

Domesticating baobab tree: a baseline study on trade and usage in Adaklu district and Ho municipality

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ABSTRACT

A baseline survey was undertaken in Ho and three communities in Adaklu District in the Volta Region of Ghana. The objective of the study was to assess the trade and usage of baobab along the value chain in order to determine the viability of domesticating the baobab tree in Ghana. A qualitative approach was adopted whereby focus group discussions and interviews were conducted with traders, buyers and consumers of baobab fruits in Adaklu District and Ho Municipality. Findings revealed that the only part of baobab being traded in was the fruit pulp in the study communities. Focus group discussants attested that there is underutilisation of baobab in their communities. They are however, aware of some nutritional and medicinal benefits of baobab. The low consumption of baobab is most likely influenced by culture. It was revealed that baobab trade is an all-women affair, well organised and has been going on for a long time. Traders come from different places to buy baobab fruit pulp from Ho market. The baobab trade is growing and has many opportunities along the value chain right from cultivation to utilisation. Baobab has the potential to create jobs, improve health and wellbeing and contribute to climate action.

Keywords: Climate action; fruit pulp; Ghana; medicinal benefits; nutritional; underutilisation
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Introduction

Baobab is a wild African tree with multiple uses (Rahul *et al.*, 2015). In addition to the diverse food preparations that can be made from the various parts of baobab in different localities, it is used to produce some medicines and cosmetics (Kabore *et al.*, 2011). Baobab is also used as raw material for various products. It has many accolades including “Wooden Elephant”, “Mother of the Sahel”, “Africa’s Superfood”

and “African tree of life” (Gebauer *et al.*, 2016). Michel Adanson after whom baobab was named *Adansonia digitata* scientifically, considered it the most useful among all trees to mankind (www.powbab.com/pages/baobab-tree). In terms of food, the nutritional composition of the plant is remarkable (Sharma *et al.*, 2015). Proteins, calcium, phosphorus, potassium, vitamin C and lipids among other nutrients are known to be significantly high in

various parts of the plant (Rahul *et al.*, 2015).

Baobab is common in Ghana and the Volta Region is no exception. It is found in the wild in the Ho Municipality and Adaklu, Agortime-Ziope, Akatsi and Tongu Districts, to mention a few areas in the region. It is called *Adido* in Ewe and its abundance might be the reason for naming one town Adidome in the Volta Region. Despite the presence of baobab in the afore-mentioned districts, its use seems to be low considering the health benefits that can be derived from its consumption, and the income that can be generated from its trade. Among the ethnic groups in West Africa where baobab utilisation is high, it has significant influence on livelihood of the people (Buchman *et al.*, 2010). Baobab is however, gaining international recognition as it has been recognised as a novel food for the European market (Kamatou *et al.*, 2011).

Baobab is a food security crop in some parts of Africa. Because baobab has not received commensurate research attention, it is classified among underutilised or orphan crops (Assogbadjo *et al.*, 2021; Wanjeri *et al.*, 2020). Notwithstanding, some studies have been carried out by researchers across Africa. Recently in Ghana, Odoom (2021) and Egbadzor (2020) characterised wild baobab in the Upper West and Volta Regions respectively. Due to the many benefits of the tree from its multiple uses including high nutritional and medicinal value and drought tolerance, it has been identified as one of the most important trees to be domesticated and conserved in Africa (Sanchez *et al.*, 2010). According to Chen *et al.* (2015), domestication process involves the artificial selection of crops to be more suitable for human requirements such as cultivation and desirable traits. Egbadzor & Akuakku (2022) in their work towards domesticating of the plant argued that, with proper research, the African baobab can fruit in just two years after planting.

Domestication and promoting the utilisation of baobab would tremendously contribute towards the attainment of the United Nations' Sustainable Development Goals (SDGs) 1, 2, 3 and 13. Domesticating and cultivating baobab will diversify income sources for farmers and contribute towards SDG 1 (no poverty).

Different parts of the baobab including the leaves, fruit pulp and seeds used as food are rich in micro nutrients such as iron and zinc. Growing and eating of the baobab will not only contribute towards SDG 2 (zero hunger) but it will also fight hidden hunger. Increased intake of this super food will promote good health and well-being and thereby address the SDG 3 (good health and well-being). For example, extracts from various parts of baobab are known to be potent against microbial activities, malaria and hyperlipidaemia associated health anomalies (Asogwa *et al.*, 2020). Baobab cultivation will also contribute to SDG 13 which is climate action as it could be used for afforestation and to promote biodiversity.

