STRATEGIC PLAN for implementation of disease prevention and control in the commercial poultry sector of Ethiopia

T. Fabri & J. Wiegel
GD Animal Health, The Netherlands

Dr Demek Wondmagegn Mengiste
ENTAG Poultry Sector Platform Coordinator

Monika Sopov
ENTAG Program Coordinator
Wageningen Centre for Development Innovation, Wageningen UR

Erika Endrődine Benkő
www.homemadeographics.hu

November 2018
ENTAG is part of the BENEFIT program implemented by the Wageningen University and Research with the support of the Royal Dutch Embassy in Addis Ababa, Ethiopia
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>5</td>
</tr>
<tr>
<td>BACKGROUND</td>
<td>7</td>
</tr>
<tr>
<td>CURRENT SITUATION</td>
<td>8</td>
</tr>
<tr>
<td>PROPOSED STRATEGIES</td>
<td>13</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>21</td>
</tr>
<tr>
<td>TERMINOLOGY</td>
<td>22</td>
</tr>
<tr>
<td>ANNEXES</td>
<td>24</td>
</tr>
</tbody>
</table>
## ANNEXES

1. **Pilot Identification and Registration (I&R)**
   - **1.1 Background**
   - **1.2 Components and Design**
     - **1.2.1 Requirements**
     - **1.2.2 Functionalities**
     - **1.2.3 Practical execution**
     - **1.2.4 Design of pilot**
     - **1.2.5 Terms and conditions**

2. **Pilot Poultry Health Expertise Center (PHEC)**
   - **2.1 Background**
   - **2.2 Components and Design**
     - **2.2.1 Responsibilities**
     - **2.2.2 Requirements**
       - **2.2.2.1 Availability of laboratory consumables**
       - **2.2.2.2 Test portfolio**
       - **2.2.2.3 Specific poultry knowledge**
       - **2.2.2.4 Network in the poultry sector**
       - **2.2.2.5 Framework of legislation and regulations**
     - **2.2.3 Design of pilot**
       - **2.2.3.1 Basic education course**
       - **2.2.3.2 Specific education**
       - **2.2.3.3 On-site support**
       - **2.2.3.4 Long distance support**
       - **2.2.3.5 Network building**

3. **Pilot Capacity Building Short Term**
   - **3.1 Background**
   - **3.2 Components and Design**
     - **3.2.1 Requirements**
     - **3.2.2 Components**

4. **Pilot Capacity Building Long Term**
   - **4.1 Background**
   - **4.2 Components and Design**
     - **4.2.1 Requirements**
     - **4.2.2 Components**
       - **4.2.2.1 Veterinary education**
       - **4.2.2.2 Education of governmental employees**
       - **4.2.2.3 Education of farm managers, farmers and farmworkers**

5. **Pilot Good Farming Practice**
   - **5.1 Background**
   - **5.2 Components and Design**
     - **5.2.1 Requirements**
     - **5.2.2 Components**
       - **5.2.2.1 Explore existing programs**
       - **5.2.2.2 Develop a program outline for Ethiopia**
       - **5.2.2.3 Development plan**
The ENTAG program very much appreciates the efforts and expertise of the GD Animal Health in developing this strategic document together with relevant Ethiopian stakeholders.

In addition, the program also acknowledges the tremendous effort of the National Veterinary Institute (NVI), Veterinary Drug and Animal Feed Administration and Control Authority (VDFACA), the National Animal Health Diagnosis and Investigation Center (NAHDIC), and the Ministry of Agriculture and Livestock Resources Epidemiology and Poultry Directorate in their input in perfecting this document to fit it best the Ethiopian context.

ENTAG also wishes to acknowledge the role the Regional Livestock Bureaus of Ethiopia, Mekelle University, Gonder University of Veterinary Medicine, The Netherlands–African Business Council (NABC) and the Ethiopian Poultry Producers and Processors Association (EPPPA) played in developing this strategic document.

Finally, the program also wishes to express its gratitude to Dr Bewket Siraw, Dr Yismashewa Wegayehu and Ato Belachew Hurrisa for their time and dedication in supporting the development process of the “Strategic plan for implementation of national poultry disease prevention and control of Ethiopia” and contributing to the refinement of the document.
The livestock production in Ethiopia is in a period of transition. The transition from traditional farming towards a more industrial form of farming is necessary to meet the increased demand of growing population of the country as it is mentioned in GTP I and II. The transition requires a coherent strategy and structure for poultry health and disease control and prevention.

The Ministry of Agriculture and Livestock Resource (MoALR) (former Ministry of Livestock and Fishery (MoLF)) has requested the Ethiopia Netherland Trade for Agricultural Growth (ENTAG) program to provide support in developing the strategic plan to strengthen the poultry health and disease control and prevention in Ethiopia. ENTAG has called for the services of the GD Animal Health in The Netherlands, which together with ENTAG staff implemented developed the strategic plan with input and reflections of the relevant Ethiopian stakeholders.

The objective of this report is, based on the analysis and discussions during numerous workshops, to advise on the structure and to describe a feasible strategic plan for organized poultry health control by the government in Ethiopia that can be endorsed by the private poultry industry, so that the Ethiopian government can support the poultry sector in increasing production to the desired level.

The strategic plan focuses on the following topics:

- Organization of poultry industry, farm locations and flock registration
- Poultry health management
- Organization of epidemiological data
- Surveillance programs for specific poultry diseases
- Monitoring the effect of disease control and intervention programs
- Organization of poultry diagnostics
- Collaboration between governmental and private stakeholders

The proposed strategic plan is limited to enhancing the performance of the poultry health and disease control and prevention within the commercial poultry sector in Ethiopia. Traditional and improved family poultry (TFP and IFP) production systems are not within the scope of the strategic plan, as organized approach to poultry health and disease control and prevention is (currently) not possible for those systems in the country. However, both TFP and IFP production systems are taken in to account as they will both benefit from the plans for health and disease control and prevention for the commercial poultry sector.

Initiatives from other stakeholders and donors are focusing on strengthening the pastoral veterinary services, which are essential for TFP and IFP production systems. Also, more knowledge of poultry diseases and poultry management and an organized disease control and prevention approach will result in better fitted prevention tools and more controlled disease situation in Ethiopia. This is beneficial to all production systems.

The approach of GD in this report is to:

1. analyze the current situation;
2. identify the progress since the start of the roadmap;
3. advise on the process;
4. mobilize stakeholders by implementing pilot projects.

It is the recommendation of GD for the Ethiopian government, based on the analysis of the current situation to launch a variety of pilot projects, which will demand that stakeholders discuss and agree on key policy issues. Recommendations for potential pilot projects can be found in Annexes. During the implementation of the pilot projects, new challenges will be encountered that have to be addressed.
Ethiopia is the most rapidly growing country in the world. The population is approximately 100 million in 2018. The economy has begun to grow in the mid-1990s. During the last decades it has become one of the fastest growing economies in the world, with a GDP (gross domestic product) growing about 10% per year. The Government of Ethiopia has expressed the wish to increase its agricultural production to a level that it will meet the demand of its own growing population and will be able to produce for export.

To reach this goal, the government issued the growth and transformation plans (GTP I (2010–2015) and GTP II (2015–2020)). Detailed roadmaps in the Ethiopia Livestock Masterplan (LMP) set out interventions to meet the targets of the GTP’s. The LMP presents an excellent overview of the situation in 2015, the desired future state and its challenges (and pitfalls) on the path towards an increased agricultural productivity. Regarding poultry the ultimate goal is to create a sustainable poultry industry with safe and good quality products at attractive (preferably internationally competitive) price levels. Within that context, the impact of interventions on poultry health has to be considered.

General objectives of LMP are:
- to reduce poverty
- to achieve better food security
- to contribute to the national income growth, export and foreign exchange earnings
- climate mitigation and adaptation

For poultry, this means that a massive growth of production is necessary to close the future gap in total meat consumption demand. This growth is proposed to come from a transformation of TFP to IFP systems (outside of the scope of the proposed strategic plan) and a substantial increase of the number and size of specialized commercial broiler and layer farms (commercial poultry production within the scope of the proposed strategic plan).

