

## Linking bio-cultural diversity to markets: The niche for locally fermented foods

<sup>1</sup>David Millar, <sup>2</sup>Alfred N. Beyuo, <sup>3</sup>Thomas Agana

<sup>1</sup>Department of African and General Studies, University for development studies (UDS), Wa Upper West Region, Ghana.

<sup>2</sup>Department of Community Development, UDS, Wa Upper West Region, Ghana,

<sup>3</sup>Department of African and General Studies, University for development studies (UDS), Wa Upper West Region, Ghana.

### Abstract

Marketing of agro-related products is a known problem. This situation is worse for fermented traditional foods. Interest is growing for these foods. The situation is ripe for research and development effort to markets and marketing of these foods. This paper draws attention to this need and beyond. The paper was written based on a desk study with limited triangulation using a checklist. The findings are that fermented foods have received very little research and development attention. They have very limited markets and market opportunities. In the worldviews of Africans, markets have a more holistic perspective beyond just a place for buying and selling and these markets have their own structures and systems and also cultures. The write-up recommended “market mapping” as one investigating strategy that conforms to a holistic approach to developing the market for fermented products. It further recommended bringing onboard all stakeholders using an endogenous development approach.

**Keywords:** Bio-cultural Diversity, Worldviews, Endogenous Development, Indigenous Foods.

### 1. Introduction

Linking markets to livelihood developments is yet to attain centre-stage. Fermented foods are a key component of food management in traditional African societies such that their markets should draw some attention. Various reasons are attributed to food fermentation. These range from value-addition and food safety, to addressing spiritual needs that require fermented foods to the needs of the market that regulate time and space for what foods. Most works on traditional foods restrict themselves to issues of preservation and value-addition of fermented foods losing sight of the market and spiritual linkages of the African knowledge base that makes it holistic <sup>[1]</sup>. In analyzing the value-chain in an indigenous agricultural system, we found out that the worldview and hence the culture of the African as reflected in his/her cosmovision pre-disposes the production system with respect to the driving forces of productivity <sup>[2]</sup>. A market is not just simply a place for selling and buying; beyond this, it is a place for (re)kindling relationships, establishing social networks (near and far), information sharing, opportunities for marriages, power brokering opportunities, wars have started and ended in markets; in fact markets are a whole ‘world of their own’; with their own rituals that makes it easy to identify the ‘the stranger’ <sup>[1]</sup>. Establishing the lost of attention to markets in our value-chain agenda, I wish to shift the debate to a similar lack of interest in African traditional foods as key to food security policies and efforts of various present development dispensations. Our current work in what we called “non-conventional foods”, it was apparent that research, development and policy attention is largely focused on rice, maize, wheat, and potatoes. Millets, sorghum, yams, plantains, and the like are relegated to the background. Our work shows that with the recent food crises (*which we call Rice Crises*), the non-conventional foods served as buffer mitigating hunger at the level of very poor

communities (some of which was also sent to supplementing feeding in the big cities as well) <sup>[3]</sup>. This general lack of interest and support to African traditional foods is stretched to its limits when the topic is further narrowed down to the niche of fermented foods. It is therefore fascinating and intriguing that there is an international network venturing into this grey area. Thus having painted a rather bleak picture of traditional African foods, and then traditional African fermented foods; I now want to return to my main preoccupation which is markets for fermented foods and their spiritual significance and dimension of the food lives of indigenous people.

