Title: An appraisal of the indigenous chicken market in Tanzania and Zambia. Are the markets ready for improved outputs from village production systems?

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Abstract

Traditional or village poultry, consisting primarily of indigenous chickens, make up over 80% of poultry in Africa. Most are kept as small flocks in free-ranging, scavenging, low input production systems. They provide vital nutritional and financial needs especially for children, women of reproductive age, people with HIV/AIDS and the poor. Poultry meat and eggs provide animal source protein and essential micronutrients which improves growth and cognitive development in children. While productivity of indigenous chickens is low due to uncontrolled disease and an unreliable scavenging resource base, the minimal inputs result in a high benefit-cost ratio. By increasing supplementary feeding through improved crop yields and improving disease control through vaccination, a higher number of chickens of greater bodyweight will be available to market. An appraisal of the indigenous chicken market in Tanzania and Zambia was conducted to identify the key individuals (including gender imbalances), market channels, commercialisation margins, market trends and competition from exotic, commercial chickens (broilers and spent layers). Consumers preferred indigenous chickens and urban consumers paid their significantly higher price, which resulted from the accumulative costs of intermediary traders' fees, transport costs and market fees. Commercial chickens in urban markets sold at a lower price but were vulnerable to fluctuating costs of high inputs. Indigenous chicken producers' margins were favourable enough to suggest that some additional costs were sustainable, provided the off take channels and consumer confidence is sustained. Markets for indigenous chickens were informal and consequently, their response to increased production may be unpredictable.

Keywords: informal markets, market channels, village poultry

Introduction

Village poultry keeping has been part of human development for centuries and continues to play a vital role in rural livelihoods, especially those of the remote and poorer communities in developing countries (Alders and Pym 2009). Over 85% of rural families in Sub-Saharan Africa keep poultry as a source of capital and dietary protein and they make a significant contribution to poverty alleviation, food security, social status and gender equality (Guèye 2000; Randolph et al 2007). In addition, they are often essential in providing nutritional and financial needs for people living with HIV/AIDS (Bagnol 2009). Women and children often own and manage village poultry (Bagnol 2009) and poultry keeping can be the first step onto the livestock ownership ladder for the poor (Guèye 2000).

Diets of vulnerable households are often nutrient deficient, with a reduced bioavailability of micronutrients. This is due to a lack of dietary quantity, quality and diversity, with children and women of reproductive age being the most affected (Neumann et al 2003). Undernutrition and stunting in children reduces cognitive development and increases susceptibility to disease, which may irreversibly affect their future potential (UNICEF 2013). In Zambia and Tanzania stunting in children under five is estimated at 45% and 42% respectively (UNICEF 2013). Improved poultry production improves family nutritional outcomes by supplying high quality protein and micronutrients (zinc, vitamin A and haem iron) through consumption of meat, liver and eggs (Alders et al 2014).

Rural poultry accounts for 80% of poultry population in Africa and they are typically kept as small flocks in free range scavenging production systems (Guèye 2000; Pym et al 2006). They require little start-up investment and have negligible inputs, meaning almost any output (meat or eggs) results in profit (de Bruyn et.al 2015). Productivity is low, primarily due to a variable scavenging resource base, a lack of supplementary feeding and uncontrolled diseases (Goromela et al 2006). Consequently, their contribution to meat and egg production is likely to be much lower than their population figures suggest (Pym et al 2006). However, natural selection under scavenging conditions has resulted in more disease resistant chickens, adapted to maximise the utilisation of their low quality diets (Pym et al 2006).

This market appraisal formed part of a larger five-year project, funded by the Australian Centre for International Agricultural Research (ACIAR), led by the University of Sydney and titled “Strengthening food and nutrition security through family poultry and crop integration in Tanzania and Zambia”. The overall aim is to reduce childhood undernutrition by analysing and testing opportunities to enhance the key role that women play in improving poultry and crop integration and efficiency to strengthen household nutrition in an ecologically sustainable manner (Alders et al 2014). This indigenous chicken market appraisal aimed to better understand the mechanisms and linkages involved between producers, traders and consumers (with particular attention to women’s opportunities and constraints) and to identify areas for further analysis, so as to ensure efficiency and more equitable distribution of gains through the value chain. Producers were identified and production systems were described, including details on inputs and outputs. Output channels from producers were

identified and followed through to market traders. Customers were questioned on preferences, demands and price sensitivity.

Study Areas and Methods

The study areas were determined by the ACIAR project and the market appraisal took place in September and October 2015. In Tanzania, the selected villages were Sanza and Ikasi (Sanza Ward) and Kinangali (Majiri Ward), Manyoni District, Singida Region. Regional markets were visited in Manyoni town and Dodoma city, and four markets were visited within Dar es Salaam (Figures 1 and 2). Manyoni District is located in the south of the Singida Region in Tanzania's semi-arid central zone. There are two main seasons: the long dry season (April to November) and the short rainy season (December to March). Annual rainfall ranges from 500-800mm with temperatures ranging from 15 °C in July to 35 °C in October (NBS, 2007). Vaccination against Newcastle disease began in Sanza Ward in mid-2014 and Majiri in early 2015.