The challenges to reach the objectives, as also mentioned in the LMP, are specified in this document (Chapter 4). However, the details of the intervention strategies are lacking in the LMP document. The proposals for potential intervention strategies are outlined in Chapter 5.
b. Key stakeholders in the Ethiopian poultry sector

Key stakeholders of the Ethiopian poultry sector and their respective mandates are listed in Table 1.

<table>
<thead>
<tr>
<th>STAKEHOLDERS IN ETHIOPIA</th>
<th>MANDATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Agriculture and Livestock Resource (MoALR)</td>
<td>Care for overall health status of livestock, prevent and control animal diseases</td>
</tr>
<tr>
<td>(formerly Ministry of Livestock and Fisheries (MoLF))</td>
<td></td>
</tr>
<tr>
<td>Veterinary Drug and Feed Administration and Control Authority (VDFACA)</td>
<td>Efficacy, safety and quality of animal feed and veterinary drugs, vaccines and biologicals</td>
</tr>
<tr>
<td>National Animal Health Diagnostic and Investigation Center (NAHDIC)</td>
<td>Execution of livestock health care including poultry</td>
</tr>
<tr>
<td>National Veterinary Institute (NVI)</td>
<td>Improvement of livestock health including poultry, i.e. by development and distribution of vaccines</td>
</tr>
<tr>
<td>Ministry of Health (MoH) and the Ethiopian Institute for Public Health (EIPH)</td>
<td>Detection, assessment and prevention and control of zoonotic diseases and food safety hazards</td>
</tr>
<tr>
<td>Universities (and veterinary faculties)</td>
<td>Education of veterinarians in all professions, including poultry health care</td>
</tr>
<tr>
<td>Ethiopian Veterinary Association (EVA)</td>
<td>Harmonization of veterinary views and communication between veterinarians and government and other stakeholders</td>
</tr>
<tr>
<td>Ethiopian Poultry Producers and Processors Association (EPPPA)</td>
<td>Serve interest of united farmers</td>
</tr>
<tr>
<td>Private poultry sector</td>
<td>Production of poultry products</td>
</tr>
<tr>
<td>Ethiopian Animal Feed Industry Association (EAFIA)</td>
<td>Serve interests of large producers of feed and other products</td>
</tr>
<tr>
<td>Large integrators</td>
<td>Production of poultry products in an organized way to maximize profits</td>
</tr>
</tbody>
</table>

c. Insufficient organization of the supply chain

The focus of the ministry has been mainly on large animals to secure production and export on the short term. Poultry production has been mainly in the context of small scale farming, which is contradictory to GTP II projections. GTP II states that most of the growth in feed production must come from increased specialized poultry production. However, significant growth of this sector is not yet established. The cooperation between the private sector and the government is limited, which is partly due to the private sector not being yet well organized and the influence of large (semi-integrated) parties is still limited.

Due to government stimulations, an increasing number of small-scale commercial poultry farms has been created, although exact numbers are not known. New farms are likely to grow in size in the future. They may run into problems due to location, biosecurity, lack of knowledge etc. Therefore, introducing regulations regarding their operations is vital.

The availability of products such as feed, but also day old chicks (DOCs), additives, vaccines and medication are neither in line with the production potential, nor adequately tailored to the field situation, according to field veterinarians. This is currently a limiting factor for growth in poultry production.

Slaughter and marketing of products are not organized and therefore, the market for chicken meat and eggs is unstable and irregular. When production increases, this aspect will require attention as a large production requires a stable market.
Within Ethiopia, a large number of universities operate and have delivered up to 4,000 graduates. Poultry health care is included in the curriculum of the training of veterinary students only to a limited extent: in the first 5 years, only a limited number of contact hours is included for poultry. In the final year before graduation, a part of the curriculum is dedicated to poultry. The influence of the private sector towards the curriculum is limited. The knowledge level of the graduates does not meet the expectations and needs of the private poultry industry. In practice, large poultry companies have their own training program for veterinarians for 3 to 6 months before they can start working. The basis of the future health care should be a broad training program of future veterinarians.

The current veterinary service structure in Ethiopia consists of a small group of private veterinarians and of predominantly government supervised and subsidized institutes. Regarding poultry, the government mainly focuses on maintaining international requirements regarding public health concerning export, the support of diagnostic institutes and the production of vaccines.

Different governmental institutes (NVI, NAHDIC, universities) perform diagnostic research activities, but the knowledge of the interpretation of diagnostic results is limited. The ability to correctly diagnose diseases is limited due to gaps in the knowledge and lack of lab resources at the diagnostic laboratory. The quality of technical staff and employees at the governmental institutes such as NVI and NAHDIC appears to be relatively good.

The current structure does not supply enough information for VDFACA to make a quick and well informed judgment to register intervention tools, like vaccines. This process delays the growth of the industry, leads to distrust and increases the risk of the use of unregistered (veterinary) products. The use of unregistered vaccines might undermine future monitoring programs.

Cooperation between private veterinarians and the governmental bodies and institutes is weak. The major mandates of the institutes are clear, but some of the work is duplicated and other work is lacking. Also, there is a lack of budget for certain veterinary services. Training on general poultry production and disease and on specific subjects such as biosecurity appears to be suboptimal.

Veterinary service is delivered by private veterinarians and government supervised and subsidized institutions. The overall quality of veterinary institutes is good, but poultry specific knowledge is lacking. Especially knowledge and experience on husbandry practices and disease interventions is currently absent or available within a limited number (one or two) of people at the institutes. Also, organizational issues arise regularly. For instance, NAHDIC is often unable to diagnose important diseases due to lack of diagnostic kits, reagents, laboratory consumables and knowledge. Another example is the vaccine production of NVI. There is no competitive/comparable data available on the produced vaccines, i.e. no data on efficacy in the field. Also, quality genetic research is done, but this research is mainly focused on genetic selection and feed improvement for traditional poultry and not aimed at commercial poultry production.

The current structure of the veterinary service regarding poultry health care and poultry health management prevents further progress of the private poultry industry. If the government does not upgrade, coordinate and supervise the improved veterinary structure for the poultry industry, the industry might take autonomous actions to secure their investments. This would mean that large investor will develop their own health care requirements and health care program, without supervision or control from the government.
Current monitoring of poultry health and diseases is minimal and disorganized; disease prevention and control measures are uncoordinated. Institutes do not cooperate and therefore, the little information that is known is scattered. To this effect, no overall information is known, and can thus not be used to improve the quality of diseases interventions. Communication between the governmental institutes is limited, as is the communication between governmental institutes and private poultry industry.

Also, the knowledge and data available at the government is not sufficient to adequately assess the field situation and to take appropriate (and timely) actions. The current disease surveillance conducted in Ethiopia is primarily passive surveillance, when existing data is collected or a response action is carried out after a report of a disease. The current surveillance in Ethiopia cannot provide a prevalence, nor can it monitor disease status.

Currently, the registration process for veterinary drugs and biological of VDFACA is tedious, contributing to shortages of effective products in the field. Ethiopia is focusing on a self-supporting vaccine supply by NVI, but due to limited production and limited portfolio this strategy cannot be maintained if the industry grows as predicted in the GTP’s. Not only because of numbers, but also because of the increase of pathogens that is inherent to the increase of production capacity. The international development of the quality and efficacy of vaccines leading to GMO’s has to be taken into account. Requirements of the private industry are not considered within the present structure, nor is there an independent body that controls effective use of products in the field.

The GTP II (LMP) documents present an excellent overview of institutional gaps in veterinary service delivery and the organization of poultry health in Ethiopia in 2015. GD reviewed this document and analyzed the situation in April 2018 by performing interviews with several important stakeholders and during discussions in workshops. Combining the information of LMP and the analysis by GD, important gaps were identified, which are presented in Table 2 on next page.

The most important gap, that restrains the industry to develop (regarding poultry health), is the absence of a clear policy of a structure in which government and private industry work together, so the government can create an environment which, has the mutual consent of all stakeholders and complies to the obligation that the government has towards other (national and international) parties. Communication and coordination between different institutes such as NAHDIC, NVI and VDFACA is poor, which results in scattered information; some tasks are duplicated while others are lacking. Also communication with the private sector is minimal.

