EXPANDED AGRIBUSINESS AND TRADE PROMOTION (USAID E-ATP)

In fulfillment of the following deliverable under task 1.3.1:

Transport Cost Assessments for each Value Chain Along a Key Corridor, Updated Annually

Poultry (FY10)

Contract/ Project No.: EDH-1-00-00005-11

Submitted to: Danielle Knueppel, COR
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TRANSPORT AND LOGISTICS COST STUDY FOR POULTRY

EXPANDED AGRIBUSINESS AND TRADE PROMOTION (USAID E-ATP)

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EXPANDED AGRIBUSINESS AND TRADE PROMOTION (USAID E-ATP)

CONTENTS

ACRONYMS

AI	Avian Influenza
ATP	USAID Agribusiness and Trade Promotion Project
AU NEPAD	African Union- New Partnership for Africa's Development
CAADP	Comprehensive Africa Agriculture Development Program
DOC	Day-old-chick
E-ATP	USAID Expanded Agribusiness and Trade Promotion Project
ECOWAS	Economic Community of West African States
FCFA	West African CFA Franc
GHC	Ghana Cedi
UEMOA	West African Economic and Monetary Union
USAID	United States Agency for International Development
USD	US Dollar

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- Laura Jane Busch MSc CA, Team Leader and Lead Field Researcher
- Daouda Moussa, Study Coordinator and Field Research Assistant
- Nathan Van Dusen, Research Task Manager

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From left to right: Daouda Moussa, Ali Isaaka, Dje Kouakou, Zoumana Coulibaly

EXECUTIVE SUMMARY

Poultry is one of the most commonly consumed meats in West Africa. Chicken meat and eggs are a major source of protein for West African consumers. However, significant challenges to regional trade in poultry exist. This Transport and Logistics assessment seeks to quantify the constraints and costs involved with trading day-old-chicks (one of the most commonly traded poultry commodities) from Kumasi, Ghana to Cotonou, Benin by road. Through this study, USAID E-ATP and its stakeholders will gain a better understanding of how inefficiencies in the transport and logistics process relate to the overall operation of the value chain and inform what can be done to address the most glaring inefficiencies.

This assessment finds that for day-old-chicks (DOC) originating in Ghana, sold to end buyers in Cotonou, direct and indirect transport and logistics costs comprise 40% of the end market price. Of these transport and logistics costs, 86% are considered to be "extra costs", meaning that 34% of the end market price is considered to be inefficient, unnecessary, unjustified, or too expensive when compared with an optimized scenario.

The long transit time and stressful transit environment that DOCs go through to reach Cotonou is detrimental to the DOCs' long term health. As a result of this, end market buyers are willing to pay a significant premium of 13% for DOCs imported from Europe via air under optimal transit conditions. This discount is applied to DOCs coming from Ghana, despite the fact that there is *no inherent difference* between Ghanaian and European DOCs, other than the time and conditions in which they travel[1].

Therefore, in addition to the high transport costs created by inefficiencies in the logistics chain, producers are obtaining depressed revenues due to the impact of transport on the DOCs' quality. The gains from removing these inefficiencies and improving the logistics process are thus extremely significant. Implementation of the recommendations in this report have the potential to increase the volume of trade in DOCs along this corridor by reducing costs to traders, improving the price, quality and availability of DOCs for consumers in end markets, and improving biosecurity

DOCs from Kumasi are offloaded and traded in Aflao before onward transit to Lomé or Cotonou

[1] This was confirmed by value chain stakeholders during interviews. Furthermore, the Ghanaian hatcheries use European parent stock to produce their DOCs.

Overall, the recommendations in this study are aimed at encouraging professional direct sales by the Kumasi hatcheries to consumers in the end markets of Lomé and Cotonou, using one specialized vehicle for the entire journey. Essential to achieving this is the improvement of procedures at the Togo and Benin borders for DOCs, including awareness building for control agents and establishment of special processing procedures.

OVERVIEW OF FINDINGS AND RECOMMENDATIONS

Findings	Recommendations
Transit times, delays and use of inappropriate vehicles contribute to mortality and deterioration of layer chick health. • The lifetime effect of stressful transport on a DOC's health and productivity is estimated to be a 13% deterioration in value • Mortality over the corridor as a whole is 5%, but can be up to 100% if problems in transport are encountered: unreliability is a major concern	• Assistance for hatcheries to establish sales and distribution offices in regional end markets so that they can engage in direct sales with end buyers and organize end-to-end smooth transport from Kumasi • Partnerships with regional transport providers to offer end-to-end professional specialized transit services to DOC exporters
Hatcheries do not engage in end to end sales with buyers in Cotonou, trade is very disjointed and organized by various middlemen. Lack of organization of importers, and many small scale imports lead to low economies of scale which drive transport costs (and time) upward. • DOCs are in transit for up to 48 hours (12 hours recommended) and may change vehicle up to 6 times • 69% of direct transport costs (fees paid to transport service providers) are found to be driven by inefficient conditions • Unnecessary handling charges (1.29% of end market price) incurred as chicks change hands and vehicle multiple times	• Assistance/access to finance for regional hatcheries to procure specialized vehicles and logistics equipment, possibly on a collective basis • Partnership with Darko Farms to highlight example of best practice in transport and logistics to encourage others to upgrade • Organization of importers for coordinated purchasing directly from Kumasi hatcheries
Current border procedures and costs make legal cross border trade in DOCs impractical, especially from Ghana into Togo. Confusing, disorganized and lengthy processing observed. Harassment at borders and along roads leads to further costs and delays. • 100% of traders interviewed smuggled DOCs through informal border into Togo to avoid using main border • Informal costs (or bribes paid) along the corridor constitute 13% of transport costs and 5.5% of end market price	• Improvement of procedures at border for DOCs including awareness building for control agents and establishment of special processing procedures for DOCs • Advocacy to ECOWAS to clarify legal texts in relation to DOC border processing • Training for value chain actors on export requirements, documentation and border procedures
Biosecurity measures are insufficient, causing high risk of cross contamination and spread of diseases such as Avian Influenza. The disastrous impact of AI has already been witnessed by West Africa during	• Training on best practice transport biosecurity to be included in any workshops or seminars organized

the 2006 outbreak. • Biosecurity measures taken at hatcheries and distribution centers vary widely from moderately good to non-existent • Widespread use of passenger vehicles means in-transport biosecurity measures are not taken (e.g. disinfecting vehicle) and chicks are in constant contact with humans	• As above, use of specialized vehicles and facilitating smooth end-to-end transit in one vehicle

1. INTRODUCTION AND METHODOLOGY

1.1 BACKGROUND

The Expanded Agribusiness and Trade Promotion Project (USAID E-ATP) is a three year regional initiative funded by the United States Agency for International Development (USAID) launched in 2009. Building on the success of the USAID Agribusiness and Trade Promotion Project (USAID ATP), USAID E-ATP has focused on three additional value chains: millet/sorghum, poultry and rice.

USAID E-ATP aims to increase the value and volume of intra-regional agricultural trade in its value chain development and associated activities along the major commercial corridors linking Benin, Burkina Faso, Cote D'Ivoire, Ghana, Mali, Nigeria, Senegal and Togo. USAID E-ATP is designed to contribute to achieving the 6 percent annual agricultural growth target set under the Comprehensive Africa Agriculture Development Program (CAADP) of the African Union's New Partnership for Africa's Development (AU-NEPAD).

Inefficiencies in West Africa's transport and logistics systems are a recognized constraint to trade within the region. Such inefficiencies increase supply chain costs for traders directly (high transport prices, informal payments) and indirectly (time to market, product spoilage), resulting in unnecessarily high consumer prices for imported commodities, lower than necessary profits for exporters and less regional trade. Furthermore, these barriers limit the free movement of agricultural goods from production surplus areas to deficit areas and exacerbate food insecurity in the region.

TABLE 2 – GENERALLY ACCEPTED FACTORS THAT INCREASE TRANSPORT AND LOGISTICS COSTS IN WEST AFRICA

1. Limited and unbalanced trade flows	2. Haphazard application of regional inter-state transport and transit treaties
3. Excessive road checkpoints	4. High vehicle operating costs
5. Bureaucratic procedures at border posts	6. Informal payments
7. Inadequate road and logistics infrastructure	8. Overloading of trucks
9. Lack of competition in trucking services	10. Strong market regulation

As part of program Outcome 1, "Significantly reduced incidence of physical and policy related barriers to moving agricultural and related commodities regionally, with a special focus on facilitating the trade in staple foods from surplus to deficit areas", this poultry Transport and Logistics assessment (focusing on Day-old-chicks, DOCs) aims to understand how these factors interact with the overall operation of the poultry value chain. Through these studies, USAID E-ATP and its stakeholders will gain a better understanding of how

inefficiencies in the transport and logistics process relate to their overall costs (and competitiveness) and what can be done to address the most glaring inefficiencies to generate a list of highest priority interventions. This study will also look for business opportunities to facilitate the creation of new public-private partnerships for investment in poultry infrastructure and to improve the overall transport and logistics operations in West Africa.

The specific corridor of focus for the study is the **Kumasi-Accra-Lomé-Cotonou** corridor.

The poultry Transport and Logistics Assessment will diagnose transportation and logistics related problems along the corridors, and propose recommendations to enhance the performance of the logistics chain. These recommendations will be validated by the stakeholders. The study will also recommend a package of best practices.

1.1.1 DEFINITIONS AND ASSUMPTIONS

1.1.1.1 ARTICULATION OF RELEVANT COSTS

Each of the cost categories and cost line items identified will be divided into Observed Cost, Extra Cost and Optimized Cost, to the extent possible with the data available:

- Observed Cost – costs as observed in the field research, based on averages and most common responses from field interviews;
- Extra Cost – a back-of-the-envelope estimation of the amount of the Observed Cost that is considered unnecessary, unjustified, or too expensive based on a variety of factors to be explained in each instance. For example, bribes and administrative charges without receipts or for which no service is rendered are considered extra costs. In some instances, extra costs are calculated based on market observations or reference to external sources. These benchmarks are used as a proxy for what a more competitive transport sector may be able to achieve in terms of lower prices.
- Optimized Cost – in this study, this is defined as the Observed Cost minus the Extra Cost.

1.1.1.2 COST CATEGORIES

The following table lists the main categories of costs and example costs observed in the poultry value chain studied. These costs will be further discussed in Section 3 along with the associated costs observed in the field research.

TABLE 3- CATEGORIES AND TYPES OF COSTS OBSERVED

Cost category	Examples of costs observed
Hatchery Logistics All transport and logistics charges incurred at the hatchery post hatching	• Pre transport preparation • Cost of carton • Losses during pre transport preparation

Handling in Transit All charges for handling services rendered throughout the logistics process after leaving the hatchery	• After leaving hatchery, loading and unloading of boxes into various vehicles
Transport All charges for transport services from farm to end market	• Transport fees and charges • Losses during transport • Long term effect of transport stress on chick health
Administrative All charges for formal trade facilitation and mandatory control procedures, for which a receipt is normally provided	• Mandatory veterinary inspections • Veterinary documentation • Official customs fees • Customs documentation
Informal Explicit bribes paid, for which no receipt is provided	• Bribes to obtain documentation • Bribes paid at checkpoints • Bribes paid at borders

The categories capture the majority of the costs during the field research from hatching to the market of final destination. When possible, copies of actual receipts were collected for formal fees.

Along the corridor studied, the main market for DOCs is *layers*, i.e. females raised as egg producers. Very little trade in *broiler* DOCs was observed, with actors citing competition from extra-regional imports of processed broiler meat as the main reason for this. Trade in *cock (rooster)* DOCs is even rarer, as demand for rooster meat is low, only arising during the Christmas period. **This study focuses only on trade in *layer* DOCs. Any reference to "chick" or "DOC" in this report refers to *layer DOCs only*.**

The point of reference for all costs along the DOC logistics chain is the smallest unit of normal trade: a box of 50 DOCs. This is standard practice along the corridor, and at no point did the study team observe trade in individual DOCs. All prices and costs are shown in US dollars. Monetized losses are based on cumulative loss multiplied by end market value. Please see annex A for more detail.

Day-old-Chick ready for shipment in Kumasi

2. THE STORY OF A DAY OLD LAYER CHICK FROM HATCHING IN KUMASI TO ARRIVAL IN COTONOU

DOCs can survive without food or water for up to 72 hours after hatching by ingesting their yolk sac, which provides them with the nourishment and hydration they need for their first days of life. As a result, trade in DOCs is very popular in the poultry value chain because, as opposed to adult chickens, DOCs are small, light and require no food or water during transit.

2.1 GENERAL TRANSPORT CONSIDERATIONS FOR DOCS

2.1.1 TRAVEL CONDITIONS

DOC's welfare, growth, development and performance may be markedly influenced by the first episode of transportation between hatchery and rearing site. As such, optimizing conditions is vital to reducing mortality rates during and following transport, and for ensuring healthy adult birds. As mentioned, chicks can survive up to 72 hours without food or water post hatching, and travel time from hatching should be no longer than 48 hours, with some scientists advising even shorter travel times of **12 hours** for optimal conditions**.** Variance in the hatching time of chicks within a consignment confounds this as animals can vary in age when transport begins, higher volumes and more frequent shipments would help to reduce this problem

Unlike adult birds who are able to regulate body temperature metabolically, recently hatched chicks cannot fully self-regulate their body temperature. As a result they are sensitive to heat stress and must be protected from extremes of heat (and cold) during transport. Thermal stress may be the major source of poor welfare during the transportation of DOCs. The recommended temperature for chick transport is 24-26 ºC, with 63-70% relative humidity. When travelling at high temperatures, it also is critical to keep chicks well ventilated to allow for more effective thermoregulation and good supply of oxygen. Excessively high temperatures (40 ºC+) can cause death within a couple of hours.

2.1.2 EQUIPMENT AND HANDLING

In an optimized scenario DOCs are transported in trucks that have the capacity to be heated and/or cooled with highly advanced air-flow systems. Furthermore, the optimal space allowance for DOCs is 21-25 cm^2 each. The design of containers/boxes to transport chicks in is thus important, and serves a dual purpose: as a way of handling chicks and also maintaining the proper conditions (heat and ventilation).

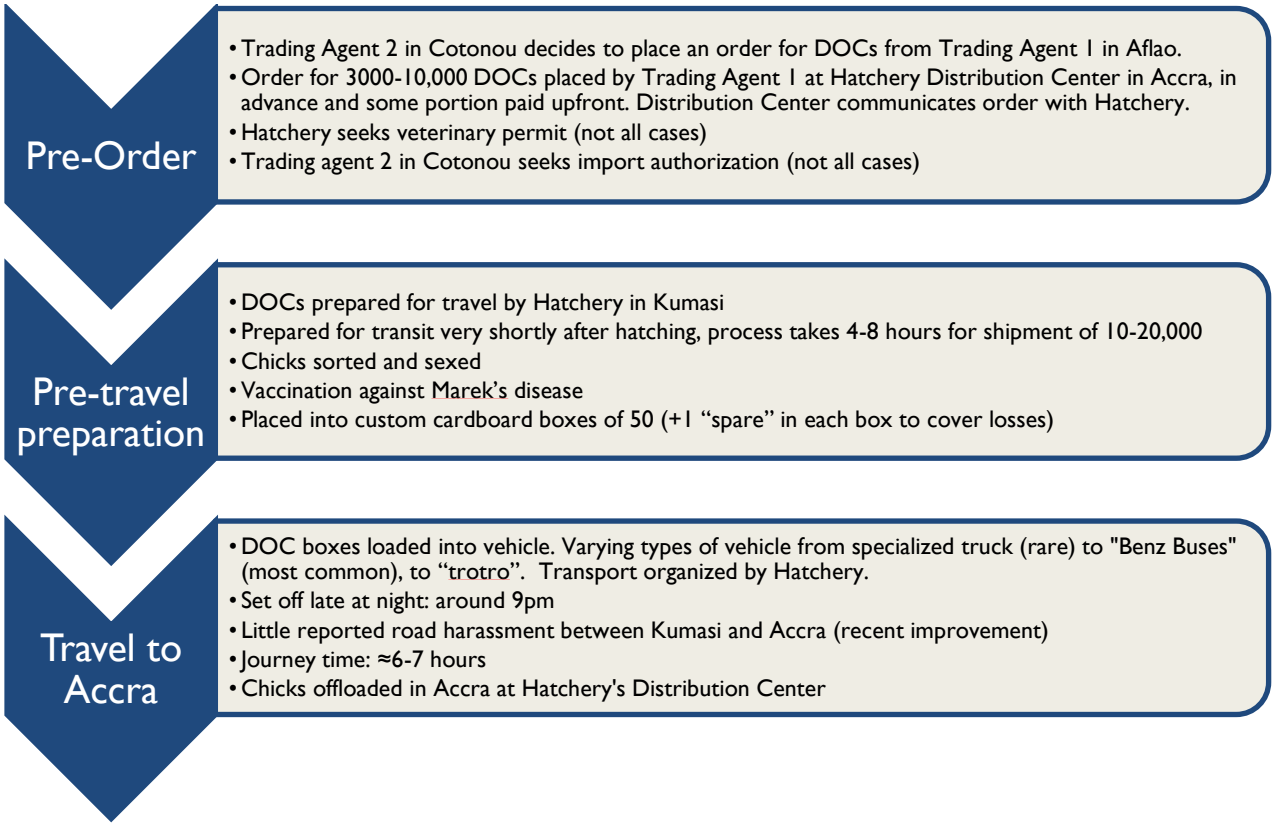
Packing of boxes into vehicles must be done carefully to allow for ventilation to flow between the boxes. Ideally the boxes are loaded onto wheeled racks, which allow a standard amount of room between each box. The boxes can be loaded onto the racks in the hatchery which are then smoothly wheeled into and secured in the vehicle, and are easily wheeled out unloaded at the point of delivery.

