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Economic Importance of Spatial Distribution of Agricultural Crops in Gombe State, Nigeria

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1. Introduction

Agriculture is the art and science of cultivating the soil, growing crops and raising livestock. It includes the preparation of plant and animal products for people to use and their distribution to markets. Agriculture provides most of the world's food and fabrics. Cotton, wool, and leather are all agricultural products. Agriculture also provides wood for construction and paper products. Nigeria has an estimated land mass 923,768km2, and diverse climatic conditions, virtually all 36 states in Nigeria produces one, two or more different crops at the same time or different seasons. Gombe State is one of the thirty-six (36) States in Nigeria. The spatial distribution of agricultural products, as well as the agricultural methods used, vary from one part of the world to another partly due to climatic variability and partly due to technological and social advancements. In Nigeria, agriculture has been an important sector of the economy in the past decades, and still remain a major driver of the economy despite the oil boom. Basically, it provides employment opportunities for the teeming population, eradicates poverty and contributes to the growth of the economy. The sector thus remains a dominant economic force, as 99% of the rural population is involved in activities related to the crop sub-sector which provides the bulk of agricultural income. Similarly, the crop sub-sector supports the processing industry by providing raw materials.

In 2023, the total GDP of the country was estimated at ₦77,936.1 billion in with the agricultural sector contributed with ₦17,585.43 billion representing about 23% of the total GDP. In terms of subsectoral GDP, crops production account for 91%, while livestock contributes 5.9%. Forestry and fishing contribute with 1% and 2% respectively. Statistical facts indicate that in the 1960's, agriculture contributed up to 64% to the Gross Domestic Products (GDP) but continued to decline due to oil boom and constant neglect of the sector by the governments at all level. Between 2013 and 2019, agricultural sector contributed an average of 24% to the nation's GDP and employed more than 70% of the country's labour force, a feat which ranks the sector as the largest employer of labour in the country. Nigeria's major agricultural imports include wheat, sugar, fish and milk, while the main agricultural exports include sesame seeds, cashew nuts, cocoa beans, ginger, frozen shrimp and cotton. Sesame, cashew nuts and cocoa account for more than half of the nation's agricultural exports. While wheat dominates agricultural imports.

In terms of export, the share of agriculture in Nigeria's total export earnings remains small compared to crude oil exports. For instance, in 2019, agriculture accounted for less than 2% of total exports relative to crude oil (76.5%). While the agricultural export declined by about 11% from ₦302.2 billion in 2018 to ₦269.8 billion in 2019, imports rose by 12.7% from ₦851.6 billion to ₦959.5 billion during the same period, the

highest value ever recorded in the country. Between, 2016 and 2019, Nigeria's cumulative agricultural imports between 2016 and 2019 stood at ₦3.35 trillion, four times higher than the agricultural export of N803 billion within the same period. Thus, Nigeria remains a net food importer — the agricultural trade deficit has widened with imports exceeding exports by ₦689.7 billion in 2019 compared to ₦549.3 billion in 2018. Given the increasing population, estimated to reach 400 million by 2050, and worsening economic situation, enhanced agriculture productivity through adaptation of new technologies and innovations as well as good value chain and export promotion is necessary to ensure food security and economic growth and development.

In Gombe State, agricultural sector is responsible for approximately 80% of employment the sector is a significant contributor to the state's economy due to its high-value crops in combination with the gradual development of an agro-industry segment. Statistical facts indicate that around 35% of land in Gombe State is used for crop cultivation, with the potential of expanding farming land by a further 6099 sq km. The principal crops in the state include groundnut, cotton, cowpea, pepper, tobacco and sugarcane, as well as food crop like maize, guinea corn, millet, rice, sorghum, cassava, okra and onion. The rich grazing land across the state makes it ideal for animal husbandry. Meanwhile, its extensive water resources provide low-cost irrigation opportunities for year-round production. In addition, fishing is a major economic activity for populations on large bodies of water, such as the Dadin Kowa dam, Balanga dam, and other rivers and lakes.

Therefore, this study was carried out to conduct a broad survey of spatial distribution of crops production in Gombe State. In addition, the study aimed to establish a database of agricultural crops and their composition in Gombe State, as well as determining the role of crop production on the livelihoods of the people of Gombe State. It further examined the contributions of the crops production to economic growth, and employment in Gombe State. The paper is organized as follows. The next section reviewed the relevant literatures. Section three described the methodology, while section four presented the results and findings. The last section concluded and offered some recommendations.

2. Literature Review

2.2. Conceptual Clarifications

Crops are plants that are grown to provide food, fuel, clothing, and more. Most crops are harvested as food for humans or fodder for livestock. In general, crop is a plant that can be grown and harvested extensively for commercial and subsistence purposes. Crops are generally classified into six (6) main categories namely:

a) Cereals
b) Roots & Tubers
c) Pulses & Legumes
d) Oils Seeds & Nuts
e) Fruits & Vegetables
f) Permanent Trees

2.2.1. Cereals

Cereals are grass-plants that are cultivated for its edible grains. They are the world's largest crops and are therefore the most widely grown staple foods. These crops include rice (paddy), wheat, rye, oats, barley, millet, and maize. Most cereals are cultivated annually, although rice is sometimes grown as a perennial crop. The term cereal is derived from the name of the Roman goddess of grain crops and fertility, *ceres*. Globally, rice and wheat are predominantly used as

human food, whereas maize is largely used as raw material industrially and as animal feed.

2.2.2. Roots & Tubers

Roots and **tubers are** crops that are specialized storage stem of certain seed plants. Tubers are usually short and thickened and typically grow beneath the soil. Largely composed of starch-storing parenchyma tissue,
they constitute the resting stage of various plants and enable overwintering in many species. As modified stems, most tubers bear minute scale leaves, each with a bud that has the potential for developing into a new plant. The term is also used imprecisely but widely for fleshy roots, corms, or rhizomes of other plants that resemble tubers—e.g., the "tuber" (actually a tuberous root) of a dahlia. Roots and tubers are resilient crops that can grow in various environments, making them vital for food security and economic stability in many regions. The most commonly grown roots and tubers in Nigeria are Irish **potatoes, sweet potatoes, cassava, yams, carrots, beets, cocoyam, living stone potatoes and turmeric.**

2.2.3. Pulses & Legumes & Beans

Legumes is a broad term, which includes all the lentils, pulses, beans and peas found in the family of fabaceae or leguminosae. A typical legume consists of the leaves, stems or pods of the plants in the fabaceae family. It is rich in dietary fibres and proteins. Pulses are the dried seeds of legumes plants. Although used interchangeably, the terms "legumes," "pulses," and "beans" have distinct meanings. A legume refers to any plant from the fabaceae family that would include its leaves, stems, and pods. A pulse is the edible seed from a legume plant. Pulses include beans, lentils, and peas. For example, a pea pod is a legume, but the pea inside the pod is the pulse. The entire legume plant is often used in agricultural applications (as cover crops or in livestock feed or fertilizers), while the seeds or pulses are what typically end up as human foods. Beans in their various forms (kidney, black, pinto, navy, chickpeas, etc.) are just one type of pulse. Examples of these crops are cowpea, pigeon peas, bambara nuts, soybeans, roselle calyx, sweet melon, garlic, melon and ginger.

