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Patrice Ygué Adegbola, Christelle Marie Komlan-Ahihou, Anselme Adegbidi,
Sounkoura Adetonah, Ousmane Coulibaly, Guy-Apollinaire Mensah and
Cocou Muriel Dorian Montcho

Full Length Research Paper

Marketing of Jew's mallow in Agbedranfo local area in the Southwest of Benin

Patrice Ygué Adegbola*, Christelle Marie Komlan-Ahihou, Anselme Adegbidi, Sounkoura Adetonah, Ousmane Coulibaly, Guy-Apollinaire Mensah and Cocou Muriel Dorian Montcho

Agricultural Research Center of Agonkanmey (CRA-Agonkanmey), National Institute of Agricultural Researches of Benin (INRAB), Benin.

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This study focuses on analyzing the functioning of the marketing systems of jew's mallow (*Corchorus olitorius*) produced in Agbedranfo (Dogbo), Southwest Benin. The methodological approach used was based on the Structure-Conduct-Performance paradigm (SCPA). A total of 60 producers, 28 retailers and 4 wholesalers were sampled. The results identified two jew's mallow marketing systems based on sales periods and production locations: marketing system of jew's mallow production was based on lowlands and of upland jew's mallow marketing system. The net margin for jew's mallow produced in Agbedranfo was 3.24 for producers, 9.67 for retailers and 8.37 for wholesalers in lowland jew's mallow marketing system. However, the relative net margins of these actors in the marketing system of upland jew's mallow were low. Moreover, a Gini coefficient of 0.34 showed an equal distribution of the gross margins obtained in the marketing system of lowland jew's mallow. The study therefore, concludes that wholesalers and retailers have higher net margins than producers. Thus, a dialogue between marketing stakeholders themselves, extension agents, non-governmental organisations (NGOs), and public authorities is therefore desired.

Key words: Jew's mallow, marketing, profitability, SCP paradigm, margin.

INTRODUCTION

In Benin, market gardener is becoming more and more important socio-economically because of the number of actors who directly or indirectly make a living from it. Lowlands, considered as of no interest in the past, are now recognized as potentially adapted to truck farming. Jew's mallow (*Corchorus olitorius* L.), commonly called "crincrin" is one of the market gardener products most cultivated (Savi, 2009). Among favorable regions for garden production in Benin are the municipalities of

Houeyogbé and Dogbo in the Mono-Couffo departments in the Southwest. These municipalities are known for their agricultural potential, as they have had local markets for the marketing of garden crops for decades (Savi, 2009).

In Benin, the departments of the Mono/ Couffo contributed 11.89% of the production in 2002, and 14.43% in 2003 (DPP/MAEP, 2008) whereas in 2007 this production passed over 23.692 tons in this area compared to a total of 293.705 tons for the whole

*Corresponding author. E-mail: patrice.adegbola@yahoo.fr.

country making it about 8.1% of total production (INSAE, 2008). This part of the national production puts the department of the Mono/Couffo in third position in relation to the other. The Ouémé/Plateau takes the head of the ordering followed by the Atlantic / Littoral which total production in 2007 was 164.263 tons (INSAE, 2008). Among the big zones of production in Benin, besides the urban and out-of-town zones, some specific zones such as the valleys are major zones that provide various products to the urban consumers. In the valley regions, the production of local and exotic vegetables (lettuce, string bean, carrot, cabbage, cucumber, beet etc.) are all year round due to irrigation (Adegbola and Singbo, 2001). These cultures are practiced only once a year during the period of subsidence (period of low waters) (Singbo and Nouhoeflin, 2005).

In contrast to the earlier affirmations, in the valley of the Mono, the jew's mallow is cultivated three times in the year. It is a leafy vegetable that is appreciated in the diet of the majority of the Beninese populations living in the South. The production of this commodity constitutes an activity that occupies majority of the producers notably women who pull from it the necessary income to the satisfaction of their essential needs. It is justified by the weak production of the only product of pension formerly recognized (the oil palm tree) which doesn't satisfy anymore the majority because of its weak productivity and its specificity. This production becomes more and more very uncertain after the climatic disruptions and its fashion of traditional production.

This specialization of the valley of the Mono in the production and marketing of jew's mallow, doesn't still make it the object of serious socioeconomic investigation. Savi (2009) analyzed the financial profitability and the technical, and economic efficiency of the production of the jew's mallow (*Corchorus olitorius*) in the Mono valley in Benin. Jew's mallow ranks fifth among the most consumed vegetable in the largest town of Benin (Cotonou) after tomato, onion, pepper and cowpea (Guidi, 2007). Each citizen of this town consumes about 12.78 g per capita per day. In fact, jew's mallow is an important source of nutrient because of its high vitamin, beta carotene and soluble and insoluble fiber content which have a beneficial effect on the intestine mucosa (Soro et al., 2012). Moreover, it is highly marketed because of the sticky aspect of its sauce which is really appreciated by consumers (FAFA, 2009). It is produced in the uplands as well as in the lowlands, and it is considered as a product highly meant for sale (Savi, 2009).

