in Swaziland by Ogle and Grivetti (1985), where they found that wild leafy vegetables were consumed more than two times weekly. A similar survey in Yaounde, Cameroon, revealed that the vegetables were consumed 3 to 4 times weekly (Kamanga *et al*, 2013).The consumption of these traditional vegetables on a regular basis demonstrate their role in the diets of people, similarly reported in other studies (Bonet and Valles, 2002; Kala, 2007). Cumulatively, the DILV species were consumed 74.0% and 77.0% of the times compared to 26.1% and 23.1% for WILVs in the rural and urban households respectively. These findings however, contrasted with Fleuret's survey in Lushoto, Tanzania where he found that WILVs were used 81% of the times compared with 17% for domesticated vegetables (Fleuret, 1979). Domesticated ILVs were more frequently consumed probably because they werethe more readily available vegetables in the study area. Their cheaper prices in comparison to those of WILVs could also be a reason for the more patronages.

No significant differences were found to exist in the frequency of consumption of vegetables between the seasons both in the rural and urban households. This goes to confirm the assertion by Popoola and Oluwalana (1998) that most NTFPs that are consumed as food are regularly demanded regardless of season or period of the year.

The majority of rural residents were producing their own vegetable requirements unlike their urban counterparts. This was so because rural residents are mostly farmers and vegetables are some of the crops they usually cultivated on their farms. These vegetables are also available in surrounding free areaforests in their communities. These gave them easy access to these vegetables. This is not the case with the urban residents who had no access to farmlands and forest in cities hence they usually buy most of their vegetable needs.

The study has shown that rural and urban residents expended various sums of money on the purchase of vegetables for consumption. However the expenditures constituted only small percentages (10.5% and 11.5% in the rural and urban communities respectively) of family's budget on food. In comparison to the costs of meat and fish, indigenous vegetables can be said to represent the most affordable and sustainable dietary source of vitamins, trace elements and other bioactive compounds. It is for their cheapness that FAO (2003), noted that improved vegetable production and consumption is the most direct, low-cost method for urban and rural poor to increase micronutrients in their diets. It is perharps for the same reason that Olagunde

et al (1992), concluded that one of the ways the malnutrition problem in Nigeria prompted by deficiency in proteins, vitamins, iron and other minerals could be addressed is the production and supply of vegetables.

Significancy test indicated that urban residents expended more on vegetable purchase than the rural residents. With easy access to farm lands, rural people often either grow their own vegetable needs or acquire them freely from nearby forest and farm lands hence depend less on markets for their vegetable needs. On the other hand, most urban residents with no access to land depend more on markets for most of their vegetable needs hence they end up spending more money on vegetable purchases at any point in time than rural residents. Significancy test further revealed that households expended more money on the purchase of DILV than on WILV species. This is understandable because not only were the DILVs more frequently consumed (consumed an average of 2.2 times compared to 1.7 times weekly for WILV species), butthey were the species consumed 74.0% and 77.0% of the times in the rural and urban households respectively (see tables 4.5 and4.6). Also, their relatively cheaper prices made them more attractive to the consumers thus leading to more expenditure on them.

Surprisingly, the result of this study revealed that households expended more on vegetable purchases during the rainy season than they did during the dry season. Bearing in mind thatvegetables particularly the DILVs are usually more abundant and cheaper during rainy seasons, it is expected that households should spend less on vegetable purchases during this period of the year. The higher expenditures witnessed in the households during this period can be attributed to increased demandfor vegetables occasioned by their relative abundance which resulted into the usual reduction in prices and by so doing, making them more attractive to the consumers. In other words, households tend to consume more vegetables during the rainy seasons due to their relative abundance and cheapness which ultimately results to increased spendings on vegetable consumption. For the WILV species in particular, the fact that many flush more during dry seasons means that they would be cheaper during the dry season thus leading to less expenditures on their purchases during this period of the year.

The subsistent/direct-use or consumptive-use values of the ILVs as obtained in this study on the one hand represent saved costs or the amounts that could have been

expended if the households were to buy the vegetables from the markets. On the other hand, they represent the opportunity costs or the money that could have accrued to them if the vegetables were to be sold. However, the higher ratings accorded the vegetables as items for income generation (i.e. their productive-use values) than as items for direct consumption (i.e. their consumptive-use values) (Appendix 4.10 and 4.11) is understandable because many people are dependent on the sale of these vegetables for their livelihoods. For many of these people, their survival revolves around marketing of these vegetables all year round.

5.1.2: Sources of the leafy vegetables, reasons for their consumption and household preference ratings of the vegetables

The two main sources for the leafy vegetables as revealed by this study were collection from around compound farms and purchase. The fact that a reasonable percentage of WILVs were sourced from within and around compound areas is an indication of their increasing domestication by the people. Also, the fact that in the urban communities, a greater percentage of WILV species consumed were acquired through purchases than DILVs meant that WILVs are scarcer in the urban areas than DILVs. In a similar study in Swaziland, Ogle and Grivetti (1985) reported that the most important collection areas for wild leaves were around agricultural fields, grazing and forest areas. Modi *et al* (2006), in their study in Umbumbulu, South Africa, reported that the major sources of leafy vegetables were through purchase, as well as from cultivated and non-cultivated lands around homesteads. Also, a study of NTFP exploitation and management carried out in Ghana by Falconer (1996) showed that farms and fallows are important sources of NTFP. According to Arnold (1991), these non-forest sources of production, are becoming increasingly important with the growing decline and degradation of nearby forests and the increase in demand for fuel, vegetables and other products.

The major reasons adduced for the consumption of the vegetables included the belief in their high nutritive value, good flavour and taste they usually give to their meals, family preferences and readily availability of the vegetables.In his study in Lushoto, Tanzania Flueret (1979), reported that wild leaves were valued mainly because of their relative cheapness and easy accessibility. A few of the respondents also claimed to be consuming the vegetables, especially the WILVs because of their

medicinal roles. Okafor (1997) in his own study noted that the non-food use for these vegetables was for medicine including the treatment of piles, high blood pressure diabeties, stomach problems, diarrhea, wound etc.Maikhuri *et al* (2000) and Nautiyal *et al* (2003) in their own studies noted that whilst the wild plants are eaten as leafy vegetables, some do play an opportunistic and overlapping role as medicinals and by so doing adding extra value, and thereby making them very attractive and important to the users.

The result of this study showed that higher preferences were given to the domesticated than the wild leafy vegetables species.The consumption and expenditure tables (Table 4.5 and 4.6) showed that these preference ratings were in consonance with the consumption patterns as those that enjoyed high preferences also enjoyed high levels of consumption. *Telfairia occidentalis* which enjoyed the highest preference ratings for instance was the species mostly consumed by the respondents. *T. occidentalis* was also found to be the most preferred indigenous vegetable species in Ogoja and Calabar districts of Cross River State (Edwin-Wosu et al (2012).As the most readily available and most commonly consumed vegetables, DILV species were more preferred than their WILV counterpart. Given the high level of consumption and preferences accorded these vegetables, every available space within and around compound areas such as fence walls, flower verges and even roadsides were put into the production of these vegetables particularly in the urban areas.

Provision of irrigation facilities for dry season vegetable production occupied the topmost position among the measures suggested by the respondents for ensuring regular and increased supply of vegetables. Seasonality no doubt is a major constraint to vegetable production hence any measure that would ensure year round production would lead to its availability always.This could bring down vegetable prices, the greatest problem associated with vegetable consumption in the study area. Also, if every household could establish their own vegetable garden no matter how small, there will be regular availability of vegetables and reduction in their prices. As well, heavy post-harvest losses occur in Nigeria due to inadequate storage facilities, especially in times of bumper harvests. According to Okereke (2008) and Mbalewe (2011), a significant quantity of products harvested in Nigeria (between 20 - 40% for perishables) perish due to lack of storage and processing facilities. Whereas food must be consumed on daily basis, production has a different specific time profile. Hence

storage and preservation are critical in ensuring that the commodities produced at a particular period are available for consumption whenever and wherever they are required.

5.2: Market Survey Information

5.2.1: Marketing patterns of the various indigenous leafy vegetable species in the various rural and urban markets

As the result of this study has shown, a large numberof people were involved in the marketing of the ILVs in the study area.When the number of people (an average of 42 and 62 persons in each rural and urban market respectively), are related to the total number of markets studied, it meant that, an average of 375.0 and 556.0 persons were engaged in the marketing of ILVs in the nine rural and nine urban markets involved in the study respectively. Therefore, if all the rural and urban markets in the southeastern part of the country are put together, the number of people engaged in ILV marketing will run into millions. It is therefore, clear from this result that, marketing of ILVs is a very important economic activity among the people of southeastern part of the country and therefore goes to confirm the assertion by Falconer (1996) that trade in NTFPs involve a large number of people.According to Schippers (2000), the production of these vegetables is increasingly targeted as a livelihood strategy as the level of urban unemployment rises.

While no noticeable difference existed in the percentage of persons engaged in the marketing of the various ILV species between the seasons, differences were noticed between the two vegetable groups. Higher percentage of people was engaged in the marketing of WILV species during the dry season in contrast to the DILV species that attracted more marketers during the rainy season. According to Getahun (1975) and Okafor (1991), many wild leafy vegetables such as *Pterocarpus spp., Myrianthus arboreus, Vitex doniana* and even *G. africanum* flush during the dry seasons and hence provide vegetables during this period. It is therefore not surprising that more number of people engage in their consumption and marketing during this period than during the rainy season.

Just as the result of this study showed that all the vegetable sellers were women and their children, similar study also indicated that women dominated ILV marketing in the Southern African Development Community (SADC) region (Lyatuu and

Lebotse 2010). In Sierra Leone, it was reported that about 80% of the urban fuelwood sellers were women (Kamara 1986), while in Kumasi Central market, Ghana, more than 90% of the NTFP traders have been reported to be women (Falconer, 1996). The study therefore also confirmed the assertion of Sunderland et al (2004), that women play a dominant role in the marketing and final sale of many NTFPs.

According to Arnold (1991), forest-based income and employment opportunities are of importance to the poor particularly women because of ease of access, very small initial capital outlay and low skill needed to enter and engage in most of them. Tewari (1994) also observed that most workers in the world's formal and informal NTFP economy are women. According to him, since a much larger share of women's income goes to support their family health and welfare, this undercounted economy is making substantial contributions to family income.

5.2.2: Average weights and prices of the various indigenous leafy vegetable species sold in the various rural and urban markets.

The study has shown that there were variations in the unit weights of the vegetables according to location with their weights being generally lower in the urban than in the rural markets.Most of the vegetables sold in the urban centres are produced in the rural communities. It is therefore not surprising that the weight of the vegetables should be higher from the source of supply. Their weights also varied according to the category of vegetable with the WILV species having generally lower weights than their domesticated counterparts. This was so because WILVs were in short supply and therefore were not readily available. There were also seasonal variations inweight with the unit weights being generally higher in the rainy season than in the dry season. Schippers (2000), in his own research also acknowledged reduction in size of leafy vegetable bundles during the dry season. The rainy season is the growing season for most vegetable species, it is expected that vegetables should be more abundant during this period of the year. It is therefore not surprising that their unit weights would be higher in the rainy season than in the dry seasons.

The WILVs generally had higher unit prices than the DILVs. The possible explanation for this price differential is mainly due to their mode of acquisition. Whereas domesticated vegetables are commonly cultivated and hence are readily available, those of WILVs are mainly being collected from the wild and fallow lands

where they are naturally growing. With deforestation becoming a major problem today particularly within the southeastern part of the country, the sources for the WILVs have been drastically reduced hence its scarcity that manifests in lower unit weights and higher prices. The belief in their high nutritive value also played a big role. *G. africanum* was found to be the most expensive indigenous vegetable species on sale in the markets just as it was found to be the most expensive indigenous vegetable species in the markets in Ogoja and Calabar districts of Cross River State (Edwin-Wosu *et al*, 2012). Edwin-Wosu *et al*, in their study adduced four possiblereasons for the relative high cost of*G. africanum*in the markets namely, its collection mainly from the wild, its transportation over long distances to the markets, processing by slicing before marketing and activities of middle men.

The unit prices of the vegetables were also found to be generally higher in the dry season than in the rainy season.More abundance and ready availability of vegetables during the rainy season periods helped to bring down their prices during this period of the year.As further noted by Schippers (2000), vegetable prices tends to fall in the wet season because it is the main production period and most rural households do not need to buy from the market. Falconer (1996)is also of the view that more people are attracted into the business of growing and marketing of vegetables during the rainy season because of favourable condition prevailing at that period. This no doubt leads to vegetable glut which eventually forces down their prices.

Another very important finding of the study was that vegetable prices were generally higher in the rural than in the urban markets. Vegetables are usually grown in rural communities purposely for sale in the urban markets where they can attract higher prices and hence higher profits to the producers. This situation often leads to vegetable glut in the urban markets and scarcity in the rural markets thus resulting to high vegetable prices in the rural markets and fall in prices in the urban markets. In addition, many urban residents make use of every available open space within and around their residential quarters for vegetable production. This situation also leads to supply becoming higher than demand thus resulting in fall in their prices.

In spite of these price differentials, the prices of the ILVs were generally low in comparison with other food items. Considering the generally low prices of these local vegetables in comparison to other food items such as meat and fish, it is obvious that their consumption represent the cheapest means of solving malnutrition problems in

Nigeria prompted by deficiency in protein, vitamins and other minerals. Moreover, just as Schippers (2000), has noted, they represent important commodities for poor households because of their relatively affordable prices in comparison to other food items like meat and fish.

5.2.3: Marketing modes, incomes and profits obtained from the sale of the various indigenous leafy vegetable species

Just as majority of the sellers of the ILV species in the urban markets (65.3%) operated the business on full-time basis (Table 4.21), a similar survey conducted in an urban central market in Ghana showed that approximately 700 people were involved in the forest product trade on a full-time basis (Falconer 1996). According to Arnold (1991), while many people depend on sale of such forest products as vegetables to supplement their farm income year round, others engage in such activities seasonally, either to exploit raw materials or markets available only at particular periods, or the labour available in slack agricultural months, or to meet seasonally induced cash needs such as agricultural loan payments or school fees. Others resort to them during emergencies for example, more people becoming involved in gathering and sale of fuel wood in years when agricultural conditions were very bad.

Rural people are mostly subsistent farmers and only engage in trading as a part-time occupation often to dispose their farm produce and to earn the necessary income for family up keep, payment of the children's school fees and medical bills. Even petty traders among them do not have permanent wares or items of trade but shift from one product to another according to the dictate of the seasons as they mostly trade on agricultural products. It is therefore not surprising that majority in the rural markets (82.6%) were in the business on part-time basis.

Their urban counterparts on the other hand are mostly either civil/public servants, artisans/technicians, those in various forms of self employment and traders. The traders amongst them often have permanent wares or trade items. For those engaged in vegetable marketing in particular, they often have regular supply sources - other vendors (mostly middlemen) who often travel as far as to the remotest villages and to different states to source for the vegetables.

Considering the average daily incomes of ₦1045.41 and ₦1330.83 in comparison to the average daily profit margins of ₦578.91 and ₦665.94 obtained by

each seller in the rural and urban markets respectively, it is obvious that marketing of ILVs, though associated with low capital outlays, has high potentials for profit. According to Lyatuu and Lebotse (2010), the production and marketing of ILVs is one of the fields that offer employment with higher profit returns but, with lower starting up capital compared to most other agricultural investments. This therefore goes to confirm the assertion by Schippers (2000), that local vegetables offer a significant opportunity for the poorest people to earn a living as producers or traders without requiring large capital investment. The World Vegetable Center (AVRDC) has also noted that vegetables provide important source of cash income. It was due to the low capital outlay required to go into indigenous vegetable production and marketing that Chadha (Undated), concludeded that for anyone interested in rural farming especially women, African indigenous vegetables offer an impotant entry point. These vegetables according to him provide an economic pillar upon which women's rural livelihood is supported.

CHAPTER SIX

6.0: CONCLUSION AND RECOMMENDATIONS

6.1: Conclusion

The study has shown that a wide range of ILV species (a total of 34 wild and domesticated species) are commonly and regularly consumed and marketed in the various rural and urban households and markets within the southeastern parts of the country. Among the most commonly consumed and marketed of these vegetables are *Telfairia occidentalis, Vernonia spp, Amaranthus spp, Solanum spp, Talinium triangulae and Ocimum sp*p. As a result of the high level of consumption of these vegetables, huge amountof money was expended on their purchase by rural and urban households on weekly basis. Further more, respondents who engaged in their sales either on full-time or part-time basis reported a very high profit margin. It is obvious that these vegetables are making invaluable contributions to the nutritional and economic well being of the people of southeastern Nigeria. These roles can however, be further enhanced if the WILV components particularly those that were highly prefered by the respondents such as*Pterocarpus spp, Gnetum africanum, Ocimum spp, Gongronema latifolium, Piper guineense and Solanum nigrum* are fully domesticated and their production commercialized. Since most of these WILV species flush during the dry season when domesticated vegetables are unavailable, their domestication could therefore close the demand – supply gap being experienced particularly during the dry season. This could bring down the price of these vegetables and thus reduce the percentage of family's budget on food going into vegetable purchase. This could also ensure that more households have easy access to their vegetable needs and ensure a better nutrition for the people.

Whereas, majority of the vegetables consumed in the rural areas were obtained from within and around compound areas, in the urban communities on the other hand, majority of the vegetables consumed were purchased from the markets. As well, a good number of the vegetable sellers, majority in the rural markets were engaged in the business on part-time basis mainly because of the seasonality in vegetable production

cycles. Any effort or programme that would ensure regular and year round production of the vegetables could attract more people to go into the business on a full-time scale. This therefore, supports the need for domestication and commercialization of the production of WILV components while the domesticated ones should be further developed.

Just as the consumption of many of the WILV species was highly localized, so also was their marketing. As a result, not many people were aware of their existence and nutritional importance. This explains why WILV species enjoyed lower patronages in terms of the number of people that were consuming or trading on them. Conscious and deliberate efforts made to popularize these vegetable species will greatly improve their patronages. Urbanization is depleting the resource base for these traditional vegetable species, but it is not in any way diminishing the demand for the vegetables.The vegetables are demanded and consumed in both the rural and urban areas.

Trade on these traditional vegetables is one of the informal sector business enterprises that require little capital outlay to start up but with high potential for profit. Nigerian women and their households can therefore be greatly empowered if governments at local, state and federal levels pay serious attention to the development of this trade.

The study has shown that vegetable consumption trends can be effectively determined or monitored through the study of their marketing patterns.

6.2 Recommendations

1. Domestication and commercialization of the WILV species especially those with high demand by the respondents are recommended. Special attention should be paid to *G. africanum* in the domestication efforts because of its highly commercial value.
2. In order to reduce the high percentage of family's budget on food, that go into vegetable purchases, households are encouraged to establish their own vegetable gardens. This will go a long way in subsidizing household vegetable needs.
3. Consideration should be given to the provision of storage facilities in the markets to enable sellers of the vegetables preserve their unsold produce. This

would help reduce waste, bring down vegetable prices as well as net more profit to the sellers.

4. Establishment of a "**National Gene Bank"** for the purpose of collection, characterization and conservation of indigenous plants such as those of the traditional vegetables as done in some other African countries like Kenya. This is necessary because most of these plants are fast going into extinction with the destruction of their forest habitats.
5. Genebank collection of the vegetables should be evaluated in terms of yield, field resistance to pests and diseases, ease of production, nutritional status and acceptance for human consumption.
6. There is also the need for collecting, preserving and documenting the traditional knowledge associated with the use of these traditional vegetables not only for maintaining the local cultural tradition but also to facilitate the research on new food sources elsewhere as well. Such traditional knowledge is going into extinction as rural people are increasingly migrating into urban cities.
7. There is a need to undertake further studies in order to find out the influence of culture, income or social status on the use and consumption of these traditional vegetables.
8. Further research is needed to identify the major technical constraints facing farmers of indigenous leafy vegetables and how to overcome them.
9. There is a need to develop and promote locally appropriate processing techniques to minimize post harvest losses and ensure regular supplies of ILVs from the production areas to consumers in peri-urban and urban centres.
10. Government and her policy makers should support promotion of ILVs and creation of awareness throughеducation, training, nutrition information, curricula, and infrastructures in terms of irrigation system and roads.
11. The private sector should be encouraged to venture into the business of vegetable processing so as to encourage rural farmers to produce more ILVs
12. Similar research is needed in the other geo-political zones of the country so as to identify more, the overlooked and underutilized indigenous vegetables of local nutritional and economic importance.

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APPENDICES

Appendix 1

Department of Forest Resources Management,
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QUESTIONNAIRE ON THE "VALUATION OF THE CONSUMPTIVE- AND PRODUCTIVE - USES OF WILD AND DOMESTICATED LEAFY VEGETABLE SPECIES IN SOUTHEASTERN NIGERIA".

Investigator: **Aju P.C**

Supervisor: **Prof. Labode Popoola**

Introduction of the Purpose of the Study and Interview

This study is primarily aimed at determining and understanding the extent to which the people of various communities in Southeastern Nigeria depend on the consumption and marketing of vegetable products obtained from the wild and semi-domesticated plants to meet their daily food and income needs. The information required shall be used to produce a Ph.D thesis. Moreover, it is also hoped that the study would lead to the identification of those important but neglected wild indigenous leafy vegetable sources the development of which would eventually lead to better improvement in nutritional situation in the country.

I therefore encourage you to give as accurate and comprehensive information as possible while promising that the information shall be held in strictest confidence.

Household Survey Questionnaire

Background Information

Place of Interview

State: Imo ☐ Anambra ☐ Ebonyi ☐

Agricultural Zone:……

Selected Urban Community:……

Selected Rural Community:……..

Date of Interview:……

Demographic Profile of Respondent

1. Age (in years)……

2. Sex: Male ☐ Female ☐

3. Highest educational level attained:……

- no formal education ☐
- primary education ☐
- secondary education ☐
- tertiary education ☐
- Others specify……

4. Family size:……

5. Occupation……

1. Give the name(s) (either in vernacular, english or botanical) of all the local leafy vegetable species consumed in the household within the last one week indicating the number of times each species was consumed, the type of meal for which it was used and the costs if bought or estimated costs if not bought thus:-

Name of vegetable	No of times Consumed	Actual cost	Estimated cost	Meal type used
i. ii iii. iv				

NB. Meal types include (a) soup (b) stew (c) salad (d) porridge (e) boiled and added to sources like rice, meat. (f) Others, specify

N.B: Various sources to include

a. Collected from around compound farms
b. Collected from other farm areas
c. Collected from the nearby forest land
d. Obtained from neighbours/friends
e. Bought from the market

6. For each vegetable species consumed, give reasons(s) for the consumption

Consumed leaf vegetable species	Reason(s) for the consumption
i. ii. iii.	

NB. Reasons for consumption may include one or more of the following:

a. Due to family preference or likeness for them.
b. Due to ready availability of the vegetable
c. Because of their relative cheapness
d. Because of type of meal for which they were used
e. Because it gives better flavour and taste to the meal
f. Because of the belief on its high nutritive value
g. Because its acquisition was free.

7. Mention the two most preferred leafy vegetable species by the majority of the household members.

1. ……(most preferred)
2. ……..(next in preference rating)

8. Give reasons for such high preference ratings for the vegetables)……
……

9. What percentage of family food budget for the week under review went into the purchase of vegetables.

a. 1-20% ☐ b. 21-40% ☐
c. 41-60% ☐ d. 61-80% ☐
e. 81-100% ☐

10. Mention if any problem(s) associated with vegetable consumption in the household during this period of the year.

……
……
……

11 What in your opinion could be done to ensure regular and increased supply of the vegetables at this time of the year.

……

……

……

Market Survey Questionnaire

1. Name and indicate the unit prices and the number of sellers by gender of each of the vegetable species in the market.

Vegetable species	Unit price	No of sellers by gender	
		Female	Male
a. b. c. d. e. f. g. h. i. j.			

2. By sampling a few of the sellers of each vegetable species, elucidate the following information

i. Sources of supply, i.e whether collected from own farm land; from forest areas; bought from other vendors; bought from outside the state.

iii. Income range per market day e.g. N200 – N400

iv. Profit range per market day e.g N50-N100

v. Whether sales are undertaken on a full-time or part time bases and

vi. Marketing constraints thus.

Appendix 2

Appendix 2.1: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by rural households in the study area in January.