2.2.4. Oils Seeds

Oil seeds and nuts are plants cultivated primarily for the extraction of oil from their seeds, fruits, or nuts. These crops play a crucial role in global agriculture and the economy, providing not only vegetable oils for cooking and food processing but also serving as vital raw materials for industrial applications, cosmetics, and biofuels. The most commonly cultivated oil seeds crops are: groundnut (peanut), rapeseed and mustard, sunflower, Soybean and linseed (flaxseed).

2.2.5. Vegetables

These are fresh edible portions of certain herbaceous plants—roots, stems, leaves, flowers, fruit, or seeds. These plant parts are either eaten fresh or prepared in a number of ways, usually as a savory, rather than sweet, dish. Vegetables are categorized into root vegetables (beets, carrots, sweet potatoes & turnips) stem vegetables (asparagus, kohlrabi & celery) leafy green (lettuce, spinach, silver beet, and baobab), allium or bulb vegetables (garlic, leeks, onions, and shallots), head or flower vegetables (artichokes, cabbage, cauliflower) and cucumber family vegetables: (pumpkin, cucumber and zucchini).

2.2.6. Tree Crops

Tree crops, otherwise called plantation agriculture, is the method of growing perennial trees or vines that are generally harvested every year and have 20+ year lifespans. Examples of permanent crops include; mango, guava, cashew, apple,

cherries, olives, nuts, coffee, and cocoa, etc. These crops play a vital role in food production, supporting livelihoods, and contributing to ecological balance. Tree crops offer significant ecological benefits that go beyond food production. They create complex vegetation structures, which include multiple layers of plants and trees.

2.3. Empirical Review

Agricultural practices in Gombe State has received the attention of large number of scholars. For instance, Samaila, Degri, and Mshelia, (2019) carried an Assessment of field insect pests damage on cowpea in Gombe State, while Musa and Abdu (2016) examined the factors influencing adoption of gum Arabic production technologies in Gombe State. in addition, Hamidu (2014) carried out a study on socio-economic characteristics and returns of dates palm marketing in Gombe metropolis, Gombe State, Nigeria: agricultural policies, resource economics and agribusiness. More so, Dabara, Lawal, Chiwuzie, Omotehinshe and Soladoye (2019) focused on land tenure systems and agricultural productivity in Gombe. Hamidu (2014) also analysed the entrepreneurship intention and involvement in agribusiness enterprise among youths in Gombe metropolis, Gombe state, Nigeria. Available literature further revealed that Bachama, Audu, Ibrahim, Matai, Adamu & Tarki (2020) examined farmers' perception on the effect of rainfall variability on rice yield in Dadin-Kowa of Gombe, Gombe State. And Shadrack & Yusuf (2016) carried out their study on agriculture as a tool for economic development in Nigeria, specifically by assessing its problems and prospects in Gombe State. A more comprehensive survey was carried out by Ikusemoran, Didams & Michael (2018) on analysis of the spatial distribution of geology and pedologic formations in Gombe State, North Eastern Nigeria. However, this study focused on spatial distribution of landforms not agricultural products. Clearly, none of these studies examined the spatial distribution of crops and their importance in Gombe State. Therefore, this study seeks to fill this gap by conducting a spatial distribution of crops production and heir economic importance in all parts of Gombe State.

3. Empirical Results & Analysis

3.1. Socioeconomic Characteristics of the Respondents

The socioeconomic characteristics of the respondents is presented in table 1. The results showed that majority of the respondents – 157 (78.5 %) are male. Only 43 (21.5 %) are female. The dominant proportion of the respondents 42.5 percent have an average age of 38. Respondents with an average age of 23 years are the second with 29.5%. Those with mean age of 53 constitute 22.5% and the least proportion is of course those with age over 60 and are 5.5%. In terms of family size, households with an average of 3 and 8 dependents constitute 39% and 36% respectively. Thus, large family size with an average of 16 dependents are 18%, while those with more than 21 persons are only 7%.

Table 1: Socioeconomic Characteristics of the Respondents

Variable	Frequency	Percentage	Cumulative Frequency
Gender			
Male	157	78.5%	78.5%
Female	43	21.5%	100%
Age			
15 – 30	59	29.5%	29.5%
31 - 45	85	42.5%	72%
46 – 60	45	22.5%	94.5%
61 & above	11	5.5%	100%
No. of Dependents			
1 – 5	78	39%	39%
6 – 10	72	36%	75%
11 – 20	36	18%	93%
21 & above	14	7%	100%
Educational Level			
No formal education	34	17%	17%
Basic Islamic/Seminary	15	7.5%	24.5%
Primary certificate	12	6.5%	31%
School Certificate	75	37.5%	68.5%
Tertiary Education	63	31.5%	100%

The qualifications of the respondents indicated that majority of them have Senior School Certificate (37.5%), while those tertiary level education sit second with 31.5%. Farmers who have no formal education constituted 17%. Those with only basic education and primary certificate have a combined proportion 14%. As far as size of the agricultural land is concerned, majority of the farmers (53.5%), cultivate an average of 3 hectares, while 23% of the farmers cultivate and average of 8 hectares. However, only 9% of the farmers cultivate more than 10 hectares. Those who cultivate less than 1 hectare are 14%. About 70 percent of the farmers are practicing mixed farming; i.e. both commercial and subsistence. Only less than 20% of the farmers cultivate for subsistence. The commercial cultivation is undertaken by 11% of the farmers. The farmers dominantly sell their produce at the local markets – about 98%. Few, in fact less than 3% of the farmers sell either at export, cooperative and super markets. About 74% of the farmers get information and updates through words of mouth. Other ways of getting the updates and information are extension services, online resources and agricultural magazines which account for 11.5%, 8% and 5.5% respectively. About 85% of the farmers are thinking of diversifying into livestock.

