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Full Length Research Paper

Exploratory and multidisciplinary survey of the cowpea network in Tolon-Kumbungu district of Ghana: A food sovereignty perspective

Wilhemina Quaye[1]*, Kwadwo Adofo[2], Yann Emeric Madode[3] and Abdul-Razak Abizari [4]

[1]Food Research Institute (CSIR), Box M20, Accra, Ghana.
[2]Crop Research Institute (CSIR), Box 3785, Kumasi, Ghana.
[3]Université d'Abomey-calavi, 01BP526 Cotonou, Benin, Nigeria.
[4]University for Development Studies, Box 1350, Tamale, Ghana.

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An exploratory survey of selected deprived communities in the Tolon-Kumbungu district of northern region of Ghana was conducted in August 2007 by a multi-disciplinary team of social scientist, food technologist, plant breeder and food nutritionist. The survey sought to identify with farmers their critical agronomic needs and production constraints in order to develop appropriate breeding strategies, as well as cowpea varietal preference for improved processing technology development. A rural participatory and conventional survey approaches were used. Close to half of the interviewed farmers cultivate both improved and local varieties. It was realized that 33 and 22% cultivated only local and improved varieties respectively. Generally, farmers indicated preference for improved varieties due to market value but rather preferred local varieties for household consumption and food sovereignty purposes. The top three most preferred varietal traits mentioned by farmers for breeding considerations included yield, tolerance to diseases and pests and seed colour. Processors preferred white seed coat varieties due to their good whipping ability and short cooking period. Farmers stressed the role of local varieties in food sovereignty with the early maturing ones being the most significant in household food provision.

Key words: Cowpea, varieties, food, sovereignty, Ghana.

INTRODUCTION

Food sovereignty has been defined as the right of people and communities to decide and implement their agricultural food policies and strategies for sustainable production and distribution of food (people's food sovereignty network, 2004). It is a concept proposed by social movement for the governance of food and agriculture. The food sovereignty concept as declared by the international peasant organization via Campesina (Desmarais, 2002; Borras, 2004) addresses pressing issues of hunger and poverty that have characterized rural economies over the years (Pretty and Koohafkan, 2002; Altieri, 2002; Mulvany, 2007; Roling, 2008). The concept has been explained at four main levels including: (i) the right to adequate, adequate, safe, nutritional and culturally appropriate food (ii) the right to access of productive resources such as land, water, seeds and biodiversity for sustainable utilization (iii) mainstream agroecological production, that is to produce food sustainably and in an ecologically acceptable manner (iv) access to trade and local markets (Windfuhr, 2005; Quaye, 2007). Figure 1 presents a conceptual framework of food sovereignty. This paper focuses on access to productive resources as well as nutritional and culturally appropriate food aspects of the food sovereignty conceptual framework. From a food sovereignty perspective, farmers, processors and communities members in general are given control over their productive resources and access to food instead of relying on conventional food supply chains that dwell mostly on comparative advantage, an option for the economically efficient (Bell-Sheeter, 2004; Pimbert, 2006; McAfee, 2008).

*Corresponding author. E-mail: quayewilhemina@yahoo.com. Tel.: +233-20-8132401.

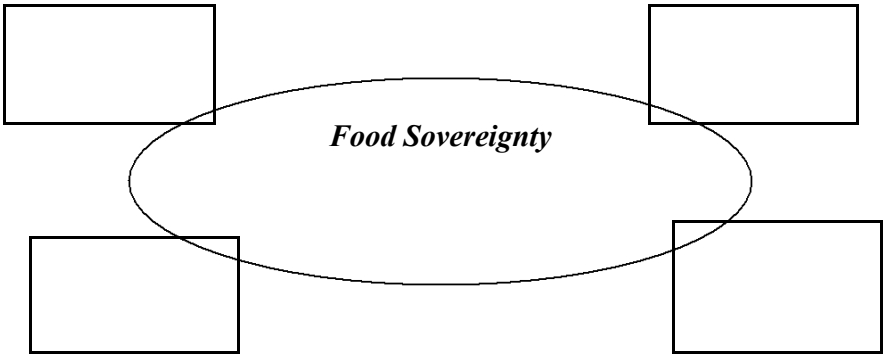

Figure 1. The conceptual framework - Food sovereignty.

The cowpea network was central to the discourse of this multidisplinary research in the northern region of Ghana. The reasons came from the socio-economic and socio-cultural significance of cowpea in the local production, processing and consumption systems. Most farmers intercropped cowpea with other crops due to its nitrogen fixation capacity for soil improvement, commercial and domestic purposes as well as for livestock feed. Other considerations for choosing the cowpea network were incomes to small-scale processors and its nutritive value. Recent studies have also shown that social organisation of local networks is of considerable importance for the production of food crops and food products for significant parts of the local population (Raynolds, 2004; Krebs, 2005; Ruivenkamp, 2005; Lockie, 2006). Therefore exploring the socio- cultural significance of cowpea varieties grown would go a long way to positively influence breeding activities.

