

Urbanization, Household Food Security and Childhood Malnutrition: A Comparison of Two Communities in Rivers State, South-South Nigeria

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Abstract Armed insurgency and environmental degradation have pushed several people out of the rural communities of the Niger delta, and into the urban centers of the region. This massive migration caused the conversion of agricultural lands into other purposes, leading to fears of household food insecurity, especially among the indigenous population. This study compares the situation in a rural, and an urban community in Rivers State, one of the States in the Niger delta region of Nigeria. It used the Cornell-Radimer Food Security Scale to assess household food security and anthropometry to assess childhood malnutrition. A total of 204 questionnaires were administered and retrieved in both study communities, while the anthropometry of 332 under-five year children was taken. There were no significant differences in the age and household size of the respondents, but the respondents in the urban community were significantly better educated (p-value < 0.001). The households in the urban community were also significantly better food secure (p-value < 0.005); and had significantly lower prevalence of wasting (p-value < 0.001), underweight (p-value < 0.005) and stunting (p-value < 0.001) than the households in the rural community. The indigenous population of the urban community was therefore better food secure, in spite of the loss of their farmlands to urbanization.

Keywords: urbanization, household food security, childhood malnutrition, Niger delta region, Nigeria

1. Introduction

The armed insurgency of the Niger delta youths resulted in the deterioration of law and order in the region, especially in the rural communities, triggering a massive migration out of the rural communities, and into the urban centers of the region. This massive rural-urban migration is further enhanced by the environmental degradation, caused by oil exploration and exploitation activities that made the sustenance of the predominant occupations in the rural communities almost impossible [1]. According to official statistics, an average of 300 major oil spillages take place in the Niger delta every year, spilling approximately 2,300 cubic meters of crude oil into the environment, and causing the destruction of farmlands, economic trees and other economic resources [1].

This massive migration into the urban centers, for safety and economic reasons resulted in significant increase in the population of the urban centers of the Niger delta region. For instance, the population of Yenagoa, the capital of Bayelsa State, in the region, increased from about 52, 000 in 1996, to 384,985 in 2009 (projected with the 2006 national census). Most of this urbanization is horizontal, and involves the conversion of agricultural lands into residential accommodation, as typified by Uyo, the capital of Akwa Ibom State, another State in the Niger

delta region that expanded into an extra 116.667 hectares of prime agricultural land, between 1984 and 2003 [2].

Most of the indigenous population of Nigerian communities has crop farming as their main occupation. We therefore wish to postulate that the use of agricultural lands for other purposes, adversely affected household food security amongst the indigenous population, especially those in the urban centers that have lost virtually all their agricultural lands to urbanization. Our suspicion is not entirely new, as suggested by the findings of other studies [3,4]; the World Health Organization also had this suspicion, and requested during the 2010 World Health Day celebrations that local studies be carried out [5]. This study tested the hypothesis in two ethnically similar communities in Rivers State. It is hoped that the findings of the study would provide the information on the situation in the Niger delta region of Nigeria, for necessary corrective actions.

2. Materials and Methods

2.1. Study Site

The study was carried out in Rumuche, a rural community; and Orowurokwo, a community in Port Harcourt metropolis. They are ethnically similar, and were chosen for the study, for their accessibility, and for their

comparable and well-organized extended family structure. Rumuche is a farming community with a projected population of 5,000 people, mostly engaged in the subsistence cultivation of cassava, yam and vegetables. Oroworokwo on the other hand, is located in the center of Port Harcourt metropolis, and completely built up. Its inhabitants used to be farmers, but are currently mostly civil servants, self-employed or employed in paid employment. Urban agriculture which has been significant in improving household food security in some Nigerian cities [6], is virtually absent in Oroworokwo, not only because of the non-availability of land, but also because of the public health law that considers important food crops as plantain, banana and pineapple, as mosquito-breeding plants that should not be found close to residential accommodation [7].

2.2. Study Design

A cross-sectional, comparative study design was used, with the data collected using structured interviewer-administered questionnaire, focus group discussion and the anthropometric measurement of under-five children; to help achieve a deeper insight into the food security situation in the communities.

