ANALYSIS OF SORGHUM VALUE CHAIN IN KANO STATE, NIGERIA

Adefemi O. Odunlade*, Hakeem A. Ajeigbe, Matthew O. Adewumi

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Introduction

- Sorghum is the fifth most important cereal crop in the world (Dahlberg et al., 2011).
- It’s one of the most important staples in the semi-arid tropics of Africa and Asia (FAO, 1995).
- Genetically suited to hot and dry agroecologies (ICRISAT, 2004).
- Potentially attractive raw material for food, feed, fuel and industry
- Sorghum has numerous health advantages
Statement of the Problem

- In Nigeria, sorghum demand exceeds supply
  - The international market is also witnessing increasing demand.

- Underdeveloped markets in Nigeria diminish the farmer’s incentive to invest in improved agricultural technologies.

- Given the importance of sorghum value chain in agricultural development, there is a need to objectively assess the potential and critical bottlenecks of specific nodes along the chains.
Research Objectives

The broad objective of this study is to assess the sorghum value chain in Kano state, Nigeria.

The specific objectives are to:

- describe the structure of sorghum value chain;
- analyze the conduct of the major actors;
- evaluate the performance of major actors along the sorghum value chain and
- identify the challenges confronting the major actors of sorghum value chain.
Theoretical Framework

STRUCTURE-CONDUCT-PERFORMANCE (SCP) FRAMEWORK

- **STRUCTURE**
  - market supply
  - market demand
  - infrastructure

To limit complexity, the focus was on economic conduct and performance, in which only monetary aspects of poverty were considered.

- **CONDUCT**
  - choices of products
  - market segments
Theoretical Framework

technologies
horizontal/vertical linkages

➢ PERFORMANCE
poverty reduction
operational chain efficiency

➢ Theory of Agricultural transformation

➢ The Concept of Value Chains

➢ The Concept of Agricultural Value Chains
SORGHUM VALUE CHAIN

LOGISTICS:
INWARD AND OUTWARD BOUND

Source: Author’s design
Methodology

STUDY AREA

SOURCES OF DATA
- Primary Data

SAMPLING TECHNIQUE
- Three-stage Sampling

DATA COLLECTION
- Semi-structured Questionnaire
<table>
<thead>
<tr>
<th>S/N</th>
<th>OBJECTIVE</th>
<th>INTERPRETATION</th>
<th>ANALYTICAL TOOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Describe the structure of sorghum value chain in the study area</td>
<td>To know how the sorghum value chain looks like in the study area</td>
<td>Descriptive Statistics</td>
</tr>
<tr>
<td>2</td>
<td>Analyze the conduct of the major actors</td>
<td>Determination of the activities and roles the major actors involved in the chain play and identify the value added by each of them</td>
<td>Descriptive Statistics and Concentration ratio</td>
</tr>
<tr>
<td>3</td>
<td>Analyze the performance of major actors</td>
<td>Costs, return and market efficiency of the major actors in the sorghum value chain</td>
<td>Gross Margin, Marketing margin and Marketing efficiency</td>
</tr>
<tr>
<td>4</td>
<td>Identify the challenges confronting the major actors along the sorghum value chain</td>
<td>Investigate the problems the major actors in the sorghum value chain in the study area</td>
<td>Descriptive Statistics</td>
</tr>
</tbody>
</table>
Results and Discussion

SOCIO-ECONOMIC CHARACTERISTICS OF THE MAJOR CHAIN ACTORS

GENDER

- MALE: 74%
- FEMALE: 26%

AGE DISTRIBUTION

- 20 – 29: 6.8%
- 30 – 39: 27.4%
- 40 – 49: 31.2%
- 50 – 59: 22.2%
- 60 and above: 12.4%

MARITAL STATUS

- Married: 90.5%
- Divorced/Separated: 1.1%
- Widowed/Widower: 1.5%
- Single: 6.8%

PRIMARY SOURCE OF INCOME

- Agriculture: 87.6%
- Others: 12.4%
Structure of the Sorghum Value Chain in the Study Area

**Major Actors**

- Input: 11.3%
- Producer: 26.3%
- Collector: 11.3%
- Processor: 19.5%
- Wholesaler: 16.5%
- Retailer: 15%

**Market Regulations**

- Yes: 86.8%
- No: 13.2%

**Entry/Exit Barriers**

- Yes: 78.2%
- No: 21.8%

**Supply Form**

- Global: 2.6%
- Local: 89.8%
- Both: 7.5%
Infrastructure Available to the Major Actors in the Study Area

## Concentration of the Major Actors

<table>
<thead>
<tr>
<th>Variables</th>
<th>Input Suppliers</th>
<th>Producers</th>
<th>Collectors</th>
<th>Processors</th>
<th>Wholesalers</th>
<th>Retailers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative sales (₦) of the four largest actors (CS)</td>
<td>3,735,400</td>
<td>1,360,000</td>
<td>15,370,000</td>
<td>365,600</td>
<td>10,000,000</td>
<td>2,495,000</td>
</tr>
<tr>
<td>Total sales (₦) of the actor group (TS)</td>
<td>14,799,650</td>
<td>7,136,000</td>
<td>68,570,000</td>
<td>2,355,100</td>
<td>75,910,000</td>
<td>10,449,500</td>
</tr>
<tr>
<td>Concentration (CS/TS)x100</td>
<td>25.23</td>
<td>19.05</td>
<td>22.41</td>
<td>15.52</td>
<td>13.22</td>
<td>23.87</td>
</tr>
</tbody>
</table>
Conduct of the Major Actors