The present knowledge level on poultry health and poultry health care is limited and scattered, both in the government as well as in the private sector. The (access to) knowledge of poultry management, but also poultry disease is still a big problem for all parties. The development of NAHDIC as a diagnostic institute for poultry and monitoring can be significantly affected.

All other gaps are related to the governmental and educational structure, which is not organized to assist and control a commercial private poultry industry. Poultry health control must comprise of more than the control of notifiable diseases. An adequate health control program should also include non-notifiable diseases with high impact, economic or social. For the program to be successful, it must consist of cooperation and mutual agreements of government and industry (producers and services) on how to respond to the isolation of a pathogen. Main subjects of a strategic plan for poultry health control are: education, regulation of production, control and supervision.
**TABLE 2**
OVERVIEW OF THE CURRENT SITUATION AND CORRESPONDING INSTITUTIONAL GAPS IN ETHIOPIA

<table>
<thead>
<tr>
<th>CURRENT SITUATION</th>
<th>INSTITUTIONAL GAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absence of clear policy</td>
<td>Unclear roles of public and private stakeholders</td>
</tr>
<tr>
<td>Insufficient poultry knowledge and access to knowledge</td>
<td>» Coordination between governmental stakeholders</td>
</tr>
<tr>
<td></td>
<td>» Cooperation between government and private sector</td>
</tr>
<tr>
<td></td>
<td>» Definition of public and private tasks and implementation</td>
</tr>
<tr>
<td>Ineffective and low quality of (veterinary) service delivery systems</td>
<td>Institutional level</td>
</tr>
<tr>
<td></td>
<td>» Governmental level</td>
</tr>
<tr>
<td></td>
<td>» Governmental institutional level</td>
</tr>
<tr>
<td></td>
<td>» Private sector level</td>
</tr>
<tr>
<td>Inadequate disease prevention and control systems and unsatisfactory surveillance activities</td>
<td>» Lack of knowledge</td>
</tr>
<tr>
<td></td>
<td>» Structures are not designed for supporting commercial poultry</td>
</tr>
<tr>
<td></td>
<td>» Limited supply and distribution of input</td>
</tr>
<tr>
<td></td>
<td>» Lack of knowledge</td>
</tr>
<tr>
<td></td>
<td>» Lack of organized disease control programs</td>
</tr>
<tr>
<td></td>
<td>» Lack of funding</td>
</tr>
<tr>
<td></td>
<td>» Lack of input of the private sector</td>
</tr>
<tr>
<td></td>
<td>» Lack of Identification &amp; Registration</td>
</tr>
</tbody>
</table>
Growth and intensification of the poultry sector will result in increased risks related to poultry health, which has been observed all over the world. Growth of production irrefutably results in:

- Increased risk of transmissible diseases
- Increased risk of infections with zoonotic pathogens
- Increased risk on ineffective use of drugs and vaccines
- Increased risk of the use of non-registered drugs and vaccines
- Increased risk on suboptimal quality products — residues, occurrence of zoonotic pathogens, antibiotic resistance.

The above risks have to be considered in Ethiopia as well before the transition progresses. The general strategy to counter attack the risks is implementing actions, which have the consent of both the government and private industry, establishing the presence of a high level poultry management and poultry health expertise center and the implementing of organized disease control programs.

Organized disease control is the principle of making arrangements between government and private industry on how to communicate and how to detect, act, prevent and respond to the presence of disease. Organized disease control is a mean leading to the ultimate goal being a sustainable industry which produces good quality products at a price attractive level, preferably even able to compete at international level, and produces under correct welfare circumstances with high level of food safety.

Part of organized disease control is surveillance or monitoring. These terms are often used interchangeably, although there are subtle differences between the definitions.

**SURVEILLANCE is defined as:**
All regular activities aimed at ascertaining the health status of a given population with the aim of early detection and control of animal diseases of importance to national economies, food security and trade. (FAO)

Surveillance activities can be divided into passive and active surveillance.

**Passive surveillance** = reporting.
Routine gathering of information on diseases, no active search for cases. Complete reliance on passive surveillance often leads to under-reporting of diseases.

**Active surveillance** = searching.
Purposeful and comprehensive searching for evidence of disease in a population. Cannot replace passive surveillance.

**MONITORING is defined as:**
All activities aimed at detecting changes in the epidemiological parameters of a specified disease.
The goals of organized disease control and prevention are threefold:

1. **Prevent spreading of identified diseases geographically and within the production chain**
   Prior to prevention of spreading, the current disease situation must be known. This means that the most significant poultry diseases must be listed and monitored. A situation and a system must be created that farmers have access to diagnostic centers that can make the correct diagnosis, can plot the outbreak in a geographical setting and can effectively communicate the situation to stakeholders.

2. **Reduce economic damage by the availability and the correct use and timing of interventions**
   For the most important diseases there has to be a consensus between the government and the private industry how to counter attack and how to respond to the presence of the pathogen. The availability of vaccines and chemicals has to be organized effectively, so that an intervention can start rapidly before the pathogen spreads within the region, or within the production chain. Interventions, including vaccination and use of chemicals, which are officially registered as active against specific disease organisms, can be less effective if the application is incorrect. In some circumstances, the efficacy of those products in the future can be affected, which has to be prevented by correct information about the use and application of the products. Circumstances may occur that products are no longer effective because of mutations within the pathogen. This kind of information is vital for all stakeholders.

3. **Ensure quality and safety of products**
   The quality and safety of the final poultry products are influenced by health issues of the origin of the products; either the final product or products from the previous links of the poultry chain. Recording of the status is essential to define quality and safety. For that purpose an Identification and Registration (I&R) system is essential. For poultry, individual tagging of birds is not an option. I&R has to be limited to administrative registration of flocks.

The position of the government in organized disease control affects the future development of the poultry sector. If the government chooses to act in slow pace and does not provide a controlled health environment for the growth of poultry production, then the individual partners of the private industry will organize their own disease control program, and health care will be a competitive issue instead of a joint action.

In developed countries the government provides regulations in compliance with international agreements when required. Implementations are provided by government and industry. Industry mainly provides in welfare-, environment-, and product quality regulations. Supervision is conducted by government and industry together. In developing countries, the government often takes lead in regulation, by strict rules and regulations, and there is limited to no cooperation with the industry. This often results in an industry that can or will not comply with governmental rules. There is no joint supervision, and reactions of the government are often random based on an unorganized control program.

The effective health control is an organized disease control program in which the government provides support to the private poultry sector.
When trying to realize the growth of the poultry industry as is intended in Ethiopia, it is important to create a situation of improved animal health within the production chain. A large contribution to this growth is expected to come from the private industry. An environment in which the private industry can develop and flourish is needed.

To create this environment, there must be an organizational structure that will take the initiative and lead the implementation of strategic interventions. Such a structure must be self-supporting and guarantee a situation to proceed in the near future. The implementation is the joint responsibility of both government and the private sector. The government has a role as policy maker, but it cannot ignore the issues raised by the private sector. However, the government has other interests (international obligations, responsibility towards population etc.) that have to be taken into account as well.

Taking the initiative and defining roles and responsibilities can be done by a platform consisting of representatives of the different stakeholders, both governmental and private sector. This platform must be a self-functioning committee (“steering committee”), which will advise the government on policy decisions. This advice can be requested by the institutional gaps that were identified must be encountered. Proposed interventions are listed in Table 3 below.