A study conducted by Santara (2009) on the profitability of the cropping systems in the lowlands of Agbédranfo, Vovokanmey and Houinga-Houégbé in the Mono-Couffo departments, has shown that in the lowland of Agbédranfo, jew's mallow based crop system is the most profitable for small producers. Despite its importance in both economic and nutritional security, jew's mallow is

one of the neglected and underutilized crops by research and development institutions. Two fundamental reasons may explain this situation: its nature as a minor crops and its specificity as a leafy vegetable, which is generally highly perishable, then expensive to store (Savi, 2009).

In this context, value addition to jew's mallow produced in Agbédranfo should go through an effective marketing system. Jew's mallow is marketed a lot because it is prepared in most households of the South-Benin with sauces (FAFA, 2009). Besides, the Jew's Mallow is the subject of important commercial exchanges with the neighboring countries. However, in Benin, the marketing of agricultural products is subject to many constrains such as market distortions and imperfections (Lutz, 1994; Kuiper et al., 1999, 2003; Lutz et al., 2006). For example, marketing system is sometimes confronted with efficiency problems in carrying out technical marketing operations, efficiency and equity in price formation and problems of *ex post* and mainly *ex ante* adjustment between production and consumption (Bergmann, 1960; Lutz et al., 2006).

Unfortunately, few reliable statistical data on its production and its sales are available; there is no statistical data on these exchanges (Agossou et al., 2001; Assogba, 2010). It is in order to bridge this knowledge gap on the merchandising of the vegetables that this research on the marketing of the Jew's Mallow produced in the shallows of the South-Benin in the department of the Mono Couffo, more particularly the Jew's Mallow produced at Agbédranfo was conducted.

This study thus focuses on the marketing of jew's mallow at Agbédranfo in Mono. From this view, this work looks at the different actors along the value chain as the producers and traders, and their partners who are the research centers and the policy decision-makers.

Theoretical framework: Structure-conduct-performance approach

The economic performance analysis of the markets uses theoretical bases taken from neoclassic theory. The limits of that theory are filled up by new economic approaches grounded on the interdisciplinarity necessary to any market study as socioeconomic institutions. At the operational level, market efficiency is assessed by analyzing the Structure-Conduct-Performance (SCP) which has had many applications in Africa, and is being improved through new tools of institutional and functional analysis of agricultural sectors (Demont et al., 2003; Mastaki, 2006).

Derived from the neoclassic theory, the Structure-Conduct-Performance paradigm was developed by the Harvard school and made popular during the years 1940 to 1960 with a study highlighting the correlations that may exist between the structure and the performance of the industry (Bain, 1951; Olagunju et al., 2012). The SCP

Table 1. Elements of the structure-conduct-performance.

Structure	Conduct	Performance
Typology of actors in the chain	Partnership between actors (taking into account asymmetries of information)	Distribution of profits (equity)
Marketing channels	Marketing	Efficiency of the marketing system
Cartography of the chain	Price fixing	-
Market entry and exit conditions	Information flow	-

Source: Adapted from Lutz (1994).

paradigm concepts were developed from 1960 to 1990. These are the price theory, the econometric estimation (Demsetz et al., 1973; Peltzman, 1976; Becker), the game theory with an interest on strategic decision-making and Nash equilibrium concept (Tirole, 1988). After 1990, the reverse relationship between the degree of concentration of the market and the degree of competition has been the hypothesis behind the SCP hypothesis of the market. This is why market concentration encourages enterprises to partner. More precisely, the standard paradigm of the SCP asserts that there is a direct relationship between the degree of the market concentration and the degree of competition between enterprises.

This hypothesis will be retained if there is a relationship between the market concentration and the performance, no matter the efficiency of the enterprise. Thus, enterprises of the more concentrated sectors will gain higher profits than enterprises operating in less concentrated sectors, irrespective of their efficiency (Olagunju et al., 2012). The SCP approach implies therefore that the structure of a market, and particularly the degree of competition met there, determines the market behavior, and that the structure and the behavior taken together determine their performances (Demont et al., 2003; Tollens, 1997). These three indivisible elements – market structure, conduct of the actors and market performance – were defined according to Clodius and Müller (1961) as follows:

Market structure is defined as the entire organizational characteristics that determine the relationships between protagonists (buyers and sellers); whether they are active or potential actors. Specifically in the frame of this study, research activities have been oriented here towards the degree of market concentration, that is the number of actors (wholesalers, retailers, etc.) and their distribution by size, the degree of product differentiation and the market entry and exit conditions. The market structure helps in describing market infrastructures. Bain (1968), Pomeroy and Trinidad (1998) and Ninglepong (2004) assert that market structure is characterized by its organization. This organization may influence strategically the nature of competition and the mode of price fixing inside the market.

