

Determination of Important Factors Affecting Production and Marketing of Korarima (*Aframomum Corrorima* (Braun) P.C.M. Jansen) in Western Ethiopia

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Abstract - Korarima (*Aframomum corrorima*) is one of the indigenous spices in Ethiopia used as raw material for consumption and medicinal purposes. However, the spice faces production and market challenges. Thus, in this particular area of study, the study was done to analyze the major factors affecting *Aframomum corrorima* production and marketing in Nekemte and Shambu and the terminal market (Addis Ababa). The study identified that 85.80%, 73.60%, 41.10%, 36.05%, 63.30%, 52.15%, 32.90%, of sampled farmers confirmed that inadequate fertilizer supply, inadequate planting materials, shortage of access to credit, wild animal competition, price setting, scale and demand, respectively, are the major factors affecting *Aframomum corrorima* production negatively. Concerning sources of market information, 25.30% and 20.39% of the total sampled farmers obtained from traders and personal observation on market, respectively. The study furthermore indicated that 92.50%, 88.60%, 85.30%, 76.30%, 74.60%, 71.70%, 50.30%, 39.50% and 32.30% of the sampled traders reported adulteration problems, quality problems, capital shortage, demand problem, lack of government support, supply shortage, problem of transport, theft problem and absence of government control on un-licensed traders were determinant factors of *Aframomum corrorima* marketing, respectively. Based on the study, there is a need for all stakeholders to decide production and market price setting strategies and improving extension system and technical supervision and follow up must be strong. Policies that would improve *Aframomum corrorima* production capacity by identifying new technologies are found to be crucial. Creating stable demand for surplus production would enhance farmers' decisions on *Aframomum corrorima* production. Furthermore, the results of the study indicated that terminal and regional markets are not integrated mainly owing to crucial problems such as inadequate market price information. Competitive market and market information services have to be strengthened to provide farmers and traders accurate and timely information on current supply, demand and prices.

Key words - Production, Marketing, *Aframomum corrorima*, Factors

I. INTRODUCTION

Korarima (*Aframomum corrorima*) is one of the native crops in Ethiopia which is used as spice and medicinal purpose. As indigenous spice, *Aframomum corrorima* grows in various regions of the country (Jansen, 1981; Edossa, 1998; Girma, *et al.*, 2009b). Capsules and/or seeds are the economic parts of the plant (Edossa, 1998; Wondyifraw, 2004; Girma *et al.*, 2008). The spice has widespread utilization in Ethiopian and nearby countries. It is obtained from the plant's seeds (usually dried). It has been part of daily Ethiopian dish in preparation of curry powder for culinary purposes. It is mostly harvested from wildy grown plants in the forests of many places of Western, South and Southwestern parts of Ethiopia. The dried fruit mixture of different clones is sold on almost every Ethiopian market in the production areas (Kohl and Uhl, 1985). The seeds are used in Ethiopia to flavor all kinds of sauces locally for which they are ground and usually mixed with other spices (Jansen, 2002; Eyob, 2009; Zenebe, 2002). The essential oil of *Aframomum corrorima* seeds has a typical odor, and is therefore, sometimes called 'nutmeg - cardamom' (Eyob *et al.*, 2007). Thus, the seeds are also used medicinally in Ethiopia (Wondyifraw, 2004; Hymete *et al.*, 2006; Zenebe, 2004).

Dried capsule of *Aframomum corrorima* has highly significant economic importance for local and as export commodity in addition to various uses. Previously, Ethiopia was well-known for its considerable exports of *Aframomum corrorima* capsules to the world market, mainly as a substitute for the Indian small cardamom (Wondyifraw and Surawit, 2004; Eyob, 2009). Currently (2012/2013) farm gate prices of dried and locally processed *Aframomum corrorima* capsules is 60 to 70 USD per kg and when it come to the central market more than 40% price increase is very common. This implies that the crop has become very important and request intervention on the development of production and post harvest package and sustainable utilization and conservation. Despite of these paramount economic roles of the commodity, research conducted on this crop in particular and other spices, herbs and medicinal plants in general has been limited to very few activities (Makheree, *et al.*, 1998).

