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Socioeconomic Characteristics of Urban Leafy Vegetables Farmers, Resource-Use Efficiency and Profitability of Production by Irrigation Systems in Lagos Metropolis, Nigeria

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Introduction

Leafy vegetable production plays a key role in the economics of Nigeria as it serves as a basic source of food, income, and employment generation especially in the off-season of rainfall agriculture. Urban vegetable production is an aspect of urban agriculture which involves the growing of vegetables crops within, and around cities (Mohammadi and Soleimani, 2014). Vegetables are the fresh portions of herbaceous plants whose roots, stems, leaves, fruits or seeds may be eaten as supporting food or main dishes (Edema, 1987; Robinson, 1990; Adeniyi *et al.*, 2012). Leafy vegetables production is different from most agronomic crops because they are highly remunerative compared to other field crops. Production of vegetables is a highly technical interplay of science, art, hard work and salesmanship. Seed rate of vegetables is nominal compared to field crops meaning small amount of seeds are required per hectare and they give high yield per unit area of land and hence generate high income for the farmers (Mohammed, 2002). Also the amount of equipment and man-power required is comparatively much lesser. The short growing season of leafy vegetables (such as celosia, amaranthus, corchorous) production, allows producers to double and even triple crop plots of land. Leafy vegetable production is growing fast around all major cities in Nigeria of which Lagos city is one (Ojo *et al.*, 2011). The potential features of Lagos State for vegetable production are the availability of swampy land areas, creeks and lagoons for urban land farming. People grow leafy vegetables in Nigeria under irrigation because most vegetables have shallow roots, which rarely exceed 24 inches in depth, and the useful products are sold on the basis of fresh weight and appearance. As the rate of vegetables is increasing daily in the Nigeria market, their cultivation is becoming a flourishing business.

This study mainly analyzed the socioeconomic characteristics of leafy vegetable farmers by methods of irrigation systems, their resource-use efficiency and profitability levels in Lagos metropolis.

Material and Methods

The study was conducted in 2012 in Ojo area of Lagos Metropolis. The study was undertaken using an approximately designed interview schedule and data were collected by face-to-face interview and personal questionnaire/assessment of the farms. A total of 142 farmers were interviewed. Some of the issues addressed by the questionnaire include socio-economic

parameters, irrigation methods, input prices across irrigation systems (e.g. costs of planting, transplanting, land purchase and preparation, etc), unit price of leafy vegetable output and quantity sold. The outputs used in the estimation of profitability were the total output (kg) of Celosia, Amaranthus, Corchorous, Spring Onion, Curry leaf, Fluted pumpkin. We therefore analyzed the data using the descriptive statistics, marginal value of resource-use, costs and returns analysis.

Results and Discussion

Results show that the minimum age of leafy vegetable farmers in the study area is 20 years while the maximum age is 66 years. The average age of farmers in the study area is 38 years, showing that a higher percentage of the farmers are in their productive active age. While a higher percentage of farmers in the manual irrigation system falls in the age group of zero to twenty-one years, a higher percentage of motorized pump irrigation users falls in the age group of 41-50 years. This shows that the older population is involved in less labour-intensive irrigation system (motorized pump). On gender basis, 96.6 percent of manual based irrigation farmers are male, while 3.4 percent are female. Contrary to our expectation, about 73 percent of motorized pump irrigation farmers are male while 26.9 percent are female, this shows that a larger percentage of men are involve in the motorized irrigation system with just very few females. On the basis of ethnicity, the 'Hausa' migrants constitute a higher percentage of the farmers (85.3percent of which use manual while 50 percent use motorized irrigation system). Furthermore, a larger percentage 85.3percent and 76.9 percent of the manual and motorized irrigation farmers respectively are married; suggesting that they labour can have access to family labour. The mean household size of farmers is 5 ± 2.2 , with a higher proportion of manual irrigation user having less than the average household size. Similarly, about 61.5 percent of the motorized irrigator users have five to eight household members. A typical farmer has 9 ± 6.4 years of farming experience. In addition, less than half of the manual irrigator users have no formal education, while a larger percentage of the motorized irrigators have formal education. The mean farm size is 0.12 ± 0.04 hectare suggesting that the urban farmers are smallholders. Further results show that farmers neither have contact with extension agents nor have access to micro-credit. Membership of vegetable production association is also lacking among the farmers. The average years of land use for production is 5.5 years.