Actors' conduct refers to the models of behaviors actors follow and the strategies they use to adapt or adjust themselves to the markets in which they sell or buy. These strategies depend on the market structure, the individual power of traders in the market and on available assets. In this study, the market conduct is tackled based on the practices of the offer, that is, the strategies and arguments used by actors in price negotiation, the mode of payment used and finally on the degree of communication among actors.

Market performance expresses the economic results of all enterprises of the market. It translates the economic result of the structure and the conduct. It takes into account the existing relationships between the margins and the production cost of marketing services (effectiveness of the market performance) (Hariss, 1993).

In the frame of this study, this paradigm is the order to better structure the aspects of the problem. Table 1 shows the different elements of the SCP on which this study is based.

MATERIALS AND METHODS

Study area, sampling and data collection method

This study was carried out in the Couffo department, and covered jew's mallow produced in Agbédranfo village (municipality of Dogbo) (Figure 1). Among the three (3) intervention sites of the project "Realizing the potential of agricultural inland valley lowlands in sub-Saharan Africa while maintaining their environmental services", coordinated by AfricaRice, the village of Agbédranfo was chosen because of the high production of jew's mallow due to the high level of land development (Santara, 2009).

The sampling was done by category of actors, and was purposive. A total of 60 producers out of 280 producers in the village, 28 retailers and 4 wholesalers were sampled. The marketers (retailers and wholesalers) were surveyed in neighboring markets (Dogbo, Azovè and Lokossa) on the market day, because most of the women retailers, customers and producers-collectors from Agbédranfo frequented these markets. Group and individual

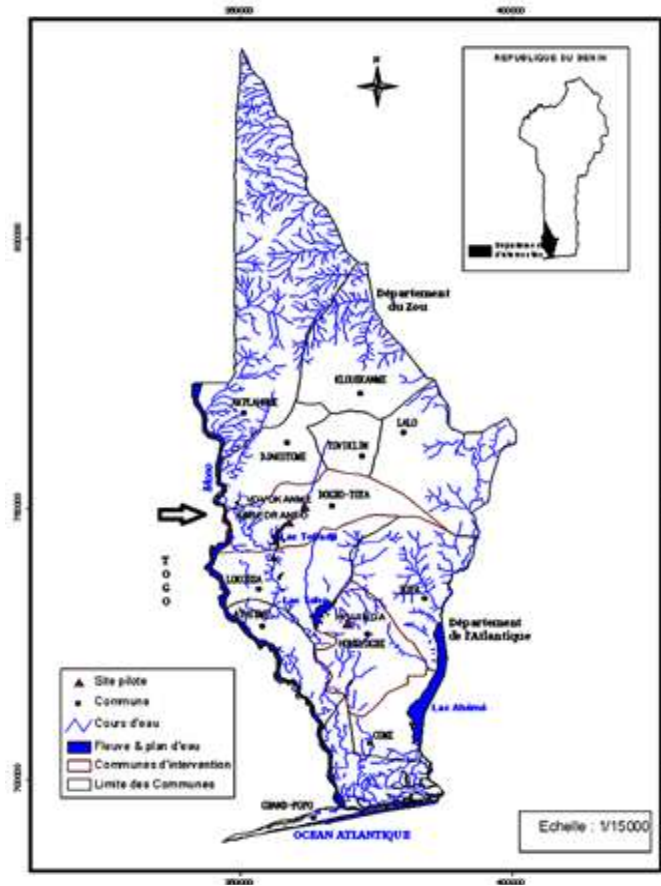


Figure 1. Map of Mono-Couffo showing Agbédranfo (Source : RAP, 2010).

discussions were made using a structured questionnaire depending on each category of actors.

Methods of analyses

Different statistical tools were used. Descriptive statistics (average, mode, minimum, maximum, crossed tables, standard deviation, frequency) were used to carry out market structure, particularly socioeconomic characteristics of producers and traders. They were used to illustrate some behaviors of the market actors.

