



Opportunities and Challenges Facing Smallholder Participation in Indigenous Poultry Production in Tharaka Nithi County, Kenya

Raphael Mwiti Gikunda

Department of Education, Chuka University,
P.O Box 109-60400, Chuka
Email: raphikunda@yahoo.com

Erastus Mwiti Mutegi

County Government, Tharaka Nithi County,
P.O Box 479-60400, Chuka
Email: erastusmwiti4@gmail.com

Abstract – Kenya has an estimated poultry population of 29 million, of these, 22 million (75 %) are free-ranging indigenous chickens. Poultry keeping is especially attractive to poor households as they require low start-up capital and have low maintenance costs. Besides, increasing demand occasioned by an increase in population in the County as a result arising from among other reasons; the opening of Chuka University as a constituent college in 2004, the productivity of indigenous poultry in the County has been low. The study adopted a descriptive research design as it was aimed at describing the status of indigenous poultry production in the County. A structured questionnaire was used to obtain farm level information from smallholder farmers. The descriptive statistics used were frequencies, percentages, mean and standard deviation. Inferential statistics included Pearson product correlation coefficient and chi square. Correlation analysis established positive significant relationships between the institutional factors and adoption of indigenous poultry production. The correlation coefficient between access to extension service and adoption of indigenous poultry was 0.304**, that of access to credit and adoption was 0.290**, and access to breeding stock and adoption was 0.361**. Based on the findings, the main problems facing indigenous poultry production were pest and diseases, and insecurity. It was also clear that the enterprise has a number of opportunities which ranges from unmet demand of indigenous poultry products, increased household income, food security and nutrition to creation of job opportunities.

Keywords – Challenges, Indigenous Chickens, Opportunities, Participation, Smallholder.

I. INTRODUCTION

Indigenous poultry production is common in rural resource poor households in developing countries. They play a vital role in the human livelihoods and contribute significantly to food security of the rural communities as chicken products have no cultural or religious taboos (Tadelle *et al.*, 2003). In Kenya like other developing countries, Indigenous Chicken constitute majority of the chicken population (70%) and are raised by the rural households under extensive system of production (Olwande *et al.*, 2010). The industry contributes about 55 percent to the livestock sector, 30 percent of the agricultural GDP, and 7.8 percent of the total GDP (MOLD, 2009). Poultry production is widespread in rural and peri-urban areas. Kenya has an estimated poultry population of 29 million birds. Seventy five (75) percent of these consist of indigenous chicken, 14 percent broilers,

8 percent layers, 1 percent breeding stock and 2 percent other poultry species (Okello *et al.*, 2010).

The Kenyan poultry industry comprises of small- and large-scale poultry producers, operating under two main production systems: the indigenous poultry production and commercial hybrid poultry production systems (Okello *et al.*, 2010). The indigenous poultry production is the main production system in Kenya. The birds are raised in a free range system where they scavenge for food during the day and occasionally receive commercial feed supplements (Okello *et al.*, 2010). Eggs and meat from indigenous chicken contribute to the protein nutrition of various household in the country. Sale of poultry products increase and diversify revenue in the live stock sector. Poultry sub-sector creates employment and promotes overall economic development. Culturally indigenous chicken have been used in traditional medicine and for various cultural rites (King'ori, 2004; Moreki *et al.*, 2010).

Participation in indigenous poultry production depends on location level factors that tend to influence participation at a meso or community scale as well as household level factors that influence participation across households within a given location (Barrett, 2008). It is widely recognized that well-functioning input and product markets provide important opportunities for income generation and wealth creation and are, therefore, key in transforming subsistence production among the smallholder farmers, poor and landless households, as well as those living in marginal areas. Hence, it is important to understand the constraints to participation in production and marketing of indigenous poultry production. In addition, identification of interventions that can overcome these constraints in order to unlock opportunities for involvement in the enterprise is also imperative. This study was therefore, meant to identify critical challenges and assess growth opportunities in the indigenous chicken value chain, which could be exploited in order to improve market access and participation by small scale farmers in Tharaka Nithi County.