Analysis of the resource-use efficiency by farmers revealed that vegetable farmers in the study area are underutilizing their resources (Table 1). Pesticides and seed show a resource-use efficiency ratio greater than one, implying that these resources are overutilised while manure, herbicides, fertilizer, hired labour, and family labour were under-utilized (Obayelu *et al.*, 2014).

Table 1: Resource-use efficiency ratio of vegetable production

Resource	MPP	MVP	MFC	Resource-use efficiency ratio
Farm size	258.113	16777.35	1616	10.38202
Manure	0.023	1.477125	495	0.002984
Herbicides	7.893	513.02	1300	0.39463
Pesticides	49.655	3227.567	1600	2.017229
Fertilizer	5.187	337.132	1700	0.19831
Seed	8.822	573.455	150	3.82303
Hired labour	0.041	2.68645	400	0.00672
Family labour	0.024	1.55155	400	0.00388

Source: Computed from data from field survey, 2012

Analysis of profitability of leafy vegetable production in the study area shows that leafy vegetable production in the study area is profitable with a gross margin of ₦116,803 per annum. Comparison of by irrigation systems show that the manual irrigation system has a gross margin of ₦ 88, 799 per annum, while the motorized irrigation farmers have gross margin of ₦ 139,652 per annum (Table 2). This shows that the motorized irrigation system has higher returns than the manual irrigation system.

Table 2: Profitability based on Irrigation Techniques

Items	Manual Irrigation System			Motorized Pump Irrigation System				
	Average number owned/rented	Average cost (₦)	Total cost	Average number owned/rented	Average cost (₦)	Total cost		
Fixed items								
Hoe	2	309	618	2	267	534		
Cutlass	1	766	766	2	671	1,342		
Shovel	1	847	847	1	750	750		
Watering can	2	1337	2674	-	-	-		
Sprayer (owned)	1	12,000	12,000	1	15, 214	15, 214		
Sprayer (rented)	1	130	130	1	125	125		
Wheel barrow (owned)	1	150	150	1	23, 500	23,500		
Wheel barrow (rented)	1	7,000	7,000	1	217	217		
Farm land rent	-	1,530	1,530	-	1,616	1,616		
Motorized pump (owned)	-	-	-	1	8,000	8,000		
Motorized pump (rented)	-	-	-	2	150	150		
Average fixed cost			25,715			51, 598		
Variable Items								
Planting Materials								
Celosia seed	0.4 kg	1627.5	651	0.6 kg	1575	945		
Amaranthus seed	0.6 kg	990	594	0.6 kg	1173.33	704		
Corchorous seed	0.5kg	1324	662	0.5kg	1500	750		
Fluted pumpkin	8 seedlings	209.375	1675	10 seedlings	194.9	1,949		
Spring Onion	75	50	3750	150	50	7,500		
Curry leaf seed	0.4kg	1750	700	0.4kg	1062.5	425		
Fertilizer	4kg	442.25	1,769	3.6kg	437.78	1,576		
Organic Manure	145kg	11.48	1,664	116kg	12.14	1,408		
Pesticides	0.1litre	1500	150	0.1litre	1500	150		
Herbicides	0.1litre	1300	130	0.1litre	1300	130		
Hired labour	2	13850.5	27,701	2	12155	24,310		
Average Variable cost			39, 446		1575	39,847		
Revenue	Average number of beds	Unit price per bed	Average output(kg)	Total	Average number of beds	Unit price per bed	Average output(kg)	Total
Celosia	74	545	1045	40,330	81	563	1007	45,603
Amaranthus	41	522	412	21,402	48	477	423	22,896
Corchorous	33	575	214	18,975	43	600	260	25,800
Fluted pumpkin	46	816	327	37,536	44	800	344	35,200
Spring Onion	28	379	46	10, 612	50	300	100	40,000
Curry leaf seed	10	1000	95	10,000	10	1,000	40	10,000
Total Revenue				128,243				179,499
Gross Margin =	₦128,243-	₦ 39, 446 =	₦ 88, 799		Gross Margin =	₦179,499 -	₦39, 847 =	₦ 139,652

Note: Note: Average bed size = 7m by 4m

Source: Computed from data from field survey, 2012

Conclusions and Outlook

Although leafy vegetable farmers are inefficient in the use of their production resources, the production of these crops by the motorized method of irrigation is more profitable than the manual system. While resources such as manure, herbicides, fertilizer, hired and family labour were underutilized use of pesticides and seeds are over-utilized in the study area. The identified resources that are either over-utilized or under-utilized should be cut down or increased until the marginal value product is equal to the marginal factor cost

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