Analysis of the Fruits and Vegetable Market Chain in Shomolu Local Government Area of Lagos State.

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Abstract: The study was carried out to analyze the fruit and vegetable market chain in Shomolu Local Government Area of Lagos state. The study was based on a survey of fifty marketers randomly selected in Bariga and Bajulaye markets in the area. A descriptive research design was used in the study and data were collected using oral interviews and a well-structured questionnaire. Data were analyzed using frequency counts, percentage, market margins, marketing channel analysis and multiple regression model to identify existing marketing channels used by vegetable marketers, determine the profitability of fruit and vegetable and isolate factors that affect quantity supplied of fruit and vegetable along the market chain. The study revealed that majority (74%) of the marketers are females. The average age of the fruit and vegetable respondent was (35.5). Local government harassments, lack of support from government, poor market stall, high cost of transportation and inadequate finance were the most perceived problems of marketing by the fruit and vegetable respondents. Channels that included local markets had high total gross margins. The regression analysis showed that quantity of fruit and vegetable produced, price of fruit and vegetable, access to market information, access to internet service and distance from the market are factors that influenced supply of fruit and vegetable in the markets. Among other things, measures that easy access to credit, reduce multiple taxes and permit on sellers are recommended.
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1. Introduction

Vegetable constitute the most important and inexpensive component of a balanced diet, which people now realize due to their high nutritive values indispensable for the body. Originally, vegetables were collected from the wild by hunter-gatherers and entered cultivation in several parts of the world, probably during the period 1,000BC to 7,000BC, when a new agricultural way of life developed.

Fresh tropical fruits are on winning ground in world markets as to recent statistical figures (Anonymous, 2001). Its production has risen by 7% annually since 1997 and the bulk of these fruits (98%) are grown in developing countries. The main reason for increase in demand of tropical fruits is the growing familiarity of consumers with tropical fruits; their taste, nutritional value and cooking qualities.

Lumpkin *et al*. (2005) pointed out that worldwide production of fruit and vegetable crops has grown faster than that of cereal crops. Between 1960 and 2000, the area under horticultural crops worldwide has doubled. Among the main reasons attributable to the growth, high return from horticulture has been reported up to five times higher. Promotion of the production of, and trade in, fruits and vegetables has recently become one of the key objectives of developing countries. IFAD's regional strategy for sub-Saharan Africa focuses on enhancing the income of small holders within the context of trade liberalization. Smallholder production and the marketing of fruits and vegetables is a key focus (IFAD, 2003). Most fruits are perennial trees and can live more than fifty years (e.g. Mangoes). Apart from their economic importance, they are forest and environmentally friendly to fight against drought, use as shade, firewood, food security, agro industry, export, etc. Fruits account for a substantial fraction of world's agricultural output and some of such as apple have acquired extensive cultural and symbolic meanings.

Fruits and vegetables are produced seasonally, but the market requires products throughout the year. As technology improved and consumer incomes increased, it became possible to provide fresh produce year-round.

Considering vividness in the requirement of soil and season, farmers can grow vegetable crops throughout the year for earning regular and steady income to meet the daily expenditure. Despite the importance of these crops there are various production constraints wherever they are grown in the country, which includes high cost of inputs, transportation, accessibility to market and insect pests and disease infestation. Many governments encourage their citizens to consume plenty of fruits and vegetables five or more portions a day often being recommended.

1.2 Statement of the Problem

The knowledge of domestic consumers of the benefits of fruits and vegetables is confined to very few varieties of fruits and vegetables. Hence, domestic demand with the exception of few widely known tropical fruits is generally small and various studies show that people generally consume fruits and vegetables on a daily basis without considering them as basic. According to Bezabin and Hadera (2007) stated that the production of fruits and vegetable is seasonal and price is inversely related to supply. During the peak supply period, the prices decline. The situation is worsened by the perishability of the products and poor storage facilities. Along the market channel, 25% of the product is spoiled. According to World Bank Group (2006), lack of concerted public support, scanty information, poor understanding of how the market chain works and lack of systematic documented knowledge are main threats that hampered the benefit of the sector. Thus, comprehensive data collection along the chain is a must to envisage the direction of input-output flows. If these jeopardy are not well addressed right onwards, it is obvious the country's competitiveness would trail far behind the existing stage. Even though fruit and vegetable are economically and socially important, fruits and vegetable marketing channel and their characteristics have not yet been studied and analyzed for local markets in Lagos state. Hence, the focus of the study to investigate fruits and vegetable market chains and factors affecting fruit and vegetable supply in Shomolu Local Government Area (SLGA). The outcomes here, hopefully will narrow the information gap on the subject and will contribute to better understanding on improved strategies for reorienting marketing system for the benefit of small farmers and traders.