This exploratory survey aimed at identifying the critical needs of cowpea farmers and processors as well as examining the potentialities in the local cowpea network from food sovereignty perspective. This gap in knowledge was filled through description of cowpea cultivation situation, identification of critical needs of farmers in order to develop appropriate breeding strategies and determination of constraints in cowpea production and coping strategies. Culinary properties of cowpea varieties used for processing have also been described from the local processors' perspective.

METHODOLOGY

This section presents the study area, sampling techniques and data collection and analysis.

Selection of survey area

Tolon- Kumbungu (Figure 2) is one of the districts in the northern region of Ghana. Northern region is the most important cowpea production area in Ghana. The region is located in the Guinea savannah agro-ecological zone. The rainy season is monomodal, starting in April/May and ending in September/October, with an annual rainfall varying between 900 and 1100 mm (Tsigbey et al., 2003; MoFA, 2007). The exploratory survey team decided on Tolon Kumbungu based on ease of accessibility, level of cowpea production and consumption.

Sampling technique, data collection and analysis

A stratified random sampling technique was used to provide appropriate representation of subgroups (farmers, processors and consumers) in the population. Actual sample size was determined based on the population of cowpea farmers in the selected communities. A total of 86 people were interviewed in August 2007. This comprised 60 farmers, 26 processors in Tibung, Wantigu, Nyamkpala, Gbanlilugu and Kpaligum all in Tolon- Kumbungu district. In addition, focus group discussions (Borgatti, 1999) with key Informants including local people who had adequate information on indigenous know-ledge, traders, chiefs and community assembly members were con- ducted. A snowball sampling technique was used to locate key in-formants.

Among the areas covered by the survey questionnaire are, socio-cultural significance of cowpea, available varieties, cropping systems, production constraints and strategies to cope, source and conservation of planting materials and processing qualities. The data collected was analyzed using SPSS 16.0 and results presented in both qualitative and quantitative statistics.

RESULTS AND DISCUSSIONS

Role of cowpea in the farming system

The ability of cowpea to fix atmospheric nitrogen into the soil in association with some soil organisms gives the crop a vital role in the local farming system as soil nitrogen content booster. This was reported by 47% of the farmers interviewed. Machuka (2001) elaborated on the significance of cowpea as an important component of traditional intercropping systems, especially in the complex subsistence farming systems of the dry savannas in sub-saharan Africa. Indeed It is shade tolerant and therefore, compatible as an intercrop with maize, millet, sorghum, sugarcane and cotton. He further stated that the crop grows well in poor soils with more than 85% sand and with less than 0.2% organic matter and low levels of phosphorus.

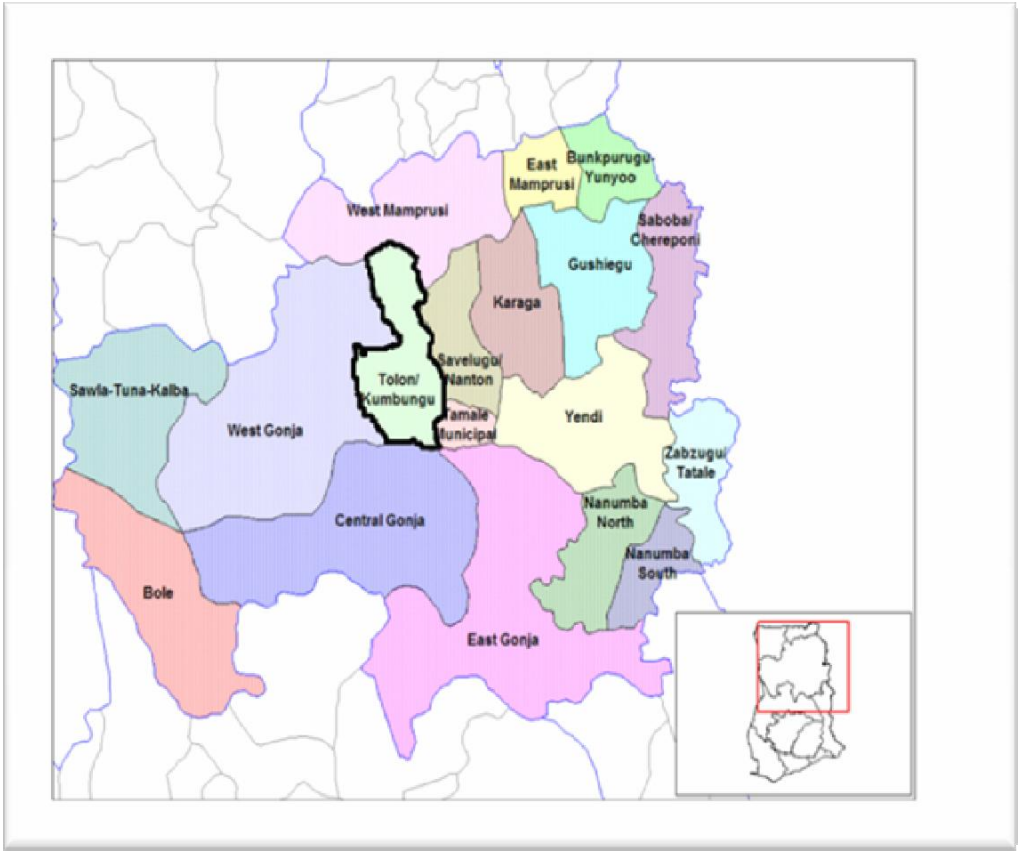

Figure 2. Map of northern region of Ghana, indicating the districts.