2.3. Sample Size Estimation

The study was designed to detect a 5.5% difference in the prevalence of childhood malnutrition, with an alpha error of 5%, acceptable beta error of 20%, and assuming a south-south Nigeria prevalence of childhood malnutrition of 12.8% [8]. Using the usual formula for sample size determination for studying proportions in populations of less than ten thousand⁹, the minimum required sample size was thus determined to be 139, but made up to 154 for each of the study communities, to take care of non-responses.

2.4. Data Collection

The data were collected by BO (the first author), and assisted by four medical students, between January and March 2012. The assistants were trained on questionnaire administration, and on anthropometric measurement, using the training and standardization manual developed by the Food and Nutrition Technical Assistance Project (FANTA) [10]. For this study, food security was defined as the ability of the household to secure food, either from its own production or through purchases, enough to meet the dietary needs of members of the household. The food insecurity experience of the respondents was therefore assessed using a set of ten questions adopted from the Cornell-Radimer Food Security Scale [11], an instrument that has been used in other studies in the region [12]. This instrument assess food insecurity through such coping behaviours as reduction in the number and variety of meals eaten, changes in the ingredients used in food preparation, and going to bed hungry, due to lack of food.

The anthropometry of the under-five children was measured using a bathroom weighing scale, and a locally constructed stadiometer; and carried out according to the standard method which included regular recalibration before each use [10]. Three types of malnutrition were assessed in the study: underweight measured by weight-

for-age, and defined as weight-for-age Z score (WAZ) < -2; stunting measured by height-for-age, and defined as height-for-age Z score (HAZ) < -2; and wasting measured by weight-for-height, and defined as weight-for-height Z score (WHZ) < -2.

The subjects for the study were selected using a multi-stage sampling technique. The first stage of the sampling process involved the random selection of two extended families, from each of the study communities, using the list of all the extended families in the communities, provided by a trusted traditional chief. The second stage involved the selection of households from the chosen extended families. This was carried out using the list provided by the secretary of the extended family. For this study, a household was defined as an aggregation of persons who lived together and shared a common source of food; and a household is considered eligible for the study only when all the adult members of productive age, reside and earn their livelihood in the community.

The questionnaire that assessed food insecurity was administered on an adult woman in the chosen households, following the receipt of an oral consent; the anthropometric measurements were taken from every under-five year child in the household; while the focus group discussions were held with the elected executives of the extended families, to gain further insight into the responses contained in the answered questionnaires. The discussions were conducted in Pidgin English and the local language, recorded using notes and audiotape, and then analyzed; all using the standard method [9], and with the necessary consents. The elected executives are members of the extended family, elected for a specified period of time, to run the affairs of the extended family. They are actively involved in the allocation of the communally owned agricultural lands, to members of the extended family, at the beginning of each farming season.

2.5. Data Analysis

The analysis of the food security situation used the hypothesis that food insecurity and hunger is an ordered sequential phenomenon that starts with the household expressing concerns over the availability of food, and ends with the household's inability to protect the children from the food shortage [11]. The prevalence of food insecurity in the households of the respondents was thus classified into five: food secure, food uncertainty, food insecure without hunger, food insecure with moderate hunger, and food insecure with severe hunger. Households were said to be food secure, when they did not affirm to any of the survey questions; they were classified as food uncertain, if they only expressed concern over their household's ability to secure enough food; classified as being food insecure without hunger when they had made adjustments to prevent hunger; considered food insecure with moderate hunger when adult members went hungry by eating less, skipping meal, or even going a whole day without meal; and classified as food insecure with severe hunger when even the children in the household went hungry, by eating less, skipping meals, or had suffered loss of weight as a result of inadequate food. The Z-scores for weight-for-age, height-for-age and weight-for-height were calculated using the reference data from the United States National Center for Health Statistics (NCHS), and the World

Health Organization, as contained in EPI-INFO version 2002. For all statistical tests, P- value of 0.05 or less was considered statistically significant.