166	Vegetable species	No of H.H that cons	% of H.H that cons	Freq of cons	Mean freq/ wk	% that bought	Total Exp/wk (₦)	Exp/H.H /wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary /H.H/wk(₦)
1	*T. occidentalis*	64	96. 3	201	3.1	43.9	2295.0	83.67	54.9	3615	104.71
2	*Solanum spp*	17	25.8	41	2.4	33.3	150.0	38.75	66.7	840	102.74
3	*Vernonia spp*	41	62.1	85	2.1	27.4	955.0	61.11	72.6	1280	52.41
4	*T triangulare*	16	24.2	37	2.3	37.2	270.0	42.50	59.4	470.0	60.21
5	*Amaranthus spp*	25	37.9	50	2.0	73.2	780.0	50.74	26.9	350.0	64.59
6	*M. koeningii*	4	6.1	9	2.3	33.3	10.0	10.0	66.7	40.0	13.75
7	*Corchorus spp*	1	1.5	3	3.0	----	----	----	100.0	30.0	30.0
8	*C. antiquorum*	*2*	*2.0*	*2*	*1.0*	----	----	----	*100.0*	*40.0*	*20.0*
9	***P. santaliniodes***	*14*	*21.2*	*22*	*1.6*	*22.2*	*90.0*	*23.33*	*77.8*	*410.0*	*37.17*
10	***P. guineense***	*2*	*2.0*	*3*	*1.5*	*100.0*	*30.0*	*15.0*	----	----	----
11	***Ocimum spp***	*8*	*12.1*	*13*	*1.6*	*72.2*	*130*	*20.0*	*27.8*	*85.0*	*28.33*
12	***G. latifolium***	*7*	*10.6*	*17*	*2.4*	*27.8*	*70.0*	*35.0*	*72.2*	*225.0*	*42.50*
13	***Pterocarpus spp***	*28*	*42.4*	*50*	*1.8*	*57.4*	*970.0*	*71.67*	*42.6*	*680.0*	*58.95*
14	***F. ovate***	*8*	*12.1*	*12*	*1.5*	----	----	----	*100.0*	*310.0*	*39.17*
15	***V. doniana***	*2*	*2.0*	*2*	*1.0*	----	----	----	*100.0*	*150.0*	*75.0*
16	***S. gilo raddi***	*1*	*1.5*	*1*	*1.0*	----	----	----	*100.0*	*40.0*	*40.0*
17	***S. nigrum***	*2*	*2.0*	*3*	*1.5*	*100*	*120.0*	*60.0*	----	----	----
18	***G. africanum***	*15*	*22.7*	*40*	*2.7*	*92.6*	*1490.0*	*132.22*	*13.0*	*60.0*	*60.0*

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild leafy vegetable species***

Appendix 2.2: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by rural households in the study area in February.

166	Vegetable species	No of H.H that cons	% of H.H that cons	Freq of cons	Mean freq/ wk	% of H.H that bought	Total exp/wk(₦)	Exp/H.H/wk (₦)	% of H.H that obtained	Total Monetary value (₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	64	97.0	192	3.0	57.2	2745	70.55	42.3	2230.0	84.52
2	*Solanum spp*	21	31.8	41	2.0	57.6	460	39.33	42.4	350.0	44.0
3	*Vernonia spp*	38	57.6	91	2.4	63.9	955	47.41	36.1	670.0	44.59
4	*T. triangulare*	15	22.7	22	1.5	72.2	465	42.59	27.8	185.0	32.92
5	*Amaranthus spp*	27	40.9	62	2.3	66.8	855	48.34	33.2	570.0	69.86
6	*M. koeningii*	3	4.6	6	2.0	25.0	50.0	50.0	75.0	45.0	22.50
7	*C. antiquorum*	2	3.0	3	1.5	----	----	----	100.0	25.0	12.50s
8	***P. santalinoides***	*7*	*10.6*	*9*	*1.3*	*33.3*	*80.0*	*40.0*	*66.7*	*170*	*36.25*
9	***G. africanum***	*16*	*24.2*	*29*	*1.8*	*79.4*	*1090*	*89.89*	*20.6*	*210*	*52.50*
10	***P. guineense***	*3*	*4.6*	*5*	*1.7*	*100.0*	*70.0*	*23.33*	----	----	----
11	***G. latifolium***	*9*	*13.6*	*12*	*1.3*	*37.5*	*90.0*	*25.0*	*62.5*	*100.0*	*16.67*
12	***Ocimum spp***	*12*	*18.2*	*26*	*2.2*	*50.0*	*130.0*	*18.35*	*50.0*	*180.0*	*23.0*
13	***F. ovate***	*4*	*6.1*	*7*	*1.8*	----	----	----	*100.0*	*140.0*	*33.34*
14	***S. nigrum***	*6*	*9.1*	*7*	*1.2*	*50.0*	*130*	*43.33*	*50.0*	*160.0*	*53.33*
15	***Pterocarpus spp***	*37*	*56.1*	*73*	*2.0*	*56.7*	*1340.0*	*65.38*	*43.3*	*795.0*	*74.44*

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild leafy vegetable species***

Appendix 2.3: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by rural households inthe study area in March.

170	Vegetable species	No of H.H that cons	% of H.H that cons	Freq of cons	Mean freq/ wk	% of H.H that bought	Total exp/wk(₦)	Exp/H.H/ wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	64	91.4	209	3.3	52.4	2715.0	78.90	47.6	2070	69.49
2	*Solanum spp*	22	31.4	58	2.6	52.1	430.0	43.33	47.9	385.0	38.33
3	*Vernonia spp*	45	64.3	114	2.5	47.7	1895.0	60.55	52.2	1395.0	51.50
4	*T. triangulare*	17	24.3	27	1.6	31.5	280.0	40.0	68.5	430.0	34.45
5	*Amaranthus spp*	37	52.9	94	2.5	63.9	1110.0	63.93	36.1	765.0	41.15
6	*M. koeningii*	6	8.6	11	1.8	83.3	80.0	21.67	16.7	30.0	15.0
7	*C. antiquorum*	2	2.9	2	1.0	----	----	----	100.0	20.0	10.0
8	***P. santalinoides***	*4*	*5.7*	*6*	*1.5*	*50.0*	*20.0*	*20.0*	*50.0*	*60.0*	*20.0*
9	***G. africanum***	*12*	*17.1*	*22*	*1.8*	*76.7*	*770.0*	*81.12*	*23.3*	*280.0*	*107.5*
10	***P. guineense***	*5*	*7.1*	*13*	*2.6*	*83.3*	*90.0*	*25.0*	*16.7*	*120.0*	*60.0*
11	***G. latifolium***	*8*	*11.4*	*21*	*2.6*	*38.9*	*130.0*	*45.0*	*61.1*	*140.0*	*22.50*
12	***Ocimum spp***	*17*	*24.3*	*29*	*1.7*	*49.1*	*240.0*	*24.17*	*50.9*	*220.0*	*26.72*
13	***V. doniana***	*1*	*1.4*	*2*	*2.0*	----	----	----	*100.0*	*20.0*	*20.0*
14	***S. nigrum***	*3*	*4.3*	*3*	*1.0*	*66.7*	*80.0*	*40.0*	*33.3*	*40.0*	*40.0*
15	***Pterocarpus spp***	*33*	*47.1*	*53*	*1.6*	*79.2*	*1120.0*	*53.20*	*20.9*	*620.0*	*53.34*
16	***C. argentea***	*1*	*1.4*	*2*	*2.0*	*100.0*	*20.0*	*20.0*	----	----	----

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild leafy vegetable species***

Appendix 2.4: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by rural households in the study area inApril.

173	Vegetable species	No of H.H that cons	% of H.H that cons	Freq of cons	Mean freq/ wk	% of H.H that bought	Total exp/wk(₦)	Exp/ H.H/WK(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	69	94.5	218	3.2	48.4	2180	68.86	51.6	2140	63.61
2	*Solanum spp*	25	34.3	44	1.8	68.5	355	39.89	31.5	540.0	56.95
3	*Vernonia spp*	49	67.1	97	2.0	46.1	785	41.72	53.9	1120.0	38.23
4	*T. triangulare*	26	17.8	48	1.9	63.2	375.0	62.50	36.8	580.0	35.19S
5	*Amaranthus spp*	33	45.2	76	2.3	59.8	380	37.0	40.2	580.0	44.22
6	*Cucurbita spp*	7	9.6	9	1.3	----	----	----	100.0	150.0	20.0
7	*M. koeningii*	10	13.7	16	1.6	65.0	170	37.50	35.0	10.0	10.0
8	*C. antiquorum*	4	5.5	5	1.3	----	----	----	100.0	45.0	11.25
9	***P. santalinoides***	*4*	*5.5*	*1*	*1.0*	----	----	----	*100.0*	*20.0*	*20.0*
10	***G africanum***	*17*	*23.3*	*35*	*2.1*	*69.2*	*980*	*64.72*	*30.8*	*400.0*	*50.0*
11	***P. guineense***	*1*	*1.4*	*3*	*3.0*	----	----	----	*100.0*	*10.0*	*10.0*
12	***G. latifolium***	*8*	*11.0*	*23*	*2.9*	*56.7*	*100*	*30.0*	*43.3*	*60.0*	*13.34*
13	***Ocimum spp***	*14*	*19.2*	*28*	*2.0*	*31.1*	*325*	*33.33*	*68.9*	*150.0*	*23.33*
14	***V. doniana***	*1*	*1.4*	*2*	*2.0*	----	----	----	*100.0*	*60.0*	*60.0*
15	***S.gilo raddi***	*1*	*1.4*	*1*	*1.0*	----	----	----	*100.0*	*40.0*	*40.0*
16	***S. nigrum***	*6*	*8.2*	*7*	*1.2*	*50.0*	*120*	*37.50*	*50.0*	*30.0*	*30.0*
17	***F. zanthozyloides***	*2*	*2.7*	*2*	*1.0*	*50.0*	*40.0*	*40.0*	*50.0*	*30.0*	*30.0*
18	***F. capensis***	*2*	*2.7*	*2*	*1.0*	----	----	----	*100.0*	*70.0*	*35.0*
20	***Pterocarpus spp***	*23*	*31.5*	*42*	*1.8*	*45.6*	*625.0*	*53.61*	*54.4*	*500.0*	*36.25*

Source: Field survey, 2007 ***NB: All vegetables in bold outlinesare wild leafy vegetable species***

Appendix 2.5: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by rural households in the study area in May.

1 73	Vegetable species	No of H.H that cons	% of H.H that cons	Freq of cons	Mean freq/ wk	% that bought	Total exp/wk(₦)	Exp/H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	71	97.3	238	3.4	44.9	2220	77.87	55.1	2355	63.07
2	*Solanum spp*	15	20.6	48	3.2	67.0	515.0	56.47	33.0	310	38.75
3	*Vernonia spp*	44	60.3	127	2.9	47.5	900.0	50.46	52.5	1310	59.92
4	*T. triangulare*	17	23.3	38	2.2	30.6	450.0	36.67	69.4	360.0	30.0
5	*Amaranthus spp*	46	63.0	104	2.3	56.5	865.0	44.54	43.5	1075	51.55
6	*Cucurbita spp*	11	15.1	19	1.7	12.5	20.0	20.0	57.5	230.0	22.50
7	*M. koeningii*	7	9.6	18	2.6	38.9	55.0	14.17	61.1	60.0	20.0
8	***Pterocarpus spp***	*25*	*34.3*	*58*	*2.3*	*66.1*	*715.0*	*63.19*	*33.9*	*630.0*	*56.50*
9	***P. santalinoides***	*3*	*4.1*	*3*	*1.0*	----	----	----	*100.0*	*40.0*	*22.50*
10	***G. africanum***	*10*	*13.7*	*26*	*2.6*	*55.6*	*470*	*52.33*	*44.4*	*530.0*	*176.67*
11	***P. guineense***	*4*	*5.5*	*11*	*2.8*	*75.0*	*70.0*	*22.50*	*25.0*	*20.0*	*20.0*
12	***G. latifolium***	*13*	*17.8*	*38*	*2.9*	*24.2*	*60.0*	*20.0*	*75.6*	*260.0*	*25.83*
13	***Ocimum spp***	*19*	*26.0*	*38*	*2.0*	*31.7*	*165.0*	*28.06*	*68.3*	*155.0*	*21.98*
14	***S. gilo raddi***	*1*	*1.4*	*1*	*1.0*	----	----	----	*100.0*	*40.0*	*40.0*
15	***S. nigrum***	*3*	*4.1*	*3*	*1.0*	*66.7*	*80.0*	*40.0*	*33.3*	*50.0*	*50.0*
16	***L. cupaniodes***	*1*	*1.4*	*1*	*1.0*	----	----	----	*100.0*	*20.0*	*20.0*
17	***C. argentea***	*1*	*1.4*	*1*	*1.0*	*100.0*	*20.0*	*20.0*	----	----	----

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild leafy vegetable species***

Appendix 2.6: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by rural households in the study area in June.

67	Vegetable species	No of H.H that cons	% of H.H that cons	Freq of cons	Mean freq wk	% of H.H that bought	Total Exp/wk(₦)	Exp/ H.H/wk (₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	65	97.0	215	3.3	51.6	3485.0	89.15	57.5	3690	115.41
2	*Solanum spp*	20	29.9	52	2.6	64.5	508.0	43.36	35.6	485	59.0
3	*Vernonia spp*	52	77.6	124	2.4	56.5	1875.0	59.05	45.3	1530	74.39
4	*T. triangulare*	30	44.8	61	2.0	54.7	571.0	46.70	50.8	1200	70.09
5	*Amaranthus spp*	39	58.2	102	2.6	52.7	1687.0	60.82	52.7	1160	60.56
6	*Cucurbita spp*	3	4.5	7	2.3	100.0	120.0	45.0	----	----	----
7	*M. koeningii*	12	17.9	27	2.3	60.8	390.0	53.33	39.2	260	30.0
8	***Pterocarpus spp***	*22*	*32.8*	*44*	*2.0*	*86.1*	*1290.0*	*70.46*	*13.9*	*190.0*	*47.50*
9	***P. santalinoides***	*3*	*4.5*	*6*	*2.0*	*66.7*	*60.0*	*30.0*	*33.3*	*80.0*	*80.0*
10	***G. africanum***	*18*	*26.9*	*47*	*2.6*	*73.4*	*1140*	*114.59*	*26.6*	*970.0*	*101.94*
11	***P. guineense***	*10*	*14.9*	*17*	*1.7*	*77.8*	*350.0*	*32.78*	*33.3*	*70.0*	*22.50*
12	***G. latifolium***	*9*	*13.4*	*13*	*1.4*	*20.8*	*140.0*	*42.50*	*79.2*	*140.0*	*23.33*
13	***Ocimum spp***	*12*	*17.9*	*24*	*2.0*	*25.9*	*180.0*	*82.50*	*66.7*	*145.0*	*18.06*
14	***S. nigrum***	*4*	*6.0*	*8*	*2.0*	----	----	----	*100.0*	*190.0*	*51.67*

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild leafy vegetable species***

Appendix 2.7: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by rural households in the study area in July.

67	Vegetable species	No of H.H that cons	% of H.H that cons	Freq of cons	Mean freq/ wk	% of H.H that bought	Total exp/w k (₦)	Exp/ H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/w k(₦)
1	*T. occidentalis*	59	96.7	188	3.2	53.4	2710.0	82.70	46.6	2260	88.31
2	*Solanum spp*	19	31.2	38	2.0	45.4	460.0	35.56	54.6	290.0	38.33
3	*Vernonia spp*	52	85.3	124	2.4	55.7	1830	58.16	44.3	1650	66.11
4	*T. triangulare*	13	21.3	26	2.0	33.3	290.0	45.0	66.7	310.0	65.0
5	*Amaranthus spp*	36	59.0	96	2.7	58.9	1830	69.94	41.1	870.0	66.11
6	*Cucurbita spp*	2	3.3	4	2.0	----	----	----	100.0	700.0	35.0
7	*M. koeningii*	9	14.8	13	1.4	58.3	115.0	19.17	41.7	45.0	12.50
8	*Corchorus spp*	1	1.6	2	2.0	100.0	20.0	20.0	----	----	----
9	***G. africanum***	*10*	*16.4*	*25*	*2.5*	*88.9*	*900.0*	*99.34*	*13.9*	*140.0*	*47.50*
10	***P. guineense***	*2*	*3.3*	*5*	*2.5*	----	----	----	*100.0*	*50.0*	*25.0*
11	***G.latifolium***	*7*	*11.5*	*12*	*1.7*	*8.3*	*20.0*	*20.0*	*91.7*	*185.0*	*30.0*
12	***Ocimum spp***	*18*	*29.5*	*33*	*1.8*	*51.9*	*305.0*	*25.74*	*48.2*	*160.0*	*30.19*
13	***Pterocarpus spp***	*12*	*19.7*	*15*	*1.3*	*38.9*	*260.0*	*52.50*	*61.1*	*630.0*	*78.33*
14	***S. gilo raddi***	*2*	*3.3*	*2*	*1.0*	*50.0*	*20.0*	*20.0*	*50.0*	*40.0*	*40.0*
15	***S. nigrum***	*3*	*4.9*	*4*	*1.3*	*66.7*	*90.0*	*45.0*	*33.3*	*40.0*	*40.0*

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild leafy vegetable species***

Appendix 2.8: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by rural households in the study area in August.

64	Vegetable species	No of H.H that cons	% of H.H that cons	Freq of cons	Mean freq/ wk	% of H.H that bought	Total Exp/wk (₦)	Exp/ H.H/wk (₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	63	98.4	255	3.6	55.26	2425.0	78.32	45.0	2825.0	114.63
2	*Solanum spp*	22	34.4	42	1.9	33.06	345.0	36.39	66.9	800.0	77.69
3	*Vernonia spp*	43	67.2	112	2.6	61.91	980.0	42.07	33.6	910.0	63.89
4	*T. triangulare*	14	21.9	21	1.5	33.33	150.0	33.33	63.9	240.0	32.22
5	*Amaranthus spp*	44	68.8	105	2.4	51.20	1040.0	47.67	45.1	1365.0	88.15
6	*Cucurbita spp*	3	4.7	10	3.3	50.0	100.0	100.0	50.0	80.0	40.0
7	*M. koeningii*	5	7.8	8	1.6	62.50	25.0	12.50	37.5	10.0	5.0
8	***Pterocarpus spp***	*10*	*15.6*	*20*	*2.0*	*86.1*	*380*	*81.25*	*63.9*	*260.0*	*58.33*
9	***P. santalinoides***	*4*	*6.3*	*5*	*1.3*	*33.33*	*130*	*65.0*	*66.7*	*100.0*	*50.0*
10	***G. africanum***	*16*	*25.0*	*30*	*1.9*	*77.86*	*870*	*95.42*	*22.2*	*450.0*	*133.33*
11	***P,. guineense***	*2*	*3.1*	*4*	*2.0*	*50.0*	*20.0*	*20.0*	*50.0*	*20.0*	*20.0*
12	***G. latifolium***	*11*	*17.2*	*27*	*2.5*	*25.0*	*20.0*	*10.0*	*75.0*	*615.0*	*71.25*
13	***Ocimum spp***	*15*	*23.4*	*29*	*1.9*	*38.89*	*155*	*14.38*	*61.1*	*140.0*	*16.67*
14	***F. ovate***	*1*	*1.6*	*7*	*7.0*	----	----	----	*100.0*	*30.0*	*30.0*
15	***S. gilo raddi***	*3*	*4.7*	*3*	*1.0*	*100.0*	*90*	*30.0*	----	----	----
16	***S. nigrum***	*4*	*6.3*	*6*	*1.5*	*50.0*	*110*	*55.0*	*50.0*	*80*	*40.0*

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild leafy vegetable species***

Appendix 2.9: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by rural households in the study area in September.

70	Vegetable species	No of H.H that cons	% of H.H that cons	Freq of cons	Mean freq wk	% of H.H that bought	Total Exp/wk (₦)	Exp/ H.H/wk (₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	67	95.7	201	3.0	47.0	2000.0	63.11	53.0	2600.0	77.97
2	*Solanum spp*	26	37.1	54	2.1	62.1	355.0	27.22	37.9	685.0	49.17
3	*Vernonia spp*	45	64.3	111	2.5	51.9	1075.0	46.06	48.2	965.0	46.41
4	*T. triangulare*	23	329	47	2.0	28.3	250.0	32.22	71.7	955.0	87.04
5	*Amaranthus spp*	40	57.1	103	2.6	42.8	900.0	47.96	40.3	1435.0	53.73
6	*Cucurbita spp*	4	5.7	6	1.5	----	----	----	100.0	95.0	22.50
7	*M. koeningii*	3	4.3	5	1.7	25.0	5.0	5.0	75.0	40.0	20.0
8	***Pterocarpus spp***	*17*	*24.3*	*27*	*1.6*	*52.6*	*440.0*	*53.96*	*42.4*	*640.0*	*90.0*
9	***P. santalinoides***	*11*	*15.7*	*14*	*1.3*	*50.0*	*1000.0*	*33.33*	*43.8*	*600*	*85.71*
10	***G. africanum***	*11*	*15.7*	*19*	*1.7*	*91.7*	*1280.0*	*135.56*	*8.3*	*650.0*	*325*
11	***P. guineense***	*6*	*8.6*	*12*	*2.0*	*100.0*	*300.0*	*42.22*	----	----	----
12	***G. latifolium***	*10*	*14.3*	*33*	*3.3*	*22.5*	*140.0*	*55.0*	*77.50*	*140.0*	*22.09*
13	***Ocimum spp***	*22*	*31.4*	*36*	*1.6*	*30.0*	*280.0*	*22.50*	*70.0*	*435.0*	*20.97*
14	***Corchorus spp***	*2*	*2.9*	*6*	*3.0*	----	----	----	*100*	*70.0*	*35.0*
15	***S. gilo raddi***	*1*	*1.4*	*1*	*1.0*	*100.0*	*40*	*40.0*	----	----	----

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild leafy vegetable species***

Appendix 2.10: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by rural households inthe study area in October.

	Vegetable species	No of H.H that cons	% of H.H that cons	Freq of cons	Mean freq / wk	% of H.H that bought	Total cost	Exp/H.H/ wk	% of H.H that obtained	Total est. cost	Est. cost/ H.H/wk
1	*T. occidentalis*	66	97.1	208	3.2	46.2	N3180	N112.60	53.8	N3180	N86.12
2	*Solanum spp*	19	27 .9	44	2.3	56.9	N515.0	N52.50	43.1	N380.0	N29.52
3	*Vernonia spp*	50	73.5	120	2.4	46.6	N1705.0	N47.13	52.3	N1370.0	N57.08
4	*T. triangulare*	27	39.7	48	1.8	54.6	N720.0	N48.43	43.5	N660.0	N38.45
5	*Amaranthus spp*	46	67.7	108	2.4	66.6	N1625	N50.71	35.0	N1150.0	N51.23
6	*Cucurbita spp*	1	1.5	1	1.0	----	-----	-----	100.0	N40.0	N40.0
7	*M. koeningii*	4	5.9	8	2.0	25.0	N20.0	N20.0	75.0	N75.0	N28.75
8	***Pterocarpus spp***	*24*	*35.3*	*42*	*1.8*	*54.8*	*N440*	*N45.83*	*45.2*	*N670.0*	*N49.08*
9	***P. santoliniodes***	*9*	*13.2*	*10*	*1.1*	*33.3*	*N80.0*	*N26.67*	*66.7*	*N360*	*N44.0*
10	***G. africanum***	*14*	*20.6*	*32*	*2.3*	*92.5*	*N1140.0*	*N104.17*	*7.5*	*N240*	*N120.0*
11	***P. guineense***	*4*	*5.9*	*5*	*1.3*	*100.0*	*N90.0*	*N35.0*	-----	----	----
12	***G. latifolium***	*6*	*8.8*	*15*	*2.5*	*33.3*	*N20.0*	*N20.0*	*66.7*	*N115.0*	*N24. 38*
13	***Ocimum spp***	*12*	*17.7*	*21*	*2.8*	*49.4*	*N130*	*N20.56*	*50.6*	*N100.0*	*N16.67*
14	***F. ovate***	*2*	*2.9*	*3*	*1.5*	----	----	----	*100.0*	*N40.0*	*N20.0*
15	***S. nigrum***	*2*	*2.9*	*3*	*1.5*	*50.0*	*N40.0*	*N40.0*	*50.0*	*N80.0*	*N80.0*

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild leafy vegetable species***

Appendix 2.11: **Weekly consumption and expenditure patterns of indigenous leafy vegetable species by rural households in the study area in November.**

	Vegetable species	No of H.H that cons	% of H.H that cons	Freq of cons.	Mean freq / wk	% of H.H that bought	Total cost/wk (₦)	Exp/H.H /wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	64	95.5	202	3.2	46.9	2170	76.28	55	2540	68.95
2	*Solanum spp* `	19	28 .4	46	2.4	59.4	375.0	27.08	40.6	310.0	34.45
3	*Vernonia spp*	45	67.2	112	2.5	58.1	1135	42.08	39.7	855.0	45.19
4	*T. triangulare*	28	41.8	62	2.2	40.6	470 .0	38.89	59.5	665.0	34.03
5	*Amaranthus spp*	25	37.3	71	2.8	57.0	795.0	63.89	43.1	920.0	75.67
6	*M. koeningii*	5	7.5	10	2.0	41.7	45.0	22.5	58.3	35.0	11.25
7	***Pterocarpus spp***	*26*	*38.8*	*39*	*1.5*	*48.5*	*400.0*	*36.56*	*46.0*	*630.0*	*40.93*
8	***P. santoliniodes***	*9*	*13.4*	*10*	*1.1*	*25.0*	*130.0*	*65.0*	*75.0*	*310.0*	*46.0*
9	***G. africanum***	*18*	*26.9*	*31*	*1.7*	*96.8*	*1615*	*72.89*	*3.2*	*50.0*	*50.0*
10	***P. guineense***	*6*	*9.0*	*6*	*1.0*	*91.7*	*80.0*	*17.78*	*8.3*	*10.0*	*10.0*
11	***G. latifolium***	*9*	*13.4*	*18*	*2.0*	----	----	----	*100.0*	*180.0*	*23.34*
12	***Ocimum spp***	*19*	*28.4*	*41*	*2.2*	*47.2*	*285*	*30.0*	*52.8*	*165.0*	*14.93*
13	***F. ovata***	*2*	*2.99*	*3*	*1.5*	----	----	----	*66.7*	*480.0*	*77.22*
14	***S. nigrum***	*2*	*3.0*	*2*	*1.0*	----	----	----	*100.0*	*80.0*	*40.0*
15	***V.doniana***	*1*	*1.5*	*3*	*3.0*	----	----	----	*100.0*	*100.0*	*60.0*

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild leafy vegetable species***

Appendix 2.12: Weekly consumption and expenditure patterns ofindigenous leafy vegetable species by rural households in the study area in December.

