

## Prospects and Constraints to Ache Production and Processing In Bogor Local Government Area of Bache State: Implication to Relevant Technology Transfer

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**Abstract:** The study was carried out in Bogoro local Government Area of Bauchi State to evaluate the prospects and constraints to production and processing of Acha (*Digitaria exillis*). Twenty-eight villages were selected from three (3) districts of the local government. A well-structured questionnaire was designed, pre-tested and purposively distributed to 84 respondents, while data was analyzed using descriptive statistical tools such as frequencies, percentages, bar charts and pie charts. The result indicated that majority of the respondents (62.5%) were females with an average of age of 20-30 years representing 43.8% of the respondents, fifty eight point eight (58.8%) were married with household size of between 6-10 representing 37.5 % of total respondents respectively. The result revealed that only 31.3% of the respondents are literates and majority (41.3%) of the respondents have Acha farming experience from 11-20 years while 46.3% are having farm size ranging from 1.5-2 hectares. The popular method of planting Acha by all the respondents indicated that 100% of them use broadcasting method, while 81.3% harvest Acha manually using hands and containers. The result indicates that (68.8%) of the respondents were milling/decortications local tools such as pestle and mortar in processing Acha with only 31.3% who use modern machines in milling. The major constraints faced by the majority of the respondents in producing and processing Acha are its' tedious nature of harvesting (29%) and processing (27%) which takes their energy, time and attention. It is recommended that government, and/or private companies should produce machines that will assist in the planting, harvesting and processing of Acha in Bogoro Local Government Area.

**Key words:** Bogoro, Acha, Production, Processing, Prospects, constraints

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### I. Introduction

Acha (*Digitaria exillis*) is a cereal crop from a grass family. It is probably one of the oldest African cereal for the thousands of years, West African have cultivated it across the dry savannas, in fact, It was their major food even through few other people have ever heard of it. This crop still remains important in areas scattered from Cape Verde to Lake Chart, Mali Burkina Faso, Guinea and Nigeria. (Philip, 2006) Despite its ancient heritage and widespread, importance, knowledge's of acha's evolution, origin distribution and genetic diversity remains scanty even within West Africa itself. Part of the reason for they has been misunderstood by scientist. This neglect made it to be considered as a lost crop of Africa. However, acha is being gradually rediscovered and considered for improvement as cultivated species (Ibrahim 2001, Morales Payan, *et al.*, 2002). More and more farmers are engaged in its production. In the year 2002, a total of 347, 330, hectares of land were devoted in its production in Africa with Nigeria, alone providing almost half of the area (FOASTAT, 2003). Acha is grown in various parts of Nigeria, Sierra-lion, Ghana Guinea, Bissau, Senegal, Togo, Mali, Benin Republic and Cote Devioir, and acha is known by various communities in Africa such as "findin" in Senegal, "findo" in Gambia, "Falio" in Sere-lion, in Mali "Foni" in Burkina "Faso", "Kpendo" in Guinea, "Podgi" in Benin republic, "pom/polin" in Cote Devior and hungry rice in English. (Gyang and Wuyep, 2005)

In Nigeria, acha is grown in commercial quantities in some state such as Bauchi, Kaduna, Kebbi, Plateau, Nassarawa, Niger, Gombe and FCT Abuja with Plateau state being the highest producer with an estimated production of 20,000 ton per annum (Gyang and Wuyep, 2005).

Acha is an annual cereal and erect herbaceous plant which reaches stature heights from 30 - 80 centimeters. The ears consist of two to five narrow pan ears, which are up to 15 centimeter long, acha is usually cultivated only type of and areas traditional hand tools.

It is a small herbaceous annual plant that grows to heights of 30-80 cm. Research shows that farm areas of below 1 hectare are used its cultivation (Kwon Ndung and Misari 1999, Kuta *et al.*, 2003). According to their research study, it said that the production is generally considered laborious, so also is its harvesting and processing. The

final processing of acha before usage is the hulling which is the separation of the hull (outer covering) from the grain of a crop either mechanically or manually by either impact of shearing.

