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Research Article

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An economic analysis of the factors influencing poultry production and marketing in Rwanda-A case of Musanze district.

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ABSTRACT
As in many other developing countries, in Rwanda poultry farming is a very important component of livelihoods, especially in rural areas. However, poultry farming does not receive the attention it deserves and requires, probably because of a lack of understanding about the role that poultry plays in poor households. The major objective of this study was to analyse poultry eggs production and marketing in Rwanda. A case of Musanze district. The results indicated that the majority of respondents sell poultry eggs at local market followed by those who sell at national market. The result of the regression analysis showed that water availability, space reserved to poultry, educational level, experience, and veterinary services were significant at $P \leq 0.01$ level to influence poultry eggs production and marketing. Money received from selling poultry production usually improve household to solve different need through Source of household food, Increased income, House utensil, School fees, Clothes of household members, life insurance, Malnutrition control, Personal expenses, Friendship, House rehabilitation, and other respectively. The results also showed that factors facing poultry farmers in their production and market in this study were at first place diseases, land tenure, high cost of adequate feeds etc., as the most superior role of poultry is provision of eggs, meat as a source of money and good nutrition. Therefore, policy makers should elaborate the manner that improve and increase poultry production in both quality and quantity for long the run to reduce poverty, end hunger, and achieve food security through sustainable agriculture and livestock production and productivity.
Keywords: Economic Analysis, Poultry, Eggs Production, Marketing.

INTRODUCTION

Rwanda is on of sub-Saharan African country and it experiences situations of food insecurity, low household incomes and high prevalence of human and animal diseases. More than 85% of the Rwandan population, which resides in the rural area, is engaged in agricultural production as a major means of livelihood (World Bank, 2006). Increasing agricultural production at the household level is vital to achieve food security (Degnet and Belay, 2001).

With the increase of world population and consequently in food demand, more and more land is being intensively cultivated and used for food production. Small-scale farmers in rural, per- urban and urban areas are finding profitable opportunities for 'backyard productions systems' in terms of crops as well as for small livestock (FAO, 2011). Home gardens that provide small-scale farm families with food and important surpluses to sell in local markets are now an integral element of many food systems. Many such gardens and backyards popularly raise poultry for family food requirements and for market. Poultry refers to domestic birds that produce eggs and meat that can be consumed and traded by small-scale farmers (FAO, 2011).

In nearly all African countries, poultry production in rural areas is predominantly based on a free-range system utilizing indigenous types of domestic fowl (Bamiro OM, *et al.*, 2006). The system is characterized by a family ownership of the birds. The birds are then left to scavenge to meet their nutritional needs. The feed resources vary depending on local conditions and the farming system.

Livestock farming contributes to the proper utilization of land resources and furnishes invaluable foods for proper nourishment, wool and leather for clothing. Livestock plays a significant role in achieving food security in the developing countries, produces useful ingredients and specialized product that are useful in medicine. At the moment livestock keeping is receiving greater attention primarily due to expected rapid increase in the

consumption of livestock products worldwide, indigenous poultry included (FAO, (2009b.).

As in many other developing countries, poultry farming is a very important component of livelihoods in Rwanda, especially in rural communities. In Rwanda, however, poultry farming does not receive the attention it deserves and requires, probably because of a lack of understanding about the role that poultry plays in poor households (FAO, 2012). In many local societies, poultry activities, especially the rearing of chickens, ducks, and turkeys have traditionally been part of rural households' coping strategies for emergencies that require the quick conversion of physical capital into social, financial and cultural capital FAO, (2009). The lack of attention to the poultry sector results in weak veterinary/extension services, and weak and outdated laws and policies. Weak veterinary services increase livelihood uncertainty among poor farming households and compound the risks of disease outbreaks, as disease control/management systems are lacking (FAO, 2009).

Livestock products have long been a pathway for income generation by the poor. Rapidly growing and changing livestock markets in the developing world provide real opportunities but also significant threats to participation of the poor. Rwandan poultry farming is still in its infancy, especially in rural areas where traditions are still supreme, and there is need for greater understanding of the role poultry plays in people's livelihoods (MINAGRI, 2012).