Food consumption is cultural, suggesting that the perceived low level of consumption of baobab in the Volta Region is due to the culture of the people. As stated by Boutaud *et al.* (2016) that "food represent first a cultural act", people of the study area are not identified with baobab eating. However, some form of baobab trade goes on in the area although records on this trade and consumption are not available. At the global scene, baobab products have become important due to their nutritional, medicinal and cosmetic values (Gruenwald & Galizia, 2005). Utilisation of baobab by local communities where the plant grows naturally, will contribute to their livelihood in diverse ways. Gathering local knowledge on baobab is a justified step towards its greater usage.

The objective of the study, therefore, was to undertake a base line survey on the trade, usage and importance of baobab among

traders, buyers and consumers of baobab parts in Ho and Adaklu District. Information from these stakeholders would among other things help in future attempt to domesticate and promote greater utilisation of the plant.

Materials and Methods

The study covered certain areas of the Volta Region of the Republic of Ghana. It was conducted in three communities in Adaklu District and Ho, the Volta Regional capital. In Adaklu, focus group discussions were held in Goefe, Helekpe and Ahunda. These three communities are among areas where baobab fruits are collected from the wild. Convenience and snow-ball sampling methods were used to sample people who pick wild baobab in these communities. In view of the research objective, qualitative approach was adopted for the study. Researchers asked questions and the focus group members responded to the questions. The number of participants in the focus groups were 6, 10 and 30 for Goefe, Helekpe and Ahunda respectively. They were predominantly women in the focus groups. However, two men each participated at Goefe and Helekpe while ten men were involved at Ahunda.

Convenience sampling technique was used in sampling traders, buyers and consumers of

baobab products in Ho. The traders and buyers were identified at the Ho Central Market. There are specific locations where baobab trade take place within the market. Three sets of interview questionnaires were developed and administered targeting these three groups along the baobab value chain. Traders refers to those who obtain the baobab fruit pulp from the localities where they are picked and sell them in the market. They can also be described as wholesalers. Buyers on the other hand refers to those who buy the baobab fruits from the market for processing into end uses. Both the traders and buyers of baobab fruits were sampled using convenience sampling at Ho market and they were consequently interviewed. Consumers were those who buy end user products like ice creams and they were sampled and interviewed at different locations across Ho. After introduction, the interviewer asked the interviewee whether he or she eats baobab. The interview continued with only those who eat baobab in one form or the other. A number of consumers were interviewed at Ho Technical University. The Ho Technical University respondents were mainly students from different parts of Ghana. That was a convenient way of identifying baobab eaters. Information on respondents of the interview are presented in Table 1.

TABLE 1
Background of Respondents

Category	Age			Years of trading or usage (% of n)			Education (% of n)				Number of Children			Gender	
	Min	Av	Max	< 6	6 – 10	> 11	None	1°	2°	3°	Min	Av	Max	M	F
Traders (n = 49)	23	38	58	55	39	6	24	54	22	0	0	3	8	0	100
Buyers (n = 47)	21	37	62	59	40	1	15	74	11	0	0	2	6	0	100
Consumers (n = 90)	18	26	69	46	9	45	0	8	4	88	0	0.68	8	9	91

Note: 1°, 2° and 3° are basic, secondary and tertiary education respectively

The respondents were grouped into traders, buyers and consumers. Their background information collected were on their age, number of years in using baobab fruit pulp, highest level of education, number of children and gender.

Results and Discussion

Nature of Baobab Trade in Ho and Adaklu

Baobab trade seems to be well established, standardized and organized in Ho and its surrounding communities. According to the people involved in the survey, the only part of baobab used in the trade in Ho and its surrounding communities is the fruit pulp. The trade chain starts from collectors who pick the wild fruit from the bush. According to the respondents who are baobab fruit pulp traders in Ho market, most of the consignments come from people referred to as collectors mainly come from Adaklu District. In addition to Adaklu District, few collectors also come from Agortime-Ziope District. There is a smooth connection between the collectors and the traders. Collectors usually bring their wares to the traders on the eve of Ho market days. Traders then sell their goods on Ho market days to buyers who come from far and near. According to one trader, “some buyers come from as far as Accra and Kumasi”.

