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Contribution on characterization of local chicken production systems in smallholder rural farmer in Nioka, Ituri province, DRC

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ABSTRACT: Ituri province in DRC faces to malnutrition of his population. Agriculture and especially livestock have a low yield due to bad government and low assistance of farmers. Importation of food is very high. A survey was implemented on local chickens rearing in Nioka and beyond in Ituri province. Conducted at the household level, standard methods of interviews and structured questionnaires were used on characterization chicken's production systems and commercialization. Survey began on March 27th 2017 to April 24th 2017. Data were analyzed using descriptive analysis such as frequency distribution, percentages and means comparison on IBM SPSS Statistics version 20 software. Results confirmed in terms of animal husbandry, extension services and marketing channel that local chickens were mostly reared in traditional systems. Chicken's products prices were high. To start a good program of chicken industry in this province and as well as in entire the country, selection of local chickens should before be carried out on characterization of production systems and genetic molecular analysis.

KEYWORDS: DRC, survey, local chickens, characterization, production.

1 INTRODUCTION

The Democratic Republic of the Congo (DRC) located in Central Africa has 2.345.409 km^2 of national territory second huge country in Africa, 71,712,867 inhabitants among them 65% live in the rural area. The rate of population increasing is 3.5% per year. Contribution of agriculture to GDP is 43% in 2009 [1] and as proportion of livestock GDP 9.2% [2]. Major livestock species and their numbers are respectively: Cattle 755,500, sheep 900,470, goats 4,027,950, swine 961,090 chickens and 19,080,437 SNSA, [3]. Food insecurity and malnutrition had become a major concern for the entire population. The rate of malnutrition 15% has been observed among the population [4]. This is particularly the case of animal proteins and important crops. Livestock production decreased drastically due to last wars and instead that, it is still been managed in extensive system [5]. The livestock productivity decreased due especially to low diseases control, lack of animal feed, low extension services and maintaining of extensive system production. Importation of meat was 54,000 tons between 2001 and 2002 [6] and even animal offal is imported losing many devises that can help him to boost his own internal livestock production. Meanwhile, DRC has a huge agricultural potential characterized by sufficient rainfall, a major river system, a high diversity of soils and broad sunshine [7]. The purpose of this study was to contribute on local chicken characterization production systems based on the KAFACI project on the promotion of good management for increased productivity of market oriented small-scale chicken producers in DRC.

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2 MATERIAL AND METHODS

Fig. 1. Localisation of Nioka surveyed region

2.1 REGION SURVEYED

Survey was done in Nioka region a Congolese rural area. At the Figure 1, it is located in Mahagi territory near a Ugandan boarder in Ituri province, North-eastern part of DRC.

2.2 SURVEY METHOD APPLIED

Survey was done from March, 27th 2017 to April, 27th 2017. Structured interview was conducted at household level and sampling was randomly chosen among the chicken's farmers. Questionnaire was focused on identification of farmers and the chicken production systems. At all 156 farmers were interviewed in twelve INERA research center; Akusi, Ngakpa, Pabong, Nioka center 1, Nioka center 2, Nioka ferme, Nioka Watsi, Rimba 1, Rimba 2, Rimba 3, Yagu and Zengo. Thirteen chicken farmers were also chosen randomly in each site to interview.

2.3 DATA ANALYSIS

Data were collected on the socio demographic characteristics, on production practices adopted by farmers, stock size and composition, management and housing systems adopted, feeding systems, diseases, weights and prices of chicken products and revenue of the farmers. Materials used were GPS and an electronic scale "Electronic Kitchen scale SF-400" to weight the eggs and chickens. Number of animals was converted into Tropical Livestock Unit (TLU), where cattle are weighed with 0.7, sheep/goat 0.1, swine with 0.2 and chicken 0.01 [7], duck was assigned 0.02 TLU, rabbit 0.01 TLU, cavy 0.005 TLU [8]. Data

were analyzed using descriptive analysis such as frequency distribution, percentages and means comparison on IBM SPSS Statistics version 20 software.