**SORGHUM VARIETY GROWN**
- **LOCAL**: 97%
- **IMPROVED**: 3%

**FARM SIZE (Ha)**
- 48.6% < 1.00 Ha
- 40% 1.00 - 5.00 Ha
- 10% 6.00 - 10.00 Ha
- 1.4% Above 10 Ha

**Average yield**: 1400kg/ha

**ESTIMATED HARVEST LOSS**
- 58.6% 1.00 - 2.50%
- 12.9% 2.60 - 5.00%
- 28.6% Above 5.00%

**PRODUCTION SYSTEM**
- **RAIN FED**: 91%
- **BOTH**: 9%

## Gender Distribution of Roles Played by the Major Actors

<table>
<thead>
<tr>
<th>ROLES</th>
<th>MALE</th>
<th>FEMALE</th>
<th>BOTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input supplying</td>
<td>98.35</td>
<td>1.65</td>
<td>-</td>
</tr>
<tr>
<td>Production</td>
<td>86</td>
<td>3.04</td>
<td>10.28</td>
</tr>
<tr>
<td>Collection</td>
<td>79.15</td>
<td>8.33</td>
<td>12.53</td>
</tr>
<tr>
<td>Processing</td>
<td>18.5</td>
<td>76.4</td>
<td>5.1</td>
</tr>
<tr>
<td>Wholesaling</td>
<td>83.28</td>
<td>12.46</td>
<td>4.26</td>
</tr>
<tr>
<td>Retailing</td>
<td>80.6</td>
<td>15.96</td>
<td>3.44</td>
</tr>
</tbody>
</table>

### Performance of Major Actors

<table>
<thead>
<tr>
<th>ACTORS</th>
<th>GROSS MARKETING MARGIN (₦)</th>
<th>NET MARKETING MARGIN (₦)</th>
<th>MARKETING EFFICIENCY (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Suppliers</td>
<td>81,456.44</td>
<td>58,547.35</td>
<td>13.46</td>
</tr>
<tr>
<td>Producers</td>
<td>70,734.93 (Gross Margin)</td>
<td>51,706.36 (Net Farm Income)</td>
<td>55.78 (Profitability)</td>
</tr>
<tr>
<td>Collectors</td>
<td>331,868.79</td>
<td>296,168.79</td>
<td>13.71</td>
</tr>
<tr>
<td>Processors</td>
<td>21,527.25</td>
<td>17,196.48</td>
<td>51.74</td>
</tr>
<tr>
<td>Wholesalers</td>
<td>246,567.33</td>
<td>225,409.44</td>
<td>13.46</td>
</tr>
<tr>
<td>Retailers</td>
<td>60,677.83</td>
<td>55,536.66</td>
<td>26.99</td>
</tr>
</tbody>
</table>

*I USD = 360.50 NAIRA; Source: Field Survey, 2017.*
## Challenges Faced by the Major Actors

<table>
<thead>
<tr>
<th>CHAIN LEVEL</th>
<th>CHALLENGES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INPUT SUPPLY</strong></td>
<td>Factory defects</td>
</tr>
<tr>
<td></td>
<td>High cost of purchase</td>
</tr>
<tr>
<td><strong>PRODUCTION</strong></td>
<td>Price fluctuation</td>
</tr>
<tr>
<td></td>
<td>Inadequate capital</td>
</tr>
<tr>
<td></td>
<td>Pest (stem borer, head bug, etc.) infestation</td>
</tr>
<tr>
<td></td>
<td>Drought</td>
</tr>
<tr>
<td><strong>COLLECTION</strong></td>
<td>Inadequate capital</td>
</tr>
<tr>
<td></td>
<td>High cost of transportation</td>
</tr>
<tr>
<td></td>
<td>Bad road networks</td>
</tr>
</tbody>
</table>
## Challenges Faced by the Major Actors

| PROCESSING         | Lack of modern processing facilities  
<table>
<thead>
<tr>
<th></th>
<th>Lack of patronage</th>
</tr>
</thead>
</table>
| WHOLESALING        | High costs of transportation           
|                    | Price fluctuations                      |
|                    | Poor market arrangements               |
|                    | Theft of stored produce                 |
| RETAILING          | Debts from customers                   
|                    | Inadequate capital                     |
Conclusion

Based on the findings of this study, it could be inferred that there is a low concentration ratio, positive marketing margins and high marketing efficiency with great tendencies of improvement at all levels of the chain. Great potential therefore exists along the value chain for all the actors and investors, if the right policies that will provide enabling environment are put in place.
Recommendations

✓ More effective marketing strategies by all major actors.

✓ Sorghum Value Chain Development platforms

✓ Upgrading indigenous production

✓ Upgrading sorghum processing to improved and large scale (Agro-industrial) processing strategies, technologies and utilization to meet up with international market standard.

✓ Policies that will encourage already existing actors and integration of more individuals (especially youths and females) into the value chain.
Acknowledgements

✓ ICRISAT - Nigeria
✓ Prof. M.O. Adewumi
✓ Conference Organisers