

# Commercial Farmer Perspective

Biosecurity, Good Farming Practices,  
Motivation and Incentives



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**SAFE**  
STRATEGIES AGAINST FLU EMERGENCE

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## PURPOSE

The purpose of this document is to describe the perspective of the small-scale private sector broiler farmer ("Sector 3" farmer). It will detail the motivating factors and challenges in adopting biosecurity measures and good farming practices.

## STRATEGIES AGAINST FLU EMERGENCE

SAFE is a USAID funded program created to help reduce the risk of transmitting avian influenza (AI) among poultry and from poultry to humans. SAFE works in partnership with the Government of Indonesia, the Indonesian poultry private sector, and civil society, to reduce the transmission of AI by improving knowledge of best practices and supporting behaviors that lower the risk of AI transmission throughout the poultry value chain.

## BACKGROUND

### H5N1 Avian Influenza and the Commercial Poultry Sector

The Indonesian commercial poultry industry suffered devastating losses during the early years of the H5N1 AI outbreak. While outbreaks have continued to plague the industry recent studies and data analysis indicate that AI outbreaks have declined considerably.

Preventing transmission of zoonotic disease in the poultry industry requires preventive measures and consistent biosecurity standards. Biosecure practices become more difficult to implement if they interfere with operations or profitability. Business owners consider potential risk, costs and benefits before investing resources to avert an event that may never occur, particularly in a self-regulating environment where such measures are not required.

Even when there is recognition of the importance of AI prevention, knowledge about disease transmission among poultry and human exposure to AI is not sufficient in an environment where structural changes are difficult to implement. The goal of the SAFE program was to reach beyond what farmers already knew about biosecurity and

good farming practices to provide meaningful, relatively simple and inexpensive solutions to the challenges surrounding biosecurity implementation. SAFE instituted facility-based technical changes and defined specific poultry handling behaviors to improve biosecurity on Sector 3 farms.

An earlier USAID program, the Community Based Avian Influenza and Control (CBAIC) project operated from 2006 to 2010. CBAIC developed and tested models to reduce AI transmission in commercial poultry through training, one-on-one technical assistance, and farm community support. At the conclusion of the CBAIC program, areas where Sector 3 compliance could be further improved were identified and subsequently addressed by SAFE program efforts. The content of this document summarizes what was learned under both the CBAIC and SAFE projects.



## THE SECTOR 3 FARMER



Sector 3 poultry farmers are small commercial producers of broiler and layer birds, with flock sizes ranging from 500 to 7000. These poultry are primarily directed to live bird markets where they are slaughtered and prepared for sale by market vendors, or in some instances, purchased live by the consumers and slaughtered at home.

Farmers are typically male and between the ages of 20 and 55, usually working in partnership arrangements with large integrated poultry producers (Sector 1), although some do operate independently. Small Sector 3 farms have been observed to practice minimal biosecurity. Due to the extent with which their products, including poultry

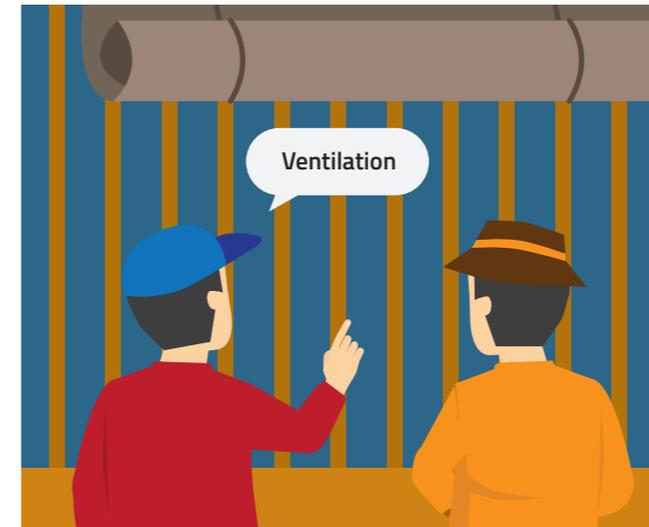
waste, come into direct contact with individuals and environments beyond the farm, these producers have been under scrutiny by the public health community for their potential role in AI transmission.