The high potential areas of Ethiopia can produce enough *Aframomum corrorima* to meet the needs of the people in the deficit areas. However, the poor production and marketing system of *Aframomum corrorima* discourage farmers to produce more. The increasing proportion of the population living in urban centers and rising level of income require more organized channels for processing and distributing agricultural products. Horticultural marketing acts as an agent of rural development. Moreover,

horticultural marketing will play a coordinating rule, steering supply and demand with respect to place, time and form utilities. A properly functioning market (such as pricing system) for horticultural products is generally perceived as the best organizational structure to achieve more efficient production, in terms of type, quantity and quality, and consumption decisions (Holloway, *et al.*, 1999).

Improved information and marketing facilities enable farmers to plan their production more in line with market demand, to schedule their harvests at the most profitable times, to decide which markets to send their produce to and negotiate on a more even footing with traders and also it enables traders to move produce profitably from a surplus to a deficit market and to make decisions about the economics of storage, where technically possible. The possible increment in output resulting from the introduction of improved technology could not be exploited in the absence of convenient marketing conditions. As efficient, integrated, and responsive market mechanism is of critical importance for optimal area of resources in horticulture and in stimulating farmers to increase their output. A good marketing system is not limited to stimulation of consumption, but it also increases production by seeking additional output.

However, there is a critical problem that stands in the course of formulating appropriate policies and procedures for the purpose of increasing marketing efficiency. This has to do with lack of pertinent marketing information and other marketing facilities. Despite the significance of *Aframomum corrorima* in Ethiopian economy and current income generating capacity of *Aframomum corrorima* as compared to its magnificent potential in the country it has not been given due attention. In Ethiopia, the production of *Aframomum corrorima* is constrained by variable seasonal conditions. As a result, the variation in its supply on rural and urban market is considerable. Furthermore *Aframomum corrorima* marketing channels and their characteristics have not yet been studied and analyzed for different parts of the country, especially Nekemte and Shambu areas, which are known in the production of *Aframomum corrorima*. Marketing of *Aframomum corrorima* in these areas is disorganized to a great extent as most of the producing areas are remote (Solomon, 2004). Buyers are not available within the vicinity and farmers have to carry the produce long distances. In need of money some farmers still take advances from the local village merchants and settle the loan with interest by selling the produce to them. In both situations, farmers often do not realize the real value for the produce. Forward or backward linkages in the supply chain do not exist. Farmers prefer to sell to the village merchants by taking the produce to nearby road head or depots. This study has then the purpose of investigating the *Aframomum corrorima* marketing chains and factors affecting Korarima supply to the market in Nekemte and Shambu, and reducing the information gap on the subject and by contributing to work better understanding on improved strategies for reorienting marketing system for the benefit of small farmer development and traders.

Objective

- To analyze the major factors affecting production of *Aframomum corrorima* in Nekemte and Shambu and the terminal market (Addis Ababa)
- To analyze the major factors affecting marketing of *Aframomum corrorima* in Nekemte and Shambu and the terminal market (Addis Ababa).

II. MATERIALS AND METHODS

Description of the Study Areas

The study was conducted in Western Ethiopia, Wollega Zone, Nekemte and Shambu woredas. The zone includes the upper catchments of several important rivers, such as Dedesa. The average annual rainfall distribution ranges from 2000mm to 2300mm, the wet seasons being between April/May and October/November. The temperature of the region ranges from 12°C to 26.50°C the average being around 19.25°C. A large portion of the region is still covered with its natural vegetation consisting of tropical Montane humid forests. Currently, some of these forests are in different degrees of degradation (NTFP-PFM, 2006). The population consists of several ethnic groups who have lived there for centuries, as well as immigrants, mostly from Amhara, Tigray and Benishangul Gumuz regions. Wollega Zone has a high population density of approximately 78 per KM². About 90% of the population is living in rural areas around the dense natural forests, while the rest (10%) lives in small urban centers (NTFP-PFM, 2006; Bureau of Agriculture and Rural Development of Wollega Zone, 2012/2013).