The foregoing discussion, therefore, raises the following research questions:

- What are the socio economic characteristics of fruits and vegetable sellers?
- What are the problems of fruits and vegetable marketing in the study area?
- What are the major fruit and vegetable marketing channels in the study area?
- What are the marketing margins within the fruits and vegetable market chain?
- What are the factors that affect Fruit and vegetable supply in the study area?

This study, therefore, seeks to provide answers to these pertinent questions.

1.3 Objectives of the Study

The main purpose of the study is to analyze the fruits and vegetable market chain and investigate the factors that influence the supply of fruit and vegetable in Shomolu local government area of Lagos state.

The specific objectives of the study are:

- To determine the socio-economic characteristics of fruits and vegetable sellers.
- To identify the major fruits and vegetable marketing channels.
- To quantify the marketing margins within the fruits and vegetable market chain.
- To identify the factors affecting the quantity of fruits and vegetable supplied to the market.

2 Methodology

2.1 Study Area

Shomolu is a Local Government Area in the Ikeja division of Lagos State. It is one of the sixteen LGAs of metropolitan Lagos. It is located in the northern part of Lagos city. According to 2006 population census, it has 402,673 inhabitants. Most of its inhabitants are *Yorubas*. It is a major nerve center for commercial printing activities in Lagos. Also because of its enormous population, it has attracted huge commercial and industrial activities. Shomolu local government area harbours several industrial and commercial enterprises. The town is plagued by problems of overcrowding, poor housing and inadequate sanitation. Other articles of trade here is the marketing of agricultural produce such as rice, fruits, beans, garri, meat, vegetables, fish etc.

2.2 Data Collection and Sampling Techniques

Survey research design was used. All the fruit and vegetable marketers in the two main markets within the local government area namely, *Bajulaye* and *Bariga* formed the population for the study. The sample for the study comprised 50 fruit and vegetable sellers from the two markets randomly selected using the Simple random sampling. A well-structured questionnaire as well as oral interview was use to collect data. The questionnaire was divided into two sections, Section A was designed to gather information on personal data of respondents, while Section B was designed to gather information on the perceived problems, channels of marketing, favourability of sources of supply, distance from farm of supply, how they get latest information about prices etc., used in analyzing the fruit and vegetable market chain. The questionnaire was read to the respondents in vernacular and responses documented accordingly.

2.2 Method of Data Analysis

The data collected were summarized using frequency counts and percentages, while the marketing margin analysis was used to determine the profitability of fruit and vegetable along the market chain. The Multiple linear regression analysis was used to estimate the factors that affect the supply of fruit and vegetable.

2.2.1 Gross Market Margin Analysis:

$$TGMM = \frac{Cprice - Pdprice}{Cprice} X100$$

$$GMMp = \frac{Cprice - MGM}{Cprice}$$

$$Pdshare = \frac{Pdprice}{Rtlprice}$$

Where:

TGMM = Total gross marketing margin

GMMp = Producer's gross marketing margin

MGM = Marketing gross margin

Csprice = Consumer's price

Pdprice = Producer's price

Rtlprice = Retail price

Pdshare = Producer's share

2.3.2 The regression model was specified as follows:

$$Y_i = \alpha_i + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + ... + \beta_i X_i + \upsilon_i \quad (1)$$

Where: Yi = quantity of fruit and vegetable supplied to market

α_i = Intercept

$ß_i$=Coefficient of the ith explanatory/independent variable

X_i = Vector of explanatory variables

U_i = disturbance term

Hence, the equation for the quantity of avocado supplied is: Quantity of fruit and vegetable Supplied = α_i+ $ß_1$Gender + $ß_2$Age+ $ß_3$Household size + $ß_4$Edu + $ß_5$Distance + $ß_6$ Experience + $ß_7$Quantity produced + $ß_8$Price + $ß_9$Internet + $ß_{10}$Market Information + $ß_{11}$ credit + Ui

Definition of variables and Hypotheses

Dependent variable

Quantity Supplied: It is a continuous variable that represents the dependent variable; the actual supply of fruit to the market, which is measured in Kg.

