



Gender Participation in Cassava Production, Processing and Marketing in Anambra State, Nigeria

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Abstract

In most parts of rural Nigeria, division of labor within the households is gender specific and according to age. Men and women perform different roles; have unequal decision-making power as well as differences in access to land and control over agricultural productive resources. As a result of these differences, their views, needs, priorities and constraints to improving their productive potentials differ. In view of this, the study investigated gender participation constraints in cassava production, processing and marketing in Anambra State, Nigeria. Primary data were collected randomly from 65 male and 65 female cassava farmers using a structured questionnaire. Data were analyzed using descriptive statistics. Results revealed that 90.8%, 89.2%, 53.8% and 46.2% males took part in cassava production operations like insect and pest management, land preparation, weeding and planting of cassava whereas 64.6%, 69.2%, 95.4% and 92.3% females carried out the same activities.

However, all males and females (100%) participated in harvesting operations. Results also showed that 44.6%-92.3 males participated in transportation of roots to house, peeling, washing, fermenting, grinding, squeezing, sieving, toasting, milling and packaging, while 76.9-96.9% females participated in the same activities. All females (100%) engaged in sieving operations. Furthermore, respondents engaged in all marketing activities with females recording higher participation in sales of produce/products (100%), storage (93.8%), sorting (90.8%), grading (89.2%), bulking of the produce (89.2%), advertisement/promotion (87.7%), assembling of the produce (84.6%), standardization of measurement (63.1%), among others while males participated more in transportation of produce to market (95.4%), loading and offloading (92.3%) and standardization of measurement (90.7%). All (100%) females took part in selling of cassava. Both gender faced similar constraints and employed similar strategies for improving participation in cassava enterprises. The study concluded that both males and females participated actively in cassava production while a greater percentage of females took part in processing and marketing. It is recommended that research and extension should target both male and female cassava farmers with appropriate technologies that will improve their participation in cassava value chain development to enhance their income, standard of living and provide employment.

Keywords: Gender; Constraints; Cassava Value Chain

Abbreviations: CBDF: Cassava Bread Development Fund; IFAD: International Fund for Agricultural Development.

Introduction

Nigeria is an oil-rich country and agriculture is still an important economic sector that serves as a major source of raw materials, food and foreign exchange that employs over 70% of the labour force [1]. Cassava is an important crop that has great potential to support agricultural growth in Nigeria due to its wide range of uses from human consumption to industrial applications [2]. Africa produces 40–50% of the global cassava output and Nigeria is one of the leading producers [3]. Demand for cassava derivatives, such as starch, gari (a type of processed cassava), tapioca, etc., have doubled over the last two decades and in recent years, the establishment of the Cassava Bread Development Fund (CBDF) and the Cassava Transformation Project by the Nigerian government have further raised hopes for improving the cassava sector [2]. In Nigeria, cassava is one of the most important crops for farmers; also the most widely cultivated crop that provides food and income for over 30 million farmers and large number of processors and traders. As a crop with by-products that have a wide array of uses, cassava is the most important food crop for Nigeria by production quantity next to yam which is the most important food crop by value.

According to FAO (1997), cassava roots are very rich in starch and contain significant amounts of calcium (50mg/100g), phosphorus (40mg/100g) and vitamins (25mg/100g). However, the leaves are a good source of protein if supplemented with the amino acid methionine despite containing cyanide. Africa produces over 54% of the world's cassava with Nigeria taking the global lead with a production of about 54.8 million metric tonnes in 2014 (FAO, 2014). Cassava is grown in all agro-ecological zones of Nigeria but thrives in the rainforest and derived savannah areas. Production is highest in the North-Central and South-South regions. Cassava is a root crop which originated in South America and is grown in tropical and subtropical areas throughout the world. Cassava is the most important crop in Africa by both production weight and value because it provides a similar source of calories as rice. Its drought-tolerance, resilience on marginal agricultural land and ability to be stored in the ground up to three years make it an important food security crop for smallholder farmers (FAO, 2000). It is a staple and also a famine reserve crop and can be an important food source when drought and conflict prevent production of other food crops. As noted by Moses, Asafu-Agyei, Adubpfluor & Augustine, cassava-based farming communities cope better in hunger stressed times and uncomfortable situations. The crop provides a reliable and inexpensive source of carbohydrates for people in sub-Saharan Africa, where consumption is the highest per capital in the world. In most parts of rural Nigeria, division of labour

within the households is gender specific and according to age. Men and women perform different roles, have unequal decision-making power as well as differences in access to land and control over agricultural productive resources.