Wollega Zone is located 325KM far from Addis Ababa found in the Oromiya Region with 9°34'00"N latitude, 37°06'00"E longitude and altitude range of 2576 meter above sea level (m.a.s.l.) (Bureau of Agriculture and Rural Development of Shambu, 2013) while Nekemte is located 345 KM from Addis Ababa with 9°5'21''N latitude, 36°33'19''E longitude, 2400 m.a.s.l. altitude, Dystric Nitisol and it is dominated by a loam soil texture (Girma and Kindie, 2008), 75 to 85% relative humidity, annual rainfall of 2000mm and mean minimum and maximum temperature of 16.30°C and 30.5°C, respectively (Edossa, 1998).

Sample Size and Method of Sampling

The sample frame of the study is the list of household in Minister of Finance in Shambu and in Nekemte which is Peasant Associations (PAs). In Shambu, there are about 75 PAs. From these major *Aframomum corrorima* producing PAs that were first identified purposively and 20 PAs were selected randomly. From these 20 PAs, 100 farmers were selected using systematic random sampling technique (Sigelman, 1999).

In Nekemte, there are about 65 PAs. From these major *Aframomum corrorima* producing PAs that were first identified purposively. From the woreda major *Aframomum corrorima* producing PAs were identified purposively. From those *Aframomum corrorima* producing PAs, 15 PAs were selected randomly in the first stage. From the woreda 100 households were selected using systematic random sampling

Method of Data Collection

Independent questionnaires were designed for farmers and *Aframomum corrorima* traders in Nekemte and Shambu. During the course of field visits, the questionnaire was tailored to all market and farmers conditions of both areas. The semi structured formal interview guidelines were written up in the form of a formal questionnaires. Before data collection, the questionnaires were pre-tested. This led to further revision of these lists to make sure that important issues had not been left out. The formal survey made formal interviews with randomly selected farmers and traders using the pre-tested semi-structured questionnaires.

In addition to the questionnaire survey, an informal survey in the form of Rapid Market Appraisal (RMA) technique was employed using checklists for both farmers and traders to obtain additional supporting information for the study. The discussions were made with key informant farmers, traders, and agricultural and relevant experts from both government and non-government organizations. But due to lack of budget to pay per-diem for farmers and traders, and for the purpose of precaution against conflict, RMA was made independently for each group before and parallel with questionnaire survey. Enumerators, who were 12th grade and well experienced on the technique of interviewing collected the primary data.

Methods of Data Analysis

In order to analyze the collected data, two types of data analysis, namely descriptive statistics and econometric analysis were used for analyzing the data from farmers and market survey.

III. RESULTS AND DISCUSSION

Factors affecting Production of *Aframomum corrorima*

Given the current production levels and the production of *Aframomum corrorima* for market as a deriving motive, there appears that the farmers have market problem. However, the less possibility of improved production and expansion of *Aframomum corrorima* might decrease the amount sold and create problems in marketing.

Table1 below summarizes production issues that impact on *Aframomum corrorima* trade potential. The table shows that primarily, *Aframomum corrorima*, poor access to agricultural inputs such as fertilizer and planting materials were indicated as the major hindrance of production. About 86% and 74% of sample farmers reported that lack of these respective inputs are causes for low productivity. Due to delay in distribution, fertilizer in particular, farmers could not apply to increase marketable surplus. Regarding seed, most of the farmers used seed form their own production or bought unknown variety from the local farmers which may result in low quality of *Aframomum corrorima*. The table reveals that access to credit was very limited, and 41.10% of farmers confirmed that there was credit problem which resulting decrease in *Aframomum corrorima* production. Since it is highly loved by wild animals, the cash crop, about 36.05% of farmers reported that wild animal competition is negatively affecting production of the crop. Farmers watch their farms since *Aframomum corrorima* starts to mature and after its harvest.