3. Results

A total of 204 questionnaires were administered and retrieved in both study communities, while the anthropometric measurements of 332 under-five year children were taken; 156 in the urban community and 176 in the rural.

3.1. The Socio-Demographic Characteristics of Questionnaire Respondents

These are summarized in Table 1. There were no significant differences in the age (p-value >0.05) and household size (p-value > 0.01) of the respondents in the study communities, but the respondents in the urban community were significantly better educated (p-value < 0.001) and were mainly self-employed or engaged in paid employment (p-value <0.001).

Table 1. The socio-demographic characteristics of respondents of the questionnaire

Variable	Rural (%) (N = 102)	Urban (%) (N = 102)	p-value
Age			
14 – 19 years	5 (4.9%)	3 (2.94%)	> 0.05
20 – 29 years	48 (47.06%)	41 (40.20%)	
30 – 39 years	30 (29.41%)	37 (36.27%)	
40 – 49 years	16 (15.69%)	18 (17.65%)	
>/ 50 years	3 (2.94%)	3 (2.84%)	
Educational status of respondents			
No formal education	14 (13.73%)	1 (0.98%)	< 0.001
Primary	30 (29.41%)	7 (6.86%)	
Secondary	55 (53.92%)	45 (44.12%)	
Tertiary	3 (2.94%)	49 (48.04%)	
Educational status of respondents spouse			
No formal education	8 (7.84%)	2 (1.96%)	< 0.001
Primary	14 (13.73%)	2 (1.96%)	
Secondary	65 (63.73%)	47 (46.08%)	
Tertiary	15 (14.71%)	51 (50.00%)	
Occupation of respondents' spouse			
Farming	39 (38.24%)	0 (0.00%)	< 0.001
Paid employment	31 (30.39%)	45 (44.12%)	
Self employed	28 (27.45%)	51(50.00%)	
Unemployed	4 (3.92%)	6 (5.88%)	
Occupation of respondents			
Farming	49 (48.04%)	0 (0.00%)	< 0.001
Paid employment	3 (2.94%)	24 (23.53%)	
Self-employed	43 (42.16%)	52(50.98%)	
Housewife/student	7 (6.86%)	6 (5.88%)	
Size of household			
1 – 3	12 (11.76%)	14 (13.73%)	> 0.01
4 – 6	61 (59.80%)	56 (54.90%)	
7 – 9	22 (21.57%)	27 (26.47%)	
>/ 10	7 (6.86%)	5 (4.90%)	

3.2. The Food Security Status of the Respondents

This is presented in Table 2. The households in the urban community were better food secure than those in the rural community (p-value < 0.005). The proportion of households with food insecurity in the urban community was 35.29%, compared to 57.84% in the rural community; while the proportion of households with food security was

35.29% in the urban community, compared to 24.51% in the rural community.

Table 2. The food security status of respondents

Variable	Rural (%) (N = 102)	Urban (%) (N = 102)	p-value
Food secure	25 (24.51%)	36 (35.29%)	<0.005
Food uncertainty	18 (17.65%)	30 (29.41%)	
Food insecurity without hunger	35 (34.31%)	14 (13.73%)	
Food insecurity with moderate hunger	12 (11.76%)	15 (14.71%)	
Food insecurity with severe hunger	12 (11.76%)	7 (6.86%)	

3.3. Nutritional Status of Children

Table 3. shows the anthropometry of the under-five children in the study communities. Whereas there was no significant difference in the age and sex of the children, the prevalence of wasting, under-weight and stunting were all significantly higher in the rural community. The prevalence of wasting in the rural community was 21.02%, compared to 8.33% in the urban community (p-value < 0.001); the prevalence of underweight was 24.43% in the rural community, compared to 10.90% in the urban community (p-value < 0.005); while the prevalence of stunting was 32.95% in the rural community, compared to 14.10% in the urban community (p-value < 0.001).