Acha (*Digitaria exillis*) is reported to have originated in West Africa where it is consumed as a cereal and remains an important crop in Eastern Senegal, Northern and southern Kaduna, Bauchi, Western Burkina Faso, Southern Mali and other African countries. In Nigeria, several names are used in calling acha such as *Findi, Fonia, Tzwan, Chid, Funde, and Findo* (Jideani, 1999) According to (Gyang and Wuyep 2005) acha contains about 7% crude protein that is high leucine (9.8%) methionine (5.6%) and valine (5.5%), (Temple and Bassa, 1991) in their research studies. It can be made into numbers of dishes such as porridge and *cuscus*. It is mixed with other ingredients to make bread, kuskus, kamu, pastries, popped and beer brewing. It can also be used as a food and it is recommended for diabetes patients by doctors, thus making the cereal very costly and unaffordable for many. The consumption of cereal such as biscuits and bread has become very popular in Nigeria especially among children and these foods contain poor sources of protein often of poor nutritional quality. Therefore, consumption of acha can serve as a substitute for search of nutritious meal (Alobo 2001) The crude protein in acha is 7%, it also has leucine at 9.8%, methionine properties at 5.6% and valine at 5.8% with high brewing and malting properties.

According to Kowalski (2010) Research and development on acha cereal grains is experiencing renewed interest in Africa and the rest of the world, particularly for its flavour and nutritional qualities. (Jideani *et al*, 2000; Shewry 2002) in their research and development stated that Acha proteins have composition similar to that of rice (Temple and Bass 1991; Jideani and Akingbala 1993), but having relatively higher Sulphur amino acid (methionine and cysteine) content. In studies by De lumen *et al* 1993; Jideani *et al* 1994, they stated that sulphur amino acids are crucial for proper heart function and nerve transmissions and that the cereals are essential sources of amino acids for people with low intake.

According to Jideani and Akingbala (1993) stated that nutrients are now said to play a role in diabetes. It is believed that Acha have more nutrients needed by the body to prevent and manage type 2-diabetes. The resistant starch is part of some ingredients that assist in preventing and managing pre-diabetes and type 2-diabetes.

### **Statement of the problem**

Acha production is mostly considered laborious. This is thought so because of the hulling which is the separation of outer covering from the grain of the crops done either mechanically or manually. This stage of acha processing is the most tedious as it is only manually done using the mortar and pestle and therefore discourages the farmers from producing it because of hired labor required.

### **Objectives of Study**

1. To study the socio-economic background of farmers in the study area.
2. To study the method of production and processing of Acha in the study area.
3. To examine the constraints faced in production and processing of Acha.

## **II. Methodology**

The experiment was conducted at Bogoro Local Government Area of Bauchi State. Bogoro is located in southern part of Bauchi metropolis. Bogoro local government has a total land area of 875km<sup>2</sup> with about 80-95% population are farmers both crops and animal production (Bogoro LGA, 1999).

Bogoro local government has area of 875km<sup>2</sup> with a population of 1,210,180 (2006 census) Bogoro located between latitude 9.30<sup>0</sup> and 12.0<sup>0</sup> north of the equator and longitude 8.5<sup>0</sup> and the Greenwich meridian and has an altitude of about 690.2m above sea level in terms of local government boundaries. Bogoro local government is bordered by Kanke local government area of plateau state to the south Tafawa Balewa local government area of Bauchi state to the north, west and to the eastern part respectively. Bogoro local government area experience both rainy (cropping) and dry seasons which occur between late October and April, while the Rainy (cropping) season occur between early May and late September. The mean annual rainfall is 680mm; the temperature ranges from as low as 11<sup>0</sup>C to as high as 40<sup>0</sup>C sometimes.

The study is to cover the entire Bogoro and Boi districts of Bogoro Local government area of Bauchi state, has a total pop of 84, 215 (2006 census) the three (3) districts Bogoro, Lusa and Boi were used in three (3) district selected is used as a sampling unit and where interviewed.

The total numbers of farmers in Bogoro Local government area is one thousand two-hundred and sixty (1,260). For these reason, 15% of total population of the farmers was used, which is randomly selected eight-four-(84) farmers were selected randomly from a joint district of Bogoro, Lusa and Boi twenty four villages were selected from each three (3) districts.

The research instruments adopted included researchers persona interview in Acha production and processing, unstructured interview sessions and the uses of well-structured questionnaire. While data collected were analyzed using statistical tools such as frequencies and percentages, while other results were presented through pie chart.

$$\frac{\text{Number of respondents (x)}}{\text{Number of Questionnaire (y)}} \times 100\%$$