Price setting is the major problem of marketing for the farmers. Farmers could not set price for their product correctly due to volatility nature of the price and lack of access to information concerning current price. The reasons stated by farmers are: usually price set by traders, more unstable *Aframomum corrorima* price than other crops, and lack of real price information from terminal market and no direct relation with traders. About 62.30% of the farmers' reported that *Aframomum corrorima* price was set by traders. Weighing or scale is the second marketing problem for 52.15% of the farmers. Even if farmers have knowledge about weighing, they are not allowed to check the scales. Another factor that has been found to have adversely affected *Aframomum corrorima* marketing was the high and multiple taxes in regional markets. Farmers had to pay tax before *Aframomum corrorima* sold. This forces them to sell at village market at low price. About, 32.90% of the sample farmers responded that face is a demand problem, due to low quality of *Aframomum corrorima* caused by of poor management and post harvest handling, increase in supply in other parts of the country and absence of regular buyers.

Table 1. Factors affecting *Aframomum corrorima* Production of households (% of farmers)

	N=100, Nekemte	N=100, Shambu	N=200, Total
Fertilizer supply	74.80	96.80	85.80
Planting Material	54.90	93.80	73.60
Credit	23.10	59.15	41.10
Wild animals	46.90	25.20	36.05
Price setting	44.40	80.20	62.30
Scale	43.70	60.60	52.15
Demand	12.65	53.15	32.90

N= Sample size

Source: Survey results, 2012/2013

Factors Affecting Access to price information of households (% of farmers)

It is assumed that producers and traders who have market information can decide how much to produce and market. Like the grain market, in the study areas, there was no organized market information system. However, Table 2 revealed that 63.90% of the total sampled households had *Aframomum corrorima* price information about the nearby market price before they sold their *Aframomum corrorima*. From the table one can see that more of Nekemte farmers (70%) had nearby market information than Shambu farmers (62%). Only, 15.05% of the total sampled household was aware of the price in Addis Ababa market. More Nekemte farmers (22%) had information about market price in Addis Ababa than Shambu farmers (5%). The chi-square tests concerning nearby and Addis Ababa market price information indicate that there are statistical significant difference at less than 10% and 1% significance level, respectively.

Table 2. Farmers' access to price information (percentage of farmers)

Variables	N=100 Nekemte	N=100 Shambu	N=200 Total	χ^2
Information on nearby market price (Yes, %)	70	62	63.90	3.147*
Information on Addis Ababa market (Yes, %)	22	5	15.05	22.673***
Source of information				
<i>Aframomum corrorima</i> traders (%)	36	9	25.30	75.917***
Telephone (%)	1	2	1.37	
On market (%)	43	6	20.39	
Broker (%)	1	4	2.903	
Other different sources (%)	29	17	21.06	

*** and * Significant at less than 1% and 10% significance level, respectively, N=sample size

Source: Survey result, 2012/2013

Regarding where they obtain the market price information, 25.30% and 20.39% of the total sampled households pointed out that they obtain price information from *Aframomum corrorima* traders and personal observation on market, respectively. More of the farmers in Nekemte (36%) got information from *Aframomum corrorima* traders than Shambu (9%). About 43% of Nekemte farmers pointed out that they checked price information by directly participating in the market themselves while only 6% of the Shambu farmers participated on the market. The rest of the sample traders indicated that they got information from different sources like telephone, brokers, and through the combination of *Aframomum corrorima* traders, personal observation. The chi-square test indicates that the statistical significant difference on source of market price information at less than 1% level.

Factors Affecting Marketing of Traders

Table3 indicates the major problems faced by *Aframomum corrorima* traders: adulteration, natural quality, capital shortage, demand, government support, supply shortage, access to credit, farmers' reluctance to sell, administrative problems, competition with licensed traders, road, theft, competition with unlicensed and unlicensed traders, storage, telephone services, information flow, health, unstable prices, packaging, broker, bank service and journey are reported as the problems. Only some of the most important problems are briefly discussed below:

Table 3. Factors Affecting Marketing of *Aframomum corrorima* traders (% of traders)

Problems	N= 20, Nekemte	N= 18, Shambu	N=8, Addis Ababa	Total N=46
Adulteration	90.9	98.1		92.5
Natural quality	91.8	92.6	62.1	88.6
Capital shortage	90	91.4		85.3
Lack of demand	70.3	80.1		76.3
Absence of government support	75.4	80.8		74.6
Supply shortage	82.2	61.4		71.7
Transport	74	40.4	10.4	50.3
Theft	40	46		39.5
Competition with unlicensed	55	24.6		32.3

N = sample size

Source: Survey results, 2012/2013

According to Table 3, adulteration is the major factor. Improving quality of *Aframomum corrorima* starts from production, harvesting, and storing of *Aframomum corrorima* by farmers. However about 92.5% of the sample traders confirmed that they face adulteration problems. About 88.6% of them confirmed that they faced quality problems due to disease; farmers' low quality seeds from markets, drought and lack of inputs for farmers.