Table 1. Local cowpea varieties grown in Tolon-Kumbungu district and their characteristics.

Variety	Characteristics	Potential yield(MT/Ha)
'Sanzi pele'	white seed coat, black eye, narrow leaves, erect stem	<1.0
'Sanzi zee'	brown seed coat, diseases and pest tolerant	<1.0
'Sanzi sabli'	black seed coat	<1.0
'Nyimpa sabli'	black seed coat, late maturing	<1.0
'milo'	light brown seed coat, early maturing, tasty, erect stem	<1.0
'tuupele'	white seed coat, creeping, high yielding, tasty	1.0

Cultivation of cowpea for domestic use was ranked by 32% of farmers as the second most important crop while cultivation for commercial purposes was ranked third by 21% of the farmers interviewed. Local farmers showed concern about biodiversity conservation and ecologically sustainable production especially with the massive change they had observed in their environment in terms of the climatic, edaphic and genetic resources for farming and agriculture in general. There is therefore the need to have and conserve a varied genetic pool of local cowpea that can be readily accessed by farmers to meet their specific needs at any point in time to facilitate sustained production. This must also be coupled with effective and efficient exploitation of the other natural resources that support their farming activities. During focus group discussions, farmers also mentioned the use of cowpea for livestock feed and compost preparation. It is clear from the above that, a key component of food sovereignty is being met if much attention is given to the role cowpea can play in farming systems of the peasant farmers. From food sovereignty perspective, cowpea could be used to enrich soil fertility and enhance access to productive resources.

Commonly used cowpea varieties

Important agronomic traits for cowpea farming

Varieties of cowpea cultivated in the surveyed area, characteristics and maturity as well as potential yields are shown in Tables 1 and 2. Varietal difference in cowpea was commonly identified by the seed colour. '*Sanze*' in the local dialect means cowpea and the colour of the

Table 2. Improved cowpea varieties grown in Tolon-Kumbungu district and their characteristics.

Varieties	Characteristics	Maturity (Days)	Potential yield(MT/Ha)	Local knowledge
'Apagabaala'	Erect, white seed coat	65 - 70	1.8	Have many wives due to high labour demand meaning "smart because of early maturation
'Vallenga'	Red seed colour	60 - 65	2.0	
'Nandanbaaya'				Good for the poor man
'Bengpla'	Erect, white seed colour, not easy To boil	52 - 60	1.5	-
'Marfo-Tuya'	Erect, white seed colour	65 - 70	2.0	-

* Erect, high yielding, not tolerant to insects and low storability.

Table 3. Constraints in cowpea production.

Constraint	% Respondents	Coping strategy
High cost of chemicals	29.2	Some farmers cope by cultivating local varieties that require no or less chemical input.
Pest and Insect damage	16.7	Combine improve varieties with local varieties that are pest and insect tolerant
Erratic rainfall/drought	16.7	-
High cost of weed control	12.5	Use family labour instead of hired labour
High labour demand	8.3	Sometimes use communal labour
High cost of ploughing	8.3	Reduce area of cultivation
Lack of finance	8.3	Seek help from relatives and sometimes form farmers own resources

seed was added to differentiate between the various local varieties. It was revealed from the study that, though farmers used their local varieties, they also cultivated some improved varieties. The varieties identified were very popular with the farmers in the localities surveyed. However, the individual farmer did not grow all the adopted varieties in one particular season but had several considerations such as availability of adequate planting materials, good performance in the previous season, high demand at the local market and ability to buy required agro-inputs needed especially for the improved ones.

On the average, each farmer kept about two varieties. The survey therefore revealed that though different varieties (local and improved) were available, the diversity was not so wide among farmers in different communities visited. This suggests that the local people depending on their local conditions (socially and environmentally), have identified themselves with specific preferences. Farmers who cultivated local varieties explained that they have low cost implications and some local varieties are dis-ease and pest tolerant, no critical need for agro-chemical application and most importantly their leaves can be consumed as vegetables in local dishes. These landraces were preferred because of their unique culinary characteristics in the preparation of local dishes. Cultivation of improved cowpea varieties was motivated by their high yielding characteristics and high market value. Prices for local cowpea varieties were low and some farmers were discouraged from producing them.

Disadvantages associated with the improved varieties are the high cost of agrochemicals for spraying and difficulty in preserving seed for propagation. It is therefore necessary for farmers to buy seeds from seed dealers during planting seasons. Farmers interviewed complained about the seemingly over-reliance on the seed industry. It is also evident that small scale farmers who sometimes find themselves on marginalized lands build resilience to food insecurity through local food sovereignty strategies and naturally shy away from varieties that rely heavily on relatively high cost of inputs.