The Sector 3 farmer is not especially motivated by the public health or personal health and safety arguments for biosecure farming operations. Rather, Sector 3 farmers' priorities center on:

- (1) raising healthy poultry,
- (2) expanding farming operations, and
- (3) maximizing their farm profit.

### Farmer Priorities

#### Priority 1: Raising Healthy Poultry



Sector 3 farmers generally agree that farms should have disease prevention systems. Reducing poultry morbidity and mortality is a priority to increase farm productivity.

These farmers report that weather is a determinant in health of poultry, which is often correlated to the seasonality of disease transmission among poultry. During wet seasons, industry data points to higher rates of viral and bacterial transfer, disease outbreak, and mortality among poultry. These increases are coupled with lower overall market prices and margins as well as distribution disruptions due to flooding to result in less efficient operations and lost revenue.

They also contend that the quality of day old chicks (DOCs) is a basic determinant of mortality rates on the farm, and

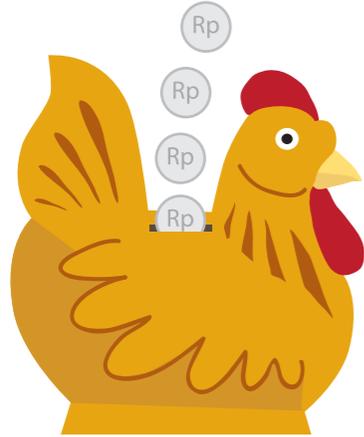
some Sector 1 companies are perceived as providing higher-quality DOCs than others. Farmers maintain that they can attribute some causes of poultry mortality to DOCs that arrive stressed, weak, ill or unvaccinated.

#### Priority 2: Expanding Farming Operations



Farmers emphasize their desire to invest money in expansion, rather than improvement, of their existing facilities. They feel that money invested in biosecure facilities would be better spent on increasing their capacity to raise more poultry. The CBAIC and SAFE programs emphasized the benefits of reducing widespread mortality and therefore preserving flock size; having a larger operation is meaningless if mortality reduces the overall outputs.

### Priority 3: Maximizing Farm Profit



Changes that prevent loss of poultry to disease or other factors (such as thieves, other animals) are of interest to farmers, but the potential to increase profit will factor heavily into deciding to implement changes. Farm profit is driven by a variety of factors, such as cost of inputs, disease, supply and demand and resulting market prices. The focus of the CBAIC and SAFE programs was therefore to emphasize increasing revenues, or reducing loss of revenues, for farmers.

## PRIORITY BIOSECURITY AND GOOD FARMING PRACTICES

Five key recommended biosecurity practices for Sector 3 farmers were identified in the 2009 and 2011 Consensus Report: Priority Audiences and Behaviors for Reducing the Transmission of AI in Indonesia; a report developed by Indonesian and international biosecurity experts. Some behaviors were more difficult to follow than others, and although farmers expressed a willingness to perform the behaviors, most were rarely practiced at the launch of the CBAIC and SAFE programs.

The Consensus Report covered the entire poultry value chain. Below we highlight priority behaviors for sector 3 broiler farmers.

### **Behavior 1. Limit access of vehicles, people, and materials to cages where poultry are housed.**

Although it is generally understood within the farming community that chicken confinement areas should not be accessible to visitors, farmers may feel pressure to defer to the preferences of transporters who arrive to the farm to collect poultry. Structural changes can reinforce these boundaries. Pass-over/pass-through systems situated at the entrance to the containment area, and footwear exchanges at the farm entrance as well as in doorways to chicken coops, reduce cross-contamination with external vehicles or footwear.

### **Behavior 2. Immediately report sudden deaths of large numbers of poultry to local government and technical service personnel.**

Reporting deaths of poultry is one of the more difficult behaviors to change, primarily because farmers fear that their entire flocks will be culled and the lack of compensation. Some farmers state they already know how to dispose of dead chickens and prefer to do it themselves.