2.1.3 BIOSECURITY

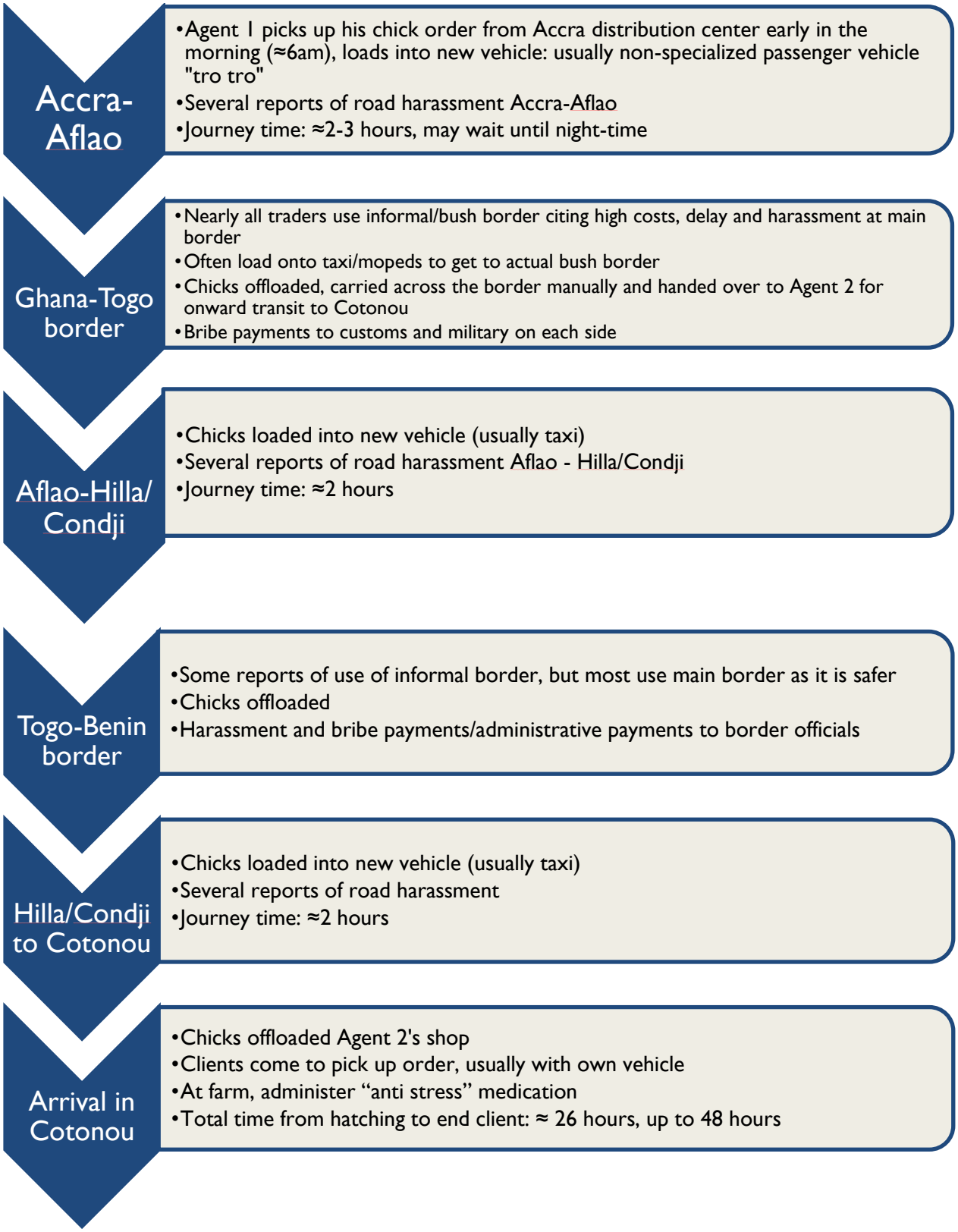
Biosecurity is an important concern in the transport of live animals, especially considering the threat of Avian Influenza, which in 2006/2007 decimated the West African poultry industry.[2] The high risks of infection during transit stem from contact with other chickens from other farms, feces, the air, dirty trucks, and human contact. In order to avoid these threats, proper biosanitary measures must be adhered to before and during transit, and trucks must be built in such a manner that they can be cleaned and disinfected quickly and efficiently.[3]

2.2 TRANSPORT OF DOCS ALONG THE KUMASI-COTONOU CORRIDOR

The transport of DOCs along the Kumasi-Cotonou corridor in most cases does not provide ideal conditions for chick health and to maintain biosecurity. The following flowchart provides an overview of the transport and logistics process on the corridor.



[2] The USAID E-ATP project has done significant work in improving biosecurity standards for poultry in West Africa.
[3] World Society for the Protection of Animals


Accra-Aflao
•Agent 1 picks up his chick order from Accra distribution center early in the morning (≈6am), loads into new vehicle: usually non-specialized passenger vehicle "tro tro"
•Several reports of road harassment Accra-Aflao
•Journey time: ≈2-3 hours, may wait until night-time
Ghana-Togo border
•Nearly all traders use informal/bush border citing high costs, delay and harassment at main border
•Often load onto taxi/mopeds to get to actual bush border
•Chicks offloaded, carried across the border manually and handed over to Agent 2 for onward transit to Cotonou
•Bribe payments to customs and military on each side
Aflao-Hilla/ Condji
•Chicks loaded into new vehicle (usually taxi)
•Several reports of road harassment Aflao - Hilla/Condji
•Journey time: ≈2 hours
Togo-Benin border
•Some reports of use of informal border, but most use main border as it is safer
•Chicks offloaded
•Harassment and bribe payments/administrative payments to border officials
Hilla/Condji to Cotonou
•Chicks loaded into new vehicle (usually taxi)
•Several reports of road harassment
•Journey time: ≈2 hours
Arrival in Cotonou
•Chicks offloaded Agent 2's shop
•Clients come to pick up order, usually with own vehicle
•At farm, administer “anti stress” medication
•Total time from hatching to end client: ≈ 26 hours, up to 48 hours

2.2.1 KEY POINTS

From the flowchart, the following points are important to note. The *quantitative costs* associated with these problems will be discussed in the following chapter.

- **Long and stressful transit has long term effect on DOC's lifelong health, and long term productivity as a layer**
- **High transport costs, quality concerns (linked to transport stress) and unreliability reduce competitiveness of Ghanaian chicks vis-à-vis European imports (using air transit) in end markets.**
- **Transit times and delays contribute to mortality and deterioration of chick health in transit:**
    - Optimal travel time is 12 hours, DOCs along this corridor are in transit for up to 48. Given the distance, a normal drive directly from Kumasi to Cotonou without stopping should take no more than 10 hours.
    - Chicks change vehicles up to 6 times on 606 km journey from Kumasi to end buyer in Cotonou, mainly caused by control procedures, harassment and unwillingness of small-scale transporters to go the distance.
    - Intermediaries/middlemen organize the majority of cross border trade observed and chicks may change hands several times.
    - Hatcheries rarely undertake export themselves and hardly ever organize end-to-end transit.
    - Current border procedures make legal cross border trade in DOCs difficult, especially from Ghana into Togo. Confusing, disorganized and lengthy processing observed. Delays caused by road and border harassment cited as key cause of mortality.
    - *Nearly all DOCs are smuggled* through informal bush border into Togo (which is impassable by vehicles), and some also use informal border crossing into Benin (across river on a pirogue).
- **Inappropriate vehicles and handling practices accelerate rate of deterioration of DOC health**
    - Widespread use of inappropriate vehicles such as taxis and passenger buses (even mopeds): temperature control and packing arrangement/stability poor
    - Poor packing practices (e.g. without room for ventilation), lack of equipment for proper packing (e.g. trolleys/racks) and lack of awareness of actors on proper handling
- **Low economies of scale drive transport costs (and time) upward**
    - Lack of organization of importers, many small scale imports
    - Numerous middlemen (agents) with very few instances of end-to-end delivery services by hatcheries

- **Biosecurity measures are insufficient, high risk of cross contamination and spread of disease**
    - Biosecurity measures taken at hatcheries and distribution centers vary widely from moderately good to non-existent
    - Widespread use of passenger vehicles means in-transport biosecurity measures are not taken (eg. disinfecting vehicle) and in constant contact with humans (nb. boxes end up full of feces)

3. TRANSPORT AND LOGISTICS COSTS ALONG THE KUMASI-ACRA-LOME-COTONOU CORRIDOR

In this section, observed transport and logistics costs for DOCs along the Kumasi-Cotonou corridor are detailed and subsequently analyzed. As explained in section 1 above, the transport and logistics costs have been grouped into 5 categories for the purpose of analysis.

3.1 TRANSPORT COSTS OBSERVED

3.1.1 HATCHERY LOGISTICS

Hatchery logistics costs observed include:

Cost category	Examples of costs observed
Hatchery Logistics All transport and logistics charges incurred at the hatchery post hatching	• Pre transport preparation • Cost of carton • Losses during pre transport preparation

3.1.1.1 PRE-TRANSPORT PREPARATION, LABOR

- Very shortly after hatching, the chicks are prepared for outbound transit. This logistics process takes place at the hatchery and requires a total of approximately 4-8 hours, with 5-10 semi-skilled workers for an outbound shipment of approximately 10,000 DOCs. In this category, the only costs are **labor costs**.

The steps in the pre transport logistics process are as follows:

1. Counting and sorting into broilers, cocks and layers. Discarding any sick or deformed chicks.
2. Vaccination against Marek's Disease[4]
3. Packing into cartons
4. Movement to distribution area
5. Loading into vehicle for outbound transit

[4] Only applies to **layer** DOCs. Marek's is a highly contagious fatal disease prevalent in poultry.

In general each box of 50 DOCs will contain 51, the extra 2% is added by the hatchery to cover any losses during transport that may occur

DOCs ready for outbound shipment in Kumasi

DOCs prepared for transport in Kumasi

3.1.1.2 LOSSES DURING PRE TRAVEL PREPARATION

- During pre-transport preparation, a small number of the DOCs die, mainly during the vaccination process.

Location incurred	Item description	% loss	USD/Box of 50 DOCs	% Hatchery Price	% Final Sales price	Borne by
Kumasi	Losses during pre-transport preparation	0.30%	0.27	0.61%	0.30%	Hatchery

3.1.1.3 PURCHASE OF CARTON

- In almost 100% of cases, DOCs are transported in specially designed, standard, disposable (single use) cardboard boxes. These boxes are designed to allow enough space and ventilation for the DOCs, as well as be stackable in such a way that there is ventilation space between each box. Actors along the logistics chain had few complaints about the quality of these boxes, although, mishandling and inappropriate/over stacking can lead to the boxes collapsing and crushing the DOCs inside.

- 

Cartons ready for shipment in Kumasi

- There was no observed evidence of overstuffing of the cartons. With approximately 50 DOCs per box, this conforms to international recommendations.
- Hatcheries did complain, however, that occasionally they were not able to find immediate supply of these boxes. The study team met with a major box manufacturer (Ghana Cartons Ltd) in Accra, who stated that as long as orders are put in with a 2 week lead time, there are no problems. Better planning on the part of the hatcheries could eliminate this issue.

Location incurred	Item description	USD/Box of 50 DOCs	% Hatchery Price	% Final Sales price	Borne by
Kumasi	Carton purchase	0.81	1.82%	0.90%	Hatchery

3.1.1.4 A NOTE ON HATCHERY BIOSECURITY PRACTICES OBSERVED

Biosecurity measures observed at hatcheries vary widely. In the best examples the following best practices were observed (see pictures and text on following pages):

Clockwise from top left: Washing feet before entering farm in Lomé, Car passing through disinfectant in Kumasi, Visitors wearing special overalls and shoes in Kumasi, Washing feet before leaving hatchery in Kumasi.

- Hatchery separate from any other poultry farming or sales/distribution activities to avoid cross contamination and minimize public proximity to the hatchery
- To gain entry into the hatchery area, visitors, workers must wear special protective shoes and clothing.
- People must pass their feet and vehicles must pass their tires through disinfectant pools.
- Areas within hatchery (e.g. fumigation rooms, incubation areas, DOC preparation areas) well demarcated and separated and the whole facility cleaned daily.
- Eggs are fumigated before incubation
- Visitors who have previously visited another farm in the same day are not allowed access.

However, these practices were only observed at a select few hatcheries and in many cases, biosecurity measures were non-existent.[5]

3.1.2 HANDLING DURING TRANSIT

Handling costs observed include:

Cost category	Examples of costs observed
Handling in Transit All charges for handling services rendered throughout the logistics process after leaving the hatchery	• Loading and unloading of boxes into vehicles

Loading boxes into vehicle, Aflao

"Benz Bus"

3.1.2.1 HANDLING IN TRANSIT COSTS

DOCs are offloaded and loaded into new vehicles several times on their journey from hatchery to end market.

[5] USAID E-ATP has a special emphasis on efforts to improve biosecurity and combat avian influenza

These costs are reflected in payments made to opportunistic informal operators in the various localities for unloading, carrying and re-loading the boxes. As the boxes are fairly small and light, this is not strenuous work. These handlers were often reported to be adolescents.

Location incurred	Item description	USD/Box of 50 DOCs	% Hatchery Price	% Final Sales price	Borne by
Accra	Handling in Accra	0.84	1.88%	0.93%	Agent
Aflao	Handling in Aflao	0.23	0.51%	0.25%	Agent 1
Hilla Condji	Handling at Hilla-Condji	0.09	0.21%	0.10%	Agent 2
Total		**1.16**	**2.60%**	**1.29%**	

Initial handling to load DOCs onto vehicles at the hatchery is shown under "Hatchery Logistics". Final handling in Cotonou is performed by the importing agent and does not attract incremental cost.

3.1.3 TRANSPORT

Transport costs observed include:

Cost category	Examples of costs observed
Transport All charges and costs for transport services from farm to end market	• Charges for transport services • Losses during transport

Loading boxes into passenger bus "tro tro"

3.1.3.1 TRANSPORT SERVICES

The usual modes of transport for each segment of the journey are as follows:

1. Kumasi to Accra: converted passenger bus, or "Benz Bus", hired by the hatchery. The full vehicle hired even if not filled.

   Only one hatchery owns a specialized DOC transport vehicle, and one hatchery has a semi-specialized ventilated truck. As these are exceptions to the norm, we have assumed the "Benz Bus" as the mode of transport for the purpose of analysis on this segment.

2. Accra to Aflao: passenger bus or "Tro tro" hired by Agent I. The agent pays by how many seats/places in the bus are required. Often passengers transported at the same time.

3. Aflao to informal border: saloon size taxi or moped. Hired by Agent 1. If by taxi pay by how many seats/places in the taxi required. Often passengers are

transported at the same time. If by moped, approximately 5 boxes per moped can be carried.

4. Aflao border to Hilla Condji: saloon car size taxi, hired by Agent 2, as above.
5. Hilla Condji to Cotonou: saloon size taxi, hired by Agent 2, as above.

Location incurred	Item description	USD/Box of 50 DOCs	% Hatchery Price	% Final Sales price	Borne by
Kumasi-Accra	Transport to Accra	1.08	2.42%	1.20%	Hatchery /Agent 1
Accra-Aflao	Transport Accra-Aflao	1.14	2.54%	1.26%	Agent 1
Aflao-informal border	Transport Aflao-Border	4.30	9.62%	4.77%	Agent 1
Aflao-Hilla Condji	Transport Aflao-Hilla Condji	1.03	2.30%	1.14%	Agent 2
Hilla Condji-Cotonou	Transport Hilla-Condji to Cotonou	0.89	2.00%	0.99%	Agent 2
Total		**8.45**	**18.88%**	**9.37%**	

3.1.3.2 LOSSES DURING TRANSPORT

Physical product loss, i.e. DOC mortality[6] during transport, is the most significant concern of those engaging in DOC transport along this corridor. DOCs are extremely sensitive to thermal stress and require good ventilation and air supply during transit. Moreover, speed of delivery is also important with some experts recommending[7] a total journey time of no more than 12 hours. Quality of vehicle is also a key factor, for those hatcheries using specialized vehicles, mortality rates were observed to be negligible.

Reported rates of mortality vary significantly. Over single journeys[8] with specialized vehicles, mortality rates are negligible. On difficult journeys using non-specialized vehicles which do not allow for optimal transit conditions, mortality rates can be 50-100%. If the weather is very hot and the boxes are improperly stacked within the vehicle without room for ventilation (for instance on the seats of a taxi) and the journey is significantly delayed, such rates are common.

Proprietors of in-transit DOCs generally make concerted efforts to reduce mortality, which include:

- Transport generally only takes place at night or in the early mornings to reduce temperature concerns.
- The windows of the vehicle will be opened to allow cross ventilation, or if in a

[6] Weight loss of DOCs during transport was not observed to be a concern amongst value chain actors interviewed
[7] See desk review
[8] i.e. with no stops or transfers

light truck, the tarpaulin rolled up on the sides to allow air to pass through while the vehicle is in motion.

- If the vehicle is delayed or stopped for any reason, the proprietor will unload the DOC boxes so they can "breathe".
- Carefully stacking boxes within vehicles, and often placing upon pallets to increase ventilation.
- Minimizing any delays such as by choosing the shortest routes, travelling when traffic is minimal, paying bribes to control officials, using informal borders and performing pre-journey maintenance checks on vehicles to avoid breakdowns.

By the time the chicks reach the end markets in Cotonou, average mortality rates for "normal" journeys are 4.5%[9]. It is important to note, however, that this figure can occasionally be drastically increased (50-100%) if the journey does not go smoothly for any reason, or if the trader does not adhere to the above practices. This unreliability is a major concern for importers in end markets.[10]

Because a certain level of mortality is expected due to the normal transit conditions, as a general rule hatcheries place an extra "spare" chick in each box of 50 DOCs to cover any losses, i.e. to cover a 2% loss. As a result, up to 2% of this 4.5% loss is borne by the hatchery and the remainder borne by the trading agent responsible for transport.

[9] This is probable an underestimate as it does not take into account the large losses which occur in limited cases. However, interviewees were unable to determine the average frequency of which these very high losses occurred so we were unable to incorporate this in the calculation

[10] Animal welfare is also a major consideration, but addressing this concern is beyond the scope of this study

Clockwise from top left: Boxes in passenger vehicle in Aflao, Close up of previous, Boxes loaded into passenger vehicle in Kumasi, Close up of previous

Location incurred	Item description	% loss	USD/Box of 50 DOCs	% Hatchery Price	% Final Sales price	Borne by
Kumasi-Aflao	Losses Kumasi-Aflao	2.00%	1.81	4.04%	2.00%	Hatchery/Agent
Aflao-Cotonou	Losses Aflao-Cotonou	2.53%	2.28	5.10%	2.53%	Agent 2
Total			**4.09**	**9.14%**	**4.54%**	

3.1.3.3 EFFECT OF TRANSPORT STRESS ON LONG TERM HEALTH AND PRODUCTIVITY OF DOC

As previously noted, long transit time and stressful transit caused by lack of specialized trucks, heat, multiple handling and vehicle changes, etc. have long term effects on a DOC's health. Buyers in end markets cited the following issues:

- DOC mortality after arrival on farm
- Shorter life spans
- Lower egg productivity
- Smaller eggs

(Both pictures) On arrival after a long and stressful journey

As a rule, on arrival at the farm, farmers will administer the DOCs with a variety of "anti-stress" medications such glucose water, vitamins, antibiotics and other special products to "revive" the chicks after transport and also to help them to develop and cope with further stresses such as additional vaccinations. This "anti-stress" medication cannot completely mitigate the effects of the difficult journey.[11]

During interviews with both farmers and veterinarians, the study team was unable to assign a figure to the long term cost of this effect, although all interviewees agreed it was important and should be taken into account.