Farmers when asked to mention two major constraints affecting cowpea cultivation gave responses as presented in Table 3. Farmers' major worry was the high cost of chemicals and the extent of insect damage. Others were erratic rainfall patterns, high cost of weed control and lack of finance. Farmers were of the view that factors such as drought, poor soil fertility, over cultivation and bush fires contribute to low agricultural productivity. Farmers stressed the role of local varieties in food sovereignty. The explanation given was that local varieties yielded little but with improved varieties without good agronomic practices such as agrochemicals application and favourable wea-

ther conditions, there could be complete crop failure. The appropriate solution for this trend can be found in a collaborative effort from researchers and farmers as they share their knowledge and skills in a more pragmatic and participatory approach. This enables scientists to understand the local farming conditions, the farmers' traditional diversity management as well as their specific needs and preferences. Hence the breeder together with farmers can test local and accessible landraces which can be improved through crosses and selection for unique traits such as pests and diseases resistance, high yields, drought tolerance and better culinary characteristics. The farmers can then identify themselves with the resulting variety. In this case, a key aspect of the concept of food sovereignty, right and access to productive resources such as seeds and biodiversity for sustainable utilization is enhanced.

Concerns raised by farmers have food sovereignty implications. For example one needs to develop varieties that might require less chemical input in order to improve technology adoption. From food sovereignty perspective development of varieties that might require less chemical inputs will enhance access to productive resource since it is addressing economic concerns raised by local farmers. With high incidence of insect damage farmers will natureally adopt a balance of improved yield and insect tolerant variety. Thus further breeding activity has to be farmer-researcher participatory to address the above issues.

Preferred varietal traits for breeding considerations

From the survey, when farmers were asked what exactly their criteria were in adopting a variety, the traits mention-ed include yield (68%), tolerance to diseases and pests (68%), seed colour (50%), market price (18%), plant ar-chitecture/morphology (18%), taste (9%) and cooking time (5%) as shown in Table 4. Farmers indicated that, if the preferred traits were improved, their whole economic life or livelihood in general will be enhanced. Langyintuo et al. (2003) also generated some consumer preferences for grain characteristics useful for breeding and food technology research. Big grain size, white seed coat co-lour, less bruchid damage and black eye were some visi-ble grain characteristics preferred by consumers. Strong preference for small seeded traditional varieties in some local areas was also mentioned. Again, Langyintuo et al. (2004) accessed cowpea supply and demand in west and central Africa as well as the effects of grain characteristics on prices. Results indicated that seasonal supply, size, colour and the level of insect damage of the grains explain between 63 and 97% of price variability.

While majority of the farmers interviewed have special preference for early maturing varieties due to 'genuine household food security' reasons, Herrero and Flores (2008) found that selecting early generations of cowpea crops to increase yield is not an effective strategy.

Table 4. Preferred cowpea varietal traits.

Preferred cowpea varietal trait	% response
Yield	68.2
Tolerance to diseases and pest	68.2
Seed colour	50
Market price	18.2
Plant architecture/ morphology	18.2
Taste	9.1
Cooking time	4,5

However, opportunities exist for achieving a small-scale truly green revolution in Africa through breeding cowpea cultivars with substantial pest and disease resistance, suggesting the use of *Marfo-Tuya* and *Apagabaala* varieties to enhance farmer productivity. Again from food sovereignty perspective, breeders need to find a balance of increasing yield and also meeting farmers' aspirations**.**

Origin and conservation of cowpea seeds

Traditionally, farmers saved seed themselves and relied on their own experience to select and improve their varieties (Kugbei, 2003). It was by this means that landraces are obtained and other varieties, which scientists used to begin the systematic improvement of crops. Seeds for most cowpea farmers in the district surveyed were sourced from agricultural officers, friends and relatives, other farmers and the market depending upon one's varietal need. It was evident that the conservation of seed was a critical issue in terms of quality and viability. While some tried using insecticide like actellic to store their seeds for the next planting season others were using substances like wood ash, pepper powder, kerosene and even containers of used pesticides to treat and store their seeds. The seeds treated with these substances are either stored in pots or sacks. To conserve their local biodiversity, farmers suggested continuous cropping of their varieties year after year as well as treating their seed stock with the right chemicals and storage under appropriate conditions. Some even requested that they should be given training in new ways of seed conservation. The implication is that there exist the opportunity for researchers and farmers to work together in a concerted manner to develop varieties having seeds with very good shelf life (even with little chemical treatment during storage). This will ensure the availability of quality seed in adequate amounts for planting when the new season begins. It can also create an income opportunity for local farmers who will act as local seed growers and thereby strengthen the local seed network.

Seed autonomy is a critical component of food sove-

Table 5. Physical description and culinary properties of cowpea varieties mentioned by processors in Tolon-Kumbungu district, Ghana.

