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## **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 Millet/Sorghum (FY 2010)**

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

**Submitted to:** Michael L. Wyzan Ph.D.  
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# EXPANDED AGRIBUSINESS AND TRADE PROMOTION

TRANSPORT AND LOGISTICS COSTS STUDY FOR MILLET &  
SORGHUM

JUNE 2011

June 2011

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# LIST OF ABBREVIATIONS

<b>ATP</b>	Agribusiness and Trade Promotion Project
<b>AU-NEPAD</b>	African Union- New Partnership for Africa's Development
<b>CAADP</b>	Comprehensive Africa Agricultural Development Programme
<b>CMTR</b>	Conseil Malien des Transporteurs Routiers
<b>E-ATP</b>	Expanded Agribusiness and Trade Promotion Project
<b>FCFA</b>	CFA Francs
<b>IICEM</b>	Integrated Initiatives for Economic Growth in Mali
<b>IRTG</b>	Improved Road Transport Governance
<b>KM</b>	Kilometers
<b>OPAM</b>	Office des Produits Agricoles au Mali
<b>SPS</b>	Sanitary and Phyto Sanitary
<b>USAID</b>	United States Agency for International Development
<b>USD</b>	US Dollars
<b>WFP</b>	World Food Program
<b>WRS</b>	Warehouse Receipts Scheme

# ACKNOWLEDGEMENTS

This Transport and Logistics Assessment was carried out by a team from CARANA Corporation, subcontractor to Abt Associates on the USAID Expanded Agribusiness and Trade Promotion (E-ATP) Project:

- 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

The field research for this assessment was shared between USAID E-ATP and the USAID *Integrated Initiatives for Economic Growth in Mali* (IICEM) Project, with part of the field research being completed by Salihou Guiro, Transport Adviser to IICEM.

This final report is authored principally by Laura Jane Busch. The author gratefully acknowledges the excellent research and logistical support of the following individuals:

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# EXECUTIVE SUMMARY

This assessment finds that for millet and sorghum along the corridors studied<sup>1</sup>, approximately 57% of final market price is represented by transport and logistics costs. Moreover, approximately 33% of end market price is represented by “extra costs”, or those costs considered as unjustified, inefficient or too expensive when compared with an optimized scenario. The main drivers of these high transport and logistics costs are found to be inadequate on farm logistics and market logistics equipment and processes, as well as expensive and inefficient transport services. This study also finds that cross-border flows of millet and sorghum are constrained by these high costs, and thus dependent on sufficiently high price differentials between regional markets to sustain traders’ profit margins.

In the context of global fears about rising food prices and food insecurity, this finding is tremendously important. Regional trade in West Africa is fundamental to food security and reducing vulnerability to external price shocks, as well as lifting millions out of poverty. But, faced with such high transport and logistics costs, traders are constrained in moving food staples like millet and sorghum from surplus to deficit areas in the region. However, the potential exists to remove many of the inefficiencies and extra costs in the value chain system, improve economic incentives to trade, and increase regional price arbitrage.

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<sup>1</sup> Millet and Sorghum: Sikasso-Dakar, Millet: Koutiala-Bobo Dioulasso-Ouagadougou

# OVERVIEW OF FINDINGS AND RECOMMENDATIONS

FINDING	RECOMMENDATIONS
<p><b>LACK OF ACCESS TO QUALITY ON FARM LOGISTICS EQUIPMENT</b></p> <p>A key driver of cost, losses and reduced quality of millet and sorghum is lack of access to good quality market logistics equipment, including de-shelling machines and weighing equipment. On farm logistics costs constitute up to 37% of total transport and logistics costs, of which up to 60% is considered to be “extra costs”. Reducing these costs would allow farmers to capture greater value from their production.</p>	<p><b>PILOT ACCESS TO FINANCE PROGRAM</b></p> <p>Simple business plans based on cost savings could be put in place with the equipment asset used as collateral- purchased on an individual or collective basis.</p> <p><b>PARTNERSHIP WITH EQUIPMENT SUPPLIER</b></p> <p>Farm logistics supplier identified, USAID E-ATP could negotiate a supply partnership.</p>
<p><b>POST HARVEST HANDLING PRACTICES REDUCE QUALITY</b></p> <p>Quality issues are a significant problem for traders in the millet and sorghum value chain, and an important constraint to expanded intra-regional trade. Impurities in millet and sorghum were observed as approximately 3%. Traders cited they would be willing to pay a significant premium for better quality products. On farm storage losses are also significant (up to 8%), but easily avoidable.</p>	<p><b>TRAINING ON POST HARVEST HANDLING</b></p> <p>Simple measures such as drying grains out on a tarpaulin, protecting them from pests and ensuring no impurities are accidentally introduced would be beneficial alongside awareness building on the potential price premiums that could be obtained by implementing these practices.</p> <p><b>CAPACITY BUILDING FOR PRODUCER COOPERATIVES TO ENCOURAGE FORMAL CONTRACTING</b></p> <p>Formally introducing buyer led demands on producers in this way is one solution to the quality and unreliability problem.</p> <p><b>TRAINING ON BEST PRACTICE STORAGE TECHNIQUES</b></p> <p>Storage best practices such as use of palettes to improve aeration, application of insecticides to reduce insects and controlling rodents were observed to reduce on farm storage losses by a significant amount. Training on these simple and easy to implement practices, as well as the potential benefits of employing them could reduce storage losses to an acceptable level.</p>
<p><b>INADEQUATE WEIGHING EQUIPMENT IN MARKETS</b></p> <p>Lack of weighing equipment is a major concern to buyers in terms of unreliability, this problem was observed to be particularly significant in Bobo Dioulasso and surrounding production areas, but may</p>	<p><b>ACCESS TO FINANCE</b></p> <p>USAID E-ATP could pilot an access to finance programs for certain market areas in the Bobo-Dioulasso region such as Bama, Banzon and Bobo Dioulasso itself , for either individual purchase (by market traders), or collective purchase, perhaps by the market association.</p>

<p>well be a problem in other areas of the region. Up to 4.56% weight difference after purchase was observed during this study.</p>	<p>Financing could be secured on the assets.</p> <p><b>USE OF STANDARD WEIGHTS</b> In conjunction with procurement of weighing equipment, the use of standard weights should also be encouraged.</p> <p><b>PARTNERSHIP WITH EQUIPMENT SUPPLIER</b> Market logistics supplier identified, USAID E-ATP could negotiate a supply partnership.</p> <p><b>PARTNERSHIP IN BRANDING QUALITY, ACCURATELY WEIGHED PRODUCTS</b> The research team has identified two potential partners interested in investing in the production of high quality, zero impurity, accurately weighed cereals for sale to mass markets. Expansion and scaling up of initiatives like this regionally would help to disseminate the message to the bottom of the value chain that quality and reliability is important and that buyers are willing to pay a premium.</p>
<p><b>AVOIDABLE STORAGE LOSSES</b> Unnecessary storage losses are occurring in market areas. These storage losses account for up to 5.86% product loss along the logistics chain. Extra costs on market storage constitute up to 13% of total observed transport and logistics costs.</p>	<p><b>TRAINING AND AWARENESS BUILDING ON BEST PRACTICE STORAGE TECHNIQUES</b> Training on these simple and easy to implement practices, as well as the potential benefits of employing them could reduce storage losses to an acceptable level.</p> <p><b>PARTNERSHIPS WITH BUYERS</b> Successful example of a WFP's buyer led initiative to ensure high quality storage of products in their supply chain to improve quality and reliability. USAID E-ATP should work with its network of larger buyers to assess their willingness to participate in similar initiatives.</p> <p><b>WRS PILOT EXPANSION</b> Not only because high quality, purpose built warehousing is scarce, but also because it could improve access to credit to purchase equipment such as de-shelling machines, weighing scales and portable bag sewing machines as recommended in this study.</p>
<p><b>LACK OF INFORMATION FOR BOTH TRADERS AND TRANSPORTERS ON EXPORTING</b> Traders expressed difficulty in obtaining appropriate export documentation, lack of information on the existence of export bans and for those who did not already engage in cross border trade, a lack of knowledge about where to begin. Truckers were often confused or unaware of their obligations regarding appropriate documentation for their vehicles and their rights and obligations for various payments</p>	<p><b>MARKET INFORMATION AND EXPORT PROMOTION CENTERS</b> USAID E-ATP could pilot the implantation of market information and export promotion centers that could provide this information to traders and truckers, as well as the required documentation. These centers could also provide training and information on best practice storage and handling techniques, as well as advice on contracting- such as providing pro-forma contracts.</p> <p><b>EXPANSION OF INTRA-REGIONAL BOURSE TRADE FAIRS</b></p>