Independent (Explanatory) variables:

The explanatory variables estimated to influence the dependent variable are the following:

1. Distance to nearest market: It is a continuous variable that is measured in kilometers which marketers cover to buy at the farm gate. The closer to the market the lesser would be the transportation cost and time spent. Therefore, it is hypothesized that this variable is negatively related to quantity supplied of fruit and vegetable to the market.

2. Gender of the marketer: gender is a dummy variable that takes a value of one if the marketer is male and zero otherwise. Both men and women participate in fruit and vegetable marketing. It could take positive or negative signs of coefficients.

3. Quantity of produced: This variable had important influence on market supply. It is expected to influence it positively. It is a continuous variable measured in kilogramme. We hypothesized that the higher they produce, the more likely the household would supply to market. Producers who produce more output than expect would supply more fruit to the market than those who produce less.

4. Market information: This is measured as a dummy variable giving value of one if the farmers had access to market information and zero if not. Farmers marketing decisions are based on market price information. Abay (2007) conclude that those farmers who had better information is to be expected to supply more fruit to the market. Therefore, it is hypothesized that market information is positively related to marketable fruit and vegetable supply.

5. Internet service access: This variable is measured as a dummy variable taking a value of one if the household has access to internet service and zero if not. Internet service will avail marketers of latest information on price, technology etc for efficiency better market. So, this variable is assumed to have positive relation with quantity supply of fruit and vegetable.

6. Education: This is a continuous variable measured in years. According to Gizachew (2006), education increases farmers' ability to get and use information, since households with better knowledge are assumed to adopt better practices. So, in this study this variable is assumed to have positive relation with marketable supply of fruits.

7. Price of fruit and vegetable: This is a dummy variable. This indicate one when prices are favourable and zero, otherwise. Therefore, it is hypothesized that this variable could be positive or negative.

8. Access to credit: This is a dummy variable, which assumes a value of one if the marketers have credit access and zero if not. Access to credit could enhance the financial capacity of the marketers to purchase the increase their stock. Therefore, it is hypothesized that access to credit would have positive influence on quantity of supply to the market.

9. Age of marketer: It is a continuous variable it is measured in years. A marketer with longer period of experience in marketing was assumed to have a better knowledge than who has a lowerexperience in agriculture because through time skill are acquire about marketing and supply.

better than those who are less experienced. It was also assumed that as age increases the production capacity will decrease and amount produced and marketed supply decrease. Hence, both inverse and direct relation was assumed to the amount supplied.

10. Years of Experience: This is a continuous variable measured in number of years spent marketing fruits and vegetable. It is hypothesized to be directly related to quantity of fruit and vegetable supplied.

11. Household size: This is a continuous variable that refers to the numbers of people in the family. It proposed to influence supply of fruit production positively. The more number of family members an individual had the more agility he put into marketing to be able to secure returns enough to cater for the family.

3. Results and Discussion

3.1 Socio-economic characteristics of the respondents

The socio-economic characteristics as shown Table 1 below are expected to play important roles in the economic performance of the fruit and vegetable respondents.

All the fruit and vegetable respondents were within 20-60 years age bracket. Majority of the fruit and vegetable respondents fall within the age bracket, 31-40 years representing (38.0%). This implies that, the respondents are neither too young nor too old and a glorious future for fruit and vegetable marketing. Most of the fruit and vegetable respondents were females (74.0%), while few were males (26.0%). This implies that more females are into fruit and vegetable marketing than males which perhaps may be due to the low economic status surrounding the business. Most of the fruit and vegetable respondents (54.0%) have family members that comprised 4-6persons. With others having between 7and 12 household size (14.0%), majority of the respondents have large households.

Table 1 further shows most of the fruit and vegetable respondents are married (68.0%) with about 16.0 and 7% being single and widow respectively. Also, few (7%) of the fruit and vegetable respondents have had education up to tertiary level and primary education (7%), while (38%) had secondary education and (17%) had no formal education. This implies that many of the fruit and vegetable respondents have had considerable level of formal education background that could enhance human capital development. The year of involvement in fruit and vegetable marketing was found to be over 12years (28%). This indicates that, the fruit and vegetable respondents are well experienced in their enterprise.