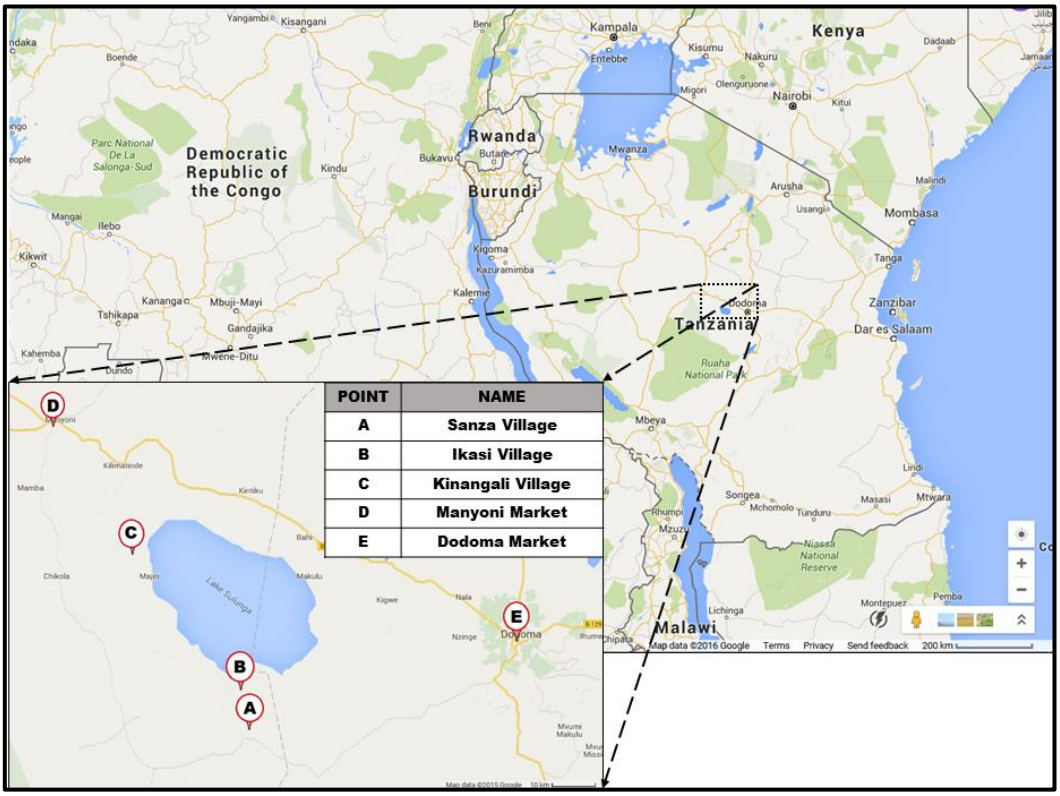

Figure 1. Locations of sites visited in central Tanzania

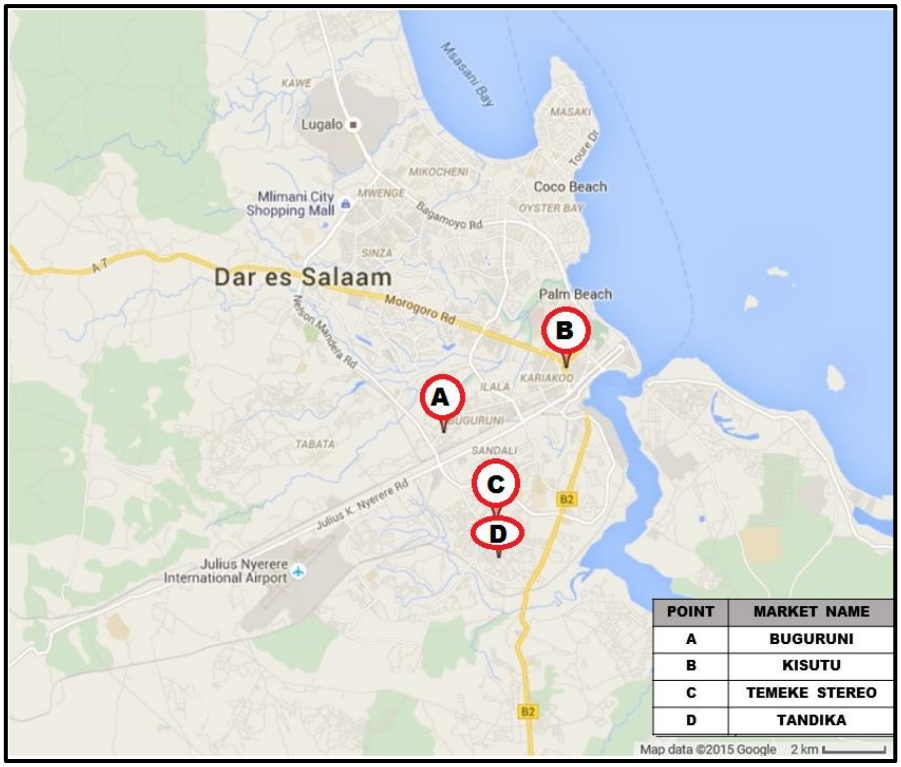

Figure 2. Markets visited in Dar es Salaam

In Zambia, the project is based in Lusaka Province. East of Lusaka city, lie the districts of Chongwe and further east, Rufunsa (Figure 3). The latter contains the wards of Bundabunda to the southwest and Shikabeta to the northeast. In Bundabunda Ward, interviews were conducted in Pongolani village with local residents and visitors from three nearby villages (Manchishi, Bundabunda and Ponda), whilst in Shikabeta Ward, four villages (Njavwa, Mululi, Luchele and Chilumbwe) were visited. Markets were visited in Chongwe Town, Katende and Lusaka (Figures 4 and 5). The climate in Lusaka province is humid-subtropical with three seasons, cool and dry (May-August), hot and dry (September-November) and warm and rainy (December-April). Annual rainfall is between 500-700 mm (FAO, 2009). On descending eastwards into the Zambezi valley, temperatures reach in excess of 40 °C in October. Project activities had a staggered start with Newcastle disease vaccination beginning only late in 2015.

Figure 3. Map of Zambian Provinces, with Lusaka Province enlarged to show districts

Figure 4. Location of sites visited to the east of Lusaka city

