ECONOMETRIC DETERMINATION OF CONTRIBUTION OF FAMILY POULTRY TO WOMEN'S INCOME IN NIGER-DELTA, NIGERIA

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ABSTRACT

This study shows that family poultry husbandry, business activities and paid employment contribute 35%, 30% and 18% respectively to the household income of women in Niger Delta, Nigeria. The average income from family poultry is ₦16, 784.53 ($124.33), which is about 25% and 50% of national minimum wage and per capita income in Nigeria respectively. The major constraints to the family poultry in the study area are disease and pest, pilfering and lack of capital. The econometric analysis indicates that wage, business and family poultry income are significant determinants of income of women in the study area. The estimated regression coefficients are, 0.35, 0.32 and 0.19 for wage, business and family poultry income respectively. This suggests that if wage income, business income and family poultry income increase by 100%, total income of the women will increase by 35%, 32% and 19% respectively. This indicates that family poultry husbandry has third rating in potentially influencing women income in the study area. It is recommended from the study that the contribution of family poultry to total income of the women can be improved through proper medication and vaccination of their birds with vaccines that are stable under tropical environment. It is also imperative that semi intensive, if not intensive, rearing technology should be considered as a reasonable option if the problem of pilfering is to be addressed. Improving the capital base of the women through formation of cooperating and micro-credit schemes should also be a welcome development in addressing the problem of lack of capital.

KEYWORDS: DETERMINATION, CONTRIBUTION, POULTRY, WOMEN, INCOME, NIGER-DELTA, NIGERIA.

INTRODUCTION

Poultry production represents one of the alternatives to feed the fast growing population. Over the last decade poultry population has grown spectacularly through the world, 23% in developed and 76% in developing countries [5]. This increase due primarily to industrial or commercial production has been most notable in South and East Asia where the average growth was 90%. For example, in India, production has increased six-fold in ten years. However, according to [3] most of the conditions required by the industrial poultry sub sector are not met in poor countries, including Nigeria. These conditions include, the ability to purchase the most efficient inputs, improved bird breeds feeds, vaccines, drugs and equipment; the availability of highly skilled manpower and the presence of strict disease control. In fact, [5] indicated that before commercial/industrial poultry production can be developed to medium or large scale units, either for broiler or eggs production, it is important to achieve either self-sufficiency in cereal production or to generate the necessary hard currencies that may be needed to purchase necessary but expensive inputs. These conditions are difficult to meet in Nigeria, and moreover the Federal government has placed a ban on importation of poultry products since January 2005. All these make family poultry (FP) an attractive sub-sector in rural Nigeria.

It has been estimated that more than 80% of the poultry population of the world is found in traditional family-based poultry production systems, contributing up to 90% of poultry products in some countries. All over the developing countries these low-input, low-output poultry husbandry system have been a traditional and integrated component of most of rural, many peri-urban and some urban households or small farms, and are likely to continue in the foreseeable future [9]. The importance of FP cannot be overemphasized. According to [5] under the free-range and backyard system, a guinea fowl produces 37-95 eggs per year, a Muscovy duck 30-80 eggs per year, geese 20-40 eggs per year, a turkey 25-100 eggs per year and a pigeon 14-29 eggs per year. The average egg weight amounts to 30-65g for domestic fowl hens, 40-40g for guinea fowl, 50-58g for Muscovy duck, 65-95g for geese, 80-100g for turkeys and 10-20g for pigeons. Keeping poultry is, in many cases considered as the first step in animal rearing activities, especially after events such as climatic disasters. Selling 4-5 chickens enabled rural women in Mozambique to buy a goat [4]. Furthermore, according to [9] keeping poultry for smallholder farmers can be considered as household savings, investment and insurance as the value of bird increases over time.