This table also shows that 58.0% of the fruit and vegetable respondents were Yoruba, 28.0% were Igbo, while 14.0% of the fruit and vegetable respondents were Hausa. This indicates that, the *Yorubas* constitute the majority in fruit and vegetable marketing. With respect to religion, majority of the fruit and vegetable respondents are Christian (56.0%), while the rest (44.0%) are Muslim. Results further shows fruit and vegetable marketing is major source of livelihood for the participants as majority (76.0%) indicated that they have no other sources of income. They largely engage in retailing as about 64% of they indicated they sell both in dozen and units while only about 30% sells bulk. Similarly, the table showed that, majority of the fruit and vegetable respondents (68%) market their produce through retailer while (32%) of the fruit and vegetable respondents market their produce through wholesaler.

As per the sources of finance to their business, majority of the fruit and vegetable respondents (52%) got their source of capital from personal savings, 24% got from cooperatives while trade payables (8%), gift from relatives (10%) and loan (6%) formed the least sources. Interestingly, majority of the respondents (70%) claimed to be in possession of internet enabled phone.

Table 1: Socio-Economic Characteristics of Respondents Fruit and Vegetable Marketers.

Characteristics	Frequency	Percentage (%)	Mean
Age			
20-30	12	24.0	
31-40	19	38.0	
41-50	13	26.0	46
51-60	6	12.0	
Total	50	100.0	
Gender			
Male	13	26.0	
Female	37	74.0	29
Total	50	100.0	
Household size of respondents			
1-3	16	32.0	
4-6	27	54.0	
7-9	6	12.0	6

Characteristics	Frequency	Percentage (%)	Mean
10-12	1	2.0	
Total	50	100.0	
Marital status of respondents			
Single	8	16.0	
Married	34	68.0	
Widow	2	4.0	18
Separated	6	12.0	
Total	50	100.0	
Educational qualifications of respondents			
Primary	7	14.0	
Secondary	19	38.0	
Tertiary	7	14.0	12
Non-formal	17	34.0	
Total	50	100.0	
Years of experience of respondents			
1-3	8	16.0	
4-6	8	16.0	9
7-9	12	24.0	
10-12	8	16.0	
Others	14	28.0	
Total	50	100.0	
Tribe of respondents			
Yoruba	29	58.0	
Igbo	14	28.0	17
Hausa	7	14.0	
Total	50	100.0	
Religion of respondents			
Christian	28	56.0	
Muslim	22	44.0	23
Total	50	100.0	
Other source of income of respondents			
Yes	12	24.0	
No	38	76.0	27
Total	50	100.0	
Forms in which fruit and vegetable are sold			
Bulk	15	30.0	
Dozen	18	36.0	13
Single	17	34.0	
Total	50	100.0	
Modes of Marketing Fruit and Vegetable			
Retailer	34	68.0	
Wholesaler	16	32.0	
Total	50	100.0	
Sources of Capital			
Relatives	5	10.0	
Personal savings	26	52.0	
Credit buying	4	8.0	
Cooperatives	12	24.0	
Loan	3	6.0	
Total	50	100.0	
Has Internet Enabled Phone			
Yes	35	70	

Characteristics	Frequency	Percentage (%)	Mean
No	15	30	
Total			

Source: Field Survey, 2015

3.1.1 Problems of Fruit and Vegetable Marketing in the Study Area

The Table 2 reveals that local government harassments (74%), lack of support from government (74%), poor market stall (68%), high cost of transportation (56%) and inadequate finance (46%) were the highest problems of marketing faced by the fruit and vegetable respondents while lack of market information (28%), high costs of fruit and vegetable (28%), insufficient supply of fruit and vegetable (28%), low demand of fruit and vegetable (26%) and inadequate storage facilities (22%) were the lowest problems of marketing faced by the fruit and vegetable respondents.

