



# Smallholder Farmer Constraints to Village Chicken Production

In Africa, indigenous chickens make up over 70 percent of the total chicken population (Abdelqauder et al., 2007). Poultry production is gaining in popularity in many villages and communities because of its potential as a **significant source of income and quality protein**. In many locations, indigenous chickens are the most widely kept livestock species. For example, poultry production in Tanzania constitutes the main part of the livestock sector. The current chicken population in Tanzania is estimated to be 69 million birds, of which 37 million are backyard and the remaining 32 million are commercial, including 8 million layers and 24 million broilers (Msami, 2008; Polder et al., 2016).

Da Silva et al. (2017) reported there are three major poultry production systems in Tanzania:

- traditional “village” or indigenous chicken,
- improved family chicken, and
- commercial specialized chicken systems.

The traditional village chicken system is an extensive scavenging dual-purpose system, with low levels of egg (50 eggs per year) and meat (1.5 kilogram for mature chicken) production. The improved family chicken system (with improved local or imported tropical breeds) is a semi-intensive, semi-scavenging, moderately high-productivity (150 eggs per year; 1.8 kilogram live weight at maturity) system. Both the village and improved family systems are traditional and smallholder farmer, family-oriented systems. Several constraints, including low-yielding genetic stock, poor animal health services, and feed shortages, are major obstacles to improving productivity of the village chicken production system, upon which millions depend for their livelihood (Da Silva et al., 2017). The commercial specialized chicken system is an intensive system for both layers and broilers, with high productivity approaching 2 kilograms live weight at maturity and 270 eggs per year (Da Silva et al., 2017).

## Village Chicken Production

Livestock production is greatly affected by both population and urbanization, which cause losses of grazing land; one of the consequences of these influences is a shift of many smallholder farmers away from ruminant production to indigenous or village chickens (Bruinsma, 2002). Considering the importance of indigenous chickens both economically and as a protein source, there is **huge potential for the poultry sector to grow and expand** across much of Africa. However, many obstacles stand in the way, disease being perhaps the largest and most serious. Disease issues, partly the result of a lack of management skills, take a heavy toll on poultry production (Awan et al., 1994) in many African countries. Sindiyo and Missanga

(2017) reported that Newcastle disease (ND), coccidiosis, and respiratory infections caused high mortality in poultry in Tanzania. A lack of management skills, poor poultry nutrition, and inaccessibility of drugs and vaccines were listed as reasons behind disease problems. It was reported that many smallholder farmers had no familiarity with disease identification, and drugs, vaccines, and feed resources were largely inaccessible because of high purchasing costs and lack of utilization skills and storage facilities (Sindiyo and Missanga, 2017).

Currently, in most developing countries, traditional scavenging village chickens form the greatest proportion of the national poultry flock (Mack et al., 2013). Village chickens are often kept in **flocks of 50 birds or fewer**, although flock size can vary greatly depending on the area or country. In most cases, birds are kept in free-ranging flocks that are owned by known households but are able to mix freely with birds from other flocks (Bessell et al., 2017). The major source of nutrition for these birds is from scavenging but may be supplemented with table scraps or, in rare cases, specialized poultry feed. Housing may be provided in rare cases, or birds may be left to roost in trees or other locations.

Village chicken production provides food and income and is an important component of food security for many impoverished villagers in developing countries. Chickens may be bartered or sold to pay for such things as school supplies and fees, clothes, or medications. They also play a role in the social life of the village as gifts to guests or ceremonial sacrifices. In addition, selling village chickens is one of the few income-generating activities available to women in poor households (Msoffe et al., 2010). Poultry flocks in villages are often cared for by women or children.

Village chicken production is a low-input system that requires minimal investment to maintain (Branckaert, 2007). Even in households without land, chickens can still be raised, as chickens from multiple households often congregate during daily scavenging to form one large village flock (Msoffe et al., 2010). Unfortunately, however, such congregating and co-mingling creates infectious disease exposure and increased transmission potential that are impossible to control.

The **disease threat is a monumental challenge** to village chicken production in most African countries. The situation is made worse by poor handling practices, poor-quality medications and vaccines, an unreliable cold-chain supply of vaccines (**most vaccines must be kept cold from manufacture until use to be effective**), poor housing and sanitation conditions, and lack of knowledgeable and qualified personnel to assist smallholder farmers. Diseases including coccidiosis, fowl pox, Marek’s, Gumboro (infectious bursal disease), and fowl coryza have high

mortality rates, but **Newcastle disease is frequently cited as the infectious disease responsible for the largest share of mortality among village chickens** (Aboe et al., 2006; Harrison and Alders, 2010; Otim et al., 2017).

