

Department of Animal Science

VILLAGE POULTRY AND SUSTAINABLE FOOD PRODUCTION

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There is an increasing need for sustainable food production systems that can ensure adequate food availability for poor and vulnerable population groups, including smallholder farmers with limited access to resources and those residing in remote locations, as well as the empowerment of women, children and youth (Food and Agriculture Organization of the United Nations (FAO), 2018). The village poultry production system, practiced by 80 percent of the world's rural population (Wong et al., 2017), has the potential to ensure food and nutritional security on a sustainable basis, particularly in low- and middle-income countries. **Thirty percent of the world's population** was affected by moderate to severe food insecurity in 2020, with most of this population living in low- and middle-income countries (FAO et al., 2021). More than half of the world's undernourished population are found in Asia (418 million), and more than one third are in Africa (282 million) (Singh et al., 2022). There are differences in hunger levels among different groups, societies and countries related to the seemingly countless constraints that include economic, political, social and environmental variables and the interaction of all these variables (Idamokoro and Hosu, 2022). Despite the numerous constraints related to addressing hunger in the world, the importance of food security for everyone cannot be overemphasized, and village poultry production is a vital key to sustainable food security in the developing world.

Poultry's part in world food security

According to the FAO (2022; 2023), poultry is the world's primary source of animal protein. Globally, poultry meat is expected to represent **41 percent of all protein from meat sources** in 2030 (OECD/FAO, 2021). Village chicken production has been projected to be one of the most sustainable means of promoting food security by a large percentage of people globally (FAO, 2014a; Desta, 2021). Village chicken production has been integrated with human subsistence for thousands of years, enhancing diets, income, and food and nutrition security for much of the world's rural poor (Alders and Pym, 2009). In addition, village chicken production increases food security in additional ways such as improving nutrient utilization and recycling soil nutrients, adding to mixed farming practices, contributing to the empowerment of women and assisting in accessing health care and opportunities for education (Wong et al., 2017).

Village poultry production systems, composed primarily of chickens, account for most poultry production in low- to middle-income countries (Gilbert et al., 2015; Rajkumar et al., 2021). Although village poultry systems often have low productivity, they play critical roles in the food and nutritional security of rural people in fragile and resource-poor ecosystems (Chaiban et al., 2020; FAO and IFAD, 2022). Animal source food (including chicken) with its high concentrations of bioavailable nutrients is particularly essential for young children, pregnant and breastfeeding women with high nutritional requirements, and chronically ill and elderly individuals (Kumaresan et al., 2008; Olaoye, 2011; Wong et al., 2017). Furthermore, village chicken production is an **important income generator for women** (Quisumbing et al., 1995), who often own and manage village poultry and utilize them as an essential element of female-headed households (Bagnol et al., 2013). Singh et al. (2022) reported **10 important factors concerning village poultry farming**. The list includes:

1. Village poultry can survive in harsh and inclement climatic conditions. They are resilient to climate change and better adapt to different environments.
2. Village chickens convert waste material such as kitchen waste, vegetable waste and green grass into high-quality animal protein.
3. Village poultry farming involves minimal initial investment.
4. It provides employment to rural poor farmers, women, unemployed youth and older family members along with subsidiary income.
5. Eggs and meat from village poultry farming command a high price as compared to those from commercial poultry farming.
6. Products from village poultry production are a good source of high-quality animal protein and hence a source of food and nutritional security to vulnerable communities.
7. Village poultry may well-integrate with other agricultural operations such as poultry-fish integrated farming systems.
8. Manure from village poultry is a rich source of soil nutrients and can be utilized to enhance soil fertility.
9. Village poultry are often owned and managed by women of the household, with the sense of ownership and income empowering rural women.
10. Village poultry consists of native and indigenous birds, which are well-adapted to the local climate and are more disease resistant than exotic or introduced poultry species. There is high genetic and phenotypic diversity in indigenous chickens that can be used as a base resource for further improving the productivity of village chickens.