3 RESULTS

3.1 SOCIAL FARMER'S CHARACTERIZATION

Regarding on the Table 1, gender issue represented males at 84% and females 16.7%. Gender balance was almost observed only in Zengo where male are 7 and female 6. The average age of the farmers was 48.9±12.5 years. Rimba 3 site had oldest farmers with an average of 54.5±10.4years when the youngest was in Ngakpa site with 44.5±17.4 years. The education level indicted that the farmers who did the secondary school were 47.6% followed by primary school 29.7, university 18.6% and illiterate 4.1%. The chicken's experience from grouping age demonstrated that up to 5 years the average of years' experience in chicken production was 2.5±1.6 years, 6 to 10 years 9.2±1.7 years and above 10 years 20.8±15.5 years. That last category is dominant and most represented in all the sites.

Table 1. Socio economic farmer's characterization

Streets and villages	Gender		Farmer's age	Education				Years experience		
	Male	Female		Illiterate	Primary	Secondary	University	Up to 5	6-10	Above 10
Akusi	11	2,0	51.9±11.4	1	6	6			12.0	33.6±10.9
Ngakpa	10	3,0	44.5±17.4	2	5	4	2	2.3±1.5	7.0	30.1±11.7
Nioka center 1	11	2,0	48.6±12.2		2	8	2	3.3±2.1	7.0	30.1±11.7
Nioka center 2	12	1,0	48.1±10.5		1	8	3	1.5±0.7		24.6±8.2
Nioka ferme	10	3,0	52.0±13.7		1	6	4	3.0±2.8	10.0	30.3±14.3
Nioka Watsi	9	4,0	46.8±9.1		6	3		2.8±1.7	7.7±2.1	27.6±15.4
Pabong	13		50.1±15.1		8	4	1	2.0±1.4		35.4±14.7
Rimba 1	11	2,0	45.2±12.1		1	7	3	2.6±2.1	9.0±1.7	24.5±14.7
Rimba 2	13		50.2±13.5		2	3	8	3.0	9.0±1.2	28.7±13.7
Rimba 3	12	1,0	54.5±10.4		1	8	4		9.3±1.5	31.2±10.7
Yagu	12	1,0	48.8±14.3	1	8	4		3.0±0.2	9.3±3.1	34.1±13.0
Zengo	7	6,0	45.2±12.5	2	2	8		1.0		26.8±10.0
Total	131 (84.0)	25,0 (16.0)	48.9±12.5	6 (4,1)	43 (29.7)	69 (47,6)	27 (18,6)	2.5±1.6	9.2±1.7	20.8±15.5
Test Stat. Value (F)			0.820							

Values in parentheses are percentages.

3.2 LIVESTOCK PRODUCTION

Results in Table 2 shows that according to the TLU of various animals identified in the study area, the three highest means that we can consider as more important in the region were recorded on cattle 3.2±2.6, goats 0.7±0.6 and swine 0.5±0.5. Many cattle were looted in the study region during the wars, but until now, it conserves his first position in terms of animal stock even if it doesn't have a good distribution in all the sites. However, goats, sheep, chickens and rabbits were more popular in all the sites. There was a highly significant difference ($P<0.001$) between TLU rabbit means across the sites.

3.3 ANIMALS SPECIES REARED

Table 2. Animals species (TLU)