<p>(official and non official) per journey.</p>	<p>Bourses were highlighted by several value chain stakeholders as an extremely effective means of building formal supply/customer relationships. USAID ATP already sponsors these events, but should consider expanding them within the region or increasing their frequency.</p>
<p><b>LOW PROFESSIONALISM AND HIGH INEFFICIENCY OF THE TRANSPORT SECTOR</b> Lack of professionalism and informality in the transport sector is a key cause of inefficiency. Transport costs are the most important driver of costs in this analysis (up to 40% of total transport and logistics cost), of which up to 42% is considered “extra cost”. Transport operatives do not generally respect proper labor rights for drivers and assistants, and lack of awareness of drivers of their rights with respect to control officials perpetuates the problem of road harassment.</p>	<p><b>ADVOCACY AND AWARENESS BUILDING</b> USAID E-ATP should focus where possible on improving awareness of the issues through its information dissemination and advocacy activities (such as IRTG and Borderless), with particular focus on reaching out to drivers and those who are on the front lines of trucking services.</p>
<p><b>REPETITIVE CONTROL PROCEDURES</b> Border and control procedures are repetitive and not streamlined. At the border the various agencies such as Customs, Gendarme, and Police do not work together coherently, with the same checks and procedures being repeated many times over.</p>	<p><b>ADVOCACY TO STREAMLINE PROCEDURES</b> Advocacy to streamline procedures, for better division of responsibility at borders (each agency checking separate things). Furthermore, along the road municipal taxes are extracted as a separate checkpoint, this could be collected at toll booths to remove this additional stop/slowdown for trucks.</p>
<p><b>MANUAL HANDLING PRACTICES ARE PROBLEMATIC</b> Manual handling of 100kg sacks is not only difficult and dangerous to the handlers, but is also a key cause of physical loss of product as the bags break open.</p>	<p><b>BUSINESS PLAN FOR REDUCED SACK WEIGHT</b> Working with existing network on sack suppliers, USAID E-ATP could explore the feasibility of introducing a range of sacks with lower weight to the mainstream market, possibly by marketing through handlers themselves.</p>
<p><b>POOR QUALITY SACKS</b> Poor quality, plastic, non durable sacks are cheap to buy but lead to many extra costs in the value chain including physical loss of product and the need to re-bag to replace worn out sacks.</p>	<p><b>FEASIBILITY STUDY FOR JUTE SACK INTRODUCTION</b> USAID E-ATP could conduct a feasibility study on the introduction of jute sacks to the millet and sorghum market, looking at market interest, ways to reduce consumer cost, and suitability for millet and sorghum.</p> <p><b>BUYER PARTNERSHIPS</b> Examples such as OPAM and WFP show that buyer-led initiatives for better quality sacks can be successful. USAID E-ATP should work with its network of buyers in the region to assess their willingness to implement buyer-led initiatives such as these.</p>
<p><b>POOR QUALITY BAG CLOSURE</b> Traditional sewing methods are not only expensive, but also are a key cause of rips in sacks from which losses occur.</p>	<p><b>PARTNERSHIP WITH AUTOMATIC BAG SEWING MACHINE SUPPLIERS</b> Suppliers identified, USAID E-ATP could seek to partner with these suppliers to encourage them to</p>

	<p>sell directly to market operators, perhaps by negotiating standard contracts.</p> <p><b>ACCESS TO FINANCE</b></p> <p>USAID E-ATP could pilot an access to finance programs for certain market areas in the region to encourage the purchase of these devices, on a collective basis, or even by an entrepreneur who wishes to sell this service to market operators.</p>
<p><b>CERTAIN OFFICIAL COSTS ARE OF QUESTIONABLE VALUE</b></p> <p>Some official costs for transporting cereals did not appear to add value, and also increase unnecessary bureaucracy.</p>	<p><b>ADVOCACY FOR REVIEW OF CERTAIN OFFICIAL COSTS</b></p> <ul style="list-style-type: none"> <li>- CMTR “ristourne”</li> <li>- EMAS (Entrepots Malien au Senegal)</li> <li>- Travail supplémentaire</li> <li>- Statistical taxes</li> </ul>

# 1. INTRODUCTION

## 1.1 BACKGROUND

The Expanded Agribusiness and Trade Promotion Project (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 (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 lower levels of regional trade. Furthermore, these barriers limit the free movement of agricultural from production surplus areas to deficit areas exacerbate food insecurity in this sub-region in the region.

GENERALLY ACCEPTED FACTORS THAT INCREASE TRANSPORT AND LOGISTICS COSTS

Limited and unbalanced trade flows	Haphazard application of regional inter-state transport and transit treaties
Excessive road checkpoints	High vehicle operating costs
Bureaucratic procedures at border posts	Informal payments
Inadequate road and logistics infrastructure	Overloading of trucks
Lack of competition in trucking services	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 millet/sorghum Transport and Logistics assessment aims to understand how these factors interact with the overall operation of the millet/sorghum 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 best practice guide. This study will also look for business opportunities to facilitate the creation of new public-private partnerships for investment in millet/sorghum infrastructure and to improve the overall transport and logistics operations in West Africa.

The specific corridor of focus for the study is the Bobo Dioulasso-Sikasso-Bamako-Dakar corridor.

The millet/sorghum 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.<sup>2</sup>

## 1.2 DEFINITIONS

### 1.2.1 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. For example, Teravinthorn and Raballand (2008) provide benchmark estimates for per ton kilometer charges for transport costs. 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.

### 1.2.2 COST CATEGORIES

The following table lists the main categories of costs and example costs observed in the millet and sorghum value chain studied. These costs will be further discussed in Section 3 and 4 along with the associated costs observed in the field research.

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<sup>2</sup> For a detailed explanation of the study's objectives and methodology, please see annex A

## CATEGORIES AND TYPES OF COSTS OBSERVED

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
<b>ON FARM LOGISTICS</b> All formal and informal transport and logistics charges incurred by producers post-harvest, including but not limited to drying, shelling, cleaning, bagging, and on farm storage and handling costs	<ul style="list-style-type: none"> <li>- On farm loading charges</li> <li>- On farm losses due to improper storage</li> <li>- On farm shelling services</li> <li>- On farm bagging services</li> </ul>
<b>MARKET LOGISTICS</b> All formal and informal charges for non-transport services rendered throughout the logistics process.	<ul style="list-style-type: none"> <li>- Loading and unloading charges (not including on farm loading)</li> <li>- Storage charges</li> <li>- Losses in storage</li> <li>- Cost of bags</li> <li>- Re-bagging and sewing charges</li> </ul>
<b>TRANSPORT</b> All formal and informal charges for transport services from farm to end market	<ul style="list-style-type: none"> <li>- Transport fees/charges</li> <li>- Transport Agent Fee</li> <li>- Losses during transport</li> </ul>
<b>ADMINISTRATIVE CHARGES</b> All formal and informal charges for trade facilitation services (customs, taxes, weigh stations, export documentation, and customs and forwarding agent fees)	<ul style="list-style-type: none"> <li>- Customs fees</li> <li>- Weigh station fees</li> <li>- Conseil Malien des Transporteurs Routiers</li> <li>- Entrepots Malien au Senegal</li> <li>- Road tolls</li> <li>- Municipal taxes</li> </ul>
<b>INFORMAL PAYMENTS</b> Explicit bribes paid	<ul style="list-style-type: none"> <li>- Bribes paid at checkpoints</li> <li>- Bribes paid at borders</li> </ul>

The categories capture the majority of the costs during the field research from the farm-gate to the market of final destination. When possible, copies of actual receipts were collected for formal fees<sup>3</sup>.