Local name	Beans colour	Cotyledons colour	Beans Size	Ease of cooking	Ease of decortication	Whipping ability	Number responding* (N/16)[1]
Improved varieties							
Apagbaala	white	White	medium	2 - 6h	2 - 12h	Medium	9
Marfo-Tuya	white	White	variable	2 - 4h	2 - 12h	High	11
Local varieties							
Bolga Bolga	white	White	Big	2h	3 - 7h	Medium	2
Gampawi blackeye	white	White	Big	2 - 3h	3 - 6h	Medium	5
Gampawi browneye	white	White	Big	2h	4h	Medium	2
Milo	brown	Cream	medium	2 - 3h	2 - 12h	High	11
Sanzee sablee	black	Yellow	small	2 - 6h	24h	Medium - low	5
Sanzee zee	red	White	small	2h	2-6h	Low	2

[1]Only 16 0ut of 26 processors interviewed were used for the characterization by culinary properties

reignty in relation to access to productive resources. When seeds are developed locally, it becomes easily accessible and available. Communities therefore have a better control over their food network.

Important culinary properties for processing cowpea foods

Table 5 presents an overview of the culinary properties of common cowpea varieties used by processors in the studied area. Respondents (69%) preferred using *Marfo-tuya* and *Apagabaala* (white seeds) as well as *Milo* (brown seeds) for processing. These varieties are characterised by low cooking time, high swelling pro-perties and medium size of grains. These three culinary traits were the most important to processors. The main cowpea processing constraint mentioned by respondents was the long cooking time for some landraces. Pro-cessing is labour intensive and time consuming. Many varieties were mentioned by the processors and usually differentiated by the grain colour. The white varieties are mostly prefer-red by processors and consumers as they are told to be more nutritious and have best culinary pro-perties. The white varieties have good whipping ability and short cook-ing time.

Popular cowpea based foods and processing steps

Cowpea-based foods mentioned by consumers and processors are very diverse. Most popular ones include *waakye*, *koose*, *gablee*, *tubani* and water-cooked *sanzie* or boiled bean (Table 6). In addition, seasonal cowpea foods were also encountered such as *Nyombeica*, *Nable-echinge*, *Gora* and *Yoro-yoro*. Cowpea-based foods are consumed at every time during the day (breakfast, lunch, in the afternoon, dinner) except *Gora* that is only taken at breakfast or lunch time and “the leaves soup” that accom-panies the traditional doughs for lunch and dinner. Cow-pea based foods eaten in studied area could be grouped into three categories depending on the main raw material used.

Foods from whole cowpeas used alone

Tuya or sanzee: The water-cooked cowpea is named according to the cowpea variety that is used. “tuya” for white cowpea and “sanzie” for coloured cowpea, espe-cially brown, red, or multicoloured ones. Beans are sorted and cooked in a large volume of water (bean to water vo-lume ratio is 1:3) to get soft. For quicker softening and cooking time reduction, an alkaline rock salt named “*kanwa*” was used. The main parameter used by process-sors to judge the quality of “ *sanzie*” was the softness of the beans. The presence of “thick water solution in the pot” was also a sign to end the cooking process.

Gablee and Tubani: These foods are processed as illustrated in Figure 3. The main unit operations in both procedures are whipping and cooking. The main differences between them come from the type of cooking, weather steam-cooking or boiling

Koose: Figure 4 shows the processing steps for *koose*. It is mainly obtained through whipping and deep-frying as well as a partial dehulling of cowpea grains. The partial dehulling by combined grinding and sieving after soaking is optional. According to processors interviewed, a good *koose* should be firm but soft. To achieve this quality, the beans need good "whipping ability", "no pest attack" and big size”. These properties are similar to the requirement for a good *gablee* or *tubani*.