It was difficult to ascertain when the baobab trade started in Ho. Some collectors said they started the business over ten years ago. Some people also mentioned that others who they learnt the trade from sold baobab fruit pulp long time ago. A household was mentioned in Adaklu Goefe during the focus group discussion that they used to send baobab pulp to Togo in the 1990s. In Ho market, 25% of the traders interviewed stated that they have been in the baobab trade for over ten years. However, there are a lot of new entrants into the business as 19 of them representing 38% have been in the business for less than five

years. The remaining 37% of the respondents have spent between five and ten years in the business. This shows growth in the business as there are considerable increasing number of collectors as well as traders. Age range of 32 and 58 for traders and buyers in Table 1 also indicates importance of the trade to different age groups. These ranges cover young adults to elderly women.

The number of baobab buyers also continue to grow. Only one buyer stated that she has been in the business for between eleven and twenty years. According to her “I was in this business long before many of them joined”. Sixteen buyers representing 36% have been in the business between six and ten years. Majority of buyers (almost 60%) are new entrants with less than five years of experience. A lot of consumers interviewed also started patronising baobab products for less than five years. The number of years of trading or using baobab shows that although the business has been there for a long time, it is currently growing.

Baobab trading is all women affair in the study communities. All the three focus groups stated with no objection that only women are involved in the baobab collection at present. Baobab pulp traders and the buyers are all women. The observation in the study communities are similar to that of Kaimba *et al.* (2020) and Jackering *et al.* (2019) in Kenya, where more females were involved in baobab collection and selling than males. Developing baobab value chain will therefore benefit women in these communities. Most of these women are responsible in keeping the home and taking care of children. If the baobab business is improved, it will empower women and contribute to the eradication of poverty which is one of the sustainable development goals of the United Nations. However, the growing baobab business without corresponding increase in the natural population of the tree and the likelihood

that men may join the trade may have environmental as well as social consequences. Buchmann *et al.* (2010) expressed similar fear for the tree in Mali, Benin and Senegal.

Baobab fruit pulp trade is seasonal. The major season starts from January and ends in April. According to the collectors, some picking can be done from November. The quantity of the fruit available for picking increases, reaches its peak in February and March and then falls. The minor season is August and September. According to the collectors, baobab tree fruiting starts once one season is about to end. From this attestation, it takes about four to five months for baobab fruit to mature i.e. from April to August and then September to December. From this, it seems the major raining season during September fruiting period leads to more fruits and longer maturity season in December to April. Longer dry season preceding the fruiting period in April leads to fewer fruits and therefore shorter fruit picking period in August and September.

Economic Impact of Baobab Trade

Baobab is economically important to all those who engage in its trade. Collectors of baobab

fruits keep on increasing in the communities. Although, no one directly disclosed how much they make in the trade, it looks lucrative with some people waking up at dawn to the bush to pick the fallen baobab fruits. It was also reported that some people now a days climb the baobab trees to harvest the fruits, a practice that is new. As one woman stated “in the past, no one plucks baobab. It falls and we pick from the ground. However, many people are now climbing those big trees to pluck the fruits. And you know, those climbing are women”. All these points to the fact that substantive amount of income is made from baobab collection by the village folks.

During the peak of the major baobab season, some traders sell as much as eight sacks every five days. Each of the sacks contains twenty of 18 cm base by 18 cm height plastic bowl that is used in measuring for sale. One container full of baobab fruit pulp was sold for GHS 5.00 (approximately USD 1.00) in April, 2019. This means that one trader could sell about GHS 800.00 every five days. The average quantity and the cost of baobab seed pulp bought on a market day is shown in Table 2.

TABLE 2

Quantity of Baobab Pulp Bought Each Market Day from a Trader and Cost

Quantity (bowls) bought each market day			Cost of baobab seed pulp (GHS)		
Minimum	Average	Maximum	Minimum	Average	Maximum
1	17.3	40	5	87.02	200

Baobab eating is not part of the culture of the people of Ho and Adaklu. This confirms the assertion of Boutaud *et al.* (2016) that food is first of all a cultural act. 46% of the consumer respondents started patronising baobab products for less than six years. These are Ewes or people from Ho and its surroundings where baobab eating is not part of their culture. They

did not eat baobab from their childhood. They only started when exposed to other cultures. 45% have been patronizing baobab products for over 11 years. This category of respondents are people from different ethnic groups and mainly from the northern part of Ghana. The nutritional quality of baobab is however known to a number of people in the study. During

the focus group discussion at Helekpe, some members lamented about what they might be missing by not eating baobab leaves as they compared themselves to those who eat them. “Look at how strong and healthy the baobab leaf eaters are?” said by a man at Helekpe.