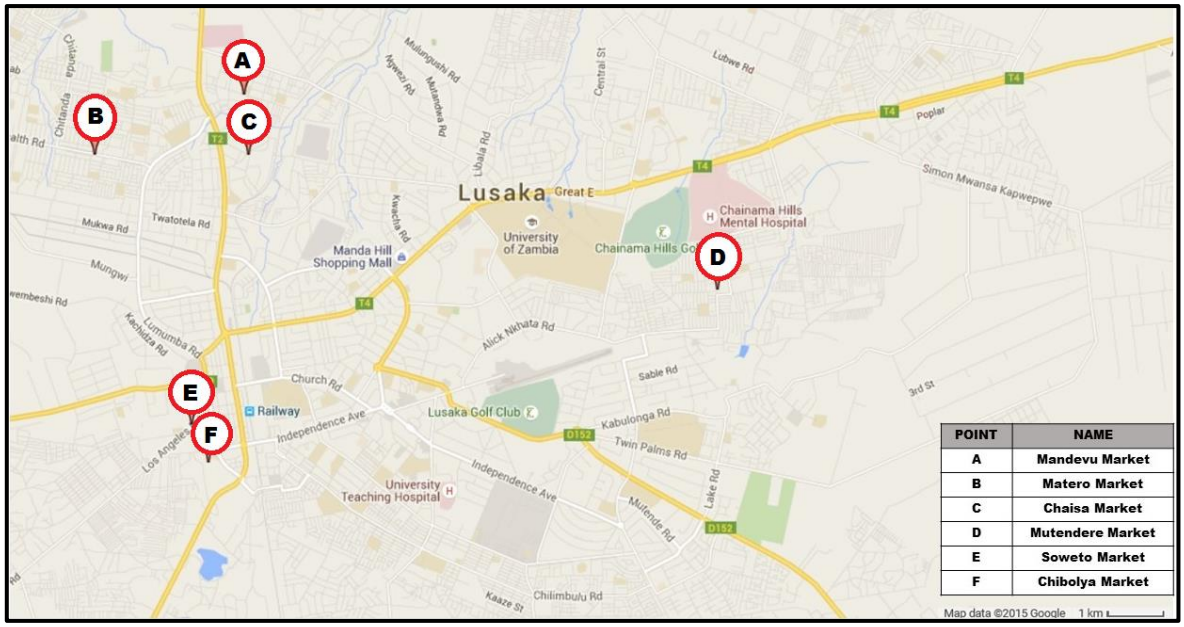

Figure 5. Location of markets visited in Lusaka city

Semi-structured, in-depth interviews (most with interpreter assistance) were conducted with individual producers, agents or intermediate vendors (hereafter intermediaries), market traders, consumers, restaurant owners, shop keepers and representatives of poultry associations and government ministry departments. Producers in Tanzania were interviewed at their homes with a visual assessment of the flock and production system where possible. In Zambia, this was possible in Shikabeta Ward, but in Bundabunda Ward producers were selected from individuals attending and passing a canine rabies vaccination clinic in Pongolani village. Intermediaries were interviewed at work or home, market traders were interviewed at their cages and similarly, restaurant owners in their restaurants. Individual consumers and restaurant buyers were interviewed after purchasing from the market. In addition, published literature was reviewed for country statistics, market trends and other poultry industry news.

The data collected were used to develop a schematic map of the main people in the production and marketing system for the principle poultry products and to identify the main flows (Rushton 2009). Price data collected were used to calculate commercialisation margins.