Newcastle disease (ND) is caused by infection with ND virus, a single-stranded RNA paramyxovirus virus (Tabler et al., 2018). Transmission routes include fecal-oral, fluid secretions, and dead birds. Consequently, in an infected village, the disease is characterized by outbreaks in many flocks at the same time. This may be compounded by farmers choosing to sell birds at the start of an outbreak, thereby spreading the infection to neighboring areas through movement of latently infected birds (Desta and Wakeyo, 2012; Sambo et al., 2015).

Although ND represents the most serious epizootic poultry disease in the world, particularly in developing countries, little to no progress has been made in controlling ND in free-ranging village chicken flocks in Africa (Sonaiya and Swan, 2004), which, again, make up over 70 percent of the total chicken population (Abdelqauder et al., 2007). Organizing effective vaccination campaigns to cover free-ranging village flocks is extremely difficult, with the main constraints being:

- difficulty of grouping an adequately large number of birds together to obtain an efficient vaccination rate;
- possibility of cross-contamination arising from birds of various ages being raised together; and
- the aforementioned difficulty of maintaining an effective cold chain for proper vaccine quality preservation.

**Diseases such as ND regularly decimate village chicken flocks**, making village chicken production a somewhat risky business. Many smallholder farmers recognize this risk and reduce its impact on household economy by keeping small flocks. However, ND is a major disease problem for all smallholder farmers wherever the disease exists. Vaccination of village flocks against ND is extremely important and represents the basis for increased development of village chicken production (Sonaiya and Swan, 2004).

## Struggles of Women Smallholder Farmers

In most developing countries, the Extension Service serves as a major source of information for farmers (Sanga, 2018). Often, however, farmers (especially women smallholder farmers) do not get information specific for their agricultural activities for a variety of reasons, including failure to ever meet the Extension officers in their area (Doss, 1999; Wakhungu, 2010). **African women comprise approximately 70 percent of sub-Saharan agricultural workers**. While more women than men are managers of natural resources, they are disadvantaged relative to men in terms of landownership, access to education, access to Extension services, and access to credit (Wakhungu, 2010).

This situation hinders poultry productivity, reduces smallholder farmers' contributions to the agriculture sector, and slows the achievement of broader economic and social development goals. Wakhungu (2010) indicated that African women farmers are unlikely to benefit from Extension services, are not likely to be able to afford

agricultural technologies, and are also underrepresented in scientific and technical research institutions, which may result in technical innovations that do not consider women's unique perspective and farming needs. Because women make up the majority of the world's poor, increased attention to their plight would have a major impact on poverty reduction and inclusion of women into productive areas of society (Wakhungu, 2010).

It must be acknowledged that **rural women carry out a fundamental role in agricultural production, rural development, and food security**. Food and Agriculture Organization (FAO) studies and statistics indicate that women produce between 60 and 80 percent of food in Africa and Asia and approximately 40 percent in Latin America (Sonaiya and Swan, 2004). In many regions, women are also responsible for the management of small livestock. Extension services should focus on appropriate approaches to working with women and poultry, as this will not only boost productivity, increase food security, and strengthen rural development, but also promote the transfer of appropriate knowledge and skills to rural women living in poor, remote areas. Unfortunately, women face greater difficulties than men with regard to access to input services and services designed to increase productivity. Extension services should focus on providing increased numbers of training programs for rural women, considering their socio-cultural traditions and their high illiteracy rates.

In many areas, these programs should **target the training of women as Extension workers**, making it easier to effectively reach greater numbers of rural women in remote areas (Sonaiya and Swan, 2004). Regardless of gender, Extension workers must have some basic socio-cultural information in order to improve the impact of their information transfer to the people they serve. This will allow them to better develop training programs based on the knowledge level and information needs of the smallholder farmers they serve.

## Extension: Constraints and Possibilities

Currently adding to the partial disconnect between the Extension Service and smallholder farmers is the fact that there are **only a few Extension officers compared to the number of smallholder farmers that could benefit from their expertise**. This results in very limited access to Extension expertise and advice for the majority of the population in rural areas. Presently, there are 10,000–20,000 farmers for every one Extension worker (Sanga, 2018). Consequently, services that Extension officers can provide are often directed toward those individuals who are more likely to adopt modern innovations, such as farmers with sufficient resources living in more urban areas (Oakley and Garforth, 1985). Sadly, most smallholder farmers in rural areas lack the information technology capabilities to access agricultural information. Their Extension officer is likely their only source of reliable information. Unfortunately, however, smallholder farmers in rural and remote areas may never see an Extension worker because of a **lack of transportation infrastructure**. In other words, the Extension workers are often unable to reach the very individuals who could most benefit from their knowledge and expertise.