II. DESCRIPTION OF THE STUDY AREA

Tharaka-Nithi County is located in the former Eastern Province of Kenya, it borders Meru County to the North and North East, Kitui County to the East and South East, Embu County to the South and South West. Temperatures range from a minimum of 11°C to a maximum of 40°C. The rainfall ranges between 200mm and 800mm per

annum. The total area of the County is 2,609.5 square kilometres, including Mt Kenya forest which is estimated at 360 square kilometres. The County is divided into four administrative Sub Counties namely Tharaka North, Tharaka South, Meru South and Maara (MoAL & F, 2013). The main economic activities are farming, pastoralism, sand harvesting and quarrying. The population density is 138 people per sq. Km and 65% of the population live below poverty line.

III. MATERIALS AND METHODS

The study adopted a descriptive research design as it was aimed at describing the status of indigenous poultry production in the County. According to Polit & Hungler (2004) descriptive design describes data and characteristics about the population or phenomenon being studied. The study population comprised of indigenous poultry farmers in the County. A stratified random sampling was used to select poultry farmers in target area. Data was collected using a structured questionnaire was used to obtain farm level information from indigenous poultry farmers. The data were analyzed using descriptive and inferential statistical tools. The descriptive statistics used were frequencies, percentages, mean and standard deviation. Inferential statistics included Spearman's rank order correlation coefficient (ρ).

IV. RESULTS AND DISCUSSION

The survey was undertaken to unveil the opportunities and challenges encountered in indigenous poultry production in Tharaka Nithi County in order to come up with solution and recommendations which when adopted would help upscale the productivity of the Indigenous poultry.

a) Farmer Characteristics

The farmers characteristics considered in the analysis were; gender, education, farm size, experience in poultry production and flock size. The study engaged 78 smallholder farmers from 10 out of 15 Divisions of the County namely: Murugi, Muthambi, Mwimbi, Igamba Ng'ombe, Magumoni, Chuka, Marimanti, Nkondi, Mukothima and Gatunga. Among the sampled farmers, 93.6% kept indigenous chicken, where 60% were women while 40% were men. Majority of the respondents (46%) had secondary education and their farm sizes ranged from 1 to 6 acres as shown in Table 1. Among the Divisions studied, Muthambi farmers had a higher poultry production experience and highest average flock size (104) as compared to the rest. As shown in Table 1, the mean farm size was 2.9311 acres, mean production experience was 5.7 years and average flock size was 41.

Table 1: Farmer Characteristics

Division		Farm size (acres)	Experience in poultry production (years)	Average number of indigenous chicken
Murugi	Mean	.7500	3.3333	28.3333
	N	6	6	6
Muthambi	Mean	2.7250	2.6200	104.0000
	N	5	5	5
Mwimbi	Mean	3.2500	18.3750	44.7000
	N	10	8	10
Igamba Nombe	Mean	2.6000	2.9200	39.0000
	N	5	5	5
Magumoni	Mean	2.0000	2.7500	20.4000
	N	12	12	10
Chuka	Mean	.9167	5.5000	43.0909
	N	12	12	11
Marimanti	Mean	3.8571	3.2286	66.4286
	N	7	7	7
Nkondi	Mean	6.7778	3.7889	36.6667
	N	9	9	9
Mukothima	Mean	5.6000	3.0000	34.0000
	N	5	5	5
Gatunga	Mean	2.0000	9.2857	21.5000
	N	7	7	6
Total	Mean	2.9311	5.6632	41.9459
	N	78	76	74
	Std. Deviation	2.91495	9.45085	41.32626

The standard deviations of farm size (2.91495), production experience (9.45085) and flock size (41.32626) were large meaning that there was a high variation in the farm sizes owned, flock sizes kept and the production experience greatly varied from one farmer to another.

b) Types of Indigenous Poultry Kept

The results further indicate that four types of indigenous poultry are reared in the County namely; local chicken, Kenbro, guinea fowl and turkey as shown in Table 2. Of these four types, local chicken were reared by majority of

the respondents (94.9%) while guinea fowls were kept by only a few farmers (11.5%). The results further indicate that the total flock sizes varied from one poultry type to another. A total of 4004 local chicken, 3104 Kenbro chicken, 109 guinea fowls and 78 turkeys were being reared by the farmers involved in the study. Most of the

farmers are now adopting a dual purpose improved indigenous breed of chicken (Kenbro) given to its low cost of maintenance and higher earnings. According to farmers, Kenbro lays more eggs than indigenous chicken and has lean, soft, high quality meat that is very popular with consumers.