### III. Result and Discussion

#### Socio-economic characteristics of respondents in the study area

	percentage	frequency (%)
<b>Sex</b>		
Male	30	37.5
Female	50	62.5
<b>Age</b>		
20-30	35	43.5
31-40	21	26.3
41-50	10	12.5
51-60	11	13.8
61 and above	3	3.8
<b>Marital status</b>		
Married	47	58.8
Single	15	18.8
Divorce	3	3.8
Widowed	10	18.8
<b>Household size</b>		
1-5	25	31.3
6-10	30	37.5
11-15	13	16.3
16-20	10	12.5
21 and above	2	2.5
<b>Occupation</b>		
Student	18	22.5
Farmer	27	33.8
Trader	26	32.5
Civil servant	9	11.5
<b>Educational status</b>		
Literate	25	31.3
Primary	21	26.6
Secondary	19	23.3
Tertiary	15	18.8
<b>Farm size of Acha in Ha</b>		
<1	23	28.8
1.5-2	33	41.3
2.5-3	21	26.3
3.5-4	3	3.8
<b>Years spent in Acha production</b>		
1-10	14	17.5
11-20	37	46.3
21-30	17	21.3
31-40	7	8.8
>40	5	6.3
<b>Total</b>	<b>80</b>	<b>100</b>

Source: Field survey, 2017

Table 1 show that majority of the respondents (62.5%) were Females while 37.5% were Males. This shows that majority of the respondent were Females. This implies that there were more female Acha producers than males. This could be attributed to the fact that Acha cereal is considered as female related cereals produced by women, while males are more involed in producing other cerels/grain crops such as corn, millet and guinea corn. This finding agrees with Philip (2006) result.

The age of farmers shows that 43.8% are within the age range of 20-30 years. This implies that the youth had enough energy, were healthier and stronger to be engaged in a tedious work of the production and processing of Acha cereal which is labour intensive. This result suggests agrees with the finding of Philip (2006)

The result also indicates that majority (58.8%) of respondents are married with highest respondents (37.5%) having family size ranging between 6-10 members. By implication, that there is need of farming in order to increase production of agricultural produce to ease the feeding challenges of their homes: That means farmers with large families size have more access to family labour, skills and strong social capital to adopt to changing situation. While those with small, family have to adopt on hired labour (Philip,(2006)

Many of the respondents are literate (31.3%) followed by 26.6% of the respondents have been exposed to primary school education; this indicates that most of the farmers in the study area can read and write. The implication is that the high level of literacy among the respondents should serve as an advantage to the respondents in terms of accessing technological innovations. This could also assist them to have access to other sources of information instead of depending on extension agents.(Akimwale,2012)

Farm size of acha by majority (41.3%) respondents ranges between 1.5-2 Ha of farm followed by 28.8% of the respondents who have less than 1 Ha.

Table 1 also indicates that the majority of the respondents (46.3%) have spent between 11-20 years in acha production, while 21.3 % of the respondents having spent between 21-30 years farming acha production. This implies that the respondents are not just farming acha but have had many years of farming acha cereal. This experience combined with adequate farm resources will translate into profitable agricultural production. This implies that farmers in the study area known about the plant called acha thou they may not be aware of its economic importance or health benefit.

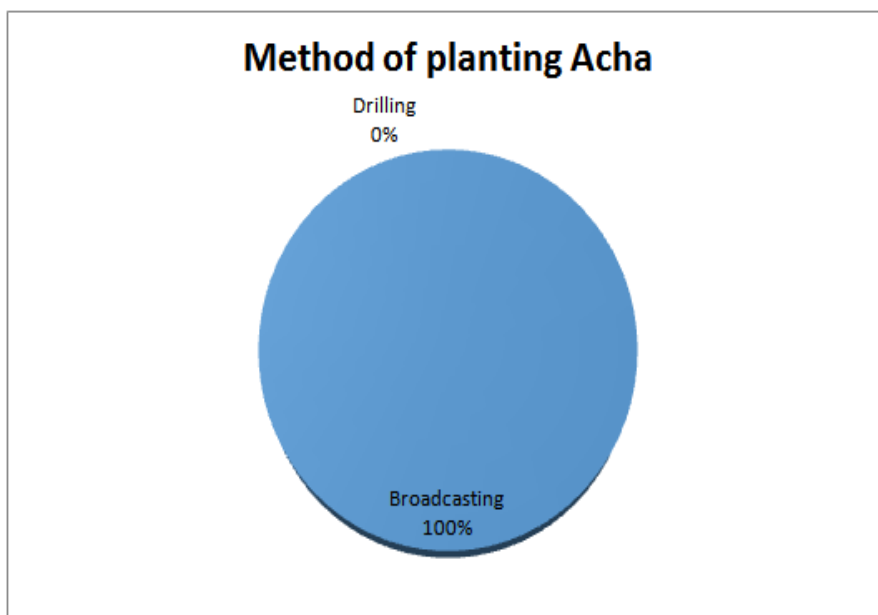
Figure 1 of Pie chart indicates that 100% of the respondents use broadcasting type method in planting acha in the study area. This results shows that majority of the farmers don't have knowledge on drilling method of planting acha. This result implies that respondents are unaware of the drilling method of planting acha.

Figure 2 shows that 18.8% of the respondent can used knife and sickle with container while 81.3% are manual method of harvest. This result shows farmers do not have knowledge on acha harvest by using knife and sickle. These results disagree with the finding of Jideani and Ibrahim (2005) for the technologies for Acha harvest using machine.

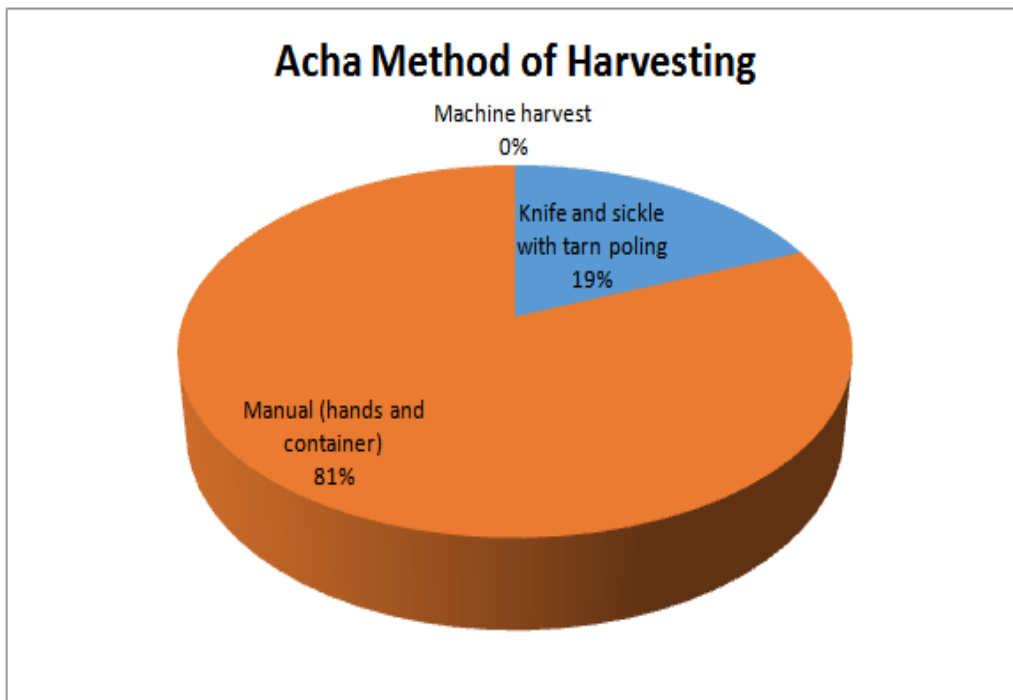
Figure 3 indicates that 31.3% of the respondents use machines in de-husking Acha while the majority (68.8%) uses mortar and pestle. This result reveal that majority of farmers are still in manual milling which can takes more time and energy that government should make machinery available for milling (decortications) Acha in the study area.

Figure 4 shows the major challenges faced in the production and processing of Acha in the study area. The result indicates that the majority of the respondents identified tedious nature of harvesting (29%) and processing (27%) of Acha as their major challenge. This implies that the production of Acha is still in its lowest level in the study area through labor intensive process. (Addonukou *et al*, 2006)