Table 3 revealed that about 85.3% of the traders indicated that they face capital shortage to conduct and expand their business. This is due to lack of lending institutions and most of the traders sold their *Aframomum corrorima* on credit to their buyers (other traders). About 76.30% of them reported that they face demand problem due to limited number of buyers, high supply of *Aframomum corrorima* in other parts of the zone and low quality of *Aframomum corrorima* due to disease, road and transportation problem. Their other problem is unstable price of *Aframomum corrorima* causes demand problem.

The table indicated that 74.6% of traders complain that the government didn't support, and didn't focus on *Aframomum corrorima* trade by building storage facility and credit facility. They also complain that they could not get regular buyers and could not sell their product to governmental organization unless they register for value added tax (VAT). This is according to them because *Aframomum corrorima* trade is seasonal and operated only few months. Traders in terminal markets also complain that they are forced to pay annual tax while their business is only for limited months. About 71.7% of them face supply shortage due to *Aframomum corrorima* storage by farmers by expecting high price, but instead exposing it to damage in the store.

The other infrastructural problem is that village markets are connected with the woreda town markets by poorly paved roads. About 50.3% of them face transport problem. Human portages and pack animals are the most frequently used to transport larger loads. Many of the roads to the village markets are difficult for vehicles during rainy season. In town, varieties of forms of transport are hired to get bags of all sample traders from Nekemte and Shambu markets reported that they could get transport only on market days and contract. Because of transportation problems, mobile traders couldn't reach to the market on time. Under such circumstance, farmers will be unable to sell their product and return it back home from the market. Theft is another problem in the survey areas. According to traders from regional markets, 39.5% of the sample traders face theft problem due to packaging problem, the product may remain on the ground thereby making it conducive to thieves. Some of traders face theft problem at the

time of their journey, because they transport their *Aframomum corrorima* at night. The small trucks and pick-ups that bring *Aframomum corrorima* from different regional markets to Addis Ababa terminal market arrive and park in open spaces within the market boundaries. Selling is conducted in a confused and crowded environment. Traders often complain about theft and being cheated by the brokers in the terminal market. The study indicates that lack of a uniform mechanism to enforce licensing requirements with regard to all traders is the most important problem in the *Aframomum corrorima* markets. About 32.3% of the traders reported that the absence of government control on un-licensed merchants. Although the law requires merchants to acquire a license from the regional authorities in order to engage in *Aframomum corrorima* trading, licensed traders allege that this is not well enforced and provides an un-even playing field in *Aframomum corrorima* trading.

IV. CONCLUSION AND RECOMMENDATION

Conclusion

The study had identified the determinants of participation decision on *Aframomum corrorima* production and marketing and its effect on the quantity supply to the local and terminal markets. *Aframomum corrorima* production is the most important and significant variable influencing the decision to participate in *Aframomum corrorima* market positively. The study had tried to analyze the major factors affecting *Aframomum corrorima* production and marketing. The study identified that about 85.80% and 73.60% of sample farmers reported that lack of inadequate fertilizer supply; inadequate planting materials are causes for low productivity. Concerning access to credit, 41.10% of farmers confirmed that there was credit problem which resulting decrease in *Aframomum corrorima* production. Since the cash crop is highly loved by wild animals, about 36.05% of farmers reported that wild animal competition is negatively affecting production of the crop.