1	*T. occidentalis*	60	88.24	149	2.48	65.96	N2880	N69.37	34.04	N1560	N77.40
2	*Solanum spp*	18	26.5	31	1.7	44.1	N500.0	N48.83	56.0	N270.0	N36.67
3	*Vernonia species*	43	63.2	88	2.1	62.0	N1280	N45.32	38.0	N740.0	N54.61
4	*T. triangulare*	21	30.9	31	1.5	87.8	N780.0	N44.35	15.9	N580.0	N80.0
5	*Amaranthus spp*	39	57.4	85	2.2	81.9	N1675.0	N55.89	18.2	N260.0	N38.33
6	*Cucurbita spp*	1	1.5	2	2.0	100.0	N80.0	N80.0	-----	----	----
7	*M. koeningii*	2	2.9	3	1.5	100.0	N50.0	N20.0	-----	----	----
8	*Corchorus spp*	5	7.4	15	3.0	100.0	N150.0	N37.50			
9	***Pterocarpus santaliniodes***	*4*	*5.9*	*4*	*1.0*	*50.0*	*N80.0*	*N40.0*	*50.0*	*N50.0*	*N25.0*
10	***G. africanum***	*16*	*23.5*	*24*	*1.5*	*92.8*	*N1000*	*N59.26*	*7.2*	*N175.0*	*N81.25*
11	***P. guineense***	*5*	*7.4*	*6*	*1.2*	*62.5*	*N50.0*	*N17.50*	*37.5*	*N35.0*	*N17.50*
12	***G. latifolium***	*11*	*16.2*	*17*	*1.6*	*50.0*	*N180.0*	*N22.50*	*50.0*	*N95.0*	*N27.50*
13	***Pterocarpus spp***	*39*	*57.4*	*76*	*2.0*	*81.2*	*N1990.0*	*N57.41*	*16.6*	*N210.0*	*N43.33*
14	***Ficus ovate***	*1*	*1.5*	*1*	*1.0*	-----	-----	-----	*100.0*	*N20.0*	*N20.0*
15	***C. argentea***	*1*	*1.5*	*1*	*1.0*	*100*	*N10.0*	*N10.0*	-----	-----	----
16	***S. nigrum***	*4*	*5.9*	*4*	*1.0*	*75.0*	*N150*	*N50.0*	*25.0*	*N40.0*	*N40.0*
17	***S. gilo raddi***	*1*	*1.5*	*1*	*1.0*	*100.0*	*N10.0*	*N10.0*	-----	-----	-----
18	***Ocimum spp***	*18*	*26.5*	*30*	*1.7*	*55.6*	*N310.0*	*N23.59*	*44.5*	*N155.0*	*N28.56*

Source: Field survey, 2007 ***NB: All vegetables in bold outlinesare wild leafy vegetable species***

Appendix 2.13: One year average for the weekly consumption and expenditure patterns of indigenous leafy vegetable species by rural households in Ebonyi State.

S/N		No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq/wk	% of H.H that bought	Total cost/wk (₦)	Exp/ H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	231	96.4	612	2.7	37.2	626.67	76.25	63.9	1194.17	96.79
2	*Solanum spp*	124	47.5	239	1.9	36.0	121.67	31.84	64.0	310.08	54.67
3	*Vernonia spp*	144	55.8	205	1.4	36.6	218.33	45.04	62.9	409.58	58.75
4	*T. triangulare*	47	9.0	73	1.5	67.1	101.67	51.60	32.9	123.33	45.17
5	*Amaranthus spp*	143	54.8	276	1.9	46.4	253.33	48.88	54.5	415.0	24.54
6	*Cucurbita spp*	19	7.3	36	1.9	20.0	60.0	30.0	80.0	81.25	26.88
7	*M. koeningii*	6	2.3	8	1.3	87.5	31.25	27.50	12.5	10.0	10.0
8	***Pterocarpus spp***	*101*	*38.7*	*152*	*1.5*	*45.8*	*250.91*	*62.18*	*52.0*	*337.50*	*71.78*
9	***P. santalinoides***	*79*	*30.3*	*109*	*1.4*	*35.1*	*102.22*	*38.89*	*64.4*	*225.91*	*43.96*
10	***G. africanum***	*12*	*4.6*	*16*	*1.3*	*95.8*	*152.50*	*92.50*	*4.2*	*20.0*	*20.0*
11	***G. latifolium***	*12*	*4.6*	*18*	*1.5*	*45.0*	*48.0*	*40.0*	*55.0*	*38.0*	*26.25*
12	***Ocimum spp***	*20*	*7.7*	*25*	*1.3*	*58.3*	*35.63*	*21.04*	*41.7*	*17.86*	*15.71*
13	***F. ovate***	*27*	*10.4*	*51*	*1.9*	----	----	----	*100.0*	*173.33*	*36.42*
14	***S. nigrum***	*37*	*14.2*	*48*	*1.3*	*54.6*	*103.33*	*48.98*	*45.5*	*98.89*	*45.05*
15	***L. cupaniodes***	*1*	*0.4*	*1*	*1.0*	---	----	----	*100.0*	*20.0*	*20.0*
16	***F. zanthoxyloides***	*4*	*1.5*	*4*	*1.0*	*16.7*	*40.0*	*40.0*	*83.3*	*43.33*	*43.33*
17	***S. gilo raddi***	*11*	*4.2*	*11*	*1.0*	*35.7*	*50.0*	*30.0*	*64.3*	*62.50*	*51.25*
18	***V. doniana***	*6*	*2.3*	*10*	*1.7*	----	----	----	*100.0*	*62.0*	*47.0*
19	***F. capensis***	*2*	*0.8*	*2*	*1.0*	----	----	----	*100.0*	*70.0*	*35.0*
	Total	***1026***	***392.6***	***1896***	***28.5***	***717.7***	***2195.51***	***684.70***	***1180.9***	***3712.73***	***772.55***
	Mean	**54**	**20.7**	**99.8**	**1.50**	**47.9**	**146.37**	**45.65**	**62.2**	**195.41**	**40.66**
	Mean for DILVs	**102**	**39.0**	**76.4**	**1.8**	**47.3**	**201.85**	**44.44**	**52.9**	**363.34**	**45.26**
	Mean for WILVs	**26**	**10.0**	**23.6**	**1.3**	**32.2**	**97.82**	**46.70**	**67.5**	**97.44**	**37.98**

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild indigenous leafy vegetable species***

Appendix 2.14: One year average for the weekly consumption and expenditure patterns of indigenous leafy vegetable species by rural households in Anambra State.

S/N		No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq/ wk	% of H.H that bought	Total cost/wk (₦)	Exp/H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	292	94.8	1117	3.8	64.1	1132.92	76.45	36.7	606.25	70.01
2	*Solanum spp.*	64	20.8	174	2.7	58.4	131.64	35.85	41.5	71.0	32.33
3	*Vernonia spp.*	222	72.1	716	3.2	64.3	684.17	62.48	35.9	413.33	55.30
4	*T. triangulare*	89	28.9	208	2.3	39.8	120.09	27.33	60.1	115.83	29.09
5	*Amaranthus spp.*	208	67.5	620	3.0	66.0	547.08	60.91	34.8	369.58	56.70
6	*Cucurbita spp.*	1	0.3	1	1.0	----	----	----	100.0	10.0	10.0
7	*M. koeningii*	59	19.2	120	2.0	46.7	46.67	21.53	53.3	51.25	16.79
8	*Corchorus spp.*	3	1.0	9	3.0	----	----	----	100	50.0	32.50
9	*C. antiquorum*	12	3.9	14	1.2	20.0	20.0	20.0	80.0	32.50	17.19
10	***G. latifolium***	*49*	*15.9*	*118*	*2.4*	*23.0*	*25.71*	*14.29*	*77.0*	*61.67*	*21.98*
11	***Ocimum spp***	*127*	*41.2*	*243*	*1.9*	*52.7*	*171.67*	*28.55*	*48.3*	*107.33*	*22.40*
12	***Pterocarpus spp.***	*62*	*20.1*	*175*	*2.8*	*75.3*	*355.0*	*64.37*	*24.8*	*67.50*	*61.25*
13	***G. africanum***	*3*	*1.0*	*12*	*4.0*	*100*	*262.50*	*137.50*	----	----	----
14	***C. argentea***	*2*	*0.7*	*3*	*1.5*	*100.0*	*20.0*	*20.0*	----	----	----
	Total	**1193**	**387.3**	**3530**	**34.9**	**710.1**	**3517.45**	**569.26**	**692.4**	**1956.24**	**425.54**
	Mean	**85.2**	**27.7**	**252.14**	**2.5**	**50.7**	**293.12**	**47.44**	**49.5**	**163.02**	**35.46**
	Mean for DILVs	**105.6**	**34.3**	**84.39%**	**2.5**	**39.9**	**383.22**	**43.51**	**60.3**	**191.08**	**35.55**
	Mean for WILVs	**48.6**	**15.8**	**15.61%**	**2.5**	**70.2**	**166.98**	**52.94**	**30.0**	**78.83**	**35.21**

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild indigenous leafy vegetable species***

Appendix 2.15: **One year average for the weekly consumption and expenditure patterns ofindigenous leafyvegetable species by rural households in Imo State.**

S/N		**No of H.H that cons.**	**% of H.H that cons**	**Freq. of cons./wk**	**Mean freq / week**	**% of H.H that bought**	**Total exp./wk(₦)**	**Exp /H.H/ wk(₦)**	**% of H.H that obtained**	**Total Monetary value(₦)**	**Monetary value/H.H/wk(₦)**
*1	*T. occidentalis*	235	96.3	731	3.1	46.9	695.42	74.70	53.8	862.92	84.69
2	*Solanum spp*	51	20.9	127	2.5	59.7	153.64	48.71	40.3	120.0	65.18
*3	*Vernonia spp*	177	72.5	3 72	2.1	48.7	312.92	37.42	50.9	372.92	50.50
4	*T. triangulare*	111	45.5	197	1.8	46.7	242.08	52.11	49.7	284.17	62.92
5	*Amaranthus spp*	69	28.3	135	2.0	65.3	177.72	52.35	30.4	146.0	65.45
6	*Cucurbita spp*	11	4.5	20	1.8	32.1	60.0	60.0	67.9	56.0	28.50
7	*M. koeningii*	11	4.5	26	2.4	38.3	120.0	85.0	61.7	30.0	30.0
8	***Pterocarpus spp***	*114*	*46.7*	*210*	*1.8*	*53.9*	*219.17*	*48.45*	*46.1*	*197.92*	*48.99*
9	***P. santcliniodes***	*2*	*0.8*	*4*	*2.0*	----	----	----	*100.0*	*50.0*	*50.0*
*10	***G. africanum***	*151*	*61.9*	*331*	*2.2*	*71.1*	*880.0*	*93.44*	*30.8*	*347.50*	*110.37*
11	***P. guineense***	*49*	*20.1*	*91*	*1.9*	*69.0*	*122.0*	*27.36*	*31.9*	*40.0*	*22.19*
12	***G. latifolium***	*42*	*17.2*	*104*	*2.1*	*17.7*	*66.67*	*43.75*	*82.3*	*111.25*	*35.76*
13	**Ocimum spp**	31	12.7	67	2.2	11.7	60.0	60.0	85.0	69.50	32.79
	Total	**1054**	**432.0**	**2414**	**28.1**	**561.1**		**683.29**	**730.7**		**690.34**
	Mean	**81.1**	**30.9**	**185.7**	**2.2**	**43.2%**		**56.94**	**56.2**		**53.10**
	Mean for DILVs	**665**	**38.9**	**66.6%**	**2.2**	**60.2%**		**58.6I**	**48.5**		**55.75**
	Mean for WILVs	**389**	**26.5**	**33.4%**	**2.1**	**39.8%**		**54.60**	**51.5**		**50.22**

Source: Field survey, 2007. ***NB: All vegetables in bold outlines are WILVs***

Appendix 2.16: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by urban households in the study area in January.

	Vegetable species	No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq / wk	% of H.H that bought	Total cost/ wk (₦)	Exp / H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. Occidentalis*	60	89.6	170	2.8	80.9	3725.0	90.34	19.1	955.0	85.42
2	*Solanum spp.*	26	38.8	38	1.5	71.1	720	52.50	21.3	150.0	30.0
3	*Vernonia spp.*	42	62.7	83	2.0	72.8	1290	47.25	27.2	855.	66.79
4	*T. triangulare*	9	13.4	14	1.6	86.1	570.0	78.83	13.9	205.0	66.25
5	*Amaranthus spp.*	29	43.3	54	1.9	85.7	970.0	51.35	8.80	120.0	37.50
6	*Cucurbita spp.*	1	1.5	1	1.0	100.0	50.0	50.0	----	----	----
7	*M. koeningii*	1	1.5	1	1.0	100.0	30.0	30.0	----	----	----
8	*Corchorus spp.*	4	6.0	14	3.5	100.0	100.0	25.0	----	----	----
9	*C. antiquorum*	1	1.5	1	1.0	----	----	----	100.0	10.0	10.0
10	***G. africanum***	*10*	*15.0*	*20*	*2.0*	*82.2*	*610.0*	*84.17*	*17.8*	*50.0*	*50.0*
11	***P. guineense***	*3*	*4.5*	*5*	*1.7*	*50.0*	*40.0*	*40.0*	*50.0*	*15.0*	*15.0*
12	***G. latifolium***	*6*	*9.0*	*13*	*2.2*	*58.3*	*120.0*	*30.0*	*41.7*	*25.0*	*12.50*
13	***Pterocarpus spp.***	*33*	*49.3*	*66*	*2.0*	*87.7*	*1570.0S*	*44.45*	*12.3*	*120.0*	*42.50*
14	***F. ovate***	*1*	*1.5*	*1*	*1.0*	----	----	----	*100.0*	*30.0*	*30.0*
15	***C. argentea***	*1*	*1.5*	*1*	*1.0*	----	----	----	*100.0*	*10.0*	*10.0*
16	***P. santaliniodes***	*4*	*6.0*	*6*	*1.5*	----	----	----	*100.0*	*150.0*	*41.67*
17	***Ocimum spp.***	*17*	*25.4*	*29*	*1.7*	*59.6*	*330.0*	*26.25*	*40.4*	*200.0*	*33.33*
18	***S. nigrum***	*2*	*3.0*	*3*	*1.5*	*100.0*	*140*	*70.0*	----	----	----

Source: Field survey, 2007 ***NB: All vegetables in bold outlinesare wild leafy vegetable species***

Appendix 2.17: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by urban households in the study area in February.

	Vegetable species	No of H.H that cons.	% of H.H that cons	Freq of cons	Mean freq / wk	% of H.H that bought	Total cost/wk (₦)	Exp/H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	62	91.2	163	2.6	45.4	1335	50.28	54.6	2455	69.14
2	*Solanum spp*	14	20.6	32	2.3	16.7	130	43.33	83.3	385	29.64
3	*Vernonia spp.*	39	57.4	76	2.0	35.0	595	44.33	65.0	1295	50.87
4	*T. triangulare*	21	30.9	40	1.9	48.2	460.0	34.72	51.9	335	40.0
5	*Amaranthus spp*	29	42.7	55	1.9	58.9	1080	66.83	41.1	635.0	57.43
6	*M. koeningii*	10	14.7	23	2.3	58.3	100.0	18.75	41.7	90.0	9.5
7	*C. antiquorum*	2	2.9	2	2.0	----	----	----	100.0	30.0	15.0
8	***P. santoliniodes***	*16*	*23.5*	*27*	*1.7*	*19.2*	*230.0*	*46.67*	*80.8*	*435*	*45.70*
9	***G. africanum***	*11*	*16.2*	*23*	*2.1*	*53.3*	*560.0*	*70.0*	*46.7*	*210*	*70.0*
10	***P. guineense***	*4*	*5.9*	*7*	*1.8*	*50.0*	*120.0*	*40*	*50.0*	*20.0*	*20.0*
11	***G. latifolium***	*7*	*10.3*	*12*	*1.7*	*33.3*	*N\30.0*	*15.0*	*66.7*	*105.0*	*25.0*
12	***Ocimum spp***	*10*	*14.7*	*17*	*1.7*	*35.4*	*200.0*	*40.0*	*64.6*	*110.0*	*20.84*
13	***F. ovate***	*10*	*14.7*	*19*	*1.9*	-----	----	-----	*100.0*	*410.0*	*41.0*
14	***Pterocarpus spp***	*30*	*44.1*	*93*	*3.1*	*70.2*	*960.0*	*51.4*	*29.8*	*720.0*	*78.43*
15	***S. gilo raddi***	*2*	*2.9*	*2*	*1.0*	----	-----	-----	*100*	*90.0*	*45.0*
16	***S. nigrum***	*2*	*2.9*	*2*	*1.0*	*100.0*	*60.0*	*30*	----	----	----
17	***V. doniana***	*1*	*1.5*	*1*	*1.0*	----	----	-----	*100*	*20.0*	*20.0*

Appendix 2.18: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by urban households in the study area in March.

	Vegetable species	No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq / wk	% of H.H that bought	Total cost/wk (₦)	Exp/H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	63	88.7	208	3.3	74.2	3305.0	73.38	25.8	2060.0	142.50
2	*Solanum spp.*	20	28.2	35	1.8	79.6	520.0	38.50	20.4	210.0	40.0
3	*Vernonia spp*	41	57.8	104	2.5	74.8	1250.0	47.22	25.2	620.0	58.67
4	*T. triangulare*	18	25.4	41	2.3	85.2	635.0	35.83	14.8	550.0	52.78
5	*Amaranthus spp.*	27	38.0	70	2.6	86.7	1220.0	56.99	13.3	230.0	55.0
6	*Cucurbita spp.*	2	2.8	5	2.5	50.0	50.0	50.0	50.0	60.0	60.0
7	*M. Koeningii*	5	7.0	10	2.0	83.3	70.0	20.0	16.7	20.0	20.0
8	*Corchorus spp*	9	12.7	41	4.6	100.0	305.0	36.57	----	---	----
9	***P. santaliniodes***	*5*	*7.0*	*6*	*1.2*	*50.0*	*140.0*	*33.34*	*50.0*	*30.0*	*30.0*
10	***G. africanum***	*9*	*12.7*	*25*	*2.8*	*100.0*	*850.0*	*80.28*	----	----	----
11	***P. guineense***	*3*	*4.2*	*4*	*1.3*	*50.0*	*10.0*	*10.0*	*50.0*	*15.0*	*15.0*
12	***G. latifolium***	*5*	*7.0*	*8*	*1.6*	*91.7*	*100.0*	*33.34*	*8.3*	*30.0*	*30.0*
13	***Ocimum spp***	*23*	*32.4*	*37*	*1.6*	*54.6*	*380.0*	*31.45*	*45.4*	*210.0*	*23.61*
14	***Pterocarpus spp.***	*30*	*42.3*	*57*	*1.9*	*95.8*	*1560.0*	*53.13*	*4.2*	*70.0*	*35.0*
15	***S. gilo raddi***	*1*	*1.4*	*1*	*1.0*	*100.0*	*30.0*	*30.0*	----	---	---
16	***S. nigrum***	*4*	*5.6*	*4*	*1.0*	*100.0*	*150.0*	*38.34*	----	----	---

Source: Field survey, 2007 ***NB: All vegetables in bold outlinesare wild leafy vegetable species***

Appendix 2.19: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by urban households in the study area in April.

	Vegetable species	No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq / wk	% of H.H that bought	Total cost/wk (₦)	Exp/H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	67	93.1	236	3.5	83.6	4630.0	87.24	16.4	810.0	78.33
2	*Solanum spp.*	16	22.2	29	1.8	88.1	380.0	30.28	11.9	60.0	30.0
3	*Vernonia spp.*	47	65.3	121	2.6	70.6	2830.0	94.92	29.4	555.0	41.46
4	*T. triangulare*	18	25.0	36	2.0	32.2	465.0	40.21	67.8	365.0	39.72
5	*Amaranthus spp.*	30	41.7	78	2.6	84.7	1670.0	81.22	15.3	210.0	52.22
6	*Cucurbita spp.*	1	1.4	1	1.0	100.0	20.0	20.0	----	---	----
7	*M. koeningii*	6	8.3	10	1.7	75.0	90.0	22.50	25.0	20.0	10.0
8	*Corchorus spp.*	35	48.6	79	2.2	97.2	3720.0	149.15	2.8	40.0	40.0
9	*C. antiquorum*	1	1.4	1	1.0	100.0	10.0	10.0	----	----	----
10	***G. africanum***	18	25.0	31	1.7	83.3	1060.0	68.06	16.7	40.0	40.0
11	***P. guineense***	8	11.1	18	2.3	75.0	490.0	208.34	25.0	25.0	12.50
12	***G. latifolium***	11	15.3	25	2.3	66.7	1050.0	18.75	33.3	40.0	20.0
13	***Ocimum spp.***	12	16.7	28	2.3	69.4	140.0	23.34	30.6	130.0	26.67
14	***Pterocarpus spp.***	35	48.6	79	2.2	97.2	3720.0	149.15	2.8	40.0	40.0
15	***F. Ovata***	1	1.4	1	1.0	----	----	----	100.0	50.0	50.0
16	***C. argentea***	1	1.4	1	1.0	100.0	20.0	20.0	----	----	----
17	***P. santalinoides***	1	1.4	1	1.0	100.0	20.0	20.0	----	----	----
18	***S. nigrum***	3	4.2	4	1.3	66.7	80.0	40.0	33.3	80.0	80.0
19	***S. gilo raddi***	1	1.4	1	1.0	100.0	40.0	40.0	----	----	----
20	**V. doniana**	1	1.4	2	2.0	----	----	----	100.0	30.0	30.0

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild leafy vegetable species***

Appendix 2.20: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by urban household in the study area in May.

	Vegetable species	No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq / wk	% of H.H that bought	Total cost/wk (₦)	Exp/H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	62	92.5	218	3.5	87.5	2371.66	72.72	18.8	720.0	83.33
2	*Solanum spp.*	21	31.3	61	2.9	71.8	560.0	40.37	28.2	170.0	33.33
3	*Vernonia spp.*	43	64.2	94	2.2	71.4	1475	57.56	26.8	700.0	65.03
4	*T. triangulare*	29	43.3	67	2.3	68.7	735.0	39.35	31.3	665.0	67.50
5	*Amaranthus spp.*	37	55.2	102	2.8	61.7	1400.0	56.09	38.3	500.0	65.56
6	*Cucurbita spp.*	4	6.0	5	1.3	50.0	50.0	25.0	50.0	50.0	25.0
7	*M. koeningii*	7	10.5	16	2.3	62.5	45.0	16.25	37.5	30.0	15.0
8	*Corchorus spp.*	7	10.5	34	4.9	100.0	205	21.25	----	----	----
9	***P. santalinoides***	*4*	*6.0*	*6*	*1.5*	*50.0*	*180.0*	*55.0*	*50.0*	*60.0*	*60.0*
10	***G. africanum***	*8*	*11.9*	*11*	*1.4*	*100.0*	*540*	*67.50*	----	----	----
11	***P. guineense***	*7*	*10.5*	*24*	*3.4*	*51.9*	*180.0*	*33.75*	*33.3*	*60.0*	*60.0*
12	***G. latifolium***	*4*	*6.0*	*8*	*2.0*	*100.0*	*90.0*	*30.0*	----	----	----
13	***Ocimum spp.***	*17*	*25.4*	*25*	*1.5*	*61.1*	*200.0*	*24.45*	*38.9*	*160.0*	*21.53*
14	***Pterocarpus spp.***	*29*	*43.3*	*55*	*1.9*	*87.0*	*1450.0*	*60.83*	*13.0*	*90.0*	*30.0*
15	***S. nigrum***	*3*	*4.5*	*9*	*3.0*	*50.0*	*100.0*	*50.0*	*50.0*	*60.0*	*60.0*
16	***S. gilo raddi***	*1*	*1.5*	*1*	*1.0*	*100.0*	*40*	*40.0*	----	----	----

Source: Field survey, 2007 ***NB: All vegetables in bold outline are wild leafy vegetable species***

Appendix 2.21: Weekly consumption and expenditure patterns of indigenous leafy vegetable species byurban household in the study area in June.