Poultry are commonly found in and around the homestead and hence provide a good opportunity for women to actively participate in a business opportunity that is also easily accessible and does not command excessive labour requirements. In African countries including Rwanda. Poultry production is the process of rearing birds domestically mainly for the supply of poultry meat and eggs for human consumption and cash sales (Dwinger and Unger, 2004). Poultry production in Rwanda has been one of the most popular enterprises adopted by small and medium scale farmers in both rural and urban centres. The subsector production is a major agricultural activity contributing about 8.8% of the national GDP (FAO, 2012).

In Rwanda, the village poultry constitutes the majority of the national poultry flock but its role to food security and poverty eradication is often neglected. Poultry industry in Rwanda is characterized by the coexistence of two systems: rudimentary village poultry and industrial poultry at its in-infancy stage. The two systems are facing scarcity of inputs to fully exploit their potential (MINAGRI, 2012). The village chicken sector contributes to the 3000 tons of eggs and 2144 tons of chicken produced annually in Rwanda (FAOSTAT, 2014).

The price of agricultural products particularly livestock products is rising both in domestic as well as international markets due to rising income in newly emerging developing nations and high population growth. Livestock products have very high-income elasticity's, and demand increases rapidly with rising income as countries shift from lower to middle income economies. This has led to a 'livestock revolution' in developing counties (Delgado *et al.,* 1999).

Market access plays an essential role in assuring better income and welfare for smallholder livestock producers. Poultry can provide a form of savings account for farmers who can have ready access to easily tradable products, such as eggs and meat that are popular among village dwellers and not only.

Poultry also, are socially accepted small livestock in many countries. Meat is a good source of protein, improving farm family nutrition and contributing to overall health of family members. Eggs provide a constant source of nutritious food throughout the year and are especially beneficial for young children, pregnant women and the elderly. Chicken manure to fertilize soil; ducks that eat insects and parasites that can be harmful both to crops and livestock. Domesticated poultry also contributes to environmental protection and conservation as people no longer have a need to hunt for protein sources in the wild (FAO, 2011). Poultry egg, apart from supplying protein is also a good source of high-energy nutrient to the ever-increasing Rwandan population, thereby significantly contributing to human nutrition and economic development. Poultry also contribute significantly to food security and poverty alleviation in disabled and disadvantaged groups in less favoured areas in Africa (Wachira *et al.,* 2010).

In spite of the immense contributions of the poultry subsector to the national economy, the subsector is facing challenges such as socio economic factors, technological factors, low eggs productivity, policy and legal frameworks, erratic and unpredictable weather, prevalence of trans-boundary animal and zoonotic diseases and pests, poor quality of ingredients used in manufacture of feed, supply of poor quality chicks, high feed cost, insufficient capital, inadequate access to and high cost of veterinary services of ingredients, and demographic factors among others(Adeyemo AA, Onikoyi MP,2012). Main diseases discouraging smallholder's farmers poultry farming and productivity in developing countries including Rwanda are like coccidiosis, variole, ascaridiosis, salmonella, Intestinal Worms, Gumboro disease, and fowl cholera (MINAGRI and FAO, 2018; Yoni Segal (2016).

As in many other developing countries, in Rwanda poultry farming is a very important component of livelihoods, especially in rural areas. However, poultry farming does not receive the attention it deserves and requires, probably because of a lack of understanding about the role that poultry plays in poor households. The major objective of this study was to analyse poultry eggs production and marketing in Rwanda. A case of Musanze district. A Cross-sectional data from rural households and communities were collected using multistage and purposive sampling technique. The proportional selected method was used to make a desired sample size of 85 respondents. An econometric model

was employed to identify factors influencing poultry eggs production and marketing.