Instead, a proxy value has been calculated based on the cost of purchasing DOCs imported from Europe in Cotonou. Many buyers in Cotonou prefer to buy DOCs from Europe as they are in better condition when they arrive. The study team confirmed with interviewees that there was no inherent difference between Ghanaian DOCs and those from Europe, *other* than the transport conditions and speed with which they arrive in Cotonou. In fact, the hatcheries in Kumasi utilize European parent stock to produce their DOCs. Despite originating much further away, European DOCs travel by air, in optimal temperature/packing conditions and much faster than those from Kumasi.

Therefore, the difference in price between European DOCs and Ghanaian DOCs, i.e. the *premium* buyers are willing to pay for a DOC arriving in optimal transport conditions, should be a good proxy for the discount applied by buyers to Ghanaian DOCs caused by the deterioration in value that can be attributed to the long term effects of stressful transport. This premium is equal to 12.9%, so we can assume that the long term effect of the stress during transport from Kumasi-Cotonou is approximately equivalent to this value.

Location incurred	Item description	% loss	USD/Box of 50 DOCs	% Hatchery Price	% Final Sales price	Borne by
Kumasi-Cotonou	Lifetime effect of stressful transport	12.9%	11.63	26.00%	12.90%	End buyer

For the purpose of analysis, the lifetime effect of stressful transport has been included within the "transport" category.

3.1.3.4 A NOTE ON BIOSECURITY DURING TRANSPORT

At the beginning of the corridor, hatcheries did report ensuring that the vehicle they hired (typically a "Benz Bus") was properly disinfected during transport. Those hatcheries with a specialized or semi specialized vehicle also ensured they were disinfected between uses.

Beyond this first stage of transport, no in-transport biosecurity measures were observed by the study team. With transport typically being undertaken in passenger vehicles, frequently alongside human passengers, it is very difficult to cleanse and disinfect the vehicles as well as avoid contact with humans. By the time the boxes reach Cotonou, they are full of feces, and may contain dead birds.

[11] The cost of "Anti Stress" medication has not been included in the analysis as it is given to chicks even if they are properly transported (e.g. those coming from Europe), it is given for reasons other than transport, such as vaccinations, and does not mitigate the effects of stressful transport completely anyway.

The problem of in transport biosecurity is further magnified because so many different vehicles are used in the transport of each DOC along the corridor. The potential consequences and opportunities for spread of disease resulting from these practices are frightening to consider.

3.1.4 ADMINISTRATIVE

Administrative costs observed include:

Cost category	Examples of costs observed
Administrative All charges for formal trade facilitation and mandatory control procedures, for which a receipt is normally provided	• Mandatory veterinary inspections • Veterinary documentation • Official customs fees • Customs documentation

3.1.4.1 PRE-TRANSPORT DOCUMENTATION

The hatchery in Kumasi is required to obtain veterinary certifications and sell the DOCs along with certain documents:

1. Veterinary movement permit[12]
2. Veterinary health certificate for export[13]
3. Customs export form[14]
4. Transport waybill
5. Invoice (not legally required)

For all of the hatcheries we spoke to in Kumasi, they were compliant and sold DOCs with the requisite documentation. However, traders/agents reported that often this was not the case and they purchased DOCs from less professional hatcheries without any accompanying documentation. Not having the legal documentation was reported to lead to increased bribe payments at checkpoints and at borders, and further incentivizes use of the informal bush borders.

Veterinary and customs documentation attracts a small cost to obtain, whereas waybill and invoice are prepared by the hatchery so they do not attract a direct cost.

Location incurred	Item description	USD/Box of 50 DOCs	% Hatchery Price	% Final Sales price	Borne by
Kumasi	Veterinary movement permit	0.03	0.07%	0.04%	Hatchery
Kumasi	Veterinary health export document	0.12	0.26%	0.13%	Hatchery

[12] See annex D
[13] See annex D
[14] See annex D

Kumasi	Customs export document	0.50	1.12%	0.55%	Hatchery
Total		**0.65**	**1.45%**	**0.72%**	

3.1.4.2 VETERINARY INSPECTION AT AFLAO

Traders/agents reported paying for official veterinary inspections before crossing the border at Aflao. Whether or not a thorough physical inspection takes place is doubtful in most circumstances, as agents said the DOC boxes remained inside the vehicle during the inspection. A receipt is given for this service.

Location incurred	Item description	USD/Box of 50 DOCs	% Hatchery Price	% Final Sales price	Borne by
Aflao	Veterinary inspection	3.33	7.45%	3.70%	Agent 1

3.1.4.3 IMPORT PERMIT TO BENIN

Because at Hilla Condji most traders/agents use the formal border, before an agent can import Ghanaian DOCs into Benin, s/he must obtain a veterinary import authorization documentation from the relevant authority in Cotonou. This document takes approximately 3 days to procure and is associated with a fee of 5 FCFA per DOC.

Location incurred	Item description	USD/Box of 50 DOCs	% Hatchery Price	% Final Sales price	Borne by
Cotonou	Veterinary import permit: Benin	0.58	1.30%	0.65%	Agent 2

In general, traders/agents do not obtain proper import/transit documentation when moving into Togo, because nearly all use the informal bush border and bribe their way through any control procedures. Therefore, this documentation was not observed in use during this study.

3.1.5 INFORMAL

Informal costs observed include:

Cost category	Examples of costs observed
Informal Explicit bribes paid, for which no receipt is provided	• Bribes to obtain documentation • Bribes paid at road checkpoints • Bribes paid at borders

3.1.5.1 BRIBE TO OBTAIN DOCUMENTATION

Hatcheries in Kumasi reported having to pay a bribe to customs to obtain export documentation.

Location incurred	Item description	USD/Box of 50 DOCs	% Hatchery Price	% Final Sales price	Borne by
Kumasi	Customs document bribe	0.83	1.86%	0.92%	Hatchery

3.1.5.2 BRIBES PAID AT ROAD CHECKPOINTS

Informal costs are extracted by customs, police, gendarmes and veterinarians along the road corridors on each segment of the journey as follows:

1. Kumasi-Accra: only a few reports of road harassment on this segment were heard (and the cost shown has been adjusted accordingly). Many interviewees stated that recent awareness campaigns initiated by the national poultry farmers association have led to elimination of road harassment for DOCs on this corridor segment. As control officials are now aware of the fragility of the live cargo, they do not seek to cause delays to the transit.
2. Accra-Aflao: most traders/agents reported road harassment on this segment. 2-10 stops by customs were reported and the severity of bribes depends on whether or not they are carrying the appropriate documentation.
3. Aflao-Hilla Condji: all traders/agents reported road harassment on this segment, with 2 checkpoints each extracting 5,000-20,000 FCFA depending on the size of the shipment.
4. Hilla Condji-Cotonou: all traders/agents reported road harassment on this segment, with 3 customs checkpoints extracting approximately 5,000-10,000 FCFA each, and 1-2 veterinary checkpoints extracting 2,000-5,000 FCFA each.

Location incurred	Item description	USD/Box of 50 DOCs	% Hatchery Price	% Final Sales price	Borne by
Kumasi-Accra	Road harassment Kumasi-Accra	0.02	0.05%	0.02%	Hatchery /Agent 2
Accra-Aflao	Road harassment Accra-Aflao	0.17	0.38%	0.19%	Agent 1
Aflao-Hilla Condji	Road harassment Aflao-Hilla Condji	0.59	1.32%	0.65%	Agent 2
Hilla Condji-Cotonou	Road harassment Hilla Condji to Cotonou	0.41	0.92%	0.46%	Agent 2
Total		**1.19**	**2.67%**	**1.32%**	

3.1.5.3 BRIBES PAID AT BORDERS

Bribes paid at borders to customs, veterinary, police and military personal were reported by every interviewee engaging in cross border trade. The bribes paid at each border are as follows:

- **Ghana-Togo:** Nearly all traders/agents reported using the informal bush border to enter Togo with their DOCs. At this border customs officials are stationed on both sides and military personnel are stationed on the Togo side and all are reported to take bribes, normally on a per box (of 50 DOC) basis.

Informal border at Aflao

Location incurred	Item description	USD/Box of 50 DOCs	% Hatchery Price	% Final Sales price	Borne by
Aflao	Ghana customs bribe	0.48	1.07%	0.53%	Agent 1
Aflao	Togo customs/military bribe	1.05	2.35%	1.16%	Agent 1
Total		**1.53**	**3.42%**	**1.69%**	

- **Togo-Benin:** Most traders use the formal border and are confronted with customs, veterinarians and police on both sides, paying bribes to each agency.

Location incurred	Item description	USD/Box of 50 DOCs	% Hatchery Price	% Final Sales price	Borne by
Hilla Condji	Togo customs	0.38	0.85%	0.42%	Agent 2
Hilla Condji	Togo police	0.22	0.50%	0.25%	Agent 2
Hilla Condji	Togo veterinarian	0.12	0.26%	0.13%	Agent 2
Hilla Condji	Benin customs	0.48	1.07%	0.53%	Agent 2
Hilla Condji	Benin police	0.09	0.20%	0.10%	Agent 2
Hilla Condji	Benin veterinarian	0.05	0.11%	0.05%	Agent 2
Total		**1.33**	**2.98%**	**1.48%**	

3.1.5.4 A NOTE ON MISAPPLIED TRADE FACILITATION COSTS NOT OBSERVED AND BORDER CROSSING EXPERIENCE

It is important to note that as a result of the use of the informal border and bribes paid at Aflao and the bribes paid to enter Benin, traders avoid many misapplied trade facilitation fees at these border crossings, which have not been included in this analysis. In fact, bribes paid at borders are an avoidance mechanism driven by the misapplication of certain fees by border officials. The misapplied fees reported[15], but not paid, by traders at the main borders are as follows:

- **Ghana/Togo:** Import duty and taxes levied by customs on day-old-chicks (originating in Kumasi, Ghana) when entering Togo at the main Aflao border of:
  - 18% x (Value of cargo + "droit de douane" of 8-15% of value + Taxe statistique of 3% of value +Benefice industrie et commercial of 5% of value of product)= total of **22% of the value of the product**
  - "Travail extra-legal" (10,000 FCFA per shipment)
  - "Redevance informatique douane" (5,000 FCFA shipment)
  - Requirement by customs of a Certificate. of Origin
  - Requirement for a Togolese veterinary certificate (unknown cost)
- **Togo/Benin:** "droit de douane" levied by customs on day-old-chicks (originating in Ghana, having transited Togo) entering Benin of **17.5% of the value of the product**

However, *trade in DOCs in ECOWAS should be duty free*, and many of the other fees and levies reported by actors during this study (such as Travail extra-legal) are widely considered to be unjustified.[16,17]

Furthermore, the study team observed confusion at each border over the correct procedures for DOCs:

- **Ghana/Togo:** On the Ghana side, the study team spoke with 2 different customs agents, the ministry for food and agriculture and the veterinarians, none of whom were clear on the correct procedure. On the Togo side, things were a little clearer, with customs corroborating the above taxes and the veterinarian confirming the need for an additional health certificate on entering Togo.

[15] As traders did not usually pay these fees so did not know, and border officials were either unaware, unavailable or unwilling to talk about the official taxes on DOCs, this may not be a comprehensive list of the exact taxes extracted.

[16] The UEMOA VAT directive (No. 02/2009/CM/UEMOA) specifies that countries may apply VAT on agricultural products and glaringly omits live birds from the list of products specifically exempted from VAT. The "droit de douane" could be an erroneous reference to VAT.

[17] USAID E- ATP has already conducted significant work in the area of improving border procedures for poultry:
In mid-2010, E-ATP completed analysis of the various fees and documentation related to the movement of poultry products across borders between ECOWAS countries. E-ATP determined that lack of knowledge of the regional rules for free trade--on the part of traders, transporters and border officials--was a main reason for the continued requirement of unnecessary documentation and other unjustified fees by border officials. In large part due to the findings of the "gap analyses" conducted by ATP/E-ATP and WATH, the ECOWAS Commission is now in the midst of launching a review of the ETLS to address the lack of knowledge of the regional trading rules.
In late 2010, the regional poultry value chain association, UOFA, which has benefited from close interaction with E-ATP, sent an initial advocacy letter to the ECOWAS Commission, a milestone in achieving E-ATP's goal of strengthening the ability of regional representative organizations to make their voice heard.
USAID E-ATP accompanied representatives in a direct advocacy mission to the ECOWAS Commission in March 2011. The regional poultry sector representatives presented an advocacy letter to the ECOWAS Presidency, including demands that ECOWAS and the national administrations remove the unfair fees and unnecessary documentation at border crossings identified by USAID E-ATP.

The border is chaotically organized with a pervasive sense of confusion. For a DOC trader trying their best to get the fragile product through the border as quickly as possible, it is easy to understand why they would opt for the simplicity (and lower cost) of the informal border.

- **Togo/Benin:** This border is less busy and seems to be better organized. Strikingly, however, on both occasions we visited the border, no official customs agents or veterinarians were present on the Benin side. The casual border laborers at the office stated that they normally did not show up until the midafternoon. While the research team did not investigate the reasons behind this, it indicates the lack of professionalism and proper process at this border.

3.2 TRANSPORT COSTS ANALYZED

3.2.1 SUMMARY OF COST DRIVERS

The transport and logistics costs observed along the Kumasi-Cotonou corridor have been described in detail above, the following table summarizes these costs. For informational purposes the price levels observed at leach locality have been included in this table, but do not necessarily mean that the box of DOCs has been bought and sold/changed hands at each point.

Location	Item description	%	USD/box of 50 DOCs	% Hatchery price	% Sales Price	Borne by
Kumasi	Veterinary movement permit		0.03	0.07%	0.04%	Hatchery
Kumasi	Veterinary health export document		0.12	0.26%	0.13%	Hatchery
Kumasi	Customs export document		0.50	1.12%	0.55%	Hatchery
Kumasi	Customs document bribe		0.83	1.86%	0.92%	Hatchery
Kumasi	Pre-transport preparation, labor		0.25	0.57%	0.28%	Hatchery
Kumasi	Losses during pre transport preparation	0.30%	0.27	0.61%	0.30%	Hatchery
Kumasi	Carton purchase		0.81	1.82%	0.90%	Hatchery

Kumasi	Sales price in Kumasi		44.72			
Kumasi-Accra	Transport to Accra		1.08	2.42%	1.20%	Hatchery
Kumasi-Accra	Road harassment Kumasi-Accra		0.02	0.05%	0.02%	Hatchery /Agent 2
Accra	Handling in Accra		0.84	1.88%	0.93%	Agent 1
Accra	Sales Price in Accra		58.53			
Accra-Aflao	Transport Accra-Aflao		1.14	2.54%	1.26%	Agent 1
Accra-Aflao	Road harassment Accra-Aflao		0.17	0.38%	0.19%	Agent 1
Aflao-informal border	Transport Aflao-Border		4.30	9.62%	4.77%	Agent 1
Aflao	Handling in Aflao		0.23	0.51%	0.25%	Agent 1
Aflao	Veterinary inspection		3.33	7.45%	3.70%	Agent 1
Alfao	Harassment at Ghana-Togo informal border		1.53	3.42%	1.69%	Agent 1
Kumasi-Aflao	Losses Kumasi-Aflao	2.00%	1.81	4.04%	2.00%	Hatchery/Agent
	Sales Price in Aflao		67.05			
Aflao-Hilla Condji	Transport Aflao-Hilla Condji		1.03	2.30%	1.14%	Agent 2
Aflao-Hilla Condji	Road harassment Aflao-Hilla Condji		0.59	1.32%	0.65%	Agent 2
Hilla Condji	Handling at Hilla-Condji		0.09	0.21%	0.10%	Agent 2
Hilla Condji	Harassment at Togo-Benin border		1.33	2.98%	1.48%	Agent 2
Hilla Condji-Cotonou	Transport Hilla-Condji to Cotonou		0.89	2.00%	0.99%	Agent 2

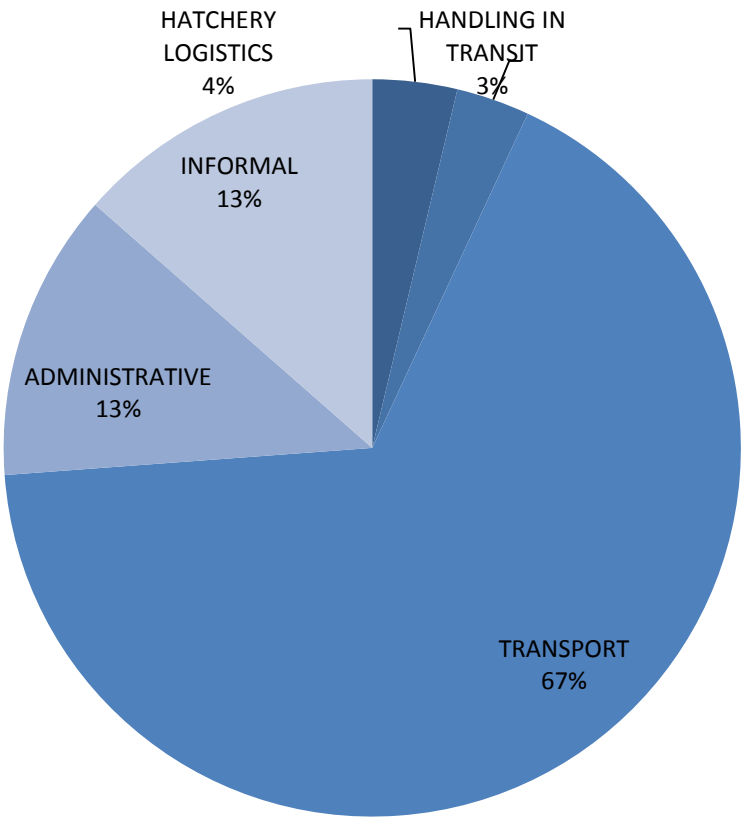
Hilla Condji-Cotonou	Road harassment Hilla Condji to Cotonou		0.41	0.92%	0.46%	Agent 2
Cotonou	Veterinary import permit: Benin		0.58	1.30%	0.65%	Agent 2
Aflao-Cotonou	Losses Aflao-Cotonou	2.53%	2.28	5.10%	2.53%	Agent 2
	Sales price in Cotonou		90.12			
Kumasi-Cotonou	Lifetime effect of stressful transport	12.9%	11.63	26.00%	12.90%	End buyer

The following table presents these costs summarized by cost type:

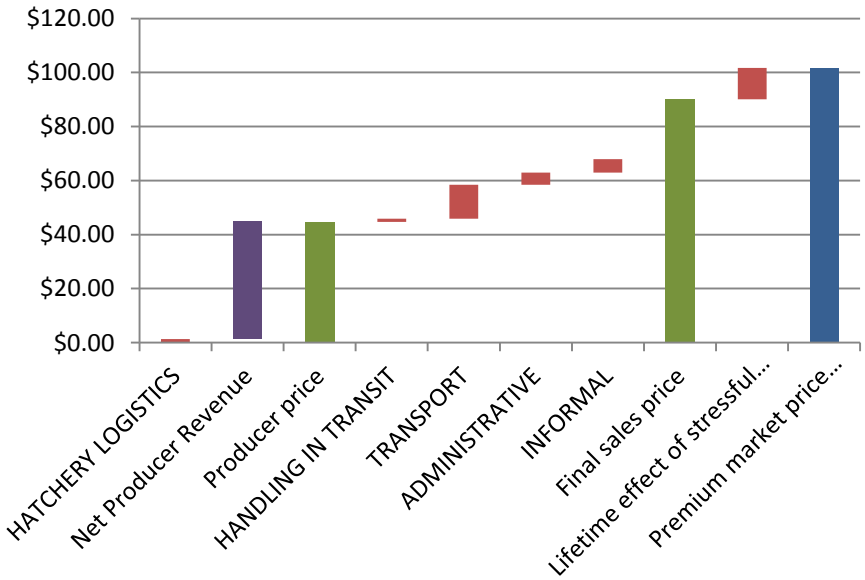
	USD/box of 50 DOCs	% Hatchery price	% Final Sales Price
HATCHERY LOGISTICS	1.34	**3.00%**	**1.49%**
HANDLING IN TRANSIT	1.16	**2.60%**	**1.29%**
TRANSPORT	24.16	**54.02%**	**26.81%**
ADMINISTRATIVE	4.56	**10.21%**	**5.07%**
INFORMAL	4.89	**10.93%**	**5.42%**
Total transport and logistics costs	**36.12**	**80.76%**	**40.08%**

The total transport and logistics costs account for $ 36.12 per box of 50 DOCs travelling from Kumasi to Cotonou, which equates to 80.76% of farm gate price and 40.08% of final end market price.