This report does not distinguish between different varieties of millet and sorghum, all prices and costs are shown in FCFA, and analyzed on a per Kg basis. Where relevant, an average price for millet and sorghum has been used for analysis. Monetized losses are based on cumulative loss multiplied by end market price. Please see annex A for more detail.

### 1.3 FLOWS OF MILLET AND SORGHUM

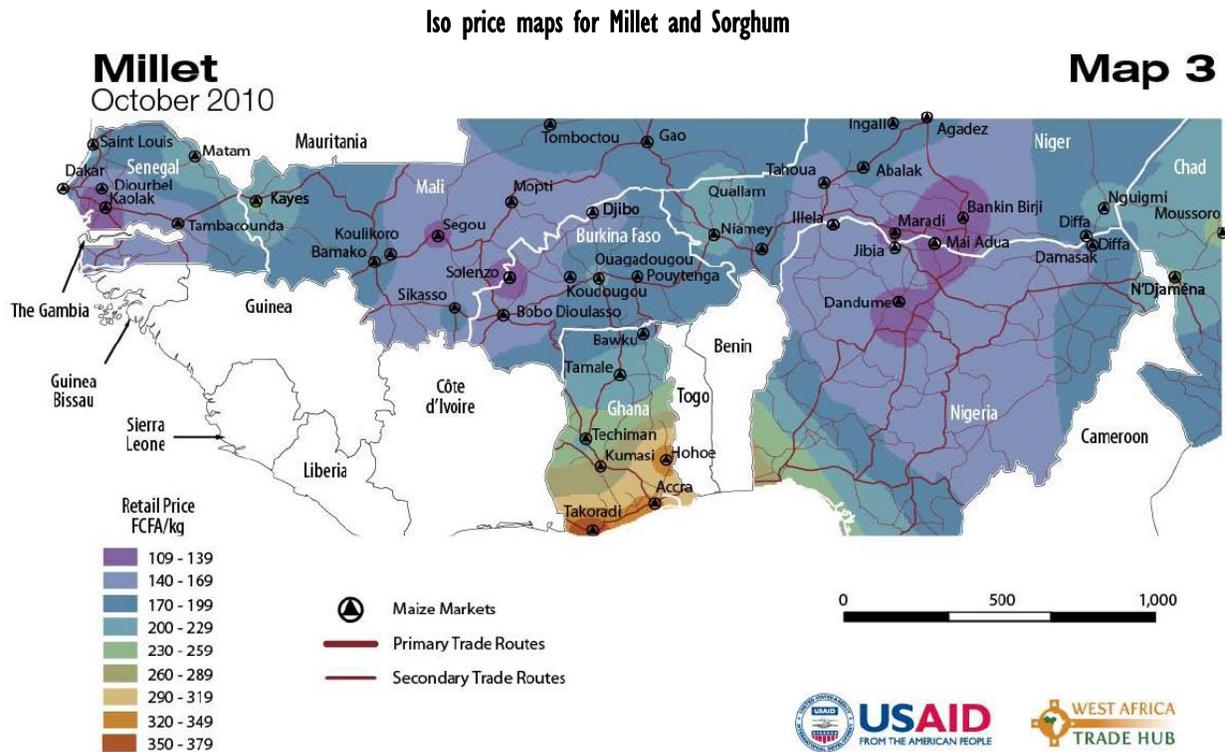
The terms of reference for the millet/sorghum Transport and Logistics Assessment call for an analysis of transport and logistics cost data along the corridor Bobo Dioulasso-Sikasso-Bamako-Dakar. During the field research, flows of both millet and sorghum were observed from Sikasso to Dakar, with traders regularly engaging in trade along this corridor.

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<sup>3</sup> See pictures throughout report.

However, no trade between Sikasso and Bobo Dioulasso was observed. Traders stated that the price differential between the markets was insufficient to cover the high perceived transport costs and produce an adequate margin. Traders cited periodic export bans on cereals as a further key reason they did not engage in cross border trade, and sourced their millet/sorghum from local production zones. Border officials at Koloko and Heremakono corroborated this, stating that little or no cereals had passed through the border.

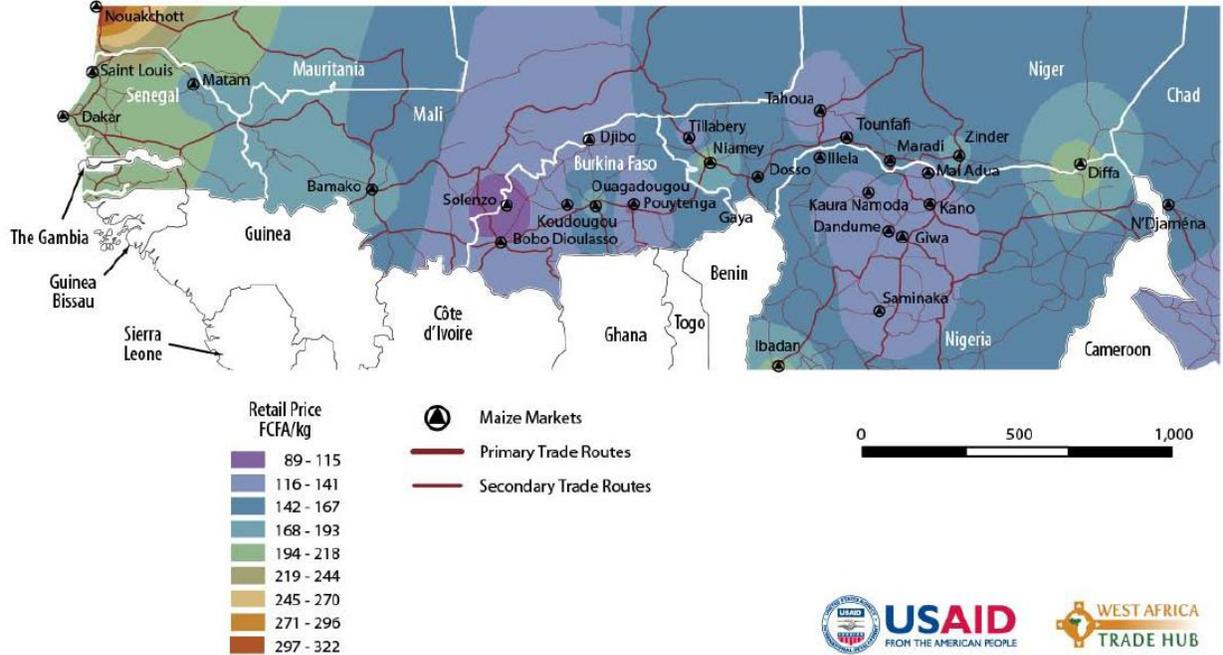
Iso-price maps recently compiled by USAID West Africa Trade Hub suggest this orientation (please see below), showing limited or no price differential between Sikasso and Bobo Dioulasso which would justify trade between these markets.



# Sorghum

October 2010

# Map 4



Conversely, the research team did observe trade in *millet* from Koutiala to Bobo-Dioulasso. Traders in both Koutiala and Bobo Dioulasso stated that when prices were right, they would occasionally engage in cross border trade in this direction. Furthermore, significant trade in both millet and sorghum was observed between Bobo Dioulasso and Ouagadougou within Burkina Faso.