	Vegetable species	No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq / wk	% of H.H that bought	Total cost/wk (₦)	Exp/H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	61	98.39	215	3.52	76.12	4125	187.32	23.88	1580	103.22
2	*Solanum spp*	15	24.19	22	1.47	55.98	490.0	83.33	44.02	285.0	40.42
3	*Vernonia spp.*	41	66.13	76	1.85	70.12	1655.0	91.48	35.45	740.0	49.19
4	*T. triangulare*	23	37.10	35	1.52	68.32	1040.0	62.11	30.37	280.0	35.0
5	*Amaranthus spp.*	43	69.39	103	2.40	78.52	2515.0	87.61	21.48	760.0	105.0
6	*Cucurbita spp.*	3	4.39	5	1.67	25.0	50.0	50.0	75.0	80.0	40.0
7	*M. koeningii*	8	12.90	10	1.25	80.56	130.0	21.11	19.44	85.0	42.50
8	*Corchorus spp.*	2	3.23	2	1.0	-	-	-	100.0	20.0	10.0
9	***G. africanum***	19	30.65	43	2.26	97.22	255.0	151.42	-	-	-
10	***P. guineense***	6	9.68	14	2.33	100.0	210.0	27.78	-	-	-
11	***G. latifolium***	4	6.45	6	1.50	100.0	100.0	23.33	-	-	-
12	***O. gratissimum***	15	24.19	20	1.33	54.63	130.0	18.89	45.37	190.0	18.89
13	***P. soyauxii***	24	38.71	49	2.04	98.15	1730.0	148.67	1.85	40.0	40.0

Source: Field survey, 2007 NB: All vegetable species in bold outlines are wild leafy vegetables

Appendix 2.22: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by urban household in the study area in July.

	Vegetable species	No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq / wk	% of H.H that bought	Total cost/wk (₦)	Exp/H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	68	100.0	245	3.60	60.20	3605.0	103.98	38.21	2650	118.56
2	*Solanum spp*	15	22.06	37	2.47	58.52	910.0	129.17	41.48	250.0	55.84
3	*Vernonia spp.*	53	77.94	131	2.47	51.76	1790.0	54.33	50.71	1395.0	89.08
4	*T. triangulare*	17	25.0	25	1.47	36.11	455.0	46.95	66.67	450.0	77.84
5	*Amaranthus spp.*	44	64.71	127	2.89	56.11	2115.0	71.44	43.41	1085.0	51.11
6	*Curcubita spp.*	1	1.47	1	1.0	-	-	-	100.0	20.0	20.0
7	*M. koeningii*	9	13.24	16	1.78	48.15	80.0	18.34	50.0	90.0	22.50
8	*Corchorus spp.*	8	11.76	26	3.25	100.0	485.0	37.29	-	-	-
9	***P. santaliniodes***	1	1.47	1	1.0	-	-	-	100.0	80.0	80.0
10	***G. africanum***	7	10.29	17	2.43	61.11	830.0	168.33	38.89	280.0	95.0
11	***P. guineense***	5	7.35	16	3.20	16.67	130.0	65.0	83.33	55.0	17.50
12	***G. latifolium***	10	14.71	21	2.10	50.0	130.0	28.33	44.44	300.0	55.0
13	***O. gratissimum***	19	27.94	37	1.95	56.67	250.0	26.67	43.33	195.0	19.45
14	***P. soyauxii***	24	35.29	37	1.54	61.11	765.0	55.69	38.89	435.0	N48.75
15	***S. gilo raddi***	1	1.47	1	1.0	-	-	-	100.0	40.0	40.0

Source: Field survey, 2007 NB: All vegetable species in bold outline are wild leafy vegetables

Appendix 2.23: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by urban household in the study area inAugust.

	Vegetable species	No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq / wk	% of H.H that bought	Total cost/wk (₦)	Exp/H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	65	97.01	213	3.28	71.12	3505.0	148.65	28.88	1480.0	68.53
2	*Solanum spp*	16	23.88	42	2.63	81.02	745.0	86.67	18.98	110.0	27.50
3	*Vernonia spp.*	53	79.10	118	2.23	62.86	1635.0	40.09	32.70	625.0	47.57
4	*T. triangulare*	14	20.90	21	1.50	70.37	595.0	71.39	29.63	200.0	31.67
5	*Amaranthus spp.*	39	58.21	112	2.87	70.24	1855.0	85.85	28.17	725.0	50.70
6	*M. koeningii*	7	10.45	11	1.57	83.33	80.0	17.50	16.67	20.0	10.0
7	*Corchorus spp.*	8	11.94	32	4.0	100.0	325.0	57.17	-	-	-
8	***G. africanum***	13	19.40	27	2.08	84.72	104.0	87 .78	14.59	200.0	66.67
9	***P. guineense***	4	5.97	11	2.75	75.0	90.0	30.0	25.0	15.0	15.0
10	***G. latifolium***	5	7.46	14	2.80	87.5	70.0	25.0	12.50	10.0	10.0
11	***O. gratissimum***	15	22.39	21	1.4	70.0	490.0	26.94	30.0	8 0.0	18.34
12	***P. soyauxii***	14	20.90	20	1.43	73.61	556.67	92.50	30.56	310.0	56.25

Source: Field survey, 2007 NB: All vegetables in bold outline are wild leafy vegetable species

Appendix 2.24: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by urban households in the study area in September.

	Vegetable species	No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq/wk	% of H.H that bought	Total cost/wk (₦)	Exp/H.H/wk (₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	67	95.7	197	2.9	60.9	2760.0	76.62	37.5	2090.0	77.11
2	*Solanum spp.*	23	32.9	47	2.0	70.7	710.0	40.42	29.3	290.0	39.17
3	*Vernonia spp.*	45	64.3	119	2.6	63.4	1320.0	49.28	36.6	900.0	60.19
4	*T. triangulare*	24	34.3	30	1.3	47.2	305.0	30.65	52.8	595.0	53.61
5	*Amaranthus spp.*	43	61.4	112	2.1	63.5	1340.0	55.46	36.5	1600.0	105.33
6	*M. koeningii*	6	8.6	10	1.7	100.0	80.0	13.34	----	----	---
7	*Corchorus spp.*	5	7.1	24	4.8	100.0	155.0	27.0	----	----	----
8	***P. Santalinoides***	*6*	*8.6*	*8*	*1.3*	*25.0*	*100.0*	*50.0*	*75.0*	*290.0*	*75.0*
9	***G. africanum***	*12*	*17.1*	*20*	*1.7*	*84.1*	*720.0*	*84.44*	*15.9*	*390.0*	*195.0*
10	***P. guineense***	*4*	*5.7*	*7*	*1.8*	*25.0*	*40.0*	*40.0*	*75.0*	*20.0*	*10.0*
11	***G. latifolium***	*11*	*15.7*	*16*	*1.5*	*75.0*	*175.0*	*20.84*	*16.7*	*30.0*	*30.0*
12	***Ocimum spp.***	*15*	*21.4*	*23*	*1.5*	*88.1*	*220.0*	*27.04*	*11.9*	*320.0*	*45.0*
13	***Pterocarpus spp.***	*22*	*31.4*	*47*	*2.1*	*83.3*	*1260.0*	*62.14*	*16.7*	*410.0*	*70.0*
14	***S. nigrum***	*4*	*5.7*	*5*	*1.3*	*100.0*	*70.0*	*42.50*	----	----	----
15	***S. gilo raddi***	*2*	*2.86*	*2*	*1.0*	*100.0*	*70.0*	*35.0*	----	----	----

Source: Field survey, 2007 ***NB: All vegetables in bold outlinesare wild leafy vegetable species***

Appendix 2.25: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by urban households in the study area in October.

	Vegetable species	No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq/wk	% of H.H that bought	Total cost/wk (₦)	Exp/H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	73	100.0	221	3.0	66.1	4005.0	90.56	34.0	2050.0	76.97
2	*Solanum spp.*	25	34.3	53	2.1	72.2	850.0	43.98	29.9	255.0	34.17
3	*Vernonia spp.*	49	67.1	113	2.3	63.2	1330.0	39.18	36.8	920.0	62.22
4	*T. triangulare*	18	24.7	24	1.3	50.0	350.0	43.75	50.0	620.0	57.38
5	*Amaranthus spp.*	45	61.6	105	2.3	56.9	1555.0	63.51	43.1	1040.0	64.45
6	*M. koeningii*	11	15.1	19	1.7	94.4	170.0	24.44	5.6	10.0.0	10.0
7	*Corchorus spp.*	5	6.9	18	3.6	100.0	115.0	23.0	----	----	----
8	***P. santalinoides***	*5*	*6.9*	*6*	*1.2*	*50.0*	*100.0*	*50.0*	*50.0*	*190.0*	*63.33*
9	***G. africanum***	*15*	*20.6*	*33*	*2.2*	*91.7*	*1900.0*	*135.84*	*8.3*	*210.0*	*105.0*
10	***P. guineense***	*2*	*2.7*	*5*	*2.5*	*50.0*	*30.0*	*30.0*	*50.0*	*20.0*	*20.0*
11	***G. latifolium***	*13*	*17.8*	*25*	*1.9*	*66.7*	*230.0*	*25.56*	*33.3*	*80.0*	*13.75*
12	***Ocimum spp.***	*16*	*21.9*	*29*	*1.8*	*41.7*	*340.0*	*25.56*	*58.3*	*65.0*	*15.56*
13	***Pterocarpus spp.***	*26*	*35.6*	*42*	*1.6*	*74.1*	*1100.0*	*56.55*	*25.9*	*310.0*	*53.34*
14	***S. nigrum***	*1*	*1.4*	*1*	*1.0*	----	----	----	*100*	*20.0*	*20.0*

Source: Field survey, 2007 ***NB: All vegetables in bold outlinesare wild leafy vegetable species***

Appendix 2.26: **Weekly consumption and expenditure patterns ofindigenous leafy vegetable species by urban households in the study area in November.**

	Vegetable species	No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq/ wk	% of H.H that bought	Total cost/wk (₦)	Exp/ H.H/wk (₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	61	92.4	192	3.2	62.2	2445.0	67.80	40.5	2700.0	96.13
2	*Solanum spp*	15	22.7	21	1.4	87.8	460.0	50.56	12.2	190.0	39.17
3	*Vernonia spp*	31	47.0	89	2.9	55.0	790.0	47.66	45.0	660.0	66.94
4	*T. triangulare*	23	34.9	37	1.6	70.7	515.0	39.54	29.3	310.0	33.33
5	*Amaranthus spp*	44	66.7	118	2.7	84.8	2470.0	71.61	16.6	830.0	82.50
6	*Cucurbita spp*	1	1.5	1	1.0	100.0	40.0	40.0	----	----	----
7	*M. koeningii*	11	16.7	18	1.6	54.2	110.0	12.0	45.8	45.0	10.84
8	*Corchorus spp*	6	9.9	28	4.7	100.0	170.0	28.33	----	----	----
9	***P. santalinoides***	*8*	*12.1*	*9*	*1.1*	*70.0*	*240.0*	*51.67*	*30.0*	*200.0*	*66.67*
10	***G. africanum***	*11*	*16.7*	*20*	*1.8*	*100.0*	*1510*	*111.11*	----	----	----
11	***P. guineense***	*6*	*9.9*	*10*	*1.7*	*50.0*	*100.0*	*18.33*	*50.0*	*15.0*	*15.0*
12	***G. latifolium***	*10*	*15.2*	*16*	*1.6*	*66.7*	*190.0*	*25.84*	*33.3*	*110.0*	*21.67*
13	***Ocimum spp***	*17*	*25.8*	*32*	*1.9*	*61.1*	*300.0*	*36.95*	*38.9*	*65.0*	*21.67*
14	***Pterocarpus spp***	*32*	*48.5*	*55*	*1.7*	*89.6*	*1345.0*	*47.50*	*10.4*	*280.0*	*57.50*
15	***S. nigrum***	*2*	*3.0*	*3*	*1.5*	*50.0*	*20.0*	*20.0*	*50.0*	*80.0*	*80.0*
16	***S. gilo raddi***	*1*	*1.5*	*1*	*1.0*	----	----	----	*100.0*	*50.0*	*50.0*
17	***V. doniana***	*2*	*3.0*	*2*	*1.0*	----	----	----	*100.0*	*80.0*	*40.0*

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild leafy vegetable species***

Appendix 2.27: Weekly consumption and expenditure patterns of indigenous leafy vegetable species by urban households in the study area in December.

	Vegetable species	No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq/ wk	% of H.H that bought	Total cost/wk (₦)	Exp/H.H/ wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/ wk(₦)
1	*T. occidentalis*	60	92.3	172	2.9	60.8	3010.0	79.95	39.2	2300.0	98.37
2	*Solanum spp*	13	20.0	28	2.2	78.7	460.0	38.0	21.3	160.0	32.50
3	*Vernonia spp*	39	60.0	85	2.2	77.0	1450.0	55.83	23.0	615.0	55.63
4	*T. triangulare*	14	21.5	23	1.6	79.3	650.0	63.75	20.7	200.0	50.0
5	*Amaranthus spp*	27	41.5	57	2.1	93.3	1575.0	66.13	6.7	420.0	140.0
6	*M. koeningii*	4	6.2	5	1.3	100.0	130.0	32.50	----	----	----
7	*Corchorus spp*	5	7.7	21	4.2	100.0	215.0	43.0	----	----	----
8	***P. santalinoides***	*11*	*16.9*	*13*	*1.2*	*47.2*	*180.0*	*26.25*	*52.8*	*170.0*	*21.67*
9	***G. africanum***	*14*	*21.5*	*29*	*2.1*	*96.7*	*1380.0*	*110.70*	*3.3*	*200*	*200.0*
10	***P. guineense***	*9*	*13.9*	*18*	*2.0*	*50.0*	*260.0*	*30.67*	*50.0*	*10.0*	*10.0*
11	***G. latifolium***	*7*	*10.8*	*13*	*1.9*	*91.7*	*215.0*	*27.50*	*8.3*	*30.0*	*30.0*
12	***Ocimum spp***	*16*	*24.6*	*26*	*1.6*	*50.6*	*255.0*	*22.22*	*49.4*	*65.0*	*23.75*
13	***Pterocarpus spp***	*38*	*58.5*	*76*	*2.0*	*91.3*	*1900.0*	*57.05*	*8.7*	*115.0*	*40.0*
14	***F. ovate***	*3*	*4.6*	*7*	*2.3*	----	----	----	*100*	*80.0*	*25.0*
15	***S. nigrum***	*1*	*1.5*	*1*	*1.0*	----	----	----	*100*	*40.0*	*40.0*

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild indigenous leafy vegetable species***

Appendix 2.28: One year average for the weekly consumption and expenditure patterns of indigenous leafy vegetables species by urban households in Ebonyi State.

S/N	Vegetable species	No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq/wk	% of H.H that bought	Total cost/wk (₦)	Exp/ H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	245	95.7	579	2.4	72.5	1174.58	129.48	27.1	610.83	93.69
2	*Solanum spp*	113	44.1	197	1.7	67.8	287.08	47.99	32.4	101.25	41.18
3	*Vernonia spp*	141	55.1	209	1.5	61.8	39 7.92	64.07	35.5	304.0	64.13
4	*T. triangulare*	63	24.6	85	1.4	58.7	196.11	53.18	41.3	161.11	58.39
5	*Amaranthus spp*	170	66.4	372	2.2	65.7	517.92	67.29	33.5	332.08	69.72
6	*Cucurbita spp*	3	1.2	6	2.0	33.3	20.0	20.0	66.7	40.0	40.0
7	*M. koeningii*	14	5.5	16	1.1	100.0	22.22	15.56	----	----	----
8	*Corchorus spp*	5	2.0	13	2.6	75.0	36.67	25.0	25.0	10.0	10.0
9	***P. santalinoides***	*35*	*13.7*	*49*	*1.4*	*62.7*	*122.50*	*41.56*	*37.3*	*135.71*	*56.90*
10	***G. africanum***	*19*	*7.4*	*24*	*1.3*	*100.0*	*173.75*	*81.98*	----	----	----
11	***P. guineense***	*5*	*2.0*	*19*	*3.8*	*37.5*	*25.0*	*25.0*	*62.0*	*37.50*	*37.50*
12	***G. latifolium***	*27*	*10.6*	*30*	*1.1*	*91.7*	*86.0*	*31.50*	*8.3*	*36.67*	*36.67*
13	***Ocimum spp***	*48*	*18.8*	*50*	*1.0*	*69.1*	*67.27*	*22.67*	*30.9*	*26.67*	*14.44*
14	***F. ovate***	*6*	*2.3*	*10*	*1.7*	----	----	----	*100.0*	*45.0*	*31.25*
15	***C. argentea***	*1*	*0.4*	*1*	*1.0*	*100.0*	*10.0*	*10.0*	----	----	----
16	***S. nigrum***	*24*	*9.4*	*34*	*1.4*	*60.2*	*115.71*	*44.41*	*39.8*	*56.67*	*56.67*
17	***Pterocarpus spp***	*148*	*57.8*	*242*	*1.6*	*79.1*	*690.0*	*87.52*	*20.9*	*161.50*	*45.04*
18	***S. gilo raddi***	*7*	*2.7*	*8*	*1.1*	*57.1*	*45.0*	*36.25*	*42.9*	*46.67*	*46.67*
19	***V. doniana***	*1*	*0.4*	*2*	*2.0*	----	----	----	*100.0*	*30.0*	*30.0*
20	***F. zanthoxyloides***	*1*	*0.4*	*2*	*2.0*	----	----	----	*100.0*	*80.0*	*80.0*
	Total	**1076**	**420.3**	**1948**	**34.3**	**1192.2**	**3987.73**	**803.46**	**804.0**	**2215.66**	**812.25**
	Mean	**53.80**	**21.0**	**97.4**	**1.7**	**59.6**	**199.39**	**40.17**	**40.2**	**110.78**	**40.61**
	Mean for DILVs	**94.25**	**36.8**	**75.8%**	**1.9**	**66.9**	**331.56**	**52.82**	**32.7**	**194.91**	**47.14**
	Mean for WILVs	**26.83**	**10.5**	**24.2%**	**1.6**	**54.8**	**111.27**	**31.74**	**31.8**	**54.70**	**36.26**

Source: Field survey, 2007 NB: All vegetables in bold outlines are wild indigenous leafy vegetable species

Appendix 2.29: One year average for the monthly consumption and expenditure patterns of indigenous leafy vegetable species by urban households in Anambra State.

S/N		**No of H.H that cons.**	**% of H.H that cons**	**Freq of cons.**	**Mean freq wk**	**% of H.H that bought**	**Total cost/wk (₦)**	**Exp/H.H/wk(₦)**	**% of H.H that obtained**	**Total Monetary value(₦)**	**Monetary value/H.H/wk(₦)**
1	*T. occidentalis*	295.0	93.7	1038	3.5	79.4	1230.0	66.16	21.3	340.42	65.23
2	*Solanum spp.*	57	18.1	121	2.1	74.4	113.33	36.78	25.6	59.38	26.29
3	*Vernonia spp.*	206	65.4	650	3.2	74.6	700.0	59.27	26.0	260.42	53.41
4	*T. triangulare*	67	21.3	134	2.0	72.5	95.0	26.39	29.2	60.45	30.38
5	*Amaranthus spp.*	195	61.9	550	2.8	86.6	802.92	67.91	14.0	343.75	74.11
6	*Cucurbita spp.*	4	1.3	5	1.3	50.0	60.0	60.0	50.0	25.0	25.0
7	*M. koeningii*	58	18.4	99	1.7	71.9	62.08	19.94	27.7	32.5	18.02
8	*Corchorus spp.*	57	18.1	272	4.8	91.7	195.45	33.07	8.3	10.0	10.0
9	*C. antiquorum*	2	0.6	2	1.0	---	---	----	100.0	10.0	10.0
10	***G. africanum***	*3*	*1.0*	*11*	*3.7*	*75.0*	*80.0*	*80.0*	*25.0*	*40.0*	*40.0*
11	***P. guineense***	*13*	*4.3*	*31*	*2.4*	*33.3*	*125.0*	*125.0*	*66.7*	*15.0*	*13.21*
12	***G. latifolium***	*42*	*13.3*	*93*	*2.2*	*80.6*	*46.67*	*18.54*	*19.4*	*24.29*	*16.79*
13	***Ocimum spp.***	*115*	*36.5*	*215*	*1.9*	*59.6*	*189.58*	*25.92*	*32.1*	*94.09*	*24.98*
14	***Pterocarpus spp.***	*80*	*25.4*	*202*	*2.5*	*91.9*	*471.67*	*80.78*	*8.1*	*43.75*	*40.0*
15	***P. santalinoides***	*3*	*1.0*	*4*	*1.3*	----	----	----	*100*	*40.0*	*40.0*
16	***C. argenta***	*2*	*0.6*	*2*	*1.0*	*50.0*	*20.0*	*20.0*	*50.0*	*10.0*	*10.0*
	Total	**1209**	**380.8**	**3429**	**37.3**	**9915**	**4191.70**	**719.76**	**603.3**	**1409.05**	**497.42**
	Mean	**75.6**	**23.8**	**214.3**	**2.3**	**62.0**	**299.41**	**51.41**	**37.7**	**88.07**	**31.09**
	Mean for DILVs	**104.6**	**33.2**	**83.7%**	**2.5**	**66.8**	**407.35**	**46.19**	**33.6**	**126.88**	**34.72**
	Mean for WILVs	**38.3**	**11.7**	**16.3%**	**2.1**	**55.8**	**133.27**	**58.37**	**43.0s**	**38.16**	**26.43**

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild indigenous leafy vegetable species***

Appendix 2.30 **One year average for the weekly consumption and expenditure patterns of indigenous leafy vegetable species by urban households in Imo state.**

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S/N	Vegetable species	No of H.H that cons.	% of H.H that cons	Freq. of cons.	Mean freq / week	% of H.H that bought	Total exp./wk (₦)	Exp /H.H week(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	210	85.4	749	3.6	60.5	959.31	91.41	40.7	795.0	121.89
2	*Solanum spp*	53	21.5	136	2.6	71.3	226.36	90.93	26.7	101.14	44.40
3	*Vernonia spp*	180	73.2	3 79	2.1	62.4	410.0	44.19	39.0	263.33	62.30
4	*T. triangulare*	98	39.8	165	1.7	64.4	379.17	63.83	40.9	242.08	69.41
5	*Amaranthus spp*	82	33.3	204	2.5	73.7	375.83	65.59	26.3	130.63	62.33
6	*Cucurbita spp*	8	3.5	13	1.6	70.0	40.0	40.0	30.0	46.67	46.67
7	*M. koeningii*	5	2.3	14	2.8	60.0	40.0	40.0	40.0	15.0	15.0
8	***Pterocarpus spp***	*117*	*47.6*	*203*	*1.7*	*84.1*	*417.22*	*53.89*	*18.0*	*76.0*	*50.5*
9	***P. santoliniodes***	*5*	*2.0*	*6*	*1.2*	*37.5*	*30.0*	*30.0*	*62.5*	*43.33*	*43.33*
10	***G. africanum***	*130*	*52.9*	*266*	*2.1*	*87.2*	*1036.67*	*110.40*	*12.2*	*215.0*	*113.27*
11	***P. guineense***	*44*	*17.9*	*87*	*2.0*	*80.3*	*90.0*	*30.96*	*16.0*	*22.50*	*17.50*
12	***G. latifolium***	*28*	*11.4*	*55*	*3.0*	*49.2*	*52.14*	*31.07*	*46.7*	*67.14*	*33.45*
13	***Ocimum spp***	*27*	*11*	*58*	*2.2*	*51.7*	*37.14*	*29.29*	*48.3*	*57.86*	*25.24*
	Total	**865**	**401.8**		**27.9**	**852.1**		**721.56**	**447.4**		**705.29**
	Mean	**66.5**	**30.9**		**2.2**	**65.6**		**55.51**	**34.4**		**54.25**
	DILVs	**636**	**37.0**		**2.4**	**66.0**		**62.28**	**34.8**		**60.29**
	WILVs	**229**	**23.8**		**1.8**	**65.0**		**47.60**	**35.0**		**47.22**

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are wild leafy vegetable species***

Appendix 2.31: **Mean weekly consumption and expenditure patterns of indigenous leafy vegetable species by rural households in the study area during the dry season.**