Table 1 cont.

Size of Agric Land	Frequency	Percentage	Cumulative Frequency
Less Than 1 Hectare	29	14.5%	14.5%
1 – 5 Hectares	107	53.5%	68%
6 – 10 Hectares	46	23%	91%
More than 10 Hectares	18	9%	100%
Type of Agricultural Practice			
Subsistence	39	19.5%	19.5%
Commercial	22	11%	30.5%
Both	139	69.5%	100%
Markets for Selling Produce			
Local Markets	195	97.5%	97.5%
Export Markets	2	1%	98.5%
Cooperative Markets	2	1%	99.5%
Supermarkets	1	0.5%	100%
Ways of Obtaining Agricultural Information and Updates			
Extension Services	23	11.5%	11.5%
Online Resources	16	8%	19.5%
Agricultural Magazines	11	5.5%	25%
Words of mouth	150	75%	98.5%
Thinking of Diversifying into Livestock			
Yes	169	84.5%	84.5%
No	31	15.5%	100%

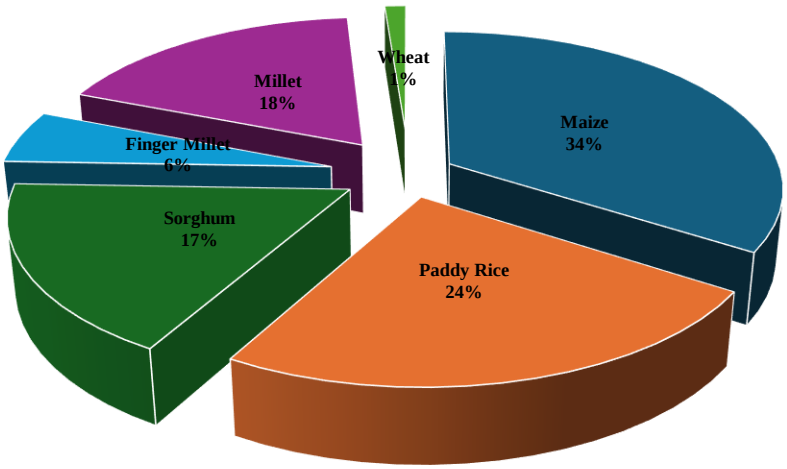
3.2. Cereal Crop Production

Cereal Crops are annual plants grown to produce grains which among others are used as food and animal feed. The important cereal crops produced in the State are maize (corn), paddy (rice), sorghum (guinea corn), finger millet and wheat. As shown in table 2, a total of 1,003.8 tons were harvested by the respondents. Maize was the largest cereal produced with a total of 342,030kg (34%). This was followed by rice with 242,050kg (24%). The third and fourth crops in this category were millet and sorghum with 174,330kg (18%) and 174,050kg (17%) respectively. The least produced crops of course were millet and finger millet with 54,268kg (6%) and 12,035kg (1%) respectively. This is shown in figure 1.

Table 2: Cereal Production

	Cereals										
Crops	Akko	Billiri	Balanga	Dukku	Funakaye	Kaltungo	Kwami	Nafada	Shongom	Y/Deba	Total
Maize	56,300	48,880	27,080	42780	45,200	19680	23,230	21360	35,440	22080	342,030
Rice	24,400	35,680	36,360	7,880	34,680	15100	12990	3,760	1200	70,000	242,050
Sorghum	13,040	7,600	34,700	10,760	21,000	9,990	12,880	19,440	11840	33,080	174,330
Finger Millet	11,440	1360	860	6,240	4580	9360	5890	13,740	238	560	54,268
Millet	18,480	10,800	4,920	36,350	28,440	11,440	15,280	16,940	6640	29760	179,050
Wheat	210	240	3,640	2,560	230	560	200	240	125	4240	12,035
Total											1,003,763kgs

Figure 1: Cereal Production



In terms of distribution across the local governments, Akko appears to be the largest producers of maize. The LGA contributed approximately with 16.5%. It was followed by Billiri and Funakaye with 14.3% and 13.2% respectivley. The fourth largest producers of maize is Dukku with 12.5%. The least producers of the crop are Kaltungo and Nafada with 5.75% and 6.25%.

3.3. Root and Tubers Crop Production

Roots and tubers are annual plants grown to produce starchy foods and spices for human consumption. The most important roots and tubers grown in the State are cassava, sweet potatoes, cocoyam, living stone, turmeric and carrots. As indicated in table 3, a total of 229.7 tons were produced in this category. Sweet potatoes was the largest roots and tubers produced with a total of 108,039kg (47%). It was closely followed by cassava with 66,650kg (29%). The third crops in this category was cocoyam with 49,005kg (21.3%). The least cultivated crops were carrot and turmeric with 3050kg (1.33%) and 1760 (0.77%) respectively. This is shown in figure 2

.

Table 3: Roots & Tubers Production in Gombe State

	Local Governments Area										
Crops	Akko	Billiri	Balanga	Dukku	Funakaye	Kaltungo	Kwami	Nafada	Shongom	Y/Deba	Total
Cassava	12,720	2,620	11,800	14,680	8000	3440	4650	3220	800	4720	66,650
Sweet Potatoes	13440	3600	4380	16,720	22,000	14,880	3,457	16322	-	13240	108,039
Cocoyam	3760	1180	7320	4350	3210	4640	2300	2400	800	19045	49,005
Living Stone	-	160	-	-	-	800	-	240	-	-	1,200
Tumeric	-	-	-	-	-	1600		160	-	-	1,760
Carrot	-	-	-	-	-	-	-		-	3050	3,050
Total											229,704 kgs

In terms of spatial distribution across the local government areas, *cassava* was largely produced in Dukku and followed by Akko. Balanga and Funakaye sit third and fourth respectively. The fifth producer is Yamaltu/Deba. Nafada and Billiri are sixth and seventh producers. The least three producers are of course Nafada, Billiri and Shongom. *Sweet potatoes* are grown largely in Funakaye, Dukku, Nafada, Kaltungo, Akko and Yamaltu/Deba local government areas. The crop is grown in small quantities in Balanga, Billiri and Kwami local government areas. However, the crop is not grown at all in Shongom local government area

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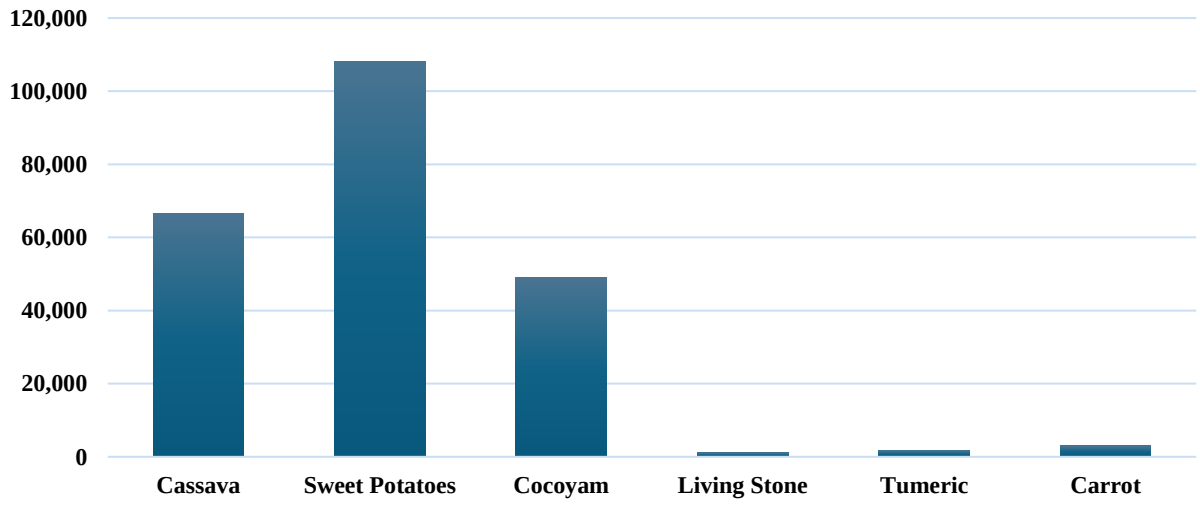
Figure 2: Production of Roots & Tubers



Cocoyam being the third largest root and tuber crop is chiefly grown in Yamaltu/Deba local government area. Other large producers are Balanga, Kaltungo, Dukku and Akko local government areas. The crop is least produced in Shongom, but grown in moderate quantities in other remaining local government areas of the state. *Living stone, turmeric and carrots* are poorly grown in the state. Thus, only Billiri, Kaltungo and Nafada local government areas produced *living stone. Turmeric* is cultivated only in Kaltungo and Nafada local government areas. Yamaltu/Deba is found out to be the only producer of the carrots.

3.4. Pulses and Legumes

Pulses and legumes are used mainly as proteins, vitamins, spices, fruits and cooking oil. The total output of pulses and legumes was 350 tons. This is presented in table 4 and figure 3. Thus, the largest pulse and legume produced was *beans (cowpea) with* 131,599kg that constitute 37%. *Soybeans* is the second largest crop produced with 90,449kg and account for 26%. *Bambaranut* sits third in the ranking with 67,200kg and account for 19% approximately. *Sweet melon* and *Roselle calyx* are the fourth and fifth in the category and had 30,155kg (9%) and 28,644kg (8%) respectively. The least produced crop was *pigeon peas* and had a total produced of 2360kg amounted to only 1% of the total production. As far as spatial

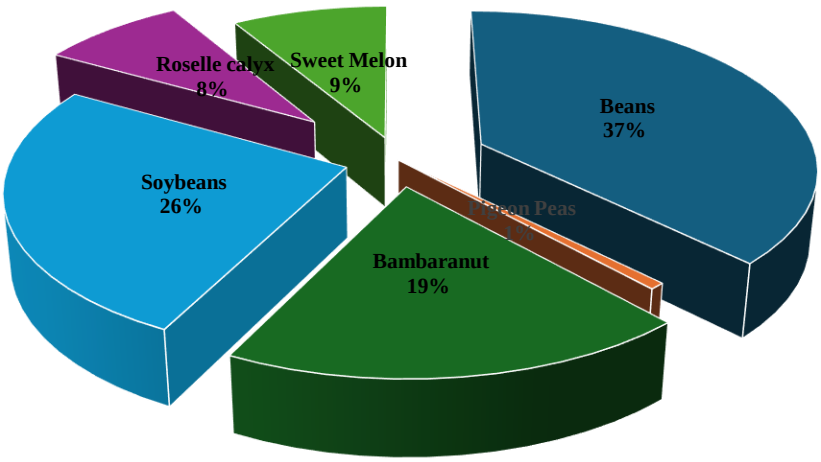
production of the crops is concerned, beans is cultivated across the entire 10 local government areas

.

Table 4: Production of Pulses and Legumes

Crops	Local Governments Area										
	Akko	Billiri	Balanga	Dukku	Funakaye	Kaltungo	Kwami	Nafada	Shongom	Y/Deba	Total
Beans	15,120	12,920	12,340	16,170	14,710	10,079	13,020	11,600	13,200	12,440	131,599
Pigeon Peas	80	200	-	160	-	140	1300	-	-	480	2360
Bambaranut	8,480	9,720	2520	9530	6,160	6120	9430	3520	5,600	6120	67,200
Soybeans	9,280	16,010	27,380	3,120	3100	8080	3919	2320	7760	9480	90,449
Roselle calyx	3,160	2,260	2700	2890	3,146	2605	3100	2703	2,630	3450	28,644
Sweet Melon	3900	380	3400	4500	7500	-	2055	420	-	8000	30,155
Total											350,407kg

Figure 3:Production of Pulses & Legumes



The *pigeon beans* is cultivated in large quantities only in Kwami local government area. The product is however cultivated in small quantities in Akko, Billiri, Dukku, Kaltungo and Yamaltu/Deba. The crop is not being cultivated at all in other remaining local government areas. The results also revealed that *Bambaranut* is cultivated across the 10 local government areas. The large scale production is coming from Akko, Billiri, Dukku, Funakaye, Kaltungo and Kwami local government areas. Like bambaranut, *soybeans* is cultivated across the state. Balanga and Billiri are leading the production. Other local government areas that recorded good level of production are Akko, Kaltungo, Shongom and Yamaltu/Deba. It also emerged from the results that *Roselle calyx* is grown everywhere in the state as all the local government areas have the potentialities of its production. Yamaltu/Deba and Funakaye lead in terms of *sweet melon* production. While the crop is grown is other local

government areas in little quantities, the results showed that Kaltungo and Shongom do not produced the crop at all.

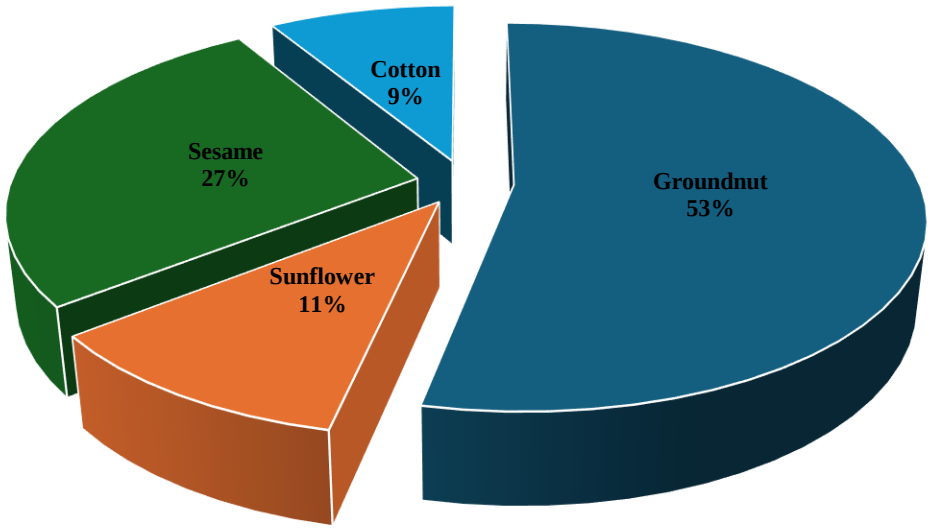
3.5. Oils Seeds & Nuts

Oil seeds and nuts are cultivated mainly for production of cooking oil, cosmetics, fuel, textile use, livestock feeds and human food. These seeds are often crushed, blended or pressed to extract the oil. There were four major oil seeds and nuts that are grown in the state namely: *groundnut, sunflower, sesame and cotton*, and a total of 161.1 tons were cultivated. The breakdown of the production is presented in table 4 and diagrammatically illustrated in figure 5.

Table 4: Production of Oil Seeds & Nuts

Crops	Local Governments Area										
	Akko	Billiri	Balanga	Dukku	Funakaye	Kaltungo	Kwami	Nafada	Shongom	Y/Deba	Total
Groundnut	5,160	4,040	3420	15875	19,520	4,348	16,708	8,160	2,060	6840	86,131
Sunflower	1360	942	5300	-	-	960	-	-	400	8770	17,732
Sesame	5,520	2388	4220	5,758	6,700	2880	5890	320	1040	5820	43,416
Cotton	10,320	-	1240	185	-	-	300	-	-	2016	14,061
Total						161,340kg					

Figure 5: Production of Oil Seeds & Nuts



The result indicated that *groundnut* was the main oil seeds and nuts produced in the state with a total production of 86,131kg (53%). Sesame emerged as the second largest crop accounting for 27% of the total production. The result further showed that *sunflower* and cotton are the least produced oil seeds and nuts crop accounting for 11% and 9% respectively. In terms of spatial distribution, *groundnu*t is cultivated across the state, but it is dominantly cultivated in Funakaye, Dukku and Kwami local government areas. The crop is reasonably produced in Nafada and Yamaltu/Deba local government areas. The crop is grown in other remaining local government areas in little and insignificant quantities. Sesame is grown chiefly in Dukku, Balanga, Funakaye, Kwami, Nafada and Yamaltu/Deba local government areas. The result further showed that *cotton* is only grown in large quantities in Akko local government area. *Sunflower* is best cultivated

in Yamaltu/Deba and Balanga local government areas.

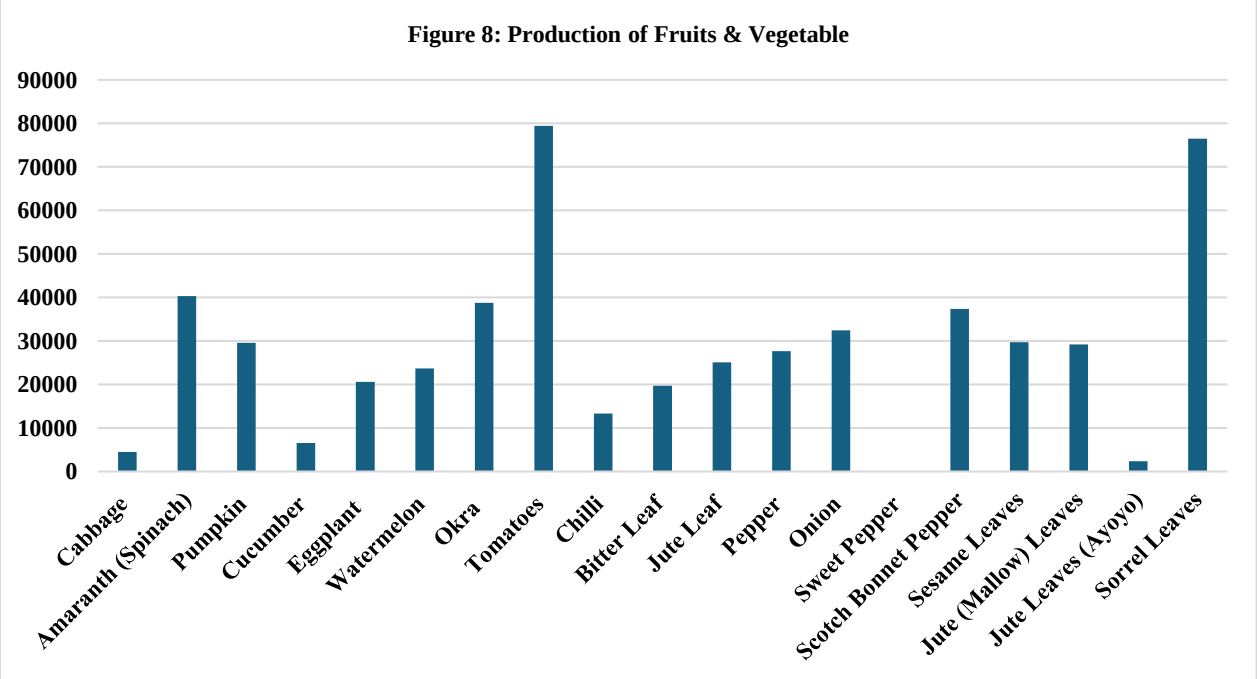
3.6. Fruits and Vegetables

Fruits and vegetables are an essential part of human's daily foods. They add flavours, taste, and spices to human meals. More so, they contain powerful nutritional materials providing vitamins, minerals, fibres and antioxidants. The result indicated that a total of 19 fruits and vegetables were produced with a total output of 593.02 tons. Table 6 present the breakdown and spatial distribution, while figure 8 illustrates the distribution diagrammatically. *Tomatoes* was the highest produced crop with 79460kg accounting 13 percent. Although the crop is produced across the 10 local government areas of the state, it largely grown in Yamaltu/Deba, Akko and Kwami local government areas. *Sweet pepper (tattasai)* is the second most cultivated vegetable with 56372kg; accounting for 9.5 percent of the total produced. Although it is produced across the 10 local government areas, Akko and Yamaltu/Deba local government areas are the dominant producers. *Amarath (aleyyafo), okra (kubewa), onion (albasa), scotch bonnet pepper (attarugu) sesame leaves (karkashi), pumpkin (kabewa), Jute-mallow leaves (lalo), pepeer (borkono)* and jute leaf (rama) are also produced in large quantities and accounted for 6.8 percent, 6.5 percent, 6.3 percent, 5 percent, 5 percent, 5 percent, 4.9 percent, 4.7 percent and 4.2 percent of the total produced respectively. *Onions (albasa)* is grown chiefly in Yamaltu/Deba local governments. Nafada, Shongom, Funakaye Dukku, Balanga and Kwami local government areas are producing the crop in little quantities. The result also indicated that *scotch bonnet pepper (attarugu)* is produced across the 10 local government areas, but chiefly in Akko and Yamaltu/Deba.

Spatially, Yamaltu/Deba has the lead in the production of *Amarath (aleyyafo), sesame leaves (karkashi), sorrel leaves (yakuwa), Jute-mallow leaves (lalo) and jute leaves (rama)* over the 9 local governments that equally produced the crop in moderate quantities. Akko and Yamaltu/Deba leads in terms of *okra (kubewa*) production in the state. *Watermelon (kankana)* being the only traditional fruit account for 4 percent of the total and largely produced in Yamaltu/Deba and Funakaye. It also emerged that *cabbage (kabeji)* and *cucumber (kukumba)* are only produced in Yamalt/Deba local government areas. With the exception of Shongom, *eggplant (yalo)* is produced across the local government areas, though largely grown in Akko and Nafada local government areas. *Pumpkin (kabewa)* is grown across the state, but largely in Akko, Dukku, Yamaltu/Deba, Kwami, Funakaye and Nafada. More so, bitter leaves are grown across the 10 local government areas.

Table 6: Fruits & Vegetables

Crop	Local Governments Area										
	Akko	Billiri	Balanga	Dukku	Funakaye	Kaltungo	Kwami	Nafada	Shongom	Y/Deba	Total
Cabbage		-	-	-	-	-	-	-	-	4500	4500
Amaranth (Spinach)	4975	3057	2500	5300	4350	2675	2670	3148	2345	9,250	40270
Pumpkin	4920	597	155	5257	4450	792	5890	3800	345	3386	29592
Cucumber	-	-	-	-	-	-	-	-	-	6570	6570
Eggplant	5080	1220	1360	1230	3450	1240	2300	3430	-	1290	20600
Watermelon	1230	-	-	2440	4600	-	4280	5400	-	5750	23700
Okra	6,690	1,530	1815	2315	10785	2220	3045	3,004	340	6990	38,734
Tomatoes	12,560	3,100	7,640	8,950	6550	4480	11,320	6700	1880	16280	79,460
Chilli	2155	3455	-	2340	-	750	-	860	450	3275	13285
Bitter Leaf	1750	790	850	3050	2350	1400	2850	1950	1850	2,880	19720
Jute Leaf	2925	1200	2150	3000	2275	2055	3010	2950	2350	3155	25070
Pepper	4100			2,050	7450	2862	5155	2300	300	3405	27622
Onion		1230	2600	2,350	2650		2,500	3900	2250	14,950	32430
Sweet Pepper	12,375	5975	4127	4175	4335	3460	8375	6450	2350	12750	56372
Scotch Bonnet Pepper	5448	4530	4560	1230	2340	2340	4550	4560	1230	6550	37338
Sesame Leaves	4448	2115	2125	4,125	2500	500	2900	450	2340	8,225	29728
Jute (Mallow) Leaves	1200	1055	1200	2,300	2450	1450	2635	3100	1275	12550	29215
Jute leaves (Ayoyo)	-	-	-	-	-	-	-	-	-	2340	2340
Sorrel Leaves	3400	4975	6100	7,210	8250	5125	7500	8240	4300	21,375	76475
Total											593,021kg



3.7. Permanent Tree Crops

Permanent crops are good outlets of investments as they supply fruits, nuts and other foods for long period of time. They give farmers a steady source of steady income and are less affected by weather and climatic shocks. These permanent crops also provide job opportunities, both on and off the farm, which can contribute to the economic growth of the communities and the country. Table 7 and figure 9 present the result of production and distribution of the tree crops. It emerged that 779.3 tons were cultivated in totality

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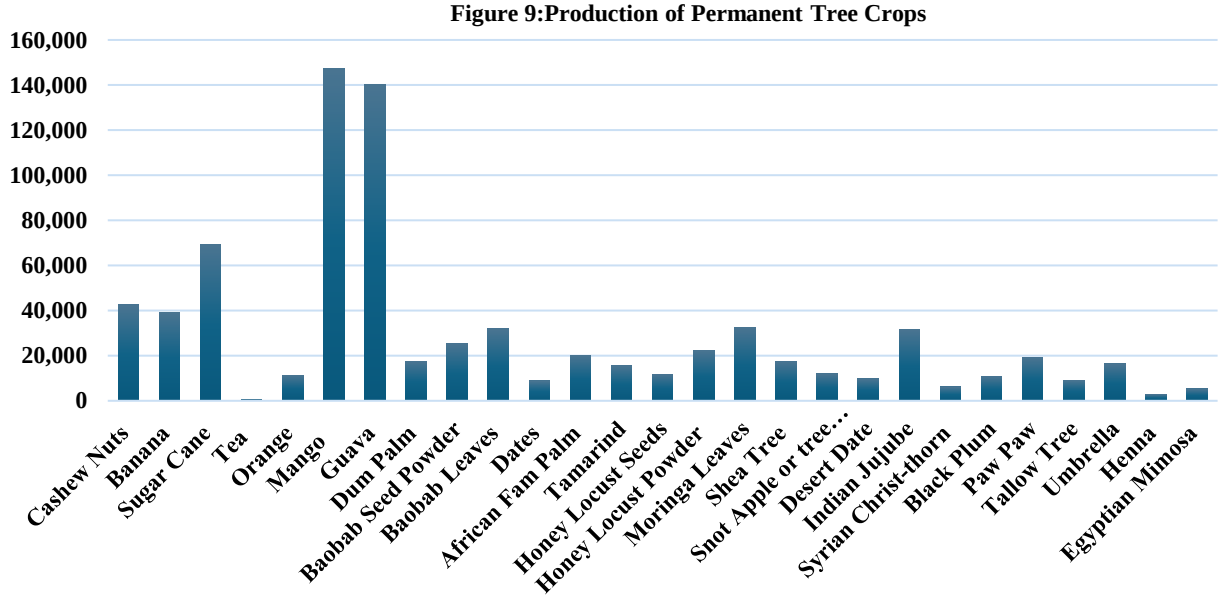
Table 7: Production of Tree Crops

Crop	Local Governments Area										
	Akko	Billiri	Balanga	Dukku	Funakaye	Kaltungo	Kwami	Nafada	Shongom	Y/Deba	Total
Cashew Nuts	5,240	7650	4560	2890	1230	7940	2347	1345	4800	4500	42,502
Banana	4500	7540	4680	1200	1150	8605	2680	2020	5320	6165	39360
Sugar Cane	1500	2,795	4,800	16,600	2300	1900	3300	15800	2500	19,450	69445
Tea	-	280	-	-	-	375	-	-	-	-	655
Orange	750	1250	1400	300	500	2110	1850	1,300	1200	1500	11410
Mango	14,200	10,075	15,300	9,900	9000	15,120	18,775	12300	11500	31,350	147,520
Guava	21,600	15,320	14500	7,750	8500	12,300	10,050	13050	11200	26,150	140,420
Dum Palm	4,200	2,850	800	1200	1500	340	2125	2100	450	2,050	17,615
Baobab Seed Powder	2250	2,159	2300	1300	2200	4,233	2900	3100	2400	2500	25,342
Baobab Leaves	2,175	1,895	3125	3980	3850	3,425	2975	3130	4450	2925	31,930
Dates	1,700	1300	700	1200	1300	900	650	630	270	300	8,950
African Fam Palm	1,250	5207	2300	700	650	4,168	800	530	3540	1100	20,245
Tamarind	1,360	1697	1500	1760	1800	1370	2200	980	1200	1,760	15,627
Honey Locust Seeds	750	993	1270	1200	1200	1540	1225	1160	1320	1160	11,818
Honey Locust Powder	1550	2,790	2100	2050	2100	2,125	2,420	1715	2600	3,008	22,458
Moringa Leaves	2,000	1743	2200	2,375	1650	1190	1370	5525	2775	11,813	32,641
Shea Tree	1230	1125	2300	1030	1320	3545	2100	1370	3400	1225	17,415
Snot Apple or tree hibiscus	-	-	-	-	-	12050	-	-	-	-	12,050
Desert Date	850	752	1300	1720	825	860	1350	1540	340	1200	9,887
Indian Jujube	4875	2250	1660	5030	4750	1325	3250	3225	1200	4150	31,715
Syrian Christ-thorn	1250	-		1300	1055	-	1120	925	-	525	6,175
Black Plum	1200	1250	1340	1560	1340	1185	1170	870	975	1175	10,865
Paw Paw	1400	2232	2055	995	1230	1708	1450	1850	1200	5128	19,248
Tallow Tree	300	350	250	1870	1900	1365	980	835	760	885	9,195
Umbrella	1230	1055	2450	2765	1090	2560	1870	905	1375	2325	16,395
Henna	500	450	300	320	200	120	375	325	135	275	3,000
Egyptian mimosa	750	340	560	760	560	455	675	450	345	510	5,405
									Total		779,288kg

The results indicated that *mango (mongoro)* and *guava (goiba)* are the largest tree crops produced in the state with 147520kg and 140,420kg representing 19% and 18% of the total yields respectively. Although the crops are cultivated in all areas of the state, it by far dominantly produced in Yamaltu/Deba local government area. Other areas of large production of the crops are Kwami, Akko, Nafada, Kaltungo, Balanga and Billiri local government areas. Sugarcane is the third largest tree crop accounting for 8.9% and with 69445kg. It is grown across the state, but chiefly in Yamaltu/Deba, Dukku, Nafada and Balanga local government areas. *Cashew* and *banana* are also important tree crops produced in the state. These two crops account for 5.5% and 5.1% of the total tree crops yield. The results showed that the crops are grown all over the local government areas of the state, Billiri Kaltungo, Yamaltu/Deba local government areas appeared to be the leading producers. Akko, Balanga and Shongom local government areas are important areas of the production.

Figure 9:Production of Permanent Tree Crops



Moringa leaves (ganyen zogale), baobab leaves (ganyen kuka) and *baobab leaves (ganyen kuka)* are also produced in large quantities in all the local government areas of the state. They accounted for 4.2%, 4.1% and 4.1% of the total tree crop production respectively. The *moringa leaves* are largely produced in Yamaltu/Deba and Nafada local government areas. The *Baobab leaves (ganyen kuka)* are cultivated mostly in Shongom, Dukku, Funakaye and Kaltungo local government areas. Dukku, Akko, Funakaye, and Yamaltu/Deba appeared to be the leading producers of *baobab leaves (ganyen kuka). Baobab Seed Powder (garin kuka)* and *Honey locust powder (garin dorowa)* are also extracted in all local areas in the state and account for 3.3% and 2.9% of the total production of tree crops production respectively. *African fam palm (giginya)*

contributed with 20,245kg representing 2.6% of the total production. Although it is cultivated in all the local government areas, but it is mostly obtained from Billiri, Kaltungo and Shongom local government areas. *Paw paw (gonda)* is also an important tree crop in the state and is cultivated in all the local government areas, but chiefly from Yamaltu/Deba, Billiri and Balanga local government areas. The results further revealed that *dum palm (goruba), Umbrella (ambulera), tamarind (tsamiya)* and *shea tree (kaɗe or kaɗanya)* are cultivated in all part of the state. They account for 2.3%, 2.1%, 2% and 2.2% respectively. The shea tree is however mostly produced in Kaltungo, Shongom and Balanga local government areas.