Table 3. Nutritional status of under-five children in study communities

Variable	Rural (%) (N = 176)	Urban (%) (N = 156)	p-value
Age (months)			
≤ 11	17 (9.66%)	19 (12.18%)	> 0.01
12 – 23	36 (20.45%)	32 (20.51%)	
24 – 35	40 (22.73%)	28 (17.95%)	
36 – 47	35 (19.89%)	36 (23.08%)	
48 – 59	48 (27.27%)	41 (26.28%)	
Sex			
Male	97 (55.11%)	73 (46.79%)	> 0.05
Female	79 (44.89%)	83 (53.21%)	
Weight-for-height (WHZ)			
< -2	37 (21.02%)	13 (8.33%)	< 0.001
-2 to 2	125 (71.02%)	137 (87.82%)	
>2	14 (13.0%)	6 (5.7%)	
Weight-for-age (WAZ)			
< -2	43 (24.43%)	17 (10.90%)	< 0.005
-2 to 2	132 (75.00%)	134 (85.90%)	
>2	1 (0.57%)	5 (3.21%)	
Height-for-age (HAZ)			
< -2	58 (32.95%)	22 (14.10%)	< 0.001
-2 to 2	118 (67.05%)	134 (85.90%)	

4. Discussion

The findings of this study reject the study hypothesis that urbanization and the conversion of agricultural lands adversely affected household food security, among the indigenous population of the urban center. This rejection could be due to the massive deterioration of the condition in the rural community that made it difficult for households to engage in subsistence agriculture to produce enough to feed. It might also be due to the numerous opportunities in the urban center that boosted the ability of the indigenous population to earn enough, to ensure the food security of their households.

The proportion of households with food insecurity in the rural community was significantly higher than the proportion in the urban community. This proportion is even higher than the average for the Niger delta region of Nigeria [14]; indicating that the ability to produce food in the studied rural community was probably compromised by the environmental degradation, caused by oil exploration and exploitation; and the breakdown of law and order, caused by youth restiveness. A study in a similar community in the Niger delta region indicates that a single crude oil spill in the region is capable of reducing household food security by as much as 60% [12], even as an average of 300 such crude oil spills are reported in the region each year [1]. The environmental degradation might have forced several of the respondents in the rural community out of the traditional occupation of farming, as only 48.04% of them indicated that they were farmers. Interestingly, most of the respondents in the rural community indicated that they were self-employed, but most were engaged in occupational activities such as petty trading and menial jobs that are often not financially rewarding.

The findings of this study also showed that members of the urban community have more than compensated for the loss of their farmlands, with the numerous opportunities offered by the urban environment. They were significantly better educated than the respondents in the rural community, which increased their likelihood of securing a paid employment, and the possibility to succeed in their self-employment. The indigenous population of urban centers in Nigeria, by the policy of government, also enjoys preferential employment opportunities. These jobs are steady and better paying than most others [14]. Thus, the respondents of the urban community might have had the better food security, because they were better educated and earned more in their occupational activities [15].

The prevalence of childhood malnutrition was also significantly higher in the rural community, but not all can be attributed to food insecurity. This is because childhood nutrition, according to a conceptual framework developed by UNICEF is not only a function of the availability of food, but also includes child care and good health care services [16]. Child care has been defined as the provision in the household and the community of time, attention, and support to meet the physical, mental, and social needs of the growing child [17]. The child care provided by the respondents in the urban community is likely to be much better, because the respondents were better educated, and more likely to access and adopt the key nutritional behaviours that have been found to be particularly protective against childhood malnutrition [18]. A Ghanaian study found that maternal education was the single most important determinant of good child care practices [19]; while a study carried out in Maputo, Mozambique found that maternal education was significantly associated with height-for-age Z-scores, especially for children less than two years of age [20].

5. Conclusion

The indigenous population of the urban community in the Niger delta region seems to have compensated for the loss of its farmlands, to urbanization, with the

opportunities offered by the urban environment. The deterioration of the environment in the rural community, enough to compromise food security is shown by the high prevalence of food insecurity and childhood malnutrition in the rural community. This situation needs to be reversed, to ensure that rural dwellers have enough opportunity to earn a decent livelihood.