S/N	Vegetable species	No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq/wk	% of H.H that bought	Total cost/wk (₦)	Exp/H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	318	94.4	967	3.0	49.2	2252.0	71.94	50.9	2582	79.36
2	*Solanum spp*	93	27.6	218	2.3	43.8	309.0	38.36	56.2	454.0	49.8
3	*Vernonia spp*	124	36.8	478	3.9	46.4	1107.0	51.10	53.1	579.0	48.9
4	*T. triangulare*	97	28.8	188	1.9	45.9	389.0	39.74	53.4	417.0	40.3
5	*Amaranthus spp*	143	42.4	332	2.3	63.9	924.0	58.75	36.1	648.0	61.74
6	*M. koeningii*	28	8.3	59	2.1	48.3	285.0	24.58	51.7	48.0	14.40
7	*C. antiquorum*	8	2.4	9	1.1	----	----	----	100.0	28.75	14.38
8	***P. santalinoides.***	*50*	*14.8*	*74*	*1.5*	*29.9*	*110.0*	*39.0*	*70.1*	*277.0*	*37.02*
9	***G. africanum***	*72*	*21.4*	*145*	*2.0*	*79.8*	*1105.0*	*89.22*	*21.1*	*162.0*	*68.0*
10	***P. guineense***	*20*	*5.9*	*34*	*1.7*	*85.0*	*78.0*	*24.22*	*15.0*	*50.0*	*30.0*
11	***G. latifolium***	*40*	*11.9*	*80*	*2.0*	*27.5*	*80.0*	*30.0*	*72.5*	*150.0*	*26.0*
12	***Ocimum spp***	*66*	*19.6*	*126*	*1.9*	*50.8*	*197.0*	*26.50*	*49.2*	*152.0*	*27.76*
13	***Pterocarpus spp***	*154*	*45.7*	*308*	*2.0*	*62.4*	*958.0*	*55.62*	*36.5*	*689.0*	*61.22*
14	***F. ovate***	*24*	*7.1*	*41*	*1.7*	----	----	----	*100.0*	*335.0*	*47.68*
15	***C. argentea***	*1*	*0.3*	*2*	*2.0*	*100*	*20.0*	*20.0*	----	----	----
16	***S. gilo raddi***	*3*	*0.9*	*3*	*1.0*	----	----	----	*100.0*	*650*	*42.50*
17	***S. nigrum***	*15*	*4.5*	*17*	*1.1*	*63.3*	*97.5*	*43.33*	*36.7*	*93.33*	*44.44*
19	***V. doniana***	*5*	*1.5*	*8*	*1.6*	----	----	----	*100.0*	*72.50*	*43.75*
	Total	***1261***	***374.6***	***3089***	***38.3***	***796.3***	***7911.50***	***612.36***	***1102.6***	***7102.58***	***767.31***
	Mean	***70.1***	***19.7***	***171.6***	***2.0***	***56.9***	***439.53***	***40.82***	***61.3***	***394.59***	***42.63***
	Mean for DILVs	***115.9***	***30.1***	***72.9***	***2.5***	***42.5***	***752.29***	***40.64***	***62.7***	***722.39***	***42.37***
	Mean for WILVs	***40.9***	***12.1***	***27.1***	***1.7***	***62.3***	***240.50***	***40.99***	***60.1***	***185.98***	***42.84***

Source: Field survey, 2007. ***NB: All vegetables in bold outline are WILVs***

Appendix 2.32: Mean weekly consumption and expenditure patterns of indigenous leafy vegetable species by rural households in the study area during the rainy season

S/N		No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq / wk	% of H.H that bought	Total cost/wk (₦)	Exp/ H.H/wk (₦)	% of H.H that obtained	Total Monetary value (₦)	Monetary value/H.H/wk (₦)
1	*T. occidentalis*	460	96.6	1493	3.3	49.5	2600.0	81.80	51.8	2721.43	87.02
2	*Solanum spp*	146	30.7	322	2.2	56.8	436.14	41.06	43.2	498.57	49.92
3	*Vernonia spp*	290	60.9	815	2.2	52.3	1307.14	49.24	47.2	1265.0	80.00
4	*T. triangulare*	148	31.1	286	1.9	37.3	434.43	42.48	62.2	615.0	51.14
5	*Amaranthus spp*	284	59.7	694	2.4	55.5	1189.57	51.24	42.3	1090.71	59.36
6	*Cucurbita spp*	33	6.9	59	1.8	26.8	220	125.0	73.2	215.83	30.0
7	*M. koeningii*	51	10.7	95	1.9	47.9	111.43	23.10	52.1	71.43	18.04
8	*C. antiquorum*	4	0.8	5	1.3	----	----	----	100.0	45.0	11.25
9	*Corchorus spp*	3	0.6	8	2.7	50.0	20.0	20.0	50.0	70.0	35.0
10	***G. africanum***	*96*	*20.2*	*214*	*2.2*	*78.4*	*968.57*	*95.16*	*22.0*	*482.29*	*136.35*
11	***P. guineense***	*29*	*6.1*	*57*	*2.0*	*57.5*	*166.0*	*30.50*	*44.1*	*34.0*	*17.70*
12	***G. latifolium***	*64*	*13.5*	*161*	*2.5*	*27.3*	*71.43*	*32.50*	*72.7*	*216.43*	*30.03*
13	***Ocimum spp***	*112*	*23.5*	*209*	*1.9*	*37.0*	*220.0*	*32.44*	*62.0*	*183.57*	*21.12*
14	***Pterocarpus spp***	*133*	*27.4*	*248*	*1.9*	*54.3*	*592.86*	*60.11*	*45.0*	*502.86*	*59.43*
15	***C. argentea***	*1*	*0.2*	*1*	*1.0*	*100.0*	*20.0*	*20.0*	----	----	----
16	***F. zanthoxyloides***	*2*	*0.4*	*2*	*1.0*	*50.0*	*40.0*	*40.0*	*50.0*	*30.0*	*30.0*
17	***L. cupaniodes***	*1*	*0.2*	*1*	*1.0*	----	----	----	*100.0*	*20.0*	*20.0*
18	***S. nigrum***	*22*	*4.6*	*31*	*1.4*	*40.5*	*88.0*	*43.50*	*59.5*	*78.33*	*48.61*
19	***S. gilo raddi***	*8*	*1.7*	*8*	*1.0*	*50.0*	*50.0*	*30.0*	*50.0*	*40.0*	*40.0*
20	***V. doniana***	*1*	*0.2*	*2*	*2.0*	----	----	----	*100.0*	*60.0*	*60.0*
21	***F. capensis***	*2*	*0.4*	*2*	*1.0*	----	----	----	*100.0*	*70.0*	*35.0*
22	***P. santaliniodes***	*34*	*7.4*	*39*	*1.2*	*30.6*	*92.50*	*38.75*	*68.4*	*200.0*	*50.37*
	Total	**1924**	**404.5**	**4752**	**41.7**	**1004.2**	**8628.07**	**794.68**	**1261.0**	**8510.45**	**970.34**
	Mean	**87.5**	**17.6**	**216.0**	**1.8**	**52.9**	**392.19**	**44.15**	**60.1**	**386.84**	**46.21**
	Mean for DILVs	**157.7**	**33.2**	**79.5%**	**2.3**	**51.4**	**256.60**	**46.47**	**54.2**	**734.55**	**46.86**
	Mean for WILVs	**38.9**	**8.2**	**20.5%**	**2.0**	**47.8**	**177.64**	**38.45**	**59.5**	**147.50**	**42.20**

Source: Field survey, 2007. ***NB: All vegetables in bold outlines are WILVs***

Appendix 2.33: Mean weekly consumption and expenditure patterns of indigenous leafy vegetable species by urban households in the study area during the dry season

S/N	Vegetable Species	No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq/wk	% of H.H that bought	Total cost/wk (₦)	Exp/ H.H/wk(₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H/wk(₦)
1	*T. occidentalis*	*304*	*90.2*	*891*	*2.9*	*68.8*	*3073.0*	*76.17*	*31.7*	*915.0*	*99.96*
2	*Solanum spp*	*92*	*27.3*	*153*	*1.7*	*72.3*	*532.0*	*45.68*	*26.2*	*196.0*	*35.67*
3	*Vernonia spp*	*196*	*58.2*	*449*	*2.3*	*68.3*	*1212.0*	*48.66*	*31.7*	*698.0*	*60.53*
4	*T. triangulare*	*85*	*25.2*	*146*	*1.7*	*81.8*	*630.0*	*52.46*	*18.9*	*369.0*	*56.47*
5	*Amaranthus spp*	*166*	*49.3*	*384*	*2.3*	*86.5*	*1582.0*	*60.39*	*12.7*	*372.0*	*70.57*
6	*Cucurbita spp*	*5*	*1.5*	*9*	*1.8*	*87.5*	*55.0*	*55.0*	*12.5*	*60.0*	*60.0*
7	*M. koeningii*	*23*	*6.8*	*37*	*1.6*	*69.5*	*78.0*	*22.90*	*30.5*	*77.50*	*15.42*
8	*C. antiquorum*	*1*	*0.3*	*1*	*1.0*	----	----	----	*100.0*	*10.0*	*10.0*
9	*Corchorus spp*	*29*	*8.61*	*119*	*4.1*	*100.0*	*188.0*	*34.08*	----	----	----
10	***G. africanum***	*60*	*17.8*	*118*	*2.0.*	*94.3*	*1070.0*	*89.10*	*5.7*	*141.67*	*110.42*
11	***P. guineense***	*26*	*7.7*	*43*	*1.7*	*52.5*	*92.0*	*23.30*	*47.5*	*18.0*	*14.50*
12	***G. latifolium***	*39*	*11.6*	*67*	*1.7*	*71.7*	*161.0*	*27.84*	*28.3*	*58.0*	*24.33*
13	***Ocimum spp***	*91*	*27.0*	*154*	*1.7*	*56.3*	*315.0*	*28.09*	*43.7*	*139.0*	*26.18*
14	***Pterocarpus spp***	*172*	*51.0*	*330*	*1.9*	*89.1*	*1024.0*	*51.91*	*10.4*	*159.0*	*43.67*
15	***F. ovate***	*5*	*1.5*	*9*	*1.8*	----	----	----	*100.0*	*43.33*	*25.0*
16	***C. argentea***	*2*	*0.6*	*2*	*1.0*	*50.0*	*10.0*	*10.0*	*50.0*	*10.0*	*10.0*
17	***P. santaliniodes***	*32*	*9.5*	*38*	*1.2*	*43.4*	*160.0*	*37.82*	*56.6*	*120.0*	*37.0*
18	***S. nigrum***	*13*	*3.9*	*15*	*1.2*	*65.0*	*115.0*	*44.59*	*35.0*	*40.0*	*40.0*
19	***S. gilo raddi***	*3*	*0.9*	*3*	*1.0*	*66.7*	*20.0*	*20.0*	*33.3*	*50.0*	*50.0*
20	***V. doniana***	*2*	*0.6*	*2*	*1.0*	----	----	----	*100.0*	*80.0*	*40.0*
	Total	**1346**	**399.4**	**2970**	**35.5**	**1223.7**	**10317.0**	**727.99**	**774.8**	**3556.50**	**829.72**
	Mean	**67.3**	**20.0**	**148.50**	**1.8**	**72.0**	**606.88**	**42.82**	**40.8**	**187.18**	**43.67**
	Mean for DILVs	**100.1**	**29.7**	**73.70%**	**2.2**	**79.3**	**918.75**	**49.42**	**33.0**	**337.19**	**51.08**
	Mean for WILVs	**40.5**	**12.0**	**26.30%**	**1.5**	**65.5**	**329.67**	**36.96**	**46.4**	**78.09**	**38.28**

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVs

Appendix 2.34: Mean consumption and expenditure patterns of indigenous leafy vegetable species by urban households in the study area during the rainy season

S/N		No of H.H that cons.	% of H.H that cons	Freq of cons.	Mean freq/wk	% of H.H that bought	Total cost/wk (₦)	Exp/ H.H/wk (₦)	% of H.H that obtained	Total Monetary value(₦)	Monetary value/H.H (₦)
1	*T. occidentalis*	463	96.7	1545	3.3	72.2	3571.66	109.58	28.2	1625.71	86.58
2	*Solanum spp*	131	27.4	291	2.2	71.2	663.57	64.89	29.1	202.86	37.20
3	*Vernoma spp*	331	69.1	772	2.3	64.8	1719.28	60.98	35.5	833.57	59.25
4	*T. triangulare*	143	29.9	238	1.7	53.3	563.57	47.77	46.9	453.57	51.82
5	*Amaranthus spp*	281	58.7	739	2.6	67.4	1778.57	71.60	32.3	845.71	70.62
6	*Cucurbita spp*	9	1.9	12	1.3	43.8	40.0	31.67	56.3	50.0	28.33
7	*M. koeningii*	54	11.3	92	1.7	77.7	96.43	19.07	22.2	42.50	18.33
8	*C. antiquorum*	1	0.2	1	1.0	----	----	----	100.0	10.0	10.0
9	*Corchorus spp*	40	8.4	159	4.0	85.7	240.0	32.02	14.3	20.0	10.0
10	***G. africanum***	*92*	*19.2*	*182*	*2.0*	*86.0*	*1234.29*	*109.05*	*13.5*	*224.0*	*100.33*
11	***P. guineense***	*36*	*7.5*	*95*	*2.6*	*56.2*	*167.14*	*62.12*	*41.7*	*32.50*	*22.50*
12	***G. latifolium***	*58*	*12.1*	*115*	*2.0*	*78.0.*	*263.57*	*24.54*	*20.0*	*92.0*	*25.75*
13	***Ocimum spp***	*109*	*22.8*	*183*	*1.7*	*63.1*	*252.86*	*24.70*	*36.9*	*162.86*	*23.63*
14	***Pterocarpus spp***	*174*	*36.3*	*329*	*1.9*	*82.1*	*1511.67*	*89.36*	*18.5*	*233.57*	*48.33*
15	***F. ovate***	*1*	*0.2*	*1*	*1.0*	----	----	----	*100.0*	*50.0*	*50.0*
16	***C. argentea***	*1*	*0.2*	*1*	*1.0*	*100.0*	*20.0*	*20.0*	----	----	----
17	***P. santalinoides***	*17*	*3.6*	*22*	*1.3*	*45.0*	*100.0*	*43.75*	*55.0*	*155.0*	*69.58*
18	***S. nigrum***	*11*	*2.3*	*19*	*1.7*	*54.2*	*116.67*	*44.17*	*45.8*	*20.0*	*20.0*
19	***S. gilo raddi***	*5*	*1.0*	*5*	*1.0*	*75.0*	*50.0*	*38.33*	*25.0*	*40.0*	*40.0*
20	***V. doniana***	*1*	*0.2*	*2*	*2.0*	----	----	----	*100.0*	*30.0*	*30.0*
	Total	**1958**	**408.8**	**4803**	**38.4**	**1175.6**	**12398.28**	**893.60**	**821.3**	**5123.85**	**802.25**
	Mean	**97.9**	**20.4**	**240.2**	**1.9**	**69.2**	**728.78**	**52.57**	**43.2**	**269.68**	**42.22**
	Mean for DILVs	**161.4**	**33.7**	**80.1%**	**2.2**	**67.0**	**1084.14**	**54.70**	**40.7**	**453.77**	**41.35**
	Mean for WILVs	**45.9**	**9.6**	**19.9%**	**1.7**	**51.6**	**412.91**	**50.67**	**47.6**	**103.99**	**39.10**

Source: Field survey, 2007. NB: All vegetables in bold outlines are wild indigenous leafy vegetable species

Appendix 2.35: ***The various meals for which the vegetables were u*sed in their preparation by the rural households in the study area**

		Soup Freq	%	Stew Freq	%	Salad Freq	%	Porridge Freq	%	Boiled Freq	%	Pepper soup Freq	%
1	*T. Occidentalis*	702	75.7	33	3.6	5	0.5	126	13.6	62	6.7	----	----
2	*Solanum spp*	115	44.9	3	1.2	97	37.9	28	10.9	13	5.1	----	----
3	*Vernonia spp*	517	94.0	1	0.2	27	4.9	----	----	5	0.9	----	----
4	*T. triangulare*	155	61.0	49	19.3	6	2.4	22	8.7	22	8.7	----	----
5	*Amaranthus spp*	91	17.0	68	13.2	7	1.4	296	57.3	55	10.6	----	----
6	*M. koeningii*	4	5.1	64	81.0	2	2.5	3	3.8	6	7.6	----	----
7	*Corchorus spp*	3	100.0	----	----	----	----	----	----	----	----	----	----
8	*Cucurbita spp*	23	59.0	2	5.1	----	----	14	35.9	----	----	----	----
9	*C. antiquorum*	12	100.0	----	----		----	----	----	----	----	----	----
10	***P. guineense***	*42*	*85.7*	----	----	*1*	*2.0*	*3*	*6.1*	*3*	*6.1*	----	----
11	***G. latifolium***	*16*	*16.0*	----	----	*26*	*26.0*	*25*	*25.0*	*5*	*5.0*	*28*	*28.0*
12	***Ocimum spp***	*32*	*17.0*	*70*	*37.2*	*12*	*6.4*	*16*	*8.5*	*16*	*8.5*	*42*	*22.34*
13	***Pterocarpus spp***	*275*	*97.3*	----	----	*4*	*1.4*	*1*	*0.4*	*2*	*0.7*	----	----
14	***C. argentea***	*2*	*100.0*	----	----	----	----	----	----	----	----	----	----
15	***P. santoliniodes***	*71*	*97.3*	----	----	----	----	*1*	*1.4*	*1*	*1.4*	----	----
16	***G. africanum***	*140*	*87.0*	----	----	*11*	*6.8*	*6*	*3.7*	*4*	*2.5*	----	----
17	***S. nigrum***	*20*	*44.4*	----	----	----	----	*25*	*55.6*	----	----	----	----
18	***F. ovate***	*24*	*80.0*	----	----	----	----	*3*	*10.0*	*3*	*10.0*	----	----
19	***F. zanthoxyloides***	*2*	*100.0*	----	----	----	----	----	----	----	----	----	----
20	***P. purpureum***	*1*	*100.0*	----	----	----	----	----	----	----	----	----	----
21	***S. gilo raddi***	*7*	*58.0*	----	----	----	----	*5*	*41.7*	----	----	----	----
22	***V. doniana***	*4*	*100.0*	----	----	----	----	----	----	----	----	----	----
23	***L. cupaniodes***	*1*	*100.0*	----	----	----	----	----	----	----	----	----	----
	Total		***1640.1***		***160.7***		***92.3***		***282.5***		***73.8***		***50.3***
	Mean		***71.3***		***6.7***		***3.8***		***11.8***		***3.1***		***2.1***
	Mean for DILVs		***61.9***		***13.7***		***5.5***		***14.5***		***4.4***		----
	Mean for WILVs		***78.5***		***2.5***		***2.9***		***10.2***		***2.3***		***3.4***

Source: Field survey, 2007 NB: All vegetables in bold outlines are wild indigenous leafy vegetables

Appendix 2.36: The various meals for which the vegetables were used in their preparation by the urban households in the study area.

	Name vegetable	Soup		Stew		Salad		Porridge		Boiled		Pepper	
		No	**%**	No	%	No	%	No	%	No	**%**	Soup	**%**
1	*T. Occidentalis*	703	77.5	42	4.6	8	0.9	108	11.9	46	5.1	----	----
2	*Solanum spp*	104	42.5	10	4.1	96	39.2	24	9.8	11	4.5	----	----
3	*Vernonia spp*	503	95.8	2	0.4	2	0.4	13	2.5	5	1.0	----	----
4	*T. triangulare*	133	57.1	55	23.6	7	3.0	21	9.0	17	7.3	----	----
5	*Amaranthus spp*	72	12.5	98	17.0	13	2.4	304	52.7	90	15.6	----	----
6	*M. koeningii*	6	8.2	57	78.1	1	1.4	----	----	9	12.3	----	----
7	*Corchorus spp*	60	95.2	1	1.6	----	----	1	1.6	1	1.6	----	----
8	*C. antiquorum*	2	100.0	----	----	----	----	----		----	----	----	----
9	*Cucurbita spp*	7	46.7	----	----	----	----	8	53.3	----	----	----	----
10	***P. guineense***	*44*	*69.8*	*1*	*1.6*	----	----	*6*	*9.5*	*2*	*3.2*	*10*	*15.9*
11	***G. latifolium***	*35*	*21.7*	*44*	*27.3*	*3*	*1.9*	*35*	*21.7*	*14*	*8.7*	*30*	*18.6*
12	***Ocimum spp***	*30*	*16.3*	*73*	*39.7*	*4*	*2.2*	*36*	*19.6*	*11*	*6.0*	*30*	*16.3*
13	***Pterocarpus spp***	*322*	*94.4*	*9*	*2.6*	*2*	*0.6*	*5*	*1.5*	*3*	*0.9*	----	----
14	***C. argentea***	*2*	*66.7*	----	----	-----	----	*1*	*33.3*	----	-----	----	----
15	***G.africanum***	*122*	*80.8*	*2*	*1.3*	*14*	*9.3*	*7*	*4.6*	*6*	*4.0*	----	----
16	***P. santoliniodes***	*43*	*93.5*	----	----	*1*	*2.2*	*2*	*4.4*	----	----	----	----
17	***S. nigrum***	*6*	*21.4*	----	----	----	----	*21*	*75.0*	*1*	*1.6*	----	----
18	***F. ovate***	*5*	*83.3*	----	----	----	----	*1*	*16.7*	----	----	----	----
19	***S. gilo raddi***	*4*	*50.0*	----	----	----	----	*4*	*50.0*	----	----	----	----
	Total		***1133.5***		***201.9***		***63.1***		***377.1***		***71.6***		***50.8***
	Mean		***59.7***		***10.6***		***3.3***		***19.9***		***3.8***		***2.7***
	DILVS		***59.5***		***14.4***		***5.2***		***15.7***		***5.3***		---
	WILVS		***59.8***		***7.3***		***1.6***		***23.6***		***2.4***		***5.1***

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVS

Appendix 2.37: **The various sources of the vegetable species consumed by the various rural households in the study area.**

		A		B		C		D		E	
		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
1	*T. Occidentalis*	306	4.0	58	7.6	2	0.3	18	2.4	382	49.9
2	*Solanum spp*	85	37.3	19	8.3	----		4	1.8	120	52.6
3	*Vernonia spp*	218	42.3	17	3.3	5	1.0	17	3.3	258	50.1
4	*T. triangulare*	97	44.1	11	5.0	8	3.6	11	5.0	93	42.3
5	*Amaranthus spp*	132	30.7	24	5.6	1	0.2	12	2.8	251	58.4
6	*M. koeningii*	21	27.6	4	5.3	2	2.6	14	18.4	35	46.1
7	***Pterocarpus spp***	96	33.7	1	0.4	14	4.9	7	2.5	167	58.6
8	***P. santoliniodes***	33	55.9	1	1.7	3	5.1	3	5.1	19	32.2
9	***G. africanum***	44	25.7	----	----	6	3.5	4	2.3	117	68.4
10	***P. guineense***	9	20.0	----	---	1	2.2	2	4.4	33	73.3
11	***G. latifolium***	42	35.90	6	5.1	13	11.1	10	8.6	46	39.3
12	***Ocimum spp***	6	21.4	1	3.6	1	3.6	2	7.1	18	64.3
13	***Corchorus spp***	----	----	----	----	----	----	1	20.0	4	80.0
14	***C. argentea***	----	----	----	----	----	----	----	----	2	100.0
15	***Curcubita spp***	18	64.3	2	7.1	1	3.6	1	3.6	6	21.4
16	***C. antiguorum***	12	100.0	----	----	----	----	----	----	----	----
17	***S. nigrum***	----	-----	11	39.3	----	----	----	----	17	60.7
18	***F. ovate***	15	100.0	-----	----	----	----	----	----	-----	-----
19	***F. zanthoxyloides***	----	----	-----	----	2	100.0	----	----	-----	-----
20	***P. purpureum***	1	100.0	----	----	----	----	----	----	----	----
21	***S. gilo raddi***	2	28.6	3	42.9	-----	----	----	-----	2	28.6
22	***V. doniana***	6	100.0	----	----	-----	----	----	-----	-----	-----
23	***L. cupaniodes***	1	100	----	----	-----	----	----	------	-----	-----
	Total		**1087.5**		**155.1**		**141.7**		**87.2**		**926.2**
	Mean		**45.3**		**5.9**		**5.9**		**3.6**		**38.6**
	Mean for DILVS		**42.9**		**4.7**		**1.3**		**6.4**		**44.5**
	Mean for WILVS		**46.7**		**7.5**		**8.7**		**2.0**		**35.0**

Source: Field survey, 2007 **NB: All vegetables in bold outlines are WILVS**

N.B.