Sites	Cattle	Goat	Swine	Sheep	Chicken	Rabbit	Duck	Cavy
Akusi		0.7±0,3	0.3±0.3	0.3±0.2	0.15±0.08	0.3±0.3	0.04±0.02	0.03±0.03
Ngakpa		0.6±0.4	0.3±0.1	0.5±0.4	0.09±0.07	0.3±0.1	0.08±0.06	0.06
Nioka center 1	7.0	0.8±0.5	0.3±0.1	0.4±0.1	0.14±0.08	0.3±0.1		0.06±0.03
Nioka center 2	2.3±2.7	0.9±1.1	0.6±0.5	0.4±0.4	0.17±0.10	0.6±0.5	0.2	0.05±0.02
Nioka ferme	7.0	0.6±0.2	0.3±0.1	0.3±0.3	0.09±0.40	0.3±0.1	0.02	0.4±0.7
Nioka Watsi		0.4±0.3	0.2	0.2±0.1	0.13±0.05	0.2		0.04±0.03
Pabong	5.6	0.7±0.8	0.9±0.9	0.3±0.2	0.15±0.08	0.9±0.9	0.04±0.03	0.06±0.05
Rimba 1		0.6±0.4	2.8	0.4±0.2	0.13±0.08	2.8	0.2±0.1	
Rimba 2	3.5	0.7±0.3	0.3±0.2	0.4±0.2	0.16±0.09	0.3±0.2	0.08±0.06	0.06±0.05
Rimba 3		0.8±0.5	0.4±0.2	0.3±0.3	0.16±0.12	0.4±0.2		
Yagu		0.8±1.2	0.3±0.1	0.6±0.4	0.11±0.10	0.3±0.1		0.03
Zengo	0.7	0.6±0.5		0.2±0.6	0.09±0.07	0.3±0.1	0.05	
Total	3.2±2.6	0.7±0.6	0.5±0.5	0.4±0.3	0.13±0.09	0.5±0.5	0.09±0.08	0.04±0.03
Test Stat. Value (F)		0.461		0.851	1.600	4.929***		

*** Significant at P<0.001

3.4 ANIMAL HUSBANDRY

3.4.1 CHICKEN FLOCK ORGANIZATION

Regarding to Table 3, the averages number per household were respectively for chickens 13.0±8.6, chicks were 6.8±5.3, pullet 3.1±2.0, cockerel 2.3±1.5, hen 3.4±2.4 and cock 1.5±0.9. The percentage of chicks was very high 38% compare to the other categories numbers such as hen 25%, pullet 17%, cockerel 11% and cock 9%. This is explained that chickens farmers had more chicks but mortality or other causes of disappearance decreased the numbers of pullets, cockerels, hen and cocks in the common farm.

Table 3. Parameters carried out on local chicken's production (averages number)

Sites	Chickens (total)	Chicks	Pullet	Cockerel	Hen	Cock
Akusi	15.1±7.9	6.2±3.2	3.7±2.3	2.2±1.8	4.2±2.5	1.3±0.7
Ngakpa	9.4±7.3	5.4±3.8	1.9±1.1	2.3±1.0	2.8±2.6	1.56±1.5
Nioka center 1	14.1±8.4	9.1±5.5	3.0±1.8	2.0±0.9	2.6±1.9	1.1±0.3
Nioka center 2	16.6±11.8	11.3±10.5	3.5±1.8	3.0±2.1	3.3±1.7	1.7±1.2
Nioka ferme	8.8±3.7	4.7±2.6	1.7±0.8	2.2±0.8	2.9±1.4	1.3±0.5
Nioka Watsi	12.5±5.4	6.3±4.6	3.0±1.5	2.1±1.1	2.4±1.4	1.1±0.4
Pabong	14.8±7.7	6.7±3.0	0.3±2.0	2.7±1.4	3.8±2.0	1.7±1.2
Rimba 1	13.4±7.8	5.3±4.5	3.3±2.3	2.3±1.8	4.0±2.6	2.1±1.2
Rimba 2	15.8±9.1	6.1±5.0	4.4±2.0	2.4±1.0	4.4±4.1	2.0±1.2
Rimba 3	15.8±11.9	6.3±6.2	3.7±3.4	2.6±2.9	4.3±2.7	1.5±0.8
Yagu	11.4±9.7	7.2±3.6	2.1±1.2	2.2±1.8	2.8±2.6	1.1±0.4
Zengo	8.6±6.6	7.2±6.7	2.3±0.9	1.0	2.6±1.3	1.7±0.8
Total	13.0±8.6	6.8±5.3	3.1±2.0	2.3±1.5	3.4±2.4	1.5±0.9
Test Stat. Value (F)	1.600	1.136	1.698	0.458	1.362	1.051
Sum	2033 (100)	776 (38)	344 (17)	228 (11)	507 (25)	178 (9)

Values in parentheses are percentages.