Mapping the marketing channels

Mapping is the most essential activity, and the core of any marketing system analysis. The objective is to give an illustration of the identified actors, the marketing chain and the flow of related products. The different phases to achieve this mapping are:

1. Identification of the links of the marketing system

2. Identification of the major actors at the micro level.
3. Distinction of the channels if necessary, and identification of the nature of business linkages.

Calculation of the margins

The performance of the marketing systems studied was evaluated through the calculation of the margins and the equity.

1. At the level of producers: The calculations of the production gross and net margin are represented respectively by the equation (1) and (2) that is,

$$\text{Production gross margin} = \text{Market selling price} \times \text{Quantity of jew's mallow produced} - \text{Direct production costs} \quad (1)$$

where:

$$\text{Direct production cost} = \text{Cost of inputs} + \text{Hired paid labor (hired just for the task)}$$

$$\text{Profit (Net margin)} =$$

$$\text{Market selling price} \times \text{Quantity of jew's mallow produced} - \text{Total production cost} - \text{Direct selling fees} \quad (2)$$

where:

$$\begin{aligned} \text{Total production cost} &= \text{Direct production costs} + \text{operating costs of the production enterprise} \\ \text{Direct selling prices} &= \text{Transport} + \text{Equipment depreciation} \end{aligned}$$

Let us point out that producers sell their own product on the market, and that some of them also buy Jew's mallow from other producers. However, in calculations, we were interested only in men and women producers who sell themselves their produce in the market.

2. At the level of women retailers and wholesalers: The calculation of the gross and net margin at the level of retailers and wholesalers is presented respectively in the equation (3) and (4) that is,

$$\text{Gross margin} = \text{Sales revenue} - \text{Purchase cost}$$

(3)

where:

$$\text{Sales revenue} = \text{Selling price} \times \text{Quantity of jew mallow sold}$$

$$\text{Purchase cost} = \text{Purchase price} \times \text{Quantity of jew mallow purchased}$$

(4)

$$\text{Net margin} = \text{Gross margin} - \text{Selling cost}$$

where:

$$\text{Selling cost} = \text{Transport fees and direct commissions} + \text{Equipment depreciation}$$

These margins calculated at the level of the different actors were then reported based on the unit of jew's mallow sold. The relative net margin is calculated as follows in the equation (5) and (6):

$$\text{Relative net margin (\%)} = 100 \times \frac{\text{total net margin}}{\text{Total exploitation cost}} \quad (5)$$

$$\text{Relative net margin (\%)} = 100 \times \frac{\text{Unit net margin}}{\text{Unit exploitation cost}} \quad (6)$$

The analysis of the net margins was done in two ways: first of all, a comparison of the relative net margins of the actors at the level of each marketing system was done using Student's t-test.

H₀: The relative average net margins of actors in both systems equal two by two.

Secondly, the net margins of actors in lowlands

marketing system were compared two by two.

H₀: the relative average net margins of the different actors of SCBF equal two by two.

Equity analysis

The equity of margins sharing by actors is an important performance indicator of a marketing system. The Gini coefficient and the Lorenz curve were used to analyze the distribution of the margins among actors of the most profitable marketing system which is the marketing system of lowland jew's mallow. The Gini coefficient (or index), a measure of the inequality associated with the Lorenz curve were calculated as indicated in equation (7):

$$G = 1 - \frac{1}{n} \times \sum_{i=1}^n (Y_i + Y_{i+1}) \quad (7)$$

Where:

1. n = Number of observations;
2. Y_i = Net margins of the different marketing actors;
3. Y_{i+1} = Cumulated net margins of the different marketing actors.

The Gini coefficient varies from 0 to 1. In case of perfect equality, it equals to 0 and in case of total inequality, it equals 1. Therefore, when this coefficient increases from 0 to 1, it will show the distribution of rising inequality.

According to Dillion and Hardaker (1993), Gini coefficient greater than 0.35 indicates that there is inequality distribution. According to Meron (2015), Gini-coefficients are aggregate inequality measures, and can vary anywhere from zero (perfect equality) to one (perfect inequality). In actual fact, the Gini-Coefficient with highly unequal distributions typically lies between 0.50 and 0.70, while with relatively equitable distributions it is on the order of 0.20 to 0.35. However, although Gini-coefficients provide useful information based on Lorenz curve shapes, a problem arises when Lorenz curves cross. It is problematic whether we can in this special case claim that a higher coefficient means a more unequal distribution, so more careful analysis is required (Todaro, 1998). The other problem associated with Gini-coefficients is that it favors equality of market shares without regard to the number of equalized firms. In other words, the coefficient equals zero for two firms with 50% market shares, for three firms with 33.33% market shares each, and so on (Meron, 2015).

A comparison of the margins, using Student's t-test, among the categories of actors was done in order to better support the results of the Gini Coefficient and the Lorenz curve.