Results

In the study sites of each country, key individuals (both male and female) and their connections within the value chain were identified and are discussed below.

i. **Producers**

Producers in Tanzania and Zambia were small scale farmers who kept poultry and produced crops (maize, sorghum, groundnuts, sesame, sweet potato and sunflower), both for sale and home consumption. Village communities in Tanzania consisted of closely spaced houses with agricultural lands in the surrounding areas, e.g. along river banks. By contrast, Zambian villagers occupied smallholding-type plots with agricultural land around each house and consequently, larger distances between them.

All village producers in both countries kept small flocks of predominantly indigenous chickens for sale and home consumption. Some producers in Tanzania kept in addition, small numbers of Guinea fowl, ducks or pigeons for home consumption. They were all kept in free range scavenging systems and housed overnight either in chicken coups (made of sticks or reeds) or in outbuildings of similar structure to the producers' home, or in a room within the home.

Although both men and women kept chickens, the majority of producers in both countries were women, whilst larger flocks in Tanzania were owned by men. Both male and female producers in both countries were equally knowledgeable on sale prices, intermediaries and costs of inputs, indicating an equal involvement in poultry keeping. In Tanzania, on average in a year, producers sold twice as many chickens than they consumed, whilst in Zambia 50% more were consumed than sold (Table 1).

Table 1. Producers' flock sizes, annual consumption and sales, disaggregated by gender

	Current flock size	Chickens consumed/year	Eggs consumed/year	Chickens sold/year	Sale price Hen USD	Sale Price Cock USD
			Tanzanian Producers Female (n=11)			
Average	28.7	11.8	28.5	31.5	3.18[a]	4.32[a]
Median	30	12	24	20	3.18[a]	4.09[a]
			Tanzanian Producers Male (n=2)			
Average	40	12	60	30	2.96[a]	4.09[a]
Median	40	12	60	30	2.96[a]	4.09[a]
			Tanzanian Producers Combined (n=13)			
Average	31	15	52	30	3.14[a]	4.29[a]
Median	30	12	30	30	3.18[a]	4.09[a]
			Zambian Producers Female (n=4)			
Average	29.3	40.7	22	5.8	3.14[b]	4.24[b]
Median	30	49	24	6	3.09[b]	4.24[b]
			Zambian Producers Male (n=8)			
Average	24.8	11.6	8.9	19.3	2.69[b]	3.72[b]
Median	21	10	8	14	2.67[b]	3.73[b]
			Zambian Producers Combined (n=12)			
Average	26.3	19.6	11.5	14.75	2.84[b]	3.89[b]
Median	22.3	13	10	9	2.88[b]	4.03[b]

Table key: 1 USD = a: 2,200 Tanzanian Shilling TZS, = b: 11.80 Zambian Kwacha ZMW (Oct 2015)

In both countries most chickens were sold early in the wet or planting period (November-January), when there was a cash requirement for crop inputs and for school fees, and this coincided with higher consumer demands during year end festivities.

Apart from selling to meet cash needs, sales were often opportunistic, to individual household consumers or passing intermediaries. Consumption by producers was often limited to periods of chicken disease outbreaks (with signs compatible with Newcastle disease); they consumed sick and even dead chickens. Hatching of eggs was the primary means of replenishing and increasing flocks size. Consequently, egg consumption was restricted to those that were damaged or those of less broody hens. None of the interviewed producers sold eggs although some indigenous eggs were found in the markets, more so in Tanzania than in Zambia. Markets in both countries had a high number of eggs from commercial layers.

In Tanzania, feed inputs (maize bran and sorghum) were limited to the dry season and sourced from either home grown excesses (or those unfit for human consumption) or grains purchased from local producers. Those with larger flocks sourced specialised feeds from local urban markets and veterinary drugs (including antibiotics, wormers, vitamins and vaccines) from either local village pharmacies or in nearby urban centres. In Zambia, only two of the 12 producers interviewed used veterinary drugs and all producers limited additional feeds to home produced grains only when needed.

Diseases (suspected Newcastle disease and fowl pox) and predation were reported to be the main causes of loss in both countries. Flock sizes were lowest in October and November (the end of the dry season), with some reporting losses of 40, 60 or 100% of their flock by this time of year.

ii. Intermediaries

In Tanzania, intermediaries were numerous, exclusively male and travelled between producers' homes by bicycle or motorbike with a woven-stick transport cage. Three quarters of producers in Tanzania sold more often to intermediaries, than to individual consumers. Intermediaries reported that stiff competition and low availability were limiting factors for business growth, as demand from market traders was always high. Some intermediaries were part time producers and bought smaller chickens to finish at home for later sale. They sold on to market traders in local villages (Sanza or Majiri) and local urban centres (Dodoma or Manyoni).

In Zambia, producers sold primarily to local individuals and small scale intermediaries (of both genders), who were mostly on foot or bicycle. Intermediaries complained of a low availability of chickens to buy. Some producers acted locally as part time intermediaries and bought additional chickens from neighbours to pool with their own. They sold the batch to traders at the market, either locally or in Lusaka, or they acted as ad hoc market traders themselves.

iii. Market traders

Indigenous poultry were sold as live chickens in designated areas within open air markets in cities and towns. Broilers and spent hens were also sold in the same markets, sometimes by distinct traders in separate areas, but also alongside indigenous chickens by the same trader.