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References

- [1] Human Right Watch. *The Price of Oil*. 1999. Available at <http://www.hrw.org/reports/1999/nigeria/index.htm>. Assessed 23/3/08.
- [2] Ekpenyong RE. *Food security, urbanization and poverty in Akwa Ibom State, Nigeria*. A poster presentation at the food and environmental change conference held at the University of Oxford, UK, 2-4 April, 2008.
- [3] Chen J. Rapid urbanization in China: A real challenge to soil protection and food security', *Catena*, 2007; 69 (1):1-15.
- [4] United Nations Office for West Africa (UNOWA). *Urbanization and insecurity in West Africa: Population movements, megacities and regional stability*. UNOWA Issue paper. New York. UNOWA. 2007.
- [5] WHO. 1000 cities, 1000 lives: Why urban health matters, World Health Day 2010. Geneva. WHO. 2010.
- [6] Aina OS, Oladapo A, Adebosin WG, Ajjijola S. Urban livelihood: Urban agriculture implication in food security, a case study of Ibadan metropolis. *Journal of Applied Phytotechnology in Environmental Sanitation*, 2012; 1 (4): 155-161.
- [7] Rivers State of Nigeria. *Section 5n, The public health law Cap106, Laws of Rivers State 1999*. Port Harcourt. 1999.
- [8] National Population Commission (NPC) [Nigeria] and ICF Macro. *Nigeria Demographic and Health Survey 2008*. Abuja, Nigeria: National Population Commission and ICF Macro. 2009.
- [9] Araoye MO. *Research methodology with statistics for health and social sciences*. Ilorin. Nathandex publishers. 2003. 119-120.
- [10] Cogill B. *Anthropometric indicators measurement guide*. Washington DC. Food and Nutrition Technical Assistance (FANTA) Project; Academy for Educational Development. 2001: 9-92.
- [11] Radimer KL, Olson CM, Greene JC, Campbell CC, Habicht JP. Understanding hunger and developing indicators to assess it in women and children. *Journal of Nutritional Education* 1992; 24: 36s-45s.
- [12] Ordinioha B, Sawyer WE. Food insecurity, malnutrition, and crude oil spillage in a rural community in Bayelsa State, south-south Nigeria. *Nigerian Journal of Medicine* 2008; 17: 304-309.
- [13] Maziya-Dixon B, Akinyele IO, Oguntona EB, Nokoe S, Sanusi RH, Harris E. *Nigeria food consumption and nutrition survey 2001-2003 summary*. Ibadan. International Institute of tropical Agriculture (IITA). 2004: 11-28.
- [14] Rondinelli, D., and J. D. Kasarda. Job creation needs in Third World cities. In *Third World Cities*, ed. J. D. Kasarda and A. M. Parnell. London: Sage Publications. 1993.
- [15] Ruel MT, Garrett JL, Morris SS et al. *Urban challenges to food and nutrition security: a review of food security, health, and care-giving in the cities*. Washington DC. Food Consumption and Nutrition Division, International Food Policy Research Institute. 1998.
- [16] UNICEF (United Nations Childrens Fund). *Strategy for improved nutrition of children and women in developing countries*. UNICEF Policy Review Paper. New York. 1990.

- [17] ICN (International Conference on Nutrition). *Caring for the socio-economic deprived and nutritionally vulnerable*. Major Issues for Nutrition Strategies Theme Paper 3. ICN/92/INF/7. Rome: Food and Agriculture Organization of the United Nations/World Health Organization. 1992.
- [18] Penny ME, Creed-Kanashiro HM, Robert RC et al. Effectiveness of an educational intervention delivered through the health services to improve nutrition in young children: a cluster-randomised controlled trial. *Lancet* 2005; 365: 1863-72.
- [19] Maxwell DC, Armar-Klemesu LM, Ahiadeke C, Ruel M, Morris S. *Urban livelihoods, food and nutrition security in greater Accra*. Research Report. Washington, D.C., International Food Policy Research Institute. 1998.
- [20] Sahn D, Alderman H. On the determinants of nutrition in Mozambique: The importance of age-specific effects. *World Development* 1997; 25 (4): 577-588.