As a result of these differences, their views, needs, priorities and constraints to improving their productive potentials differ. This could affect their various outputs even in cassava enterprise development. However, the understanding of gender participation and constraints in cassava production, processing and marketing among rural farmers in Anambra State, Nigeria is important in view of the current threat to food security as a result of the economic recession facing the country and the need to increase and sustain the enterprise among farmers. This will ensure effective allocation of resources for increased and sustainable cassava development activities, thereby increasing cassava outputs for improved livelihoods for the people. Gender is a term often associated with roles and responsibility of males and females in the society as a social classification of sex. It is the socio-cultural differences between males and females as against the biological differences.

It is also described as a concept used in social science analysis to look at roles and activities of men and women. Thus, the focus of gender analysis is not biological differences between men and women but rather on their experiences as members of society. Gender participation give insight into issues affecting women and it is focused mainly on the relationship of both men and women to the social and economic structure of a society. In view of this, the research therefore looked into the socio-economic characteristics of cassava farmers in the study area; determine the gender participation in cassava production, processing and marketing; identify gender constraints to cassava production, processing and marketing; and suggested strategies for improving gender participation in the production, processing and marketing of cassava produce/products.

Methodology

The study area for this research is Anambra State. The State is presently located in the South-east of Nigeria. The State is bounded by Delta State to the West, Imo State to the South, Enugu State to the East and Kogi State to the North. It has estimated population of 4, 177, 828 million people (National Population Commission, 2006) which stretches over about 60kilometers between surrounding community. The State lies on the longitude 6° 35E and 7° 21E and latitude of 5.38N and 6° 47E (Wikipedia. org/Wiki anambra State, 2010). Anambra State comprises 21 local governments and is predominantly occupied by Igbo people who are farmers. Anambra State comprises four agricultural zones: Awka,

Anambra, Aguata and Onitsha zones.

The target population for this study was all the cassava farmers in the state. Multistage sampling techniques were used for this study. In the first stage, five local governments out of the 21 local governments were purposively selected due to the popularity in cassava production; they are Ayamelum, Anambra East, Anambra West, Awka North and Ogbaru Local government. In the second stage, two communities each from the listed local governments were selected to give a total of ten communities that were used for the study. In third stage, 13 farmers each from the community were selected and this gave a total of 130 respondents. Data for the study were collected from primary sources using a structured questionnaire. Data were analyzed using descriptive statistics such as frequency, percentage and mean scores.

Results and Discussion

Age (years): The results in Table 1 showed that 24.6 % and 46.2% of the male and female respondents respectively were within the age bracket of 21-30 years. Similarly, 58.5% and 38.5% of the male and female farmers fell within the age bracket of 31 - 40 years while 12.3% and 9,2% of respondents were within the age bracket of 41-50 years. Also, 4.6% of the male respondents were above 50 years of age, while only 6.2% of the female farmers fell into this category. The average age for the respondents was 53 years and 37 years for males and females respectively. This implies that female cassava farmers were younger than their male counterparts. It also implies that the population was made up of middle age farmers, whose strength and energy are vital in cassava production, processing and marketing [4]. The finding corroborated with the study of Agada, Onochie and Mbah which reported that female cassava in Makurdi, Benue State, Nigeria were younger than their male counterparts with the mean age of 45.7 and 36.9 years for males and females respectively.

Education: Majority of the male (55.4%) and the female (58.5%) respondents had an appreciable level of post primary education whereas 13.8% of the males and 15.4% of the females had no formal education. This implies a population that can easily learn and offers an easy communication platform for the transference of innovation with respect to better ways of producing, processing and marketing cassava. Since the finding reveals that a higher percentage of the respondents had formal education, thus adoption of innovation by the farmers in the study area could be more effective.

Household size: Findings in Table1 also revealed that 15.4% of the male and 55.4% of the female respondents had a household size ranging between 6 and 10 persons with an average household size of 11 persons and 10 persons for

male and female farmers respectively. This shows that males had larger household sizes compared to females. The finding is in line with the general practice of communal life common in the study area. This can be an indication of availability of family labor for cassava production, processing and marketing for both male and female farmers considering the fact that labor is a major factor of cassava production [5].

