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## Value Chain Analysis and Assessment of Export Potentials for Acha from Plateau State, Nigeria

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### **Abstract:**

*There is increased interest in the development of agriculture in Sub-Sahara Africa due to the role they play in increased income and sustainability of rural economies. Value chain had been identified as a very important means of understanding the operations of a sector with a view of strengthening the system, and understanding the context for enhanced productivity for local and international markets. Acha is a crop with immense potentials and is receiving immense attention, nevertheless the immense potentials of Acha is not replicated with corresponding as regards technological innovation by development and funding agencies and other stakeholders. Value chain analysis of the sector especially in a state like Plateau State, North Central Nigeria reputed for Acha farming is undertaken. Research instruments are interviews, questionnaires and document reviews were also conducted to provide data for the research, while analysis was done using Value System Analysis, SWOT analysis, Competitive diamond analysis and strategic and operational productivity analysis. The research concluded that there is a growing world demand for Acha without a corresponding increase in production capacity to meet that demand. Value chain actors for Acha in Plateau State do not have the capacity to expand and meet local demand and venture into exports, in view of this, there is the need for government and development partners involvement in the Acha value chain in Plateau State to support, strength, enhance and prepare the value chain for international markets.*

**Keywords:** Value chain, Competitiveness, actors

### **1. Introductory Background**

Kaplinsky and Morris (2000) and Webber (2007) defined value chain as the set of steps and actors involved in the process from production to delivery of a product to the market, it focuses on value creation, innovation, product development, and marketing. They explained that the productivity and efficiency of agricultural value chains are basic to the success of Sub Saharan Africa's (SSA) rural economies and to the incomes of SSA rural populations. Value chain analysis will broaden understanding of the value chains and serve as a basis for increased productivity in terms of value and profitability, with an antecedent result of increased income for the actors. This is because Sixty-five percent of Africans in SSA live in rural areas with 70 percent of their labour force engaged agriculture. Value chain productivity and efficiency is very important in increased incomes and sustainability of rural economy, agricultural productivity of Nigeria has been reported to be on a decline, thus accentuating the need for value chain analysis. Value chain analysis is also important for the value chain actors in the chain this is because specific Value chain analysis will provide information on the competitive considerations as it relates to identification and taking advantage of market opportunities, this will be gained from an understanding of the contextual nature of the value chains. Even when market opportunities are apparent and enticing enough for actors to take advantage of, forces within the environment and their volatility can impede on the ability of the actors to take advantage of the inherent opportunities.

Plateau State North Central Nigeria is reputed for the cultivation of numerous agricultural produce. Acha is one of those agricultural produce cultivated in the state. The National Research Council (1996) said that Acha is one of the oldest cereals in West Africa, citing its cultivation to over 5000 BC till date. Although also referred to as hungry rice by the natives of West Africa who eat it; this is erroneous and shows an inappropriate understanding of Acha, this is because referring to Acha as hungry suggests that it is something that is consumed only when there is dearth of food (Glew, Laabes, Presley, Schulze, Andrews, Wang, Chang & Chuang (2013), this was corroborated by Jideani (1999) who added that Acha is not only valued, but highly fancied comparative to other cereals due its outstanding nutritional value. While the National Research Council (1996) who said that Acha is considered to be of immense value because of its delicate taste and the ostensible economic and cultural value in West Africa. Acha is cultivated in numerous countries including Nigeria. Jideani (1999) said in Nigeria, Acha is cultivated mostly in Plateau, Bauchi, Kaduna and Niger States, although they are also cultivated in other states, but in relatively small quantity compared to the four identified above. In Plateau State, Acha is reported to be cultivated in 12 LGAs of the state and is widely consumed by a vast majority of the state's population. There have been changes and improvement in the way and manner Acha is being cultivated, processed, packaged and distributed overtime, new uses have been discovered for Acha, while awareness of its benefits is on the upsurge, as a result of this, activity in the value chain have been altered, part of this is accentuated in increase in market participants in the value chain, along with more functions and activities involved in the processes of the cultivation to consumption. Nyam, Kwon-

Ndung and Wuyep (2017) said available data reveal an estimated annual production of acha of 70,000 metrics, they further stated that the economic returns of Acha is more profitable than other competing value chain crops.