As can be seen from the pie chart and graph below, the most important driver of transport and logistics costs is transport costs, which represent 67% of the total costs (and includes the lifetime effect of stressful transport).



The following step chart shows how the different components of transport and logistics costs (shown in red) relate to overall prices. The blue bar indicates the premium market prices paid for the European DOCs, which differ from Ghanaian DOCs in that they are transported in optimal conditions. The difference between these two prices is the discount applied to the Ghanaian DOCs resulting from the effect of stressful transport.



Please note that net producer revenue does not take into account any other costs of production.

3.2.2 EXTRA COST ANALYSIS

This section analyzes each observed cost in terms of optimized and extra costs.

3.2.2.1 HATCHERY LOGISTICS

The following table summarizes the extra costs identified in the Hatchery Logistics category:

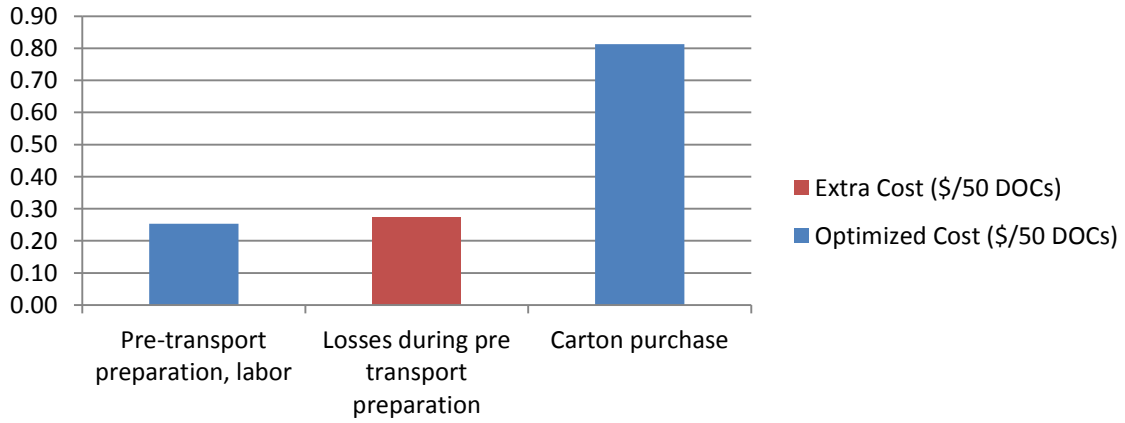
HATCHERY LOGISTICS	Observed %	Observed Cost ($/50 DOCs)	Optimized Cost ($/50 DOCs)	Extra Cost ($/50 DOCs)
Pre-transport preparation, labor		0.25	0.25	0.00
Losses during pre-transport preparation	0.30%	0.27	0.00	0.27
Carton purchase		0.81	0.81	0.00
Total		**1.34**	**1.07**	**0.27**

Pre-transport preparation, labor: labor for preparing the DOCs for outbound shipment is based on the market rate for semi-skilled labor in Kumasi. The process was observed to be fairly efficient and it is hard to imagine how it could reasonably be improved, for example via use of specialized equipment, given the nature of DOCs, in this context. Therefore, no extra costs are found in this category

Losses during pre-transport preparation: According to the USAID E-ATP Poultry expert, if vaccinations are undertaken by experienced personnel, this loss should be negligible, therefore it is considered to be an extra cost.

Carton purchase: Most operators found the widely used cardboard cartons to be suitable for purpose and of good quality. Although there were reports of the boxes collapsing, this appears to be more an issue of improper handling rather than of carton quality. External research shows that these boxes are very similar to those used in US and European markets, and are reasonably priced in comparison. Therefore, no extra costs are found in this category.

The following chart compares optimized and extra costs in Hatchery Logistics:



The only extra costs found in Hatchery Logistics are a small level of losses during pre-travel preparation. ($0.27/50 DOCs, out of $1.34/50 DOCs in total hatchery logistics costs). Aside from this, hatcheries appear to be doing a good job. Almost all of the inefficiencies observed in the poultry logistics chain occur after leaving the hatchery.

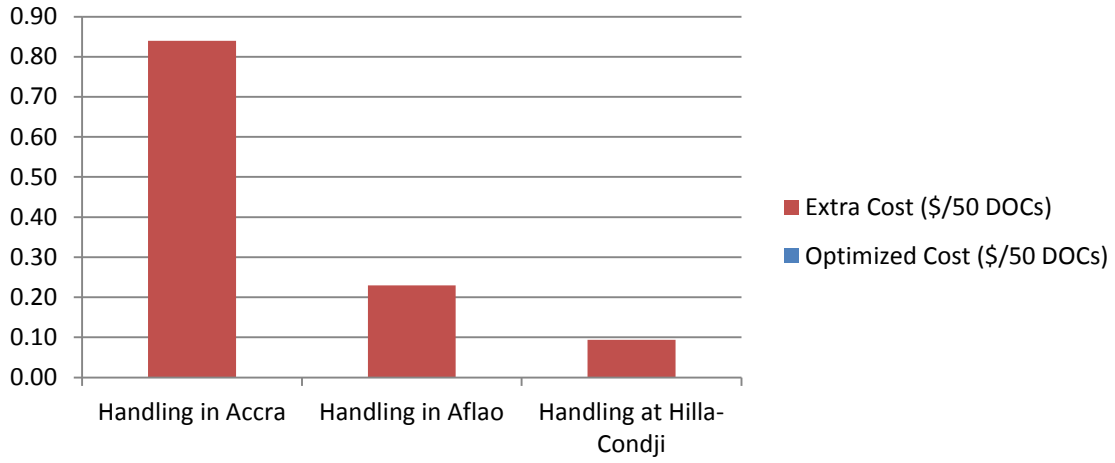
3.2.2.2 HANDLING IN TRANSIT

The following table summarizes the extra costs identified in the Handling in Transit category:

HANDLING IN TRANSIT	Observed %	Observed Cost ($/50 DOCs)	Optimized Cost ($/50 DOCs)	Extra Cost ($/50 DOCs)
Handling in Accra		0.84	0.00	0.84
Handling in Aflao		0.23	0.00	0.23
Handling at Hilla-Condji		0.09	0.00	0.09
Total		**1.16**	**0.00**	**1.16**

In an optimized scenario, hatcheries would engage in end to end sales, i.e. selling directly to end consumers in Cotonou. Hatcheries would organize transport directly to Cotonou, there would be no need for stops, change of vehicle and middle men. Therefore, in an optimized scenario, all of these handling costs would be eliminated. All handling in transit costs are this considered to be extra costs.

The following chart compares optimized and extra costs in handling in transit:



100% of observed costs in Handling in Transit are considered to be extra costs.

3.2.2.3 TRANSPORT

The following table summarizes the extra costs identified in the Transport category:

TRANSPORT	Observed %	Observed Cost ($/50 DOCs)	Optimized Cost ($/50 DOCs)	Extra Cost ($/50 DOCs)
Transport to Accra		1.08	1.08	0.00
Transport Accra-Aflao		1.14	0.84	0.30
Transport Aflao-Border		4.30	0.00	4.30
Losses Kumasi-Aflao	2.00%	1.81	0.00	1.81

Transport Aflao-Hilla Condji		1.03	0.23	0.80
Transport Hilla-Condji to Cotonou		0.89	0.44	0.46
Losses Aflao-Cotonou	2.53%	2.28	0.90	1.38
Lifetime effect of stressful transport	12.90%	11.63	0.00	11.63
Total		**24.16**	**3.49**	**20.67**

Transport costs:

The following table shows observed transport costs on a per Km basis:

Segment	KM	Observed Cost ($/50 DOCs)	$/50DOCs/Km
Transport to Accra	252	1.08	0.004
Transport Accra-Aflao	195	1.14	0.006
Transport Aflao-Border	3	4.30	1.434
Transport Aflao-Hilla Condji	54	1.03	0.019
Transport Hilla-Condji to Cotonou	102	0.89	0.009
Total	**606**	**8.45**	

To calculate optimized costs in this category several **assumptions** have been made about an optimized scenario:

- Hatcheries engage in direct sales to end consumers and organize end-to-end transport to Cotonou without any stops or change in vehicle
- The vehicle passes through the main border at Aflao into Togo
- The current **$/Km** of the Kumasi-Accra segment ($0.04/50 DOCs/Km), which the hatchery itself generally organizes, is the approximate amount hatcheries would reasonably be willing to pay for a specialized vehicle to transport chicks directly to Cotonou.

Therefore the $/Km cost of the Kumasi-Accra segment has been multiplied by the total journey length of 606 Km to give an optimized cost for the entire journey. This total optimized cost has been apportioned to each segment based on its length[18].

As the Aflao-informal border segment does not play a part in the optimized scenario, this is all considered to be extra cost.

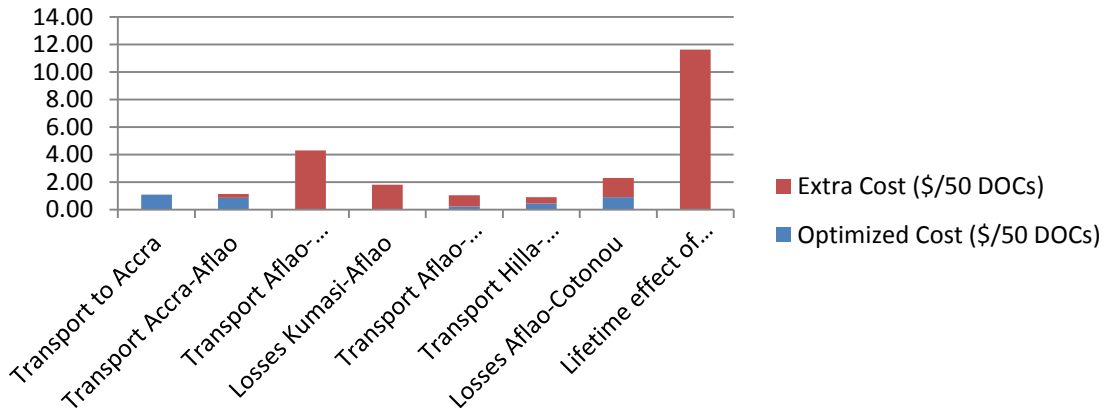
Transport losses: in an optimized scenario, use of a specialized vehicle would bring physical losses down to a negligible level. Stakeholders interviewed felt that a maximum rate of loss of 1% for the whole journey (Kumasi-Cotonou) would be reasonable if the transport was end-to-end and in a specialized vehicle. Therefore the optimized total losses are 1% for the journey as a whole.

[18] This may be an underestimate, as hatcheries might be willing to pay more than they currently spend on a Benz Bus to rent a specialized vehicle. Further market research would determine the premium they would be willing to pay. This rate does not include any road tolls paid along the way, which are assumed to be negligible on a per box basis.

For the segment Kumasi-Accra, transport with a specialized vehicle already takes place by one operator and losses are negligible, therefore optimized losses for this segment alone are zero.

Lifetime effect of stressful transport: In an optimized scenario with optimal travel times and transport environment, this cost would not occur. It is thus considered to be an extra cost.

The following chart compares optimized and extra costs in Transport:



Extra costs amount to 20.67 $/50 DOCs, out of 24.16 $/50 DOCs of total Transport costs. In other words, 86% of Transport costs are considered to be extra costs.

3.2.2.4 ADMINISTRATIVE

The following table summarizes the extra costs identified in the Administrative category:

ADMINISTRATIVE	Observed Cost (FCFA/kg)	Optimized Cost ($/50 DOCs)	Extra Cost ($/50 DOCs)
Veterinary movement permit	0.03	0.00	0.03
Veterinary health export document	0.12	0.12	0.00
Customs export document	0.50	0.50	0.00
Veterinary inspection at Aflao	3.33	0.00	3.33
Veterinary import permit: Benin	0.58	0.00	0.58
Total	**4.56**	**0.62**	**3.95**

Veterinary movement permit: Once a hatchery has already obtained the veterinary health export document, there should be no need to obtain additional movement documentation. In fact, the need for this document was not specified by all hatcheries. None of the officials/control agents at the borders we spoke to, including the veterinarians, stated that this document was required. It is therefore considered to be an extra cost.

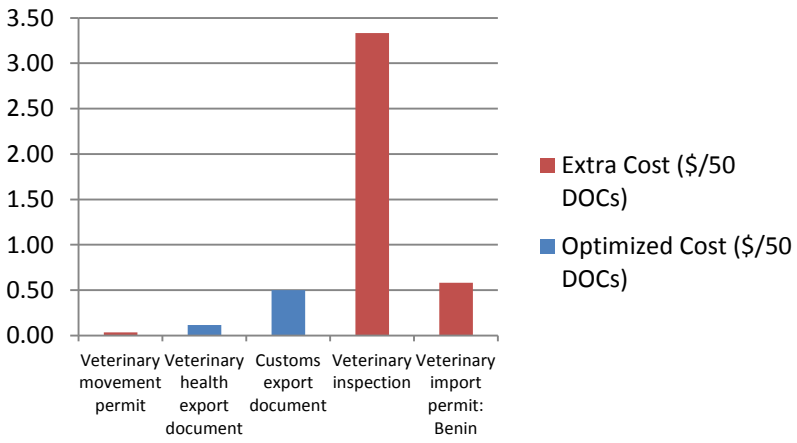
Veterinary health export document: This is a reasonable requirement for live animal export and therefore this cost is not considered to be an extra cost.

Customs export document: This is a reasonable requirement export of products and therefore this cost is not considered to be an extra cost.

Veterinary inspection at Aflao: This should not be required as the shipment should already have valid veterinary inspection documentation from the hatchery. It is therefore considered to be an extra cost.

Veterinary import permit: Benin: This should not be required as under ECOWAS rules, the veterinary document already issued by Ghana should suffice for the Benin authorities.[19]

The following chart compares optimized and extra costs in Administrative:



Extra costs amount to 3.95 $/50 DOCs, out of 4.56 $/50 DOCs of total Administrative costs. In other words, 86% of Administrative costs are considered to be extra costs.

It is important to note, however, that the decision to use the informal border at pay bribes at Aflao, is partly to *avoid* paying up to 22% in "official" misapplied taxes on the value of the shipment, plus various other fees at the main border. The same logic applies to the bribe payments at the main border of Hilla Condji, where "official" misapplied customs fees were reported to be 17.5% of the value of the shipment. However, *under regional trade rules DOCs should be duty-free*. The only reasonable cost that could be applied at the borders is a customs inspection fee/freight forwarders fee of approximately 2,500 FCFA per shipment. Therefore, this amount of 2,500 per border would be paid in an optimized scenario. This cost per unit of a 10,000 DOC shipment going directly from the Kumasi hatchery to Cotonou, and is equal to $0.0006 USD per box of 50 DOCs per border. To reflect the true cost saving of implementing an optimized scenario, this cost should be taken into account, even if it was not observed during the study.

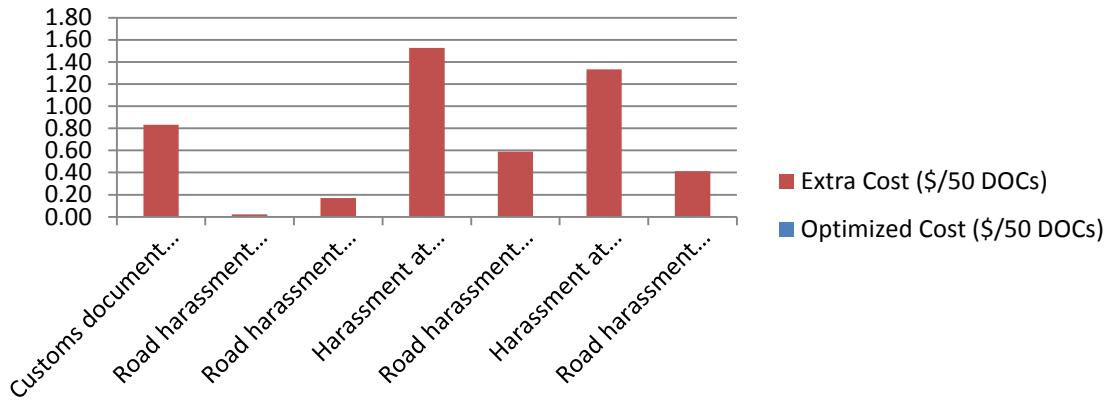
[19] While this is true, but it is difficult to point to the ECOWAS rule that spells it out. The poultry value chain operators should join with the other ATP/E-ATP value chains in asking ECOWAS to state explicitly that countries should respect the mutual equivalence of SPS texts and eliminate the requirement of a certificate of origin, as under ECOWAS A/P1/1/03. (see recommendations)

3.2.2.5 INFORMAL

The following table summarizes the extra costs identified in the Informal category:

INFORMAL	Observed Cost ($/50 DOCs)	Optimized Cost ($/50 DOCs)	Extra Cost ($/50 DOCs)
Customs document bribe	0.83	0.00	0.83
Road harassment Kumasi-Accra	0.02	0.00	0.02
Road harassment Accra-Aflao	0.17	0.00	0.17
Harassment at Ghana-Togo informal border	1.53	0.00	1.53
Road harassment Aflao-Hilla Condji	0.59	0.00	0.59
Harassment at Togo-Benin border	1.33	0.00	1.33
Road harassment Hilla Condji to Cotonou	0.41	0.00	0.41
Total	**4.89**	**0.00**	**4.89**

All informal payments paid as bribes to control agents without receipt are considered as extra costs.