MATERIALS AND METHODS

Study area description

Musanze District is one of five districts of Northern Province created by organic law NO 29/2005 of 23/12/2005 related to the administrative entities of the Republic of Rwanda. Musanze is divided into 15 sectors 68 cells and 432 villages. The total area of the district is 530, 4 $km^{2,}$ among which 60km^2 of Virunga National Park and 28 km^2 of Lake Ruhondo. It is bordered by the Republic of Uganda and Democratic Republic of Congo to the North through Virunga National Park, Gakenke District in the South, Burera District to the East, Nyabihu in West and Ruhondo Lake in the South West. The district has two distinct zones and consequently related types of soils; one being volcanic area with moderate slopes and volcanic ash soils with lava predominant stones, the average altitude is 1860 m. The other part comprises steeply hills where erosion is active. The Musanze District has a tropical climate of high altitude with an average temperature of 20ºC and the rain that varies between 1400 mm and 1800 mm (NISR, 2012).

Agriculture is the lifeblood of the District. At least 91% of the population is engaged in agriculture. Musanze is considered as a country granary. The production of Maize, Irish potatoes, Fruits and vegetables is significantly high when there is no climate condition change. In terms of livestock, 68% of all households in Rwanda own some type of livestock, a slight decrease in Musanze District where 69% of all households own some type of livestock. This shows that Musanze District is above the national average in terms of households raising livestock (NISR, 2012).

Study population and sample size

The study was carried out in Musanze district and was targeted smallholder poultry keepers in study area. All respondents were poultry keepers engaged in poultry farming of at least 18 years of old who is accepted by laws of government of Rwanda to be mature, because below of these ages he/she is considered as child who cannot make decision on his/her own. At sector level, the village were randomly selected while within selected villages; poultry egg farms were proportionally select to make 85 poultry egg farms as sample size. The populations for this study were household members in randomly selected villages in five sectors. The interviewed farmers are current or those who are not currently in poultry farming but in new past participated in poultry farming in study area.

Table 1. Distribution of household respondents by sector

Sector	Sample frame	Sample size
Kinigi	42	15
Busogo	60	19
Rwaza	54	17
Gaskaki	63	21
Remera	35	13
Total	254	85

Study Design, and Sampling Procedure

Cross-sectional data from rural households and communities were collected using survey methods. Both multistage and purposive sampling were used to select five (5) sectors from Musanze district due to the high number of poultry keepers and poultry egg farms. The participants were proportionally selected from villages to make a desired sample size.

Data Analysis

Descriptive analysis using tabulation and graphical approaches, and correlation and contingency table analysis were also carried out, to assess associations among the variables. The descriptive statistics analysis that was employed using diagrams, charts, percentages, means, variances and standard deviations to examine the poultry marketing system as well as farmers' demographic and socio-economic characteristics. Poultry keepers and other sources were analysed using descriptive and inferential statistics where econometric models were also applied by the help of statistical software packages such as SPSS and STATA. Econometric model was also used to identify factors influencing poultry eggs production and marketing through Cobb Douglas(C-D) production function. Multiple Regression analysis was used to analyse data for this study. The Regression model is expressed as follows:

$$Y = a + B_1 X_1 + B_2 X_2 + B_3 X_3 \ldots B_8 X_8 + u$$

Where:

Y = Number of eggs produced (in crates)
X_1 = quantity of feeds (Kg)
X_2 = Water availability (L)
X_3 = Labour (men/day)
X_4 = Space reserved to poultry (m^2)
X_5= Price of egg produced (Rwf)
X_6 = Age (in years)
X_7= Education (in years)
X_8 = Farmer's experience (in years)
X_9= Distance to market (km)
X_{10} = Access to veterinary services (no = 0, yes = 1)
a = Constant
B_1 - B_{10} = regression coefficients
U= Error term

RESULTS AND DISCUSSION

Socio-Economic Characteristic of Sampled Farmers

Socio-economic characteristic of sampled farmers presented generally show characteristics of the respondents including the gender, age, education levels of the household's head, marital status of respondents, and relationship of respondent to household head.

Results of the study showed that 62.4% of the respondent are male, while 37.6% were female. This shows that male are poultry keepers than female indicating that male are more household heads than female. It is because, gender issues are a very important factor in poultry farming, and can either enhance good farming practices or slow down innovations because of the different gender perceptions held at the household and community levels.

Results of the study also showed that 41.2 % of the respondent are within the age 41-60; 30.6% are within the age range of 31-45 years, 20% are within age 18-30 and only 8,2% were of age 61 and above. This shows that majority of poultry farmers are in their productive years. Majority of the respondents attended primary school with 38. 82% followed by secondary with 23. 6%. The third class is of vacation study with 20%, the fourth has no formal education having 12. 9% while university had 4.7%. This implies that majority of the poultry farmers had at least formal education meaning that they should quickly adopt innovations and manage well the poultry farms through training and advice provided by extensionist and veterinary.

Table 2. Socio-economic characteristics of poultry keepers sampled

Descriptive characteristics	Frequency	Percentage (%)
Gender of respondents		
Male	53	62.4
Female	32	37.6
Age of respondents		
18-30	17	20
31-45	26	30.6
46-60	35	41.2
61and above	7	8.2
Marital Status		
Single	17	20
Married	39	45.9
Divorced	19	22.4
Widower	10	11.7
Education level respondents		
None	11	12.9
Primary	33	38.8
Secondary school	20	23.6
Vocation	17	20
University	4	4.7
Relationship of respondent		
Husband	43	50.6
Wife	25	29.4
Children	11	12.9
Other	6	7.1
Market of poultry production		
Local	37	43.5
National	16	18.8
Regional	13	15.3
International	4	4.7
Neighbours	9	10.6
Other	6	7.1

About 45. 9% of the respondent were married followed by divorced with 22. 4%. The third one is single presented by 20% while the last one is widower with 11, 7%. In this study, it was found that the married poultry farmers are the majority indicating that the higher force are together the higher the production increase. The results also indicated that considering the relationship of respondent to household head, the majority of household head were husbands with 50.6% followed by wives with 29. 4%. The children come at the third place with 12.9% and other occupies the last place with 7.1% of the respondents. This result should confirm that in study area the husbands the best owner of family property and opinion leader that other members of family.

The study was also interested to know how eggs production are marketed in the study area. Respondents showed that marketing opportunity for poultry eggs production was available because they were close to local markets particularly many hotels, bars and restaurants, government and private offices where employee can access the poultry production as well as high demand for eggs and meat, especially during the season of high tourism visit and period of salaries for employees.

The results indicated that the majority of respondents sell poultry eggs at local market at 43.5% followed by those who sell their production at 18.8%. The third one is those who sell their eggs production at regional market with 15.3%. This is followed by 10.6% representing those who sell to the neighbours. Others like international market and other are respectively represented by 7.1% and 4.7%. All these respondents above reported that there is no problem related with the market for selling eggs production. This because even local demand for poultry production is too high due to how they were located near main roads where traders should easily access. The majority of respondents also reported that there had been increases in the marketing and prices of poultry eggs and meats production over the last five years because of cross-border markets, especially in DRC (Goma), and second cities population growth particularly Musanze.

Regression Results of Factors Influencing Poultry Eggs Production and Marketing

The data collected from the respondents were analysed used using a multiple linear to find out the factors influencing poultry eggs production and marketing in study area. R-square value (R^2) of 0.77% means that 77% of the total variation in the socio-economic factors influencing poultry egg production and marketing was explained by the dependent variable. The findings obtained are in the table 3. below.

The result of the regression analysis in (table 3) showed that seven out of ten variables were positively significant. Water availability, space reserved to poultry, educational level, experience, and veterinary services were significant at $P \leq 0.01$ level. Feeds was significant at $P \leq 0.05$ level while labour was significant at 10% level. Two variables age and distance to market were negatively significant at 10% level. Moreover, Price of egg produced was not significant.

The quantity of feeds had a positive influence on poultry eggs production and marketing. This implies that a unit increase in the quantity of feeds reserved to poultry will lead to increased poultry egg production by 0.04 unit. The results also indicated that, the volume of water had a positive influence on poultry eggs production and marketing. This implies that a unit increase in volume of

water reserved to poultry will lead to increased poultry egg production by 0.31%. The results also indicated that, the space reserved to poultry had a positive influence on poultry eggs production and marketing. This means that one-metre square increase to space reserved to poultry will lead to increased poultry egg production by 0.34%. This is due to the increase of air circulation in poultry house. The level of education had a positive influence on poultry eggs production and marketing. This implies that a one-year increase in the level of education of the respondent will lead to increased poultry egg production by 0.2 %. This could be because education helps the farmers to understand better the innovation and advice introduced to them as regard poultry egg production and facilitate them to make sound and useful economic and managerial economic decisions. It also should be explained like this, the higher educational attainment the faster adoption of innovation.

Table 3. Regression of Factors Influencing Poultry Eggs Production and Marketing

Variables	Coefficient	Standard Error	t	P-value
Constant	3.085	1.919	1.607	0.000
Quantity of feeds	0.039	3.030	0.013	0.005
Water availability	0.307	0.597	0.514	0.002
Labour	0.278	0.139	2	0.017
Space reserved to poultry	0.342	0.175	1.954	0.000
Price of egg produced	0.017	0.098	0.173	0.218
Age	-0.525	0.337	-1.558	0.097
Education level	0.202	0.075	2.693	0.000
Farmer's experience	0.459	0.382	1.201	0.004
Distance to market	-0.330	0.708	-0.466	0.049
Access to veterinary services	0.487	0.042	11.595	0.000
Number of obs = 85				
Prob > F = 0.0000				
F (10, 74) = 43.72				
R-squared = 0.769				

The results of the study also revealed that farming experience showed positive influence on poultry production and marketing of eggs production. This implies that one-year increase of experience of the respondent in poultry farming will increase poultry eggs production by 0.44unit of production. This should be because with more experience in domain, the farmer is likely to identify and analyse problems, and conduct experiments aiming at developing local solutions appropriate to local specific challenges. Access to veterinary services had also a positive influence on poultry eggs production and marketing. This means that 1% increase to access to veterinary services will increase eggs production by 0.487%. This is significantly because access to veterinary services will helps farmers to more control pests and diseases, control of poor-quality food and water, sanitation and other related harmful challenges. Based on the principle learning by doing poultry farmers try develop their decision-making, which helps them to handle current and future challenges effectively, and thus farmers become progressively managers of their own economic activities.

The results of the study also revealed that farming age and distance to market showed negative influence on poultry production and marketing of eggs production. This implies that one kilometre increase to the market of the respondent the poultry eggs production and marketing will decrease by 0.33 unit. This means that, the longer the distance to the market, the higher the quantity or number of eggs that should be Brocken in the way. Similarly, to the age of respondents, one-year-old increase of respondent will reduce egg production by 0.53 unit.

The Impact of Poultry Farming Production on Farmers' Welfare

Poultry eggs and meat increases the farm family's nutritional intake, provides for greater family health, and overall contributes to more food security. Consumption of poultry meat and eggs is important for pregnant women, children and the elderly. Poultry can make a significant contribution in areas where child malnutrition is common. Enhanced nutrition improves growth, mental development, school performance and labour productivity and reduces the likelihood of illness.

Table 4. The Impact of Poultry Farming Production on Farmers' Welfare

Impact	Frequency	%	P-value
Source of HH food	18	21.2	0.000
Increased income	14	16.5	0.000
House utensil	12	14.1	0.001
School fees	11	12.9	0.004
Clothes of HH members	9	10.6	0.000
Mutuelle de santé	8	9.4	0.003
Malnutrition control	5	5.8	0.006
Personal expenses	3	3.5	0.047
Friendship	2	2.4	0.908
House rehabilitation	2	2.4	0.578
Other	1	1.2	0.192

Poultry framing is a very important resource for household income, socio-cultural and nutritional requirements. The most superior role of poultry is provision of eggs, and meat as a source of money and good nutrition. This because eggs are the easiest to convert into cash used to settle basic needs at home, such as house utensil, salt, sugar, soap paraffin, cooking oil,

and other personal expenses. The results from household respondents indicated that poultry eggs produced are firstly sold at local market. Money received from selling poultry production usually helps household to solve different need respectively Source of HH food (21.2%), Increased income (16.5%), House utensil1(4.1%), School fees (12.9%), Clothes of HH members (10.6%), Mutuelle de santé (9.4%), Malnutrition control (5.8%), Personal expenses (3.5%), Friendship (2.4%), House rehabilitation (2.4%), and other (1.2%). The respondents reported that eggs they don't use eggs as food they actually consume damaged eggs and sometimes few no damaged eggs but for children and wives for malnutrition control while high percentage of good and safe eggs are sold to convert in the other needs. The table below shows the mean and median of different outputs from poultry.

Poultry production is quit important form smallholder kippers because it helps in the other social functions. Unforgotten important benefit from poultry is the chicken props that are very rich in fertile and are mainly used as organic fertilisers to increase agricultural production and productivity what in return used for poultry feeds.

Constraints of Smallholder Keepers in Farming and Marketing of Poultry Production

Constraints facing smallholder poultry farmers are mainly management, environmental and the poultry/ chickens themselves. Poultry are kept all over the world for various reasons. They are one of the cheapest sources of egg meat and can be kept by anyone, even in backyards. In Rwanda, poultry are kept mainly by both smallholders' ad large commercial farmers for meat or egg production, by smaller farmers and by households in backyards. Two very important factors that should be addressed to ensure that you have a healthy flock of chickens are management and environment. When chickens are healthy, they eat less food and produce more meat and eggs. They are less trouble to look after and less money is spent on medical costs. Moreover, in contrast there are different factors facing poultry farmers in their production and market.

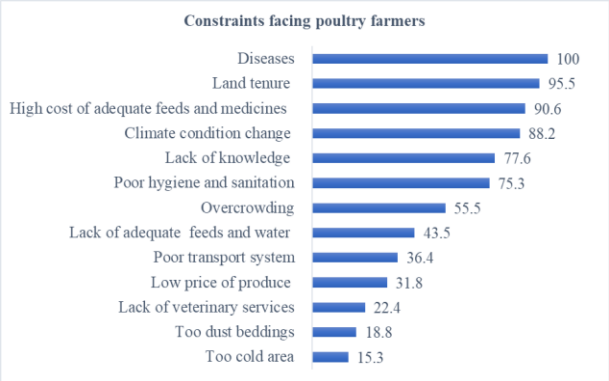

Figure 1. Constraints Facing Farmers in Farming and Marketing of Poultry Production

The results of the study presented in (Figure1) indicated that the respondents reported that factors respectively Diseases(100), Land tenure(96.5%), High cost of adequate feeds and medicines(90.6%), Climate conditions change(88.2%), Lack of knowledge(77.6%), Poor hygiene and sanitation(75.3%), Overcrowding(56.5%), Lack of adequate feeds and water(43.5%) , Poor transport system(36.4%), Low price of produce(31.8%), Lack of veterinary services(22.4%), Too dust beddings(18.8%), and Too cold area(15.3%) challenge their poultry farming.

In the study area, all respondents (100%) reported that disease was the main and the first constraint of poultry eggs production and marketing. This is because disease can spread rapidly among chickens because they are usually kept together in a cage or chicken house. They also share the same food and water bowls, which can spread disease and infections from sick to healthy chickens.

The respondents reported that the main factors that can contribute to disease include management, environment and the chickens themselves. In management there are poor-quality food and water, poor hygiene and inadequate cleaning programme, leaking water bowls, rat and fly problems, overcrowding of chicks, chickens of mixed ages reared together, no security measures to prevent people, and animals from entering the chicken house. For the environment there, too hot or too cold conditions, wet litter, dusty bedding, high build-up of chicken droppings, no air circulation, and sharp wires in the cages.

The farmers indicated that disease have many consequences for their livelihoods at both the community and individual household levels. They said that within households, priority requirements change, as the chickens that would have been used to feed visitors/relatives or sold for survival are no longer available. The capital available to farmers is therefore reduced, especially when are not producing and die. Therefore, all listed constraints particularly disease brings poverty to the household of rural areas.

The respondents surveyed said that the major diseases challenging farmers in study area are Coccidiosis, Variole, and Salmonella, ascardiosis Intestinal Worms, Gumboro disease, and Fowl cholera. In the constraints, inadequate feeds for poultry was also showed in the major challenges. It is sometimes come when food for humans is scarce. At this time, poultry have less access to the food and the production directly is reduced. Conflicts with neighbours when chickens destroy crops, especially young beans and maize was indicated as the issue. This one-force farmer to keep their poultry indoors and diseases spread faster as well as reduction of eggs production. High cost of adequate feeds and medicines for farmers, this is of the issue reducing the profitability of poultry farming, especially as there is also a lack veterinary service.

In this study, it was found that the married poultry farmers were the majority indicating that the higher force

are together the higher the production increase. Respondents showed that marketing opportunity for poultry eggs production was available. The results indicated that the majority of respondents sell poultry eggs at local market followed by those who sell their production at national market. The third one is those who sell their eggs production at regional market

The result of the regression analysis showed that seven out of ten variables were positively significant. Water availability, space reserved to poultry, educational level, experience, and veterinary services were significant at $P \leq 0.01$ level to influence poultry eggs production and marketing. Feeds was significant at $P \leq 0.05$ level to influence poultry eggs production and marketing while labour was significant at 10% level to influence poultry eggs production and marketing. Two variables age and distance to market were negatively significant at 10% level. Moreover, Price of egg produced was not significant to influence poultry eggs production and marketing.

The results from household respondents indicated that poultry eggs produced are firstly sold at local market. Money received from selling poultry production usually improve household to solve different need through Source of HH food, Increased income, House utensil1, School fees, Clothes of HH members, Mutuelle de santé, Malnutrition control, Personal expenses, Friendship, House rehabilitation, and other respectively. The results showed that factors facing poultry farmers in their production and market in this study were respectively Diseases, Land tenure, High cost of adequate feeds and medicines, Climate conditions change, Lack of knowledge, Poor hygiene and sanitation, Overcrowding, Lack of adequate feeds and water, Poor transport system, Low price of produce, Lack of veterinary services, Too dust beddings, and Too cold area. The respondents surveyed said that the major diseases challenging farmers in study area are Coccidiosis, Variole, and Salmonella, Ascardiosis Intestinal Worms, Gumboro disease, and Fowl cholera. After the results and conclusion of the study, more recommendations were given that:

CONCLUSION

The main objective of this study was to analyse poultry eggs production and marketing in Rwanda. A case of Musanze district. The results of the study indicated that in area many rural households keep poultry on a smallholder production while a few numbers keep them as a commercial purpose. Results of the study showed that the majority of the respondent were male. This shows that male are poultry keepers than female indicating that male are more household heads than female. The result of the regression analysis showed that seven out of ten variables were positive and significant. Water availability, space reserved to poultry, educational level, experience, and veterinary services were significant at $P \leq 0.01$ level to influence poultry eggs production and marketing. Feeds was significant at $P \leq 0.05$ level to influence poultry eggs production and marketing while labour was significant at 10% level to influence poultry eggs production and marketing. The results from household respondents also indicated that money received from selling poultry production usually improve household to solve different need through source of household food, increased income, house utensil1, school fees, clothes of household members, life insurance, malnutrition control, personal expenses, friendship, house rehabilitation, and other respectively. The results showed that factors facing poultry farmers in their production and market in this study were respectively diseases, land tenure, high cost of adequate feeds and medicines, climate conditions change, lack of knowledge, poor hygiene and sanitation, overcrowding, lack of adequate feeds and water, poor transport system, low price of produce, lack of veterinary services, Too dust beddings, and Too cold area. The respondents surveyed said that the major diseases challenging farmers in study area are Coccidiosis, Variole, and Salmonella, Ascardiosis Intestinal Worms, Gumboro disease, and Fowl cholera. After the results and conclusion of the study, some recommendations were given. Policy makers should formulate livestock policies that should address livestock breeding and livestock diseases control to facilitate poultry farmer from expensive raw materials, feeds and medicines of poultry. The private veterinaries should be more aggressive and charge realistic fee for the service to attract more farmers in sector. Government agencies and local government should improve and increase poultry production through capacity building for both veterinary and poultry keepers and take care of veterinary services that handle vaccination, production, breeding, disease control. University and secondary schools and other institutions related with poultry production should focus on practice rather than theories through the formation of short vocational and specialization courses and training for both veterinary and poultry keepers.

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