Table 2: Summary of problems faced by fruit and vegetable respondents

Problems	Agree (%)	Disagree (%)
Inadequate finance	23 (46.0)	27 (54.0)
Inadequate storage facilities	11 (22.0)	39 (78.0)
High cost of transportation	28 (56.0)	22 (44.0)
Insufficient supply of fruit and vegetable	14 (28.0)	36 (72.0)
Poor market stall	34 (68.0)	16 (32.0)
Local government tax collectors harassments	37 (74.0)	13 (26.0)
High costs of fruit and vegetable	14 (28.0)	36 (72.0)
Low demand of fruit and vegetable	13 (26.0)	37 (74.0)
Lack of support from government	37 (74.0)	13 (26.0)
Lack of market information	14 (28.0)	36 (72.0)

Source: Field Survey, 2015

3.2 Fruit and Vegetable Marketing Channels and Margins

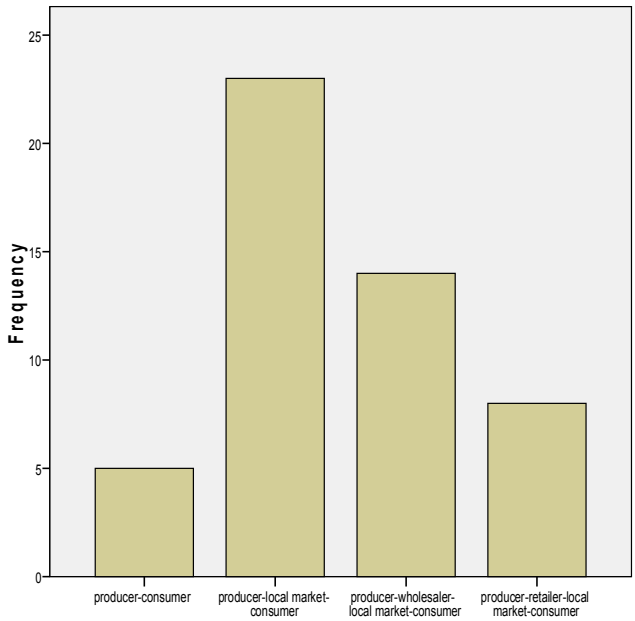

Figure 1: Fruit and Vegetable Marketing Channels
Source: Field Survey, 2015

Figure 1 presents channels through which fruit and vegetable move from the production site until they reach the final buyer. According to Teka (2009), a marketing channel involves a series of intermediaries through which fruit and vegetable pass from producers to consumers. As Figure 1 shows, the 2nd channel- Producer-local market-consumer has the highest rank.

It also means that the local market will have the largest share from the sales because the goods will be sold at a price that will bring about high income.

Table 3: Market channels and marketing margin analysis for fruit and vegetable

Market Actors	Marketing Measures	Fruit and Vegetable market channels			
		CHA-1	CHA-2	CHA-3	CHA-4
Producer	Price	**13,750.00**	**13,750.00**	**13,750.00**	**13,750.00**
Local market	Price		**62,750.00**	**62,750.00**	**62,750.00**
	Gross margin		**3,202.82**	**3,202.82**	**3,202.82**
Wholesaler	Price			**42,000.00**	
	Gross margin			**3,440.21**	
Retailer	Price				**22,000.00**
	Gross margin				**3,019.91**
Total Gross Marketing Margin		**14,405.17**	**73,664.92**	**48,162.95**	**24,159.28**

Source: Field Survey, 2015; Note: CHA=channel
Ranks of channels by producer's share
Channel-1 Producer→consumer;
Channel-2 Producer→localmarket→consumer
Channel-3 Producer→wholesaler local market→consumer
Channel-4 Producer→retailer→localmarket→consumer

Four marketing channels were identified for fruit and vegetable in the study area as indicated in Table 3 and figure 1. The results revealed that most of the fruit and vegetable goes through channel-2, followed by channel-3 and channel-4. Channel-1 accounted for the least of the fruit and vegetable in the market. The possibility here is that the producer does not make enough profit from channel-1.

3.3. Factors affecting quantity supplied of fruit and vegetable in the SLGA

In this section the factors that influence the supply of fruits and vegetable are presented and discussed. Multiple linear regression models were employed to analyze the factors that affect the supply of fruit and vegetable. Before estimating the parameters multicolliniarity and heteroscedasticity detection tests were performed using appropriate test.