4. CONCLUSIONS TO COST ANALYSIS AND RECOMMENDATIONS

4.1 CONCLUSIONS TO COST ANALYSIS

4.1.1 HEADLINES

For a box of 50 DOCs travelling from Kumasi to Cotonou, total transport and logistics costs are $36.12, which represents 81% of the hatchery price in Kumasi, and 40% of the end market price in Cotonou.

Of these observed costs, 86% are represented by "extra costs", i.e. costs considered as unjustified, inefficient or too expensive when compared with an optimized scenario. Thus, **34% of the end market price for DOCs in Cotonou is considered to be represented by inefficient costs**.

Furthermore, the long transit time and stressful transit environment that DOCs go through to reach Cotonou is significantly detrimental to the DOCs' long term health. As a result of this, end market buyers are willing to pay a significant premium of 13% for DOCs imported from Europe via air under optimal transit conditions. This discount is applied to DOCs coming from Ghana, despite the fact that there is *no inherent difference* between Ghanaian and European DOCs, other than the time and conditions in which they travel[20].

Therefore, in addition to the impact on margin of the high transport costs created by inefficiencies in the logistics chain, producers are obtaining significantly depressed revenues due to the impact of transport on the DOCs' quality. The premium for shipping chicks in optimal transit conditions to the end market is high, and there is a huge opportunity for hatcheries to vertically integrate down the supply chain in order to capture greater margin.

The gains from removing the inefficiencies and improving the logistics process are thus extremely important, having the potential to increase the volume of trade in DOCs along this corridor by reducing costs to traders, and improving the price, quality and availability of DOCs for consumers in end markets.

[20] This was confirmed by value chain stakeholders during interviews. Furthermore, the Ghanaian hatcheries use European parent stock to produce their DOCs.

The following table summarizes the extra costs by category:

Summary: Extra costs	Observed Cost ($/50 DOCs)	Optimized Cost ($/50 DOCs)	Extra Cost ($/50 DOCs)	% Extra cost over observed cost
HATCHERY LOGISTICS	1.34	1.07	0.27	20.47%
HANDLING IN TRANSIT	1.16	0.00	1.16	100.00%
TRANSPORT	24.16	3.49	20.67	85.54%
ADMINISTRATIVE	4.56	0.62	3.95	86.49%
INFORMAL	4.89	0.00	4.89	100.00%
TOTAL	**36.12**	**5.18**	**30.94**	**85.67%**

4.1.2 COST DRIVERS

4.1.2.1 TRANSPORT COSTS

Transport costs represent 67% of total observed transport and logistics costs, of which 86% is considered to be "extra cost". The main drivers of these extra costs are:

- Long term effect on lifetime health and productivity of DOCs caused by long and stressful transport, all of which is considered to be extra cost. This is single the main driver of extra costs in this logistics chain, equivalent to almost 13% of the final end market price.
- Direct cost of transport services, which because of the multiple changes in vehicle, small shipments and the use of non-specialized vehicles along the journey, mean low economies of scale are achieved. Thus, 69% of these costs are considered inefficient when compared with an optimized scenario of a single end-to end journey in a specialized vehicle.
- Physical losses (DOC mortality) of 4.53% caused by suboptimal transport environment: long journey times, multiple stops and use of inappropriate vehicles. It is important to note, however, that this figure can occasionally be drastically increased (50-100%) if the journey does not go smoothly for any reason, or if the trader does adhere to best practices. This unreliability is a *major* concern for importers in end markets. 78% of these physical losses are considered to be unreasonable in comparison with an optimized scenario with a specialized vehicle i.e. losses of no more than 1%.

4.1.2.2 INFORMAL COSTS

Informal costs (or bribes paid to control officials) represent 13% of total observed transport and logistics costs, of which 99.98% is considered to be "extra cost". Due to the fragile nature of the cargo and high risk of mortality if the journey is delayed for any reason, traders are always willing to hand over bribes to avoid being held up.

- Bribes extracted at borders:
  - **Ghana/Togo**: Because the costs and waiting time/delay at the main border at Aflao are considered to be too high, almost all traders prefer to use the informal bush border to smuggle their DOCs into Togo. This is literally a gap in the hedge, accessible by a dirt road, but the border crossing is impassable

by vehicles. Customs officials and military are stationed this post and extract bribes, generally on a per box basis.

  - **Togo/Benin**: In general traders use the main border into Benin, as they consider the bush border (which involves crossing a river on a pirogue) to be too dangerous. Bribes are paid to customs, veterinarians and police on both sides of the border.

- Bribes extracted at checkpoints are common on each segment of the journey, mainly involving customs officials but also police and veterinarians.

On a positive note, very few actors reported paying bribes on the Kumasi-Accra segment. Recent efforts of the Ghana National Association of Poultry Farmers working with the Government of Ghana to build awareness of control officials along the road as to the fragile nature of DOC cargo, has led to less harassment of trucks carrying DOCs.

- Hatcheries also reported paying bribes to obtain required trading documentation.

4.1.2.3 ADMINISTRATIVE COSTS

Administrative costs represent 13% of total observed transport and logistics costs, of which 86% is considered to be "extra costs". The main drivers of these extra costs are:

- Superfluous veterinary inspection conducted at Aflao, even if the shipment is already accompanied by a veterinary health certificate
- Veterinary import permit to bring DOCs into Benin. Under ECOWAS Benin should recognize the veterinary health certificate provided in Ghana.

However, bribes extracted at borders entail avoidance of certain reasonable official costs. These reasonable official costs, which, in an optimized scenario amount to approximately 2500 FCFA per shipment per border, should be included when calculating the true cost gains that would be made if border corruption was eliminated.

4.1.2.4 HANDLING IN TRANSIT

Handling in transit costs represent 3% of total observed transport and logistics costs, of which 100% is considered to be "extra costs". In this logistics chain, post hatchery handling costs arise because of the multiple changes in vehicle that occur from production point to end market. Casual labor is hired to assist with transferring the DOC boxes from one vehicle to another. In an optimized scenario, with a single end to end journey in a specialized vehicle, these handling in transit costs would be eliminated.

4.1.2.5 HATCHERY LOGISTICS

Hatchery logistics costs represent 4% of total observed transport and logistics costs, of which 20% considered to be "extra costs". Hatchery logistics entails pre-travel preparation of chicks including sorting, sexing, vaccinating and packing into cartons. The costs of this are labor, losses during preparation and purchase of carton boxes. Only the small level of losses during pre-transport preparation was found to be unjustified in this context.

4.2 RECOMMENDATIONS

Many opportunities exist to improve the inefficiencies in this system, and facilitate faster and better transport for DOCs along this corridor to:

- Reduce DOC mortality and long term health effects of stressful transport
- Reduce costs to value chain actors
- Eliminate or reduce the need for middlemen
- Increase reliability to end buyers
- Improve biosecurity

And overall, to encourage greater volume of trade in DOCs along the corridor, increase the quality and availability, and reduce the cost of poultry products to consumers in end markets.

4.2.1 ASSISTANCE FOR HATCHERIES TO ESTABLISH SALES AND DISTRIBUTION OFFICES IN REGIONAL END MARKETS

The logistics system for DOCs moving from Kumasi to Cotonou is characterized by disjointedness and lack of continuity, with DOCs changing hands and vehicle several times along the corridor, and cross border trade facilitated by a network of middlemen. This leads to high costs and delays, as well as poor transit conditions for DOCs meaning high in transit mortality and long term health effects, leading to lower prices.

Hatcheries *do not engage in end-to-end sales with their regional end markets*. Instead, networks of "agents" or middlemen/traders organize trade and transport of DOCs from Ghana into the end markets of Lomé and Cotonou. The opportunities for hatcheries to capture greater margins through vertical integration are huge.

Many of the larger hatcheries in Kumasi already successfully operate sales and distribution centers in Accra from which they conduct sales to local farms, as well as selling to the agents trading to Togo and Benin. Setting up similar centers in Lomé and Cotonou would:

- Obviate need for agents/middlemen;
- Facilitate professional, smooth end-to-end transit in one vehicle (which would also improve biosecurity);
- Improve economies of scale; and
- Make purchase easier and more reliable for end customers who could deal directly with the source hatchery rather than with agents (which would also improve biosecurity as DOC origin would be easily traceable)

USAID E-ATP is already well known and trusted by several hatcheries in Kumasi. It could work with these hatcheries and encourage/facilitate them to set up distribution centers in Lomé and/or Cotonou through:

- Demonstrating the potential benefits
- Assisting with business and strategy planning

- Help hatcheries to network with actors (known to the project) in Lomé and Cotonou who could be potential business partners, facilitating relationship building through workshops and other events, helping with communication
- Assisting with access to financing

4.2.2 IMPROVEMENT OF BORDER PROCEDURES FOR DOCS

In almost all cases, DOCs are smuggled through the informal bush border into Togo and then pay high bribes to control officials at the Togo/Benin border to avoid official customs fees and facilitate crossing the border as fast as possible.

Particularly at Aflao, current border crossing procedures at the main border and "official" costs make it *completely impractical* for traders to use it. The fragility of DOCs mean that any delays (which are likely to be long at the main border) lead to high mortality, and the "official" costs levied of over 22% of the value of the cargo (plus any bribes that would be extracted) mean that almost all prefer to use the informal border to pass from Ghana into Togo.[21]

At Hilla Condji, traders pay high bribes to pass through without delay and to avoid paying "official costs" are over 17.5% of the value of the cargo.

There is clearly an urgent need to:

- Reduce the practice of smuggling at Aflao, which not only means that a change in vehicle is necessary but also eliminates any necessary official controls (mainly related to biosecurity).
- Reduce costs to traders at the main border
- Speed up processing at the main border to reduce DOC mortality

Without improving border procedures at Aflao and Hilla Condji, it would be difficult to implement the other recommendations successfully, as the current situation, especially at Aflao mean that legal cross border trade and smooth transit in one vehicle is impractical.

Ghana has already had success, after working with the Ghana National Association of Poultry Farmers, to build awareness of control officials along the road from Kumasi to Accra to reduce road harassment and delays. USAID E-ATP could assist the Association to continue their advocacy work with control officials at the Aflao border. USAID E-ATP should also consider working with other regional associations and stakeholders to conduct advocacy and awareness building on the fragility of DOCs and the need for border processing to take place smoothly and without delay.

USAID E-ATP should also continue its work in reducing policy barriers to intra-regional trade, particularly in encouraging the implementation of ECOWAS protocols. Trade in DOCs (which are unprocessed goods) within ECOWAS should be duty free, but duties are being applied at

[21] A very telling anecdote: In one case, a trader with a semi-specialized vehicle would travel to Accra to collect the DOCs, Drive them to the informal border at Aflao (which is impassable by vehicles), offload them onto the ground, then drive through the main border *empty* so he could avoid the majority of official fees and taxes, then circle round to the informal border on the Togo side to collect his DOCs and continue the journey east.

both Aflao and Hilla Condji. USAID E-ATP should work towards ensuring these unjustified tariffs are removed.

In the ECOWAS text it is difficult to identify specific language on the mutual equivalence of veterinary documentation within ECOWAS countries for DOCs. The E-ATP poultry value chain team should join with the other USAID ATP/E-ATP value chains in asking ECOWAS to state explicitly that countries should respect the mutual equivalence of SPS texts and eliminate the requirement of a certificate of origin, as under ECOWAS A/P1/1/03. Furthermore, it is possible that the "droit de douane" referenced by traders on entering Togo and Benin, is actually VAT. While It is not entirely "illegal" for customs officials to collect 17.5% in VAT on DOCs upon entering their territory, as they retain some national flexibility on trade in live animals, the USAID E-ATP project should work towards ECOWAS clarifying the application of VAT on DOC trade within the ECOWAS zone.

USAID E-ATP should also look into the feasibility of setting up "one-stop" processing at each border for DOCs, so that border crossing is simple and fast. The best agency to locate this one-stop shop with could be the veterinarians, who understand best the needs of the DOCs and would be able to perform any necessary biosecurity checks as well as work with customs to process the export/import.

The West Africa Trade Hub will shortly be setting up a "Border Information Center" at Aflao, which will act as a resource center for traders and officials, assist traders with border crossing, facilitate mediation and will be training center. USAID E-ATP should work with the poultry associations to link them with staff at this border center such that they can communicate the border issues their members are having, and the Border Information Center can work/advocate to reduce these problems.

Lastly, in the livestock value chain, USAID ATP has successfully established "Operation Tabaski" along several corridors, above all focusing on the traditional trade route Ouagadougou-Bamako-Dakar. This operation involves accompanying a caravan of traders along the corridor, guiding them through borders and checkpoints legally and without paying bribes. It acts as confidence builder to the traders, sets an example to uniformed officials and through publicity, demonstrates best practice in the value chain. USAID E-ATP could run a similar operation for DOCs along the Kumasi-Cotonou corridor. USAID E-ATP's approach would need to lay emphasis on helping prospective trading partners bridge the practical questions of language barriers and the risks and costs of moving between the currency areas of the Ghana cedi and the West African Franc.

4.2.3 ORGANIZATION OF IMPORTERS FOR COORDINATED PURCHASING SCHEME

Individual imports of DOCs into the end markets of Lomé and Cotonou, organized by the numerous agents and middlemen, are generally very small scale, and do not allow end buyers to take advantage of economies of scale. End buyers are not well organized into networks, and associations find it difficult attract members. These low economies of scale drive costs and transit times upward.

Associations in both Lomé and Cotonou expressed interest in the idea of assisting members to organize bulk orders of DOCs to improve economies of scale in purchasing. USAID E-ATP

could assist these associations, as well as work with its network of end buyers to both improve their collective organization as well as arrange coordinated purchasing schemes. Ideally these purchases could be arranged directly with the Kumasi hatcheries and cut out middlemen/agents. These higher volume transactions could encourage hatcheries to engage more frequently in end-to-end trade with these foreign markets, facilitate a smoother and faster transport for the DOCs, add to their incentive to set up sales offices in these end markets while reducing costs and improving quality and reliability for the end buyers.

4.2.4 ACCESS TO SPECIALIZED VEHICLES

One of the main problems in the existing logistics chain for DOCs is the widespread use of non-specialized vehicles: from converted "Benz Buses", to passenger buses "Tro-Tros", to taxis and even mopeds. Not only do these buses not allow for the optimal transit environment for DOCs (temperature and ventilation), but they also often mean it is difficult to stack the DOC boxes well, leading to further problems such as crushing, instability and falling over and no ventilation. These factors lead to high mortality during transport. Furthermore, the lack of specialized vehicles leads to serious biosecurity concerns, with vehicles not disinfected between uses and often transporting human passengers at the same time as DOCs.

In specialized vehicles, the driver can control the temperature and ventilation of the truck to ensure optimal transit conditions. Furthermore, the boxes can be loaded onto portable racks which can be wheeled in and out of the vehicle for easy loading, and secured in the vehicle during transport. These racks also allow for proper ventilation, and prevent crushing and instability. Specialized vehicles can also be easily cleaned and disinfected between uses.

Several options to facilitate access to specialized vehicles are available:

4.2.4.1 PARTNERSHIP WITH REGIONAL TRANSPORT PROVIDERS TO PROVIDE SPECIALIZED TRANSIT SERVICES TO DOC EXPORTERS

In interviews with actors along the value chain, it is clear that demand for specialized vehicles exists, and most people are very cognizant of the benefits of using specialized vehicles in terms of DOC health and biosecurity. Hatcheries, for example, would pay for specialized vehicles if they were available to rent.

USAID E-ATP should partner with its existing contacts in the transport sector to assess the feasibility for these companies to procure specialized vehicles and begin offering these services to regional DOC traders moving DOCs from Kumasi to the end markets of Lomé and Cotonou. Business planning, costing and testing of the potential market for this proposal would be necessary to establish that it would be a viable business. USAID E-ATP could assist with this process. Some issues that would need to be overcome are:

- It would require highly trained drivers that understand the needs and requirements of transporting DOCs
- Finding goods to back-haul on the return journey (taking biosecurity into account)

4.2.4.2 ASSISTANCE FOR REGIONAL HATCHERIES TO PROCURE SPECIALIZED VEHICLES

The study team established that several hatcheries in Kumasi would really like to procure their own specialized vehicles, but lacked the means to do so. Hatcheries expressed strong demand for concessional loans with which to buy these vehicles, as current commercial lending interest rates did not make it viable. USAID E-ATP could assist these hatcheries with access to finance for this type of purchase, loans could be easily secured either on the vehicle itself of on other hatchery assets (land and buildings). Leasing arrangements would also be a good option in this case.

However, hatcheries would need to ensure that they were transporting enough volume in these vehicles to justify owning one. This problem could be overcome by assisting hatcheries to procure vehicles on a *collective basis*.

4.2.4.3 PARTNERSHIP WITH DARKO FARMS TO HIGHLIGHT EXAMPLE OF BEST PRACTICE IN TRANSPORT AND LOGISTICS

There is only one example in Ghana of the use of a specialized vehicle for DOC transit, Darko Farms[22]. Darko Farms is one of the largest and best established poultry companies in the region. Not only do they engage in DOC trade, they also raise chickens and sell processed chicken meat. Interviews with Darko established that their ownership and use of the specialized vehicle (which they purchased new from Holland) is economically viable and provides several benefits in terms of health and low mortality of the DOCs, as well as ease of loading and unloading.

USAID E-ATP should work with Darko Farms (the project now has a good relationship with them) to better understand the costs and benefits of the specialized vehicle, as well as use their example as a "success story" to highlight to other regional hatcheries that this best

[22] Akate Farms also has a semi-specialized vehicle, with a fan ventilation mechanism and racks inside to stack the boxes, but it does not allow for automatic temperature control by the driver.

practice is a viable business strategy for them and to encourage them to upgrade their current transportation methods.