Cruz (2007) observed the torpidity in acha production, he attributed this largely to the inadequacy of research and development attributed to the product. Jideani and Jideani (2011), Okeme. Omale and Gwamis (2017) and Cruz (2007) suggested that to avoid the decline of the commodity, there is the need to initiate the measures to address the numerous post harvest problems constraining the development of the value chain. This includes perfection of post-harvest methods and overall improvement in the quality and the follow-up of sales and distribution. Thus for acha to be transformed into a profitable business, there is the need for analysis of the value chain with a view of making far-reaching recommendations that will enhance productivity. Okeme. Omale and Gwamis (2017) also suggested some efforts into cultivation having observed that yield can be improved through timely and better seeding, better weed and pest control. This analysis and understanding of value chains alone will guarantee the deployment of resources to create the most value for both the producer and customer accordingly.

Cruz (2007) categorized value chain activities for acha into the following segments which he identified as relevant for improving competitiveness, these are: production- competitiveness can be improved through adapting varieties, appropriated production and farming systems; technology competitiveness can be improved through innovation in post-harvest mechanization and processing and marketing systems competitiveness can be improved through local and export markets. Kumar and Rajeev (2004) explained it is not enough to undertake value chain analysis with focus on only internal forces, instead there is the need to add the external forces that along with broaden understanding of every aspect of the industry or sectors. Their perspectives of internal forces are same with all other authors- production, marketing etc they said the external forces include: technological, ecological, economic, new industry trends and regulatory development. Viable value chains are reported to have been upgraded through enhancing suppliers and supporting industries and working with the government to improve the business environment.

Jideani (2012), Philip and Itodo (2006) said acha is a crop with immense potentials and is receiving immense attention, they however observed that despite the immense potentials of acha, it is not receiving adequate attention as regards technological innovation by development and funding agencies. Facts of these inadequacies are accentuated in the inability of key aspects of the acha value chain to experience any form of technological advancement in cultivation, threshing, winnowing and hulling. The traditional methods used for years are still being used till date. They were unanimous in stating that the challenge lies in producing enough acha to meet its growing demand, therefore Value chain analysis is a good starting point in this course.

## 2. Methodology

Webber (2007) suggested a number of tools to guide value chain analysis; he was emphatic in suggesting that no particular tool is pervasive enough to be applied to any form of value chain analysis, instead the purpose of the analysis will determine the most appropriate tool to use and multiple tools might be needed to mutually correspond findings. He also suggested that no particular tool is sufficient to provide all encompassing knowledge and understanding of the value chain particularly in situations where the analysis is undertaken to gain general understanding of the value chain activities and participants as is the case with this research.

Four focused group discussions (FGD) were conducted in four LGAs of Plateau State. Two validation workshops were facilitated in two LGAs. Participants at the FGD included acha farmers, input providers, local traders, processors, government officials, regulatory agents and customers. The FGD was conducted to gather inputs into the SWOT analysis. The Validation workshops involved participants of the FGD, who validated findings of the Value System analysis SWOT analysis and elaborated on the competitive diamond analysis, strategic and operational productivity analysis.

The following tools suggested by Webber (2007) were used for the value chain analysis, he observed that the value system analysis, SWOT analysis and Competitive diamond tools can provide information on the value chain segment, activities and their interaction, while strategic and operational productivity tool can be used to assess international marketing potentials for a value chain:

- Value system analysis- this entails having a cascade of value adding activities at each stage of the value chain; it serves to give an overview of the roles of segment and the additional value they bring to the product. It tracks the distribution of net revenue for one unit of a good from raw material to point of sale. For the acha value chain, Philip and Itodo (2006) suggested the following segments for acha value chain; Cultivation, harvesting, threshing and winnowing, dehulling, destoning, and Packaging and distribution.
- The SWOT analysis- this tool is used at various levels, a segment or the overall chain. The tool is a good way of identifying areas to be examined in details as such it is an excellent analytical starting point.
- Competitiveness diamond- is a more thorough tool this is because it assesses competitiveness and provides guidance to be used for improving competitiveness. It is structured around four pillars: (1) Factor (input) conditions: skilled labor, infrastructure, etc. (2). Demand conditions: size and type of accessible demand; (3). Related/supporting industries: presence of supplier and supporting industries. (4). Context for firm strategy and rivalry: conditions for conducting business
- Strategic productivity- this provides a framework that will unearth requested investment and actions required to increase the performance of the chain in regional and international markets. It does this through generating answers to questions on- products offered by companies on the chain and whether they represent the highest value segment; Markets served by the companies in the chain and whether they represent the highest value markets; and which customers the chain is best positioned to target.