Cassava farm size (ha): The results revealed that majority of the respondents (males= 58.5%; females= 61.5%) had farm sizes ranging from 3-4 hectares each with mean farm size of 1.9 hectares for both male and female farmers. This result implies that majority of the respondents were smallholder cassava farmers and this may have a negative effect on their productivity.

Farming experience (years): The result in Table 1 shows that 53% and 58.5% of the male and the female respondents had farming experience of less than or equal to 10 years with mean farming experience of 17 years and 16 years for the male and female farmers respectively. Given the mean age of the farmers as 53 years and 37 years for male and female respectively, it implies that the respondents started cultivating cassava early in life and hence could be considered experienced in cassava farming and this experience is crucial in ensuring sustainable cassava production and productivity.

Membership of social organizations: Results showed that 73.8% of the male and 80% of the female respondents belonged to one association or another while 26.2% of the males and 20% of the females were not members of any association. This implies that majority of male and female cassava farmers were members of social organizations where they come together for mutual benefits. Farmer organizations are essential institutions for empowerment, poverty alleviation and advancement of farmers and the rural poor. Although, both gender belonged to various social organizations, more females than males were members of such organizations. This is expected as females have more leisure time than males which could be invested in attending meetings. This finding is contrary to the findings of Agada, Onochie and Mbah, who said males have more leisure time than females which could be invested in attending meetings.

Income (naira): This study revealed that the mean cassava income for the males was **₦52,466.7** while that of the females was **₦60,908.0**. The result implies that the income from cassava was higher for females than for males. It also showed that more people earned an annual cassava income of ₦50, 000 and below. This implies that both male and female farmers in the study area were small scale cassava farmers. With such income, the continued participation of the respondents in cassava cultivation might be threatened in the future. The study agrees with the report of Akinbile and Ndaghu [6]; Onochie and Mbah, who observed that low income from cassava production might threaten continued participation of males and females in cassava cultivation.

Characteristics	Male (n=65)		Female (n=65)			
	Frequency	Percentage	Mean	Frequency	Percentage	Mean
Age (years)						
21-30	16	24.6		30	46.2	
31-40	38	58.5		25	38.5	
41-50	8	12.3	53.0	25	9.2	37.0
>50	3	4.6		6	6.2	
Education						
Non-formal	9	13.8		10	15.4	
Primary	15	23.1		15	23.1	
Secondary	36	55.4		38	58.5	
Post-secondary	5	7.7		2	3.1	
Household size						
<5	30	15.4		36	55.4	
6-10	16	24.6	11.0	20	30.8	10.0
11-15	9	13.8		5	7.7	
16-20	6	9.2		2	3.1	
>20	6	6.2		2	3.1	
Cassava farm size (ha)						
1.99	38	58.5		40	61.5	
2-2.99	20	20.8	1.9	20	30.8	1.9
3-3.99	7	10.8		5	7.8	
Farming experience (years)						
≤10	35	53.3		38	58.5	
11-20	15	23.1		13	20.0	
21-30	10	15.4	17.0	8	12.3	16.0
>30	5	7.7		6	9.2	
Membership of farmer Association						
Yes	44	73.8		52	80.0	
No	17	26.2		13	20.0	
Annual cassava farm income (naira)						
≤50,000	38	58.5	52,466.7	40	61.1	60,908.0
50,001- 100,000	23	35.4		23	35.4	
>100,000	4	7.7		2	3.2	

Table 1: Socio-Economic Characteristics of Cassava Farmers by Gender. **Source:** Field survey, 2019

Gender Participation in Cassava Farming Operations

The participation of male and female farmers in cassava production operations are presented in Table 2. The findings showed that 89.2% of the male farmers were engaged in land preparation compared to 69.2% of the females who took part in the same activity. The results also revealed that while 46.2% each of the males participated in planting, 92.3% of the females took part in the same activities. In addition, while 90.8% of the male farmers took part in insect/pest and disease management, 64.6% of the females were participated in the same activity. Furthermore, the result of the study showed that 53.8% of the male farmers were engaged in weeding compared to 95.4% of the females who participated in the same activity. All males (100%) and

females (100%) participated in harvesting operation.