Price setting is another major problem of marketing affecting production. Usually price set by traders, more unstable *Aframomum corrorima* price than other crops and shortage of real price information from terminal market and no direct relation with traders. About 63.30% of the farmers' reported that *Aframomum corrorima* price was set by traders. About 63.90% of the total sampled households had *Aframomum corrorima* price information about the nearby market price before they sold their *Aframomum corrorima* but not the terminal market. Concerning sources of market price information, 25.30% and 20.39% of the total sampled households pointed out that they obtain price information from traders and personal observation on market, respectively. Weighing or scale is the second marketing problem for 52.15% of producing the crop. Another factor that has been found to have adversely affected *Aframomum corrorima* marketing was the presence of multiple taxes in regional markets. Paying tax before selling of their produce forces farmers to sell at village market at low price. About, 32.90% of the sample farmers responded that face is a demand problem, due to low quality of *Aframomum corrorima* caused by of poor management and post harvest handling, increase in supply in other parts of the country and absence of regular buyers.

About 92.50% of the sample traders confirmed that they face adulteration problems. About 88.60% of them confirmed that they faced quality problems; farmers' low quality seeds from markets, drought and lack of inputs for farmers. About 85.30% of the traders indicated that they face capital shortage to conduct and expand their business. About 76.30% of them reported that they face demand problem due to limited number of buyers, high supply of *Aframomum corrorima* in other parts of the zone and low quality of *Aframomum corrorima* due to road and transportation problem. Moreover, 74.60% of traders complain that the government did not support, and did not focus on *Aframomum corrorima* trade. They also complain that they could not get regular buyers and could not sell their product to governmental organization unless they register for value added tax (VAT). Traders in terminal markets also complain that they are forced to pay annual tax while their business is only for limited months. About 71.70% of them face supply shortage due to *Aframomum corrorima* storage by farmers by expecting high price, but instead exposing it to damage in the store.

Human portages and pack animals are the most frequently used to transport larger loads because of poorly paved roads. Many of the roads to the village markets are difficult for vehicles during rainy season. Because of transportation problems, mobile traders couldn't reach to the market on time. Under such circumstance, farmers will be unable to sell their product and return it back home from the market. Traders often complain about theft in the terminal market. According to traders from regional markets 39.50% of the sample traders face theft problem due to packaging problem, the product may remain on the ground thereby making it conducive to thieves. The study indicates that lack of a uniform mechanism to enforce licensing requirements with regard to all traders is the most important problem in the *Aframomum corrorima* markets. About 32.30% of the traders reported that the absence of government control on un-licensed traders.

Recommendations

Based on the study, the enhancement of *Aframomum corrorima* producers' bargaining power through cooperatives is the best measure that should target at reducing the oligopolistic market structure in the regional markets. Such measure also facilitates the regular supply of *Aframomum corrorima* at reasonable price to consumers. There is an urgent need for government intervention with regard to Nekemte and Shambu market price setting strategy. This needs measures from the relevant government organs. Findings based on the results of the study, to promote *Aframomum corrorima* market participation in a sustainable way, some policy implication are suggested to be addressed by stakeholders. The most important variables influencing the decision to participate in *Aframomum corrorima* market are *Aframomum corrorima* production and crop yield. Consequently, extension workers advertising are to be designed to encourage farmers to participate in *Aframomum corrorima* production and market. Keeping households specialization and social role in *Aframomum corrorima* production potential areas is necessary like other crops. Moreover, *Aframomum corrorima* production and extension contacts are the positive determinant factors of the quantity of *Aframomum corrorima* supplied. Therefore, policies that would improve *Aframomum corrorima* production capacity by identifying new technologies and the causes of diseases problems. Creating stable demand for surplus production would enhance farmers' decisions on *Aframomum corrorima* production. Agricultural extension services are the major institutions operating in the rural areas. To obtain this

advantage there is a need to improve extension system, and technical supervision and follow up must be strong. Strengthening of market extension is necessary. And it is necessary to provide information and enhance the knowledge and skills of farmers and other institutional changes ought to be made. The results of the study also revealed that terminal and regional markets are not integrated mainly owing to crucial problems such as inadequate market price information. Competitive market and market information services have to be established or strengthened to provide farmers and traders accurate and timely information on current supply, demand and prices at national and regional levels.

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