Family poultry in Nigeria accounts for more than 80% of poultry population and about 90% of poultry product. Commercial poultry accounts for only 11% of the total estimated population of 82.4 million chickens [2]. Experiences in Bangladesh and other countries have shown that poultry can be used as a tool for poverty alleviation. Smallholder poultry production is feasible at village level, where it is enough to introduce low cost technology for improving production considerably. Indirectly, only low level investments are needed and there is no need for large land areas, which makes village production environmentally friendly. Experience has shown that ten chickens (egg laying hens) are enough for one family to earn 100 US dollars/year [8].

In investigating income source of women in Africa, the role of FP should not be undermined, because FP production are under the control of women and they gain a substantial part of their income from FP. More than 70% chicken owners in rural areas of Sub-Sahara Africa are women [4]. Gueye [5] commented, "the gender-disaggregated data that would provide exact figures on women's role in, and contributions to this subsistence poultry sub-sector are still insufficient". She stated that FP development does require the availability of gender-disaggregated data and analysis. She believed that this is prerequisite for significantly promoting gender and resource equipment, Kitalyi [7] holds the same belief, he suggested that transformation of family poultry production systems into economically viable enterprise would require better understanding of the socio-economic aspects of the production system.

There is urgent need to evaluate income sources available to women in the Niger Delta because of the pervasive level of poverty in the area despite the fact that this is the region, which has produced most of the oil in the country, and generate 90% of the government revenue. The fact that the level of poverty is high can be attested to by the persistent crisis in the area. The underdevelopment of this oil-rich community is a popular knowledge [11].

The broad objective of this study is to determine the contribution of family poultry as an income source to the total household income of women in the Niger-Delta Nigeria. The subsidiary objective is the examination of constraints associated with family poultry production in the study area with a view to giving recommendations on how to improve the family production in the study area.

MATERIALS AND METHOD

Area of study: The study was carried out in the Niger-Delta, Nigeria. The Niger-Delta is made up of nine out of 36 States of the Federal Republic of Nigeria. The Niger-Delta covers about 105000km^2, which is about

3 percent of the total land area of Nigeria. It contains about 30 million Nigerians. It is located in Southern part of Nigeria, situated between latitudes 4^{O} 30'N-6 20'N and longitudes 5^{O}10'E-8^{O} 30'E. About 65% of the people of the area are engaged in farming and fishing using traditional methods. Agricultural activities in the area are also hampered with oil spillage [10]. The states that make up the Niger-Delta are Rivers, Delta, Cross-Rivers, Akwa-Ibom, Ondo, Bayelsa, Imo, Abia, Edo and Anambra.

Sampling procedure and sample size: The sampling technique used was a mullti-stage sampling procedure. Edo State was randomly selected from the nine States in the Niger-Delta. The second stage of selection was the random selection of eight local government areas (LGAs) from three senatorial districts that make up Edo State. The third stage of sampling was the random sampling of nine communities from the eight LGAs. The final stage of selection was the random selection of twenty women from each community. In the Edo North senatorial area, the women were sampled from the following communities: Afuze (Owan East L.G.A.), Igarra (Akoko-Edo L.G.A.). Uneme(Akoko-Edo L.G.A.). From Edo Central, women were sampled from the following communities: Ubiaja (Esan South East L.G.A.), Irrua (Esan Central L.G.A.), Ekpoma (Esan West L.G.A.) and from Edo North women were sampled from the following communities: Ekenwan (Oredo L.G.A.), Evohotubu (Egor L.G.A.) and Ikpoba Hill (Ikpoba Okha L.G.A.).

We were fully aware of the difficulties in getting information related to income of the women. We made use of trained women enumerators to assist us in filling in the questionnaires in order to overcome the problem. 180 sets of questionnaires were used to collect relevant information from the women; some of the information asked for in the questionnaires were filled in by the researcher for those who are not well educated. Only 119 of the returned questionnaires were found usable. (Some respondents did not complete their questionnaires). The information in 119 questionnaires were analyzed using percentage distribution and regression analysis.

Methods of data analysis: Percentage distribution and Multiple regression analysis were employed in this study.

Table 1: Distribution of women according to source of income in the study area.