In order to show a complete analysis of trade between Mali and Burkina Faso in this area, the research team was able to gather sufficient data to analyze transport and logistics costs for millet on eastbound the corridor Koutiala-Bobo Dioulasso-Ouagadougou, which are presented in this report along with analysis for millet and sorghum westbound along the Sikasso-Bamako-Dakar corridor.



## 2. SUMMARY OF TRANSPORT COST ANALYSES

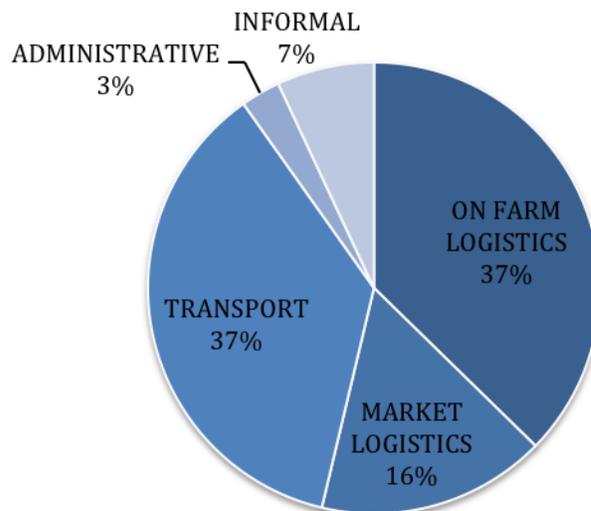
The following chapters describe in detail all transport and logistics costs for millet and sorghum traveling from Sikasso to Dakar and millet traveling from Koutiala to Ouaga via Bobo Dioulasso. These costs are then analyzed in terms of optimized costs and extra costs, to highlight transport and logistics inefficiencies along these corridors. This section summarizes these key numerical findings.

### 2.1 MILLET/SORGHUM: SIKASSO TO DAKAR

TOTAL OBSERVED TRANSPORT AND LOGISTICS COSTS FOR MILLET/SORGHUM SIKASSO-DAKAR

	FCFA/Kg	% Farm gate price	% Final Sales Price
ON FARM LOGISTICS	38.38	34%	22%
MARKET LOGISTICS	16.89	15%	10%
TRANSPORT	37.51	34%	22%
ADMINISTRATIVE	2.93	3%	2%
INFORMAL	7.18	6%	4%
<b>Total transport and logistics costs</b>	<b>102.88</b>	<b>92%</b>	<b>59%</b>

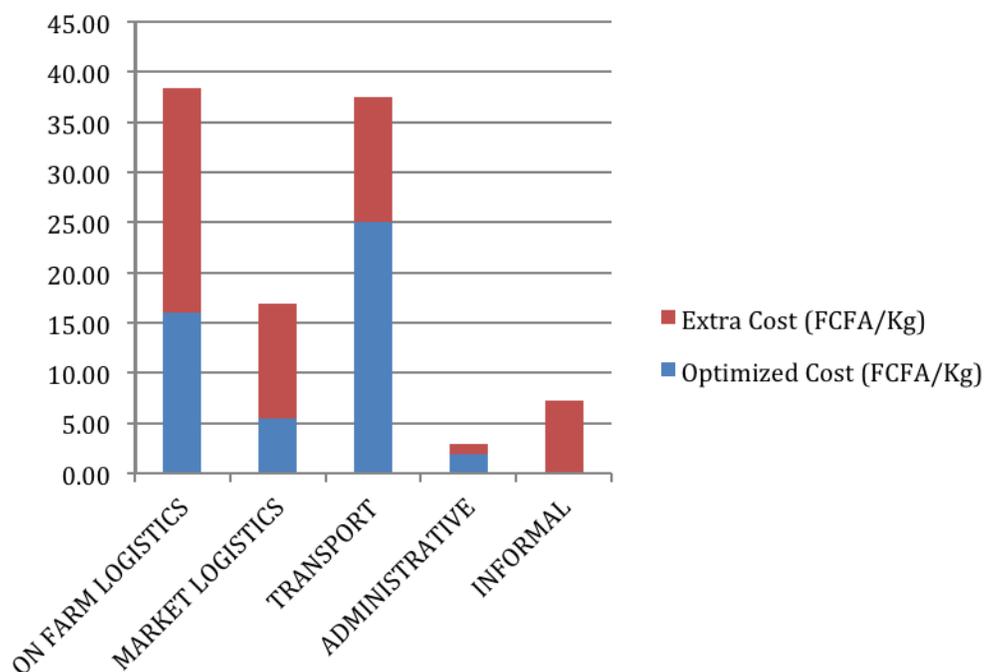
TOTAL TRANSPORT AND LOGISTICS COSTS FOR MILLET/SORGHUM SIKASSO-DAKAR



EXTRA COSTS FOR MILLET/SORGHUM SIKASSO-DAKAR

Summary: Millet/Sorghum Sikasso-Dakar	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)	% Extra cost over observed cost
ON FARM LOGISTICS	38.38	16.03	22.35	58%
MARKET LOGISTICS	16.89	5.45	11.44	68%
TRANSPORT	37.51	25.03	12.47	33%
ADMINISTRATIVE	2.93	1.89	1.04	36%
INFORMAL	7.18	0.00	7.18	100%
<b>TOTAL</b>	<b>102.89</b>	<b>48.40</b>	<b>54.48</b>	<b>53%</b>

EXTRA COSTS BY CATEGORY



PHYSICAL LOSSES

Cost Category	Item description	Observed loss	Indicative weight of sack	Cumulative loss
ON FARM LOGISTICS	Losses during drying and shelling	5.14%	0.95	5.14%
ON FARM LOGISTICS	On farm storage losses	8.00%	0.87	12.73%
TRANSPORT	Losses in transit farm to consolidation	0.47%	0.87	13.14%
TRANSPORT	Losses in transit consolidation-Sikasso	1.50%	0.86	14.44%
MARKET LOGISTICS	Storage losses in Sikasso	1.38%	0.84	15.62%
TRANSPORT	Losses in transit Sikasso-Dakar	0.98%	0.84	16.46%
MARKET LOGISTICS	Storage losses in Dakar	2.50%	0.81	18.54%
<b>Total</b>				<b>18.54%</b>

For millet/sorghum traveling from Sikasso to Dakar via Bamako, total transport and logistics costs are 102.88 FCFA/Kg, which represents 92% of producer price and 59% of end market price. Of these costs, 53% represent extra costs. Extra costs represent 31% of the end market price. Total cumulative losses along the logistics chain are 18.54%.

In order of importance, the cost components of transport and logistics costs are:

- **On farm logistics (37% of total observed costs, of which 58% is extra cost)**

In this category, the key cost drivers are fees for the rental of de-shelling machine and on farm storage losses.

- **Transport (37% of total costs, of which 33% is extra cost)**

In this category, the key cost drivers are direct transport costs, ie. price paid for transport services.

- **Market logistics (16% of total costs, of which 68% is extra cost)**

In this category, the key cost drivers are re-bagging costs (caused by the need to verify quality and remove impurities from the grain), handling costs and storage losses.

- **Informal costs (7% of total costs, of which 100% is extra cost)**

In this category, the key cost driver is bribes paid at the border in order to enter Senegal.

