

A Survey on Village Chicken Losses: Causes and Solutions as Perceived by Farmers

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Abstract

The survey was conducted to examine poultry production and determine causes of poultry losses in a communal area of Zimbabwe. Qualitative data were obtained using participatory rural appraisal (PRA) techniques, while quantitative data were captured through a structured questionnaire administered to 416 households. The majority (68%) of the farmers in the study kept indigenous chickens and the remainder had exotic broilers and layers. Ownership of poultry was similar among men and women. In terms of management, indigenous chickens survived mainly through scavenging with minimal or no supplementary feeding provided. Health management was also poor, with minimal use of veterinary therapeutic intervention in the event of disease outbreak. The major causes of losses were disease, predators and external parasites, as well as thieves. The occurrence of disease and predator problems was seasonal, the former being high during the hot season. Reasons given for high mortality during the hot season were improper housing and the heat. In addition, mortality was highest in young chicks, particularly during the first three weeks after hatching. The major disease problems were Newcastle disease (ND) and coccidiosis, while the main predators identified included dogs, baboons, and several nocturnal feral cats. In conclusion, the major findings of this study were that there is an abundance of indigenous chickens and farmers attach great importance to them in their daily lives but take very little care of them. However, the farmers are aware of the potential benefits that can accrue from improving productivity of poultry. Given the opportunity, farmers would like to improve poultry housing and care of chicks, improve on disease prevention and control, particularly ND.

IN ZIMBABWE, village chickens are estimated to number between 15 and 30 million. This estimate is based on about one million communal farmers, each keeping an average of 20 birds. Village chicken production has withstood the test of time and is often described as a low input-low output production system. This makes it a very sustainable system for the resource poor communal area farmers. Because of this attitude, very little attention has been paid to this industry in terms of research and development, resulting in the lack of information on the status of poultry production in the communal areas. This lack of attention has led to many constraints in terms of improving productivity of village chickens, not only in Zimbabwe, but also in other African and developing

countries. On the other hand, commercial production of the different classes of poultry has increased over the years and is poised to grow in Zimbabwe. This is a direct response to the increased demand for poultry meat as a substitute to beef in the general consumer's diet due to the ever escalating and inflated prices of beef. In addition, village chickens are important for various social and traditional rituals and will always be part of the farming systems in the communal areas of Zimbabwe (Scoones 1992).

Village chickens play a very important role in the livelihoods of those people keeping them. These chickens have a multitude of functions, and these include the many cultural and traditional roles, food and income generation (Scoones 1992; Kusina and Kusina 1999). Despite their importance, productivity has been hampered by many constraints, resulting in low average flock sizes (15–20 birds) (Muchenje and Sibanda 1997; Kusina and Kusina 1999). At present, there exists a paucity of information on management

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and productivity of village chickens by farmers. The objectives of the current study were to determine (1) causes of village chicken losses as perceived by farmers, (2) how farmers control poultry diseases and (3) the level of farmers' understanding of ND.

Research Methodology

Site

Data were obtained from 416 rural households from Guruve District of Mashonaland, Central Province of Zimbabwe. The district is situated in a relatively dry area, receiving about 300–500 mm of rainfall per year. Agricultural production in the area comprises integrated livestock production with cotton and tobacco being the major cash crops. The area is endowed with a diversity of livestock that includes cattle, goats and poultry. Small poultry enterprises are in operation in the area (Matawo 1998).

Data collection

Following research site identification, a preliminary study was conducted to establish farmer attitudes and their response to the introduction of a new project on poultry. This was conducted through the Rapid Rural Appraisal (RRA) approach. Data obtained from the random interviews with individual farmers, farmer groups, cooperatives, community leaders and rural governance were then used to develop a structured questionnaire in order to obtain quantitative data.

Participatory rural appraisal (PRA)

Qualitative data were collected using Participatory Rural Appraisals (PRA) techniques. The PRA tools that were used included diagramming, scoring, ranking and calendars.

Baseline survey

The information collected using the structured questionnaire included types of poultry reared, flocks size and dynamics, production levels, housing, feeds and feeding management and health management. On-farm (site) observations on other aspects of production such as housing, feeding, feed and water availability were made and data recorded by research assistants or enumerators. Details on the latter are reported elsewhere (Kusina and Kusina 1999).

Workshop

Additional information was gathered from farmer representatives and other interested groups on constraints and targets for future activities. Possible approaches to address the constraints of poultry production were the major issues discussed. Participants

were separated into five mixed groups of men and women and each group was tasked with the need to generate information as advisory recommendations on first, the current situation of poultry production in the communal area of study. Second, they were asked to suggest a way forward to confront problems associated with poultry diseases and other causes of losses. In addition, participants were requested to deliberate on issues of feeds and feeding, management and marketing of poultry, as well as farmer training needs in poultry production as reported earlier by Kusina and Kusina (1999).

Data analysis

Qualitative data were transformed into pie charts and bar graphs to give a pictorial representation of the findings of the study. Quantitative data were analysed using the Statistical Package for Social Sciences (SPSS, 1997) to depict descriptive statistics.

Results and Discussion

Types of poultry and flock sizes

Various types of poultry were found with indigenous chickens being the most predominant, accounting for 68% of all types of poultry kept by the households in the study area. The finding that indigenous chickens were the most predominant type of poultry clearly indicates that they were the most important type of poultry in the study area. This was not surprising in view of the fact that, compared to broilers and exotic layers, indigenous chickens require and are given very little expert care or any form of management. Their inherent ability to scavenge makes them the 'ideal' poultry to keep under rural management, where livestock and people often compete for food, such as cereals. Also, they are utilised for a variety of social and cultural purposes that are important in the lives of rural people (Scoones 1992; Kusina and Kusina 1999).

Flock composition, dynamics and productivity

Information on flock composition, dynamics and productivity is presented in Table 1. It is important to emphasise the fact that due to the absence of previous information in the form of records on purchases, sales, slaughters and mortality, among other things, data presented on dynamics has to be taken with caution. Nonetheless, in relation to productivity, farmers indicated that on average, the indigenous chickens laid three clutches of eggs per year, each with a mean of 14 eggs. Hatchability of the eggs was high averaging, 82 % and chick survivability averaged 70% (Table 2). Despite the

purported high survivability of the chicks from the formal survey, PRA information did not corroborate such high survivability. Further, the relatively high hatchability and survivability performance recorded in this study does not agree with those reported in other studies. For example, Kitalyi (1998) reported lower hatchability in studies of village chickens in a number of African countries. The reason for the differences between this study and some reported literature might be the time when the project was conducted. This study was conducted during the winter months of June to August and during this time, hatchability and survivability of poultry tend to be higher than the rest of the year.

Table 1. Flock composition and productivity of the indigenous chickens.

Characteristics	Mean	Standard deviation
Flock size	15	14.6
Male chickens	2	2.3
Female chickens	12	14.2
Chicks	9	12.8
Number of clutches per year	3	0.6
Number of eggs per clutch	14	3.0
Hatchability (%)	82	13.0
Survivability (%)	70	20.0

Total number of respondents: 416

Table 2. Pattern of seasonal losses of indigenous chickens.

Season	Number	Per cent
Hot dry season	158	47
Hot rainy season	97	29
Cold season	73	22
All year round	7	2

Number of respondents: 335

Mortality and causes of poultry losses

Notwithstanding the purported high survivability mentioned above, farmers confirmed that they experienced losses in their chickens as illustrated in Figure 1. Basically, losses were due to diseases, parasites and predators. The extent and severity of losses were reported to be seasonal (Table 2) with the greatest magnitude of losses (47%) occurring during the hot, dry season. In addition, losses or mortality were highest in chicks, particularly during the first 3 weeks after hatching.

When looking at Figure 1, the central circle represents all poultry losses in the area. The area covering a problem or cause of loss and the distance from the

centre indicates the ease with which poultry can be lost through that particular cause. The smaller the area and the further it is away from the centre, the less important the problem is as a cause of poultry loss. In view of that, it is evident that ND is depicted as the biggest cause of poultry loss in the diagram. In addition to the data presented in Figure 1, other causes of poultry losses identified were exposure to heat and cold. The extent to which heat and cold contributed to losses as compared to diseases and other problems is depicted in Figure 2. Losses due to adverse effects of heat predominated and were higher than losses from disease. This response is because of the fact that heat will cause many chicks to die at the same time while diseases such as ND can be prevented and others can be treated. This loss may be seasonal but this is where management is crucial, for example, provision of water is very important in combating effects of heat stress. Also, appropriate housing to provide adequate ventilation can help in reducing the effects of heat stress in chickens.

The effect of cold was less severe than that of heat and diseases. Farmers, even in the rural areas, have ways of keeping chicks warm during the cold season, for example, placing chickens in boxes and housing them in their kitchens where it is warm overnight.

Diseases

Newcastle disease was presented as the major cause of poultry loss by most of the farmers. This situation prevails in many other African countries (Chabeuf 1990; Kitalyi 1998). Data from Yongolo (1996) on village poultry studies conducted in Tanzania support the argument that ND is the most devastating disease of village chickens. Similarly, farmers agreed that although the disease was not endemic, it was becoming the biggest problem since it was now occurring more often than in the past (once every two years) and wipes out the whole flock when there is an outbreak. Also, farmers were aware of ND outbreaks and consequences of the disease through the media and press as well as through local knowledge. Thirty-nine percent of the farmers confirmed that their poultry flocks had been affected by ND in recent years. The extent of poultry losses from the ND outbreaks were variable. Fifty-five percent of respondent farmers indicated losses exceeding 50% of the flock.

To confirm whether farmers were familiar with ND, they were asked to describe the clinical signs of the disease. It was noted that the majority of the farmers (>80%) were familiar with the signs of the disease. Some of the signs described by the farmers were greenish diarrhoea, swelling of the neck and

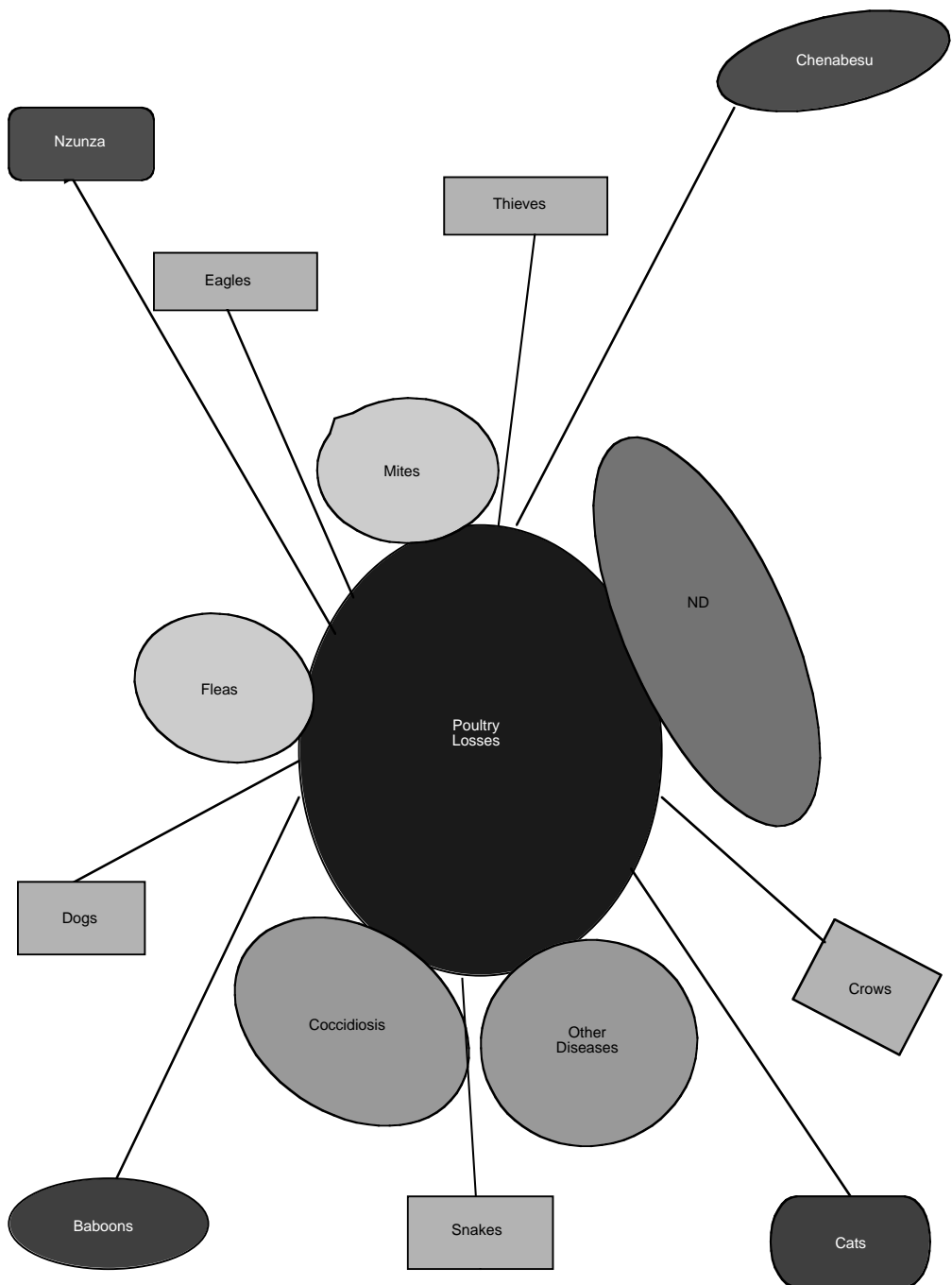


Figure 1. Venn Diagram showing causes of poultry losses.

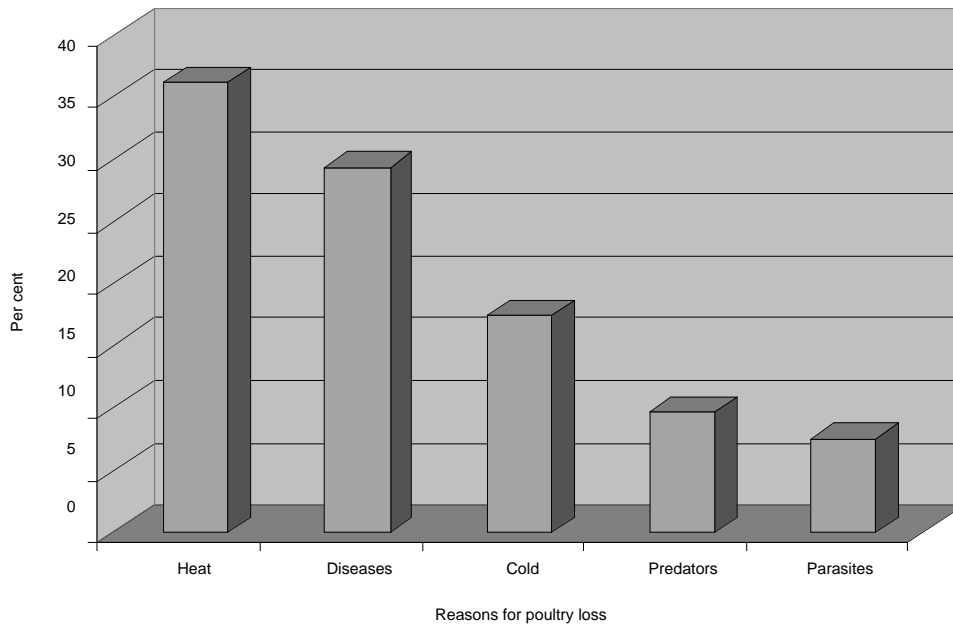


Figure 2. Causes of poultry loss according to farmers.

head, sudden death with no clinical signs, and nervous signs, for example, tremors, convulsions and paralysis of legs and wings.

Farmers were asked to disclose traditional means of treating ND. Their responses were that they did not have a treatment regime specific for ND but rather for most poultry diseases. Some of these local or traditional methods of treatment were mixing of various substances with drinking water, for example, chimney soot, washing detergent, extractions of cactus species, pepper and chillies and other herbs. The dosages of these types of treatments were not controlled and their effectiveness still remains debatable. It was also noted that farmers were aware of how the disease was transmitted to their flocks, for example, introduction of new birds into their flocks through acceptance of gifts from their relatives or purchasing of birds for breeding from other places. This observation is supported by evidence from Martin (1992) who reported that the main form of transmission of ND was through bird-to-bird contact. This was exacerbated by the fact that farmers did not have any solutions to this problem citing that it was socially unacceptable to refuse gifts from their relatives and friends. They indicated that they either sold or slaughtered sick birds before they died so that they could salvage some value out of the birds.

Other modes of ND transmission include exposure to wild birds and the existence of various age groups

of birds in the flock. This problem arises from the fact that vaccination of a flock today does not protect the hatchlings from the next brood. Invariably the newly hatched chicks are susceptible to the disease (Olabode et al. 1992).

In Zimbabwe, under the Animal Health Regulation of 1996, ND is scheduled a notifiable disease and in the face of a ND outbreak, the Government Veterinary Services are notified and normal practice dictates that all poultry in the area be vaccinated. In fact, more than 50% of the farmers in the survey acknowledged having had their poultry vaccinated while others were sceptical about the whole exercise. However, above 80% of the respondents indicated willingness to have their poultry vaccinated against ND in the event that an outbreak occurs. They also emphasised the need for speedy reaction control measures to be put in place to combat any further outbreaks and minimise their losses. Lack of strategic ND control measures in village chickens has a major adverse impact on the national poultry industry. In the event of an outbreak in communal areas and with no intervention immediately instituted, this exposes the commercial poultry industry to the disease and has a negative impact on the export of both commercial chickens and ostrich. Village chickens that survive epizootics often harbour or act as reservoirs of the virus and are often suspected as possible sources of the virus in the

commercial sector (Spradbrow 1993–1994). Other diseases identified by farmers but not shown in Figure 1 are fowl pox and fowl cholera and suspected infectious bursal disease (IBD).

Another disease that was identified as a major cause of poultry loss was coccidiosis that was said to occur often during winter. Participants however indicated that coccidiosis was less devastating than ND as it was curable. The disease only becomes a serious problem when people fail to buy the drugs that are required. Inability to procure necessary veterinary supplies was due to the cost of the drugs and the considerable distance to sources of the supplies. Although this could not be verified, some farmers purportedly used local herbal medicines for treatment of various poultry diseases.

External parasites

In addition to diseases, a number of external parasites mainly, fleas and mites, were identified as contributing to poultry losses. Among the adverse effects of these parasites on poultry production were associated with a reduction in growth rates of poultry through irritation. Some suck blood resulting in anaemia and others cause hens to abandon brooding that results in poor hatchability. The parasites were very common in most poultry houses particularly during the hot rainy season. The ectoparasites also kill chicks. These were however not considered as a major problem since they could be prevented simply through improvement in housing design to ensure proper ventilation and avoid moist conditions in poultry houses. Further hygienic standards are absolutely essential to provide a clean environment in the poultry houses. Farmers indicated that they sometimes spray the chicken houses with insecticides or use traditional medicines to reduce pests.

Predators

Another cause of poultry losses was a variety of predators. Although a number were identified, they were generally classified as a minor problem. These included cats, baboons, monkeys, dogs, hawks, eagles, crows, and thieves (Figure 1).

Seasonal patterns of poultry losses

Seasonal calendars were developed to show the severity of losses throughout the year. As mentioned earlier, most losses occurred during the dry hot season. The farmers attributed these losses to the effects of heat and inadequate nutrition for the birds (Table 2). Similarly, the problem of predators was also seasonal. According to the data obtained, there were some specific diseases, predators and pests that were common during particular times of the year.

There were more diseases as well as predators in the dry season. Farmers highlighted that, in addition to heat, other contributory factors to the high losses were poor housing and nutrition.

Predators were noted to be a menace during the dry season. During this period, the problem of predators was twofold. First, the shortage of natural foods for baboons and other predators force them to forage as close to the homesteads as possible. Second, the vegetation cover declines substantially during the dry season. This leaves chickens, especially chicks, exposed to airborne predators such as hawks and eagles. In contrast, good vegetation cover during the wet season provides some form of protection for poultry against flying predators. Human predators (thieves) have also been identified as contributing to poultry losses.

Other causes of mortality

Other causes of mortality that were not so obvious to the farmers were poor management practices, nutrition and housing of the village chickens. Although farmers know the importance of chickens in their livelihoods, they do not attach a high monetary value to the chickens. Because of this, village chickens are left to fend for themselves in every possible way. This lack of attention contributes to very high losses especially during the chick stage.

Nutrition

The major feed resource base for rural poultry is scavenging and it consists of anything edible found within the environment. This scavenging feed resource base (SFRB) can include household waste, grains, worms and insects, grasses and many more. The SFRB is not constant but changes with season and household farming activities, for example, sowing and harvesting. According to Tadelle (1996), protein supply may be critical, particularly during the drier months of the year, whereas energy may be critical during the rainy season. To improve the nutrition of village chickens, and hence productivity, supplementary feeding may be necessary as this will reduce pressure on the available SFRB. This will increase the biomass that can be supported by the system, reduce survival pressure and selection against the weakest members of the flock and hence reduce mortality of chickens due lack of adequate nutrition. Lack of adequate nutrition predisposes chickens to the effects of diseases. Farmers interviewed in the survey realised the benefits of supplementary feeding to their poultry. To this end, they use a diversity of household farm produce and kitchen waste to provide supplementary feeding for their poultry. For example, the most commonly used

supplementary feeds include maize, sunflower seed meal, sorghum, finger millet, and kitchen leftovers. The majority of respondents (67%) acknowledged using crushed maize as a supplementary ration for poultry. Frequency of feeding and amounts were variable and depended on seasonal supply and fluctuation in local feed resources such as cereal grains. In addition, poultry feed is expensive for the rural resource-poor farmers to purchase (ARC 1999). That being the case, it is important to develop feeds based on locally available ingredients to supplement the SFRB of rural chickens.

Housing

Good housing is a prerequisite for any viable and sustainable poultry project. In response to a question on where poultry are kept during the day and at night, all households acknowledged that exotic chickens are kept in fowl runs, both during the day and at night. Conversely, indigenous chickens and all other kinds of poultry were released to scavenge during the day and either enclosed or left in the open at night. It was also observed that 95% of the households kept their indigenous chickens in 'poor' fowl runs at night, while 3% left them to stay in trees or in open spaces. A small proportion (2%) of the households acknowledged keeping laying indigenous chickens in woven baskets at night.

Experience with rural poultry work currently running in Sanyati District of Mashonaland West Province highlighted the need for decent housing for poultry as a strategy to reduce losses, particularly from predators. In this situation, the chickens have minimal protection as some of them roost in trees at night. Chicks are exposed to predatory birds such as eagles and hawks. Snakes prey on hens roosting or nesting in baskets outside the fowl runs. This situation can, therefore, be managed through construction of proper housing using resources available in the community.

The most common type of housing observed in the study area is a raised structure made from locally available materials such as wood, thatch, bricks and sometimes scrap metal. The structure is constructed in such a way that there are a number of units used for different purposes, including keeping chickens at night and for laying chickens. Although there was some type of housing, this was generally inadequate and inappropriate. The lack of adequate housing can partly explain poultry losses/mortality. It is known that lack of proper shelter for the chickens immediately after hatching results in high mortality, as the chicks are exposed to vagaries of nature and are a prime target for carnivores such as birds, dogs, cats and reptiles such as snakes. The chicks are most

vulnerable during the first few weeks after hatching. A slight change in management techniques can reduce this kind of loss substantially, for example, provision of a wire mesh cage with adequate ventilation and drainage, at least for the first 4–5 weeks after hatching. This would reduce chick losses and substantially improve survivability of the chicks, and eventually increase the output of eggs and meat. This can be achieved with minimal inputs of feed and water provision and a modest fowl run which is kept clean to prevent diseases. Disease is a major problem and can be exacerbated by the presence of external parasites such as fleas and mites, which can proliferate under poor housing conditions. Farmers should ensure that cleaning of fowl runs is done as regularly as possible. In addition, the type of poultry housing will dictate the cleaning frequency required. Poor housing facilities were observed during the exercise and farmers requested an affordable housing design to be put in place. If this occurs, it would be ideal if most of the resources utilised are from the community.

Conclusion

The major finding of the study was that the households had small flock sizes and diseases and predators reduced productivity of these flocks. ND was identified and accepted as the greatest danger to the expansion of poultry production. There is need for intervention in diseases and predator control. Control of diseases can be achieved through improvement in veterinary and advisory services. To this end, veterinary drugs should be made available and affordable in the vicinity of the participating groups of farmers to allow for immediate reaction to a disease outbreak. The problem of predators dictates that 'predator proof' housing such as wire gauze fencing and roofing can help to reduce some of the losses, especially during the night. Perhaps to prevent daylight predation, darker breeds of chickens such as those found in rural areas that are not easily identified by predators should be encouraged. Also, chicks need to stay in protected areas for the first 4–5 weeks of life as a way to avoid predators and accidents. Protection of chicks in the early days after hatching is critical, as this is the time when they are most vulnerable to predators.

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