Other poultry such as ducks, geese, turkeys, guinea fowl and pigeons were also available, but in lower numbers.

Markets in Dar es Salaam and Dodoma were organised and regulated, with traders paying monthly market fees and service charges. They bought stock from intermediaries (primarily from Singida, Dodoma, Tanga and Tabora Regions) at collection points outside the market in the early morning.

Additional fees paid by traders included transport costs from the collection point to their cages, some paid contracted intermediaries for the transport from a rural source and some rented market cages. All traders incurred costs of feeding chickens whilst awaiting sale. Traders were almost exclusively male. They reported that female traders were scarce due to the anti-social hours, the hard bargaining required, fear of financial risk and additional household and maternal responsibilities.

Manyoni Town was visited on a weekday but reportedly had a larger formal market on Saturdays. Roadside traders in Manyoni, however were active all week. They stocked indigenous chickens only, in static cages and paid monthly council fees and property rental fees. Local ward markets (Majiri and Sanza) were active every two weeks and sold indigenous chickens only. Indigenous eggs were for sale in one of the four markets visited in Dar es Salaam (Kisutu) and in small numbers alongside commercial eggs in a Manyoni street store. Here eggs sold for TZS 400/ indigenous egg and TZS 300/ commercial egg.

Markets in Lusaka had a greater mix of commercial broilers and spent hens together with indigenous chickens. Some markets (Chaisa and Soweto), sold commercial chickens exclusively, whilst others sold a mix including other poultry species. Chibolya market was traditionally a livestock market, used predominantly by Southern Province farmers for cattle, pigs and small ruminants. Consequently, indigenous poultry at Chibolya was predominantly from Southern Province and they had a reputation for being of better quality and weight. Chibolya market had a cooperative of approximately 72 traders who bought in bulk at negotiated prices, before distributing to their individual members. Members paid a fee to the co-operative, as well as market fees and service charges. Traders from other markets bought indigenous chickens from Chibolya to sell as “Southern Province” chickens elsewhere. Some individual producers paid a day-rate market fee for space to sell chickens direct to the public from their transport cages. There was an even mix of male and female traders overall, more male in the Chibolya co-operative but one market (Mutendere) had only female traders. Chongwe was a regional market in Lusaka Province but had only commercial chickens for sale. Katende, a small roadside market, had one trader (female) who sold indigenous chickens only.

Indigenous eggs were found for sale in low numbers at Chibolya market and consisted of those laid in the market cages. They were priced at ZMW 3/egg. There was a predominance of eggs from commercial layers in all Lusaka markets, priced at ZMW 24/tray of 30 eggs, whilst supermarkets sold them at ZMW 33/tray.

iv. Consumers

When purchasing live indigenous chickens, consumers focused on their size, estimated weight and overall health. They began with a visual inspection and then selected a few to handle to assess the body weight and general health. Some consumers preferred hens for their more tender meat, whilst other preferred cocks for their size and taste. A price was then negotiated before the live chicken was taken home for slaughter and preparation when desired.

In both countries, traders reported that customers consisted of an even mix of both sexes, although more female customers were seen in the markets. Most home consumers expressed a preference for indigenous chickens because of the taste and texture of the meat and believed they were "clean" and "free of disease and drugs", compared to broilers and spent hens. The majority of urban consumers chose to buy the higher priced indigenous over commercial chickens, if within their purchasing power. In Zambia there was a greater availability of commercial chickens, both as live chickens in the urban markets and as dressed and chilled or frozen carcases in supermarkets. Home consumers in Zambia were therefore more open to purchasing commercial chickens, primarily because of their lower price and availability, whilst some preferred their tenderer meat.

In both countries, hotel and fast food restaurants in the cities bought batches of live commercial chickens in preference because of their lower prices, yielding better margins when sold as prepared meals. Traders of commercial chickens in Dar es Salaam estimated 90% of their sales were to restaurants, the rest to individuals. Purchases for restaurants were by intermediaries or restaurant workers, who were more often men. The chickens were usually slaughtered and dressed for a fee by butchers at the market. Restaurants serving indigenous chicken dishes, clearly identified them as such and charged more for them. Rural restaurants usually only served indigenous chicken dishes, being the rural customer's preference.

In Zambia, the poor availability of indigenous compared to commercial eggs meant that the latter were more readily purchased and consumed. In Tanzania, indigenous eggs were available and preferred, however customers complained that eggs were not always fresh.

v. Market channels

Figures 6 and 7 show the various market channels for indigenous chickens in Tanzania and Zambia respectively and indicate the flow of chickens and the people involved.