- **Administrative (3% of total costs, of which 36% is extra cost)**

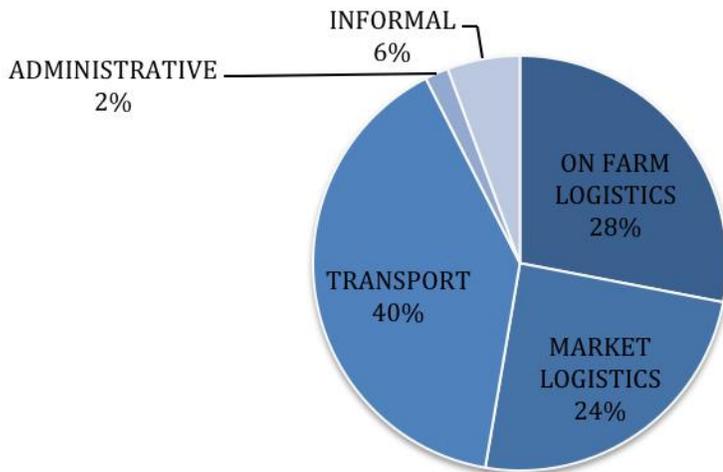
In this category, the key cost driver is axel load fines due to overloading.

## 2.2 MILLET: KOUTIALA TO OUAGA VIA BOBO DIULASSO

TOTAL TRANSPORT AND LOGISTICS COSTS FOR MILLET KOUTIALA TO OUAGA

	FCFA/KG	% Farm gate price	% Final Sales Price
ON FARM LOGISTICS	25.54	22%	15%
MARKET LOGISTICS	22.49	20%	14%
TRANSPORT	36.28	32%	22%
ADMINISTRATIVE	1.68	1%	1%
INFORMAL	5.18	5%	3%
<b>Total</b>	<b>91.18</b>	<b>80%</b>	<b>55%</b>

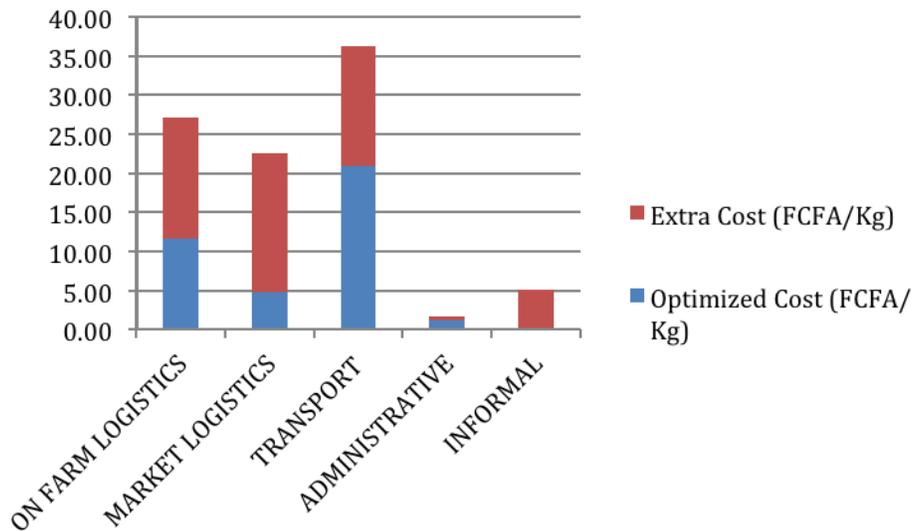
TOTAL TRANSPORT AND LOGISTICS COSTS FOR MILLET KOUTIALA TO OUAGA



EXTRA COSTS FOR MILLET KOUTIALA TO OUAGA

Summary: Millet Koutiala-Ouaga	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)	% Extra cost over observed cost
ON FARM LOGISTICS	25.54	11.63	15.41	56%
MARKET LOGISTICS	22.49	4.81	17.68	79%
TRANSPORT	36.28	20.94	15.35	42%
ADMINISTRATIVE	1.68	1.24	0.44	26%
INFORMAL	5.18	0.00	5.18	100%
	<b>91.18</b>	<b>36.12</b>	<b>58.83</b>	<b>60%</b>

EXTRA COSTS BY CATEGORY: MILLET KOUTIALA TO OUAGA



## OBSERVED LOSSES

Cost Category	Item description	Observed loss	Indicative weight of sack	Cumulative loss
ON FARM LOGISTICS	Losses during drying	1.00%	99.00	1.00%
ON FARM LOGISTICS	Losses during shelling	2.00%	97.02	2.98%
ON FARM LOGISTICS	Losses during storage	3.00%	94.11	5.89%
TRANSPORT	Losses in transit	0.38%	93.76	6.24%
MARKET LOGISTICS	Storage losses in Koutiala	0.35%	93.43	6.57%
TRANSPORT	Losses in transit	2.00%	91.56	8.44%
MARKET LOGISTICS	Storage losses in Bobo	3.75%	88.13	11.87%
TRANSPORT	Losses in transit	1.19%	87.08	12.92%
MARKET LOGISTICS	Storage losses in Ouaga	2.41%	84.98	15.02%
<b>Total</b>				<b>15.02%</b>

**For millet/sorghum traveling from Koutiala to Ouaga via Bobo, total transport and logistics costs are 91.18 FCFA/Kg, which represents 80% of producer price and 55% of end market price. Of these costs, 60% represent extra costs. Extra costs represent 35% of the end market price. Total cumulative losses along the logistics chain are 15.02%**

In order of importance, the cost components of transport and logistics costs are:

- **Transport (40% of total costs, of which 42% is extra cost)**

In this category, the key cost drivers are direct transport costs, ie. price paid for transport services.

- **On farm logistics (28% of total observed costs, of which 56% is extra cost)**

In this category, the key cost driver is fees for the rental of de-shelling machine.

- **Market logistics (24% of total costs, of which 79% is extra cost)**

In this category, the key cost drivers are storage losses.

- **Informal costs (6% of total costs, of which 100% is extra cost)**

In this category, the key cost driver is bribes paid between Koutiala and Bobo Dioulasso.

- **Administrative (2% of total costs, of which 26% is extra cost)**

In this category, the key cost drivers are municipal taxes and customs fees.



# 3. TRANSPORT AND LOGISTICS COSTS ALONG THE SIKASSO-BAMAKO-KAYES-DAKAR CORRIDOR

In this section, observed transport and logistics costs for millet and sorghum along the Sikasso-Dakar corridor are detailed and described in detail. They are 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 ON FARM LOGISTICS

On farm logistics costs observed include:

<b>COST CATEGORY</b>	<b>EXAMPLES OF COSTS OBSERVED</b>
<b>ON FARM LOGISTICS</b> All formal and informal transport and logistics charges incurred by producers post-harvest, including but not limited to drying, shelling, cleaning, bagging, and on farm storage and handling costs	<ul style="list-style-type: none"><li>- Losses during drying and shelling</li><li>- On farm loading charges</li><li>- On farm losses due to improper storage</li><li>- On farm shelling services</li><li>- On farm bagging services</li></ul>

#### 3.1.1.1 LOSSES AND COSTS DURING SHELLING AND DRYING

Post harvest, typically the millet/sorghum is dried on a tarpaulin (“bâche”) in the sun for approximately 2 weeks. The key cause of loss during drying is from animal and birds eating the crops. Producers also cited theft during the drying process as an important cause of loss.

After drying, the millet and sorghum is de-shelled mechanically, the machine is brought to the farm and the producer pays for its usage<sup>4</sup>. During mechanical de-shelling, losses are caused by the poor quality of the machine destroying the grains. Farmers stated that they would like to be able to purchase their own machines, but lacked capital to do so.

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<sup>4</sup> Interviewee in Sikasso stated that fees for use of the machine for millet/sorghum were higher than for maize as the process was more intricate, took longer and was more damaging to the machine.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA/Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM	LOSSES DURING DRYING AND SHELLING	5.14%	8.96	8.06%	5.14%	FARMER
FARM	FEEES FOR USE OF DE-SHELLING MACHINE		12.50	11.24%	7.17%	FARMER

### 3.1.1.2 ON FARM STORAGE LOSSES

Of the producers interviewed in the Sikasso region during this study, all used fairly modern, brick built storage facilities on their farms. Please see the pictures to right (Koutiala) and left (Sikasso). Significant losses occur mainly caused by rodents, insects and moisture. The producers interviewed who had implemented simple measures to prevent these losses, namely use of wooden pallets for aeration and the application of insecticides to the warehouse had been able to significantly reduce their losses by around 50%. Farmers generally store only long enough to wait for a client to purchase their millet/sorghum.



LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA/Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM	ON FARM STORAGE LOSSES	8.00%	13.23	11.89%	7.59%	FARMER

### 3.1.1.3 ON FARM BAGGING AND SEWING

The producers interviewed in the Sikasso region purchased plastic sacks and sewing materials, and hired assistance to manually fill and sew bags. 100 kg Sacks cost 250 FCFA each, filling and sewing costs 78.5 FCFA per bag.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA/Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM	ON FARM BAGGING AND SEWING	3.29	2.95%	1.88%	FARMER

### 3.1.1.4 ON FARM LOADING CHARGES

Of all the producers interviewed who used a truck to transport their millet/sorghum from farm to consolidation market, an average fee of 0.39 FCFA/Kg is charged to load each 100kg sack onto the truck.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM-ZEBOUA	ON FARM LOADING CHARGES	0.39	0.35%	0.23%	FARMER

### 3.1.2 MARKET LOGISTICS

Market logistics costs observed include:

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
<b>MARKET LOGISTICS</b> All formal and informal charges for non-transport services rendered throughout the logistics process.	<ul style="list-style-type: none"> <li>- Loading and unloading charges (not including on farm loading)</li> <li>- Storage charges</li> <li>- Losses during storage</li> <li>- Cost of bags</li> <li>- Re-bagging and sewing charges</li> </ul>

#### 3.1.2.1 HANDLING FEES

Throughout Mali and Burkina Faso, the price for loading or unloading a 100kg bag was consistently quoted as 50 FCFA. This process is entirely manual, with the handler lifting the sack on his head to load it onto the truck (see right, Sikasso), and carrying it on his back to unload it. Handling a 100kg sack manually is a very difficult and indelicate process, it is difficult for handlers to treat each sack with care so as not to cause rips and splits in the non-durable plastic material. For example, normally they are dropped or thrown to the ground rather than being placed. Traders cited manual handling practices as the key cause of sack breakage, which is the main source of in transit and storage losses (discussed below).



Furthermore, the manual handling process is dangerous to the handlers. Handlers we spoke to experienced severe back and neck pain, and had witnessed serious accidents occurring. The average daily wage for a handler is just 1,500 FCFA, and they may lift up to 100 100 kg sacks per day.

From arrival at the consolidation point to arrival in Dakar, a sack will be unloaded 3 times and loaded twice.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
ZEGOUA	UNLOADING FEE	0.50	0.45%	0.29%	TRADER
ZEGOUA	LOADING FEE	0.50	0.45%	0.29%	TRADER
SIKASSO	UNLOADING FEE	0.50	0.45%	0.29%	TRADER
SIKASSO	LOADING FEE	0.50	0.45%	0.29%	TRADER
DAKAR	UNLOADING FEE	0.50	0.45%	0.29%	TRADER
	<b>TOTAL</b>	<b>2.50</b>	<b>2.25%</b>	<b>1.45%</b>	

### 3.1.2.2 COSTS FOR CLEANING AND REMOVING IMPURITIES

Impurities in millet and sorghum were cited by the majority of traders as a major quality problem. As shown in the picture to the left (Bama), wood, parts of the plant stalk as well as rocks and other materials are introduced. As a result, traders often cleaned and re-bagged their millet and sorghum before re-sale. This is a cost caused by post harvest handling practices- the majority of impurities are introduced during the drying process. Many traders complained that impurities



were introduced deliberately by farmers to increase sack weight, and that impurities were placed in the middle or bottom of the sack so as to avoid detection if the sack was opened for inspection.

Quality issues were consistently cited as the main problem for value chain stakeholders, right up to the major buyers and processors. Larger buyers such as OPAM (Office des Produits Agricoles du Mali) and Brakina, specify quality requirements in their contracts, with maximum limits for impurities.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
SIKASSO	CLEANING TO REMOVE IMPURITIES	2.00 <sup>5</sup>	1.80%	1.15%	TRADER

<sup>5</sup> This cleaning was observed to be undertaken by approximately 40% of traders in Sikasso, and the cost has been adjusted for frequency.

### 3.1.2.3 STORAGE COSTS- SIKASSO

Traders in Sikasso utilized brick built buildings, generally with corrugated aluminum or brick roofs to store sacks of millet and sorghum while awaiting sale (see picture right, Sikasso). Traders with more resources were able to store for several months to time the market and wait for the best price, but generally storage was only observed to be undertaken for 1-2 months. For very short term storage, sacks are often stored outdoors.



Storage prices vary in Sikasso, and there appears to be significant economies of scale to be made in renting large storage space. For example, a 600 sack warehouse rents for 0.38 FCFA/Kg, whereas a 200 sack warehouse rents for 1.25 FCFA/Kg. An average value is shown below.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
SIKASSO	STORAGE IN SIKASSO- 1.5 MONTHS	1.02	0.92%	0.59%	TRADER

### 3.1.2.4 LOSSES IN STORAGE - SIKASSO

The main cause of losses during storage is rodents, insects and moisture. Very few of the traders we interviewed utilized palettes or insecticides, or took other measures to control rodents. Of those traders who did use palettes and insecticides, storage losses were minimized to a negligible level.

In one case we observed in Koutiala, the World Food Program (WFP) had specified particular storage methodology in its contract with a producer association. It had provided funding to construct a purpose built warehouse, provided palettes and insecticide treatments, good quality sacks and training on proper stacking of sacks- for example away from the warehouse walls. This warehouse was exemplary, with zero storage losses.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
SIKASSO	STORAGE LOSSES IN SIKASSO	1.38%	2.06	1.85%	1.18%	TRADER

### 3.1.2.5 STORAGE IN DAKAR

Storage in Dakar markets was observed to be in non-purpose built rooms that are not well ventilated

LOCATION INCURRED	ITEM DESCRIPTION	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
DAKAR	STORAGE IN DAKAR	2.67	2.40%	1.53%	TRADER

### 3.1.2.6 STORAGE LOSSES IN DAKAR

Losses in storage were observed to be 2.5%.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
DAKAR	STORAGE LOSSES IN DAKAR	2.50%	3.64	3.27%	2.09%	TRADER

### 3.1.2.7 SACKS

As a result of the need to clean and remove impurities, verify quality and re-pace worn out sacks, the millet/sorghum is generally re-bagged in Sikasso before onward sale. Sacks are purchased in the Sikasso marketplace for 250 FCFA each. In Sikasso, we only observed plastic sacks, which are non durable and can easily rip or break during handling, transit and storage. Exposure to the sun leads to degradation of the material (see right). Generally these sacks are only used once, as they are not durable enough to be re-used. As mentioned, traders cited poor quality sacks as a key cause of losses<sup>6</sup>, but are unable to source a better alternative for a reasonable price.



Larger buyers such as OPAM and WFP specify particular types of bags to be used. For example, OPAM specifies the use of jute sacks (see right), which are much more durable than plastic sacks and so can be used for long term storage (more than 1 year). Unfortunately, jute sacks are very expensive, prices from 500-800 FCFA per sack were cited, so this too expensive for most traders without contracts with larger buyers.



<sup>6</sup> Interviewees were unable to quantify the specific loss % occurring as a result of sack quality/sewing methods. These losses are accounted for in the storage loss (market logistics) and in-transit losses (transport).