4.2.5 TRAINING ON BEST PRACTICE

Simple improvements in transport and logistics and increased capacity of value chain actors could have great benefits for the value chain in terms of improved DOC health, reduced mortality, lower costs and biosecurity.

USAID E-ATP already successfully conducts workshops, seminars and trainings for the poultry value chain, and should seek to include the following content in any future trainings:

- Best practice transport and logistics techniques and handling (see best practice guide);
- Biosecurity concerns/hazards and measures to be taken during transport, especially in relation to preventing the spread of avian influenza;
- Procedures and required documentation for export to make border processing easier, so that traders and transporters will know their rights when face-to-face with potentially corrupt or poorly informed border officials. This training could utilize the *Trader-Transporter How-To Guide* and the *Trader-Transporter Cards* that the Policy and Transport teams of ATP/E-ATP have been developing; and
- Training on best practice transport biosecurity to be included in any workshops or seminars organized

4.2.6 ANNUAL UPDATES TO BASELINE COST DATA

It is not recommended that cost data variables identified in this study be updated annually as specified in the terms of reference. The study team does not believe that this activity is a valuable method of monitoring overall transport and logistics costs and any reductions due to project activities. Costs along these corridors may vary for a multitude of factors, and annual observations do not represent a robust measuring tool. The study team instead recommends targeted monitoring of specific transport and logistics costs subsequent to the implementation of recommendations.

4.2.7 ENVIRONMENTAL CONSIDERATIONS

Recommendations regarding construction of market logistics infrastructures or other construction projects may cause both direct and indirect potential adverse environmental impacts. For example, soil compaction and erosion, sedimentation of streams and surface waters, contamination of water supplies, forest conversion, pollution, and loss of habitat and environmental services.

These considerations have been taken into account when formulating the recommendations in this report. It is not deemed that these recommendations will have significant environmental impacts as none involve construction of new infrastructure or significant alterations to existing infrastructure along the corridors. Reducing barriers to trade could be expected to have positive environmental impacts due to shorter periods of time during which trucks are idling. This positive impact might be offset if truckers are able to increase the frequency of their trips, but both of these effects could be expected to be minimal.

ANNEX A: OBJECTIVES AND METHODOLOGY

OBJECTIVES

The Poultry Transport and Logistics Assessment will diagnose transportation and logistics related problems along the corridor, and propose recommendations to enhance the performance of the logistics chain. These recommendations will be validated by the stakeholders. The study will also recommend a package of best practices.

- Identify the primary inefficiencies in the poultry transport and logistics system along corridors and across border posts, with vetting hypotheses coming from desk review and discussions with the value chain leaders and transport/policy advisors
- Analyze the relationship between inefficiencies, total transport and logistics costs, production costs, and price in the end market;
- Identify public and private opportunities to improve procedures and technologies to address glaring inefficiencies in the poultry transport and logistics process
- Recommend value-chain stakeholder strategies, based on study findings and global best practices, for implementing more efficient procedures and technologies
- Consult with stakeholders on study findings and recommendations to support their leadership role in implementing solutions

APPROACH AND METHODOLOGY

APPROACH

To achieve these objectives, the following tasks were identified:

- Conduct a **desk review** of available documentation on poultry transport and logistics procedures and challenges in West Africa and share with all team members for their input[23]
- Meet with the E-ATP management team and the technical team at the beginning of the field work and at the end of the field work
- Design an **Interview Guide** and conduct a **survey** to estimate the cost of transporting poultry along the Kumasi-Accra-Lomé-Cotonou corridor and to analyze the relationships among producers, processors, traders, transport operators, forwarding agents, customs and control agencies, and other market

[23] See Annex B

intermediaries active in the target corridors[24]

- Conduct **field research** to administer questionnaires to producers, traders, agents and other stakeholders to collect data for poultry transport and logistics costs. Also, to observe the state of road infrastructure, trucks, loading and off-loading materials, and markets
- **Analyze** data collected to determine actual costs and inefficiencies emerging from stakeholder interviews
- Produce a **final report** on all findings, including the following deliverables:
  - Transport cost assessments for the poultry value chain along key corridors
  - Package of best practices in value chain logistics developed and recommended for the poultry value chain

METHODOLOGY

SECONDARY RESEARCH

The *Desk Review*[25] preceded field research and was performed in May 2011, principally by lead field researcher Laura Jane Busch and project specialist Virginia Schippers. This review of the most relevant research and publications on the poultry value chain transport and logistics in West Africa informed the research team working hypotheses, as well as served as background documentation for the development of the Transport and Logistics *Interview Guide*.[26]

PRIMARY RESEARCH

The primary research was conducted in May 2011 by an E-ATP field research team comprised of Laura Jane Busch (lead field researcher) and Daouda Moussa (Study Coordinator and Field Research Assistant), with assistance from Zoumana Coulibaly, Ali Isaaka and Dje Kouakou.

The team conducted 47 interviews during a 16 day field mission between May 8th and May 24th, 2011 in the following principle locations:

- Kumasi, Ghana
- Accra, Ghana
- Aflao, Ghana
- Lome, Togo
- Hilla Condji, Togo/Benin
- Cotonou, Benin

[24] See Annex C
[25] See Annex B
[26] See Annex C

As far as possible the Interview Guide was used to guide to questions during interviews, however, given the often informal nature of the value chain stakeholders it was frequently difficult to follow the prescriptive questions to the letter. Interviews were more often conducted as more informal discussions, loosely based on the Interview Guide questions to solicit specific data points and facilitate an open conversation about challenges and constraints to increased intra-regional commerce.

In Ghana the survey instrument was administered in English, occasionally translated into Twi. In Togo and Benin, it was administered in French and also occasionally translated in local languages.

DEFINITIONS AND ASSUMPTIONS

ARTICULATION OF RELEVANT COSTS

Each of the cost categories and cost line items identified will be divided into *Observed Cost, Extra Cost* and *Optimized Cost,* to the extent possible with the data available*:*

- ***Observed Cost*** – costs as observed in the field research, based on averages and most common responses from field interviews;
- ***Extra Cost*** – a back-of-the-envelope estimation of the amount of the Observed Cost that is considered unnecessary, unjustified, or too expensive based on a variety of factors to be explained in each instance. For example, bribes, storage losses, and administrative charges without receipts or for which no service is rendered are considered extra costs. In some instances, extra costs are calculated based on market observations or reference to external sources. These benchmarks are used as a proxy for what a more competitive transport sector may be able to achieve in terms of lower prices.
- ***Optimized Cost*** – in this study, this is defined as the Observed Cost minus the Extra Cost.

COST CATEGORIES

The following table lists the main categories of costs and example costs observed in the poultry value chain studied.

Cost category	Examples of costs observed
Hatchery Logistics All transport and logistics charges incurred at the hatchery post hatching	• Pre transport preparation • Cost of carton • Losses during pre transport preparation
Handling in Transit All charges for handling services rendered throughout the logistics process after leaving the hatchery	• After leaving hatchery, loading and unloading of boxes into various vehicles
Transport All charges for transport services from farm to end market	• Transport fees and charges • Losses during transport

	• Long term effect of transport stress on chick health
Administrative All charges for formal trade facilitation and mandatory control procedures, for which a receipt is normally provided	• Mandatory veterinary inspections • Veterinary documentation • Official customs fees • Customs documentation
Informal Explicit bribes paid, for which no receipt is provided	• Bribes to obtain documentation • Bribes paid at checkpoints • Bribes paid at borders

The categories capture the majority of the costs during the field research from hatching to the market of final destination. When possible, copies of actual receipts were collected for formal fees.

VARIETIES

Along the corridor studied, the main market for DOCs is *layers*, i.e. females raised as egg producers. Very little trade in *broiler* DOCs was observed, with actors citing competition from extra-regional imports of processed broiler meat as the main reason for this. Trade in *cock (rooster)* DOCs is even rarer, as demand for rooster meat is low, only arising during the Christmas period. **This study focuses only on trade in *layer* DOCs. Any reference to "chick" or "DOC" in this report refers to *layer DOCs only*.**

CURRENCY

All prices and costs are shown in US Dollars (USD/$). Data was collected in both Ghana Cedis and FCFA, but have been converted into dollars for comparison. Exchange rates used are below, these were based on the observed rates obtainable along the corridors during the field research.

USD/FCFA	**430.0**
USD/GHC	**1.5**
GHC/FCFA	**286.7**

PRICES AND COSTS

The source for all observed prices and costs shown in this report are directly from primary research conducted during this study, unless otherwise noted. As quoted prices often varied between interviewees, the research team endeavored to collect as many data points as possible. Values shown are based on an average of answers provided in interviews at each location, excluding obvious outliers and answers judged by the research team to be unreliable.

Where a percentage was given as a cost, for example percentage losses in transport, this percentage was multiplied by the final end market price loss to monetize the value of the cost.

UNITS OF ANALYSIS

The point of reference for all costs along the DOC logistics chain is the smallest unit of normal trade: a box of 50 DOCs. This is standard practice along the corridor, and at no point did the study team observe trade in individual DOCs.

ANNEX B: LITERATURE REVIEW

KNOWN TRANSPORT AND LOGISTICS ISSUES FOR POULTRY

This literature review provides an overview of the main transport and logistics constraints to trade in poultry in West Africa.

OVERVIEW OF SECTOR

As one of the most commonly consumed meats in West Africa, and also a major source of protein, poultry is among the most important agricultural commodities traded in the region. Poultry consumption in West Africa is growing fast, meeting the demands of the increasingly populated and increasingly wealthy urban areas. Furthermore, several studies from African and Asian countries have highlighted the importance of poultry raising and consumption to rural livelihoods, providing income, food security, nutrition, and intra-household gender equality.[27] Studies have shown that more than half of all rural households keep small-scale flocks of 1-500 birds and rural households can acquire up to 15% of their income from poultry.[28]

High costs of production and marketing in West Africa, however, mean that local producers struggle to compete with lower cost producers in other (non-African) countries.[29] Many studies cite the high costs of production inputs and low quality (taste) of West African Poultry as a major barrier to competitiveness.[30] While reliable information on producer prices is scarce, government surveys of certain countries suggest that imported poultry tends to be less expensive than domestically produced items.[31]

Major competitors to regional producers include the EU, the United States, and Latin America. And, as West African countries transition to the lower tariff rates (20% on poultry) agreed to under the ECOWAS Common External Tariff (CET) regime, regional producers are losing their historical protection from those competitors.[32] For example, 77% of domestic demand for chicken in Ghana is now met by imports.[33] According to Commod@frica, poultry imports Africa-wide increased from 260,000 tons in 2000 to 1.067 million tons in 2010.[34]

The capacity of domestic poultry production was also crippled by the 2006/2007 Avian Influenza (AI) epidemic. In some cases, poultry farm operators never recovered from their financial losses when only 50%-90% compensation was provided for destroyed flocks or egg stocks.[35] This heavy loss of assets was compounded by the collapse in trade across borders when the AI outbreaks were met with import bans in several West African countries. Lifting

[27] Impact of HPAI on Ghanaian Rural Poultry Producers' Incomes, Ekin Birol and Dorene Asare-Marfo, DFID. IFPRI, ILRI, RVC
[28] IBID
[29] Poultry Value Chain Study: E-ATP
[30] The Poultry Site. Ghana's Animal Research Launches New Chicken Breed
[31] Poultry market in West Africa: Benin, Ghana: Evans School of Public Affairs, University of Washington
[32] Poultry market in West Africa: Benin, Evans School of Public Affairs, University of Washington
[33] Impact of HPAI on Ghanaian Rural Poultry Producers' Incomes, Xinshen Diao, DFID. IFPRI, ILRI, RVC
[34] Poultry industry in West Africa struggling to deal with cheap poultry imports, Agritrade
[35] Poultry Value Chain Study: E-ATP

the bans requires a series of formal steps, including approval by the OIE[36]. Given the capacity constraints for managing this process in most West African countries, many of the bans remain in place 2-3 years after signs of AI have abated.[37] USAID E-ATP was instrumental in lifting the ban between Côte d'Ivoire and Burkina Faso, and is working with stakeholders to do the same in other West African countries.

As AI-related bans begin to lift, the poultry industry will have to face increased competition from imports coupled with the industry-wide deterioration of assets that comes with several years of underinvestment. Organizing largely smallholder operations to compete in this context will be a significant challenge. The smaller, industrial poultry subsector that has emerged in peri-urban areas around the largest towns and cities will likely need to lead the way, exploiting every opportunity to increase the efficiency of their operations. Yet, this subsector represents only around 10-20% (data from Benin & Ghana) of domestic production and requires assistance to bridge the large gap between regional supply and regional demand.[38]

Part of the efficiency equation lies in the potential gain from reducing the cost and time associated with regional poultry transport.

TRANSPORT AND LOGISTICS CONSTRAINTS

Across industries in West Africa, transport and logistics severely limit the extent to which goods can reach their destination markets in a timely, cost effective manner while maintaining quality standards.

Transport and logistics issues along key trade corridors are pervasive, characterized by high costs, long transit times, uncertainty, and corruption.[39] In their 2008 study of transport costs in Africa for the World Bank, Teravanithorn and Rallaband estimated that transport prices for most African landlocked countries range from 15% to 20% of import costs, three to four times more than most developed countries.[40] More specifically, a study conducted by the West Africa Trade Hub found that transport costs along the Tema-Ouagadougou corridor are up to 7 times higher (despite labor costs being 25 times lower), can take over 4 times longer and involve much more uncertainty than along a transport corridor of comparable distance (Newark-Chicago) in the USA.[41]

Specific transport and logistics issues relating to the Poultry value chain are described in detail below.

BIOSECURITY

Nearly all of the intra-regional trade in poultry in West Africa is in live birds, with most urban households accustomed to buying live chickens and either slaughtering the birds at home or at marketplaces. Biosecurity practices along the logistics chain are inadequate, even at large commercial farms.[42] Live bird trade, typically in bamboo or wooden cages, and poultry

[36] =World Organization for Animal Health
[37] Poultry Value Chain Study: E-ATP
[38] Poultry market in West Africa: Benin, Evans School of Public Affairs, University of Washington
[39] West Africa Trade Hub Tema-Ouaga Transport and Logistic Report, 2010
[40] Transport Prices and Costs in Africa : A Review of the Main International Corridors, Teravaninthorn & Raballand, The World Bank, 2009
[41] West Africa Trade Hub Tema-Ouaga Transport and Logistic Report, 2010
[42] Poultry Value Chain Study: E-ATP

slaughter at unsanitary, artisanal slaughter points is subject to potentially serious biosecurity and biosafety problems.[43]

Biosecurity is especially important considering the threat of AI, and its potential to spread rapidly through transport of infected material or chickens. Transmission has been shown to be faster through trade and transport than via direct transmission between neighboring villages.[44] The high risks of infection during transit stem from contact with other chickens from other farms, feces, the air, dirty trucks, and human contact. One recommendation emerging from current literature is to increase construction of trucks that can be disinfected quickly and efficiently.[45]

ABSENCE OF COLD CHAIN LOGISTICS

Absence of a cold chain from the point of slaughter to sales outlet makes it difficult to offer high-quality and safe chilled poultry products to buyers. The cost of electricity and cold storage in much of West Africa is also very high, and home ownership of refrigerators is limited primarily to upper income households.[46] Further research into the logistical constraints and investment potential in this area, however, could open a new line of service for industrial poultry farms seeking to add further value to a growing affluent and urban population.

HANDLING AND TRANSPORT PRACTICES

Handling and transport practices in West Africa result in high instances of mortality among birds and day-old chicks.

Birds:

According to the E-ATP West Africa Poultry Value chain assessment, long distance trade in live poultry takes too long, resulting in stressed birds and high mortality. Mortality of 1-5 birds per cage of 40-50 is not uncommon.

Day-old-chicks (DOCs):

DOC development can be markedly influenced by the first episode of transport between hatchery and rearing site.[47] Before hatching, chicks prepare themselves for their first few days of life by taking the yolk, a store of nutrients, into the abdominal cavity. Absorption of the yolk should allow chicks to survive a short time without food or water. Optimally, travel time from hatching should be no longer than 48 hours, with some scientist advising even shorter travel times of 12 hours.[48] Variance in the hatching time of chicks within a consignment limits the tolerance even further.[49] Long distances, delays along the road and poor physical road infrastructure lead to high mortality in transit or poor condition of DOCs on arrival.

[43] IBID
[44] A Transport Model for the Spread of Bird Flu, ILRI, Tropentag, September 2010, Zurich
[45] World Society for the Protection of Animals
[46] Poultry Value Chain Study: E-ATP
[47] The Humane Society of the United States: Welfare Issues with Transport of day-old-chicks
[48] IBID
[49] European Food Safety Authority, The welfare of animals during transport, 2004

Unlike adult birds who are able to regulate body temperature metabolically, recently hatched chicks cannot fully self-regulate their body temperature. As a result they are sensitive to heat stress and must be protected from extremes of heat (and cold) during transport.[50] Thermal stress is another potential source of poor DOC deterioration in transit. The recommended temperature for DOC transport is 24-26 ºC[51], with 63-70% relative humidity.[52] When travelling at high temperatures it also is critical to keep the cargo space well ventilated to allow for more effective thermoregulation[53] and a constant supply of oxygen. Excessively high temperatures (40 ºC+) can cause death within a couple of hours.[54] In an optimized scenario, DOCs are transported in climate-controlled trucks with advanced airflow systems.[55] Few trucks used in West Africa are customized to meet these requirements.

The optimal space allowance for DOCs is 21-25 cm² each.[56] The design of transport, therefore, serves the dual purposes of maintaining adequate spacing while also ensuring proper ventilation. In an optimized scenario traders use custom built plastic trays. In West Africa, however, DOCs are often transported in traditional bamboo cages or boxes. This, in addition to overloading/overstacking practices, leads to further mortality.

Further understanding of how handling and transport practices play into mortality rates and other logistics costs is necessary to inform interventions in this area.

INFORMALITY

Much of the cross-border poultry trade is managed by informal sector traders who find it too burdensome to obtain the appropriate export/import documentation, or cannot conform to the required standards. This small-scale, cross-border movement of birds is nearly impossible to trace and control. This trade is particularly prevalent from southern Mali to neighboring Cote d'Ivoire and from southern Burkina Faso into Ghana. Traders cross the border on bicycles and motorbikes, and with small lots in cages on top of buses, vans and trucks.[57]

As a result, the development of long-distance and more formalized trade is inhibited, perpetuating a tradition of informal cash transactions with no documentation and few contracts, along with difficulties in obtaining credit. Research into how these factors affect transport and logistics costs for poultry could highlight important recommendations for intervention.