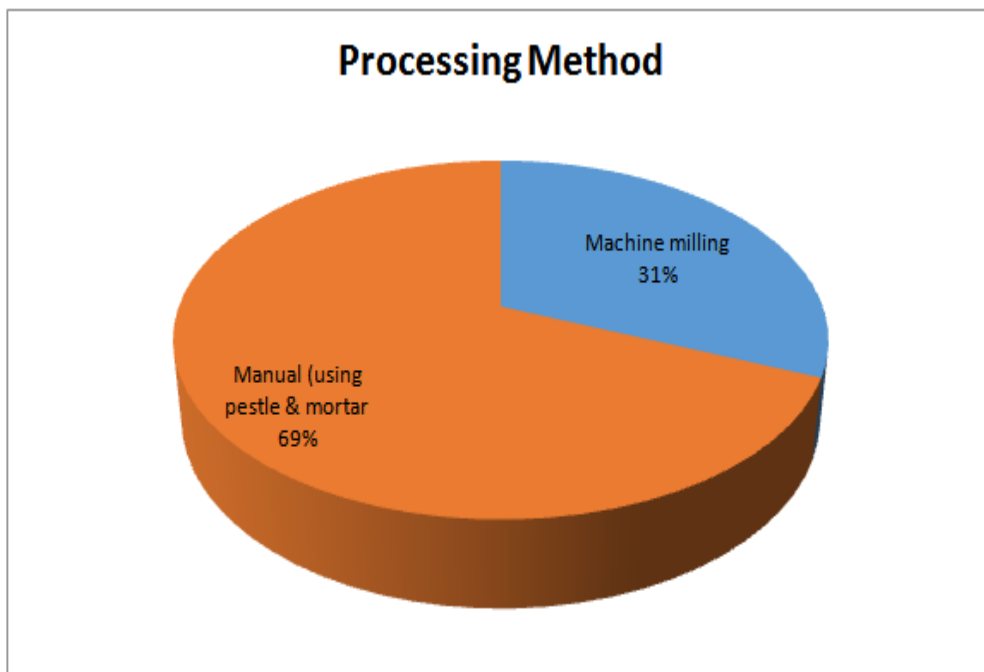
**Figure 1: Distribution of respondents according to method of planting of Acha**



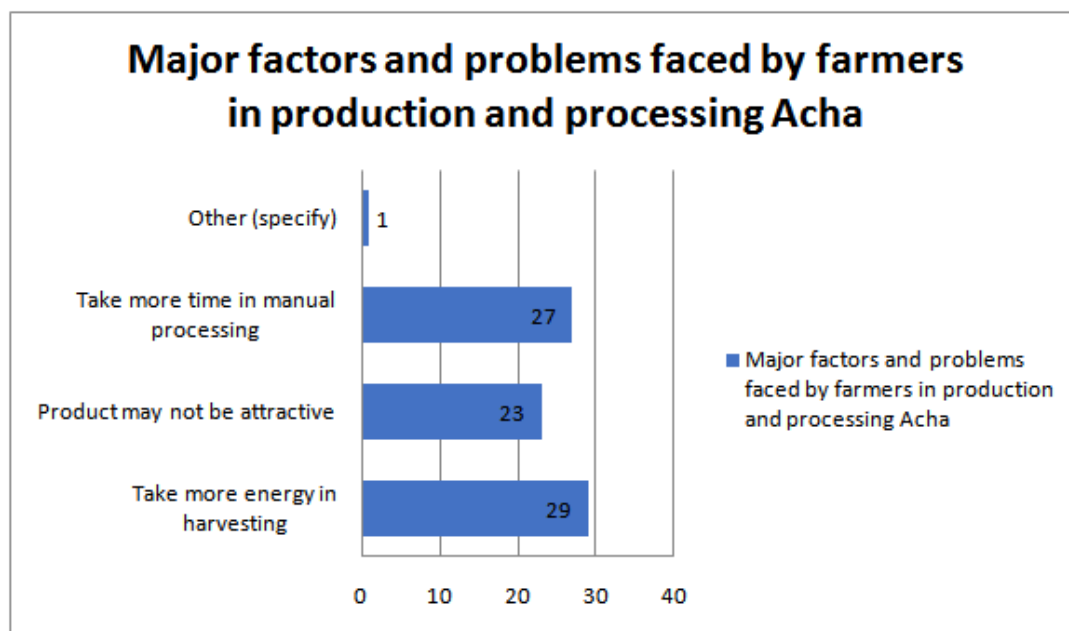
**Figure 2: distribution of respondents according to their Acha method of harvesting**



**Table 3: Distribution of respondents according to processing method**



**Figure 4: Distribution of respondents according to major factors and problems faced by farmers in production and processing of Acha**



#### IV. Conclusion

It is no doubt that Acha (*Digitaria exilis*) constitute great value to respondents in the study area with economic and nutritional value as well, in this study the production and processing process of Acha still remains very challenging and tedious. Therefore, the following recommendations are made.

#### Recommendations

- There is need to improve productivity of Acha from 500-600 kg of grains to mechanized farming by adaption of appropriate production and farming systems of technology (by way of innovation). It is recommended that government, and/or private companies should produce machines that will assist in the planting of Acha in Bogoro Local Government Area.
- Effort should be made to Nigerian engineers to develop a machine that will specifically plant and harvest Acha.
- Government should make provision of de-husking machine that will free stone Acha for consumption to boost farmers processing in Bogoro Local Government Area.

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