LOCATION INCURRED	ITEM DESCRIPTION	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
SIKASSO	PURCHASE OF SACK IN SIKASSO (SINGLE USE)	2.50	2.25%	1.43%	TRADER

### 3.1.2.8 RE-BAGGING AND SEWING CHARGES - SIKASSO

Re-bagging and sewing services are provided in the market. Traditional sewing methodology leads to rips in the sack (see below), and is a key cause of holes from which losses occur.<sup>7</sup>



The research team observed two instances where wholesalers used a portable automatic sewing machines to close bags after re-bagging. This process took just a few seconds and produced an even seam with no ripping. The wholesalers stated that this machine could be bought new for a cost of 150,000 FCFA, and generally lasted for 2-3 years. Please see the pictures below.



<sup>7</sup> Interviewees were unable to quantify the specific loss % occurring as a result of sack quality/sewing methods. These losses are accounted for in the storage loss (market logistics) and in-transit losses (transport).

### 3.1.3 TRANSPORT

LOCATION INCURRED	ITEM DESCRIPTION	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
SIKASSO	FILLING AND SEWING	0.50	0.45%	0.29%	TRADER

### 3.1.4

Market logistics costs observed include:

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
<b>TRANSPORT</b> All formal and informal charges for transport services from farm to end market	<ul style="list-style-type: none"> <li>- Transport fees/charges</li> <li>- Transport Agent Fee</li> <li>- Losses during transport</li> </ul>

#### 3.1.4.1 TRANSPORT FEES AND CHARGES

Transport fees and charges are direct fees paid to transport service providers. This price does not generally include handling, but it does include several official and informal costs paid along the road to control officials, including tolls, weigh stations police and gendarme bribes- this is discussed in the following section. Transport prices vary depending on the demand for transport, which is highly dependent on crop calendar (especially for cotton).

It should also be noted that the observed professionalism of transporters was low, with many deliberately running trucks illegally, and had little respect for the labor rights of the drivers they employed. For example, it is the law that an employer must pay into social security (“Caisse de Securite”)<sup>8</sup> for employees, and this is supposedly checked by border police agents as trucks pass through checkpoints. No truck owners interviewed provided this for their drivers, and many drivers stated they were rarely even paid their salary on time.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA/ Kg	FCFA/Kg/K M	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM-ZEGOUA	FARM TO CONSOLIDATION TRANSPORT COST (10KM)	6.57	0.657	5.91%	3.77%	FARMER
ZEGOUA-SIKASSO	CONSOLIDATION-SIKASSO TRANSPORT COSTS	5.00	0.052	4.49%	2.87%	TRADER
SIKASSO-DAKAR	SIKASSO TO DAKAR TRANSPORT COSTS	21.25	0.013	19.10%	12.19%	TRADER

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<sup>8</sup> Cited by border officials in Burkina and Mali

### 3.1.4.2 TRANSPORT AGENT FEE

Although very few traders reported any difficulty finding a truck when they needed it, several traders in Sikasso cited using an agent to source vehicles for the transport of their millet/sorghum to Dakar. This cost is borne by the transporter, however, not the trader and included within the transport price charged.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
SIKASSO	AGENT FEE TO FIND TRUCK	0.25	0.22%	0.14%	TRANSPORTER

### 3.1.4.3 LOSSES DURING TRANSPORT

Losses during transport occur as a result of poor handling practices as well as holes in bags. No losses in transit were reported between Sikasso and Dakar, however this does not seem credible so the research team have assumed an average rate for this segment.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM-ZEBOUA	LOSSES IN TRANSIT FARM TO CONSOLIDATION	0.47%	0.71	0.64%	0.41%	FARMER
ZEBOUA-SIKASSO	LOSSES IN TRANSIT CONSOLIDATION-SIKASSO	1.50%	2.27	2.04%	1.30%	TRADER
SIKASSO-DAKAR	LOSSES IN TRANSIT SIKASSO-DAKAR	0.98% <sup>9</sup>	1.45	1.30%	0.83%	TRADER

### 3.1.5 ADMINISTRATIVE

Administrative costs observed include:

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
<b>ADMINISTRATIVE CHARGES</b> All formal and informal charges for trade facilitation services (customs, taxes, weigh stations, export documentation, and customs and forwarding agent fees)	<ul style="list-style-type: none"> <li>- Customs fees</li> <li>- Weigh station fees</li> <li>- Conseil Malien des Transporteurs Routiers</li> <li>- Entrepots Malien au Senegal</li> <li>- Road tolls</li> <li>- Municipal taxes</li> </ul>

<sup>9</sup> No in transit losses were reported for the Sikasso-Dakar journey, but the research team did not find this to be credible. An assumed rate of 0.98% has been used, this is an average of transit losses between consolidation and Sikasso and transit losses between farm and consolidation.

Administrative procedures/obligations for trading/transporting millet and sorghum that either did not attract a monetary cost, or were not directly related to the movement of millet and sorghum are not included.<sup>10</sup>

It should also be noted that traders cited a difficulty in obtaining the appropriate export documentation from their local chamber of commerce/municipal authority and that often they just did not bother, preferring to pay the associated bribes in transit.

Furthermore, particularly at borders, the research team observed that control procedures are very repetitive, with the 3 main agencies (Customs, Police and Gendarmerie) asking the same questions and for the same documents on *both* sides of the border. The agencies do not appear to be working together, procedures are overlapping and the border process is not streamlined.

### 3.1.5.1 MUNICIPAL TAXES

In Mali, municipal taxes (“la Mairie”) are levied at several towns along the route from Sikasso to Dakar. This cost is paid by the transporter

- Sikasso (see picture)
- Bougouni (see picture)
- Senou
- Kati
- Kolokani
- Kayes



A receipt is given for these costs, each payment is 500 to 1000 FCFA per 40T truck, and is supposed to cover the costs to the municipality of the truck transiting the town. The municipal tax is a separate control post, at either the entry or exit of the municipality, and in addition to the cost, causes an additional delay to the truck. Paid by the transporter, and included within the transport price paid by the trader.

### 3.1.5.2 ROAD TOLLS (PEAGE)

Toll booths are located along the route at several municipalities in Mali. Tolls are levied depending on truck size and chassis configuration. The normal payment for a 40 T truck is 2,500 at each toll booth. Please see pictures for examples of the receipts given.



<sup>10</sup> For example, this analysis does not include municipal taxes on traders’ shop space in the various localities.

The road tolls are paid by the transporter, and included within the price transport price paid by the trader.

### **3.1.5.3 CUSTOMS FEES**

In interviews with customs agents at the border, they stated that the only official costs they charged were the following:

- Inspection fee of 2,500 FCFA per hour of inspection, with a minimum charge of 2 hours = 5,000 FCFA
- After hours “Travail Supplémentaire” comes into effect between 6pm and 7.30am and on weekends and holidays. This doubles the inspection fee to 5,000 FCFA per hour, with a minimum 2 hour charge = 10,000 FCFA<sup>11</sup>
- Statistical tax levied to cover the cost of collecting statistical data on imports and exports of 5,000 per truck.
- Fines and warnings “Proces Verbale” for customs infractions such as missing documents. These fines are codified for the different types and severity of infractions and are laid out in a handbook published by the transport ministry. The customs agents interviewed stated the fines range from 3,000 FCFA to 70,000 FCFA, and a receipt is given. In reality, however, fines are normally levied as bribes, and no official receipt is given. This practice was confirmed by the customs agents themselves. Even though they did not condone it they admitted it was commonplace. Informal charges such as this will be discussed below.
- Passavant: this is a document that used to be required to enter a country with a foreign truck, stating that the truck would spend no longer than 30 days in country. The fee for this document is 2,500 FCFA. However, this charge is now illegal under ECOWAS and should no longer be levied. Several truckers reported still having to pay this fee, and customs agents reported still charging it. Those truckers who knew it is not legal were able to avoid paying it by negotiating with the customs agents.

These customs fees are paid by the trader/proprietor of the goods in transit.