Both male and female cassava farmers were engaged in all the cassava farming operations. However, the female respondents recorded higher participation in some of the cassava farming operations compared to the males. Therefore, it is important to note that women's activities in root production have increased due to increased need for food and cash and this will as well help to reposition agriculture for economic development. The findings agreed with the earlier report by the International Fund for Agricultural Development (IFAD), (1994) that females normally do weeding, planting and harvesting. This has implication for research and extension to reach out to both male and female cassava farmers in the study area with appropriate technologies and information.

Farming Operations	Male (n=65)		Female (n=65)	
	Frequency*	Percentage	Frequency*	Percentage
Land preparation	58	89.2	45	69.2
Planting	30	46.2	60	92.3
Weeding	35	53.8	62	95.4
Insect pest and disease management	59	90.8	42	64.6
Harvesting	65	100	65	100

Table 2: Gender Distribution of Respondents According to Participation in Cassava Farming Operations. Field survey: 2019

Gender Participation in Cassava Processing

The results on participation of male and female farmers in cassava processing in the study area indicated that 53.8% of the males took part in peeling of cassava tubers compared to the 81.5% of the females who took part in the same activity. However, 92.5% of the males participated in transportation of the cassava roots to the house compared to the 76.9% of the females who engaged in the same operations. More so, 64.6%, 49.2%, 50.8%, 46.2% and 44.6% of males involved in washing of peeled roots, fermenting of tubers, sun drying, squeezing and grinding compared to 95.4%, 96.9%, 89.2%, 96.9% and 90.8% of the females who participated in the same operations. In addition, all the females (100%) were engaged in sieving operation against 43.2% of the males who participated in the same operation. Packaging (56.9%), toasting (52.3%), chipping (98.3%), squeezing water out of the tubers (96.7%), and milling (53.8%) activities were undertaken by the males. In contrast, 90.8% of the female farmers took part in packaging, toasting (89.2%), chipping (87.7%) and milling (87.7%). Other processing activities which recorded less than 60% male respondents'

participation included peeling of roots (53.8%), sun-drying (50.8%), grinding (44.6%), sieving (43.1%), toasting (52.3%), squeezing water out of the roots (46.2%), fermenting of tubers (49.2%), packaging (56.9%), chipping (58.5%) and milling (53.8%). The results imply that both male and female respondents were engaged in cassava processing in the study area. However, the participation of females in cassava processing activities was higher compared to their male counterparts. This was expected as crop processing is one of the main pre-occupations of rural female farmers in Nigeria.

However, men are becoming more involved since cassava processing has become more lucrative. The result agrees with the finding of Riisgard [7]; Onochie and Mbah, who reported that small scale cassava processing is the domain of women. The implication of this finding for extension workers is to disseminate information on improved cassava processing to both male and female farmers in the study area. Also, extension agents should encourage both gender to form groups for easy access to loan facilities that would enable them acquire processing equipment's for processing quality products for the markets.

Activities	Male (n=65)		Female (n=65)	
	Frequency*	Percentage	Frequency*	Percentage
Transportation of tubers to the house	60	92.3	50	76.9
Peeling of tubers	35	53.8	53	81.5
Washing of peeled tubers	42	64.6	62	95.4
Fermenting of tubers	32	49.2	63	96.9
Squeezing water out of the tubers	30	46.2	63	96.9
Sun-drying	33	50.8	58	89.2
Grinding	29	44.6	59	90.8
Sieving	28	43.1	65	100
Packaging	37	56.9	59	90.8
Toasting	34	52.3	58	89.2
Chipping	38	58.5	57	87.7
Milling	35	53.8	57	87.7

Table 3: Gender Distribution of Respondents According to Participation in Cassava Processing. Field survey: 2019