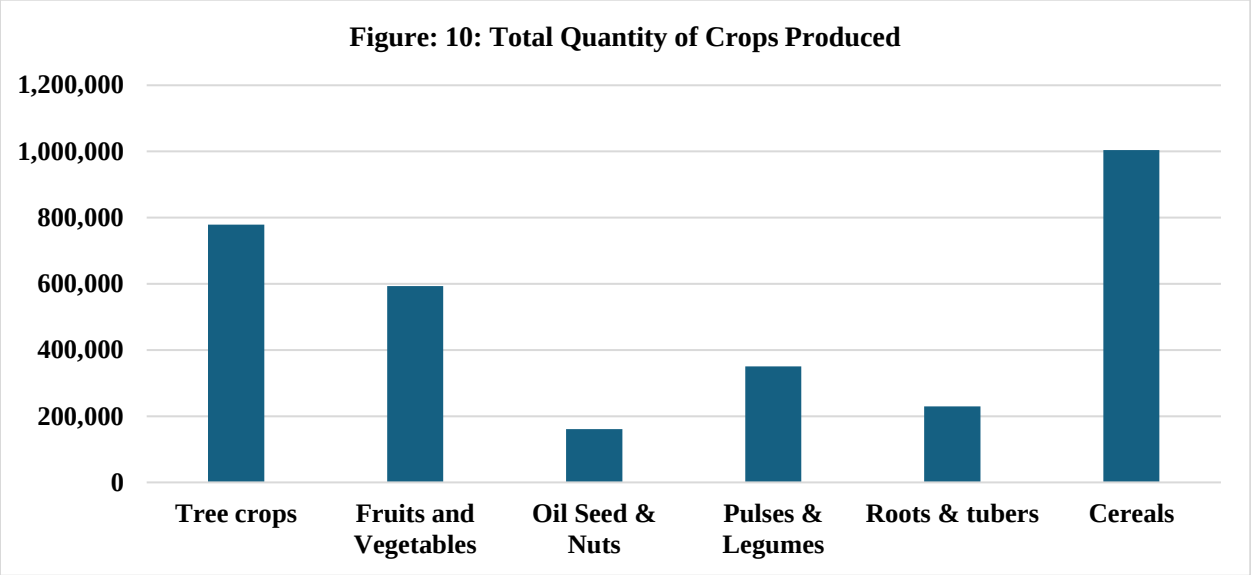
Orange (lemo), honey locust seeds (ɗorowa) and *snot apple or hibiscus (goron tula)* are in addition grown in the state and each contributed 1.5% of the total production. While oranges and locust seeds are cultivated in all local governments, snot apple is only cultivated in Kaltungo local government areas. *Black plum (dinya), desert date (adua), tallow tree (taura),* and *dates (dibino)* account for 1.4%, 1.3%, 1.2% and 1.1% of the total production respectively. There are other tree crops that are cultivated in little quantities such as *tea (shayi), Egyptian mamosa (gabaruwa), and Syrian Christ-thorn (magarya)* in the state. The result revealed that tea is only grown in Billiri and Kaltungo local government areas.

3.8. Total Quantity of Crops Produced

As presented in table 10, an overall total of 3,117.5 tons were cultivated from the six categories of the crops in Gombe State. Cereals appeared to be the largest crops produced with 1,003.8 tons accounting for 32.3%. The total output cultivated from tree crops stood at 779.3 tons representing 25%, while fruits & vegetables had a total output of 593 tons equivalent to 19%. Pulses & legumes and roots & tubers were the fourth and fifth and contributed with 350.4 tons (11.2%) and 229.7 (5.2%) respectively. The least category of crops in terms of quantity of production was oil seeds & nuts that had a total output of 161.3 tons proportional to 5.2% of the overall total output. Figure

Table 10: total quantity of crops produced by category

S/No.	Crop category	Quantity	Percent
1.	Cereals	1,003,763	32.2
2.	Fruits and Vegetables	593021	19
3.	Oil Seed & Nuts	161,340	5.2
4.	Pulses & Legumes	350,407	11.2
5.	Roots & tubers	229,704	7.4
6.	Tree crops	779,288	25
	Total	3,117,523	100



4. Major Findings and Conclusion

Based on the results of the survey, the socioeconomic features of the farmers are that majority of the farmers are men with and average age of 30 years. It also emerged that large number of farmers have an average dependency 6 children. Majority of the farmers have secondary education and below. Most farmers cultivate for commercial and subsistence purposes on an average of 3 acres. In addition, the farmers mostly sell their produce in local markets. Information and updates on agriculture reach them mostly through words of mouth and large part of the farmers are thinking of diversifying into livestock farming. The study grouped the crops into six major categories namely: cereals, fruits & vegetables, oil seeds & nuts, roots & tubers and tree crops. The major category of crops produced are cereals, tree crops and fruits and vegetables. The major cereal crop cultivated in the state is maize (corn), largely produced in Akko local government area and it is followed by paddy (rice) and millet that are dominantly grown in Yamaltu/Deba and Dukku local government areas respectively. The production of roots and tubers crops is dominated by sweet potatoes being largely cultivated in Funakaye Local Government Area. Cassava was found to be the second most cultivated root and tuber crop, chiefly produced in Dukku local government area. The third most produced crop in this category is of course cocoyam and is produced in commercial quantities in Yamaltu/Deba local government area. Beans is the dominant category of pulses and legumes cultivated and mostly in Dukku, Akko and Funakaye local government areas. Soy beans is also grown in large quantiies in Balanga and Billiri local government areas. In the category of oils and nuts ground nut and sesame are the crops produced in commercial quantities. While groundnut is chiefly cultivated in Funakaye, Dukku and Kwami local government areas, sesame was produced Yamaltu/Deba, Kwami, Dukku and Akko local government areas. Tomatoes and sorrel leaves are the major fruits and vegetables produced largely in Yamaltu/Deba local government areas. Mango and Guava dominated the production of tree crops and are mostly produced in commercial quantities in Yamaltu/Deba local government areas.

5. Recommendations

Based on the major findings and conclusion, the study offers the following recommendations:

i. There is need to encourage women to participate in crops farming,
ii. The large number of youth that are engaged in the crop farming need to be encouraged financially and technically,
iii. Extension services be expanded by governmental and non- governmental organizations in order to give rural farmers modern skills of crops farming, especially on ICT and other modern ways of crop farming,
iv. There should be policies for giving farmers more access to agricultural lands in order to practice large – scale and commercial farming,
v. Crops farmers particularly those in rural areas should be given avenues to market their products in cooperatives markets, supermarkets and export markets so as to fetch good prices,
vi. Crop processing plants and factories should be established at areas where crops are largely produced for cleaning and standard packaging in order to add value to the crops and reduce the cost of transportation,
vii. Fruits and vegetables should be packaged and transported in modern containers at the areas of high cultivation for the crops to have good prices, and
viii. Lastly, agro-processing industries should be established in areas where tree crops are dominantly produced to absorb the output and manufacture related products.

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