Table 2: Types of poultry kept

Poultry kept	Local chicken		Kenbro		Kanga (guinea fowl)		Turkey	
	Freq	%	Freq	%	Freq	%	Freq	%
Farmers rearing	74	94.9	21	26.9	9	11.5	11	14.1
Farmers not rearing	4	5.1	57	73.1	69	88.5	67	85.9
Total	78	100.0	78	100.0	78	100.0	78	100.0
Total flock sizes	4004		3104		109		78	
Mean flock sizes	190.67		41.95		12.1		7.09	

c) Reasons for Keeping Poultry

When asked to indicate the reasons for keeping poultry, 51.28% of the respondents indicated that they reared poultry for sale while 48.72% kept it for own consumption

as depicted in Figure 1. This shows that most of the smallholder farmers in the County were keeping poultry for commercial purposes.

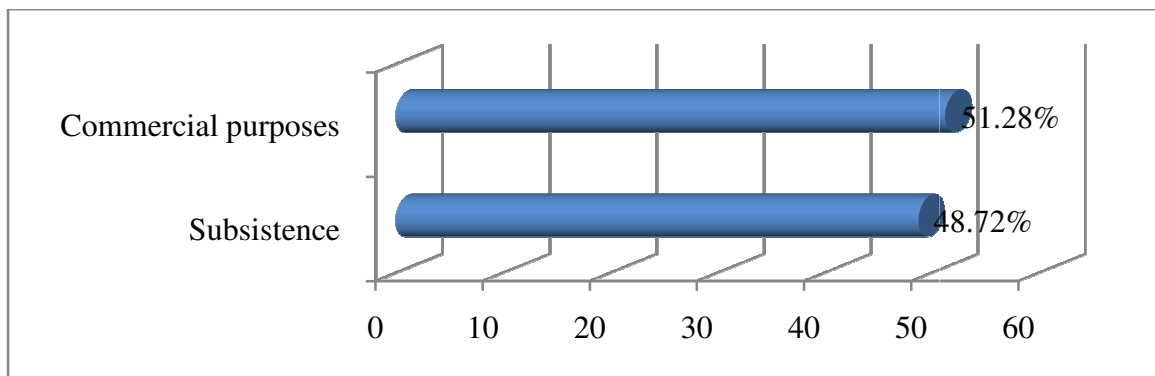


Fig.1. Reasons for rearing indigenous poultry

d) Rearing Systems Practiced

The results also indicate that the farmers practiced three kinds of rearing systems in indigenous poultry production namely: free range, intensive and semi-intensive. As shown in Figure 2, most of the respondents (42.3%)

practiced free range system, 26.9% used intensive system and 30.8% practiced semi intensive system to rear poultry. This shows that most of the indigenous poultry in the County generally are scavengers.

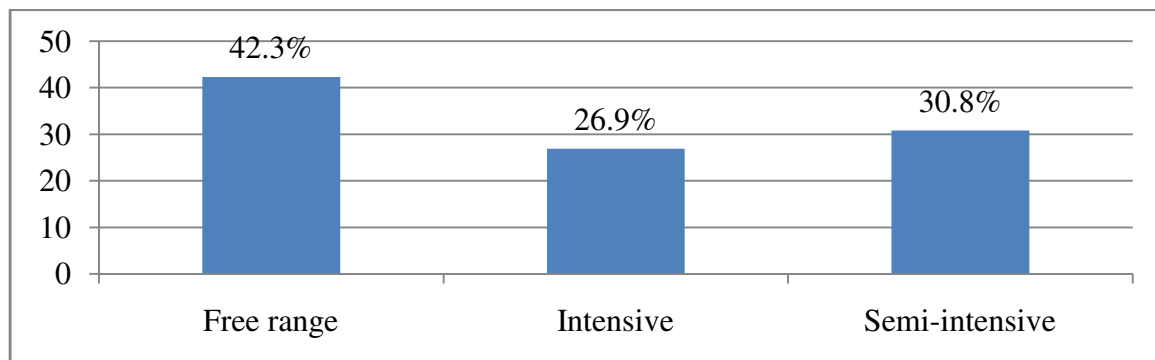


Fig.1. Rearing systems practiced

e) Source of Breeding Stock

Majority of the respondents (67.1%) sourced their breeding stock from neighbours and friends as its cheap as compared to other sources. Other farmers got their stock

from hatcheries (18.4%) and KARLO (Kenya Agricultural Research and Livestock Research Institute) (14.5%) as illustrated in Figure 3.

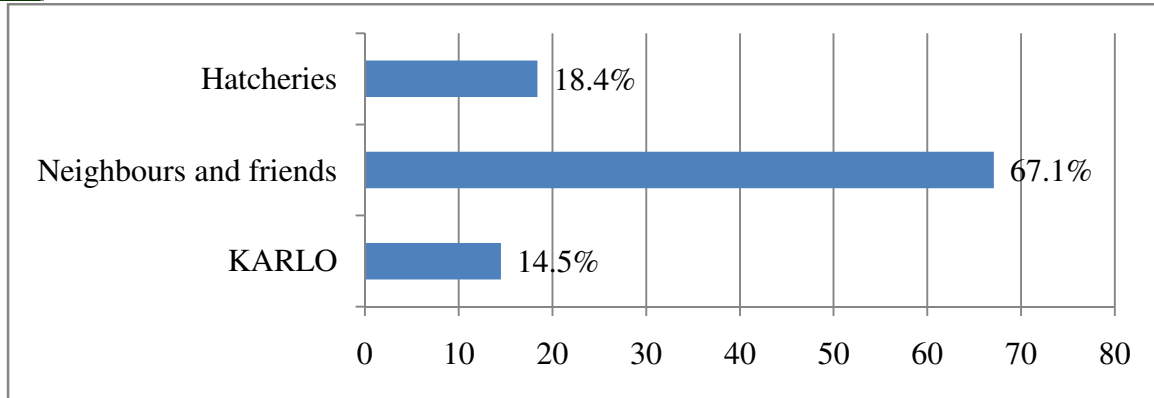


Fig.2. Source of breeding stock

f) Indigenous Poultry Feeding

The study also revealed that most of the smallholder farmers (62.8%) used farm produce and leftovers although scavenging was the major feeding system practiced. It also emerged that from 57.7% of the respondents that most of the farmers did not have knowledge and skills of

formulating feeding ration for their poultry using the locally available feedstuff. About 68% of the respondents supplemented their poultry with commercial feeds. Of these, 50% supplemented their poultry on daily basis, 19.3% supplemented on weekly basis, and 30.7% did it occasionally as shown in Figure 4.

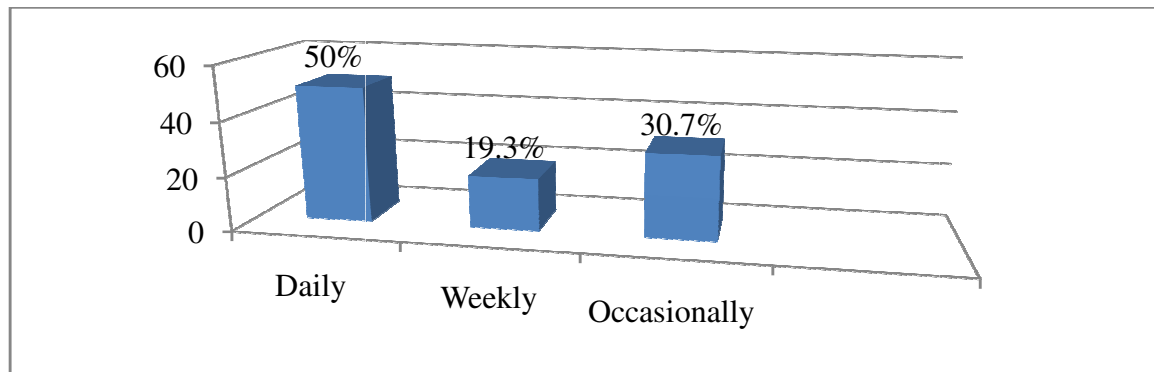


Fig.3. Frequency of feed supplementation

g) Influence of Farm and Farmer Characteristics on Indigenous Poultry Production

In a scale of 1-5, where 1 implies very low, 3 moderate and 5 implies very high, the respondents were asked to indicate the extent to which farm and farmer characteristics influenced smallholder farmers' participation in indigenous poultry production. The mean and standard deviations of the responses were computed. Spearman's correlation was used to establish the influence of the characteristics on adoption of indigenous poultry. The results in Table 3 indicate that most of the respondents felt that farmer educational level, farm income, off farm income and farm size were important

characteristics that influenced the adoption of indigenous poultry production as shown by the mean responses of 2.8462, 3.3846, 3.0789 and 3.1521 respectively. The standard deviations ranged from 0.88387 to 1.22739 which indicates a variation in the item responses.

Spearman's correlation analysis revealed a significant positive relationship between the above mentioned characteristics and adoption of poultry production. The correlation between farmer education level and adoption of indigenous poultry was 0.301**, farm income and adoption was 0.504**, off farm income and adoption was 0.295**, and farm size and adoption of indigenous poultry was 0.359**.

Table 3: Influence of farm and farmer characteristics on indigenous poultry production

Farm and Farmer Characteristics	Mean	Std. Deviation	Spearman's correlation (rho)	
			Correlation coefficient	Sig. (2-tailed)
Farmer education level	2.8462	.88387	0.301**	0.007
Farmer's experience in poultry keeping	2.1667	1.22739	0.108	0.348
Gender	2.9103	1.16425	0.001	0.995
Farm income	3.3846	1.02223	0.504**	0.000
Off farm income	3.0789	1.21943	0.295**	0.009
Farm size	3.1521	1.22366	0.359**	0.001

** Correlation is significant at the 0.01 level (2-tailed).

This shows that an increase farmer education level, farm income, off farm income and farm size would lead to increase in indigenous poultry production. Farmer's experience in poultry keeping and gender did not have a significant influence on adoption of indigenous poultry production.

h) Institutional Factors influencing Adoption of Indigenous Poultry

The study also sought to determine the influence of institutional factors on adoption of smallholder indigenous poultry production. In a scale of 1 to 5; where 1 implies very low, 3 moderate and 5 very high, the respondents were asked to indicate the extent to which institutional factors influence adoption of indigenous poultry. According to the results in Table 4, majority of the

respondents felt that access to extension services, credit facilities and breeding stock highly influenced participation in indigenous poultry production as indicated by the mean responses of 2.8243, 3.0000 and 3.1081 respectively. Correlation analysis established positive significant relationships between the institutional factors and adoption of indigenous poultry production. The correlation coefficient between access to extension service and adoption of indigenous poultry was 0.304**, that of access to credit and adoption was 0.290** and, access to breeding stock and adoption was 0.361**. This shows that an increase in access to the institutional services would lead to an increase in participation in indigenous poultry production.

Table 4: Influence of institutional factors on adoption of indigenous poultry

Factor	Mean	Std. Deviation	Spearman's correlation (rho)	
			Correlation Coefficient	Sig. (2-tailed)
Access to extension services	2.8243	1.50213	0.304**	0.007
Access to credit facilities	3.0000	1.48047	0.290**	0.010
Access to breeding stock	3.1081	1.31969	0.361**	0.001

** . Correlation is significant at the 0.01 level (2-tailed).

i) Challenges to Indigenous Poultry Production

The study further assessed the challenges facing smallholder participation in indigenous poultry production. In a scale of 1-5, where 1 implies very low, 2 low, 3 moderate, 4 high and 5 very high, the respondents were asked to indicate the level at which they were faced by the following challenges in the production indigenous poultry. The results show that (Table 5) the main problems were pest and diseases, and insecurity with mean responses of 3.7051 and 3.5513 respectively. Pest and diseases are mainly brought about by the fact that most of the birds are reared using scavenging systems hence exposed to the pest and diseases. The other challenges were moderate as indicated by their mean scores; lack of technical advice from extension officers (3.1410), inadequate feed (3.1154), heavy losses due to predation (2.9615), poor housing (3.1410), Lack of labour (2.6410) and unavailability of breeding stock (3.1795).