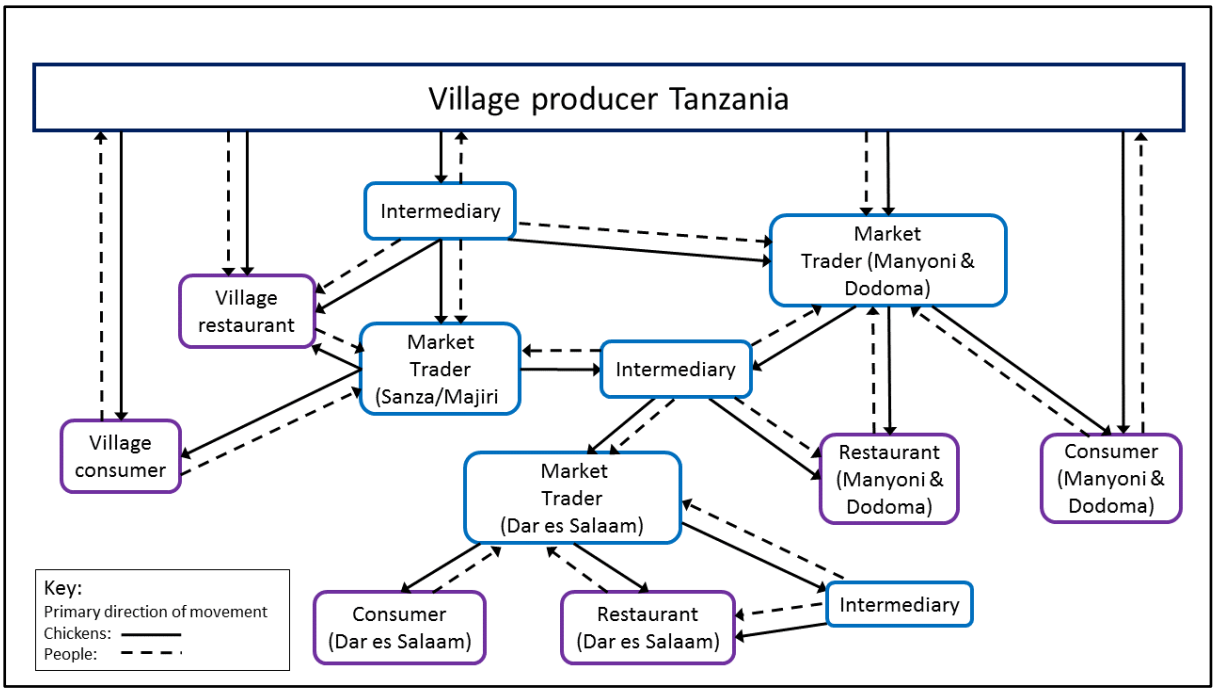

Figure 6. Market channels for indigenous chickens in Tanzania

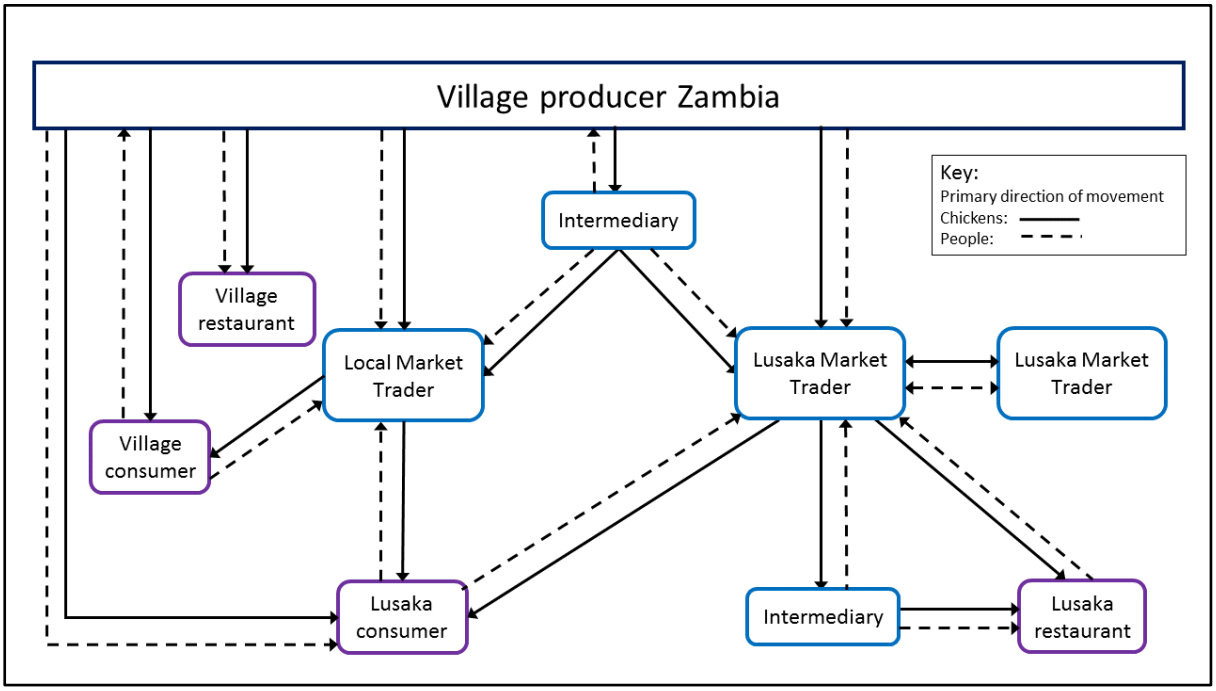

Figure 7. Market channels for indigenous chickens in Zambia

Individuals played distinct roles in Tanzania, although there was some overlap at the rural level between producers and intermediaries. In Zambia some producers acted as intermediaries and as ad hoc market traders. In general, producers sold opportunistically to intermediaries and individuals who called at their homes but also took chickens directly to