A = Collected from around compound form
B = Collected from other farm areas
C = Collected from near by forest land
D = Obtained from neighbours / friends
E = Bought from the mark

Appendix 2.38: The various sources of the vegetable species consumed by the urban households in the study area

		A		B		C		D		E	
		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
1	*T. Occidentalis*	211	27.8	21	2.8	2	0.3	7	0.9	517	68.2
2	*Solanum spp*	36	17.5	8	3.9	5	2.4	10	4.9	147	71.4
3	*Vernonia spp*	144	28.7	6	1.2	1	0.2	23	4.6	327	65.3
4	*T. triangulare*	66	31.0	4	1.9	2	0.9	-----	4.7	131	61.5
5	*Amaranthus spp*	82	20.2	15	3.7	2	0.5	4	1.0	304	74.7
6	*M. koeningii*	7	10.8	2	3.1	1	1.5	6	9.2	49	75.4
7	*Corchorus spp*	*3*	*5.0*	----	----	----	----	----	----	*57*	*95.0*
8	*Curcubita spp*	*6*	*40.0*	*1*	*6.7*	*1*	*6.7*	*1*	*6.7*	*6*	*40.0*
9	*C. antiquorum*	*1*	*100.0*	----	----	----	----	----	----	----	---
10	***P. guineense***	*6*	*10.2*	-----	-----	----	-----	*8*	*13.6*	*45*	*76.3*
11	***G. latifolium***	*19*	*17.1*	*5*	*4.5*	*3*	*2.7*	*6*	*5.4*	*78*	*70.3*
12	***Ocimum spp***	*46*	*26.3*	*8*	*4.6*	*1*	*0.6*	*15*	*8.6*	*105*	*60.0*
13	***Pterocarpus spp***	*39*	*12.2*	*2*	*0.6*	*5*	*1.6*	*10*	*3.1*	*265*	*82.6*
14	***C. argentea***	----	-----	-----	------	----	-----	-----	-----	*2*	*100.0*
15	***P.santoliniodes***	*17*	*32.1*	*1*	*1.9*	*6*	*11.3*	*5*	*9.4*	*24*	*45.3*
16	***G. africanum***	*6*	*16.6*	*1*	*0.7*	*2*	*1.4*	*5*	*3.6*	*108*	*77.7*
17	***S. nigrum***	*1*	*4.8*	*4*	*19.1*	-----	-----	------	-----	*16*	*76.2*
18	***F. ovate***	*6*	*85.7*	-----	------	-----	-----	------	-----	*1*	*14.3*
19	***S. gilo raddi***	*1*	*14.3*	*2*	*28.6*	*1*	*14.3*	------	-----	*3*	*42.9*
	Total		**500.1**		**83.1**		**44.4**		**75.6**		**1196.8**
	Mean		**26.3**		**4.4**		**2.3**		**4.0**		**63.0**
	DILVS		**31.2**		**2.6**		**1.4**		**3.6**		**61.3**
	WILVS		**21.9**		**6.0**		**3.2**		**4.4**		**64.5**

Source: Field survey, 2007 **NB: All vegetables in bold outlines are WILVS**

Appendix 2.39: Reasons adduced by the rural respondents for the consumption of the vegetables in the study area

		A		B		C		D		E		F		G		H	
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
1	*T. occidentalis*	142	15.1	106	11.2	4	0.4	57	6.1	52	5.5	564	59.8	10	1.1	8	0.9
2	*Solanum spp*	16	6.6	15	6.2	-	-	57	23.4	81	33.2	73	29.9	2	0.8	-	-
3	*Vernonia spp*	148	22.5	61	9.3	8	1.2	116	17.6	137	20.8	144	21.9	12	1.8	32	4.9
4	*T. triangulare*	22	9.1	19	7.8	21	8.6	56	23.1	43	17.7	65	26.8	11	4.5	6	2.5
5	*Amaranthus spp*	56	12.0	45	9.6	19	4.1	70	15.0	37	7.91	229	48.9	8	1.7	4	0.9
6	*M. koeningii*	1	1.2	2	2.4	7	8.5	16	19.5	47	57.3	8	9.8	1	1.2	-	-
7	*Corchorus spp*		-	-	-	-	-	2	66.7	1	33.3	-	-	-	-	-	-
8	*Curcubita spp*	9	28.1	4	12.5	1	3.1	3	9.4	2	6.25	6	18.8	7	21.9	-	-
9	*C. antiquorum*	6	40.0			4	26.7	-	-	-	-	-	-	5	33.3	-	-
10	***P. guineense***	***5***	***10.6***	-	-	*1*	*2.1*	*4*	*8.5*	*18*	*38.3*	*12*	*25.5*	*1*	*2.1*	*6*	*12.8*
11	***G. latifolium***	***8***	***6.9***	*1*	*0.9*	*5*	*4.3*	*25*	*21.6*	*41*	*35.4*	*21*	*18.1*	*6*	*5.1*	*9*	*7.8*
12	***Ocimum spp***	***4***	***2.2***	*4*	*2.2*	*8*	*4.3*	*38*	*20.5*	*105*	*56.8*	*20*	*10.8*	*2*	*1.1*	*4*	*2.2*
13	***Pterocarpus spp***	***74***	***25.5***	*12*	*4.1*	*4*	*1.4*	*42*	*14.5*	*48*	*16.6*	*93*	*32.1*	*11*	*3.8*	*6*	*2.1*
14	***C. argentea***	-	-	-	-	*1*	*50.0*	-	-	-	-	*1*	*50.0*	-	-	-	-
15	***P. santoliniodes***	***25***	***37.9***	*21*	*31.8*	*4*	*6.1*	*5*	*7.6*	*2*	*3.0*	*5*	*7.6*	*4*	*6.1*	-	-
16	***G. africanum***	***32***	***19.9***	*9*	*5.6*	*1*	*0.6*	*23*	*14.3*	*26*	*16.2*	*59*	*36.7*	*3*	*1.9*	-	-
17	***S. nigrum***	***1***	***2.9***	*5*	*14.3*	-	-	*7*	*20.0*	*2*	*5.7*	*19*	*54.3*	*1*	*2.9*	-	-
18	***F. ovate***	***12***	***41.4***	*9*	*31.0*	*1*	*3.5*	-	-	*2*	*6.9*	*1*	*3.5*	*4*	*13.8*	-	-
19	***F. zanthoxyloides***	-	-	*1*	*33.3*	-	-	-	-	*1*	*33.3*	-	-	*1*	*33.3*	-	-
20	***P. purpureum***	-	-	-	-	-	-	-	-	*1*	*50.0*	*1*	*50.0*	-	-	-	-
21	***L. cupaniodes***	-	-	*1*	*100.0*	-	-	-	-	-	-	-	-	-	-	-	-
22	***S. gilo raddi***	***1***	***16.7***	*2*	*33.3*	*2*	*33.3*	*1*	*16.7*	-	-	-	-	-	-	-	-
23	***V. doniana***	***3***	***60.0***	*2*	*40.0*	-	-	-	-	-	-	-	-	-	-	-	-
	Total	***565***	***338.4***	***319***	***355.6***		***158.3***		***304.2***		***444.1***	***13.21***	***504.3***		***136.4***		***38.8***
	Mean	***24.6***	***14.7***		***15.5***		***6.9***		***13.2***		***19.3***	***57.43***	***21.9***		***5.9***		***1.7***
	WILVS		***16.0***		***21.2***		***7.5***		***8.8***		***18.7***		***20.6***		***5.0***		***2.1***
	DILVS		***14.9***		***6.6***		***5.9***		***20.1***		***20.2***		***24.0***		***7.4***		***1.0***

Source: Field survey, 2007 **NB: All vegetables in bold outlines are WILVS**

Appendix 2.40: Reasons adduced by the urban respondents for the consumption of the vegetables in the studyarea.

		A		B		C		D		E		F		G		H	
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
1	*T. occidentalis*	*141*	15.6	92	10.2	3	0.3	57	6.3	46	5.1	560	62.0	4	0.4	-	-
2	*Solanum spp*	*19*	8.8	11	5.1	3	1.4	44	20.5	55	25.6	80	37.2	1	0.5	2	0.9
3	*Vernonia spp*	*168*	28.0	57	9.5	6	1.0	91	15.1	128	21.3	124	20.6	2	0.3	25	4.2
4	*T. triangulare*	*41*	18.3	11	4.9	26	11.6	24	10.7	35	15.6	78	34.8	5	2.2	4	1.8
5	*Amaranthus spp*	*47*	10.7	47	10.7	11	2.5	59	13.5	35	8.0	233	53.2	5	1.1	1	0.2
6	*M. koeningii*	*4*	5.4	2	2.7	4	5.4	22	29.7	37	50.0	4	5.4`	1	1.4	-	-
7	*Curcubita spp*	*4*	25.0	2	12.5	1	6.3	2	12.5	2	12.5	15	38.3	-	-	-	-
8	*Corchorus spp*	*29*	29.0	4	4.0	6	6.0	29	29.0	10	10.0	21	21.0	-	-	1	1.0
9	*C. antiquorum*	-	-	-	-	1	100	-	-	-	-	-	-	-	-	-	-
10	***P. guineense***	*6*	9.84	2	3.28	4	-	13	21.31	18	29.5	21	34.4	-	-	1	1.6
11	***G.latifolium***	*8*	7.55	3	2.83	5	3.77	26	24.53	39	36.8	18	6	9.84	2	3.28	-
12	***Ocimum spp***	***5***	2.8	3	1.7	5	2.84	36	20.5	96	54.6	26	8	7.55	3	2.83	4
13	***C. argentea***	***1***	25.0	-	-	2	50.0	-	-	1	25.0	-	-	-	-	-	-
14	***Pterocarpus spp***	***71***	21.0	17	5.0	16	4.7	39	11.5	38	11.2	155	45.9	2	0.59	-	-
15	***P. santoliniodes***	***14***	30.4	11	23.9	7	15.2	7	15.2	1	2.2	4	8.7	2	4.35	-	-
16	***S. nigrum***	-	-	4	18.2	-	-	2	9.1	2	9.1	14	63.6	-	-	-	-
17	***S. gilo raddi***	***1***	20.0	-	-	-	-	2	40.0	-	-	2	40.0	-	-	-	-
18	***V. doniana***	***3***	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	***F. ovate***	***2***	33.3	2	33.3	-	-	-	-	-	-	1	16.7	1	16.67	-	-
20	***G. africanum***	***38***	24.5	2	1.3	2	1.3	27	17.4	25	16.1	48	31.0	2	1.29	2	7.1
	Total		**415.4**		**149.2**		**212.4**		**296.9**		**332.6**		**537.6**		**31.99**		**24.2**
	Mean		**20.8**		**7.5**		**10.6**		**14.9**		**16.6**		**26.9**		**1.60**		**1.2**
	WILVS		**25.0**		**8.1**		**7.1**		**14.5**		**16.8**		**24.7**		**2.36**		**1.5**
	DILVS		**15.7**		**6.6**		**15.0**		**15.3**		**16.5**		**13.3**		**0.66**		**0.9**

Source; Field survey, 2007 **N.B All vegetables in bold outlines are WILVS**

A = Due to family preference
B = Due to ready availability
C = B/cos of their relative cheapness
D = B/cos of type of meal for which they were used
E = B/cos it gives better flavor and taste to the meal
F = B/cos of the belief in its high nutritive value
G = B/cos its acquisition was free
H = B/cos of its medicinal

Appendix 3

Appendix 3.1: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected rural markets in the study area inJanuary.

	Vegetable species	Mean no of sellers/ species/ market	% of sellers/species/ market	Mean unit weight/ bundle (G)	Mean price/ bundle (₦)	Mean price/kg (₦)
1	*T. occidentalis*	21.8	16.28	216.67	16.67	76.94
2	*Solanum spp*	6.4	4.72	94.17	16.67	177.02
3	*Vernonia spp*	18.0	13.4	128.8	12.50	97.09
4	*T. triangulare*	7.2	5.4	291.7	20.0	68.57
5	*Amaranthus spp*	8.5	6.3	229.2	16.67	72.74
6	*Cucurbita spp*	2.3	1.7	200.0	10.0	50.0
7	*M. koeningii*	6.2	4.6	46.7	10.0	214.27
8	*Corchorus spp*	2.4	1.8	132.0	20.0	151.52
9	***G. africanum***	*5.7*	*4.2*	*40.0*	*20.0*	*500.0*
10	***P. guineense***	*9.2*	*6.8*	*52.5*	*10.0*	*190.48*
11	***Ocimum spp***	*12.2*	*9.1*	*62.2*	*10.84*	*174.36*
12	***Pterocarpus spp***	*16.5*	*12.3*	*214.2*	*25.0*	*116.73*
13	***C. argentea***	*1.3*	*1.0*	*300.0*	*20.0*	*66.67*
14	***S. nigrum***	*4.0*	*3.0*	*150.0*	*10.0*	*66.67*
15	***P. santoliniodes***	*2.5*	*1.9*	*180.0*	*10.0*	*55.56*
16	***G. latifolium***	*5.0*	*3.7*	*45.0*	*10.0*	*222.22*
17	***F. ovata***	*3.0*	*2.2*	*15.0*	*10*	*66.67*
18	***S. gilo raddi***	*2.0*	*1.5*	*130.0*	*10.0*	*87.26*
		134.1	***100***			

Source: Field survey, 2007 ***NB: All vegetables in bold outline are WILVs***

Appendix 3.2: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected rural markets in the study area in February.

	Vegetable species	Mean no of sellers/ species/ market	% of seller/species/ market	Mean unit weight/ bundle (G)	Mean price/ bundle(₦)	Mean price/Kg.(₦)
1	*T. occidentalis*	19.5	15.5	280.0	20.0	71.43
2	*Solanum spp*	7.0	5.6	65.0	10.0	153.85
3	*Vernonia spp*	26.0	20.6	127.0	10.0	78.74
4	*T. triangulare*	5.5	4.4	240.0	10.0	41.67
5	*Amaranthus spp*	4.2	3.4	350	20.0	57.14
6	*M. koeningii*	5.0	4.0	70.0	10.0	142.86
7	*Corchorus spp*	1.5	1.2	135.0	10.0	74.07
8	***P. guineense***	*10.5*	*8.3*	*70.5*	*10.0*	*173.91*
9	***G. latifolium***	*6.6*	*5.2*	*125.0*	*10.0*	*157.48*
10	***Ocimum spp***	*5.0*	*4.0*	*68.0*	*10.0*	*147.06*
11	***Pterocarpus spp***	*25.3*	*20.0*	*80.0*	*10.0*	*56.34*
12	***G. africanum***	*7.5*	*6.0*	*70.0*	*70.0*	*903.23*
13	***S. nigrum***	*1.5*	*1.2*	*140.0*	*10*	*71.43*
14	***S. gilo raddi***	*1.0*	*0.8*	*150.0*	*10.0*	*66.67*

Source: Field survey, 2007. All vegetables in bold outlinesare WILVs

Appendix 3.3: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected rural markets in the study area in March.

	Vegetable species	Mean no of sellers/ species/ market	% of seller/species/ market	Mean unit weight/ bundle (G)	Mean price/ bundle (₦)	Mean price/Kg. (₦)
1	*T. occidentalis*	18.0	14.9	220.0	20.0	90.91
2	*Solanum spp*	4.5\	3.7	80.0	20.0	250.0
3	*Vernonia spp*	19.0	15.7	107.5	10.0	93.02
4	*T. triangulare*	7.0	5.8	330.0	10.0	30.0
5	*Amaranthus spp*	5.5	4.5	325.0	20.0	61.54
6	*M. koeningii*	6.0	5.0	60.0	10.0	166.67
7	*Corchorus spp*	2.5	2.1	160.5	10.0	62.31
8	***P. guineense***	*10.5*	*8.6*	*52.5*	*10.0*	*190.48*
9	***G. latifolium***	*7.4*	*6.1*	*55.0*	*10.0*	*181.82*
10	***Ocimum spp***	*5.0*	*4.1*	*50.0*	*10.0*	*200.0*
11	***Pterocarpus spp***	*24.0*	*19.9*	*152.5*	*20.0*	*131.15*
12	***G. africanum***	*8.3*	*6.8*	*82.5*	*70.0*	*848.48*
13	***C. argentea***	*1.4*	*1.1*	*255.0*	*10.0*	*39.22*
14	***S. nigrum***	*2.0*	*1.7*	*140.0*	*10.0*	*71.43*
		120.9	***100***			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVs

Appendix 3.4: **The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected rural markets in the study area inApril.**

	Vegetable species	Mean no of sellers/ species/market	% of sellers/species/ Market	Mean unit weight/bundle (G)	Mean price/ bundle (₦)	Mean price/Kg (₦)
1	*T. occidentalis*	26.0	21.9	145.0	20.0	137.93
2	*Solanum spp*	3.5	3.0	72.5	20.0	275.86
3	*Vernonia spp*	20.0	16.9	92.5	10.0	108.11
4	*T. triangulare*	12.5	10.6	260.0	10.0	43.70s
5	*Amaranthus spp*	4.0	3.4	300.0	20.0	66.67
6	*Cucurbita spp*	1.0	0.8	130.0	10.0	76.92
7	*M. koeningii*	6.0	5.1	55.0	10.0	181.82
8	*Corchorus spp*	3.5	3.0	134.0	10.0	74.63
9	***P. guineense***	*8.5*	*7.2*	*49.0*	*10.0*	*204.08*
10	***G. latifolium***	*6.0*	*5.1*	*52.5*	*10.0*	*190.48*
11	***Ocimum spp***	*3.0*	*2.5*	*75.0*	*10.0*	*133.33*
12	***Pterocarpus spp***	*18.0*	*15.2*	*132.5*	*20.0*	*150.15*
13	***G. africanum***	*5.5*	*4.6*	*87.5*	*70.0*	*800.0*
14	***S. nigrum***	*1.0*	*0.8*	*170.5*	*10.0*	*58.65*
		118.5	**100**			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVs

Appendix 3.5: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected rural markets in the study area inMay.

	Vegetable species	Mean no of Sellers/ species/ market	% of sellers/species/ Market	Mean unit weight/ bundle (G)	Mean price/ bundle (₦)	Mean price/ Kg (₦)
1	*T. occidentalis*	35.5	26.2	247.5	**15.0**	60.61
2	*Solanum spp*	7.5	5.5	70.0	20.0	285.71
3	*Vernonia spp*	16.0	11.8	100.0	10	200.0
4	*T. triangulare*	11.0	8.1	360.0	10.0	27.78
5	*Amaranthus spp*	11.0	8.1	250.0	20.0	80.0
6	*M. koeningii*	12.0	8.9	50.0	10.0	200.0
7	*Corchorus spp*	3.5	2.6	155.5	10.0	64.31
8	*Cucurbita spp*	6.5	4.8	225.0	15.0	66.67
9	***P. guineense***	*8.0*	*5.9*	*55.0*	*10.0*	*181.82*
10	***G. latifolium***	*5.5*	*4.1*	*66.5*	*10.0*	*150.38*
11	***Ocimum spp***	*4.5*	*3.3*	*127.5*	*10.0*	*78.43*
12	***Pterocarpus spp***	*7.5*	*5.5*	*125.0*	*20*	*160.0*
13	***G. africanum***	*4.5*	*3.3*	*77.5*	*45.0*	*580.65*
14	***S. nigrum***	*2.0*	*1.5*	*205.0*	*10.0*	*48.78*
15	***C. argentea***	*0.5*	*0.4*	*260.5*	*10.0*	*38.38*
		135.5	**100**			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVS

Appendix 3.6: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected rural markets in June

	Vegetable species	Mean no of sellers/ species/market	% of sellers/species/ Market	Mean unit weight\bundle (G)	Mean price / bundle(₦)	Mean price / Kg(₦)
1	*T. occidentalis*	25.3	24.6	462.5	20.0	43.24
2	*Solanum spp*	13.5	13.1		20.0	210.52
3	*Vernonia spp*	15.5	15.1	122.5	10.0	81.63
4	*T. triangulare*	6.5	6.3	260.0	10.0	38.46
5	*Amaranthus spp*	12.0	11.7	317.0	20.0	63.09
6	*Cucurbita spp*	3.0	32.9	285.0	15.0	52.63
7	*M. koeningii*	4.0	3.9	50.0	10.0	00.0
8	*Corchorus spp*	3.5	3.4	220	10.0	45.45
9	***G. africanum***	*4.0*	*3.9*	*70.0*	*35.0*	*500.0*
10	***P. guineense***	*5.0*	*4.9*	*52.5*	*10.0*	*190.48*
11	***G. latifolium***	*3.5*	*3.4*	*95.0*	*10.0*	*105.26*
12	***Ocimum spp***	*3.5*	*3.4*	*222.5*	*10.0*	*44.94*
13	***Pterocarpus spp***	*1.5*	*1.5*	*87.0*	*15.0*	*171.43*
14	***C. argentea***	*1.0*	*1.0*	*230.0*	*10.0*	*43.48*
15	***S. nigrum***	*1.0*	*1.o*	*180.0*	*10.0*	*55.56*
		102.8	***100***			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVS

Appendix 3.7: **The mean number of sellers, unit weights and prices of local vegetable species on sale inthe selected rural markets in the study area inJuly.**

	Vegetable species	Mean no of sellers/ species/market	% of sellers/species/ Market	Mean unit weight/bundle (G)	Mean price/ bundle(₦)	Mean price/Kg(₦)
1	*T. occidentalis*	24.0	23.4	322.5	15.0	46.51
2	*Solanum spp*	22.0	21.5	77.5	15.0	193.55
3	*Vernonia spp*	13.5	13.2	130.5	10.0	76.86
4	*T. triangulare*	6.5	5.3	270.0	12.5	50.31
5	*Amaranthus spp*	5.0	4.9	375.0	20.0	53.33
6	*M. koeningii*	4.0	3.9	60.0	10.0	166.67
7	***Pterocarpus spp***	*1.0*	*1.0*	*105.6*	*20.0*	*189.48*
8	***G. africanum***	*4.5*	*4.4*	*36.0*	*20.0*	*555.56*
9	***P. guineense***	*6.5*	*6.3*	*55.0*	*10.0*	*181.82*
10	***G. latifolium***	*8.0*	*7.8*	*92.5*	*10.0*	*108.11*
11	***Ocimum spp***	*2.5*	*2.4*	*137.5*	*10.0*	*72.72*
12	***C. argentea***	*2.0*	*2.0*	*250*	*10.0*	*40.0*
13	***S. nigrum***	*3.0*	*2.9*	*200.0*	*10.0*	*50.0*
		102.5	***100***			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVs

Appendix 3.8: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected rural markets in the study area inAugust.

	Vegetable species	Mean no of sellers/ species/ market	Mean no of sellers/species/ Market	Mean unit weight/ bundle (G)	Mean price/ bundle(₦)	Mean price/Kg(₦)
1	*T. occidentalis*	19.5	18.3	355.5	15.0	42.19
2	*Solanum spp*	31.5	29.6	103.8	15.0	144.51
3	*Vernonia spp*	17.5	16.4	120.9	15.0	124.12
4	*T. triangulare*	3.0	2.8	315.0	10.0	31.75
5	*Amaranthus spp*	3.0	2.8	400.0	20.0	50.0
6	*Cucurbita spp*	1.5	1.4	200.0	10.0	50.0
7	*M. koeningii*	4.5	4.2	60.0	10.0	166.67
8	*Corchorus spp*	1.5	1.4	200.0	10.0	50.0
9	***P. guineense***	*4.5*	*4.2*	*63.0*	*10.0*	*158.73*
10	***G. latifolium***	*8.5*	*8.0*	*74.5*	*10.0*	*134.23*
11	***Ocimum spp***	*5.5*	*5.2*	*80.5*	*10.0*	*124.22*
12	***G. africanum***	*3.5*	*3.3*	*30.0*	*20.0*	*666.64*
13	***S. nigrum***	*2.5*	*2.4*	*210.0*	*10.0*	*47.62*
		106.5	***100***			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVs

Appendix 3.9: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected rural markets in the study area inSeptember

	Vegetable species	Mean no of sellers/ species/market	% of sellers/species Market	Mean unit weight\bundle(G)	Mean price/ bundle(₦)	Mean price/Kg(₦)
1	*T. occidentalis*	21.5	20.3	342.3	15.0	43.82
2	*Solanum spp*	28.0	26.4	92.3	15.0	162.60
3	*Vernonia spp*	14.5	13.7	137.4	15.0	109.21
4	*T. triangulare*	2.0	1.9	290.0	10.0	34.48
5	*Amaranthus spp*	3.0	2.8	350.0	20.0	57.14
6	*Cucurbita spp*	2.0	1.9	180	10.0	55.56
7	*M. koeningii*	5.5	5.2	60.5	10.0	165.29
8	*Corchorus spp*	2.0	1.9	200.0	10.0	50.0
9	***P. guineense***	*5.5*	*5.2*	*62.5*	*10.0*	*160.0*
10	***G. latifolium***	*4.5*	*4.3*	*74.0*	*10.0*	*135.14*
11	***Ocimum spp***	*6.5*	*6.1*	*127.5*	*10.0*	*78.43*
12	***G. africanum***	*4.5*	*4.3*	*27.35*	*20.0*	*731.20*
13	***S. nigrum***	*3.5*	*3.3*	*190.0*	*10.0*	*52.63*
14	***P. santoliniodes***	*1.0*	*O.9*	*260.0*	*10.0*	*38.46*
15	***S. gilo raddi***	*2.0*	*1.9*	*200.0*	*10.0*	*50.0*
		106.0	***100***			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVs

Appendix 3.10: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected rural markets in the study area in October.