- Operational productivity- this assesses efficiency of the value chain's segments and its activities, it reviews the extent of availability or accessibility of improved technology, manufacturing, and service processes. It attempts to answer the following questions- the market that are profitable to serve relative to current cost structure and extent to which cost structure competitively excludes a producer; how value chain compare to other competing value chains and tradeoffs between cost and quality; and extent of cost control.

Interview, questionnaires and document reviews were also conducted to provide data for the research. Generally, data for the research was collected from value chain participants specifically as follows: farmers (80), local traders (60) final consumers (70), processors (40), stores and super markets- retail outlets for processed acha (30) customers- others that purchase and use for their production activities (80), experts (20) and regulatory agents (20).

### 3. Results and Discussions

#### 3.1. Value System Analysis for Acha in Plateau State

Findings on this is presented as follows

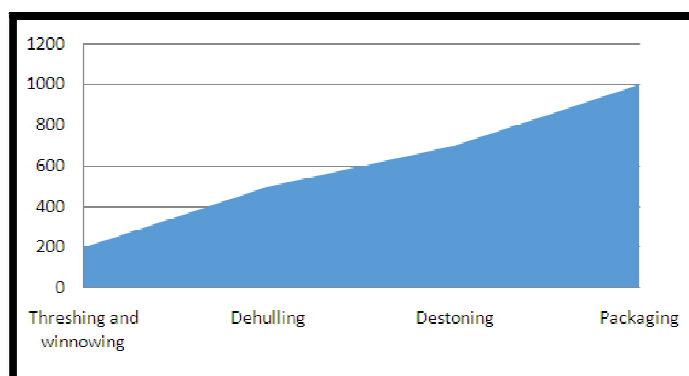


Figure 1: Net Revenue per Kg of Acha for Each Component of the Value System

Value Chain Activities	Activities and Existing Approach	How Existing on Approach Affects Value Chain	Estimated Revenue Per Kg (NGN)
Cultivation	Activities undertaken include land preparation, planting and weeding done with traditional hand-tools. No reported use of technology/mechanization. Depends entirely on raining seasons, no reported irrigation farming despite availability of lands.	Farmed only once a year during the rains.	-
Harvesting	Manual cutting of stocks with sickles or sharp knives	Time and labour cost, delayed availability of produce.	-
Threshing and winnowing	grains are obtained by beating the sheaves with a club ended stick	methods often contaminate the final product with sand.	200
Dehulling	enacted grains in protective hulls are released by pounding (impact and rubbing action) in a mortar using pestle	Grains can be crushed and mixed with sand. A lot of time is consumed doing this.	500
Destoning	Manually by vibrating the grains on a rough disc-like-woven surface. This is done using water and two calabashes; this action makes the heavier sand settles at the bottom of the calabash	Time is taken a lot of time and effort is taking to properly destine	700
Packaging and distribution	Manually done with measurement scale to fetch and pour into branded nylons, which are sealed.	Undertaken by very actors due to the time and labour intensive	1000

Table 1: Value System Analysis for Acha in Plateau State

The values system analyses reveal a highly manual value chain without the use of technology or mechanization. Significant value and review are received at all stages of the value chain. Introduction of technology can only be through government or development aid, this is because of the paucity of capital among the value chain actors. Respondents agree that the manual processes are responsible for the low production capacity and the inability of the value chain to meet up with local demand.