Table 4. Laying frequency and incidence of mortality per season

Sites	Laying frequency per week			Time of high mortality		
	Once a day	Once 2 days	Once three days	Hatching	Weaning	Adult
Akusi		13		11		1
Ngakpa	4	7	2	11	1	1
Nioka center 1	5	8		7	5	1
Nioka center 2	1	9	3	8	4	1
Nioka ferme	2	10	1	10	3	
Nioka Watsi	6	6	1	5	7	1
Pabong	1	12		10	1	2
Rimba 1		10	3	11	1	1
Rimba 2	3	8	2	10	3	
Rimba 3	3	8	2	11	1	1
Yagu	2	10	1	10		3
Zengo		12	1	5	3	5
Total	27 (17.3)	113 (72.4)	16 (10.3)	109 (70.3)	29 (18.7)	17 (11.0)

Values in parentheses are percentages.

3.4.2 LAYING FREQUENCY AND TIME OF HIGH DEATH OF CHICKENS

Table 4 shows that hen usually laid egg once each two days 72.4% and the high mortality occurred around hatching time 70.3%, followed by at the weaning period 18.7% and at adult stage age 11.0%.

Table 5. Weights of eggs, cockerels, pullets, hens and cocks

Sites	Egg	Pullet	Cockerel	Hen	Cock
Akusi	38.4±3.3	7333.8±241.8	995.1±181.1	1177.6±195.6	1860.3±332.9
Ngakpa	41.7	797.1±200.6	1016.7±195.5	1176.9±134.3	1772.9±222.5
Nioka center 1	39.6±3.8	734.1±380.9	1007.4±375.8	1290.2±148.4	1636.7±434.0
Nioka center 2	41.5±4.6	752.5±219.4	1214.5±343.2	1397.2±165.5	1812.2±301.0
Nioka ferme	37.8±2.0	777.0±139.1	1261.4±450.4	1251.4±158.6	1757.5±247.8
Nioka Watsi	35.4±3.4	863.5±375.0	924.8±188.4	1104.9±259.5	1614.5±354.4
Pabong	42.1±5.3	774.8±177.1	1152.6±22.9	1226.8±161.4	1828.2±323.6
Rimba 1	39.1±3.5	650.9±84.1	1084.1±383.2	1191.2±129.7	1584.0±193.1
Rimba 2	41.2±5.2	741.9±154.9	1077.9±362.1	1266.0±92.3	1732.4±216.3
Rimba 3	41.5±5.9	751.7±182.7	1123.8±319.1	1300.2±217.9	1811.0±161.1
Yagu		847.0±237.5	1002.1±184.2	1309.4±72.0	1655.5±253.3
Zengo	43.7±5.8	710.0±454.8	944.0±93.3	1291.8±176.7	1454.9±219.0
Total	40.1±4.6	760.8±241.5	1068.6±288.2	1246.3±177.8	1722.9±288.1
Test Stat. Value (F)	1.600	0.549	0.722	2.497**	1.375

** Significant at P<0.05

3.4.3 WEIGHTS OF CHICKENS

Regarding to Table 5, averages of chicken products weight were respectively 40.1±4.6g of egg, 1068.6±288.2of cockerels, 760.8±241.5g of pullet, 1246.3±177.8g of hen and 1722.9±288.1g of cock. The weights in the sites were performed for egg in Zengo 43.7±5.8g, cockerel 1261.4±450.4 in Nioka ferme, pullet 863.5±375.0g in Nioka Watsi, hen1397.2±165.5g in Nioka center 2 with 1771.0±177.9g where there was a significant difference (P<0.05) between the means across the sites and cock in Akusi 1860.3±332.9g.