Source of income	Number of respondents	Percentage (%)	Ranking
Business income	52	43.70	1st
Family poultry income	42	35.29	2nd
Wage income	34	28.57	3rd
Farm income	28	23.53	4th
Rent income	26	21.85	5th
Gift income	7	5.88	6th
Loan income	5	4.20	7th
Other livestock income	4	3.36	8th
Fishing income	3	2.52	9th
Others	2	1.68	10th

Source: Computed from Field Survey, 2004. * Multiple responses

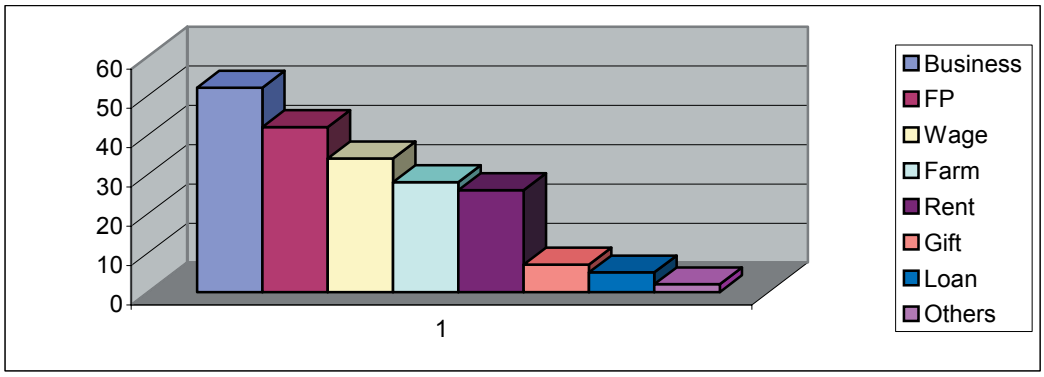

Figure 1: Ranking of income sources

Ordinary Least Square (OLS) multiple regression was specified to determine the contribution of each income source to total household income of the women.

The OLS model is specified as

$Y = \beta_0+\beta_1X_1+\beta_2X_2+\beta_3X3+\beta_4X_4+\beta_5X_5+\beta_6X_6+\beta_7X_7+E$

where Y is the total household income, X_1 is family poultry income, X_2 is wage income, X_3 is farm income, X_4 is fishing income, X_5 is other livestock income, X_6 is loan, X_7 is rent, X_8 is gift, X_9 is business income, X_{10} is other income sources, βs are regression coefficients to be estimated, e is the error term, which accounts for other determinants of total household income not included in the model. All the income items are expressed in Naira. Different functional forms of linear, Cobb-Douglas, quadratic, exponential and semilog were estimated and the Cobb-Douglas equation was selected as the best equation using economic, econometric and statistical criteria.

RESULTS

Results of descriptive analysis

Table 1 shows that majority of the women (44%) are involved in different forms of business. About 35% of them rear family poultry; about 29% of them generate their income from paid employment. It should be noted that the women, involved in business deal with selling eggs and poultry. The table also shows that 24% and 22% of the women derived their income from farming and rent respectively.

Table 2 shows that most of the income of the women comes from family poultry. About 35%, 30% and 18% of their income came from family poultry, business and paid employment respectively. The able also shows that the women generated average income of ₦16784.53 (124 US dollars) per year from family poultry after the consumption at home. This amounts to about 50% of per capita income of 270 US dollars per year in Nigeria and also translates to about 25% of minimum wage of 515 US dollars per year in Nigeria.

Table 3 shows that 54%, 40% and 32% of women involved in family poultry encountered the problems of disease and pest, pilfering and lack of capital respectively. This indicates that disease and pest, pilfering and lack of capital are the major problems confronting these women. Lack of capital ranks third among the main problems, although one would have thought that lack of capital had been the first major problem of the women. Table 4 shows that the majority of the birds are kept in intensive system.