Findings for this research are summarized in the table below:

<p style="text-align: center;"><b>Strength</b></p> <ul style="list-style-type: none"> <li>-high availability of land</li> <li>- availability of local markets</li> <li>- availability of affordable labour</li> <li>-high local demand</li> <li>-multiple marketing channels</li> <li>- transport facilities</li> <li>- good communication network</li> <li>-availability of variety of seeds</li> </ul>	<p style="text-align: center;"><b>Weakness</b></p> <ul style="list-style-type: none"> <li>-lack of access to finance</li> <li>-weak technological base</li> <li>-absence of any form of public private partnership</li> <li>-poor infrastructures</li> <li>-poor use of innovative and technologically driven marketing strategies</li> <li>-non unionization or association among participants and actors</li> <li>-near absence of deliberate policy by government or any form of support or incentive to provide support</li> <li>-lack of support from appropriate government agencies</li> </ul>
<p style="text-align: center;"><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>-growing local, regional and global demand for Acha</li> <li>-increase awareness of the health benefits of Acha</li> <li>-increase demand for</li> <li>-large number of participants</li> <li>-availability of information to enhance performance of all value chain activities, from the benefit, educational institutions</li> <li>-presence of many institutions that can enhance capacity of actors.</li> <li>-increased population</li> <li>- Increase presence of development organizations such as NGOs and developmental partners.</li> <li>-Growing market demand and consumer preference even at the local markets</li> <li>- market demand surpassing supply</li> <li>-new uses for acha</li> </ul>	<p style="text-align: center;"><b>Threat</b></p> <ul style="list-style-type: none"> <li>-insecurity in some locations where acha is farmed</li> <li>-high regulatory procedures for starts ups, particularly NAFDAC and SON requirements, especially at processing and packaging</li> <li>-high competition from other cereals and sorghums which have advance technology and are of intentional standards</li> <li>-influx of process acha from other parts of Nigeria into the state</li> </ul>

Figure 2: SWOT Analysis for the Acha Industry Value Chain in Plateau State

### 3.2. Competitiveness Diamond Analysis

#### 3.2.1. Factor (Input) Conditions

A distinction is made between basic and advanced factor inputs. Respondents identify factor inputs into the Acha value chain to include seedlings for cultivation, fertilizer, pesticides and water, majority of respondents (80%), although 30% respondents identify the cost and availability of fertilizer and pesticides as a constraint.

The climate in Plateau State is considered conducive while the cost, productivity and location of land although key for competitive advantage, yet is very available and not a constraint (100%). Labor is identified as a constraint by 15% of respondents, while the majority said that there is an abundance of low cost labor at the factor input stage. Logistics in the entire value chain in terms of transportation, receiving and processing orders as well as delivery to customers are rated to be efficient by 75%. Available information system is centered on pattern of demand and supply, price levels, market intelligence and signals, the effectiveness is rated 20%. Knowledge resources, R&D and Technology availability is rated as effective by 10%, cultivation is undertaken using manual means by majority of farmers (100%), post harvest and processing is also manually undertaken by majority(100%), so also is marketing and distribution.

Access to capital resources is rated as non available and none accessible, majority of respondents (85%) ventured into the value chain with no form of external capital resources, while 75% said they have identified market opportunities for expansion, diversification and integration but are constrained by capital. Providers of capital resources essentially include government and banks- commercial and micro finance, none of these banks have special product targeted at Acha value chain actors and none have granted any form of capital facility for any of the value chain participant in the last 5 years. Assessment of infrastructure was done within the context of roads mostly for farmers that cultivate in rural areas, to power mostly for processors and communication facilities, mostly phones for marketing outlets and channels involved in distribution. Majority of respondents (70%) said road is still a challenge especially during the raining season, they reported instances of vehicles breaking down in the course of transportation of Acha from the farm, some made mention of areas that were not accessible by motor vehicles during the raining seasons, majority of respondent (80%) agreed there is a general high cost of transport due to bad roads. Closely related to this is the issue of storage facilities for farmers, majority of respondents said storage immediately after harvest is still a challenge, harvested products have to be kept away from rodents and birds as well as humans that pilfer it. Although majority of processors (90%) manually process their harvested Acha, the few that use mechanized means identify power as a challenge, using alternative source of power increases the cost making it difficult to compete with other manually processed Acha that are of the same quality. As regards marketing outlets, communication is readily available so it is not so much of a challenge.

### 3.2.2. Demand Conditions: Size and Type of Accessible Demand

As regards the demand conditions, the acha value chain in Plateau State although exposed to sophisticated and demanding customers, yet does not rely on these customers. Majority of customers surveyed (90%) said they buy from local traders after the threshing, they only destone the Acha, Majority of farmers 100% said market demand is high and not a challenge for their farmed Acha, once they want to sell, there are always buyers willing and available to buy at prevailing market prices.