Table 6. Chicken accommodations

Chicken houses	Sites												
	Akusi	Ngakpa	Nioka center 1	Nioka center 2	Nioka ferme	Nioka Watsi	Pabong	Rimba 1	Rimba 2	Rimba 3	Yagu	Zengo	Total
Adobes kitchen and free-range	10	7	10	8	5	9	10	4	3	2	7	11	86 (56.0)
Adobe kitchen and enclosure	1		1		2		1				3		8 (5.2)
House adobe and scavenging	1		1	2	2	1	1	1	1	1	3		14 (9.2)
Chickens accommodated in human house	1	5	1	1	1	1	1	1	2	1		1	16 (10.5)
House adobe and enclosure		1		1		1				1			4 (2.6)
Planck's house and scavenging								2	1				3 (2.0)
Bricks house and enclosure						1			2				3 (2.0)
House on bricks and pavement				1	1			2		8		1	13 (8.5)
Bricks kitchen and scavenging					2				3				5 (3.3)
On a tree									1				1 (0.7)
Total													**153 (100)**

Values in parentheses are percentages.

3.4.4 CHICKEN ACCOMMODATIONS

Regarding the Table 6, the three common accommodations found were the adobes kitchen and scavenging 56% followed by chickens accommodated in human house 10.5% and house adobe and free-rang 9.2%.

Table 7. Chicken feeding systems

Feeding systems	Sites												
	Akusi	Ngakpa	Nioka center 1	Nioka center 2	Nioka ferme	Nioka Watsi	Pabong	Rimba 1	Rimba 2	Rimba 3	Yagu	Zengo	Total
Wet season													
Scavenging	5	3	5	3	3	5	4	1	4	4	5	2	44 (14,3)
Scavenging with grains	8	10	7	9	10	7	9	11	9	9	8	11	108 (35,2)
Enclosure with grain			1			1							2 (0,7)
Concentrate feeding				1									1 (0,3)
Dry season													
Scavenging	5	3	5	3	3	3	4	1	4	4	5	2	42 (13,7)
Scavenging with grains	8	10	7	9	10	7	8	12	9	9	8	11	108 (35,2)
Enclosure with grain						1							1 (0,3)
Concentrate feeding				1									1 (0,3)
Total													**307 (100)**

Values in parentheses are percentages.

3.4.5 CHICKEN FEEDING SYSTEMS

Results at Table 7 shows that the feeding systems were dominated in wet and dry seasons by both scavenging and scavenging with grains 35.2%. These feeding systems are followed by scavenging in the wet 14.3% and in dry seasons by 13.7%. The two systems evaluated here represented 69.2%. Scavenging dominated as feeding systems. There was also any difference of feeding systems during the two seasons.

Table 8. Chicken diseases

Diseases	Sites												
	Akusi	Ngakpa	Nioka center 1	Nioka center 2	Nioka ferme	Nioka Watsi	Pabong	Rimba 1	Rimba 2	Rimba 3	Yagu	Zengo	Total
New Castle	11	10	11	10	7	10	9	12	10	10	11	13	124 (24,1)
Gumboro	1												1 (0,2)
Marek				1		1			1	1	1		5 (1,0)
Salmonellosis	8	7	3	2	1	6	6	2	2	3	10	4	54 (10,5)
Infectious br*	12	6	7	10	7	7	11	13	9	7	10	13	112 (21,8)
Flow pox	2	1	6	4	3	3	1		2		6		28 (5,5)
Coccidiosis	6	2	2	3	2	1	4	2	2	9	3	7	43 (8,4)
Worms	12	6	9	9	3	8	11	9	5	9	6	10	97 (18.9)
Insects	1	3	4		5	3	1	1	3	3	5		29 (5,7)
Rapt		4	2	3	3	3			3		2		20 (3,9)
Total													513 (100)

*Infectious br. = Infectious bronchitis, values in parentheses are percentages.

At Table 8, the three important chicken diseases recorded were New castle 24.1%, infectious bronchitis 21.8% and worms 18.9%. Rapt which represent 3.9% means looting, wild animals and raptors which attack chickens in the household.

Table 9. Chickens care and extension services

	Responses	Sites												
		Akusi	Ngakpa	Nioka center 1	Nioka center 2	Nioka ferme	Nioka Watsi	Pabong	Rimba 1	Rimba 2	Rimba 3	Yagu	Zengo	Total
To care chickens	Yes	9	2	7	8	6	7	8	8	6	12	9	8	90 (56,3)
	No	5	11	6	5	7	6	5	5	7	1	4	8	70 (43,7)
If yes, kind of medicine	Modern	1	1	5	7	4	5		4	4	9	5	3	48 (54,5)
	Traditional	5			1	2	1	4	4	1		3	1	22 (25.0)
	Both	3	1	1			1	3		1	3	1	4	18 (20,5)
Do you receive vet. Services*	Yes		1	1	1	5	5	4	1	4				22 (14,1)
	No	13	12	12	12	8	8	9	12	9	13	13	13	134 (85,9)

*vet. Service = Veterinary service, Values in parentheses are percentages.

Regarding at Table 9, farmers recognized that they didn't care their chickens 56.3% when 43.7% cared their birds. Among the farmers who cared their chickens 54.5% used modern medicines and 25.0% traditional medicines. The other farmers 20.4% used both modern and traditional medicines.

3.5 EXTENSION SERVICES

According to the extension services at Table 9, majority of them 85.9% didn't beneficed of extension services support and visit and those who were supported were 14.1%.

3.6 CHICKEN MARKETING CANNEL

Regarding the Table 10, the average prices of egg was 0.85±0.09$, a pullet 2.9±0.8, a cockerel 4.5±1.1$, a hen 4.1±0.5, and a cock 6.7±0.7$. Across the sites, the high prices were recorded on egg 0.2±0.3$, pullet 4.0±0.9$ with a highly significant difference ($P<0.001$) between the means across the sites, a cockerel Nioka center 1, Nioka ferme and Yagu 5.0$, and respectively for hen and cock at Rimba 1 with 4.4±0.9 and 7.0±1.3$.

According to the farmer's revenue, majority of chicken farmers about 82% had from 31 to 100$ per month 35.5%, 101 to 200$ per month 25.2% and 30$ per month 21.3%.

Table 10. Chickens products prices and farmers income

Sites	Chicken flock					Monthly income ($US)				
	Egg	Pullet	Cockerel	Hen	Cock	30	31-100	101-200	201-300	301-400
Akusi	0.06±0.01	2.4±0.78	3.2±1.0	3.8±0.4	6.5±0.8	1	6	3	3	
Ngakpa	0.08±0.08	3.1±0.4	4.4±1.1	4.1	6.8±0.4	3	7	3		
Nioka center 1	0.08	3.3±0.04	5.0	4.2±0.3	6.9	6	1	6		
Nioka center 2	0.08	2.9±0.7	4.6±1.2	4.1	6.8±0.3	1	7	3	1	
Nioka ferme	0.08	3.3	5.0	4.1	6.9±0.04	2	6	2	3	
Nioka Watsi	0.08	3.3	5.0	4.1	6.8±0.3	7	5			1
Pabong	0.06±0.09	2.5±0.7	4.2±1.3	3.8±0.4	6.3±1.2	3	4	4	1	1
Rimba 1	0.2±0.3	2.7±1.1	4.0±1.6	4.4±0.9	7.0±1.3	1	4	6	1	1
Rimba 2	0.07±0.01	2.6±0.9	3.9±1.7	4.1±0.7	6.5±0.8		2	5	5	1
Rimba 3	0.09±0.02	2.5±0.9	4.0±1.2	4.1±0.6	6.2±1.2	1	2	2	8	
Yagu		3.5±0.5	5.0±0.7	4.3±0.5	6.9	5	6	2		
Zengo	0.08±0.09	4.0±0.9	4.9±1.7	4.3±0.6	6.6±0.7	3	5	3	1	1
Total	0.85±0.09	2.9±0.8	4.5±1.1	4.1±0.5	6.7±0.7	33 (21.3)	55 (35.5)	39 (25.2)	23 (14.8)	5 (3.2)
Test Stat. Value (F)	8.872	3.806***	2.108*	1.777	1.249					