Table 2. Socio-demographic characteristics of the actors of the different marketing systems.

Actors/Characteristics	Producers		Woman producer- collector		Normal women retailer		Particular retailer		Wholesaler		
	Average	Standard deviation	Average	Standard deviation	Average	Standard deviation	Average	Standard deviation	Average	Standard deviation	
Age (years)	43	14.35	33	7.11	36	11.24	42	9.04	51	1.5	
Number of years of experience in jew's mallow (years)	24	16.34	17	8.22	16	11.60	26	10.88	29	9.42	
Seed capital (FCFA)	-	-	-	-	3882	4287.17	1340	1147.5	11000	5656.85	
Sex (%)	Women	85	-	100	-	100	-	100	-	100	-
	Men	15	-	-	-	-	-	-	-	-	-
Schooling rate (%)	Yes	20	-	30	-	28.6	-	20	-	-	-
	No	80	-	70	-	71.4	-	80	-	100	-
Marital situation (%)	Married	75	-	95	-	92.9	-	100	-	-	-
	Widow	20	-	5	-	3.6	-	-	-	100	-
	Single	5	-	-	-	3.5	-	-	-	-	-
Religion (%)	Christian	42.5	-	50	-	39.3	-	60	-	50	-
	Animist	57.5	-	50	-	60.7	-	40	-	50	-
Socio-cultural group (%)	Adja	97.5	-	90	-	92.9	-	100	-	75	-
	Others	2.5	-	10	-	7.1	-	-	-	25	-

FCFA : Franc de la Communauté Financière en Afrique (Franc of the Financial Community in Africa) €1=695.96 FCFA

RESULTS AND DISCUSSION

Marketing systems of jew's mallow

In Agbédranfo, jew's mallow was produced throughout the year in two (2) distinct production zones. From mid-March (normal cropping season: rainy season) while it was produced in the uplands with three (3) production cycles per year. From mid-November to mid-March (off cropping season), it was produced in the lowland with two (2) production cycles per year. The differentiation of the production zones related to the cropping periods led to the identification of two (2) marketing periods of jew's mallow: normal

cropping season (from mid-March to mid-November) and off-season (from mid-November to mid-March) which is the period of shortage.

Taking into account the selling periods, the two identified marketing systems are: the marketing system of lowland jew's mallow and the one of upland jew's mallow. The different marketing systems are different in their structure. During the shortage, producers can sell directly to retailers or to consumers while in the normal cropping season, they sell mainly to wholesalers.

The socio-demographic data of actors is presented in Table 2. Results showed that the marketing of jew's mallow is a women's business (97%). The oldest actor (51 years) and the most

experimented ones (29 years) were wholesalers. Wholesalers had a seed capital three to four times higher than that of women retailers (Table 2). All wholesalers were widows (Table 2). Generally, most of the actors were illiterate. Large proportions were married and spoke Adja language (Table 2).

Three (3) categories of actors were identified: producers, retailers and wholesalers. The implication of women in jew's mallow marketing tallies with the results obtained by Maundu et al. (1999), Vihotogbé (2001), Adjatin (2006), Assogba Komlan (2010) and Levasseur et al. (2007). The limited implication of men (3%) can be explained by the concepts of horizontal and