Constraints to village poultry production

The role of small-scale, low-input village or indigenous chicken production in improving the livelihoods of vulnerable households has been noted and the importance of indigenous chickens in national poverty reduction strategies in developing countries is well recognized (Hailemichael et al., 2016). Chickens are the **most common species of domestic fowl** in the world, accounting for approximately 90 percent of total poultry production (FAO, 2014b). Chicken is also the only livestock that is regarded as being **under the independent control of women** in many rural



Figure 1. Village chickens resting in the shade.



Figure 2. Village chickens in their protective housing.

settings as most women can make independent decisions on the sale or slaughter of village chickens without having to consult their spouses (Dumas et al., 2017; FAO, 2014c). In addition, the village production system places few additional time demands on women (Quisumbing et al., 1996), and the minimal input requirements and flexible production system contributes to village poultry popularity (Milkias et al., 2019). Birds often scavenge and forage on their own for much of their food and require little time or financial commitment from their smallholder caretakers (Figures 1 and 2).

Unfortunately, **multiple constraints cast a shadow over the production of village chickens** by smallholder farmers. Poultry diseases, predators, high cost and limited availability of feeds, poor housing structures, inadequate nutrition, lack of Extension services and personnel, lack of market access and limited management and production information are only some of the numerous constraints that smallholder farmers face (Anyona et al., 2023). Constraints often transcend boundaries and their impact on chicken production can vary greatly at regional, local and even household levels related to strong influence from sociocultural, economic, environmental, institutional and gender factors. More importantly, gender analysis in chicken production indicates that men and women are impacted differently by these constraints (Anyona et al., 2023). Constraints are often compounded for women by the patriarchal nature of society and socially constructed gender roles that increase their vulnerability relative to men (Panda, 2016). Their decision-making power over several production factors is also curtailed by cultural norms and unequal power relations within the household (Macharia et al., 2018).

Despite the constraints, village poultry production, including improved productivity through appropriate interventions, can be a **source of sustainable food production** (Singh et al., 2018; Rajkumar et al., 2021). One important intervention is the introduction of improved genetic breeding stock for increased meat and egg production in isolated rural areas. There has been increasing focus on **improved poultry genetic stock suitable for village-type production** systems in Africa and Asia. These varieties that offer higher production potential — even on a low plane of nutrition — were developed specifically for village production systems in resource-poor areas and fragile ecosystems (Singh et al., 2018; Rajkumar et al., 2021). Dumas et al. (2016) reported that improved intervention programs (including Newcastle disease vaccination

and good housing and management practices) boost village chicken production as a practical measure to promote food security, social, agricultural and ecological resilience among financially constraint populations, and this improvement resulted in the rise of the average flock size of village chickens reported by local households. Unfortunately, vaccination, which is effective in preventing numerous chicken diseases including Newcastle disease, is **rarely practiced by smallholder farmers** (Njue et al., 2006) for numerous reasons.

This is the case even though Newcastle disease mortality rates of 100 percent affect village poultry production in many locations worldwide (Ashraf and Shah, 2014; Osti et al., 2017). In many areas, this is exacerbated by the low availability of Extension and veterinary services combined with the high costs of vaccination. Newcastle disease outbreaks worldwide are associated with a variety of factors, including lack of biosecurity, inadequate vaccination and poor vaccination programs, lack of an adequate vaccine cold chain, antigenic variation, maternal antibody inhibition of live vaccines, short duration of the immune response and immunological suppression (Dimitrov et al., 2016). However, significant growth in the size of flocks and the profitability of poultry have been achieved through effective Newcastle disease vaccination programs (Harrison and Alders, 2010). Engaging **women as community vaccinators** can be a critical success factor for the sustainability of vaccination programs. Training community vaccinators is shown to be an effective approach to addressing animal health issues at the village level (Campbell et al., 2018).