An FAO study in 2009 listed some of the major challenges and constraints to achieving an effective and sustainable poultry-disease control strategy in smallholder poultry production systems. The number-one constraint mentioned by respondents was **scarce or lacking Extension Service providers**, along with inadequate availability of drugs and vaccines, lack of poultry production knowledge, keeping birds in free-range systems, lack of cooperation among smallholder farmers, unavailability of vaccines, and corruption (FAO, 2009).

In part because of a lack of Extension Service providers, electronic communication-based technologies will be critical in the future in terms of information dissemination to poultry farmers. **Productivity depends largely on information**—information on modern management practices, disease control, vaccination procedures, biosecurity, marketing strategies, and adding value to poultry products. Sanga (2018) indicated that tools such as cell phones, computers, and internet service can play important roles in sharing poultry farming information.

Sanga et al. (2016) reported that an intervention, which complemented the existing agricultural Extension Service by blending it with web-based and mobile-based farmers' advisory information systems, had been developed. The system is named "UshauriKilimo," which is a Swahili word meaning "agricultural advisory." In short, UshauriKilimo is a Mobile-based Extension, Advisory, and Learning System (MEALS) that links poultry farmers and information providers in communication and dissemination of information. While the system offers great potential and many possibilities, **farmers face major challenges in accessing agricultural information**, including unreliable electricity service; high costs; poor TV, radio, and cell phone signals; and illiteracy (Temba et al., 2016; Msoffe and Ngulube, 2016).

**Literacy levels and a lack of understanding** concerning vaccinations, disease prevention, and biosecurity practices are major constraints to village chicken production. Another obstacle is mistrust of outsiders by village smallholder farmers. Msoffe et al. (2010) reported novel training methods that avoided traditional lecture-style presentations were well-received by villages. These novel methods engaged the village leadership early on and allowed village and sub-village leaders to exercise their normal leadership roles in mobilizing the collective action of village residents.

This **village community approach should be well suited to the ecological and social features of many rural African countries**. Again, free-ranging chickens in a village or sub-village setting are essentially one flock, even though the flock may include birds from numerous smallholder farmers, because they forage and scavenge together throughout the day. Therefore, in order to prevent disease outbreaks, disease biosecurity practices must be undertaken collectively by everyone in the village whose birds congregate together. A coordinated effort on the part of the entire community is critical to biosecurity and improving the health of all the chickens in the village. This type of multi-level community approach that engages and trains local leaders and farmers may be more effective

than engaging outside governmental staff to handle disease control. Again, trust is a huge issue, and villagers must buy into any disease-control program for it to be successful. They must take ownership of the program for it to work and, therefore, **local village leadership should be involved early** in the planning stages and have lead roles as the program is implemented.

Although the work of Msoffe et al. (2010) was conducted in Tanzania, a similar situation exists in much of the rest of Africa. Kusina and Kusina (1999) indicated that the development of smallholder poultry production systems in Uganda, particularly village chicken production, could help to meet the nutritional, income, employment, and gender needs of rural people. These researchers reported that almost every household in rural areas in Uganda kept village poultry, but the **smallholder poultry production sector continued to be hampered** by low productivity, poor management, poultry diseases, predation, poor reproductive performance, poor growth rates, and lack of organized markets. These constraints resulted from the use of low-performance poultry breeds; various cultural, biological, social, and economic factors that influence healthy flock management in villages; and a shortage of feed resources (Kusina and Kusina, 1999).

## Summary

There are numerous smallholder farmer constraints to village chicken production across much of Africa. Although there is **huge potential for the poultry sector to grow and expand**, traditional scavenging village chickens currently make up the largest proportion of the national poultry flock in many countries. The **disease situation** (especially Newcastle disease) is a serious problem in many African countries. **Lack of an adequate cold-chain system** to keep vaccines cold and viable until they are used is another major concern. **Literacy and a lack of understanding** of disease prevention and control, biosecurity, general best management practices, and marketing strategies are also major constraints to improved poultry production. A lack of knowledgeable Extension personnel also hampers improved poultry productivity.

Although a number of constraints and challenges exist, the potential for poultry production in many African countries to enhance food security and contribute to household and national economic improvement is tremendous. Targeted improvements in the areas of management practices, flock health, biosecurity, feed resources, genetics, processing, and marketing would allow many African countries to better meet the protein needs (through both meat and eggs) of their growing populations.

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