restaurants and markets when they needed an urgent sale to meet cash demands. Consumers in towns and urban environments (especially in Zambia due to the close proximity of Lusaka city) sometimes bought direct from producers when visiting rural family. In Tanzania most urban traders relied on intermediaries, with some contracting intermediaries for a regular supply. In Zambia, both intermediaries and producers visited markets to sell to traders and some Lusaka traders sourced stock from other urban markets.

vi. Commercialisation margins

Commercialisation margins can be used to demonstrate equitability along the market chain but are of less value in situations where the product is transformed along the chain or the products lacks a standard unit of measure (Rushton 2009). In this market, the live indigenous chickens lacked a standard value e.g. price/kg. There were also several possible market channels as shown above, each requiring a separate calculation. Two similar channels as examples from Tanzania and Zambia are shown in Table 2 below.

Table 2. Examples of Commercialisation margins

	Buying Price (TZS)	Selling Price (TZS)	Margin (TZS)	% of consumer price
Tanzania				
Producer to Intermediary to Dodoma town Market Trader to Consumer				
Producer		7,000		64
Intermediary	7,000	9,000	2,000	18
Dodoma Trader	9,000	11,000	2,000	18
Consumer	11,000			
Final Product Value			11,000	100
Zambia				
	Buying Price (ZMW)	**Selling Price (ZMW)**	**Margin (ZMW)**	**% of consumer price**
Producer to Intermediary to Lusaka city Market Trader to Consumer				
Producer		35		64
Intermediary	35	45	10	18
Lusaka Trader	45	55	10	18
Consumer	55			
Final Product Value			55	100

vii. Market trends and commercial poultry competition

In Tanzania, the commercial poultry industry is predominantly situated peri-urbanly and it supplies an estimated 80% of the poultry meat and eggs consumed in the urban areas. Indigenous chickens are raised mainly in rural areas and estimated to make up 100% of the rural and 20% of urban poultry meat and egg consumption (Kaijage 2015). Tanzanian poultry population estimates are shown in Table 3. Recently, commercial production has increased dramatically but with no grandparent farms, Tanzania is still a net importer of parent stock, with only a slow growth in local parent stock farms and hatcheries (Kaijage 2015). High start-up costs and inputs have also hampered growth (NBS 2012). The Tanzanian Shilling (TZS) depreciated 40% against the US dollar (USD) during the period of November 2014 to October 2015, which impacted on the costs of imports such as parent stock and poultry specific feeds.

Table 3. Tanzania poultry population figures 2008 and 2015 in millions (% of total)

	Total chickens	Indigenous	Broilers	Layers
2008 [a]	43.8	41.9 (96%)	0.6 (1.3%)	1.3 (2.7)
2015 [b]	69	37 (54%)	24 (35%)	8 (11%)

Table key: Sources: a = NBS (2012), b = Kaijage (2015)

Although home consumers had a strong preference for indigenous chickens, commercial broilers and spent hens were much cheaper. Prices for commercial chickens in Dodoma and Dar es Salaam were the same, given they were produced locally and easily available. In contrast, indigenous chicken prices rose steadily when comparing those in rurally located city markets to those in Dar es Salaam, primarily as a result of transport costs and poor supply (Table 4). Although margins were smaller for commercial chickens, they primary customers were restaurants who bought in batches, maintaining a higher throughput for traders.

Table 4. Margins of Tanzanian traders for broilers/ spent hens and indigenous chickens

	Traders	Broilers/Spent hens (TZS)	Indigenous chickens (TZS)
Dodoma	Purchase Price	4,500-5,000	9,000
	Sale price	5,500-6,000	11,000
Dar es Salaam	Purchase price	4,500-5,000	13,000
	Sale Price	5,500-6,000	17,000

In Zambia, no national livestock census has been conducted for almost 20 years. Estimates from the National Livestock Epidemiology and Information Centre (NALEIC) either do not include poultry at all, or do not disaggregate figures into poultry groups, or chicken types (i.e. indigenous or commercial). Reported figures invariably related to commercial chicken numbers only as the indigenous chicken market was very informal. The poultry industry contributed to 48% of the livestock sector, 4.8% of the GDP and provided direct and indirect employment to approximately 80,000 people (PAZ 2013). Commercial production systems were sensitive to costs of grain, imported feed additives and fuel. These costs were rising due to local currency depreciation (45% against the USD: November 2014-October 2015) and drought affected grain harvests. Market traders in Lusaka reported spent hen prices had risen from ZMW 13 to ZMW 30 in the previous 12 months. The rising cost of grain and fuel was adding to the purchase prices for market traders. The recent drought was impacting on hydroelectric capacity causing electricity outages and affecting hatcheries and survival of young chicks. The government's recent decision to limit importation of chicken products was however supporting private investor confidence in the commercial chicken industry (Lusaka Times 2015). Indigenous chicken prices were reportedly not completely unaffected by rising input costs as larger producers were supplementing with grains.