Gender Participation in Cassava Marketing

The results on participation of male and female farmers in cassava marketing indicated that most respondents took part in assembling of products or produce (male=60%; female=84.6%); bulking of produce/products (males=43.1%; females=89.2%); storage of products and produce (males=47.7%; female=93.8%); transportation of products/produce to the market (males=95.4%;female= 60%); loading/offloading (males=92.3%; females=58.5%); sorting (male=50.5%;female= 90.8%); grading (males=50.8%; females=89.2%); advertisement/promotion (males=44.6%; females=87.7%); standardization of measurement (males=90,7%; females=63.1%); and sales of produce/

products (males=58.5%; females=100%). The findings show that both male and female farmers participated in cassava produce and product marketing, but females were more involved in the marketing activities compared to their male counterparts. The results of this study agree with the report of IFAD (1994); Onochie and Mbah, which noted that women play a dominant role in marketing of cassava and other crops. In many cases, women buy the agricultural produce from their husbands and other farmers and market this at a profit. At times, they buy cassava in the soil, harvest, process and market. Women farmers would, therefore, need access to nearby markets where they can easily dispose of their produce/products and prevent deterioration which will reduce their income and food security.

Activities	Male (n=65)		Female (n=65)	
	Frequency*	Percentage	Frequency*	Percentage
Assembling of products or produce	39	60	55	84.6
Bulking of products and produce	28	43.1	58	89.2
Storage of products or produce	31	47.7	61	93.8
Transportation of products and produce to the market	62	95.2	39	60
Loading/ unloading	60	92.3	38	58.5
Sorting	38	50.5	59	90.8
Grading	33	50.8	58	89.2
Advertisement/promotion	29	44.6	57	87.7
Standardization of measurement	59	90.7	41	63.1
Sales of produce/products	38	58.5	65	100

Table 4: Gender Distribution of Respondents According to Participation in Cassava Marketing. Field survey, 2019

Gender Constraints to Participation in Cassava Production, Processing and Marketing

Entries in Table 5 showed the respondents' constraints to participation in cassava production, processing and marketing. The results revealed that both gender were faced with 11 serious production constraints out of the 13 listed while all the respondents faced the same processing constraints. Also, both male and female farmers were confronted with the marketing problems such as high cost of bulking and transportation (Male: M=2.4; Female: M=2.3), poor linkages between markets, producers and processors (Male: M=2.1; Female: M=2.3), lack of government or institutional support for market development (Male: M=2.1;

Female: M=2.3), weak market information (Male: M=2.4; Female: M=2.4).The results indicated that both male and female cassava farmers experienced similar constraints in cassava production, processing and marketing.

The findings agree with the report of Asante-Pok [8] who noted that the constraints in cassava production include a wide range of technical, institutional and socioeconomic factors. It is important to note that without disease resistant and high-yielding seed varieties, adequate post-harvest processing technologies and access to ready markets, farmers may not be willing to invest in cassava enterprise development.

	Male (n=65)		Female (n=65)	
	Mean	Standard Deviation	Mean	Standard Deviation
Production Constraints				
High cost of improved varieties	1.8	0.8	1.6	0.7
Lack of good quality planting materials	1.7	0.7	1.8	0.7
Inadequate input supply	2.3	0.8	2.3	0.7
High cost and unavailability of fertilizers, herbicides, pesticides, etc to farmers when needed	2.4	0.7	2.2	0.7
Poor access to credit	2.3	0.7	2.3	0.7
Inadequate extension services	2.2	0.8	2.3	0.7
Unavailability and unaffordability of tractor rental services and other labor saving devices	2.4	0.9	2.4	0.7
Low soil fertility	2.4	0.7	2.3	0.8
Weed problem	2.4	0.7	2.3	0.7
High incidence of pest and disease infestation	1.8	0.8	2.4	0.7
Poor cultural practices	2.3	0.7	2.2	0.9
Shortage/high cost of labor	2.2	0.7	2.2	0.8
Low rate of adoption of improved technical packages by Farmers	2.3	0.7	2.1	0.7
Processing Constraints				
High cost of processing equipment and associated infrastructure Cost	2.2	0.8	2.4	0.7
Lack of grades and standards	2.2	0.7	2.2	0.7
Poor quality raw materials for processing	2.1	0.8	2.4	0.6
Limited range of processed products	2.3	0.8	2.4	0.8
Irregular supply of cassava tubers	2.3	0.8	2.2	0.9
	2.2	0.7	2.2	0.7
Poor infrastructure (water, roads, electricity)	2.3			
Marketing Constraints				
High cost of bulking and transportation	2.4	0.7	2.3	0.7
Poor linkages between markets, producers and processors	2.1	0.8	2.3	0.8
Lack of government or institutional support for market Development	2.2	0.7	2.4	0.7
Poor access to markets	1.8	0.7	1.8	0.7
High transaction cost	1.8	0.8	1.9	0.8
Poor quality of products	2.3	0.7	1.9	0.7
Poor pricing of cassava products	1.8	0.9	1.9	0.7
Weak market information	2.4	0.8	2.4	0.8