**TABLE 3
INSTITUTIONAL GAPS AND THEIR CORRESPONDING PROPOSED INTERVENTIONS**

<table>
<thead>
<tr>
<th>INSTITUTIONAL GAP</th>
<th>INTERVENTION</th>
</tr>
</thead>
</table>
| 1 Unclear policy and roles of public and private stakeholders | » Establish and operationalize a steering committee  
» Develop a guideline on responsibilities of all stakeholders |
| 2 Insufficient poultry health knowledge and access to knowledge | » Ensure quality of veterinary education  
» Establish a Poultry Health Expertise Center  
» Conduct a pilot program focusing on a specific disease |
| 3 Ineffective and low quality of (veterinary) service delivery systems | See “Inadequate disease prevention and control” |
| 4 Inadequate disease prevention and control and unsatisfactory surveillance activities | » Establish clear legislative chain of command  
» Ensure coordination between governmental stakeholders  
» Introduce registration, standardization and pharmacological surveillance of drugs and products  
» Introduce control and certification of products used in poultry production  
» Concentrate veterinary knowledge of poultry diseases and health care  
» Introduce feasible and cost effective prevention and control strategy (surveillance) |

**ADVICE** • Establish and operationalize a poultry steering committee (SC). Commence the writing of a Terms of Reference (ToR) to define its composition, tasks, the mandate, its responsibilities and its financial position and budget.
government (or not). A certain level of empowerment has to be guaranteed prior to the establishment of the steering committee by the Ministry (MoALR). Each advice should be followed by a response from the government, within a suitable timeframe. The responsibility following the empowerment of the steering committee (SC) works both ways. The SC has the obligation to respond to questions of the government, but also the government has to respond to advices of the SC. However, a response is not equal to a guaranteed implementation.

The SC must consist of important stakeholders with interest in the poultry sector, regarding policy, genetics, feed, poultry health, and marketing and processing. Care must be taken to limit the number of participants of the committee. The committee can be constructed out of existing structures. Regular meetings must be guaranteed.

The SC will have the authority to install (technical) working groups on issues raised. The working group will explore the issue, investigate possible approaches and propose an action plan to the SC. The SC will interpret and translate it into a proposal to the government and private industry.

One of the first actions of the SC will be to determine the terms and conditions for poultry farms regarding quality of production. In time, certification in the form of a license to produce should be implemented for Ethiopian poultry farms. The general outline of conditions and legal arrangements must be determined by the government. Detailed specifications can be developed by a working group, involving stakeholders from the private industry.

The structure of the SC could be temporary and could proceed into a Poultry Board. However, it is important to guarantee continuity. A growing and developing poultry industry will continue to present different issues, and policy must be dynamic responding to newly presented challenges in the field.

A Terms of Reference should be written, so that a SC can be established and operationalized in the short term.

---

**2 Insufficient poultry health knowledge and access to knowledge**

**ADVICE** • Ensure that the knowledge level of the next generation of veterinarians regarding poultry management and poultry health care is improved by re-evaluating the curriculum and by implementing a master study program, which specializes in poultry to ensure that veterinarians can act as clinical veterinarians in the poultry sector. Cooperation with veterinary faculties in other countries, such as The Netherlands, is advised.

• Organize a post academic poultry study program to ensure correct and sufficient knowledge for the current and future veterinarians to work within the industrial settings.

• Raise the knowledge level of the current generation of veterinarians that work in the (private) poultry industry by training key veterinarians in a training of trainers (ToT) setting.

**Academic training:** Because of the high number of veterinary faculties, the limited knowledge that is present is scattered. Centralization of a poultry related curriculum will give better assurance of the quality of the curriculum. In the first years, poultry health and poultry diseases must be incorporated in the general curriculum to provide a better basic knowledge. A specialized course on poultry management, health and diseases must be offered.

**Post-academic training:** Incorrect use of intervention tools increases the risk of endangering the quality and safety of poultry products on the long term. Post academic training must raise the knowledge level of veterinarians working in the poultry sector to aid them in the use of intervention tools, evaluating efficacy and making them aware of the value of central monitoring and evaluation. A program for continuing professional development (cpd) must be created to ensure quality of veterinarians working in the field. This program can be developed from subjects of the specialization course and implemented in the general program for cpd for veterinarians. To ensure commitment of veterinarians, a registration and certification system must be included. The SC can appoint a working group to design the structure and content of cpd for poultry veterinarians.

**Pilot:** Within a pilot construction, a master program can be established, in cooperation with other universities, and a training program can be set up for the key veterinarians to start the process of ToT.
Establish Clear Legislative Chain of Command

See establishment of a steering committee.

Ensure Coordination between Governmental Stakeholders

To provide tools for the establishment and maintenance of poultry health, high quality feed and veterinary products, such as drugs and vaccines are needed. A continuous, reliable supply of drugs and additives is essential to accommodate the growing poultry sector. Responsibility for this lies with the Veterinary Drug and Feed Additives Control Authority (VDFACA).

Communication between VDFACA and other important stakeholders (private sector and institutes like NVI and NAHDIC) is essential to provide the necessary tools for the poultry sector. Updates on the current field situation should be received regularly. These updates can come from the specialized poultry unit at for instance NAHDIC, but also field veterinarians should be able to directly contact VDFACA and voice their needs. Especially concerning vaccines, a balance has to be kept between adequate control (efficacy and safety studies) and timeliness of availability.

Advice • It is advised to organize a monthly meeting of the governmental institutes under supervision of a poultry health expertise center (PHEC) to present data of organized disease control and to exchange information of the disease situation and to determine coordinated interventions. Proceedings of these meetings will be sent to the SC. The SC will advise on how to communicate and ensure regular distribution of the findings to the private sector. The MoALR will either be present at these meetings, or will receive the proceedings.

Further Develop Registration, Standardization and Pharmacological Surveillance of Drugs and Products

Products used on farms should be checked for efficacy, quality and safety. This can be provided by a registration process (for example by pharmacopeia guidelines for drug registration tests). Produced products should be of standardized quality and drug activity, otherwise good usage recommendations are not possible. Usage recommendations should include advices for application in different field situations, for example in the presence of maternal antibodies.

Post-market surveillance should be established for registered products. Complaints and remarks concerning registered products should be listed at VDFACA and action should be undertaken. This can be done by VDFACA, or can be conferred back to the manufacturer. Complaints or remarks concerning efficacy, quality or safety of the product have to be collected in a national database. The database of this information can be a part of an organized disease control program.

Advice • It is advised to re-evaluate the current procedure of registration within the steering committee and consider to accept approved registrations from other countries, such as the EU and the US. Increased focus should be on efficacy of products in the field.

Introduce Control and Certification of Product Production Used in Poultry Production

Safety and quality of products can be certified by a scheme such as GMP (Good Manufacturing Practices). By describing the production process in Standard Operating Procedures (SOPs) and determining control points, the process of production can be certified. Also, storage, transport etc. should be incorporated. A certificate, like GMP+, can be asked as a license to sell. This can all be organized by a separate body within the MoALR.

Advice • It is advised to discuss within the steering committee to introduce a system of certifying feed in a program of GMP. If such a system is requested, a working group can be established to set the standards and the way of certification. At a later time, this can be discussed for other products as well used in poultry production.

Concentrate Veterinary Knowledge of Poultry Diseases and Health Care

A central location that deals with all issues of poultry health, poultry diseases, poultry diagnostics and poultry intervention strategies is a benefit to the sector. It is important not to divide the tasks associated with the control of poultry diseases and assure cooperation between all governmental bodies that are related to disease control and disease prevention.
The poultry industry can only respond to (emerging) diseases if the diagnostic capacity is well organized and meets the needs of the sector. This consists of adequate logistics, portfolio, response time and correct interpretation of laboratory results.

**INTRODUCE FEASIBLE AND COST EFFECTIVE PREVENTION AND CONTROL STRATEGY (SURVEILLANCE)**

The objective is to implement a monitoring system consisting of both passive and active surveillance. The best way to do that system is to define the pillars of organized disease control, analyze each pillar and develop an appropriate action plan.

Surveillance must lead to control of specific diseases in different levels of the sector. Surveillance is disease specific as the goal and the objective may differ (Table 4). A priority list must be determined and agreed on both government and private industry. By a quick survey, insight in the current disease situation and bottlenecks can be obtained. The SC will eventually decide on which diseases will be monitored, and how that will be conducted.

**ADVICE**

- It is advised to set up a PHEC within NAHDIC with at least 5 veterinarians focusing on poultry diseases and poultry health care. This includes general husbandry, organized disease control, interpretation of diagnostic lab results, communication with the private poultry industry and organization of the monitoring. A training program for the above mentioned specialists can be one of the pilots to be executed in the near future.

- It is advised to organize monthly meetings of the governmental institutes, under supervision of PHEC, to present data of organized disease control, to exchange information about the disease situation and to determine coordinated interventions. Communication and coordination with the private poultry industry must be ensured.