Table 4 presents the determinants of the supply of fruit and vegetable. The result shows that among the eleven hypothesized determinants of market supply of fruit and vegetable, five variables were found significant. These are quantity of fruit and vegetable produced, price of fruit and vegetable, access to market information, access to internet service and distance from the market. The coefficient of multiple determinations (R^2) was estimated (0.876) and adjusted R^2 value was 0.846. This means that 87.6% of the variation in the dependent variable is explained by the explanatory variables included in the model. Furthermore, the adjusted R^2 of 84.6% which is significant further consolidated the goodness of the model. The result in table 4 shows that the quantity produced is significantly and positively related to marketed supply of fruit and vegetable at 1% significance level. The value of the coefficient for production of fruit and vegetable implies that an increase in production of fruit and vegetable by one unit per hectare resulted in an increase in farm level marketable supply of fruit and vegetable. Similarly, the result shows that the price of fruit and vegetable is significantly and positively related to marketed supply of fruit and vegetable at 10% significance level. This complied with the law of supply that price and quantity supplied are directly related. Thus as the price fruit and vegetable increase in the market, farmers will supply more quantity of fruit and vegetable to the market to get better returns for the products. A priori, access to market information is positively related to market supply of fruit and vegetable at 10% significance level. As hypothesised access to internet service affected the marketed supply of fruit and vegetable positively and significantly at 5% significance level. This might be because internet service enables the traders to have better knowledge

about how to get better production and productivity, and creates awareness about new technologies. Distance from the market is significantly and negatively related with the marketed supply of fruit and vegetable at 1% significance level. As the distance from the production area to market place become farther and farther, the producers supply lesser quantity of fruit and vegetable to the market. This is might not be unconnected with the nature of the product (i.e. perishability) and the costs which are related with transportation and handling.

Table 4: Factors affecting the supply of fruit and vegetable

Variables	Coefficients	Std.Err.	t	P-value
Constant)	-0.267	0.981	-0.273	0.786
Gender	0.100	0.185	0.543	0.589
Age (in years)	0.001	0.009	0.098	0.923
Education	0.011	0.078	0.134	0.893
Quantity produced	0.732***	0.024	30.825	000
Price of F & V	0.003*	0.002	1.756	0.084
Household size	0.054	0.042	1.286	0.203
Years of experience	0.002	0.027	0.091	0.928
Access to market information	0.125*	0.069	1.81	0.073
Access to internet service	0.522**	0.199	2.620	0.011
Distance from the market	-0.170***	0.060	-2.820	0.006
Access to credit service	0.033	0.186	0.178	0.895
$R^2$0.876				
Adjusted R^2 0.846				

4. Recommendation and Conclusion

This study investigated the fruit and vegetable marketing chains in shomolu Local Government area of Lagos with the of unravelling the routes through which fruit and vegetable reached consumers in this area, the problems being faced by their sellers, the returns and factors which affect the supply of fruit and vegetable to the two prominent market in the Local Government area. Summarily, majority (74%) of the respondents involved in fruit and vegetable marketing are females are within the age bracket of 31-40 with household size ranging from 4-6 and married (68%). Also, Majority had relatively sufficient years of education (12 years) and adequate trading experience (12 years). The major problem of fruit and vegetable marketing is limited access to external finance as majority (52%) of the respondents got their source of capital from their personal savings. Equally worrisome, is harassment and sometimes crating away of goods (fruit and vegetable) by government officials.

The study reveals that the channel with high total gross marketing margin obtained was through producer-local market- final consumer. It also shows that quantity of fruit and vegetable produced, price of fruit and vegetable, access to market information, access to internet service and distance from the market influenced quantity of fruit and vegetable supplied to the market.

Based on this study, it is recommended as follows:

One, as revealed by this study, marketing channel affects profit margin thus, Fruit and Vegetable marketers should be assisted in identifying the best channel. Two, marketers should form cooperatives in order to arrest price volatility within the fruit and vegetable supply chain. Three, since rents and permits are charged on each sellers, Government should provide adequate market stall for the marketers to store and display their goods. Excess taxes are spread on price thus escalating prices and reducing demand/ sales, government should help streamline multiple permits and taxes imposed on fruit and vegetable sellers. Finally, Policies that ease access to loan and financial support to agribusiness should be promoted.

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