	Vegetable species	Mean no of sellers/ species/ market	% of sellers/species/ Market	Mean unit weight/ bundle (G)	Mean price/ bundle(₦)	Mean price/Kg(₦)
1	*T. occidentalis*	21.50	16.23	322.5	15.0	46.58
2	*Solanum spp*	15.0	11.3	115.0	15.0	130.43
3	*Vernonia spp*	21.5	16.2	106.2	10.0	94.21
4	*T. triangulare*	10.5	7.9	204.8	10.0	48.84
5	*Amaranthus spp*	9.0	6.8	310.0	10.0	32.26
6	*Cucurbita spp*	1.0	0.8	160.0	10.0	62.50
7	*M .koeningii*	8.5	6.4	71.0	10.0	140.0
8	*Corchorus spp*	1.5	1.1	185.4	10.0	53.95
9	***P. guineense***	*13.5*	*10.2*	*55.7*	*10.0*	*179.53*
10	***G. latifolium***	*7.5*	*5.7*	*76.5*	*10.0*	*130.72*
11	***Ocimum spp***	*8.5*	*6.4*	*130.5*	*10.0*	*76.92*
12	***P. santoliniodes***	*2.0*	*1.5*	*247.0*	*10.0*	*40.49*
13	***G. africana***	*9.0*	*6.8*	*38.4*	*20.0*	*520.29*
14	***S. nigrum***	*2.0*	*1.5*	*175.6*	*10.0*	*56.96*
15	***C. argentea***	*1.5*	*1.1*	*320*	*10.0*	*31.25*
		132.50	**100**			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVs

Appendix 3.11: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected rural markets in the study area in November

	Vegetable species	Mean no of Sellers/ species/ market	% of sellers/species/ Market	Mean unit weight/ bundle (G)	Mean price/ bundle(₦)	Mean price/Kg(₦)
1	*T. occidentalis*	19.33	18.08	242.5	**15.0**	N61.86
2	*Solanum spp*	14.5	13.6	113.0	15.0	132.74
3	*Vernonia spp*	14.0	13.1	131.0	10.0	76.34
4	*T. triangulare*	1.3	1.2	131.0	10.0	76.34
5	*Amaranthus spp*	5.0	4.7	262.0	10.0	38.17
6	*Corchorus spp*	1.2	1.1	150.5	10.0	66.42
7	*M. koeningii*	6.0	5.6	121.5	15.0	123.46
8	***G. africanum***	*5.4*	*5.0*	*140.5*	*70.0*	*498.22*
9	***P. guineense***	*9.5*	*8.9*	*70.5*	*10.0*	*141.84*
10	***G. latifolium***	*8.0*	*7.5*	*95.5*	*15.0*	*157.07*
11	***Ocimum spp***	*3.0*	*2.8*	*137.5*	*10.0*	*72.73*
12	***Pterocarpus spp***	*16.3*	*15.2*	*144.0*	*15.0*	*104.17*
13	***S. nigrum***	*3.0*	*2.8*	*170.0*	*10.0*	*58.82*
14	***C. argentea***	*0.6*	*0.5*	*300.3*	*10.0*	*33.31*
		106.89	**100**			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVs

Appendix 3.12: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected rural markets in the study area inDecember.

	Vegetable species	Mean no of sellers/ species/ market	% of seller/species/ market	Mean unit weight/ bundle (G)	Mean price/ bundle(₦)	Mean price/Kg.(₦)
1	*T. occidentalis*	18.0	16.7	215.0	15.0	69.76
2	*Solanum spp*	5.0	4.6	100.0	15.0	150.0
3	*Vernonia spp*	18.0	16.7	130.0	10.0	76.92
4	*Corchorus spp*	1.5	1.3	133.5	10.0	74.91
5	*Amaranthus spp*	3.22	3.0	240.8	10.0	41.54
6	*M. koeningii*	5.4	5.0	105.3	10.0	95.14
7	***Pterocarpus spp***	*30.5*	*28.3*	*202.5*	*7.5*	*37.37*
8	***Ocimum spp***	*6.0*	*6.0*	*140.0*	*10.0*	*71.43*
9	***G. latifolium***	*3.0*	*2.8*	*76.5*	*10.0*	*130.72*
10	***P. guineense***	*10.0*	*9.3*	*75.0*	*10.0*	*133.33*
11	***S. nigrum***	*2.0*	*1.8*	*160.0*	*10.0*	*62.50*
12	***C. argentea***	*1.0*	*0.9*	*280.0*	*10.0*	*35.71*
13	***G. africanum***	*4.3*	*3.9*	*75.0*	*70.0*	*933.33*

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVS

Appendix 3.13: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected urban markets in the study area inJanuary.

	Vegetable species	Mean no of sellers/ species/ market	% of sellers/ species market	Mean unit weight/ bundle (g)	Mean price/ bundle(₦)	Mean price/kg(₦)
1	*T. occidentalis*	21.8	16.3	216.7	16.67	76.94
2	*Solanum spp*	6.3	4.7	94.2	16.67	177.02
3	*Vernonia spp*	18.0	13.4	128.8	12.50	97.09
4	*T. triangulare*	7.2	5.4	291.7	20.0	68.57
5	*Amaranthus spp*	8.5	6.3	229.2	16.67	72.74
6	*Cucurbita spp*	2.3	1.7	200.0	10.0	50.0
7	*M. koeningii*	6.2	4.6	46.7	10.0	214.27
8	*Corchorus spp*	2.4	1.8	132.0	20.0	151.52
9	***G. africanum***	*5.7*	*4.2*	*40.0*	*20.0*	*500.0*
10	***P. guineense***	*9.2*	*6.8*	*52.5*	*10.0*	*190.48*
11	***Ocimum spp***	*12.2*	*9.1*	*62.2*	*10.84*	*174.36*
12	***Pterocarpus spp***	*16.5*	*12.3*	*214.2*	*25.0*	*116.73*
13	***C. argentea***	*1.3*	*1.0*	*300.0*	*20.0*	*66.67*
14	***S. nigrum***	*4.0*	*3.0*	*150.0*	*10.0*	*66.67*
15	***P. santoliniodes***	*2.5*	*1.9*	*180.0*	*10.0*	*55.56*
16	***G. latifolium***	*5.0*	*3.7*	*45.0*	*10.0*	*222.22*
17	***F. ovata***	*3.0*	*2.2*	*15.0*	*10*	*66.67*
18	***S. gilo raddi***	*2.0*	*1.5*	*130.0*	*10.0*	*87.26*
		134.1	***100.0***			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVS

Appendix 3.14: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected urban markets in the study area inFebruary.

	Vegetable Species	Mean no of sellers/ species/ market	% of sellers/species/ market	Mean unit weight/ bundle (G)	Mean price/ bundle(₦)	Mean price/kg (₦)
1	*T. occidentalis*	22.2	18.0	179.2	15.0	83.72
2	*Solanum spp*	5.3	4.3	110.3	20.0	181.41
3	*Vernonia spp*	12.2	9.9	94.5	10.84	114.71
4	*T. triangulare*	7.5	6.1	278.3	16.67	59.89
5	*Amaranthus spp*	8.2	6.6	197.9	15.84	80.03
6	*Cucurbita spp*	2.0	1.6	215.3	10.0	46.46
7	*M. koeningii*	6.3	5.2	42.8	9.17	214.05
8	*Corchorus spp*	2.0	1.6	97.5	10.0	102.56
9	***P. santaliniodes***	*4.3*	*3.5*	*165.8*	*10.0*	*60.33*
10	***G. africanum***	*4.5*	*3.8*	*24.2*	*20.0*	*827.47*
11	***P. guineense***	*9.7*	*7.9*	*46.6*	*10.0*	*214.46*
12	***Ocimum spp***	*10.8*	*8.8*	*69.6*	*10.0*	*143.70*
13	***Pterocarpus spp***	*14.7*	*11.9*	*232.5*	*28.34*	*121.89*
14	***C. argentea***	*2.0*	*1.6*	*288.2*	*20.0*	*69.40*
15	***S. nigrum***	*2.3*	*1.9*	*145.3*	*20.0*	*137.62*
16	***F. ovate***	*2.0*	*21.6*	*160.0*	*10.0*	*62.50*
17	***G. latifolium***	*6.0*	*4.9*	*32.5*	*10.0*	*307.69*
18	***S. gilo raddi***	*1.0*	*0.8*	*125.0*	*10.0*	*80.0*
		123.2	*100.0*			

Source: Field survey, 2007 NB: All vegetables in bold outlines are WILVs

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Appendix 3.15: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected urban market in the study area inMarch.

	Vegetable species	Mean no of sellers/ species/ market	% of sellers/ species/ market	Mean unit weight/bundle (G)	Mean price/ bundle(₦)	Mean price/Kg(₦)
1	*T. occidentalis*	21.8	19.0	165.0	16.67	101.03
2	*Solanum spp*	7.5	6.5	95.0	20.0	210.53
3	*Vernonia spp.*	15.0	13.0	79.2	10.0	126.31
4	*T. triangulare*	7.8	6.8	222.5	16.67	74.92
5	*Amaranthus spp.*	7.7	6.7	196.7	15.84	80.54
6	*M. koeningii*	8.0	7.0	52.5	10.0	190.48
7	*Corchorus spp.*	1.0	0.9	80.0	10.0	125.0
8	***G. africanum***	*4.0*	*3.5*	*36.7*	*30.0*	*818.10*
9	***P. guineense***	*9.0*	*7.8*	*46.7*	*10.0*	*214.27*
10	***G. latifolium***	*7.8*	*6.8*	*40.0*	*10.0*	*250.0*
11	***Ocimum spp.***	*10.5*	*9.1*	*59.2*	*10.0*	*169.00*
12	***Pterocarpus spp.***	*13.0*	*11.3*	*197.5*	*28.34*	*143.49*
13	***C. argentea***	*1.0*	*0.9*	*590.0*	*10.0*	*16.95*
		115.2	***100***			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVs

Appendix 3.16: **The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected urban markets in the study area inApril.**

	Vegetable species	Mean no of sellers/ market	% of sellers/ species market	Mean unit weight/bundle (G)	Mean price/ bundle(₦)	Mean price/Kg(₦)
1	*T. occidentalis*	21.1	17.15	224.45	18.89	84.16
2	*Solanum spp*	5.8	4.7	76.9	14.44	187.78
3	*Vernonia spp.*	15.6	12.6	97.2	10.0	102.86
4	*T.triangulare*	12.1	9.8	207.8	12.78	63.95
5	*Amaranthus spp.*	7.6	6.1	226.1	17.78	78.63
6	*M. koeningii*	10.3	8.4	53.3	8.33	156.20
7	*Cucurbita spp*	1.0	0.8	150.0	10.0	66.67
8	*Corchorus spp.*	1.3	1.1	175.0	10.0	48.19
9	***G. africanum***	*4.7*	*3.8*	*28.6*	*20.0*	*699.54*
10	***P. guineense***	*11.7*	*9.5*	*48.6*	*10.0*	*205.59*
11	***G. latifolium***	*9.0*	*7.3*	*45.7*	*10.56*	*231.12*
12	***Ocimum spp.***	*11.3*	*9.2*	*72.3*	*8.33*	*115.17*
13	***C. argentea***	*1.0*	*0.8*	*207.5*	*10.0*	*48.19*
14	***S. nigrum***	*1.0*	*0.8*	*170.0*	*10.0*	*58.82*
15	***Pterocarpus spp.***	*8.7*	*7.0*	*159.2*	*27.28*	*174.45*
16	***P. santoliniodes***	*1.0*	*0.8*	*200.0*	*10.0*	*50.0*
		123.1	***100.0***			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVS

Appendix 3.17: the mean number of sellers, unit weights and prices of local vegetable species on sale in the selected urban market inthe study area inMay.

	Vegetable species	Mean no of sellers/species/ market	% of sellers/ species/ market	Mean unit weight/bundle (G)	Mean price/ bundle(₦)	Mean price/Kg(₦)
1	*T. occidentalis*	20.8	18.9	240.5	20.0	83.16
2	*Solanum spp*	4.1	3.7	113.3	15.56	137.30
3	*Vernonia spp.*	17.4	15.9	94.4	10.0	105.89
4	*T. triangulare*	11.7	10.6	187.0	13.34	71.93
5	*Amaranthus spp.*	6.9	6.3	265.6	17.22	64.85
6	*Corchorus spp.*	1.3	1.2	130.0	10.0	76.92
7	*Cucurbita spp.*	2.0	1.8	185.0	10.0	54.05
8	*M. koeningii*	10.9	9.9	67.0	8.33	124.33
9	***P. guineense***	*4.6*	*4.1*	*50.3*	*10.0*	*198.89*
10	***G. latifolium***	*4.3*	*3.9*	*45.0*	*10.0*	*222.22*
11	***Ocimum spp.***	*12.4*	*11.3*	*91.7*	*8.33*	*90.87*
12	***Pterocarpus spp.***	*5.78*	*5.3*	*137.6*	*21.11*	*153.46*
13	***C. argentea***	*1.0*	*0.9*	*400*	*10.0*	*50.0*
14	***S. nigrum***	*1.0*	*0.9*	*150*	*10.0*	*66.67*
15	***P. santoliniodes***	*1.0*	*0.9*	*185.0*	*10.0*	*54.05*
16	***G. africanum***	*2.7*	*2.4*	*39.4*	*36.67*	*929.77*
17	***L. cupaniodes***	*2.0*	*1.8*	*145.0*	*20.0*	*137.93*
		109.9	***100***			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVs

Appendix 3.18: The mean number of sellers, unit weights and prices of local vegetable species on sale inthe selected urban market in the study area in June.

	Vegetable species	Mean no of sellers/ market	% of sellers/ species/ market	Mean unit weight/bundle (G)	Mean price/ bundle(₦)	Mean price/Kg (₦)
1	*T. occidentalis*	24.2	16.3	264.5	17.78	67.23
2	*Solanum spp*	13.3	9.0	97.8	18.89	193.19
3	*Vernonia spp.*	20.5	13.8	137.2	18.89	137.66
4	*T. triangulare*	9.1	9.4	193.6	12.50	67.62
5	*Amaranthus spp.*	11.7	7.9	294.4	22.78	77.37
6	*Corchorus spp.*	2.0	1.4	192.5	10.0	51.95
7	*M. koeningii*	11.1	7.5	71.7	11.11	155.02
8	***G. africanum***	*5.3*	*3.6*	*51.7*	*36.67*	*709.70*
9	***P. guineense***	*13.3*	*9.0*	*69.2*	*10.83*	*156.57*
10	***G. latifolium***	*11.0*	*7.4*	*72.3*	*11.67*	*161.34*
11	***Ocimum spp.***	*11.8*	*8.0*	*74.6*	*11.11*	*149.02*
12	***Pterocarpus spp.***	*13.1*	*8.8*	*156.7*	*45.56*	*290.80*
13	***C. argentea***	*0.7*	*0.5*	*210.0*	*10.0*	*47.62*
14	***S. nigrum***	*0.7*	*0.5*	*160.0*	*10.0*	*62.50*
15	***P. santoliniodes***	*0.7*	*0.5*	*190.0*	*10.0*	*52.63*
		148.5	***100***			

Source: Field survey, 2007 NB: All vegetables in bold outlines are WILVs

Appendix 3.19: The mean number of sellers, unit weights and prices of local vegetable species on sale in selected urban markets surveyed in July.

	Vegetable species	Mean no of sellers market	% of sellers species market	Mean unit weight / bundle (G)	Mean price / bundle	Mean price / kg
1	*T. occidentalis*	20.6	16.8	285.6	N15.55	N54.46
2	*Solanum spp*	12.1	9.9	99.4	N13.89	N139.68
3	*Vernonia spp*	14.7	12.0	135.8	N11.11	N81.82
4	*T. triangulare*	9.2	7.5	200.7	N11.67	N60.49
5	*Amaranthus spp*	11.6	9.5	293.9	N16.67	N56.72
6	*Corchorus spp*	3.2	2.6	188.9	N11.67	N61.78
7	*M. koeningii*	7.6	6.2	70.6	N8.33	N188.06
8	*Curcubita spp*	0.3	0.2	330.0	N10.0	N30.0
9	***P. guineense***	*10.4*	*8.5*	*81.7*	*N10.0*	*N122.44*
10	***G. latifolium***	*11.3*	*9.3*	*65.2*	*N9.44*	*N144.74*
11	***Ocimum spp***	*10.2*	*8.4*	*77.2*	*N10.0*	*N129.50*
12	***Pterocarpus spp***	*6.7*	*5.5*	*148.3*	*N27.78*	*N187.29*
13	***C. argentea***	*0.7*	*0.6*	*225.0*	*N10.0*	*N44.44*
14	***S. nigrum***	*1.0*	*0.8*	*180.0*	*N10.0*	*N55.56*
15	***P. santolinissdes***	*0.7*	*0.6*	*200.0*	*N10.0*	*N50.0*
16	***G. africanum***	*2.1*	*1.7*	*49.7*	*N26.67*	*536.94*
		122.3	***100.0***			

Source: Field survey, 2007 NB: All vegetables in bold outlines are WILVS

Appendix 3.20: The mean number of seller unit weight and prices of local vegetable species on sale in the selected urban markets in the study area in August.

	Vegetable species	Mean no of sellers/species/ market	% of sellers/ species/ market	Mean unit weight/ bundle (G)	Mean price/ bundle(₦)	Mean price/kg (₦)
1	*T. occidentalis*	20.2	15.8	361.7	21.11	58.37
2	*Solanum spp*	11.6	9.0	177.2	17.22	97.17
3	*Vernonia spp*	15.1	11.8	149.4	10.0	66.92
4	*T. triangulare*	8.7	6.8	267.2	14.44	54.04
5	*Amaranthus spp*	10.0	7.8	298.9	17.78	59.49
6	*Cucurbita spp*	0.7	0.5	400.0	10.0	25.0
7	*Corchorus spp*	1.6	1.2	306.9	16.88	55.0
8	*M. koeningii*	10.8	8.4	56.7	8.33	146.99
9	***P. guineense***	*10.5*	*8.2*	*57.5*	*10.83*	*188.35*
10	***G. latifolium***	*12.4*	*9.7*	*90.6*	*11.11*	*122.69*
11	***Ocimum spp***	*13.7*	*10.7*	*83.9*	*11.11*	*132.44*
12	***Pterocarpus spp***	*10.4*	*8.2*	*147.8*	*22.22*	*150.36*
13	***G. africanum***	*1.6*	*1.2*	*60.0*	*13.33*	*222.17*
14	***P. purpureum***	*0.7*	*0.5*	*200.0*	*10.0*	*50.0*
		127.9	***100.0***			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVS

Appendix 3.21: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected urban markets in the study area in September.

	Vegetable species	Mean no of sellers/ species/ market	% of sellers/species/ market	Mean unit weight/ bundle (G)	Mean price/ bundle(₦)	Mean price/kg(₦)
1	*T. occidentalis*	23.7	17.4	258.3	15.55	60.19
2	*Solanum spp*	9.7	7.1	185.0	12.78	69.08
3	*Vernonia spp*	16.2	12.0	112.8	10.0	88.67
4	*T. triangulare*	7.2	5.3	306.7	13.33	43.47
5	*Amaranthus spp*	10.6	7.8	322.8	17.78	55.08
6	*Cucurbita spp*	1.0	o.7	135.0	10.0	74.07
7	*M. koeningii*	8.0	5.9	51.1	6.94	35.79
8	*Corchorus spp*	2.7	2.0	235.0	13.75	58.51
9	***G. africanum***	*3.7*	*2.7*	*51.7*	*16.67*	*322.62*
10	***P. guineense***	*9.5*	*7.0*	*64.4*	*10.0*	*155.18*
11	***G. latifolium***	*9.6*	*7.0*	*102.8*	*11.94*	*116.17*
12	***Ocimum spp***	*10.6*	*7.8*	*85.2*	*10.55*	*123.79*
13	***Pterocarpus spp***	*10.8*	*7.9*	*185.0*	*22.78*	*123.14*
14	***S. nigrum***	*5.7*	*4.2*	*175.0*	*10.0*	*57.14*
15	***Pterocarpus spp.***	*2.3*	*1.7*	*240.0*	*10.0*	*41.67*
16	***S. gilo raddi***	*4.7*	*3.4*	*165.0*	*10.0*	*60.61*
		135.7	***100.0***			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVs

Appendix 3.22: **The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected urban markets in the study in October.**

	Vegetable species	Mean no of sellers/ species/ market	% of sellers/species/ market	Mean unit weight/ bundle (G)	Mean price/ bundle(₦)	Mean price/kg(₦)
1	*T. occidentalis*	23.7	18.4	211.7	15.56	73.51
2	*Solanum spp*	13.7	10.7	110.8	15.0	135.34
3	*Vernonia spp*	14.6	11.3	131.1	10.0	76.27
4	*T. triangulare*	5.6	4.3	279.2	16.67	59.71
5	*Amaranthus spp*	7.9	6.1	266.5	15.0	56.29
6	*Cucurbita spp*	0.3	0.3	125.0	10.0	80.0
7	*M. koeningii*	8.7	6.7	67.8	8.33	122.90
8	*Corchorus spp*	2.8	2.2	177.5	10.0	56.34
9	***G. africanum***	*3.8*	*2.9*	*44.5*	*18.34*	*412.21*
10	***P. guineense***	*7.0*	*5.4*	*53.3*	*8.75*	*164.32*
11	***G. latifolium***	*7.0*	*5.4*	*71.2*	*10.0*	*140.51*
12	***Ocimum spp***	*10.3*	*8.0*	*93.3*	*9.17*	*98.24*
13	***Pterocarpus spp***	*12.0*	*9.4*	*151.7*	*20.0*	*131.86*
14	***S. nigrum***	*3.3*	*2.6*	*120.0*	*10.0*	*83.33*
15	***P. santaliniodes***	*4.7*	*3.6*	*250.0*	*10.0*	*40.0*
16	***C. argentea***	*1.7*	*1.3*	*300.0*	*10.0*	*33.33*
17	***S. gilo raddi***	*1.7*	*1.3*	*130.0*	*10*	*76.92*
		128.7	***100.0***			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVs

Appendix 3.23: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected urban markets in November.

	Vegetable species	Mean no of sellers/species / market	% of sellers/ species/ market	Mean unit weight/ bundle (G)	Mean price/ bundle(₦)	Mean price/kg (₦)
1	*T. occidentalis*	17.4	15.9	176.5	16.67	94.46
2	*Solanum spp*	10.7	9.7	107.2	15.0	139.96
3	*Vernonia spp*	15.0	13.7	135.9	12.22	89.91
4	*T. triangulare*	4.8	4.4	289.9	16.67	57.51
5	*Amaranthus spp*	6.2	5.7	351.9	16.67	64.04
6	*Corchorus spp*	1.8	1.7	85.0	10.0	117.65
7	*M.koeningii*	6.7	6.1	42.7	7.50	175.76
8	***G. africanum***	*2.1*	*1.9*	*40.7*	*26.67*	*655.77*
9	***P. guineense***	*8.0*	*7.3*	*57.4*	*10.0*	*174.09*
10	***G. latifolium***	*4.4*	*4.1*	*66.6*	*9.17*	*137.71*
11	***Ocimum spp***	*11.7*	*10.4*	*69.01*	*9.44*	*136.79*
12	***Pterocarpus spp***	*13.3*	*12.2*	*221.4*	*21.67*	*97.87*
13	***S. nigrum***	*2.7*	*2.4*	*75.0*	*10.0*	*133.33*
14	***P. santoliniodes***	*3.5*	*3.2*	*165.0*	*10.0*	*60.61*
15	***S. gilo raddi***	*1.3*	*1.2*	*100.0*	*10.0*	*100.0*
		109.7	***100***			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVs

Appendix 3.24: The mean number of sellers, unit weights and prices of local vegetable species on sale in the selected urban markets inthe study area in December.

	Vegetable species	Mean no of sellers/species/ market	% of sellers/ species/ market	Mean unit weight/ bundle (G)	Mean price/ bundle(₦)	Mean price/kg (₦)
1	*T. occidentalis*	19.8	17.4	188.3	16.67	88.51
2	*Solanum spp*	11.8	10.3	98.2	18.34	186.82
3	*Vernonia spp*	14.9	13.1	150.0	11.25	75.0
4	*T. triangulare*	6.2	5.4	285.0	18 .34	64.35
5	*Amaranthus spp*	8.5	7.5	200.8	15.84	78.87
6	*Corchorus spp*	0.7	0.6	105.0	20.0	190.48
7	*M. koeningii*	4.8	4.2	60.8	10.67	175.38
8	***P. guineense***	*6.2*	*5.5*	*58. 8*	*10.0*	*170.21*
9	***G. latifolium***	*3.8*	*2.8*	*57.9*	*10.0*	*172.65*
10	***Ocimum spp***	*9.8*	*8.6*	*55.1*	*9.17*	*166.58*
11	***Pterocarpus spp***	*16.2*	*14.2*	*200.8*	*23.34*	*116.22*
12	***C. argentea***	*1.0*	*0.9*	*190.0*	*10.0*	*52.63*
13	***S. nigrum***	*4.0*	*3.5*	*65.0*	*10.0*	*153.85*
14	***G. africanum***	*3.3*	*2.9*	*45.8*	*20.0*	*436.30*
15	***P. santoliniodes***	*0.3*	*0.3*	*145.0*	*10.0*	*68.97*
16	***S. gilo raddi***	*2.7*	*2.3*	*95.0*	*10.0*	*105.26*
		113.9	***100***			

Source: Field survey, 2007. NB: All vegetables in bold outlines are WILVs

Appendix 3.25: **The mean number of sellers, unit weights and prices of leafy vegetable species in the selected rural markets in the study area during the dry season**

S/N	Vegetable species	Mean no of Sellers/ species/ market	% of sellers/ species/ Market	Mean unit weight/ bundle (G)	Mean price/ bundle (₦)	Mean price/Kg (₦)
1	*T. occidentalis*	18	15.3	251.7	**18.0**	71.51
2	*Solanum spp*	7	5.9	90.0	15.0	166.67
3	*Vernonia spp*	18	15.3	124.1	10.0	80.58
4	*T. triangulare*	5	4.2	209.0	10.0	47.85
5	*Amaranthus spp*	5	4.2	294.4	15.0	50.94
6	*M. koeningii*	6	5.1	89.2	11.25	126.14
7	*Corchorus spp*	2	1.7	117.1	10.0	85.43
8	***P. santoliniodes***	*1*	*0.9*	*200.0*	*10.0*	*50.0*
9	***G. africanum***	*6*	*5.1*	*91.0*	*70.0*	*769.23*
10	***P. guineense***	*10*	*8.5*	*65.1*	*10.0*	*153.61*
11	***G. latifolium***	*6*	*5.1*	*72.2*	*11.0*	*152.35*
12	***Ocimum spp***	*5*	*4.2*	*104.1*	*10.0*	*96.06*
13	***Pterocarpus spp***	*24*	*20.3*	*174.3*	*12.5*	*71.72*
14	***S. nigrum***	*2*	*1.7*	*152.0*	*10.0*	*65.79*
15	***C. argentea***	*1*	*0.9*	*278.4*	*10.0*	*35.92*
16	***F. ovate***	*1*	*0.9*	*180.0*	*10.0*	*55.56*
17	***S. gilo raddi***	*1*	*0.9*	*150.0*	*10.0*	*66.67*
	Total	**118**	**100**	**2642.6**	**252.75**	**2146.03**
	Mean	**6.9**	**5.9**	**155.5**	**14.87**	**126.24**
	Mean for DILVs	**8.6**	**7.4**	**167.9**	**12.75**	**89.87**
	Mean for WILVs	**5.7**	**4.8**	**146.7**	**16.35**	**151.69**

Source: Field survey, 2007 ***NB: All vegetables in bold outlines are WILVs***

Appendix 3.26: **The mean number of sellers, unit weights and prices of leafy vegetable species in the selected rural markets in the study area during the rainy season.**

	Vegetable species	Mean no of Sellers/ species/ market	% of sellers/species/ Market	Mean unit weight/ bundle (G)	Mean price/ bundle	Mean price/Kg
1	*T. occidentalis*	24.6	20.07	313.97	**N16.43**	N52.33
2	*Solanum spp*	17.23	14.1	89.4	N17.14	N191.64
3	*Vernonia spp*	16.9	13.8	115.7	N11.43	N98.80
4	*T. triangulare*	7.4	6.1	280.0	N10.36	N39.33
5	*Amaranthus spp*	6.7	5.5	328.9	N18.57	N56.47
6	*Curcubita spp*	2.5	2.0	196.7	N11.67	N59.34
7	*M. koeningii*	6.4	5.2	58.1	N10.0	N172.21
8	*Corchorus spp*	2.5	2.0	182.3	N10.0	N54.87
9	***P. santoliniodes***	*1.5*	*1.2*	*253.5*	*N10.0*	*N39.45*
10	***G. latifolium***	*5.1*	*4.1*	*46.9*	*N32.86*	*N700.49*
11	***P. guineense***	*7.4*	*6.0*	*56.1*	*N10.0*	*N178.25*
12	***G. latifolium***	*6.2*	*5.1*	*75.9*	*N10.0*	*N131.70*
13	***Ocimum spp***	*4.9*	*4.0*	*128.7*	*N10.0*	*N77.69*
14	***Pterocarpus spp***	*7.0*	*5.7*	*112.6*	*N18.75*	*N166.46*
15	***S. nigrum***	*2.0*	*1.6*	*190.2*	*N10.0*	*N55.59*
16	***C. argentea***	*1.3*	*1.0*	*265.1*	*N10.0*	*N37.72*
17	***S. gilo raddi***	*2.0*	*1.6*	*200.0*	*N10.0*	*N50.0*
	Total	***122.7***	***100***	***2851.7***	***N227.21***	***N2167.26***
	Mean	***7.2***	***5.9***	***167.8***	***N13.37***	***N127.49***
	Mean for DILVs	***10.7***	***8.7***	***190.3***	***N13.20***	***N91.61***
	Mean for WILVs	***4.1***	***3.4***	***147.7***	***N13.51***	***N159.37***

Source: Field survey, 2007 NB: ***All vegetables in bold outlines are WILVS***

Appendix 3.27: The number of sellers, unit weights and prices of indigenous leafy vegetable species in the selected urban markets during the dry season

S/N	Vegetable species	Mean no of sellers/ species/ market	% of sellers/sp/	Mean unit weight/ bundle (G)	Mean price/ bundle(₦)	Mean price /Kg.(₦)
1	*T.occidentalis*	21	17.1	185.1	16.13	88.26
2	*Solanum spp*	8	6.5	101.0	18.0	78.31
3	*Vernonia spp*	15	12.2	117.7	11.36	96.54
4	*T.triangulare*	8	6.5	273.5	17.67	64.61
5	*Amaranthus spp*	7	5.7	235.3	16.17	68.72
6	*Cucurbita spp*	2	1.6	207.5	10.0	48.19
7	*Corchorus spp*	2	1.6	99.9	14.0	140.14
8	*M. koeningii*	6	4.9	49.1	9.47	192.87
9	***P guineense***	*8*	*6.5*	*52.4*	*10.0*	*190.88*
10	***G latifolium***	*5*	*4.I*	*48.4*	*9.83*	*203.10*
11	***Ocimum spp***	*11*	*8.9*	*63.0*	*9.89*	*156.98*
12	***Pterocarpus spp***	*15*	*12.2*	*213.3*	*25.34*	*118.81*
13	***P. santoliniodes***	*3*	*2.4*	*163.9*	*10.0*	*61.0*
14	***S.nigrum***	*3*	*2.4*	*108.8*	*16.67*	*153.17*
15	***G. africanum***	*4*	*3.3*	*37.5*	*23.33*	*622.63*
16	***F.ovata***	*2*	*1.6*	*155.0*	*20.0*	*129.03*
17	***S. gilo raddi***	*2*	*1.6*	*112.5*	*10.0*	*88.89*
18	***C.argentea***	*1*	*0.8*	*342.0*	*15.0*	*43.86*
	Total	***123***	***100***	***2565.9***	***263.07***	***2645.99***
	Mean	***6.9***	***5.6***	***142.6***	***14.62***	***147.00***
	Mean for DILVs	***8.7***	***7.0***	***158.6***	***14.13***	***109.71***
	Mean for WILVs	***5.3***	***4.4***	***129.7***	***15.01***	***176.84***

Source: Field survey, 2007 NB: ***All vegetables in bold outlines are WILVs***

Appendix 3.28: The mean number of sellers, unit weights and prices of indigenous leafy vegetable species in the selected urban markets during the rainy season.

S/N	Vegetable species	Mean no of sellers/ species/ market	% of sellers/sp/ market	Mean unit weight/ bundle (G)	Mean price/ bundle(₦)	Mean price/kg(₦)
1	*T. occidentalis*	22	16.4	263.8	17.78	67.40
2	*Solanum spp*	10	7.5	122.9	15.40	125.27
4	*T. triangulare*	9	6.7	244.6	13.53	60.17
5	*Amaranthus spp*	9	6.7	281.2	17.86	63.52
6	*Corchorus spp*	2	1.5	200.8	11.76	58.56
7	*M.koeningii*	10	7.5	62.6	8.53	136.28
8	*Cucurbita spp*	1	0.8	220.0	10.0	45.45
9	***P. guineense***	*10*	*7.5*	*60.7*	*11.49*	*195.85*
10	***G. latifolium***	*9*	*6.7*	*70.4*	*10.67*	*151.58*
11	***Ocimum spp***	*12*	*9.0*	*82.6*	*9.80*	*118.64*
12	***Pterocarpus spp***	*10*	*7.5*	*155.2*	*30.80*	*198.49*
13	***P. santoliniodes***	*2*	*1.5*	*210.8*	*10.0*	*47.43*
14	***S. nigrum***	*2*	*1.5*	*159.2*	*10.0*	*62.83*
15	***G. africanum***	*3*	*2.2*	*46.5*	*24.05*	*517.09*
16	***C. argentea***	*1*	*0.8*	*268.5*	*10.0*	*37.24*
17	***P. purpureum***	*1*	*0.8*	*200.0*	*10.0*	*80.65*
18	***S. gilo raddi***	*3*	*2.2*	*147.5*	*10.0*	*67.80*
19	***L. cupaniodes***	*2*	*1.5*	*145.0*	*10.0*	*137.93*
	Totals	***134***	***100***	***3003.7***	***262.07***	***2274.33***
	Mean	***7.0***	***5.3***	***158.1***	***13.79***	***119.70***
	Mean for DILVs	***10.0***	***7.4***	***182.2***	***13.16***	***82.35***
	Mean for WILVs	***4.9***	***3.7***	***140.6***	***14.26***	***146.87***

Source: Field survey, 2007: NB: ***All vegetables in bold outlines are WILVs***

Appendix 3.29: Main sources of the vegetable species sold in the various rural markets in the study area.

	Vegetable species	Own Farm		Forest Area		Other Vendors	
		Freq	%	Freq	%	Freq	%
1	*T. occidentalis*	50	70.4	----	----	21	29.6
2	*Solanum spp*	30	60.0	----	----	20	40.0
3	*Vernonia spp*	36	63.2	----	----	21	36.8
4	*T. triangulare*	20	46.5	16	37.2	7	16.3
5	*Amaranthus spp*	30	76.9	----	----	9	23.1
6	*Cucurbita spp*	11	100.0	----	----	----	----
7	*M. koeningii*	20	50.0	----	----	20	50.0
8	*Corchorus spp*	8	53.3	4	26.7	3	20.0
9	***Pterocarpus spp***	*23*	*46.9*	*11*	*22.5*	*15*	*30.6*
10	***P. santaliniodes***	*16*	*66.7*	*5*	*20.8*	*3*	*12.5*
11	***G. latifolium***	*4*	*18.2*	*5*	*22.7*	*13*	*59.1*
12	***P. guineense***	*5*	*33.3*	*6*	*40.0*	*4*	*26.7*
13	***G. latifolium***	*12*	*36.4*	*5*	*15.2*	*16*	*48.5*
14	***Ocimum spp***	*22*	*46.8*	*16*	*34.0*	*9*	*19.2*
15	***F. ovate***	*5*	*62.5*	*3*	*37.5*	----	----
16	***S. nigrum***	*15*	*83.3*	*3*	*16.7*	----	----
17	***S. gilo raddi***	*10*	*71.4*	----	----	*4*	*28.6*
18	***V. doniana***	*4*	*100.0*	----	----	----	----
	Total	**321**	**1085.9**		**273.3**		**440.9**
	Mean		**60.3**		**15.2**		**24.5**
	Mean for DILVs		**65.0**		**8.0**		**27.0**
	Mean for WILVs		**56.6**		**20.9**		**22.5**

Source: Field survey, 2007 NB: All vegetables in bold outlines are WILVs

Appendix 3.30: Main sources of the vegetable species sold the in the various urban markets in the study area

1	*T. occidentalis*	16	23.9	----	----	51	76.1
2	*Solanum spp*	16	33.3	----	----	32	66.7
3	*Vernonia spp*	7	12.7	----	----	48	87.3
4	*T. triangulare*	17	28.8	----	----	41	70.7
5	*Amaranthus spp*	15	25.4	----	----	44	74.6
6	*Cucurbita spp*	----	----	----	----	11	100.0
7	*M. koeningii*	12	28.6	----	----	30	71.4
8	*Corchorus spp*	2	9.5	----	----	19	90.5
9	***Pterocarpus spp***	*6*	*13.0*	*5*	*10.9*	*35*	*76.1*
10	***P. santaliniodes***	*9*	*39.1*	*5*	*21.7*	*9*	*39.1*
11	***G. africanum***	----		*3*	*16.7*	*15*	*83.3*
12	***P. guineense***	*4*	*22.2*	----	----	*14*	*77.8*
13	***G. latifolium***	*5*	*25.0*	----	----	*15*	*75.0*
14	***Ocimum spp***	*16*	*25.4*	----	----	*47*	*74.6*
15	***F. ovate***	*2*	*33.3*	----	----	*4*	*66.7*
16	***S. nigrum***	*3*	*15.8*	----	----	*16*	*84.2*
17	***S. gilo raddi***	*2*	*13.3*	----	----	*13*	*86.7*
18	***V. doniana***	----	----	----	----	*5*	*100.0*
	Total		**349.5**		**49.3**		**1400.7**
	Mean		**19.4**		**2.7**		**77.8**
	Mean for DILVs		**20.3**		**0.0**		**79.7**
	Mean for WILVs		**18.7**		**4.9**		**76.3**

Source: Field survey, 2007 NB: All vegetables in bold outlines are WILVs

Appendix 4

Appendix 4.1: Result of test of significant difference between the percentage of people that consumed WILVs and those that consumed DILVs in the rural communities.

Category of vegetables	WILVs	DILVs
No of spp in each category	14	9
Mean (X)	9.15	33.23
Standard Deviation (S)	9.51	30.57
*Z – cal	- 11.92*	
Z – Critical at 5%	1.96	

=Z cal. significant at 5% level

Decision: Reject null hypothesis.

Source: Computed from field survey, 2007

Appendix 4.2: Results of test of significant difference between Household expenditures on WILVS and DILVS in the rural communities

Category of consumed Vegetables	WILVS	DILVS
No. of spp in each category	14	9
Means (X)	40.15	54.01
Standard deviation	20.32	31.72
Z – Calculated	- 5.66*	
Z – Critical at 5%	1.96	

*= Z Cal significant at 5% level.

Decision: Reject the null hypothesis

Source: Computed from field survey, 2007.

Appendix 4.3: Results of test of significant difference between Household expenditures on WILVs and DILVs in the rural communities

Category of consumed Vegetables	WILVs	DILVs
No. of spp in each category	14	9
Means (X)	40.15	54.01
Standard deviation	20.32	31.72
Z – Calculated		- 5.66*
Z – Critical at 5%		1.96

*= Z Cal significant at 5% level.

Decision: Reject the null hypothesis

Source: Computed from field survey, 2007.

Appendix 4.4: Result of test of significant difference between the percentage of people that consumed WILVs and those that consumed DILVs in the urban communities

Category of vegetable	WILVs	DILVs
No of spp in each category (n)	11	9
Mean (X) 1	11.25	32.15
Standard Deviation (S)	12.19	30.27
Z – Calculated		- 9.91*
Z – Critical at 5%		1.96

*= Z cal significant at 5% level.

Decision: Reject null hypothesis

Source : Computed from field survey, 2007

Appendix 4.5: Results of test of significant difference between the frequency consumption of WILVs and DILVs in urban areas

Category of consumed vegetables	WILVs	DILVs
No of vegetable spp (n)	11	9
Mean (X)	1.75	1.98
Standard Deviation(S)	0.79	0.60
Z- Cal		-0.62^{NS}
Z – Critical at 5% =		1.96

NS= Z cal not significant at 5% level.

Source: Computed from field survey, 2007

Appendix 4.6: Results of test of significant difference between household expenditures on WILVs and DILVs in the urban communities

Category of consume Vegetables	WILVs	DILVs
No. of spp in each category (n)	11	9
Mean (X)	44.85	52.96
Standard deviation	25.29	21.09
Z – Calculated		- 3.47*
Z – Critical at 5%		1.96

Decision: Reject null hypothesis

* = Z Cal. significant at 5% level

Source: Computed from field survey, 2007

Appendix 4.7: Results of test of significant different in household expenditures on vegetables between rural and urban households

Location of household	Rural Household	Urban Households
No. of vegetable spp (n)	23	20
Mean expenditure (X)	56.94	55.51
Standard Deviation (S)	18.41	26.13
Z – Calculated		- 0.76*
Z – Critical		1.96

* = Z cal. significant at 5% level

Decision: Reject null hypothesis

Source: Computed from field survey, 2007

Appendix 4.8: Result of test of significant difference in the frequency of consumption of vegetables in the rural area between the seasons

Seasons of the year	Rainy season	Dry season
No of vegetable spp (n)	21	18
Mean (x)	1.79	1.96
Standard Deviation (S)	0.64	0.66
Z- Calculated		-0.65^{NS}
Z- Critical at 5%		1.96.

NS = Z – Calculated no significant at 5% level.

Source: Computed from field survey, 2007

Appendix 4.9: Results of test of significant difference in the frequency of consumption of various vegetable species between the seasons in the urban area.

Seasons of the year	Rainy season	Dry season
No of vegetable spp (n)	20	20
Mean (X)	1.92	1.78
Standard Deviation (S)	0.78	0.73
Z- Calculated	0.5^{NS}	
Z- Critical at 5%	1.96	

NS = Z calculated not significant at 5% level.

Source: Computed from field survey, 2007

Appendix 4.10: Results of test of significant difference between the productive and consumptive use values of the vegetables in the rural communities

Type of Use Values	Productive Use Values	Consumptive Use Values
No of vegetable spp	18	22
Mean values (x)	46.31	42.16
Standard Deviation (S)	26.91	21.60
Z – Calculated	2.63^{NS}	
Z – Critical at 5%	1.96	

NS = Z – Calculated not significant at 5% level

Source: computed from field survey, 2007

Appendix 4.11: Results of test of significant difference between the productive and consumptive use values of the vegetables in the urban communities

Type of Use Values	Productive Use Values	Consumptive Use Values
No of vegetable spp	17	20
Mean (X)	48.67	41.59
Standard Deviation (S)	23.77	25.41
Z – Calculated	4.34*	
Z – Critical at 5%	1.96	

* Z Cal. Significant at 5% level

Appendix 4.12: Results of test of significant difference in the reasons adduced for vegetable consumption between the rural and urban households.

Household location	WILVs	DILVs
No. of adduced reasons (n)	8	8
Mean (X)	450.88	439.50
Standard Deviation (S)	1590.52	371.17
Z – Calculated	0.74^{NS}	
Z – Critical at 5% level	1.96	

NS = Z cal. not significant at 5% level

Source: Computed from field survey 2007

Appendix 4.13: Results of test of significant difference in the reasons adduced for the consumption of WILVs and DILVs in the rural households.

Household location	WILVs	DILVs
No. of adduced reasons (n)	8	8
Mean (X)	116.88	334
Standard Deviation (S)	66.50	321.12
Z – Calculated	31.20*	
Z – Critical at 5% level	1.96	

* = Z cal. significant at 5% level

Decision: Reject null hypothesis.

Source: Computed from field survey 2007

Appendix 4.14: Result of test of significant difference in the reasons adduced for the consumption of WILVs and DILVs in the urban households.

Household location	WILVs	DILVs
No. of adduced reasons (n)	8	8
Mean (X)	116.75	322.75
Standard Deviation (S)	94.82	287.23
Z – Calculated	5.90*	
Z – Critical at 5% level	1.96	

* = Z cal. significant at 5% level

Decision: Reject null hypothesis.

Source: Computed from field survey 2007

Appendix 4.15: Results of test of significant difference between the preference ratings of WILVs and DILVs in rural households

Category of consumed vegetables	WILVs	DILVs
No of spp in each category	10	9
Mean (X)	2.38	14.16
Standard Deviation(S)	2.69	24.1
Z – Cal	- 6.85*	
Z – Critical at 5%	- 1.96	

*= Z Cal significant at 5% level.

Decision: Reject the null hypothesis

Source: Computed from field survey, 2007

Appendix 4.16 Results of test of significant difference between the preference ratings of WILVs and DILVs in urban households

Category of consumed Vegetables	WILVs	DILVs
No. of spp in each category (n)	9	8
Mean (X)	2.56	15.83
Standard Deviation(S)	3.19	24.16
Z – Cal	- 7.21*	
Z – Critical at 5%	1.96	

*= Z cal significant at 5% level.

Decision: Reject the null hypothesis.

Source: Computed from field survey, 2007

Appendix 4.17: Results of test of significant difference between the prices of WILVS and those of DILVS in the rural markets.

Category of marketed Vegetable	WILVs	DILVs
No. of vegetable spp	10	8
Mean prices / Kg	₦145.05	₦87.73
Standard Deviation (S)	191.16	47.40
Z – Calculated	11.46*	
Z – Critical at 5% level	1.96	

* = Z cal. significant at 5% level.

Decision: Reject null hypothesis

Source: Computed from field survey, 2007

Appendix 4.18: Correlation of weights with prices of indigenous leafy vegetable species in the rural markets within the study area.

Source of variation	Mean	Pearson Correlation coefficient
Weight	165.59	- 1*
Price	₦125.11	

*Correlation is significant at 0.05 level (2-tailed)

Source: Computed from field survey, 2007

Appendix 4.19 Results of test of significant difference between the prices of WILVs and those of DILVs in the urban markets

Category of marketed Vegetable	WILVs	DILVs
No. of vegetable spp (n)	12	8
Mean price / Kg (X)	₦139.67	₦94.99
Standard Deviation (S)	133.92	37.23
Z – Calculated	- 3.85*	
Z – Critical at 5%	1.96	

*= Z cal. significant at 5% level

Decision: Reject null hypothesis.

Source: Computed from field survey, 2007.

Appendix 4.20: Correlation of weights with prices of indigenous leafy vegetable species in the urban markets within the study area.

Source of variation	Mean	Pearson Correlation coefficient
Weight	118.32	- 1*
Price	₦149.56	

*Correlation is significant at 0.05 level (2-tailed)

Source: Computed from field survey, 2007

Appendix 4.21 Results of test of significant difference in the prices of vegetables between the rural and urban markets.

Market locations	Rural markets	Urban markets
No. of vegetable spp(n)	18	21
Mean price 1 kg	₦119.58	₦117.58
Standard Deviation(S)	148.70	107.65
Z – Calculated	- 0.6^{NS}	
Z – Critical at 5%	1.96	

NS = Z calculated not significant at 5% level

Source: Computed from field survey, 2007.

Appendix 4.22 Results of test of significant difference inincomes of vegetables sellers between the rural and urban markets.

Market locations	Rural markets	Urban markets
No. of vegetable spp(n)	19	18
Mean income	₦348.47	₦443.61
Standard Deviation(S)	363.55	389.59
Z – Calculated	-14.89	
Z – Critical at 5%	1.96	

Z calculated significant at 5% level

Source: Computed from field survey, 2007.

Appendix 4.23 **Results of test of significant difference inincome between thesellers of WILVs and DILVsin the rural markets.**

Vegetable Category	WILVs	DILVs
No. of vegetable spp(n)	11	8
Mean income	₦404.18	₦271.86
Standard Deviation(S)	451.49	153.23
Z – Calculated	17.05	
Z – Critical at 5%	1.96	
Z calculated significant at 5% level		

Source: Computed from field survey, 2007.

Appendix 4.24 **Results of test of significant difference inincome between thesellers of WILVs and DILVsin the urban markets.**

Vegetable Category	WILVs	DILVs
No. of vegetable spp(n)	10	8
Mean income	₦485.76	₦390.92
Standard Deviation(S)	488.95	194.08
Z – Calculated	11.40	
Z – Critical at 5%	1.96	
Z calculated significant at 5% level		

Source: Computed from field survey, 2007.

Appendix 4.25 **Results of test of significant difference in the profit margins obtained from the sale of vegetables between the rural and urban markets**

Market location	Rural markets	Urban markets
No. of vegetable spp (n)	19	17
Mean profit (X)	₦98.44	₦110.99
Standard Deviation (S)	46.66	49.79
Z – Calculated	- 5.41*	
Z – Critical at 5%	1.96	

*= Z cal. significant at 5% level

Decision: Reject null hypothesis.

Source: Computed from field survey, 2007

Appendix 4.26: **Results of test of significant difference in the margins profit obtained from the sale of WILVs and DILVs in the rural markets**

Category of marketed Vegetable	WILVs	DILVs
No. of vegetable spp (n)	11	8
Mean profit (X)	₦102.67	₦87.98
Standard Deviation (S)	50.43	37.95
Z – Calculated	4.80*	
Z – Critical at 5%	1.96	

* = Z cal. significant at 5% level

Decision: Reject null hypothesis.

Source: Computed from field survey, 2007

Appendix 4.27: Results of test of significant difference in the margins of profit obtained from the sale of WILVs and DILVs in the urban markets

Category of marketed vegetable	WILVs	DILVs
No. of vegetable spp (n)	9	8
Mean profit (X)	₦103.82	₦119.05
Standard Deviation (S)	56.24	39.87
Z – Calculated	- 4.55*	
Z – Critical at 5% level	1.96	

* = Z cal. significant at 5% level

Decision: Reject null hypothesis.

Source: Computed from field survey 2007