Table 5: Challenges facing smallholder indigenous poultry production

Challenge	Mean	Std. Deviation
Inadequate feed	3.1154	1.18410
Poultry diseases and pests	3.7051	1.22304
Heavy losses due to predation	2.9615	1.16711
Poor housing	3.1410	1.20307
Lack of labour	2.6410	1.19495
Unavailability of breeding stock	3.1795	1.17045
Insecurity	3.5513	1.28284

j) Opportunities Existing in Indigenous Poultry Production

The study also sought to establish the opportunities that exist in indigenous poultry production. In a scale of 1 to 5; where 1 implies strongly disagree, 3 somehow agree and 5 implies strongly agree, the respondents were asked to indicate the extent to which they agreed that opportunities existed in indigenous poultry production. The results in Table 6 show that most of the respondents pointed out that there was unmet demand of indigenous poultry products hence; there was ready market (3.3077). The respondents also confirmed that participation in indigenous poultry production increased household income (3.6282), ensured food security and nutrition (3.6538) and also created job opportunities through self-employment, marketing and transportation of the products. The standard deviations ranged from 0.95451 to 1.35136 indicating that the level of agreement varied from one respondent to another.

Table 6: Opportunities of indigenous poultry production

Opportunity	Mean	Std. Deviation
Increased household income	3.6282	1.09437
Food security and nutrition	3.6538	1.10285
Creation of employment	3.8462	0.95451

V. CONCLUSION

Majority of the rural households in the County reared indigenous poultry which ranged from local chicken, Kenbro, guinea fowl to turkey. Of these four types, local chicken were reared by majority of the farmers although, the population of Kenbro has been in the increase owing to the fact that it's a dual purpose improved indigenous breed of chicken which requires low cost of maintenance and gives higher earnings. Majority of indigenous poultry in the County are generally scavengers, but in most

households they are supplemented using cereal grain, food leftovers and commercial feeds. It was also evident that the main source the breeding stock was neighbours and friends because farmers could not afford chicks from KALRO and hatcheries. Participation in indigenous poultry production is mainly dependent on institutional factors as well as farmer and farm characteristics.

The main problems facing indigenous poultry production were pest and diseases, and insecurity. The other challenges were moderate and included lack of technical advice from extension officers, inadequate feed, heavy losses due to predation, poor housing, Lack of labour and unavailability of breeding stock. Based on the findings it is also clear that the enterprise has a number of opportunities which ranges unmet demand of indigenous poultry products, increased household income, food security and nutrition to creation of job opportunities.

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AUTHOR'S PROFILE



Raphael Mwiti Gikunda

is a lecturer in the Department of Education, Chuka University. He has a Masters Degree in Agricultural Extension and Bachelor's degree in Agricultural Education and Extension obtained from Egerton University. His research interests are broad, but geared towards the empowerment of rural people for improved livelihoods. Before joining Chuka

University, he was the Programme Officer at African Institute for Capacity Development, Kenya Country Office. He can be contacted at P.O. Box 109- 60400, Chuka University, Kenya.

Phone: +254- 724-889055.

Email: raphael.mwiti@yahoo.com



Erastus Mwiti Mutegi

Is an agriculturalist with keen interest in improving farm productivity by optimal utilization of locally available raw materials and simple techniques. He has a Bsc. Degree in Agricultural Extension and Bachelor's degree in Agricultural Education and Extension obtained from Egerton University. He taught Agriculture and Bio in various high schools and an Examiner in the same. Currently, he is pursuing Master of Science in Animal Nutrition at Chuka University. He can be contacted at P.O. Box 109- 60400, Chuka University, Kenya.

Phone: +254-721543506.

Email: erastusmwiti4@gmail.com