Recording poultry mortality will help farmers to identify changes in mortality trends and may provide a tool for widespread surveillance. However, challenges remain in incentivizing farmers, and the industry at large, to rapidly report large-scale mortality. The reluctance to report deaths of poultry in the event of an outbreak heightens the importance of preventive biosecure practices and farm operations.

### **Behavior 3. Do not sell poultry products after sudden deaths at the farm.**

The farmer, as well as the collector make the determination of healthy poultry based on observation alone. Farmers report that sick chickens appear sluggish, have a bluish cast, appear cold and shivering, or have dull feathers.

Unhealthy-looking poultry are separated from the flock as a precautionary measure.

However, it may be difficult to ascertain which poultry are infectious at a given time. Therefore, no poultry should be sold after sudden deaths at the farm. Farmers emphasize the need for high-quality DOCs to ensure that flocks are not compromised from the beginning of the 30-day cycle sparing farmers from unnecessary loss of poultry.

**Behavior 4. Appropriately bury dead poultry.**

Most farmers find it easy to properly bury dead poultry as recommended in a burial plot beyond a 2 meter radius from the confinement. Other practices,

such as selling to catfish farmers or feeding to other animals on the farm, should be discouraged.

**Behavior 5. Appropriately cook dead chickens before feeding them to fish.**

Farmers can make a profit from selling dead poultry to catfish farmers, or choose to use it as feed for their own fish. If they must use poultry as feed, it should be cooked appropriately beforehand.

With the exception of selling, buying, or giving away only healthy poultry, farmers interviewed prior to the intervention rarely followed these recommendations (Table 1).

**Table 1: Knowledge and practices of Sector 3 producers before intervention, 2009.**

Behavior	Knowledge	Willingness	Practice
1. Limit access of vehicles, people and materials to cages where poultry are housed.	Yes	Yes	Rarely
2. Report sudden death of large quantities of poultry.	Yes	Yes	Rarely
3. Sell, buy or give away only healthy poultry.	Yes	Yes	Commonly
4. Bury dead poultry.	Yes	Yes	Occasionally
5. Cook poultry before feeding to fish.	(not measured)	(not measured)	(not measured)

## BEHAVIOR CHANGE

**Key Lesson Under CBAIC**

CBAIC worked with 330 broiler farms between 2008 and 2010 and learned that despite the best efforts of the industry technical service staff to teach farmers about biosecurity and good farming practices, and the farmers desire to change, they needed to “see” biosecurity to understand it. They also needed to be given options that would work under their particular physical environment and cost was always an issue.

SAFE’s approach to farmer behavior change was to continue to address both public health and business concerns. Critical to the program was translating the conceptual practices from the “Consensus Report” and operationalizing them at the field-level so that farmers could visualize the changes required and receive support to implement those changes. “Teaching Farms” were needed to demonstrate good biosecurity and farming practices.

## Farmer Perspectives on new biosecurity techniques and practices

SAFE conducted a study to understand the perspective and willingness of farmers to adopt biosecurity techniques and practices that were about to be introduced through the teaching farms.

### Use of fences

Most participants said they had not installed fences on their farm. Some justified this by noting the limited area of land available for the farm. Some said that the chicken house was located on a piece of land they shared with a neighbor as an access route or shortcut between the main road and the farm.

Some farms were located on fishponds or paddy fields; they could not build fences around their farms. Others pointed out that since their farms were far from villages or neighboring houses, people rarely passed by the farm.

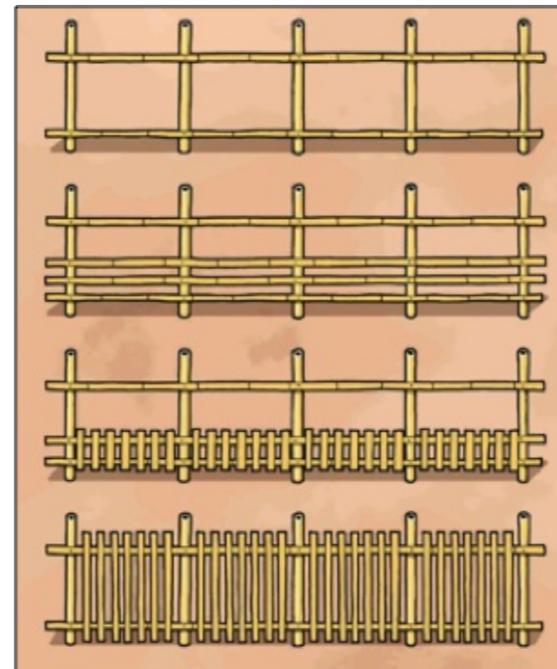
Some participants claimed that they did not have the funds needed to install a fence, and even if they did have the money, they would not have time to install it. A few participants commented that in truth they were reluctant to install a fence since they did not think it was necessary.

Most participants agreed if they had the money, they would prefer to spend it on increasing the chicken population rather than installing a fence, with some saying: "Installing a fence costs almost as much as building a new chicken house."

Findings are below. Under the "Overcoming Barriers and Capitalizing on Incentives" section, SAFE summarizes the actual changes made by farmers and reviews the farmers' motivations.

Participants who had installed fences said that the main reason they did so was for security, since it reduced disturbances from other people and also deterred thieves.

Figure 1. Fences



### Pass-through system

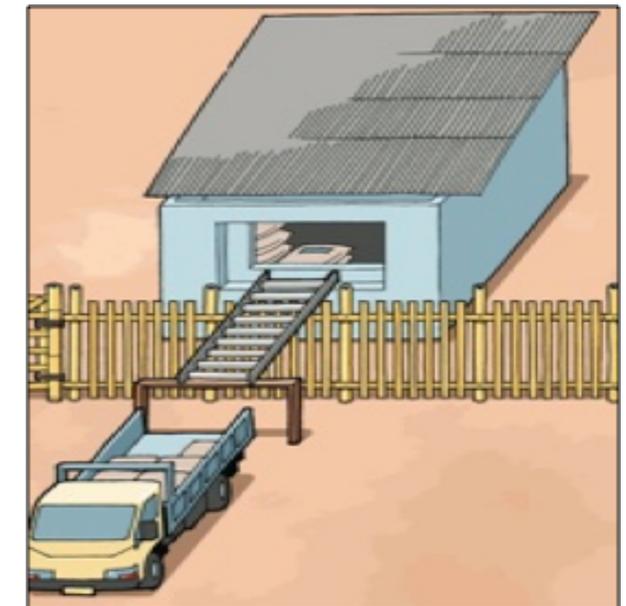
Most participants said they allowed the trucks and other vehicles carrying the chicken feed or used by transporters to enter their farm. Most participants' storage rooms are located near the chicken house, or even in the same building as the chicken house. According to some participants, "if the trucks or vehicles can access the warehouse, we let them enter the farm as close as possible to the storage."

However, participants without truck or other vehicle access do not let the trucks enter their farm. Instead, they carry the chicken feed from the trucks either on their shoulders or in a cart. At harvest time, all participants agree that disease transmission is no longer their concern. Consequently, they let the transporters' vehicles enter the farm, even going as far as the chicken house door. According to some, the transporter usually wants to select the chicken himself; the farmers cannot deny them entry to the chicken house.

When asked about the risks, all participants agreed that trucks, vehicles and cages can all bring disease. However, for practical reasons, they choose to allow the transporters and feed carriers to enter the farm. They point out that they would have to pay more for workers to carry the feed or chicken, so they prefer to let the trucks and other vehicles enter the farm.

When participants saw the picture of the pass-through system, no participants from Garut and Tasikmalaya had seen this system before. However, some of those in Tangerang and Bogor said they had seen the conveyor belt system. A common reaction to the conveyor belt system was that it "is too expensive." Since the warehouse is usually located near or even inside the chicken house, they assume they would need a long conveyor belt, which would be impractical and uneconomic.

Figure 2. Pass-through system



### Pass-over system

The simple pass-over system was also seen as unsuitable by the participants, primarily because most of them did not use fences. Another reason given was that the land is usually muddy, making it impossible to use a trolley. However some participants do use carts to move the chicken feed to the storage, when the road is more than 100 meters away. Most farmers carry the feed and chicken on their shoulders, and there is a carrying fee for the workers (anak kandang).

A participant from Bogor said she stopped the trucks at the gate where the storage was located. She rented the farm, and it was the farm owner who built the gate and the storage. Other participants approved, saying: *"It is the owner and not the tenant who should build the fence, gate, and pass-over system."*

### Footwear exchange

All participants agreed that footwear exchange or using disinfectant on the footwear before entering the chicken house was an ideal practice. They also agreed that this measure could prevent diseases being transmitted to their chicken. All participants also said that the technical service had already told them about this method. They were familiar with it. Some participants claimed to have already installed a footwear exchange system by either providing footwear exclusively for inside the chicken house or putting in place a bucket of disinfectant for footwear. However, the farmers rarely practiced the footwear

Figure 3. Pass-over system



exchange. Previously, some owners had provided footwear solely for use inside the chicken house. But their workers had failed to put the system into practice, since they eventually used the footwear outside the chicken house as well. Some participants said they had only practiced it for a week or two after following instructions from the technical service staff, but afterwards either the workers or the owners failed to continue with the practice. The farmers said that the system was not practical and slowed them down.

The alternative method of using plastic bags as footwear was also considered impractical because the paddy husks used for the litter are sharp. Some participants added that they would have to provide a lot of plastic bags for the footwear. All participants perceived plastic bags as being impractical to use when in a hurry.

Figure 4. Footwear exchange system



### Ventilation

According to the farmers, there are several causes of stress for the chicken – loud noises, extreme temperatures, vaccine reactions, late feeding, and chicken house cleanliness. When the farmers were asked about ventilation, they agreed that a poor ventilation system could also cause the chicken stress. All participants agreed that stress could increase the risk of disease transmission.

### Curtain system

When the participants were shown the display picture of a bamboo chicken house, they all noticed that the curtain system was different to what they have now. They explained that the curtain system they use involves dividing the curtain into two halves. The top half is opened from top to the center, and the bottom half is opened from the bottom to the center. However the bottom curtain can only be opened when the chicken is old enough. This curtain system is the one most commonly used by the farmers in all study sites. The participants said that to prevent chickens from becoming stressed, they usually open the curtain to let fresh air into the chicken house.

# OVERCOMING BARRIERS AND CAPITALIZING ON INCENTIVES

Based on the findings of studies from 2009 to 2012, SAFE, together with industry and academia, created a program to improve farmer knowledge, address

misinformation and perceived barriers to change and motivate actions to improve biosecurity. The main components of the program are outlined below.

## 1. Teaching Farm model

Farmers visited one of 12 teaching farms that demonstrated recommended biosecurity and good farming practices. These included:

### Farm Entrance

- Space for parking area outside of the farm
- Locks on all gates
- Pass-over/pass-through areas
- Footwear available for visitors at farm entrance
- Soap and hand-washing equipment



Pass over/pass through area

### Doorway of Chicken Houses

Shoe exchange system or proper footwear dip system.

- Sandals or other footwear in the chicken house near the step-over barrier
- Small fenced area for the footwear within the chicken house



Sandal exchange at doorway of chicken house

### Dead Bird Handling

- Acceptable disposal method for dead birds (bury, compost, or boil)
- Sheets to record poultry mortality.



### General

- Clean buildings and equipment without old manure/litter prior to DOC arrival
- Potable water



## 2. Technical assistance to farmers

Industry and SAFE staff provided direct technical assistance to participating farmers, helping them to make changes at their farm and implement new techniques.



## 3. Educational institutions



Academic institutions and SAFE provided new lectures and information on biosecurity for Sector 3 broiler farms and students, and created teaching farms, at three academic institutions.

## 4. Sector 1 poultry producers

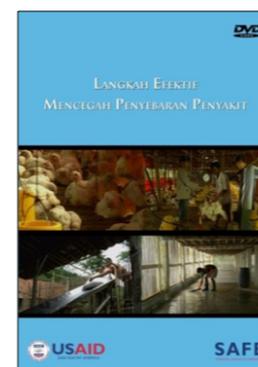
The private sector helped to improve technical and communication capacity of its technical services staff through formal training and accommodating on-the-job training, as technical service staff were able to observe SAFE technical assistance sessions for farmers.

## 5. Technical service staff

Technical staff collaborated with SAFE personnel to assess farm conditions, identify problems and potential solutions, and help implement biosecurity and good farming practices.

## 6. Communication tools and materials

Booklets on preventing the spread of disease, teaching farm displays, and farmer-to-farmer videos were disseminated for educational purposes among Sector 3 farmers, industry and academia. An SMS system was developed for rapid dissemination of messages to technical staff and farmers.



## 7. Technical and farmer discussion groups

Technical staff met with farmers to solicit their responses to proposed interventions, learn more about their farming experiences and develop practical solutions to improved biosecurity.



## 8. "Champion Farmers"

As an incentive this competition rewarded "early adopter" farmers that followed recommended practices.

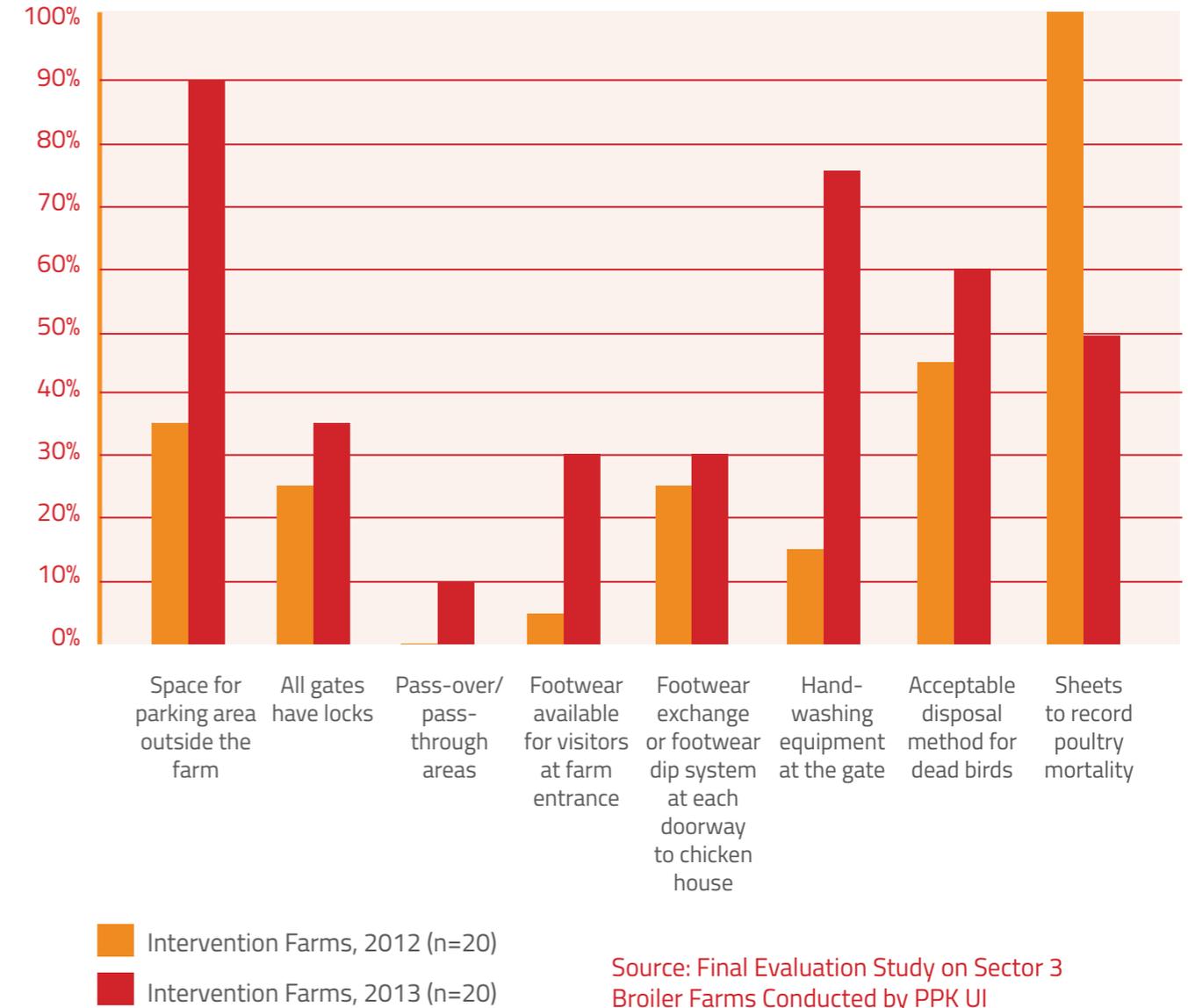


# RESULTS

The program found that farmers are willing to finance changes themselves, if a compelling business argument can demonstrate that doing so will improve farm operations, decrease losses or improve revenue. During the course of the program, over 300 farmers dedicated their own funding to improving the biosecurity of their farms.

The parking outside of the farm increased from 35% to 90%, and those with hand-washing equipment at the farm entrance increased from 15% to 75%. The only practice that decreased was keeping records of poultry mortality, which all intervention farms did at the start of the program but only half continued to do so at follow-up, likely an artifact of mortality data records sheets being collected by industry technical staff and SAFE staff, and farmers not feeling the need to keep their own records.

Figure 5 . Increased biosecurity practices on farms receiving SAFE assistance (2012-2013)



Source: Final Evaluation Study on Sector 3 Broiler Farms Conducted by PPK UI

## Identifying Easy and Difficult Changes

The changes that were easiest to make were those that can be done at reasonable day-to-day costs and where facilities support the implementation of biosecure practices. The farm's physical layout and structure were important determinants of behaviors. For example, one reason regular hand-washing with soap was not regularly conducted was due to convenience and access (i.e., there was no sink located near the chicken house).

## Attitudes and Beliefs

Interviews with farmers assessed their perceptions and priorities. Farmers reported that teaching farms and peer-to-peer demonstrations of biosecure farming practices successfully addressed farmers' uncertainty about the feasibility of making structural and behavioral changes.

Sector 3 farmers understand:

1. Connection between clean and sanitary facilities and mortality rates of poultry; and
2. Clean, well-ventilated, sanitized conditions as basic principles of farm management to prevent disease.

Sector 3 farmers are concerned that:

3. Poultry are more vulnerable and have lower immunity when placed under stress;
4. Poultry morbidity and mortality will affect their production and acceptance of poultry by Sector 1 companies with whom they contract; and
5. Poultry are at risk of AI infection, but do not report concern about AI risk to themselves, their families, or communities.

## Motivations and Incentives

Farmers were driven sometimes by interests based on their personal beliefs (doing the right things) and sometimes by external motivators such as financial rewards or threats of punishment, or moral/social acceptance by communities or other farmers.

Qualitative interviews indicated that program farmers were motivated to act by several factors.

1. **Economic.** Farmers desired increases in performance and decreases in poultry mortality in order to increase revenue. By far the most important motivator.
2. **Social.** Farmers were willing to learn from other farmers' biosecurity challenges and successes.
3. **Health.** Farmers expressed a desire to provide healthy chickens to their families and neighbors.

## From an Economic Point of View

Biosecurity efforts can be linked with Sector 3 priorities by emphasizing their usefulness in preventing AI as well as other infectious diseases and providing specific tools to help them protect their flocks.

Under a study conducted under the CBAIC project, net savings projections estimated that farmers can recover costs within four to seven production cycles, and experience ongoing benefit in the form of lower poultry mortality. During rainy seasons, poultry deaths predictably increased for Sector 3 farmers but those farms that participated in the program suffered fewer deaths compared to non-participating farms.

Under the SAFE project, 347 farmers self-financed changes contesting the long held notion that farmers will not spend their resources on installing biosecurity changes.

**Table 2: Self-financed Changes by Farmers**

N=345		
Changes	Number of Farmers	Percentage of total
Parking area outside the farm	135	39%
Footwear at the entrance to the farm		
▪ For staff	99	29%
▪ For visitor	79	23%
All gates have locks	90	26%
Pass-through or pass-over	26	8%
Upgraded hand washing area	269	78%
Footwear exchange at the chicken house doors		
▪ Footwear for the inside of the chicken house	300	87%
▪ Small fenced area for the footwear	289	84%
Proper disposal of dead chickens	169	49%
Record sheet	154	45%
Buildings and equipment clean	158	46%
Good drinking water	152	44%

Industry corporate support is also a strong driving factor in biosecurity compliance. Sector 1 companies share responsibility for monitoring and supervising biosecurity changes and maintenance within Sector 3 farms.

It is important that Sector 1 establishes and complies with a minimum acceptable standard

for the Sector 3 farms they contract with to raise poultry. Governmental regulatory oversight may be necessary to maintain this standard in the absence of Sector 1 industry concerns to force these changes out of fear that not all companies will implement the same high standards and contract farmers will leave to those companies with less stringent requirements.

**From a Social Point of View**

Visiting the teaching farms encourages other farmers to follow early adopter farmers in their biosecurity changes and successes. They believe that they are also able to develop their farm to operate as a teaching farm.



".....I want to be like pak H.Ujang... many things to do.. I have not covered the floor... (in front of cage)... I expect it can be done similar to teaching farm... I plan to have a hole for dead chickens, water filter, solid floor, wash basin for the visitor in front of farm.... the priority is solid floor.... outside the cage.. " (Sector 3 farmer in Bandung).

Maintaining good social relationships in their neighborhood is perceived as important to operating their farm business. They do not want the neighbors complaining about poor or unsanitary conditions in their farms.

"..we can be successful in creating a clean environment for the chicken house, and not have any problems in my neighborhood" (Sector 3 farmer in Banten)

**From a Health Point of View**

Healthy chickens are linked to good business therefore the farmers are motivated to implementing changes. Healthy chickens impact farm performance and revenue. Farmers also believe it is beneficial for their family to consume healthy chickens.

"...small inexpensive changes can be applied by farmers... they bring positive changes to the harvest, especially to the health of poultry. Now there is no trespassing - people or wild animals may not enter my farm since they can bring disease to our chickens. SAFE's suggestions are cheap and appropriate, fences made out of bamboo, facilities such as handwashing areas, footwear exchange, and the pass-over system... all influence the health of chickens... it is also all good for our families as well..." (Sector 3 farmer in Tasikmalaya).

## FUTURE DIRECTIONS

The CBAIC and SAFE programs identified a variety of challenges that Sector 3 farmers encounter in attempting to implement biosecure practices. Proposed solutions capitalize upon the incentives that were identified among farmers, and require a combination of public and private sector policies, standards and activities.

While farmers have begun to adopt biosecure practices, as with many behavior changes, it is easy to revert to former practices if there is no disincentive in doing so. Industry leadership in the form of technical assistance and incentives will continue to be required to consistently motivate farmers to adopt and sustain recommended practices. Several points to consider in future programming:

1. Improved farmer biosecurity practices can be built into the industry incentive system
2. There is a regulatory role for government as an incentive for change.
3. Distributing information and encouraging adoption of biosecure practices were best accomplished through:

- Farmer-to-farmer learning.
  - Communication materials designed specifically for farmers.
4. Partnerships between industry and academia prove to be valuable in:
- Understanding the context of the Sector 3 farmer.
  - Developing relevant, evidence-based approaches.
  - Providing more knowledgeable graduates with practical hands-on biosecurity experience.

Strengthening biosecurity in Sector 3 farms can reduce the risk of mortality from AI and other diseases among poultry, and collaboration between industry and government agencies could further motivate increased biosecurity in the interest of the entire commercial poultry sector.