Although over 95% of rural Zambian households kept indigenous chickens (Simainga et al 2011), the production and market systems were underdeveloped and neglected with no real production and sales data available (Bwalya and Kalinda 2014). Although there was substantial consumer support for indigenous chickens, the wider availability and cheaper prices of commercial chickens provided stiff competition. Wealthier consumers in Lusaka purchased dressed and packaged commercial broilers from the supermarket and occasionally

purchased live indigenous chickens for a special occasion or celebration. The less well-off consumers bought live broilers and indigenous chickens direct from market traders or rural producers. Broilers and spent hens were being sold at 64-73% of the price of indigenous chickens in the live markets of Lusaka (Table 5). By comparison, broilers in supermarkets were priced at ZMW 24/kg (ZMW 34 for a 1.4kg dressed, packaged and refrigerated carcase).

Table 5. Margins of Zambian traders for broilers/ spent hens and indigenous chickens

	Traders	Broilers/Spent hens (ZMW)	Indigenous chickens (ZMW)
Lusaka	Purchase Price	25-30	45
	Sale price	35-40	55

Discussion and Conclusions

In both Tanzania and Zambia, indigenous chickens are the dominant type of rural poultry. They are kept in low input production systems, as free range scavengers with some additional feeding of household scraps or locally produced grains. They are kept for home consumption or sold for cash, mostly opportunistically to intermediaries or consumers calling at producers' homes. The market systems are informal, underdeveloped and lack firm data on throughput and standard unit pricing. Both women and men acted as producers, men perhaps more in charge of larger flocks. Intermediaries and market traders in Tanzania were almost exclusively male, whereas both genders filled these roles almost equally in Zambia.

Commercial chickens were marketed in urban markets through the same live bird markets as indigenous chickens and also as slaughtered, processed chickens through supermarkets. The commercial chicken industry was more established and organised in Zambia than Tanzania. Commercial chickens provided strong competition with indigenous chickens, given their cheaper pricing and greater urban availability.

Although commercialisation margins do not take account of input costs, these are known to be minimal for producers. It could be concluded that, even if inputs were increased (such as Newcastle disease vaccination and more supplementary grain based home grown feeds), producers would still maintain a profit margin. With expected higher survival rates and body weights, the higher numbers available for sale and potentially higher sale price would also improve overall profits. Currently demand for indigenous chickens remains high and although commercial chicken prices increase urban competition, their rising production costs are likely to increase future sale prices. Even if demand for indigenous chickens fell, producers could still make a profitable business with a lower sale price if demand remained stable.

However, with an informal and unregulated market it is difficult to predict how it would cope with changes to throughput. The system was heavily dependent on intermediaries (especially

in Tanzania), several of whom were part time farmers. The time that producers had the highest need to sell, coincided with the planting season when part time intermediaries would be active in their own farming activities, thereby reducing a reliable off take mechanism. In Zambia, where producers were dependent on local neighbours to buy, the local market might easily become flooded. This may require marketing to intermediaries, who are currently limited in the area, or independent marketing in Lusaka, where competition from well regarded "Southern Province chickens" at Chibolya market was high. In Tanzania, urban prices for indigenous chickens reflected the additional costs of sourcing from more distant rural areas, namely costs of multiple intermediaries and transport. This limited their market to wealthier consumers and increased their potential vulnerability to pressure from cheaper commercial chickens.

This market analysis has highlighted a situation of high demand and inconsistent supply of indigenous chickens. Therefore, interventions to improve economic benefits through improved husbandry, production and market stability, will go hand in hand with improving nutrition of producers (directly through increased consumption and indirectly through income) and consumers.

Further analysis of the value chain is advised to identify areas of weakness and opportunity, especially the favoured channels and key individuals involved and their profit margins. In addition, aspects within the value chain, which would lead to increased consumption of chicken products and therefore improved nutrition, should be considered.

Acknowledgements

This Project (FSC/2012/023) is funded by the Australian Centre for International Agricultural Research (ACIAR), and the Governments of Tanzania and Zambia. It builds on previous work supported by ACIAR, the Australian Department of Foreign Affairs and Trade and the Governments of Tanzania and Zambia.

Conflict of interest

The authors declare they have no conflict of interest.

Ethics

The project was reviewed by the Clinical Research Ethical Review Board at the Royal Veterinary College, London and given approval (URN 2015 1399). This research did not include any clinical studies or patient data. All interviewees gave informed consent prior to their inclusion in the study and the identity of participants has not been disclosed.

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