Results of aggression analysis

Table 5 shows the potential role of each income source in stimulating the income of the women in the study area. The whole estimated equation is significant at 1% confidence level. The adjusted R square of 0.79 indicates that the specified explanatory variables account for 79% variation in the income of the women in the study area. The table also indicates that the only wage, business and family poultry income are significant at 5% level of significance. Taking the regression coefficients as the direct elasticity of each income source, 0.35, 0.32 and 0.19 estimated for wage, business and family poultry income respectively, suggest that if wage income, business income and family poultry income increase by 100%, total income of the women will increase by 35% and 19% respectively.

DISCUSSIONS

About 35% of the women rear family poultry; about 29% of them generate their income from paid employment. It should be noted that the women who are involved in business deal with selling eggs and poultry products as a business activity. Although, the 35% as the proportion of women involved in family poultry is less than 44% estimated for women in Botswana [5], however, it is an indication that is the second most important source of their income. The table shows that 24% and 22% of the women derived their income from farming and rent respectively. This confirms more participation in family poultry than in farming by the women in the study area.

About 35%, 30% and 18% of their income came from family poultry, business and paid employment respectively. The implication of this is that, although majority of the women are involved in other occupation; their major income comes from family poultry husbandry. The 35% estimation as the proportion of total household income of women derived from family poultry is higher than 29% estimated for women in Tanzania [4]. The contribution of family poultry husbandry to the household resources of these women should also be appreciated from a food security perspective. Family poultry is an immediate source of animal protein to them, which has been proved to be superior to the protein of plant and red meat origin [7]. It was also shown that the women gained an average income of ₦16,784.53 ($124 US dollars) per year from family poultry above the household consumption. This is about 25% of the minimum wage and about 50% of the per capita income in Nigeria as at 2004.

The study indicates that disease and pest, pilfering and lack of capital are the major problems these women have to face. Lack of capital ranks third among their problems, although one would have thought that this had

Table 2: Amount of income generated from different income sources in the study area.

Sources	Amount (₦)	Percentage	Average income (₦)
Family poultry	704950.3	35.03	16784.53
Business income	602856.6	29.96	10961.01
Wage income	355297.1	17.66	10449.91
Loan income	30800	1.53	6160.00
Rent income	119913.3	5.96	4612.05
Other livestock	7300	0.36	1825.00
Farm income	33280	1.65	1188.57
Gift	3250	0.16	464.29
Others	154800	7.69	77400
Total	2012447.3	100	

Source: Computed from Field Survey, 2004

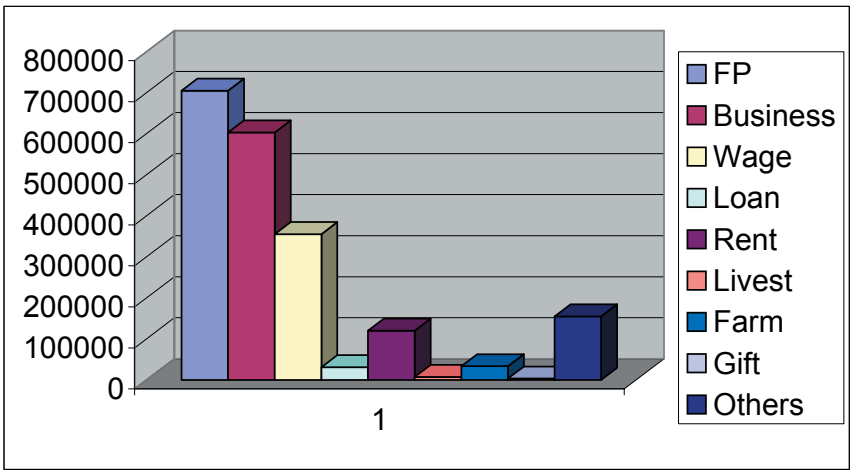

Figure 2: Income range for each income source

Table 3: Distribution of respondents according to problems encountered in raising the birds.