All the baobab traders and buyers in the study deal in only the pulp. It was also deduced that the greater quantity of the baobab goes out of the Volta Region. This is because traders from far away buy larger quantities from the Ho market. Those buyers within Ho buy smaller quantities that they use for ice cream or drinks for sale. Local use of baobab in Ho is thus small. Knowledge of people on the nutritional value of baobab, however, could help in promoting its greater use. Statements like “it is nutritious”, “it tastes good”, “it is medicinal” and “it cures fever” from buyers and traders, is a positive indication that adoption of baobab as food in the study communities could be achieved. These mentioned attributes of baobab are all important in making food choice (Wadolowska *et al.*, 2008).

Usage of Baobab for Food and Medicine

Generally, the subjects of the study believe that baobab is important. They believe that the plant is good as food and medication among other things. The leaf was mentioned by majority of the respondents as ingredient for stew and soup, although, most of them do not use it themselves. The few baobab leaf eaters in the study come from northern part of Ghana where baobab leaf is a major leafy vegetable (Gamor *et al.*, 2015). Baobab leaf was also reported to be important in the meals of people of eleven ethnic groups in Benin, Mali and Senegal by Buchmann *et al.* (2010). Some respondents also stated that the seed is used for soup which they further described as similar to groundnut soup. The nut inside the seed is roasted, ground and used to prepare soup. Apart from the nut,

pulp from the seed and the leaf, no other part was mentioned as food ingredient.

In the case of the medicinal value mentioned in the study, the respondents’ assertion has scientific proof (Sharma *et al.*, 2015). Antiviral, analgesic, cytotoxicity and some other constituents extracted from baobab in Egypt is a confirmation of the medical properties present in the plant (Ateya *et al.*, 2016). With respects to cultural practices, one respondent among the consumers who hails from the Northern Region explained that baobab is culturally important as its pulp is used in preparation of *Tuo-Zafi* – a popular dish in Ghana made from flour of cereals – during final funeral rites. The addition of baobab flour according to the respondent makes the dish extra delicious.

Baobab is locally underutilised in the study communities. The fruit pulp is the part mostly used. All the value chain actors take drink or ice-cream made from baobab fruit pulp. This result is similar to the observation of Schumann *et al.* (2012), in Burkina Faso where the baobab fruit pulp is the most important part used as food. Only few people among the collectors eat baobab leaves. Leaf eaters are not common among the traders and consumers also.

Potentials for Domestication

Continuous trade in baobab will greatly depend on availability of the plant. However, no trader or buyer in the study expressed interest in baobab farming. Collectors on the other hand, are willing to grow the plant but with condition that the materials to plant must be early maturing. Naturally, baobab seeds take relatively a long time to germinate. There are however available techniques to germinate the seeds in less than two weeks. Grafting experiments carried out in Kenya have shown prospect for producing plants that can produce

fruits in significantly shorter periods after planting compared to the present situation (Anjarwalla *et al.*, 2017).

Educational activities are needed to create awareness of the usefulness of baobab. As a vital plant for food, baobab needs to be cultivated. At the moment, all baobab parts are collected or harvested from the wild. Increasing utilisation of baobab will put pressure on the natural population of baobab in view of the fact that increasing death of natural baobab trees has already been reported in some communities (Asogwa *et al.*, 2020). Awareness creation and cultivation must go simultaneously. A lot of business opportunities will be created along baobab value chain if it is developed.

Conclusion and Recommendation

Baobab trade is an old business, however, it is currently growing in Ho and its surrounding communities. There is an enormous opportunity in the sector. The trade relies on baobab fruit which is still in the wild. The first opportunity is to cultivate the tree and that will create more jobs especially for the rural farmers. However, to make the cultivation possible, there should be scientific research to domesticate the tree and come out with desired cultivars for cultivation.

There is a lot to gain in promoting greater use of baobab in terms of commerce. Although, currently not cultivated, traders come from different places to buy baobab fruit pulp from Ho. This already existing market can be expanded if the tree is cultivated. Cultivation can also target international markets as there is growing demand for the products of baobab in Europe. Various stakeholders including the government, research organisations and farmers have to come together to work toward domestication and greater utilisation of baobab. Baobab is an ancient tree but has potential for the future.

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