Other interventions include skill enhancement, health prophylaxis measures, implementation of an on-farm biosecurity program and efficient market linkages (Singh et al., 2022). Education and empowerment of farmers can contribute to strengthening the knowledge of holistic agroecosystem management, improve decision-making management skills, facilitate group collaborations and encourage local innovation, especially by women and young people (FAO and IFAD, 2022). Anyona et al. (2023) indicated a targeted approach to address the constraints that takes into consideration gender- and region-specific differences is necessary. Indeed, women often have limited to no benefits from Extension services or trainings in new technologies. In addition, most remote areas of developing countries often have limited Extension and veterinary services that cannot cover the vast areas effectively, which hinders farmers' access to critical services and information (FAO, 2014b). Therefore, a **long-term development approach** should identify locally appropriate strategies for scaling up successful practices, which could include model farms, demonstration sites, Extension services and farmer field schools, among other approaches (Kurz et al., 2023).

Food security and village chicken farming

To address food security, there is a need to develop strategies that enhance the resilience of the most vulnerable households in developing regions of the world. One suggested strategy is creating jobs and employment opportunities that enhance the income of resource-poor households (Ayoo, 2022). Although most rural households are subsistence based, they often generate income by selling surplus crops and livestock products to cover other expenses. Poultry production can play an important role in this regard, as it is **most rural households' primary livestock production activity** (Birhanu et al., 2023). In addition, because women play major roles in poultry production, poultry production helps reduce inequality by enhancing their income and control over a household's limited resources.

The increasing trend in food prices has become the primary global social and economic concern in the past few decades as it makes the cost of basic household food more expensive for resource-poor households (Birhanu et al., 2023). In 2019, the high cost of healthy diets and persistently high levels of income inequality put healthy diets out of reach for approximately three billion people, particularly the poor, throughout the world (Singh et al., 2022). Poverty and inequality are **underlying causes of food insecurity and malnutrition**. Income inequality in particular increases the likelihood of food insecurity, especially for socially excluded or marginalized groups (FAO et al., 2021). Currently, moderate to severe food insecurity affects more than **30 percent of the world population**, with most of this population living in low- to middle-income countries (Singh et al., 2022).

Village chicken farming can increase food security by changes in best management practices to increase chicken production. There exists a wealth of indigenous knowledge and practices related to village chicken production, which, together with the correct interventions incorporating improvements in the production of village chickens such as nutrition (from domestic and environmental waste), housing, management and genetics/improved germplasm, have the potential to achieve sustainable production for the benefit of food insecure populations (Idamokoro and Hosu, 2022). Village poultry productivity can be improved by the introduction of improved germplasm (Singh et al., 2018; Chaiban et al., 2020), as there is a need to develop birds with genetic potential for enhanced growth and egg production. In addition, the birds should resemble indigenous birds with multicolored plumage, longer shanks, higher productivity, adaptability to varied agroclimatic conditions and better immunity (Kumaresan et al., 2008; Rajkumar et al., 2021). Also, these birds should have the **ability to perform well on a limited nutritional plane** with a meat texture and flavor similar to local indigenous chickens (Singh et al., 2022).

Moderate to severe food insecurity was **10 percent higher among women than among men** in 2020 (FAO et al., 2021). Income from the sale of village poultry products is often the main source of income for female-headed households. In Africa, most women have access to village poultry but may not have full control over ownership and decision making, thereby depriving them of economic benefits (Gueye, 2000). However, the involvement of women farmers has resulted in positive and significant improvement in the family financial situation. Adoption of improved management practices resulted in increased flock size, increased household income, increased household food security and increased decision-making power for women (Alders and Pym, 2009). For example, women in Africa were able to purchase goats and cattle by selling excess poultry, empowering them with the resources that were previously denied to them (Singh et al., 2022).

Summary

Village poultry production offers a **potential means to improve food security** and generate income and employment for resource-poor smallholder farmers in many regions of the developing world. However, numerous constraints stand in the way of making village chickens a sustainable method to fight food insecurity. Disease, predation, low market pricing, high input costs, lack of capital, lack of markets, lack of access to Extension and veterinary services and access to information are all constraints that must be overcome. Keep in mind the importance of **involving the local community** at every step along the village poultry production path to achieve maximum acceptance and buy in of new interventions, management practices and

technologies. With the collaborative support of all stakeholders including government, research institutions and community organizations, combined with indigenous wisdom and improved, cost-effective interventions, village chicken production has the potential to sustainably address food insecurity and improve the livelihoods of smallholder farmers in developing countries around the world.

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