Problems	Number of respondents	Percentage	Ranking
Disease and Pest	66	55.46	1st
Pilfering	47	39.50	2nd
Lack of capital	38	31.93	3rd
Poor sales	12	10.08	4th
Lack of feed	11	9,24	5th
Lack of water	10	8.40	6th
Marketing problem	4	3.36	7th
Accident	4	3.36	7th
Fire outbreak	1	0.84	9th
Disposal of poultry waste	1	0.84	9th

* Multiple responses
Source: Computed from field data, 2004.

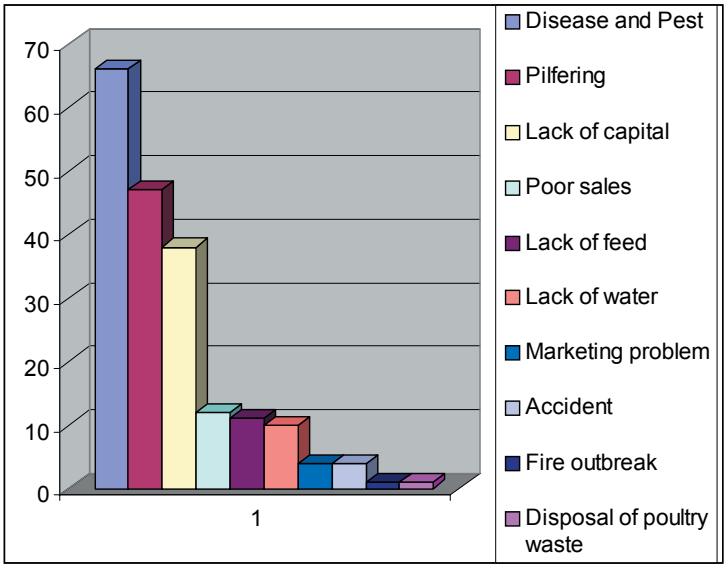

Figure 3: Ranking of problems encountered in rearing family poultry.

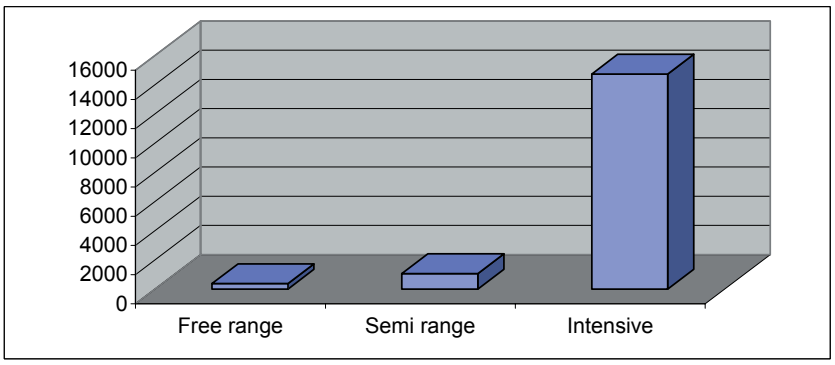

Figure 4: Rearing methods

Table 4: Distribution of the women according to rearing methods

Rearing system	No. Of birds kept	Percentage
Free range	378	2.34
Semi range	1064	6.48
Intensive	14730	91.18
Total	16154	100

Source: Computer from Field Survey, 2004

Table 5: Cobb-Douglas function showing the potential of each income source in increasing the total income of the women

Income source	Regression Coefficient	t-ratio	Ranking
Constant	3.89	8.71*	
Family poultry	0.19	2.08*	3rd
Wage income	0.35	3.54*	1st
Farm income	0.09	0.94	7th
Fishing income	0.12	1.38	4th
Other livestock income	0.02	0.18	10th
Loan	0.04	0.37	9th
Rent	0.06	0.60	8th
Gift	0.10	1.15	6th
Business income	0.32	3.65*	2th
Other income sources	0.11	1.24	5th