*** Significant at P<0.001, values in parentheses are percentages

4 DISCUSSION

4.1 LIVESTOCK AS AN ASSET TO PUSH OUT MALNUTRITION AND POVERTY

Chicken farmers interviewed means age were 48.9±12.5years. Respondents' mean age was 40.9 years in Sud-Kivu [9]. The gender issue showed 84.0% males and 14.0% females, another survey done in Sud-Kivu showed 54.3 % women and 45.7 % men interviewed on monogastric animals [10]. In Senegal poultry production is mainly managed by women and children [11]. On TLU, six animal species Goat, sheep, swine, chicken, rabbit and cavy are good represented in the sites. Majority of chicken's farmers did at least the secondary school 47.6%. The relationships of TLU with both education level and land size available point at multidimensional poverty restricting livestock husbandry [12]. The principal animal reared in Ituri was cattle. Cattle are here like in Sud-Kivu symbols for peasants' social status and their possession reflects the wealth class that people belong to according to their self-perception [13]. Unhappily, cattle are not intended for regular consumption [12] like small animals [14]. The local chicken rate of mortality in Nioka is high 70.3% between hatching compared to this with weaning and adult stage periods. The characteristics of these local chickens in Nioka are almost similar to those observed in Africa where 40% of the chicks die within the first 8 - 12 weeks, hen lay in 3-4 clutches of 10-15 eggs each clutch a year and that is 30 to 60 eggs per year, hen weight 1170 to 1500g as observed [15], [16]. To fight malnutrition and poverty, DRC government should promote chicken industry. African population is estimated at 2.4 billion in 2050 Le [17]. The African population increment will play a negative role on the development of the pastoralism systems. As reproduction cycle of ruminants is long, intensification production of meat and milk shall be encouraged. Meanwhile, a particular attention should be paid to promote the monogastric animals production. Non ruminants are prolific, robust animals have excellent meat quality; they can play an important role in fighting food insecurity [12]. We need a good program of local chickens characterization coupled with genetic molecular analysis in the entire Sud-Kivu province and why not in all the country before the selection begins. DRC should also promote more improved chicken production for food and income in the province.

4.2 REGULAR INCOME GENERATION

Majority of chicken's traders 35.5% had a revenue up 31to 100$ that is less than to Ethiopian where poultry farmer had up 91 to 150$ per month [18]. Chicken products prices are almost similar in Nioka when in Tanzania, hen cost 4.3$ and coq 7$ [15]. A poultry trader purchases 20 Birr in the vicinity of Jimma town (50 km radius) 4.4$ for one hen in rural area and makes a monthly profit of 200 Birr (22 USD) in Ethiopia [18]. These prices are similar to those recorded in Nioka. The traditional systems in Nioka must be improved. It is possible in Sud-Kivu, DRC to make benefit of 7$ monthly the first year and 107.3$ per month the second year on local chickens' production with at beginning ten hens and one cock [14]. In Tanzania, a farmer can begin with one cock and 5 hens, using a basket for night and get a net cash flow per year of 200,320 TSh (174.2$) [15]).

5 CONCLUSION

Survey described the local chickens' systems in Nioka located in Ituri province, DRC. Results showed that about gender, males 84% were more involved on local chickens than the females 14%. Most of the chicken farmers were in secondary school. On local chickens' production; the rate of mortality is high 70.3% around hatching period. Scavenging is almost the only source of diet of local chickens and accommodation was inadequate. Weights of eggs, pullets, cockerels, hens and cock were respectively 40.1±4.6g, 760.8±241.5g, 1068.6±288.2g, 1246.3±177.8g and cock 1722.9±288.1g. However, chicken products prices are almost similar compared to other rural areas in Africa. Breeders and country deciders should continue with the local chicken characterization in the entire province. To start a good program of chicken industry in this province and as well as in all the country, selection of local chickens should be implemented on the basis of morphometric and genotypic when at the same time the improved chickens should be developed for more food and income.

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