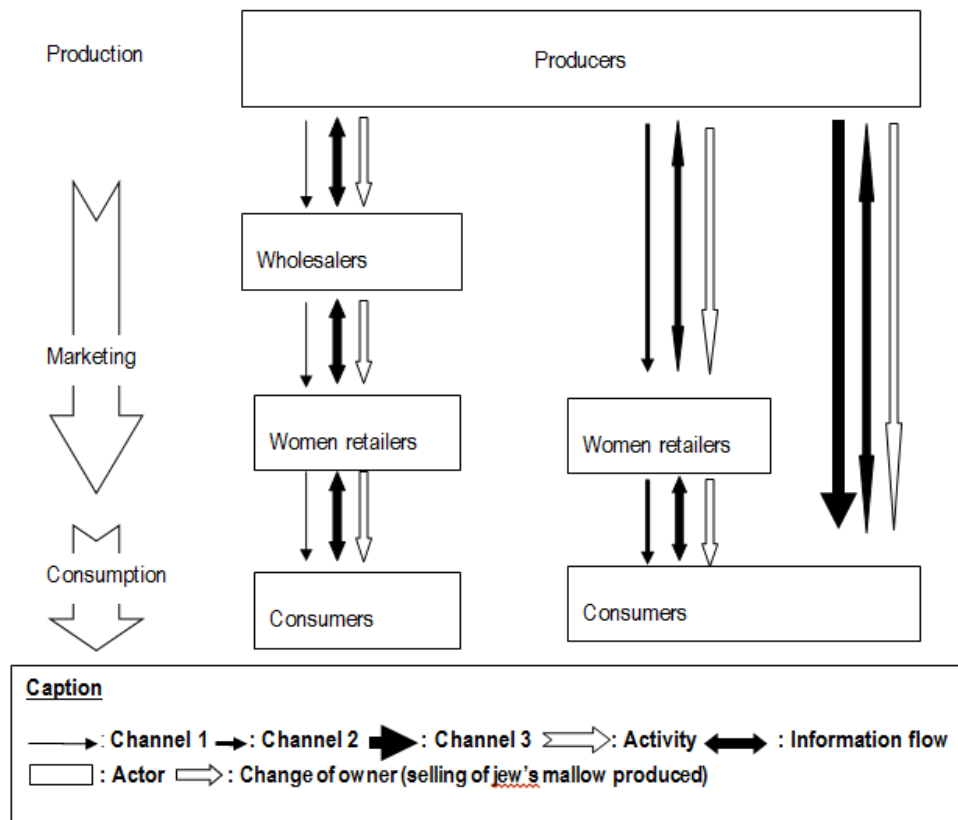


Figure 2. Cartography of the distribution channels of jew's mallow produced in Agbédranfo throughout the year (adapted to the cartography elements of a value chain (GTZ, 2007).

vertical specialization of African towns' socioeconomics. While the first concept is segregation by gender based on the nature of the activities, the second is an asymmetric sexual characterization based on the profitability and the scale of activities (Faure and Labazee, 2002). The appreciable number of widows especially at the level of the wholesalers tallies the requirements of wholesaler. In fact, wholesalers need to often travel exploring production zones. Therefore, they are often absent from home. The presence of a husband could be a constraint to the necessary freedom of action in the performance of her functions.

Depending on the distribution strategies that the different actors of jew's mallow marketing adopt, three (3) distribution channels of jew's mallow existed irrespective of the marketing system. These channels were fragmented into sub-channels (Figure 2).

Gross and net margins of the different actors

The Student's t-tests showed that at the threshold of 5%, the relative average net margins of the actors of the two systems were significantly different two by two (Table 3).

The relative net margin in lowland marketing system was higher than the one obtained in the upland marketing system no matter the actors. Moreover, these margins were different from an actor to another no matter the marketing system (Table 3).

Accordingly, marketing of jew's mallow is more profitable for the lowland marketing system than the upland one. This result tallies with Singbo and Lvasseur (2006) who showed that jew's mallow production is clearly more profitable in the lowlands. Also, Savi (2009) showed that jew's mallow production is globally profitable in the valley of Mono. These results tally with the present study. In addition, the gross margin per square meter, that is, FCFA 206 obtained in this study is higher than the one (FCFA 120 to 177) obtained in the lowlands in Cotonou by Soudjinou and Komlan (2010).

The difference of margin between both marketing systems depends on many factors. During the period of abundance, that is, in upland jew's mallow marketing system, the jew's mallow market of Dogbo, like in any other location, is saturated because the rainy season favours production and supply is higher than demand. Then following the demand theory, prices decreases (*Ceteris paribus*). This explains the limited power of

Table 3. Trading account of producers, retailers and wholesalers.

Items	Marketing system of					
	Uplands			Lowlands		
	Producer	Retailer	Wholesaler	Producer	Retailer	Wholesaler
Quantity purchased (kg)	-	24	34	-	35	42
Quantity sold (kg)	236.8	23	25	208	34	38
Purchase price (FCFA/kg)	-	48	48	-	265	281
Selling price (FCFA/kg)	113	206	185	267	479	581
Receipts (FCFA)	26758	-	-	55536	-	-
Direct production costs (FCFA/kg)	35	-	-	58	-	-
Total production cost (FCFA/kg)	36	-	-	59	-	-
Invested cost (FCFA/kg)	51	63	93	63	45	62
Direct selling fees (FCFA /kg)	15	-	-	4	-	-
Direct marketing fees (FCFA /kg)	-	55	93	-	37	62
Operation costs (FCFA/kg)	-	8	0	-	8	0
Gross margin (FCFA)	18470	-	-	43472	-	-
Gross margin (FCFA/kg)	78	156	120	209	206	270
Net margin (FCFA)	14682	-	-	42432	-	-
Net margin (FCFA/kg)	62	93	92	204	434	519
Relative net margin	1.21	1.48	0.98	3.24	9.67	8.37
Student's T (H0: the relative average net margins of actors in both systems equal two by two)	SCBF and SCTP producer		SCBF and SCTP retailer		SCBF and SCTP wholesaler	
	-13.428***		-7.785***		-4.639**	
Student's T (H0: the relative average net margins of the different actors of SCBF equal two by two)	Producer and Retailer		Producer and Wholesaler		Retailer and Wholesaler	
	-4.772**		-4.128**		-0.491	

Source: data survey (2010); ***: highly significant at 1%, **: significant at 5%; SCBF: Lowland jew's mallow marketing system; SCTP: Upland jew's mallow marketing system.

women producers from Agbédranfo in the price determination, hence the negative margins.

On the other hand, only developed lowland jew's mallow production zones (as the study area) produce jew's mallow during the off-season. Consequently, in that period, competition is low. Thus, during this period, the market of produced jew's mallow is less saturated, and the price of the basket is very high. Demand becomes higher than supply and unlike the other period of commercialization, producers impose their selling price.

The results tally with the affirmation that gardening crops supply is influenced by the rainfall regime especially for field-grown crops (rainy season), and irrigation practice in some regions. The use of lowland, which is dependent of the rainfall regime, also influences this supply (Agossou et al., 2001).

Analysis of actors' margin distribution

The margin is the instrument to measure the performance of the activities of commercial actors that gives us a clear picture of their profit distribution from the producer to the retailer. Thus, the Gini index (G) was calculated by taking

into account the net margins of the actors in lowland jew's mallow marketing system. The previous results showed that lowland is more profitable. We will therefore consider lowland marketing system in the analysis of market concentration. The average value of G was: $G = 0.34109$ ($0 < 0.34109 < 1$). In addition, Gini coefficient is less than 0.35 therefore there is an equal distribution of net margins among the actors.

These results show that there is a low concentration of the marketers. It means that actors of the market have mutual influence in themselves. Since the wholesalers and retailers are not many, they could have influence on the price of the market. And then, they could also be the price setters, which explains their higher net market margins compare to producers'.

This result was illustrated by the Lorenz curve (Figure 3). It showed the distribution of the net margins of the different actors of the marketing. The points of this curve have started gradually to be separated from point A with the coordinates (55.80). Therefore, 80% of the actors had a net margin of 55% and the remained 20% of the cumulated number of actors had a cumulated net margin of 45%. This cumulated net margin corresponded to the net margins of the majority of the women retailers and

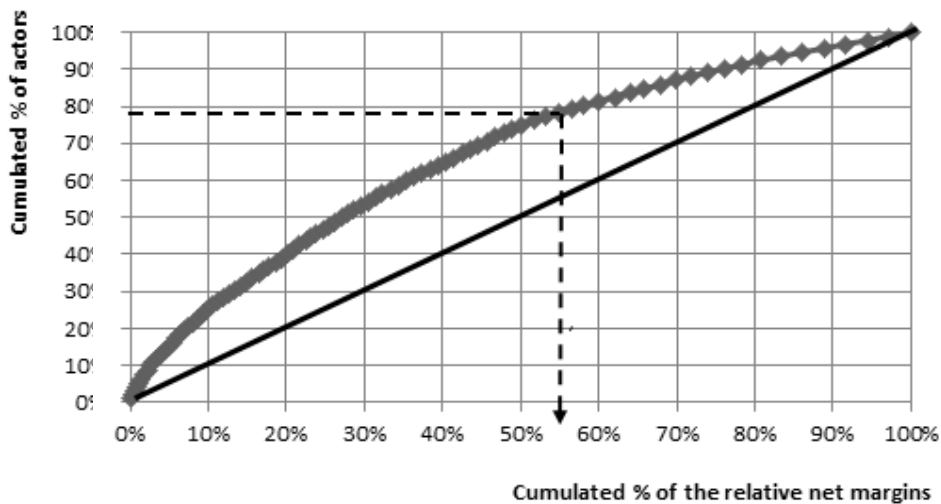


Figure 3. Lorenz curve for the actors of jew's mallow marketing in Agbédranfo.

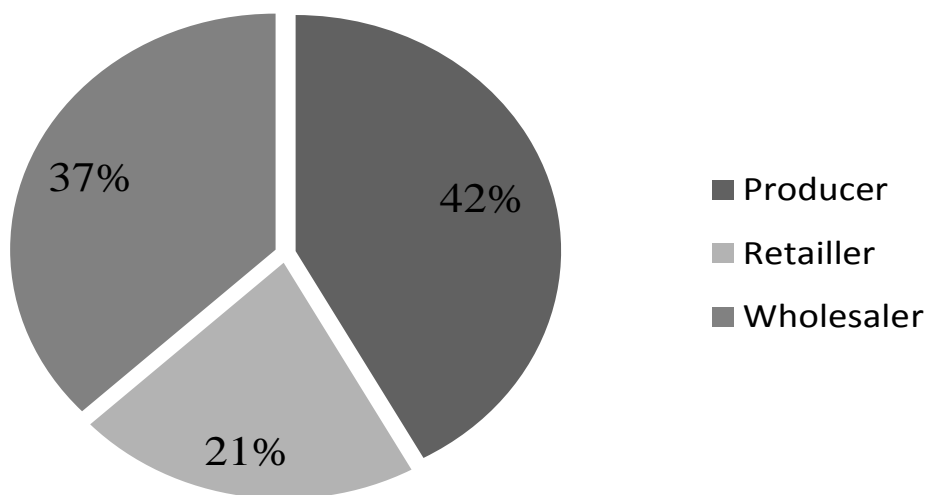


Figure 4. Distribution of average net margins among actors of lowland jew's mallow marketing system.

wholesalers. This result tallies with the one obtained comparing the net margins of these two groups of actors in the marketing system of lowland. There was no significant difference ($p > 0.05$) between the net margins of the retailers and the wholesalers (Table 3).

This result confirms the results of Kelechi et al. (2013) who found that although the Gini coefficient is 0.49, there were no significant differences between net margins of retailers and wholesalers of okra in South-Eastern Nigeria. Also this result confirms also the findings of Mani (2014) in Katsina State, Nigeria for date palm marketing. Mani (2014) found a Gini coefficient of 0.47 among wholesalers, showing a purely competitive market pointed towards a low level of seller concentration in wholesalers. The Gini index and the Lorenz curve showed

an even distribution of the net margins among the actors in the lowland marketing system. Women retailers and wholesalers had the highest profit to the detriment of women producers. The assertion according to which small producers, although they made the major job in agricultural products supply, have very low revenues because of the nature of the inputs used and mainly their living conditions (Nouhoheflin, 2001) tallies with the results of the present study.

The highest net margins are recorded with retailers and wholesalers (Figure 4). This result does not tally with the affirmation that retailers suffer prices imposed by wholesalers without taking into account the supply and demand conditions (Lutz et al., 2006). This result therefore tallies with Lutz et al. (2006) who stipulate that

retailers do not allow wholesalers to behave like “price makers” in the sense of the “Stackelberg leadership”.

The investments of producers were higher than those of retailers and wholesalers. Moreover, the margins of producers were lower than those of retailers and wholesalers. Margins of actors were not proportional to the invested costs. So there was no equity and the distribution of margins among actors is therefore uneven. Producers are price takers due to the jew's mallow is very perishable, and they do not have appropriate storage facilities, they are obliged to sell it at a lower price. Also producers, are mainly women (97%), and they receive influence of their husbands and they need cash to take care of their children. These sociologic factors influence their bargaining power. These farmers should be organized into cooperative, which could help to build storage facilities and then contribute to increase their bargaining power.

CONCLUSION

The Couffo department is identified as one of the major jew's mallow producers in Benin. In fact, enjoying the presence of about thirty lowlands and about ten artesian wells, some villages of this department produce jew's mallow throughout the year. This is the case of the village of Agbédranfo where jew's mallow producers grow it during the rainy season in the uplands and during the dry season in the lowlands. Jew's mallow produced is sold throughout the year.

Thus, depending on the production areas of jew's mallow and the selling strategy, the marketing system of upland jew's mallow and the one of the lowland jew's mallow are the two marketing systems in Agbédranfo. Besides the market of Dogbo, jew's mallow is sold on the farms, in the houses and in the markets of Lokossa and Azovè. It is sold by three groups of actors – women producers, retailers and wholesalers –, jew's mallow transits through three channels before reaching the consumers. The selling price fluctuates throughout the year. Cheap during the period of abundance (rainy season), jew's mallow produced in Agbédranfo is expensive during the dry season. During the period of abundance, only women traders are able to make a positive margin even if it is very small. On the contrary, during the period of shortage (dry season), the profitability of jew's mallow marketing is effective at the level of all actors. There is an uneven distribution of margins between actors. Retailers, make the highest profits that are 2 to 3 times higher than those of the producers.

The oligopsony during the abundance period, the oligopoly during the shortage period and the price fluctuation due to an unequal demand and supply thus translate the inefficiency of jew's mallow exchanges. This situation backs up the assertion according to which the

marketing of agricultural products in Africa is subject to many constraints that are, among other, market distortions and imperfections. A better mastery of the marketing techniques of actors could reduce the existing inequality.

Conflict of interests

The authors have not declared any conflict of interests.

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