Computed from Field Data, 2004
Adjusted R-square = 0.79 F-ratio = 3.888*

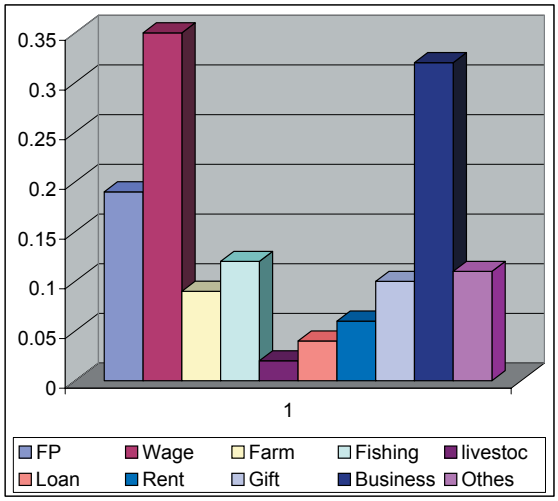

Figure 5: Potential of income sources in influencing total household income of the women

been the first major problem for them. Ranking lack of capital third suggests that family poultry is not capital intensive, thus making it an attractive venture for poor women. Nevertheless, the output for these women and consequently the income of the family poultry husbandry can be improved by controlling diseases and pests, pilfering and provision of capital. Kitalyi [7] demonstrated that the major disease affecting family poultry rearing is the Newcastle disease. Controlling Newcastle disease through the development of appropriate vaccine that will be stable under tropical environments will be a major breakthrough in stimulating increased production and output of family poultry husbandry and consequently resulting in higher income. Pilfering can be minimized by proper security and intensive or at least semi-intensive or at least semi-intensive systems of poultry rearing. The capital base of the women can be enhanced through formation of cooperatives and micro-credit schemes.

The intensive system of poultry rearing as being used by these women is a good method of rearing the birds. This will enable the rearers to take appropriate care of their birds, which enhances their productivity. However, this has implications on the cost of rearing. An intensive form of rearing is effective in controlling diseases and infections but is more expensive than the current extensive systems.

This study demonstrates that family poultry is the third most important income generating opportunity in influencing women's incomes in the study area. It should be noted that out of the three most important significant determinants of the women's incomes, the most practicable and less resource-intensive one is family

poultry rearing. The low level of education among women limits their chance in paid employment [6]. Poor access to capital and credit may also limit the ability of women to utilize business opportunities (trading, marketing, etc.) [1]. The hope of generating income from family poultry husbandry for women is the highest among the most important determinants of the total income because of its low requirement for land and starting capital. A poor woman can enter into share ownership, where a woman can be rearing poultry on behalf of another woman; the proceeds of the family poultry enterprise will then be shared between them when the birds are sold. Another advantage of family poultry as source of income is the case with which it can be combined with other income sources.

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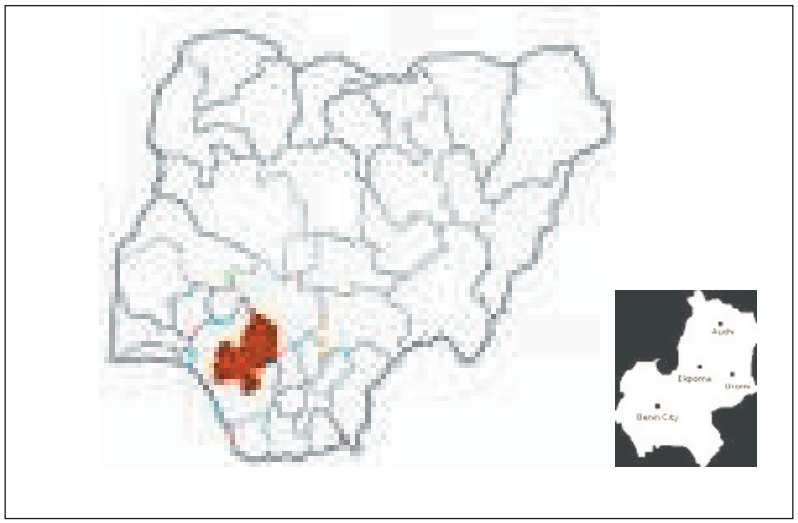

Map of Nigeria Showing Edo State