TRUCKING SERVICES

ECOWAS protocols state that vehicles must comply with certain standards with the aim of reducing road damage, accidents and the use of substandard vehicles. There are regulations on transport permits, vehicle dimensions and loads, as well as haulage practices. However, a

[50] The Humane Society of the United States: Welfare Issues with Transport of Day-old-chicks
[51] European Food Safety Authority, The welfare of animals during transport, 2004
[52] The Humane Society of the United States: Welfare Issues with Transport of Day-old-chicks
[53] IBID
[54] IBID
[55] World Society for the Protection of Animals
[56] European Food Safety Authority, The welfare of animals during transport, 2004
[57] Poultry Value Chain Study: E-ATP

recent study by the USAID West Africa Trade Hub indicates that these protocols are often not being well implemented in practice.[58]

The USAID study on Onion Transport and Logistics along the Madaoua-Accra corridor notes that because agricultural traders are less likely to utilize formal trucking operators to transport their products, they are more likely to be using illegal, unlicensed, overloaded and poorly maintained trucks which drive up costs in terms of delays, spoilage, and higher bribes paid.[59]

Further research into the vehicle-related costs along the poultry value chain, and the interaction between vehicle standards, informality, service procurement and contracting, overloading, breakdowns, inefficiencies, delays, mortality, bribes, and costs could help to inform target interventions such as training, change in policy or change in the application of existing policy.

TRUCKING MARKET

The trucking market in West Africa is characterized by local private entrepreneurs and private fleet operators (many of which operate under contracts for other transport intermediaries or carriers) provide road transport. This results in a highly fragmented market and a wide variation in pricing by locality and by country, with operating costs, vehicle utilization and load factors all having a role in determining local inland cost.[60]

According to the World Bank, the West African trucking industry exhibits low levels of productivity, low levels of competition between fleet operators, and high rates of collusion (cartels), which significantly drive up transport prices and reduce quality of service. They find that profit margins of trucking companies are excessively high.[61] There is an oversupply of trucks at the vehicle level due to low capacity utilization rates, and low incentives to maintain fleet quality leading to inadequate maintenance, frequent breakdowns, and inefficient service.

A study by the West Africa Trade Hub on transport in the cashew value chain notes that a key cost driver is fragmentation in the trucking market between farm and processor.[62] In that there are a lot of small, independent trucking operators, coupled with poor market information for those wishing to procure trucking services, so it is difficult for those wishing to procure trucking services to find good quality operators, compare stable prices, and establish formalized contracting and service provision.

Further research into the trucking market in relation to intra-regional transport barriers to trade would complement existing studies and highlight areas in which inefficiencies could be addressed.

[58] Gap Analysis, ECOWAS Free Trade Area. Ghana, West Africa Trade Hub 2010
[59] Onion Transport and Logistics Study along the Madaoua-Accra Corridor, ATP West Africa, 2010
[60] The Role of Transportation & Logistics in International Trade, The Developing Country Context, TESS 2003
[61] Transport Prices and Costs in Africa : A Review of the Main International Corridors, Teravaninthorn & Raballand, The World Bank, 2009
[62] Transport and Logistics in the Cashew Value Chain, West Africa Trade Hub 2009

CUSTOMS, HARASSMENT AND INFORMAL COSTS

Delays and informal costs at the border and at checkpoints are a major driver of road transport costs according to several USAID and World Bank. In addition to slowing down the movement of goods from source to markets, these activities represent illicit taxes that raise the cost of doing business and ultimately impact the overall volume of trade. The delays that checkpoints and inefficient borders impose are of particular concern for exporters of DOCs, given the short window of time before the condition of the chicks begins to deteriorate.

While most informal payments are paid either by forwarders or truckers, the costs are included in the price they quote to traders. Past studies by USAID ATP have found that truckers and traders transporting agricultural products pay even more in bribes than those transporting other commodities. One suspected reason for the higher rate of bribes extracted from agricultural traders is the cost associated with delays, in the form of product spoilage (or, in the case of poultry, mortality). In addition to "speed payments", agricultural traders are more likely to need to bribe their way out of non-compliance with transport regulations, as they are less likely to utilize formal trucking operators to transport their products, often opting for illegal, unlicensed, overloaded and poorly maintained trucks.

Further research into road harassment in terms of its causes and effects on the poultry value chain will inform more specific interventions.

CONCLUSION

Expansion in intra-regional trade in poultry is an important opportunity for economic growth in West Africa. Transport and logistics issues along the transit corridors in question represent significant barriers to this trade expansion. A review of existing literature has highlighted known problems, and demonstrates that further research and study of these issues in relation to the poultry value chain will be necessary to undertake targeted interventions to reduce inefficiency and costs, and improve quality and volume traded.

ANNEX C: INTERVIEW GUIDE

Expanded Agribusiness and Trade Promotion

Interview Guide

Day-old-chicks: Kumasi, Accra, Lome, Cotonou

This interview guide is designed to assess transport and logistics costs for day-old-chicks from the point of hatching in Kumasi to delivery at the final end market or buyer's facility in Cotonou. It is not intended as a written questionnaire, rather guide for the interviewer to direct the discussion.

Interview guides have developed for:

- Producers
- Traders
- Transporters
- Market operatives
- End buyers
- Interviews also expected with the following, with no prescribed format:
- Veterinarians
- Producer/trader associations
- Institutional stakeholders/NGOs

Day-Old Chick Transportation Survey

This survey is being carried out by Abt Associates under the Expanded Agribusiness and Trade Promotion (E-ATP) Project. E-ATP is a West Africa regional project funded by USAID. The purpose of the survey is to measure the handling and transportation costs associated with moving poultry from production zones to consumer markets in West Africa. By identifying the current handling and transportation practices, the project aims to identify ways of reducing excess transport and logistics costs, and thereby increasing sales product value to producers and reduce costs to consumers.

Thank you

Producers

Family Name:
First Name:
Gender:
Telephone/email:
Date:
Location:

1. What type of day-old chicks do you raise?
   - Layers
   - Broilers
   - Cockerels
   - Other (please specify)
2. Do you hatch your own DOCs or do you buy them?
3. If you buy them, where do you buy them from?
4. How do you store your DOCs prior to leaving the facility? Cost?
5. What is the % loss during storage?
6. What biosecurity measures do you take at your facility?
7. Are veterinary services available? At what cost?
8. Who do you mainly sell to?
   - Larger producer
   - Trader
   - Processor
   - Other (please specify)
9. Where are your buyers located?
10. Peak sales price for your DOCs (per carton/per head: specify unit)
11. Low sales price for your DOCs (per carton/per head: specify unit)
12. What are the most important factors in the selling price of your DOCs?

3	2	1
Very important factor	Somewhat important factor	Not important factor

   - Weight
   - Condition and health of the bird
   - Type of bird
   - Sex of the bird
   - Color of the animal
   - Other (please specify)
13. How do you transport your DOCs from your production site to the location of sale?
   - Air
   - Truck
   - Walk
   - Other
   - Not applicable - poultry sold at production area
14. Do you put your DOCs in cages or cartons for transport?
15. How many DOCs are in each cage or carton?

16. Describe the cartons?
17. How many cartons per truckload?
18. What are the handling procedures? Cost?
19. What are the % losses during handling?
20. If you use a truck, do you:
    - Pay an agent to find trucks
    - Ask for cost quotations from different freight companies
    - Have a long-term contract/agreement with a preferred transport partner
    - Use your own vehicle
21. Other (please specify)
22. Cost of transporting your DOCs from the production area to the sale area:
    - Cost of loading truck
    - Cost of freight services
    - Cost of unloading truck
    - Other: please explain
23. Distance from production area to the sale area (km)
24. Length of time in hours to travel from production area to the sale area:
    - Average
    - Minimum
    - Maximum
25. Main cause of delays?
26. State of road?
27. Are the trucks modified with cages or cartons to keep the animals protected during transit?
28. Are the trucks designed to control the temperature in the cabin?
29. Are the trucks designed for cross ventilation?
30. Are the trucks disinfected before and after transportation of DOCs?
31. What biosecurity measures are taken in transit?
32. During transit, what facilities are available? Please state the costs of these facilities.
    - Rest stops with cages for keeping DOCs
    - Food and water for DOCs
    - Veterinary care
    - Other(Specify)
33. Losses during loading? %?
34. Average loss of animal weight in transit due to deterioration? %?
35. Average amount of birds lost in transit due to mortality? %?
36. Losses during unloading? %?
37. At the point of sale, what facilities are available? Please state the costs of these facilities.
    - Cages for keeping animals
    - Food and water for animals
    - Veterinary care
    - Refrigerated storage
    - Other(Specify)
38. Average loss of animal weight during marketing/sale due to deterioration?
39. Average amount of birds lost during marketing/sale due to mortality?
40. What are the most important causes of your DOC losses (Death, weight loss and health deterioration)?

3	2	1
Very important cause of losses	Somewhat important cause of losses	Not important cause of losses

    - Disease/infection
    - Lack of veterinary services/medicines
    - Poor storage facilities

- Lack of food/water
- Inadequate containers/cartons
- Overloading of cartons
- Inadequate trucks
- Poor handling
- Loading of vehicle
- Delays in transit
- Unreliability of transit
- Other (specify)

1. Do you use a conveyance company/freight forwarder to assist with official documentation? What is the cost of this?
2. What official documentation are you required to obtain, and what are the fees?
   E.g. Health and vaccination certificates, export permits

Document	Fee

3. Control Charges (please specify if paid by trader or transporter and per what unit)
   - Official Customs charges
   - Unofficial Customs charges
   - Official Police and Gendarme charges
   - Unofficial Police and Gendarme charges
   - Transport union charges
   - Heath/veterinary costs
   - Costs of permits and licenses

41. Potential projects. Which of the following projects would be most beneficial to the DOC value chain in relative terms :

3	2	1
Extremely Beneficial	Somewhat Beneficial	Not beneficial

- Rest stops with facilities for storing DOCs
- Truck design to accommodate the needs of transporting DOCs
- Availability of veterinary services
- Truck weigh stations
- Loading and unloading center for trucks
- Freight exchange or freight information center
- Training on good handling of DOCs
- Availability of refrigerated/climatized trucks for transporting DOCs or processed chicken products
- Greater availability of competitively priced transportation products
- Other (Please describe)

Day-Old Chick Transportation Survey

This survey is being carried out by Abt Associates under the Expanded Agribusiness and Trade Promotion (E-ATP) Project. E-ATP is a West Africa regional project funded by USAID. The purpose of the survey is to measure the handling and transportation costs associated with moving poultry from production zones to consumer markets in West Africa. By identifying the current handling and transportation practices, the project aims to identify ways of reducing excess transport and logistics costs, and thereby increasing sales product value to producers and reduce costs to consumers.

Thank you

Traders (Collectors/Wholesalers/Retailers)

Family Name:
First Name:
Gender:
Telephone/email:
Date:
Location:

1. What type of DOCs do you trade?
   - Layers
   - Broilers
   - Cockerels
   - Other (please specify)
2. Who do you buy from?
   - Traditional/backyard poultry farmer
   - Large producer
   - Other (please specify)
3. Purchase origin of DOCs?
4. Amount of DOCs you have bought since January 2011
5. Biosecurity measures taken?
6. Who do you sell to?
   - Large producer
   - Traders
   - End user/local market
   - Slaughterhouse/Processor
   - Restaurants/Hotels
   - Other (please specify)
7. Destination city of sale:
8. Average peak purchase price for your DOCs (per carton/per head/per kg: specify unit)
9. Average low purchase price for your DOCs (per carton/per head/per kg: specify unit)
10. Average peak sales price for your DOCs (per carton/per head/per kg: specify unit)
11. Average low sales price for your DOCs (per carton/per head/per kg: specify unit)
12. What are the most important factors in the price of your DOCs?

3	2	1
Very important factor	Somewhat important factor	Not important factor

   - Weight
   - Condition and health of the bird
   - Type of bird
   - Sex of the bird
   - Color of the bird
   - Other (please specify)

13. How do you transport DOCs from the purchase area to the location of sale?
    - Hire a truck
    - Not applicable – transport arranged by producer
    - Use my own truck
    - Producers deliver poultry to me
    - Other(specify)
14. If you use a truck, do you:
    - Pay an agent to find trucks? Cost?
    - Ask for cost quotations from different freight companies
    - Have a long-term contract/agreement with a preferred transport partner
    - Use your own vehicle
    - Other (please specify)
15. Cost of transporting your DOCs from point of purchase to destination market:
    - Cost of loading truck
    - Cost of freight services
    - Cost of unloading truck
    - Other: please explain
16. How many cartons/cages per truck?
17. How many birds per cage/carton?
18. How many cartons/kg per truck load?
19. Distance from production area to the sale area (km)
20. Length of time in hours to travel from production area to the sale area:
    - Average
    - Minimum
    - Maximum
21. Main cause of delays?
22. Are the trucks modified with cages to keep the animals protected during transit?
23. Are the trucks able to control the temperature in the cabin for the DOCs?
24. Are the trucks disinfected before and after transport of the DOCs?
25. What other biosecurity measures during transit?
26. During transit, what facilities are available? Please state the costs of these facilities.
    - Rest stops with cages for keeping animals
    - Food and water for animals
    - Veterinary care
    - Other(Specify)
27. At the point of sale, what facilities are available? Please state the costs of these facilities.
    - Cages for keeping animals
    - Food and water for animals
    - Veterinary care
    - Other(Specify)
28. Do you store the DOCs? How?
    In what sorts of facilities/conditions do you store the DOCs?
    What is the cost of this storage?
    What is the % loss of DOCs during storage?
29. Average loss of animal weight in transit due to death or deterioration:
    - During purchase
    - During loading
    - During transit
    - During unloading
    - During storage
    - During marketing
26. Average amount of birds lost due to mortality:

- During purchase
- During loading
- During transit
- During unloading
- During storage
- During marketing

30. What are the most important causes of your DOC losses?

3	2	1
Very important cause of losses	Somewhat important cause of losses	Not important cause of losses

Cause	During transit	During marketing
Disease/infection		
Lack of veterinary services/medicines		
Poor storage facilities		
Lack of food/water		
Inadequate containers/cartons		
Overloading of cartons		
Inadequate trucks		
Poor handling		
Loading of vehicle		
Delays in transit		
Unreliability of transit		
Other (specify)		

31. Do you use a conveyance company/freight forwarder to assist with official documentation? What is the cost of this?
32. What official documentation are you required to obtain, and what are the fees?
    E.g. Health and vaccination certificates, export permits

Document	Fee

33. Control Charges (please specify if paid by trader or transporter and per what unit)
    - Official Customs charges
    - Unofficial Customs charges
    - Official Police and Gendarme charges
    - Unofficial Police and Gendarme charges
    - Transport union charges
    - Heath/veterinary costs
    - Costs of permits and licenses
34. Potential projects. Which of the following projects would be most beneficial to the DOC value chain in relative terms :

3	2	1
Extremely Beneficial	Somewhat Beneficial	Not beneficial

- Reduction in number of checkpoints along the road
- Truck design to accommodate the needs of transporting DOCs
- Weigh stations
- Road infrastructure repairs/pavement?
-
- Loading and unloading center for trucks
- Freight exchange or freight information center
- Training on good handling of DOCs
- Availability of refrigerated/climatized trucks for transporting DOCs or processed chicken products
- Greater availability of competitively priced transportation
- Other (Please describe)

Day-Old Chick Transportation Survey

This survey is being carried out by Abt Associates under the Expanded Agribusiness and Trade Promotion (E-ATP) Project. E-ATP is a West Africa regional project funded by USAID. The purpose of the survey is to measure the handling and transportation costs associated with moving poultry from production zones to consumer markets in West Africa. By identifying the current handling and transportation practices, the project aims to identify ways of reducing excess transport and logistics costs, and thereby increasing sales product value to producers and reduce costs to consumers.

Thank you

Transporters/drivers

Family Name:
First Name:
Gender:
Telephone/email:
Date:
Location:

1. Corridor usually travelled?
2. Route followed?
3. Number of trips per month?
4. Number of trips with trucks returning empty per month?
5. How do you advertise your services and find customers?
6. What price do you charge?
7. Do you have a lot of competitors?
8. How do you determine price? Does the price vary?
9. Do you sign formal contracts with your customers?
10. How is payment taken? (e.g. cash upfront/installments/at the end of the journey)
11. Are vehicles equipped with climate control/ventilation? What are the costs? Why/why not use them?
12. What biosecurity measures do you take?
13. Are you aware of the importance of biosecurity?
14. Control costs (please specify if paid by transporter or trader)
    - Road tolls
    - Official Customs charges
    - Unofficial Customs charges
    - Official Police and Gendarme
    - Unofficial Police and Gendarme
    - Transport union charges
    - Heath/veterinary costs
    - Costs of permits and licenses
    - Other
15. Transportation delays
    - Time of waiting from between truck arrival and loading (in hours)
    - Time of loading the truck in origin city
    - Average delay in crossing the border
    - Average delay waiting at checkpoints
    - Number of checkpoints crossed between origin city and destination city
    - Number of truck breakdowns
    - Hours of delay for truck breakdowns
    - Other delay (please specify)
    - Time spent from arrival to unloading of the truck in destination city
    - Time spent unloading the truck in destination city
16. Potential projects. Which of the following projects would be most beneficial to the DOC transportation industry in relative terms :

3	2	1
Extremely Beneficial	Somewhat Beneficial	Not beneficial

- Reduction in number of checkpoints along the road
- Weigh stations
- Road infrastructure repairs/pavement
- Truck design to accommodate the needs of transporting DOCs
- Loading and unloading center for trucks
- Freight exchange or freight information center
- Training on good handling of DOCs
- Training on truck maintenance
- Training on truck fleet management
- Training on biosecurity
- Availability of refrigerated/climatized trucks for transporting DOCs or processed chicken products
- Other (Please describe)

Day-Old Chick Transportation Survey

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Thank you

Market

Family Name:
First Name:
Gender:
Telephone/email:
Date:
Location:

1. Market infrastructure description (include costs)
   - Loading and unloading
   - Storage
   - Biosecurity
   - Sale/display
2. Potential projects
   - Loading and unloading
   - Storage
   - Biosecurity
   - Sale/display

Day-Old Chick Transportation Survey

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Thank you

Buyer

Family Name:
First Name:
Gender:
Telephone/email:
Date:
Location:

4. What type of DOCs do you buy?
   - Layers
   - Broilers
   - Cockerels
   - Other (please specify)
5. Who do you buy from?
   - Traditional/backyard poultry farmer
   - Large producer
   - Trader
   - Other (please specify)
6. Purchase origin of DOCs?
7. Amount of DOCs you have bought since January 2011?
8. Average peak purchase price for your DOCs (per carton/per head/per kg: specify unit)
9. Average low purchase price for your DOCs (per carton/per head/per kg: specify unit)
10. What are the most important factors in the purchase price of your DOCs?