- It is advised to create a situation in which the diagnostic laboratory can better respond to the disease situation in the field and in timely manner. A yearly budget has to be managed by NAHDIC, and orders for consumables must be directly controlled by the NAHDIC management. A contribution (to testing costs) of the submitters of samples must be considered.

**ORGANIZED DISEASE CONTROL**

Policy and legislation

Laboratory services

Identification and registration

Monitoring program

Surveillance and communication

Biosecurity system

Good farming practice

Animal health programs

Research and development

**EDUCATION**

CLEAR CHAIN OF COMMAND AND LEGISLATIVE FRAMEWORK

---

**TABLE 4**

DIFFERENT REASONS AND OBJECTIVES FOR SETTING UP SURVEILLANCE FOR POULTRY DISEASES AND SOME EXAMPLES

<table>
<thead>
<tr>
<th>REASONS FOR SURVEILLANCE</th>
<th>MONITOR OCCURRENCE</th>
<th>MONITOR CIRCULATING STRAINS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internationally obligated</td>
<td>ND, AI</td>
<td>AI</td>
</tr>
<tr>
<td>Public health</td>
<td>Zoonotic Salmonella</td>
<td>AI</td>
</tr>
<tr>
<td>Economically relevant</td>
<td>IBD</td>
<td>IB</td>
</tr>
</tbody>
</table>
ADVICE • It is advised to implement a monitoring system consisting of both passive and active surveillance. The proposed plan for implementation of actions is given in the form of pilot projects (elaborated individually in the Annexes with titles corresponding to the cursive sentences above).
• It is advised to start with an active case, a disease which is present in Ethiopia (e.g. according to the private industry), and problems are encountered in the prevention and control of that specific disease. A quick survey can be conducted among important stakeholders to determine the most pressing disease issues in Ethiopia.

The pilots are developed to start on small scale. New problems and institutional gaps will be encountered during the implementation process. Those have to be countered before the project can be rolled out on a larger scale. The steering committee will take the lead in the process of adjusting strategic approaches and tackling problems in execution.

### TABLE 5
**PILLARS ARE DESCRIBED AND ELABORATED INTO ACTIONS**

<table>
<thead>
<tr>
<th>PILLARS</th>
<th>DESCRIPTIONS</th>
<th>ACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Policy and legislation (obligatory and voluntary)</td>
<td>Establish a steering committee as specified in gap 1 in &quot;strategic interventions&quot;</td>
<td>• Start Pilot Capacity Building Short Term</td>
</tr>
<tr>
<td>2. Laboratory services for diagnosis of disease and intervention advices</td>
<td>Start capacity building as elaborated in gap 3 and 4 in &quot;strategic interventions&quot;</td>
<td>• Start Pilot Identification and Registration (I&amp;R)</td>
</tr>
<tr>
<td>3. Identification and registration system</td>
<td>Develop a legal framework and a guideline for practical implementation of an I&amp;R system of poultry farms</td>
<td>• Start Pilot Identification and Registration (I&amp;R)</td>
</tr>
<tr>
<td>4. Monitoring program</td>
<td>Arrange planning, execution of sampling, testing and interpretation of lab results</td>
<td>• Start Pilot Identification and Registration (I&amp;R) • Start Pilot Capacity Building Short Term</td>
</tr>
<tr>
<td>5. Surveillance, reporting, outbreak response, communication structure</td>
<td>Install a poultry health expertise center to advise and aid the sector</td>
<td>• Start Pilot Poultry Health Expertise Center (PHEC) • Start Pilot Capacity Building Short Term • Start Pilot Capacity Building Long Term</td>
</tr>
<tr>
<td>6. Biosecurity standards at different production levels</td>
<td>Determine feasible and cost effective requirements and include them in Good Farming Practice</td>
<td>• Start Pilot Good Farming Practice</td>
</tr>
<tr>
<td>7. Good Farming Practice (GFP) or a “license to produce”</td>
<td>Define content of a certification program to which each poultry farm should adhere, i.e. farm location, lay out, inventory, management, registration, etc.</td>
<td>• Start Pilot Good Farming Practice</td>
</tr>
<tr>
<td>8. Animal health programs for different diseases</td>
<td>Develop a program for control and prevention of appointed diseases, including the availability of tools for prevention or treatment, required test methods, communication conditions and governmental response</td>
<td>• Start Pilot Capacity Building Short Term</td>
</tr>
<tr>
<td>9. Research and development</td>
<td>To be implemented in Poultry Health Expertise Center and selected Universities. The steering committee is involved in determining direction of research</td>
<td>• Start Pilot Poultry Health Expertise Center (PHEC) • Start Pilot Capacity Building Long Term</td>
</tr>
</tbody>
</table>
### Table 6

**Institutional Gaps with their Corresponding Proposed Interventions, Followed by Proposed Further Actions**

<table>
<thead>
<tr>
<th>GAP</th>
<th>INTERVENTION</th>
<th>FURTHER ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Unclear roles of public and private stakeholders</td>
<td>» Establish and operationalize a steering committee</td>
<td>» ToR Steering Committee</td>
</tr>
</tbody>
</table>
| 2  Insufficient poultry health knowledge and access to knowledge      | » Ensure quality of veterinary education  
   » Establish a Poultry Health Expertise Center  
   » Conduct a pilot program focusing on a specific disease | » Pilot Capacity Building Long Term  
   » Pilot Poultry Health Expertise Center (PHEC)  
   » Pilot Capacity Building Short Term |
| 3  Ineffective and low quality of (veterinary) service delivery systems| » See “Inadequate disease prevention and control”                                                           |                                                                                |
| 4  Inadequate disease prevention and control and unsatisfactory surveillance activities | » Establish clear legislative chain of command  
   » Ensure coordination between governmental stakeholders  
   » Introduce registration, standardization and pharmacological surveillance of drugs and products  
   » Introduce control and certification of products used in poultry production  
   » Concentrate veterinary knowledge of poultry diseases and health care  
   » Introduce feasible and cost effective prevention and control strategy | » ToR Steering Committee  
   » ToR Steering Committee  
   » ToR Steering Committee  
   » Pilot Poultry Health Expertise Center (PHEC)  
   » Pilot Identification and Registration (I&R), Pilot Capacity Building Short Term, Pilot Capacity Building Long Term, Pilot Good Farming Practice |
REFERENCES


<table>
<thead>
<tr>
<th>TERM USED</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic plan</td>
<td>A plan on how to proceed, overview of gaps for which a specific action plan needs to be composed</td>
</tr>
<tr>
<td>Action plan</td>
<td>A detailed guideline on what to do and how to do it, concerning a specific challenge</td>
</tr>
<tr>
<td>Organized disease control</td>
<td>The principle of making arrangements on how to communicate and how to detect, act, prevent and respond to presence of disease</td>
</tr>
<tr>
<td>I&amp;R</td>
<td>Identification and registration, register information on animals (farms/flocks) in a central database</td>
</tr>
<tr>
<td>Commercial poultry farms</td>
<td>Farms producing poultry products with intent to sell for a profit</td>
</tr>
<tr>
<td>Small scale farms</td>
<td>Less than 500 birds at a location</td>
</tr>
<tr>
<td>Medium to large scale farms</td>
<td>500 or more birds at a location</td>
</tr>
<tr>
<td>Zoonotic pathogens</td>
<td>Pathogens that are naturally transmitted between animals and humans, and have the ability to cause disease in humans, i.e. Salmonella</td>
</tr>
<tr>
<td>Good Farming practice</td>
<td>Set of conditions and operating procedures that are consistent with a qualitatively good way of keeping chickens in a commercial manner. Can also be referred to as Good (Animal) Husbandry Practice</td>
</tr>
<tr>
<td>License to produce</td>
<td>Regulations/conditions that have to be met in order to be allowed to keep poultry for the production of commercial products</td>
</tr>
<tr>
<td>License to sell</td>
<td>Regulations/conditions that have to be met in order to be allowed to sell products commercially</td>
</tr>
<tr>
<td>Quality system</td>
<td>Additional regulations (without specific legal basis) enforced through, for example, trade agreements</td>
</tr>
</tbody>
</table>
In the annexes below, concepts for potential pilot projects for the Ethiopian context are described. The pilot projects allow testing of long term perspectives, and during implementation adjustments can be made as new institutional gaps are likely to be encountered. These gaps have to be properly assessed and appropriate strategies need to be developed and implemented to bridge the gaps. The steering committee will have the leading role in adjusting the strategic approaches and managing the challenges during implementation.

The pilots below are developed to start on smaller scale. After necessary adjustments, they can be rolled out on a larger (e.g. nationwide) scale.

For all pilot projects below:
» Timeline will be determined between GD and relevant Ethiopian stakeholders, assuming services of GD will be required.
» More elaborate GD contribution and corresponding budget will be provided by GD on request.
1. Pilot Identification and Registration (I&R)

1.1 BACKGROUND

Registration of farm locations and actively present flocks is essential for organizing disease control, disease surveillance and traceability. As individual tagging of birds is not an option, an I&R system should contain an administrative registration of flocks. The first step should be the identification and registration of commercial farms, the second step the registration of poultry flocks.

It is recognized that a large portion of poultry in Ethiopia is kept in a traditional or intensified traditional way. However, it is advised to implement I&R for commercial farms only, meaning medium to large farms. Smaller sized farms can be added once the system is running effectively. It is advised to keep registration limited to farm and flock characteristics and to not register competitive data, such as production parameters. Once a list of important poultry diseases has been determined, disease modules can be added to the I&R system and monitoring programs can be rolled out.

The number of medium to large farms (500 birds or more) is manageable, and the system can be tested and adjusted to fit the Ethiopian situation. The advice is to start with monitoring of farms of a specific production type, either breeder or layer farms. The monitoring should start nationwide. The importance and benefit for the individual farm owner and/or company must be communicated clearly.

It is desirable that the system is suited to run monitoring programs for poultry diseases in the future, including the coordination of sampling and the registration of flock statuses. Once the system is up and running for medium to large farms, a disease module can be added and the monitoring of a specified disease can begin.

1.2 COMPONENTS AND DESIGN

The pilot proposes a central registration in a digital database. Options for manual data collection are also provided. The current proposal describes the use of a software program developed by GD Animal Health, called Plexus. Plexus can be used to manage animal health, provide transparency of the production process and monitor specific poultry diseases in a country.

1.2.1 REQUIREMENTS

For a successful implementation of an I&R program, several requirements are needed.

- Legislation and agreements
  - Obligation to register data
  - Ownership of database, access rights, responsibilities, deadlines for registration, penalties, administration, control, audits.

- A central location for the database/registration
- A counterpart in Ethiopia with adequate technical and veterinary knowledge

And once a specific disease monitoring module is added:

- Laboratory capacity
- Knowledge of experts and field veterinarians
- Availability of prevention/treatment tools

1.2.2 FUNCTIONALITIES

The system can be used for different production types; (grand) parent farms, but also for broiler and layer farms and for rearing.

An I&R system, like Plexus, can provide several functionalities for the poultry sector:

- Administration; identification and registration of farms and flocks
  - Movements of (parts of) flocks have to be registered

And once a specific disease monitoring module is added to the system:

- Importing laboratory results (manually or automated)
- Planning and coordination of testing
- Awarding a status to a flock (compliant/non-compliant and negative/ambiguous/positive)
- Analyze epidemiology of disease
- Register vaccinations
- Register (preventative) treatments
  - Antibiotics

1.2.3 PRACTICAL EXECUTION

General requirements as mentioned in 1.2.1 must be met for this pilot to be successful.

There must be a central location where Plexus is coordinated from. It is proposed to organize this at NAHDIC. It will be easier to link the monitoring program to laboratory results generated at NAHDIC. Also, the necessary expertise to correctly interpret laboratory results is present there, if the PHEC is located there (see Pilot Poultry Health Expertise Center /PHEC/).
2. Pilot Poultry Health Expertise Center (PHEC)

2.1 BACKGROUND

To determine the list of important poultry diseases, a correct diagnosis of disease is essential. The diseases present in Ethiopia must be determined. Circulating strains of pathogens have to be identified and whether the presence is bound to certain geographical areas or levels of the production chain. Once diseases have been diagnosed correctly, appropriate intervention methods have to be identified. Currently, the quality of veterinary service is not adequate enough, therefore capacity building is necessary. Capacity building must be started at different levels. Capacity building must be aimed at farmers and farm workers, government, laboratories, veterinarians, other advisors and researchers. For each target, a program must be established for short and long term education.

Once the quality of overall veterinary service is satisfactory, there will still be a need for poultry specific expertise. This proposal consists of an action plan (guideline) to establish a poultry health expertise center (PHEC). The center employs approximately 5 veterinarians, who have knowledge on the field situation and laboratory results. They are 24/7 available for advising field veterinarians. The activities and responsibilities include the portfolio of the laboratory, processing time, basic knowledge of laboratory analysis, interpretation of results and advice on how to act at farm level. The veterinarians also coordinate active surveillance and report passive surveillance. The proposal for the establishment of a poultry health expertise center is specified below.

It is advised to start with one central expertise center. If future demands ask for a more regional approach, certain responsibilities and tasks can be relocated and executed by respective regional centers.

The expertise center (PHEC) will operate within the area described by the steering committee (see ToR Steering committee). The working area includes health and safety, biosecurity, animal welfare, ethics,
environmental contamination, genetic manipulation and quality assurance. Exact policy and responsibilities of different institutes will be appointed by the steering committee.

Mandate of PHEC:
» Act as the national location where a practical issues (non-policy) related to poultry health are handled
» Provide national helpdesk for poultry health for veterinarians, other professionals in the poultry sector and farmers

Tasks of PHEC:
» Interpretation of post mortem results
» Interpretation of laboratory results in accordance with vaccination programs (vaccine and moment of vaccination) and earlier contact with the pathogen
» Detecting trends and developments in occurrence of existing diseases, in cooperation with MoALR
» Detecting new or changed occurrences of diseases/problems and advice the steering committee/MoALR how to act
» Detecting possible threats to public health and advising the steering committee/MoALR how to act
» Act as ToT center to educate veterinarian and regional laboratory employees
» Acting as an operator of the national I&R for poultry
» Acting as operator of the active surveillance systems which imbedded in national health programs or voluntary programs of the private sector

2.2 COMPONENTS AND DESIGN

2.2.1 RESPONSIBILITIES

It is advised to establish a poultry health expertise center (PHEC). The center has to employ approximately 5 veterinarians, who have knowledge of poultry diseases in general but also the field experience and laboratory results. They are available 24/7 to field veterinarians for advice. The activities include managing the portfolio of the laboratory, processing time, basic knowledge of laboratory analysis, interpretation of results and advice on how to act at farm level. The veterinarians also coordinate active surveillance and report passive surveillance.

Responsibilities of PHEC are:
» Coordinate with NAHDIC to ensure diagnostic services, including test portfolio, processing times
» Data analysis, executed together with the Epidemiology department of MoALR
» Information and help desk center
» Research
» Education
» Monitoring
» Execution of disease control programs

2.2.2 REQUIREMENTS

For the successful establishment of a PHEC, several issues must be addressed. These requirements are:
» Adequate availability of laboratory consumables at NAHDIC
» Sufficient test portfolio at NAHDIC
» Ability to respond to "new" issues
» Specific poultry knowledge
» Broad network in the poultry sector
» Framework of legislation and regulations

2.2.2.1 Availability of laboratory consumables

The availability of laboratory consumables is important for the delivery of diagnostic opportunities. Only when consumables (including test kits) are adequately available can a laboratory provide the necessary support for the poultry sector. In case of new or emerging diseases, the laboratory must be able to respond by increasing the test quantity and frequency.

Laboratory consumables must be of a constant quality with same properties, as to produce constant quality and range of results (using the same cut-offs for example).

2.2.2.2 Test portfolio

The test portfolio of a laboratory must be sufficient to meet the demands of the field. Therefore, it cannot be a fixed portfolio. It must be able to respond to changes in the field, like the rise of "new" issues and (re-emerging) diseases. The laboratory therefore, needs a connection with experts on poultry health. Which tests are most appropriate to meet the demand must be assessed. Also, new insights or new tests can arise, requiring a response from the laboratory. Experts of the PHEC can advise the laboratory on these issues.

2.2.2.3 Specific poultry knowledge

Veterinarians of the PHEC must have specific poultry knowledge to be able to fulfill the responsibilities of PHEC. Knowledge must include not only disease specific information, but also knowledge on general issues:
» General poultry husbandry and Good Farming Practices
» General knowledge of poultry diseases and intervention
» Practical implementations and implication of intervention
» Principles and execution of organized disease prevention and control
» Diagnostics; options, characteristics of different tests, interpretation of results
» Insight into the disease situations in the world and in the neighboring countries of Ethiopia
» Data analysis
2.2.2.4 Network in the poultry sector

A broad network in the Ethiopian poultry sector is necessary for PHEC to fulfill its responsibilities. The network must include connections in different governmental bodies, in the private sector (farmers, advisors and veterinarians), pharmaceutical companies and international counterparts.

2.2.2.5 Framework of legislation and regulations

The private industry has to have an active input in the role and work performed by PHEC. This has to be established in its legal framework.

The position of PHEC in organized disease prevention and control needs a legislative basis. The center must have certain authorities and must have access to all laboratory results, which are collected throughout the country.

Agreements on the communication of reports of PHEC have to be included in the legal framework. It must be defined who can have access to results of tests, but also communication of results to the government has to be specified. For certain diseases (for instance notifiable diseases) the government needs to receive a notification of positive results, but for other diseases that may not be necessary and anonymous reports can sufficient. Confidentiality of results is very important to the private sector, as it has a direct impact on their market position.

Also, arrangements on financial issues are necessary. A contribution of the submitter is to be discussed, not only for the active monitoring programs, but also for individual submissions. Especially, if confidentiality and timeliness of processing can be guaranteed the private industry seems to be willing to contribute to the test costs. A fee per test provides the laboratory with additional resources and also creates a responsibility for producing results.

2.2.3 DESIGN OF PILOT

2.2.3.1 Basic education course

It is proposed to start with a basic education course for the appointed veterinarians. GD can supply a basic poultry health and disease course, including post mortem techniques and sampling techniques.

2.2.3.2 Specific education

Once a basic knowledge level is established, a more specific education course can be started consisting of an internship in The Netherlands. Several aspects of poultry husbandry should be covered, such as the execution of vaccinations, the provision and aspects of veterinary care, including post mortem and further diagnostics. Also education in the field of epidemiology can be implemented in the program.

2.2.3.3 On-site support

The pilot includes on-site assistance for a period of three years. It will be restricted to 2 visits a year, which also includes training sessions, network support and assistance with the implementation of “Plexus”. (Combined with Pilot Identification and Registration (I&R).)

2.2.3.4 Long distance support

Once basic and specific training of the experts is completed, long distance support will be provided for a certain period of time, or on the basis of a long-term financial agreement. This proposal provides a period of three years of long distance support. This matches the support provided in the Pilot Identification and Registration (I&R) (use of the software program Plexus). The long distance support consists of back stopping by veterinarians of GD Animal Health by telephone or email. Also, cases handled by PHEC will be collected and supplied to veterinarians of GD for peer consultation. The peer consultation will start with a frequency of once a week, to be able to identify possible knowledge or technical gaps and respond accordingly. In time, the frequency will be adjusted to once a month. GD will support PHEC with data analysis if necessary. Especially, when Plexus is used for data registration the options for data analysis will be more elaborate. Information gathered by PHEC will be summarized in monthly reports, reviewed by GD. Reports will be shared.

2.2.3.5 Network building

During the basic training in The Netherlands, the project will assist to give an insight into the GD cooperation with the field veterinarians in the VMP network, and will facilitate collaboration with the veterinary faculty – (post graduate) education of veterinarians and globally operating pharmaceutical companies. A similar structure must be developed for the Ethiopian situation.

A strong and broad national network has to be created to ensure PHEC can fulfill its goals. In the project, support will be given in executing trainings for the stakeholders in the poultry industry.
3. **Pilot Capacity Building Short Term**

### 3.1 BACKGROUND

To determine the list of important poultry diseases, a correct diagnosis of disease is essential. The diseases present in Ethiopia must be determined. The circulating strains of pathogens have to be identified and whether the presence is bound to certain geographical areas or levels of the production chain. Once diseases have been diagnosed correctly, appropriate intervention methods have to be identified. Currently, the quality of veterinary service is not adequate enough, therefore capacity building is necessary.

Once the quality of overall veterinary service is satisfactory, there will still be a need for poultry specific expertise. It is advised to establish a poultry health expertise center (PHEC). The center employs approximately 5 veterinarians, who have knowledge of field situation and laboratory results. They are available 24/7 to field veterinarians for advice. The activities include the portfolio of the laboratory, processing time, basic knowledge of laboratory analysis, interpretation of results and advice on how to act at farm level. The veterinarians also coordinate active surveillance and report passive surveillance.

Capacity building must be started at different levels, and must be aimed at farmers and farm workers, government, laboratories, veterinarians, other advisors and researchers. For each target, a program must be established for short- and long-term education.

It is advised to assign one veterinary faculty to provide a poultry related curriculum, pre- and/or post-academic. The knowledge will be centralized there. Veterinary education is the first step; by using the training of trainers approach, other advisors and workers in the poultry sector can be educated. Once the faculty is assigned, (post-academic) training of poultry veterinarians can commence.

### 3.2 COMPONENTS AND DESIGN

#### 3.2.1 REQUIREMENTS

For successful execution of this proposal some requirements have to be present:

- **An expertise center**
  
  A center with expert veterinarians (as proposed in Pilot Poultry Health Expertise Center (PHEC)) is needed for the execution of this pilot. The expertise is used for the development (and execution) of a training program for private veterinarians. Also, the experts can develop an appropriate monitoring program for the selected disease. The expertise center, in collaboration with other experts, must be able to interpret the results of the monitoring program.

- **An Identification and Registration system**
  
  An adequate I&R system (as proposed in Pilot Identification and Registration (I&R)) is needed for the execution of the designed monitoring program. Information on flocks present on farms and additional information on these flocks, such as origin and age is needed. Ideally the system also provides the opportunity to plan a monitoring program and register the results.

- **Laboratory capacity**
  
  The ability to perform tests for the selected disease, especially the tests selected within the monitoring program is needed. But also, the ability to perform additional tests can provide valuable information on occurrence and epidemiology of the disease (for instance serotyping or sequencing of the agent).

#### 3.2.2 COMPONENTS

The proposed intervention is focusing on a selected disease. Central supervision of this program is important, to ensure sufficient education on all different levels in the sector. It is proposed to organize the supervision from a location with knowledge and access to the identification and registration database, such as PHEC (Pilot Poultry Health Expertise Center (PHEC)). The decision for a specific disease must be made by the private poultry sector, in collaboration with the government. Therefore, it is proposed to ask the steering committee (ToR) to decide on the disease to be selected.

The first step is to further train experts (of PHEC) on this disease. These experts will familiarize themselves with all different aspects of the disease, such as characteristics of the pathogen, epidemiology, diagnosis, clinical signs of disease, options for treatment and preventative measures. This training can be provided by GD.

Next, the laboratory must be able to perform the required laboratory tests. This training can also be provided by GD.

Once the experts and laboratory are up to date, the training of trainers can be initiated. Private veterinarians, but also farm managers, other advisors on farms and government staff will be trained by the experts.
4. Pilot Capacity Building Long Term

4.1 BACKGROUND

Currently, the quality of veterinary service is not adequate enough to support the growing poultry sector, therefore, capacity building is necessary.

Once the quality of the overall veterinary service is satisfactory, there will still be a need for poultry specific expertise. It is advised to establish a poultry health expertise center (PHEC). The center employs approximately 5 veterinarians, who have knowledge of field situation and laboratory results. The proposal for the establishment of a poultry health expertise center is specified in Pilot Poultry Health Expertise Center (PHEC).

However, capacity building must be started at different levels and with different length (short and long term) of the veterinary service delivery: farmers and farm workers, government, laboratories, veterinarians, other advisors and researchers.

To centralize knowledge, it is advised to assign one veterinary faculty (or at least a limited number of faculties) to develop and implement a poultry related curriculum. Through the training of trainers approach, advisors and workers in the poultry sector can be educated. Once the faculty is assigned, (post academic) training of poultry veterinarians can commence.

An appropriate curriculum has to be developed for both veterinary as farm manager levels. Needs of the private sector need to be inventoried and incorporated.

Next to the practical provisions, requirements for communication have to be discussed. The communication of the results must be agreed upon. Receivers of the results and confidentiality have to be recorded in advance.

It must be decided whether a farmer should financially contribute to the monitoring program and the tests required. As this program is a pilot it is also possible to seek other possibilities to provide the financing required.

Once a monitoring program is started, GD will supervise the execution. Support will be provided by daily contact with experts of GD on laboratory specifics, but especially on interpretation and expert view by PHEC. Technical updates on laboratory and knowledge will be provided regularly, on site and by long-distance support. The execution of the program will be evaluated regularly, during the process and after completion.

4.2 COMPONENTS AND DESIGN

4.2.1 REQUIREMENTS

For the successful improvement of poultry specific education levels several requirements must be met:

» One (or more) assigned veterinary faculty for poultry specific education

Poultry specific academic knowledge is not widely available, therefore, it is advised to assign only a small number of faculties, preferably only one, to provide poultry specific education.

» Intensive contact between assigned faculty and the Poultry Health Expertise Center (Pilot Poultry Health Expertise Center (PHEC)).

4.2.2 COMPONENTS

The program for long-term capacity building consists of several levels of education. For individual components, collaboration with third parties such as pharmaceutical companies and private poultry farms can be sought.

4.2.2.1 Veterinary education

First the current curriculum and its poultry section should be reviewed. A poultry specific education program for veterinary students must be developed. It is proposed to develop a master program focusing on poultry health and disease. Also, practical training of young veterinarians should be incorporated, for instance by a traineeship on appointed farms.
For the development of the curriculum, collaboration with other faculties abroad should be sought. GD can provide contact with other faculties, for example, Utrecht University in The Netherlands, and can assist in the development of the new curriculum.

Postgraduate education of veterinarians can be provided by the faculty, together with PHEC as well. GD can aid the development of a postgraduate education program and the content of such courses.

4.2.2.2 Education of governmental employees

The additional poultry specific education for employees of different governmental bodies and institutes is important as employees are involved in the development and enforcement of legislation.

Education can be provided by both the assigned veterinary faculty and PHEC, and can be supported by GD.

4.2.2.3 Education of farm managers, farmers and farmworkers

Another important component of the capacity building program is the education of farmers and farmworkers. Several initiatives already exist and effort should be made to utilize and perhaps combine these existing programs. Additional education on health and diseases specifically can be provided by specialists and experienced field veterinarians, supported by the veterinary faculty and PHEC. GD can provide contacts of appropriate partners, like Aeres group.

5. Pilot Good Farming Practice

5.1 BACKGROUND

Registration of farm locations and actively present flocks is essential for organizing disease control, disease surveillance and traceability. To ensure quality of the farms, a form of certification should be implemented. This can be done by providing a license to produce. For a farm to obtain a license to produce, it must meet certain conditions relating to Good Farming Practice (GFP).

The government will produce the outline of conditions. Further detailed specifications, based on governmental outlines, can be developed by the private industry in a quality system. A legislative authority has to be set up. Audits can be executed by the government or the private sector.

The quality system can be set up by private sector, in consultation with the government. General and specific rules for production can be designed, for different production types. Rules should not be restrictive, but should provide minimal requirements for good farming practice.

Participation in a quality system can provide farms with more and better business opportunities, as it guarantees a certain level of quality without the need for additional audits by the customer. It provides an opportunity for the government as well, as it would ensure certain level of good farming practice without the need for legislation and government enforcement.

5.2 COMPONENTS AND DESIGN

5.2.1 REQUIREMENTS

There are some specific requirements that must be provided for successful implementation of the pilot.

» A steering committee

The establishment of a steering committee (or other organizational structure) is necessary for the coordination of the development of a Good Farming Practice program. Agreement on the content of the private sector and government is essential.

» Identification and registration of farms (Pilot Identification and Registration (I&R))

I&R is necessary to identify farms that need to oblige to the GFP program.

» Legal framework

5.2.2 COMPONENTS

5.2.2.1 Explore existing programs

The first step is to assess programs for Good Farming Practice in other countries. Developed countries can be investigated for options, but also other African or Asian countries can be checked for their GFP program. The perfect program for Ethiopian farms will not exist, but possibly it can be assembled from parts of programs in other countries.

It is advised to have the steering committee install a working group for the assessment and the subsequent development of a program to ensure GFP. GD will supervise and support the working group in its assignment.
5.2.2.2 Develop a program outline for Ethiopia

Findings of the exploration will be used to develop an Ethiopian GFP program. The establishment of such a program is not a project that can be finished in a short period of time. It is a dynamic process that needs to be evaluated and updated regularly to suit the growing poultry industry. Important characteristics are feasibility and cost effectiveness.

General subjects to be regulated in Good Farming Practice are mentioned in Table 7.

5.2.2.3 Development plan

The development plan should at least consist of the following subjects:

» Terms and conditions for farms
   The terms and conditions for farms to be able to participate in the GFP program must be set by the working group.

» Legislative framework
   Legislation must be reviewed to make sure that there is a basis to make the GFP mandatory for farms. Also, there must be a foundation for auditing of compliance.

» Auditing scheme
   A scheme for audits and the execution of the audits must be deliberated.

» Practical side: implementation, communication, etc.
   Also the practical details of execution must be worked out in a detailed plan.

» Benefits for the farmer
   To ensure long term participation there must be a benefit for the farmer. The individual regulations are beneficial to farm management, as they will provide a high level of quality in themselves. However, it is desirable to present an additional benefit. For example, the benefit for participation can be a less stringent auditing scheme.

<table>
<thead>
<tr>
<th>TABLE 7</th>
<th>SUBJECT OF A GOOD FARMING PRACTICE PROGRAM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FACTORs OF REGULATION IN A QUALITY SYSTEM</strong></td>
<td></td>
</tr>
<tr>
<td>Building and layout of the facility</td>
<td>• Unique location identification</td>
</tr>
<tr>
<td></td>
<td>• Structural conditions of buildings</td>
</tr>
<tr>
<td>Traceability</td>
<td>• Unique flock identification</td>
</tr>
<tr>
<td></td>
<td>• Registration of all movements</td>
</tr>
<tr>
<td>Feed and drinking water</td>
<td>• Availability</td>
</tr>
<tr>
<td></td>
<td>• Condition of the system</td>
</tr>
<tr>
<td></td>
<td>• Quality control</td>
</tr>
<tr>
<td>Employees (farm workers)</td>
<td>• Animal care standards</td>
</tr>
<tr>
<td></td>
<td>• Loading procedures</td>
</tr>
<tr>
<td></td>
<td>• Animal treatments and vaccinations</td>
</tr>
<tr>
<td></td>
<td>• Pest control</td>
</tr>
<tr>
<td></td>
<td>• Cleaning and disinfection</td>
</tr>
<tr>
<td>Welfare</td>
<td>• Availability of water and feed</td>
</tr>
<tr>
<td></td>
<td>• Light schedules</td>
</tr>
<tr>
<td></td>
<td>• Regular health checks</td>
</tr>
<tr>
<td>Performance and health</td>
<td>• Flock information (origin, history)</td>
</tr>
<tr>
<td></td>
<td>• Veterinary care</td>
</tr>
<tr>
<td></td>
<td>• Registration of medications and additives</td>
</tr>
<tr>
<td>Hygiene</td>
<td>• Farm grounds (restricted access, drainage)</td>
</tr>
<tr>
<td></td>
<td>• Visitors (registration, hygiene protocol)</td>
</tr>
<tr>
<td></td>
<td>• Pest control</td>
</tr>
<tr>
<td></td>
<td>• Storage (feed, cadavers, etc.)</td>
</tr>
<tr>
<td>Food safety</td>
<td>• Compliance to monitoring program</td>
</tr>
<tr>
<td></td>
<td>• Application conform to registration of medication (withdrawal periods)</td>
</tr>
</tbody>
</table>