Table 5: Mean Distribution of Respondents According to Constraints to Participation in Cassava Production, Processing and Marketing. Field survey, 2019

Strategies for Improving Gender Participation in Cassava Production, Processing and Marketing

Results in Table 6 showed the respondents' perceived strategies for improving participation of males and females in cassava production, processing and marketing in the study area. The results indicated that both male and female farmers reported that all the strategies were effective for improving their participation in cassava production, processing and marketing. However, the most effective strategies noted by the male farmers were making improved planting materials available to farmers at the right time and in the right quantity (M=2.3), encouraging the formation of cooperative societies to enhance farmers access to finance (M=2.4), devising innovative low cost strategies for farmers

to access funds (M=2.4), and enabling the provision of viable and relevant efficient and effective extension services to farmers, which could be offered by input suppliers as a package for selling their products (M=2.4). On the other hand, the most effective strategies proposed by the female respondents included making improved planting materials available to farmers at the right time and in the right quantity (M=2.4), use of resistant and high yielding varieties (M=2.3), proper and regular weeding of cassava farms (M=2.4), and devising innovative low-cost strategies for farmers to access funds (M=2.4). Therefore, extension organizations should implement these strategies in order to enhance gender participation in cassava production, processing and marketing in the study area.

Strategies	Male (n=65)		Female (n=65)	
	Mean	Standard Deviation	Mean	Standard Deviation
Make improved planting materials available to farmers at the right time, affordable price and at the right Quantity	2.3	0.8	2.4	0.7
Use of resistant and high yielding varieties	2.4	0.8	2.3	0.7
Use of recommended spacing and planting	2.2	0.8	2.4	0.7
Proper and regular weeding of cassava farms	2.2	0.8	2.4	0.7
Regular contacts by extension agents for dissemination of information	2.2	0.7	2.3	0.7
Provide machineries for cassava production	2.3	0.7	2.3	0.8
Facilitate access to affordable and available fertilizers, pesticides, etc. to farmers when and where needed	2.3	0.7	2.2	0.9
Plant sweet cassava varieties which have a relatively low cyanide content	2.4	0.7	2.2	0.8
Encourage the formation of cooperative societies to enhance farmers access to finance	2.4	0.7	2.2	0.8
Subsidize the prices of agricultural inputs	2.2	0.7	2.3	0.8
Rehabilitate rural feeder roads to reduce transportation costs	2.3	0.8	2.2	0.7
Devise innovative low cost strategies for farmers to access funds	2.4	0.7	2.4	0.7
Improve linkages within cassava value chain	2.2	0.7	2.2	0.8

Table 6: Mean Distribution of Respondents According to Strategies for Improving Participation in Cassava Production, Processing and Marketing. Field survey, 2019

Conclusion and Recommendations

The study concluded that all the respondents were in their productive age and income from cassava enterprise for both male and female farmers was low due to the smallness of

area of land under cultivation. In addition, both male and female farmers actively participated in cassava production, processing and marketing activities [9]. However, males recorded higher participation in cassava production operations compared to the females who dominated most

processing and marketing activities. Also, both gender faced similar constraints and employed similar strategies for improving participation in cassava enterprise activities in the study area. Based on this, the following recommendations were made: Government and private organizations should encourage and support these young men and women who are already into cassava production, processing and marketing through the provision of improved production and processing technologies to improve income and food security in the study area.

There is need for every local government in the state to establish nearby markets where cassava produce/products can easily be sold and prevent glut and deterioration which may reduce farmers' income and food security leading to diminishing interest in cultivating the crop. Anambra State Government should encourage cassava farmers to increase the land area under cultivation to enhance their productivity, boost their income and improve their standard of living through the provision of farm machinery, fertilizers and herbicides at subsidized rates. Owing to the fact that both male and female farmers took part in all aspects of cassava business development activities, research institute should develop gender sensitive technologies for dissemination to both gender to enhance production, productivity and quality of processed products.

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