### 2. Supporting literature

Conventional approaches to environmental conservation have tended to consider the role of humans only or mostly in terms of the threats that the intensification of human extractive and transformative activities poses for the environment. From this perspective, finding solutions to environmental problems largely means dealing with the human factor <sup>[1, 4]</sup>. Underlying this perspective is a philosophical view that depicts humans as external to, and separate from, nature, and interacting with it mostly in an effort to establish dominion over it. Complementarily, nature is seen as separate from humans and as existing in a primordial, “virgin” state unless and until they are encroached upon by humans <sup>[5]</sup>. That the exponential increase in the pace and scale of human activities has come to constitute the prime threat to the environment is undeniable, both through the direct effects of extraction and transformation of natural resources, and through the indirect effects of these activities (such as global climate change). It is now widely recognized that we have entered an era in which massive species extinctions, habitat deterioration, and loss of ecosystem functions are all due principally to human intervention <sup>[6]</sup>. From the 1980s onwards, however, several

paradigms have challenged the philosophical perspective described above, presenting a different view of human relationships with the environment and thus of the relationships between the state of the environment, the threats or pressures on it, and the response options to counter or alleviate the threats. Three will be mentioned here in particular.

In the natural sciences, the field of ecosystem health embraces a “humans-in-environment” approach which, while acknowledging that the global commons are severely imperilled by human action, takes as its main goal to address Aldo Leopold’s challenging question: how can we humanly occupy the Earth without rendering it dysfunctional? In the social sciences, the field of bio-cultural diversity<sup>[4]</sup>—drawing from anthropological, ethno-biological, and ethno-ecological insights about the relationships of human language, knowledge, and practices with the environment—takes as its fundamental assumption the existence of an “inextricable link” between biological and cultural diversity. And in the realm of policy, the sustainable development paradigm that emerged in the 1980s proposes that the key to sustainability resides in balancing three “pillars:” environment, society, and economy<sup>[7]</sup>. The documents spawned by the 1992 Rio Summit on Environment and Development (Rio Declaration, Agenda 21 Convention on Biological Diversity) also recognize the relevance of traditional environmental knowledge for the conservation of biodiversity.

### 3. Methodology

According to Sarantakos<sup>[8]</sup> a focus group discussion (FGD) consists of one or two researchers and several participants, mostly between five (5) and ten (10) persons, although with deviations, who meet as a group to discuss a given research topic. In this research, the participants for a focus group ranged from 5 to 10 and together with a field assistant (or note-taker) the researcher (the moderator) lead the discussion by asking participants to respond to open-ended questions while the assistant took detailed notes on the discussions that ensued. This method yielded a large amount of information over a relatively short period of time in the field.

According to Powell<sup>[5]</sup>, focus group interviews offer several perspectives on the same issues and peoples shared understanding of everyday life and ways that individuals are influenced by others in a group situation. The distinguishing characteristic of FGDs is the data and insight produced by participants through interaction. Focus group research is therefore needful to draw on respondents’ experiences, attitudes, beliefs, actions and reactions that may not be feasible using other methods. In this study, FGDs was used to solicit information from household heads in the study area.

In-depth interviews are optimal for collecting data on individuals’ personal histories, perspectives, and experiences. According to Mack *et al.*<sup>[9]</sup>, one reason for the popularity of this technique is that it is not only very effective in giving a human face to research problems, but also it can be a rewarding experience especially for interviewers by offering them the privilege of having people who are virtually strangers entrust them with a glimpse into their personal lives. Apart from this advantage, the method enabled us elicit a vivid picture of the respondents’ perspective.

### 4. Findings and discussions

Amongst indigenous foods, there is a distinction between indigenous foods and traditional foods. There are also

differences between economic, health and nutritional values of indigenous foods. We also include here the spiritual significance and dimension of the food lives of indigenous people.

Much of the literature on food and agriculture that advocates for sustainable agro-ecological models have established beyond reasonable doubts, the proven potential of this model to help address world hunger and sustainable agricultural production than the large scale profit oriented industrial agricultural mode<sup>[10]</sup>. However, few of this scientific works have seriously and comprehensively addressed the ‘critical’ scientific basis of indigenous food and agricultural science relative to modern technology based food and agricultural science. This study acknowledges this achievement but departs from this trend by seeking to establish the knowledge community of indigenous food, their fermentation, and linkage of this to viable markets.

#### 4.1 Fermentation

The oldest form of biotechnology is in the form of fermented foods. Culture maintenance and monitoring, sterilization and prevention of contamination, inoculums development, strain improvement, screening and selection, mutagenesis and genetic manipulation, safety and legislation relating to the industrial use of genetically manipulated micro-organisms have all been part of fermentation researches<sup>[11]</sup>.

Industrial and local fermented foods, the role of micro-organisms in manufacture and spoilage of fermented products abound in traditional systems as well. Our study found the following forms of fermented foods:

- Yeast based products (e.g. food yeast and derivatives)
- Bread and cake (kose) and alcoholic beverages
- Bacteria-based (e.g. dairy products).
- Meat and fish products.
- Processing of soybean and soybean products.
- Dawadawa processing and products.
- Production of other indigenous fermented foods and drinks (such as sour water for T.Z.).

While adding on to the list of findings, this is similar to work done by Biakolo<sup>[12]</sup> where they argue that fermentation has been an age-old practices among indigenous African societies and play a vital role in their food and nutritional security systems. Their study however fell short to linking fermented foods to market niches in the area.

#### 4.2 Food Processing

Indigenous fermented foods in Africa have usually been derived from cassava tubers, cereal, legumes, oil seeds, palm tree sap, milk and various other local products. Okagbure<sup>[13]</sup> has pointed out that 'the scientific basis of indigenous food fermentation lies in the nature of the micro-organisms involved in fermentation, and microbially induced change of the base product; the nature of the enzymatic reactions which take place; and the specific nature of the end-product in terms of nutritional and preservative qualities'.

Common to various parts of the continent have been dehydrated granular food products which involved fermentation, frying and de-juicing; or products such as sorghum, maize, or other cereal fermented and made into alcoholic beverages. Food processors became aware of the significance of the various agencies by virtue of trial and error experimentation. Metallic objects were sometimes used to hasten fermentation and in this

case serve as trace elements, thus promoting the growth of the relevant micro-organisms.

African civilization may be associated with specific methods of preparing and even consuming food items in ways which reflect some measure of relative uniformity throughout the continent. Fast food items ranging from couscous to "gari" or cassava granules; various types of cereal-based flour, pulverized tubers of various kinds and a wide variety of vegetable-based soups have given African culinary traditions, a distinct character which may also be discussed in discussions on micro-biology and food processing. It has to be stressed that food preparation involves hypothesis formulation; the assumption of regularity in nature and a measure of logical consistency in thought in such a way as to facilitate repeatable and predictive capability on the part of the food processor or agent associated with food preparation.

Women are the most active group in this domain. Hence, paying attention to this serves as a first step to mobilize and sustain the interest of women in the area. Addressing this as a poverty concerns should leverage campaigns on advocacy and policy influencing. *It is from this start point that we argue that linking markets to livelihood developments is yet to attain centre-stage of women empowerment in the Upper East Region of Ghana.* If this is to be done, our experience shows that market-linkage support for fermented food production is a key component of foods in particular and income management in general for the local communities in the Upper East Regions of Ghana. Most development activities on traditional foods restrict themselves to issues of food fermentation, preservation, and value-addition (as in processing), losing sight of the market linkages with the consumer. Whatever the situation, linking local production to markets remain an issue and a concern for women empowerment in rural communities.

#### 4.3 Food Markets

Smallholders' participation in markets have mostly been treated under transaction cost, price incentives as well as access to productive resources including technology [14]. Barrett [15], however, cautions us that just getting prices right does not induce broad-based, welfare-enhancing market participation and that one also needs to get institutions and endowments right. Inefficient food markets have been identified as a major challenge of smallholder agriculture in sub-Saharan Africa [16] and it has been argued that improving the function of the food markets will improve agricultural productivity through investments in inputs and technologies which will enhance yields [17]. Thus, interventions to improve agricultural productivity in sub-Saharan Africa have been geared towards integrating smallholders into agricultural commodity markets. Unfortunately, most of the market-oriented liberalization policies for smallholders that overtook most of sub-Saharan Africa have not fully delivered on the promises leading to some farmers reverting into subsistence [16]. Household endowments like landholdings, livestock ownership, or credit access affect food grain sales by smallholders and has been explained using the semi-subsistence poverty trap hypothesis in which poor farmers lack the assets to produce marketable surpluses and hence are not able to reap the gains from market-based exchange, limiting their ability to accumulate assets which reinforces the initial condition of lack of endowments [15].

Grain markets in most of sub-Saharan Africa is characterised by regular, sharp seasonal price fluctuations [18]. As a result,

farmers who are able to afford it, hold their grain in order to be able to enjoy future price increases or to smooth consumption [19]. Stephens and Barrett [18], however, have observed that many smallholders do not appear to take advantage of the opportunities created by the predictable seasonal price variation in storable commodities but instead often sell their farm produce at low prices after harvest and buy back same produce at higher prices months later. *The authors describe this as the "sell low, buy high" puzzle which they argue is at odds with "unconstrained, inter-temporal profit-maximising behaviour".* It is important, therefore, to acknowledge the heterogeneity of smallholders since different categories of smallholders respond differently to new market opportunities [20]. Above all, it is important to understand what smallholders do and why.

#### 4.4 Market Facilities

Marketing facilities and other post-harvest infrastructure are usually limited in expanding urban areas. Urbanization is largely unplanned and local authorities generally do not have clear policies on developing facilities to meet their future needs. The objective of marketing interventions is to bring an improvement in the marketing of horticultural and other agricultural produce, promoting strategies for increasing food security. An efficient and functioning marketing system is a precondition for agricultural diversification and improved nutrition. This enables better prices to be obtained by producers (leading to higher incomes) and improves the availability of competitively priced produce to consumers [21].

Government policies increasingly recognize the importance of marketing to the commercialization of agriculture and the expansion of agriculture productivity. Linking of producers to consumers is usually addressed in two ways: through improved marketing extension and by improving physical infrastructure. Some general principles need to be clarified to provide a basis for understanding food-marketing systems within a development context. In order to make any effective interventions in a marketing system it is necessary to define the types of marketing channels, their linkages and functions.

The term "market linkages" is often referred to in the literature on rural development. What precisely does it mean? The term linkage obviously implies a physical connection between the producer and the ultimate consumer. Linkages also involve financial transactions - the selling and buying of goods - and can be broadly defined in four different ways [22]:

- by the form of financial transactions or type of intermediaries who undertake the transactions;
- by the channels through which transactions occur and the type of facilities used for transactions;
- by how they are linked together by transport and communications networks;
- by the spatial distribution of transactions - where they occur and whether this forms a pattern.

There is obviously a close interaction between these definitions, but it is useful to separate them so that a clearer understanding can be developed of the marketing system.

However, before describing these mechanisms it is important to understand what the market linkages are intended to achieve. They are meant to facilitate the flow of produce between the different levels of the marketing system. The input to the process is the agricultural production (the supply) and the output is the consumption of that produce by consumers (the demand).

This guide does not focus on the performance of the marketing system as such but assumes that if the system can be made more efficient it will be more competitive, will facilitate economic growth and will maximize benefits to farmers. Thus, the marketing process needs to be undertaken as efficiently as possible, at the lowest cost and with the minimum of losses occurring at each stage <sup>[22]</sup>.

#### 4.5 Market Structures

Markets have an influencing on production systems. In traditional Africa, the structure of most markets is a network of small and large markets, linking far and near and scheduled based on an input-output relationship. A near rotation is designed for market days <sup>[23]</sup>. The attendance of markets appears to have some social order: women first, youth second, and the older generation more towards the evening. Within the market, there are sections for every major commodity while the minor commodities are spread evenly almost as fill-ins <sup>[24]</sup>. This arrangement is largely for mundane items. The auspicious/spiritual items are given very special locations traded by special persons. Most often they form the bulk of fermented foods except those that are beverages or drinks.

#### 4.6 Marketing of fermented foods

The primary source of production of the local farmer is to feed the family and for community use (as various forms of in-kind/reciprocity arrangements). Normally surpluses are sold for cash earnings except in compelling cases when non-surpluses are sold <sup>[25]</sup>. Sales are both as cash and as barter. Cash sales often link outward to other markets and address the needs for non-farm people, workers in the cities and industry. These serve as incentives for production and these are the “*visible markets*”. Fermented foods however largely fall into the category of the “*invisible markets*” <sup>[13]</sup>.

Demand-and-supply forces are rudimentary and expansion into larger markets or network of markets. Without market systems or market networks, there is a limited market only for what can be consumed at the time it is produced and not far from where it is produced. Consequently the producer may not be able to sell or be underpaid for whatever is produced <sup>[26]</sup>.

Two other related components to marketing are storage (storage systems which includes packaging) and transportation. According to Kendie and Martins <sup>[27]</sup>, the provision of storage to allow for even distribution systems over the seasons and over space coupled with the ability to move things easily around with minimal damage and stress has an enabling effect for markets to expand their potentials and hence increase productivity.

The third category has to do with processing. The first need for processing is transformation. Then we have value-addition, providing multiple forms of the same product, and preservation (for especially perishables) <sup>[28]</sup>. This is where fermentation plays a key role. Fermentation forms, transforms, preserves, and adds value to traditional African foods. This role of preservation enjoins quality improvements of products for their various market niches.

The political interest and will in any enterprise is very important. This is particularly essential for government and donor support for research and development into traditional African foods when the commonly held idea is that such foods cannot address Africa’s food security needs.

## 5. Conclusions

The aim of this paper is ‘to support the development of endogenous sustainable agriculture in Ghana, in order to secure a stable food and nutritional security for the local population while creating sustainable labour incomes’ through markets.

From an endogenous development perspective, citizens and decision makers need to devise their own road map for the transformation of rural areas and for the improvement of food and nutritional security in such a way that there will be sustainable job creation for productive ventures. We, the authors of this paper make *our focus the smallholder family farm production systems that make a link to urban food markets and in so doing create self-employment for the private sector*. Highlighting on the spiritual role of fermented foods, our investigations identified the following food categories:

- Food for the dead
- Food for the ancestors.
- Food for funerals.
- Food to get rid of the ‘evil one’.
- Food for the pacification of various spirits.
- Food for cleansing.
- Food for maturity and productivity.
- Food for the gods.

We firmly believe in the potentials of agro-biocultural diversity, locally fermented foods that serve both economic and socio-cultural purposes, and, above all, the spiritual role of fermented foods. This research also revolves around the smallholder farm endogenous knowledges and their relevance for also feeding urban areas.

## 6. Recommendations

This is not an extensive work but a preliminary study that should serve as a pointer or a motivation to look beyond our current research focus. Hence the recommendations here are suggestions for more work in the area of markets as nexus to our current work on productivity and quality controls. Hence:

- Research as to how to enhance quality should include a parallel action research on with what we call “*market mapping*” – not only for fermented folds but integrated and holistic markets. This is not only to stop at mapping locations of markets but also mapping the systems, structural organization, stakeholder analysis, various functionaries, networks of various markets, and the socio-cultural implications if there is the need to reorganize markets for the needed strategic responses.
- There are various configurations that drive a production system: technology, governance, finance, resources, competitive interest or competing claims to limited opportunities, markets, and consumers. Hence all investigations into markets will require a *holistic approach* covering the other strategic areas mentioned herein
- A bottom-up *endogenous development approach* needs to be adopted for such a study. Start with the communities own marketing systems and then graft on any modifications with their consent. We have commented elsewhere that fermented foods also have spiritual connotations hence the need to tread carefully allowing community leaderships and institutions to lead the way.

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