3	2	1
Very important factor	Somewhat important factor	Not important factor

   - Weight
   - Condition and health of the bird
   - Type of bird
   - Sex of the bird
   - Color of the bird
   - Other (please specify)
11. How do you transport DOCs from the purchase area to your facility?
   - Hire a truck
   - Not applicable – transport arranged by producer
   - Use my own truck
   - Producers deliver poultry to me
   - Other(specify)
12. If you use a truck, do you:
   - Pay an agent to find trucks
   - Ask for cost quotations from different freight companies
   - Have a long-term contract/agreement with a preferred transport partner
   - Use your own vehicle
   - Other (please specify)
13. Cost of transporting your DOCs from point of purchase to your facility:

- Cost of loading truck
- Cost of freight service
- Cost of unloading truck (per carton/per head/per kg: specify unit)
- Other: please explain

14. How many cartons/cages per truck?
15. How many birds per cage/carton?
16. How many cartons/kg per truck load?
17. Length of time in hours to travel from production area to your facility:
    - Average
    - Minimum
    - Maximum
18. Main cause of delays?
19. Are the trucks modified with cages to keep the animals protected during transit?
20. Are the trucks able to control the temperature in the cabin for the DOCs?
21. Are the trucks disinfected before and after transport of the DOCs?
22. What other biosecurity measures during transit?
23. During transit, what facilities are available? Please state the costs of these facilities.
    - Rest stops with cages for keeping animals
    - Food and water for animals
    - Veterinary care
    - Other(Specify)
24. At your facility, what services are available? Please state the costs of these.
    - Cages for keeping animals
    - Food and water for animals
    - Veterinary care
    - Other(Specify)
25. Average loss of animal weight in transit due to death or deterioration:
    - During purchase
    - During loading
    - During transit
    - During unloading
27. Average amount of birds lost due to mortality:
    - During purchase
    - During loading
    - During transit
    - During unloading
26. What are the most important causes of your DOC losses?

3	2	1
Very important cause of losses	Somewhat important cause of losses	Not important cause of losses

Cause	During transit	During marketing
Disease/infection		
Lack of veterinary services/medicines		
Poor storage facilities		
Lack of food/water		
Inadequate containers/cartons		
Overloading of cartons		
Inadequate trucks		
Poor handling		

Loading of vehicle		
Delays in transit		
Unreliability of transit		
Other (specify)		

27. Do you use a conveyance company/freight forwarder to assist with official documentation? What is the cost of this?
28. What official documentation are you required to obtain, and what are the fees?
    E.g. Health and vaccination certificates, export permits

Document	Fee

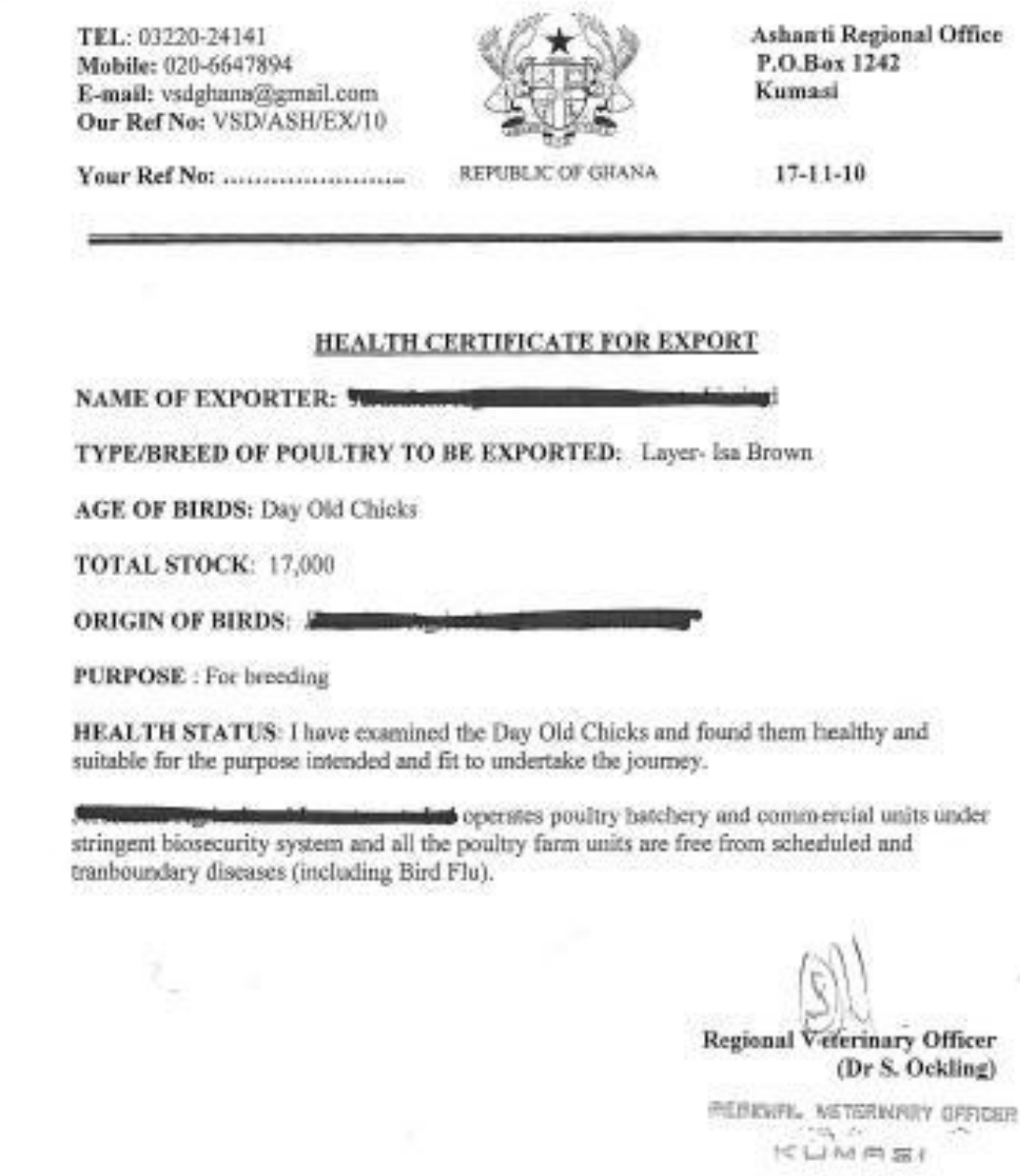
29. Control Charges (please specify if paid by trader or transporter and per what unit)
    - Official Customs charges
    - Unofficial Customs charges
    - Official Police and Gendarme charges
    - Unofficial Police and Gendarme charges
    - Transport union charges
    - Heath/veterinary costs
    - Costs of permits and licenses
30. Potential projects. Which of the following projects would be most beneficial to the DOC value chain in relative terms :

3	2	1
Extremely Beneficial	Somewhat Beneficial	Not beneficial

- Reduction in number of checkpoints along the road
- Truck design to accommodate the needs of transporting DOCs
- Weigh stations
- Road infrastructure repairs/pavement?
- Loading and unloading center for trucks
- Freight exchange or freight information center
- Training on good handling of DOCs
- Availability of refrigerated/climatized trucks for transporting DOCs or processed chicken products
- Greater availability of competitively priced transportation
- Other (Please describe)

ANNEX D: DOCUMENTATION OBSERVED

Veterinary Export permit for Ghana



TEL: 03220-24141
Mobile: 020-6647894
E-mail: vsdghana@gmail.com
Our Ref No: VSD/ASH/EX/10

Your Ref No: .....

REPUBLIC OF GHANA

Ashanti Regional Office
P.O.Box 1242
Kumasi

17-11-10

HEALTH CERTIFICATE FOR EXPORT

NAME OF EXPORTER: [redacted]

TYPE/BREED OF POULTRY TO BE EXPORTED: Layer- Isa Brown

AGE OF BIRDS: Day Old Chicks

TOTAL STOCK: 17,000

ORIGIN OF BIRDS: [redacted]

PURPOSE : For breeding

HEALTH STATUS: I have examined the Day Old Chicks and found them healthy and suitable for the purpose intended and fit to undertake the journey.

[redacted] operates poultry hatchery and commercial units under stringent biosecurity system and all the poultry farm units are free from scheduled and tranboundary diseases (including Bird Flu).

Regional Veterinary Officer
(Dr S. Ockling)

REGIONAL VETERINARY OFFICER
KUMASI

Veterinary Import Permit, Togo

MINISTERE DE L'AGRICULTURE,
DE L'ELEVAGE ET DE LA PECHE.

CABINET

SECRETARIAT GENERAL

DIRECTION DE L'ELEVAGE
N° 0307 /MAEP/CAB/SG/DE

REPUBLIQUE TOGOLAISE
Travail-Liberté-Patrie

Lomé, le 24 MARS 2010

AUTORISATION D'IMPORTATION D'ANIMAUX ET/OU VIANDES

LE MINISTRE DE L'AGRICULTURE, DE L'ELEVAGE ET DE LA PECHE

Vu l'arrêté interministériel n° 78/MAEP/MCIA du 25 octobre 2005, portant interdiction d'importation de volailles vivantes et de viandes de volailles ;
Vu l'arrêté n° 69/MAEP/CAB/SG/DEP du 12 décembre 2006, portant fixation des conditions d'importation et de dépotage d'animaux vivants et de denrées alimentaires d'origine animale ;
Vu le dossier de demande de l'importateur enregistré sous le n° 0955/MAEP du 17/03/2010 ;

AUTORISE :

[redacted] à importer les volailles ci-après.

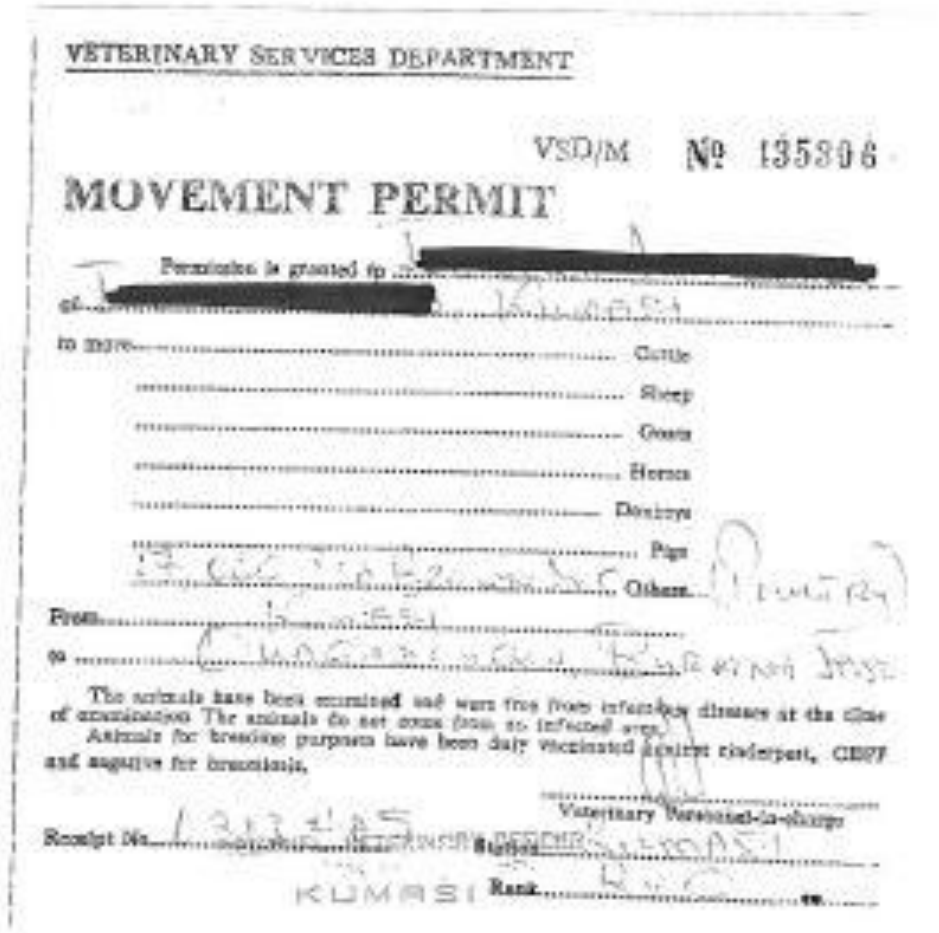
Désignation	:	Poussins (Pondeuses) d'un jour
Nombre total	:	4.500
Date d'embarquement	:	29/03/2010
Date d'arrivée	:	29/03/2010
Provenance	:	KUMASI (GHANA)

Pour le Ministre et P.O.
Le Directeur de Cabinet

KONLANI K. Dindiogue

N. B. : Le transfert des oiseaux du GHANA au TOGO par la frontière de Kodjoviakopé doit se faire sous le contrôle du Chef de la Division du Contrôle Vétérinaire (DCV) de la Région Maritime

Ghanaian Veterinary Movement Permit



VETERINARY SERVICES DEPARTMENT

VSD/M № 135806

MOVEMENT PERMIT

Permission is granted to [redacted]

of [redacted]

to move ..... Cattle

..... Sheep

..... Goats

..... Horses

..... Donkeys

..... Pigs

..... Others

From .....

to .....

The animals have been examined and were free from infectious disease at the time of examination. The animals do not come from an infected area.

Animals for breeding purposes have been duly vaccinated against rinderpest, CBPP and anguina for trypanosomiasis.

Veterinary Personnel-in-charge

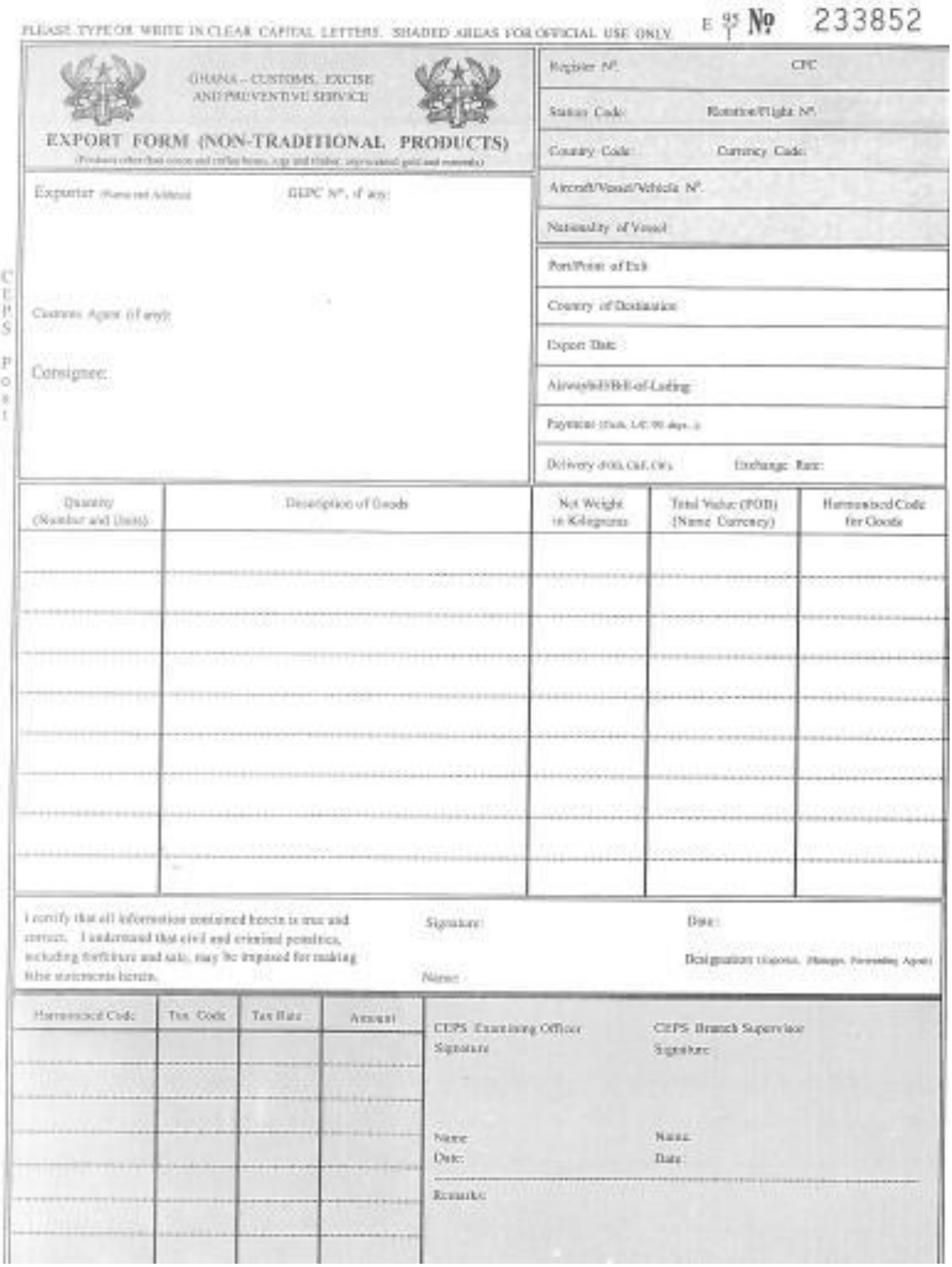
Receipt No. .....

Station .....

KUMASI

Rank .....

Ghanaian Customs Export Document



PLEASE TYPE OR WRITE IN CLEAR CAPITAL LETTERS. SHADED AREAS FOR OFFICIAL USE ONLY. E 95 № 233852

GHANA – CUSTOMS, EXCISE AND PREVENTIVE SERVICE

EXPORT FORM (NON-TRADITIONAL PRODUCTS)

(Products other than cocoa and coffee beans, scrap and timber, unprocessed gold and minerals)

Register №: CPC:

Station Code: Runsite/Flight №:

Country Code: Currency Code:

Aircraft/Vessel/Vehicle №:

Nationality of Vessel:

Port/Point of Exit:

Country of Destination:

Export Date:

Airway bill/B/L-of-Lading:

Payment (Cash, L/C, 90 days...):

Delivery (FOB, C&F, CIF): Exchange Rate:

Exporter (Name and Address): GEPC №, if any:

Customs Agent (if any):

Consignee:

CEPS Post

Quantity (Number and Units)	Description of Goods	Net Weight in Kilograms	Total Value (FOB) (Name Currency)	Harmonized Code for Goods

I certify that all information contained herein is true and correct. I understand that civil and criminal penalties, including forfeiture and sale, may be imposed for making false statements herein.

Signature: Date:

Name: Designation (Exporter, Manager, Forwarding Agent):

Harmonized Code	Tax Code	Tax Rate	Amount

CEPS Examining Officer Signature: Name: Date:

CEPS Branch Supervisor Signature: Name: Date:

Remarks: