

# Socio-economic Importance of Urban' Markets Supply Chains of Indigenous Leafy Vegetables in Côte d'Ivoire

A. Mahyao<sup>1</sup>, C. Kouame<sup>2</sup>, E. Agbo<sup>3</sup>, J.C. N'Zi<sup>4</sup> and L. Fondio<sup>5</sup>

<sup>1</sup> Department of Economic Sciences, University of Cocody-Abidjan, Côte d'Ivoire

<sup>2</sup> The world Vegetable Center, Regional Officer Cameroon

<sup>3</sup> Food Sciences and technology Department, University of Abobo-Adjamé, Côte d'Ivoire

<sup>4</sup> Departments of Biosciences, University of Cocody-Abidjan, Côte d'Ivoire

<sup>5</sup> National Agronomic Research Center, Côte d'Ivoire

**Key words :** Urban market, indigenous leafy vegetables, production, commercialization, Côte d'Ivoire.

## Abstract

With the rapid urbanization in developing countries, urban markets' supply with nutritive food is a major concern. Indigenous Leafy vegetables (ILVs) have high nutritive values. They are often grown in urban and peri-urban areas in Côte d'Ivoire. Socio-economic surveys were conducted in 2006 to characterize the market supply chain of ILVs in the two biggest cities (Abidjan and Yamoussoukro) of the country. A rapid appraisal of the chain revealed three types of production sites; main, secondary and marginal where indigenous leafy vegetables are cultivated as sole crops, associated crops or spontaneous crops, respectively. It was also found that rural markets of Yamoussoukro constitute suppliers of ILVs to the city where the vegetables are commercialized on secondary urban markets (93 %). In Abidjan, ILVs are commercialized on principal urban markets (66 %). The study showed that the markets supply chains are dominated by women (100 % at Yamoussoukro and 97.5 % at Abidjan). Principal actors in the chains are the producer-retailers, the wholesaler-retailers and the retailers. These traders are young and are of different social background. In majority, traders are illiterate (76 % at Yamoussoukro and 67 % at Abidjan). On the whole of the two cities, the economic value of indigenous leafy vegetables sold on markets goes from 0.4 to 3.60 \$US per day. The most important revenues come from retailing jute mallow (*Corchorus spp*) (3.60 \$US in Abidjan) and sweet potato leaves (*Ipomea batatas*) (2.99 \$US in Abidjan and 1.71 \$US in Yamoussoukro). Considering a maximum investment cost made by traders (1 \$US per day in Abidjan and 0.5 \$US per day in Yamoussoukro), retailing any of these two indigenous vegetables yielded profit of more than the poverty line (1 \$US per day).

## INTRODUCTION

With the rapid urbanization in developing countries, food security is a major concern (Arangrande and Argentini, 2001). Indigenous Leafy Vegetables (ILVs) have high nutritive value (Rubaihayo, 2002) and are important source of income (Gockowski, 2003). In Côte d'Ivoire, Abidjan and Yamoussoukro are two major cities (INS, 2001) where ILVs are widely cultivated in urban and periurban spaces. Socioeconomic surveys were conducted in 2006 (January to July) in these two cities. The objective of the study was to characterize urban' markets supply chains and to assess the economic value of the commercialization of ILVs.

## **MATERIALS AND METHODS**

Through a rapid appraisal of the truck farming in urban and periurban spaces of Abidjan and Yamoussoukro, the production sites were identified and characterized according to the production system of ILVs. Markets of ILVs were also identified and traders were numbered in order to show their importance. A sample of traders were selected and interviewed in Abidjan (160 traders out of 407 numbered) and Yamoussoukro (45 traders out of 61 numbered). Data were collected by a questionnaire on socio-demographic characteristics (sex, age, education, nationality, marital status and number of children) of traders. The characteristics of markets supply (source and frequency) and incomes generated from the commercialization of ILVs were also collected. Descriptive statistics methods (frequency and average) were used for data analyses.

## **RESULTS AND DISCUSSION**

### **Production sites and markets**

The rapid appraisal of the truck farming revealed three types of production sites; main, secondary and marginal. ILVs are cultivated as sole crops on main sites, as associated crops on secondary sites and spontaneous crops on marginal ones. In the two cities, main sites are located in urban spaces when secondary and marginal ones are on both urban and periurban (Table 1). Generally, on secondary sites, ILVs are cultivated in association with exotic vegetables. Specifically in the zone of Yamoussoukro where the periurban is still rural, it was found that ILVs are associated with yams or plantain in fields of the rural space (Zatta, N'Gattakro, Toumbokro and Zambakro). The production of this rural space is commercialized on rural markets where traders get supply for urban markets. The markets located in the periurban of Abidjan (Bingerville and Anyama) are also suppliers of urban markets.

Two types of markets (principal and secondary) can be found in urban centre of Abidjan and Yamoussoukro; principals and secondary markets. The principal market is a central market when the secondary one is the peripheral. Contrary to Yamoussoukro where one principal market exists, there are several principal markets in Abidjan. Basing on the traders numbered across markets, it was found that a great part of them are on principal markets (66 %) in Abidjan when the major part is on secondary markets (93 %) in Yamoussoukro (Table 2). The principals' markets of Abidjan are Gouro Adjamé, Attécoubé and Abobo. In Yamoussoukro, the most important market is Lossenilôgô. These markets are located in districts where population live in majority in poverty. The proximity of markets and low prices of ILVs make sure that this high nutritive food can be picked up easily by poor population. The promotion of urban' markets supply chains of ILVs could be a better way for poverty alleviation.

### **Socio-demographics characteristics of traders**

In majority, traders of ILVs are women (98 % of traders of Abidjan and 100 % of traders of Yamoussoukro). An important part of them are young (35 % and 51 % aging less than 25 years) and illiterate (67 % and 76 %); Ivorian (67 % and 56 %); married (56 % and 64 %) and have less than 2 children (54 % and 56 %) (Table 3). The great presence of young and illiterate women shows that the activity of commercialization of ILVs is an important source of employment for illiterate female population.

### **Source and frequency of markets supply**

The sources of supply for traders are markets (80 % of traders of Abidjan and 33 % of traders of Yamoussoukro); production sites (19 % and 62 %) and door-to-door delivering (1 % and 5 %) (Table 4). In relation to the source of supply, three types of traders were identified: the producer-retailer (15 % of traders of Abidjan and 31 % of traders of Yamoussoukro), the wholesaler-retailer (11 and 38 %) and the retailer (74 and 31 %). Producer-retailers are farmers or farmers' wives and they get ILVs only on production sites before retailing to consumers. Wholesaler-retailers get the product on both production sites and markets before reselling it to Retailers or retailing to consumers. Retailers get ILVs on markets with wholesalers or are door-to-door delivered by farmers before retailing to consumers. The study revealed also that the principals' sources of supply for traders of Abidjan are the market Gouro-Adjame (46 %) and the production site Airport-portbouet (12 %). For the traders of Yamoussoukro, the mains' sources are the production sites (31 %) and the market Lossenilôgo (20 %).

In majority, the frequency of markets supply with ILVs is daily (78 % of traders of Abidjan and 83 % of traders of Yamoussoukro). Taking into account the perishable of the product, this high frequency of supply is a strategy to reduce the risk of loss of conservation. In Abidjan, the daily frequency of supply is most observed on markets (62 % of traders) when in Yamoussoukro, the daily frequency is observed on production sites (54 % of traders). Other traders get supply two or three times a week (20 % of traders of Abidjan and 15 % of traders of Yamoussoukro) or once a week (2 % of traders in each city).

### **Incomes generated from commercialization**

The revenues yielded from the commercialization of ILVs goes from 0.93 to 3.6 \$US in Abidjan and from 0.4 to 1.71 \$US in Yamoussoukro (Fig. 1). Highest revenues come from retailing jute mallow (*Corchorus spp*) (3.60 \$US in Abidjan) and sweet potato leaves (*Ipomea batatas*) (2.99 \$US in Abidjan and 1.71 \$US in Yamoussoukro). Investments costs supported by traders per day are approximately 1 \$US per day in Abidjan and 0.5 \$US in Yamoussoukro. Retailing any of these two vegetables in the two cities yielded profit of more than the poverty line (1\$US per day). Taking into account the possibility of a trader to sell more than one indigenous leafy vegetable per day, the commercialization of ILVs could be a gainful activity.

### **CONCLUSION**

Urban' markets supply chains of indigenous leafy vegetables (ILVs) are socially and economically important in Côte d'Ivoire. This sector is an important source of employment and income for female population. The commercialization of ILVs is dominated by women and daily income generated is up to 3.6 \$US. The promotion of markets supply chains can contribute to food security and poverty alleviation in urban and periurban areas in Côte d'Ivoire.

### **ACKNOWLEDGMENTS**

This study was funded by a collaborative grant of the International Foundation for Science (IFS) (Grant # K/3915-1) and the West and Central Agricultural Research for Development Council (WECARD). Thanks to OCPV (Office d'Aide à la Commercialisation des Produits Vivriers) and to ANADER (Agence Nationale d'Appui au Développement Rural).

## Literature cited

- Aragrande M. and Argentini O., 2001 Studying food supply and distribution systems to cities in developing countries and countries in transition, Methodological and operational guide, Food into Cities Collection, DT/36-01E, FAO, Rome.
- Gockowski, 2003 African traditional leafy vegetables and the urban and periurban poor. Food Policy, 28. 221-235
- INS, 2001 Premiers résultats définitifs du RGPH - 98. Bureau Technique du Recensement, Abidjan, Côte d'Ivoire.
- Rubaihayo, 2002 Contribution des légumes indigènes à la sécurité alimentaire des ménages. Notes sur les Connaissances Autochtones, 44. 4p

## Tables

Table 1: Production sites of indigenous leafy vegetables in Abidjan and Yamoussoukro, Côte d'Ivoire

Areas	Type of site	Sites names		ILVs cultivated			
		Abidjan	Yamoussoukro	Local names	Usual names	Scientific names	
Urban	Main (Sole crops)	Airport-Portbouet	Ahoussoukoffikro	Kprala	Jute Mallow	<i>Corchorus spp</i>	
		M'Pouto-Cocody	Petit-Bouaké	Epinaard	Spinach	<i>Basella alba</i>	
		Banco-Yopougon		Brombrou	Amaranth	<i>Amaranthus spp</i>	
	Secondary (Associated crops)	Marcory-Sans fil	Garde Républicaine		Sôko	Lagos spinach	<i>Celosia argentea</i>
			Konan		Dah	Roselle	<i>Hibiscus sabdariffa</i>
			Fondation		Fouet	Black nightshade	<i>Solanum scabrum</i>
Marginal (Spontaneous crops)		Nanan		Winwin	Spider plant	<i>Cleome gynandra</i>	
		Djahakro					
Periurban	Secondary (Associated crops)	Gbagba-Bingerville	Zatta	Wossobrou	Sweet Potato leaves	<i>Ipomea batata</i>	
		Kilshier-Anyama	N'Gattakro Toumbokro				
	Marginal (Spontaneous crops)	Songon-Agban	Zambakro N'Dakonankro Aboukro	Anangobrou	Waterleaf	<i>Talinum fruticosum</i>	

Table 2: Markets of indigenous leafy vegetables in Abidjan and Yamoussoukro, Côte d'Ivoire

Type of market	Abidjan			Yamoussoukro		
	Markets	Traders	%	Markets	Traders	%
Principal	GouroAdjamé	65	16	Big Mkt	4	7
	Abobo	42	10			
	Attécoubé	39	10			
	Marcory	25	6			
	Port Bouet	21	5			
	Koumassi	18	4			
	Treichville	9	2			
	Forum Adjamé	7	2			
	Cocody	7	2			
	Anyama	23	6			
	Bingerville	14	3			
<b>Sub-total</b>		<b>270</b>	<b>66</b>		<b>4</b>	<b>7</b>
Secondary	Sicogi Yopougon	34	9	Losseni	22	36
	Wassakara	17	5	Fondation	16	26
	2 plateaux	16	5	Mô-faitai	10	16
	Notre Dame Treichville	10	2	Kokrenou	7	11
	Wharf Port Bouet	10	2	Mkt 220	2	3
	Carena Plateau	10	2			
	Cocody petit marché	10	2			
	Anono	10	2			
	Azibo	9	2			
	PK 17 Yopougon	7	2			
	Poulet Koumassi	4	1			
<b>Sub-total</b>		<b>137</b>	<b>34</b>		<b>57</b>	<b>93</b>
<b>Total</b>		<b>407</b>	<b>100</b>		<b>61</b>	<b>100</b>

Table 3: Socio-demographics characteristics of traders of indigenous leafy vegetables in Abidjan and Yamoussoukro, Côte d'Ivoire

		Traders of	
		Abidjan (%)	Yamoussoukro (%)
Sex	Male	2	-
	Female	98	100
Age	≤ 25 years	35	51
	> 25 years	55	49
Educational level	Illiterate	67	76
	Primary school	21	14
	Secondary school	10	6
	Franco-arable	2	4
Nationality	Ivorian	67	56
	Non-Ivorian	33	44
Marital status	Married	56	64
	Single	36	36
	Divorced	2	-
	Widow	6	-
Number of children	≤ 2 children	54	56
	> 2 children	46	44

Table 4: Typology of traders of indigenous leafy vegetables, source and frequency of markets supply in Abidjan and Yamoussoukro, Côte d'Ivoire

Sources of supply	Typology of traders (%)				Frequency of supply (%)			
	Producer-retailer	Wholesaler-retailer	Retailer	Total	weekly	2 or 3 times	daily	Total
<b>Abidjan</b>	<b>15</b>	<b>11</b>	<b>74</b>	<b>100</b>	<b>2</b>	<b>20</b>	<b>78</b>	<b>100</b>
Production sites	15	4	-	19	-	4	15	19
Markets	-	7	73	80	2	16	62	80
Door-to-door delivery	-	-	1	1	-	-	1	1
<b>Yamoussoukro</b>	<b>31</b>	<b>38</b>	<b>31</b>	<b>100</b>	<b>2</b>	<b>15</b>	<b>83</b>	<b>100</b>
Production sites	31	31	-	62	2	6	54	62
Markets	-	7	26	33	-	6	27	33
Door-to-door delivery	-	-	5	5	-	3	2	5

Figure 1: Daily incomes (\$US) generated from the commercialization of indigenous leafy vegetables in Abidjan and Yamoussoukro, Côte d'Ivoire