100% of buyers surveyed said they do not anticipate trends in global demand because the locally produced acha meets their needs. No section of the market provides any form of signal and there are no recorded changes in the industry in addition to the absence of selling via e commerce. Local demand is said on the rise by majority of respondents (80%) without a corresponding increase in supply. Segmentation involves local traders that buy and resell against buyers that either buy directly from farmers or from local traders. Majority of buyers (95%) said local traders only add value of place utility through making the product available at convenience location of purchase; this was corroborated by majority of local traders (75%).

As regards regional and international demand, there is still a high demand for Acha, however, Plateau State and Nigeria at large have not met its local demand let alone export. Cruz (2007) said if size of demand is high and factor inputs low, efforts should be directed at enhancing the factor inputs so as enable the value chain meet up with demand.

### 3.2.3. Related/Supporting Industries: Presence of Supplier and Supporting Industries

The research discovered that there are very few competitive and high quality suppliers, the competitive and high quality suppliers are the few processors that process and package acha. Only four brands of the processed and packaged acha were identified from a sample of 30 retail outlets that sell processed and packaged acha. Majority of processors sampled (100%) said that competition is not rift. As regards financial sector efficiency and effective, majority of respondents (90%) said it is generally ineffective and inefficient, this findings in consistent with the findings on challenges associated with factor inputs identified above, both farmers and processors agree that expansion is tight to availability of finance, financial institutions also confirmed that they do not have a special policy targeting acha farmers. There are no specialized business services targeted at acha farmers, no associations and no ties with research institutions, although a number of such institutions exist, yet there are no evidence of any form of relationship between them and participants of the acha value chain. There are no public private partnerships as government has not engaged value chain participants in any form of interface. Although the quality of education and training providers was rated high (90%), respondents said it was in the broad field of agro allied ventures and not acha specifically. Standards and certifications for local production are being met; however market participants agree that it will be difficult to meet international standards.

### *3.3. Context for Firm Strategy and Rivalry: Conditions for Conducting Business*

Majority of respondents (100%) agree that rivalry is none existent in the value chain, since they do not meet demand let alone compete. 80% said there are remarkable innovations in the cultivation, processing and distribution of Acha, these innovations are as a result technological adaptation of lessons learnt and best practice from other value chains and international markets. Other indicators on this aspects as mentioned by include: strategy is not about price, there is no form of cooperation to position itself better in world market, the small size of industry actors doesn't permit any form of management labour relationships, no competition, there are no parastatals and monopolies, the industry is not protected from international competition, strategy is reactive than proactive, there is no private-public dialogue nor strategy on distribution channels, no e commerce and competing firms, the industry involves commodities.

### *3.4. Export Potentials of Acha from Plateau State*

Webber (2007) said that exports from Africa will compete with that of more advanced and sophisticated countries. Hence, the need to bench market Acha from Plateau State against international producers that will be competing with it. Findings above already indicate that Plateau State is yet to meet local demand for Acha let alone export. Majority of farmers (100%) and distributors (100%) confirm a constantly available local market for their products. In addition to this, the export potential for the product is constraint by low technological base of value chain actors to produce acha of international standard, the inaccessibility of capital to expand production base, the absence of associations and unions to strength and facilitate exportation.

The strategic productivity analysis revealed that although Acha in the Plateau State Value Chain doesn't represent the highest value segment and market served by the chain (100%), the segment is not positioned to serve the international markets, this finding agrees with that of the operational productivity where respondents agree that there is a none availability or accessibility of improved technology, manufacturing, and service processes by 100% of respondents. The value system analysis presented earlier had identified a non-mechanization of any of the value chain activities of the value chain. The cost structure of Plateau State Acha is high due to the manual methods, the existing production methods will not guarantee economies of scale in view of which transportation and other overheads costs will further exacerbate the cost making it unprofitable to compete in regional or international markets. This is while also acknowledging earlier findings that local production has not met local demands for Acha in Plateau State.

## **4. Conclusion**

There is a growing world demand for acha without a corresponding increase in production capacity to meet that demand. Value chain actors for Acha in Plateau State do not have the capacity to expand and meet local demand and

venture into exports, in view of this, there is the need for government and development partners involvement in the acha value chain in Plateau State to support, strength, enhance and prepare the value chain for international markets.

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