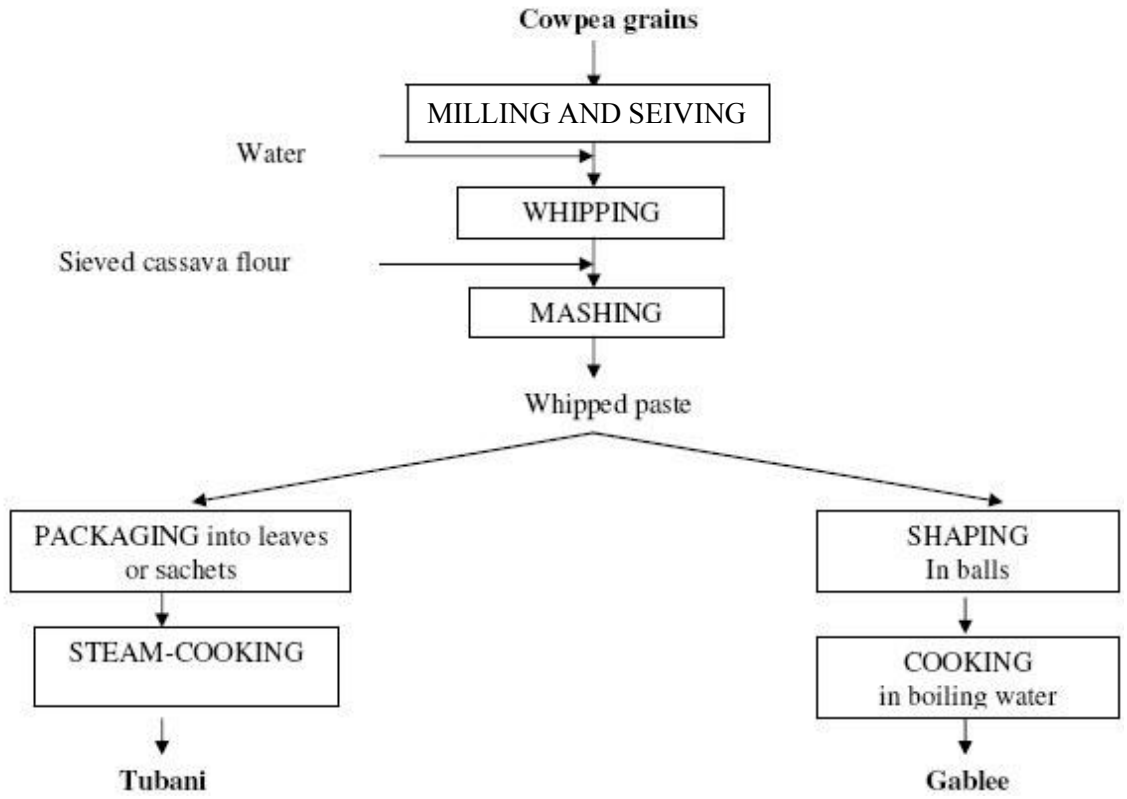

Figure 3. Flow diagrams for tubani and gablee processing.

Table 6. Popular commercial cowpea based products.

Products	% Response
Gable and *Tubani*	25.0
Gable, Tubani and *Waakye*	12.5
Koose, Gable and *Tubani*	37.5
Koose, Waakye and *Tubani*	12.5
Boiled beans	12.5

Foods from a combination of whole cowpea and cereal grains

***Waakye*:** Rice and whole beans boiled together is called *Waakye*. To obtain *waakye*, grains are water-sorted and rinsed. Beans are boiled in water until they are half-softened. Then, sorted-rice is added to beans, mixed and cooked together until they all get soft. To soften the beans faster, " *kanwa*" is added by some processors. At the end of the process, both beans and rice need to be soft. Quality of *waakye* is appreciated by the softness of grains and the non-cohesive character of the particles (beans and rice should not become paste).

***Nableechinge*:** It differs from waakye by the use of millet or maize instead of rice. Moreover, cereals are partially decorticated (pounded and winnowed). According to processors interviewed this food has the same quality parameters as *waakye*. *Yoro-yoro* and *Nableechinge* are the same products except for the fact that the ratio of cereal to bean is 3:1 for *Yoro-yoro* and 1:1 for *Nableechinge*.

Foods involving cowpea leaves

***Nyombeica*:** The mixture of cowpea leaves and whole maize or cowpea flour is steam-cooked. As shown in Figure 5, leaves are pounded (and not squeezed after pounding) and mashed with maize flour or cowpea flour. This mixture is manually shaped in balls and steam-cooked. The firmness of the balls after cooking and the softness of maize and leaves (showing that they are cooked) express the quality of *Nyombeica*. For this preparation, processors prefer the young leaves of the local landraces as they are not treated with chemicals. The leaves should not have been attacked by pests. This product is mainly consumed by women, children and elderly people.

***Goara*:** Cowpea leaves are boiled (sometimes with *kanwa*) and the cooked leaves eaten with koose.

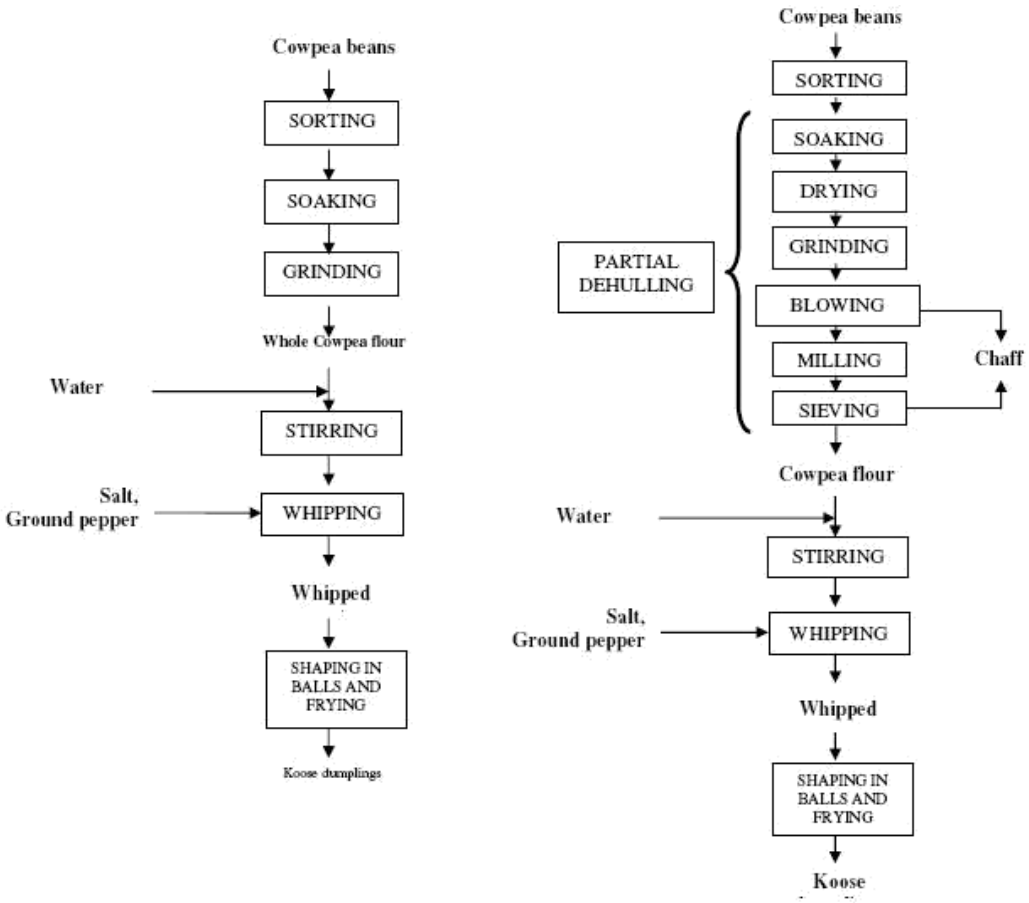

Figure 4. Flow diagrams for koose processing.

Cowpea foods and food sovereignty

Cowpea is widely consumed in Ghana with cereals like rice, millet or maize (*waakye, nableechinge, yoro-yoro*) as well as other popular staples like processed cassava (*gari*), yams and ripe plantains (red-red). These mixtures could ensure supply of diverse nutrients for consumers. Moreover, waakye, tubani and gablee have been mentioned as foods prepared during special cultural occasions such as naming and wedding ceremonies as well as funeral rites in the study area. These foods are therefore embedded in the local culture and daily activities of people, cultural identity of food. Cowpea has a social-nutritionally defined role and is strategically positioned for strengthening local food network and enhancing food sovereignty.

Cowpea processors in the communities visited sourced significant proportion of raw material (cowpea) from farmers in the localities. Again this suggests that promoting food sovereignty concept can improve livelihood in rural economies. Moreover, local materials are used for processing foods in the region. The people decided by themselves to use “kanwa” and some “*leaves”* to soften beans quickly. This practice is really common in west and central Africa as reported and investigated by many researches (Minka et al., 1999; Uzogara et al., 1990; Uzogara et al., 1988). This reveals the capacity of people to make choices on how best to process their foods. Indeed, the long cooking time is one of the major constraints for processing some cowpea varieties. This is also leading to a natural selection of white varieties having short cooking time and best technological properties. Quality criterion for *gablee* and *tubani* processing, according to processors, is the firmness of the balls. The necessity to get firm balls could explain the use of cassava flour during the processing of *gablee (*Moorshy, 2002).

Processing habits as described above could lead to nutritional differences and affect consumers’ nutritional status. Soluble nutrients could be lost in the case of *gablee*

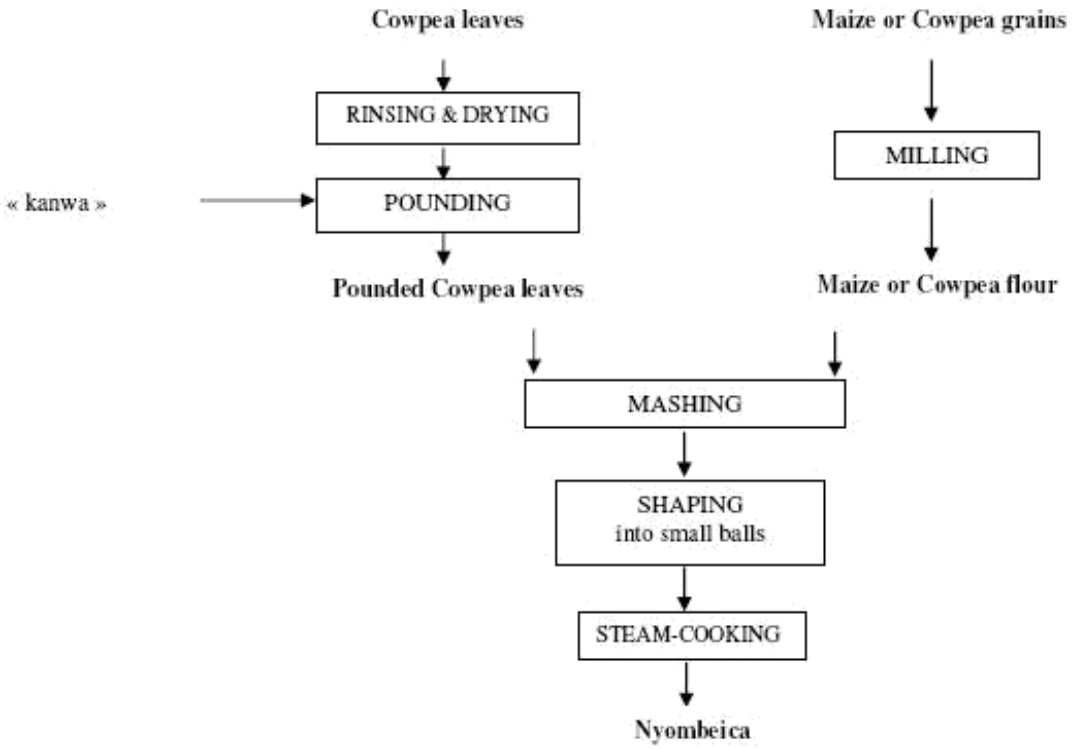

Figure 5. Flow diagram for Nyombeica processing.

processing as the whipped paste is immersed in the boiled water. This remark is also applicable to *waakye* and the other boiled cowpea foods. *Nyombeica and tubani* (which are steam-cooked) could be used as preservative for minerals. According to the processors, *nyombeica* enhances haemoglobin level in the body. From food sovereignty perspective, high preference for *nyombeica* by the vulnerable class of the population (women, children and elderly people) naturally ensures their rights to access nutritious but culturally accepted foods. Cowpea leaves are known to be good sources of some amino acids, vitamins, minerals (phosphorus) and proteins, with higher nitrogen content in the younger leaves. It has also been proven that cowpea leaves contain ascorbic acid (Ahenkora et al., 1998). Ascorbic acid is known to enhance iron absorption by reducing the impact of inhibitors (Hallberg et al., 1989).

Conclusions and Recommendations

i.) Food sovereignty concept has been explained at four main levels including (1) the right to adequate, safe, nutritious and culturally appropriate food (2) the right to ac-cess of productive resources such as land, water, seeds and biodiversity for sustainable utilization (3) mainstream agroecological production, that is to produce food sustainably and in an ecologically acceptable manner (4) access to trade and local markets. The local cowpea net-work in Tolon- Kumbungu district of Ghana has been used to explain the access to productive resources as well as nutritious and culturally appropriate foods aspects of food sovereignty in this paper.

ii.) Cowpea has a socio-economic and socio-cultural significant role in the local production, processing and consumption systems of the people in the Tolon-Kumbungu district. Most farmers intercropped cowpea with other crops due to its nitrogen fixation capacity for soil improvement, commercial and domestic purposes as well as for livestock feed. The consumption of cowpea-based foods like *waakye*, *tubani* and *gablee* is embedded in the local culture and daily activities of the people in the studied area. Any improvement in cowpea production, processing and consumption will therefore enhance food sovereignty of the local people.

iii.) Close to half of the farmers interviewed cultivated both improved and local varieties, 33 and 22% cultivated only local and improved respectively. Generally, farmers indicated preference for improved varieties due to market value but however prefer the local varieties for household consumption and food sovereignty purposes.

iv.) From the survey it can be concluded that the first three most preferred varietal traits for cowpea breeding considerations include yield, tolerance to diseases and pests and seed colour. It is therefore recommended that constraints related to the cultivation of local varieties need to be addressed quickly to ensure improved livelyhoods for the local people. Training of farmers in seed conservation is also recommended in order to enhance

seed access and seed autonomy, the right over productive resources and reduction in over-reliance to seed Industries.

v.) Constraints facing farmers in cowpea cultivation include high cost of chemicals, pest and insect damage, erratic rainfall patterns, high cost of weed control and lack of production credit. It was evident that small scale farmers who sometimes find themselves on marginalized lands build resilience to food insecurity through local food sovereignty strategies and naturally are less adoptive to varieties that rely heavily on external inputs.

vi.) From food sovereignty perspective development of varieties that might require less chemical inputs will enhance access to productive resource. Farmers are likely to adopt a balance of improved yield and insect tolerant variety resulting from farmer-researcher participatory breeding activities.

vii.) From the processors point of view, the white cowpea varieties are mostly preferred due to their good whipping ability and relatively short cooking time. Results on varietal preference or commonly used varieties among processors indicate that *Marfo-Tuya, Milo and Akpaabala* are the first three most popular varieties used for pro-cessing. It is recommended that an objective scientific analysis should be conducted in future research effort to determine the value of parameters such as ease of cooking and decortication in cowpea processing.

viii.) The main cowpea processing constraint mentioned by respondents was the long cooking hours. From food sovereignty perspective, the local processors had developed some alternative methods to soften beans during processing on their own. This reveals the capacity of local people to solve their own problems to enhance ac-cess to nutritious and culturally accepted foods.

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