### **3.1.5.4 EMAS (ENTREPOTS MALIEN AU SENEGAL)**

EMAS agents are posted at the Mali-Senegal border to collect taxes from trucks for using the Dakar port, as well as collect statistics. The port taxes are levied indiscriminately on trucks, no matter whether they will be using the port in Dakar or not. For example, trucks of millet/sorghum destined for sale in Dakar still must pay. The official fee for EMAS is 500 FCFA/ton, 20,000 FCFA for a 40T truck. However, truckers reported negotiating with EMAS agents for a reduced fee of 10,000 if they did not take a receipt, suggesting EMAS agents may be corrupt.

EMAS is paid by the trader/proprietor of the goods in transit.

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<sup>11</sup> The research team has assumed that passing the border takes place during the “travail supplémentaire” hours, therefore paying the maximum customs fee in order to illustrate the maximum level of fees paid.

### 3.1.5.5 CMTR (CONSEIL MALIEN DES TRANSPORTEURS ROUTIERS)

The CMTR was founded in 2004 and became operational in 2009. It was set up to encompass all previous professional transporting bodies and create a unified voice for the Malian transport sector. The CMTR main role is as interlocutor between the transport sector and the government, and its aims include promoting free circulation of goods and professionalizing the transport sector. The CMTR provides the “lettre de voiture” or transport waybill, for a fee of 1,000 FCFA and also charges a fee of 5,000 FCFA per international journey (2,500 per domestic journey). Foreign trucks entering and ending their journey in Mali, must pay 10,000 FCFA. This fee is known as “la Ristourne” (see picture).



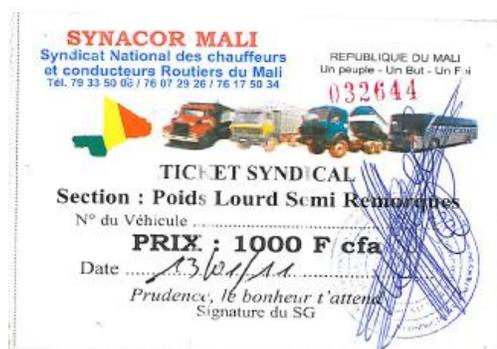
All drivers and transporters interviewed saw no value in the CMTR ristourne payments, and did not feel a service was provided in return for the fee. CMTR representatives interviewed, including the president of the CMTR in Bamako, vehemently defended the work of the CMTR in representing the interests of the transport sector. It is widely felt, however, that the CMTR is not effective and adds little value considering the amount of money it charges.

The CMTR is paid by the transporter, and included within the price of transport paid by the trader.

### 3.1.5.6 SYNDICAT DES CHAUFFEURS

Various “syndicats”, which are local transport unions charge a fee of 1000 FCFA per journey. Drivers felt that this was a reasonable fee and the unions provided a useful service to them if they needed assistance or arbitration.

Paid by the transporter, and included within the price of transport paid by the trader. See receipt in picture.



### 3.1.5.7 CERTIFICATE OF ORIGIN

Traders reported having to procure a certificate of origin for export to Senegal, at 1500 FCFA. This is, however, not necessary under ECOWAS rules.

### 3.1.5.8 WEIGH STATION FINE

Truck must comply with ECOWAS axle load legislation and pay any related fines for being overweight. The weigh station is located outside Bamako. Overloading of trucks is standard practice, and transporters reported paying an average of 46,000 FCFA in fines. Transporters stated that without overloading their vehicles it is impossible to make a profit.

### 3.1.5.9 UNLOADING/PARKING IN DAKAR

#### Summary of administrative charges

Transporters reported paying 4,000 per truck to park and unload their vehicles on arrival in Dakar. This is included in the transport price paid by the trader.

ITEM DESCRIPTION	FCFA TOTAL	FCFA/Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
MUNICIPAL TAX	9000	0.23	0.20%	0.13%	TRANSPORTER
ROAD TOLLS	12000	0.30	0.27%	0.17%	TRANSPORTER
CUSTOMS FEES	15000	0.38	0.34%	0.22%	TRADER
PASSEAVANT	2500	0.06	0.06%	0.04%	TRANSPORTER
EMAS	20000	0.50	0.45%	0.29%	TRADER
LETTRE DE VOITURE	1000	0.03	0.02%	0.01%	TRANSPORTER
CMTR	5000	0.13	0.11%	0.07%	TRANSPORTER
SYNDICAT DES CHAUFFEURS	1000	0.03	0.02%	0.01%	TRANSPORTER
CERTIFICATE OF ORIGIN	1500	0.04	0.03%	0.02%	TRADER
WEIGH STATION FINE	46000	1.15	1.03%	0.66%	TRANSPORTER
UNLOADING/PARKING IN DAKAR	4000	0.10	0.09%	0.06%	TRANSPORTER
<b>TOTAL</b>		<b>2.93</b>	<b>2.63%</b>	<b>1.68%</b>	

### 3.1.6 INFORMAL

Informal costs observed include:

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
<b>INFORMAL PAYMENTS</b> Explicit bribes paid	<ul style="list-style-type: none"> <li>- Bribes paid at checkpoints</li> <li>- Bribes paid at borders</li> </ul>

#### 3.1.6.1 BRIBES PAID AT CHECKPOINTS AND BORDERS

Road harassment and corruption are widely acknowledged as a problem. Bribes are extracted by customs, police, gendarme and SPS services at the borders along the route. The amount of checkpoints is extremely high, contrary to UEMOA legislation, and bribe extraction seems standard procedure. The research team spoke with multiple drivers who described the bribe amount at each checkpoint along the road, and their reports corroborated each other accurately. Drivers reported bribes being worse at night, and bribes paid to get through international borders are extremely high, with customs agents citing export bans and other false legislation in order to extract these payments. Transporters use the services of a freight forwarding agent at the border, who handles the paperwork and bribes on their behalf.

As the IRTG/OPA reports deal with road harassment in detail, only headline figures are reported here.

This report assumes that customs bribes and SPS bribes are paid by the trader, and police/gendarme bribes are paid by the transporter. In reality who pays the bribes depends on the situation, but this division appears to be the most common.

ITEM DESCRIPTION	FCFA TOTAL	FCFA/Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
CUSTOMS BRIBE	38000	0.95	0.85%	0.54%	TRADER
OTHER REPORTED BORDER BRIBES	185000	4.63	4.16%	2.65%	TRADER
POLICE BRIBE	22500	0.56	0.51%	0.32%	TRANSPORTER
GENDARME BRIBE	40750	1.02	0.92%	0.58%	TRANSPORTER
SPS BRIBE	1000	0.03	0.02%	0.01%	TRADER
<b>TOTAL</b>		<b>7.18</b>	<b>6.46%</b>	<b>4.12%</b>	

### 3.1.7 ITEMS NOT INCLUDED IN TRANSPORT COST ANALYSIS

#### 3.1.7.1 IMPURITIES

Impurities in millet and sorghum were cited as a major concern for traders on this corridor. These impurities are introduced at the post-harvest handling stage either through poor practices or through dishonest farmers adding material to increase sack weight. The average reported percentage of impurities was **1.33%**, however many interviewees were unable to estimate the rate. This has not been included in the transport cost analysis above because it is not a cost, it just serves to shift margins to different value chain actors- eg. increasing farmer margins to the detriment of the traders', or by the farmer applying a discount to the millet and sorghum he purchases as he expects a certain impurity rate. It is still, however, a major logistics concern for value chain actors.

## 3.2 TRANSPORT COSTS ANALYZED

### 3.2.1 OVERALL COST DRIVERS

The transport and logistics costs observed along the Sikasso-Dakar corridor have been described in detail above, the following table summarizes these costs. Please note that prices shown are an average of millet and sorghum prices observed, as explained in section 1 above (and annex A).

DETAILED TRANSPORT AND LOGISTICS COSTS PER KG OF MILLET/SORGHUM TRAVELING FROM SIKASSO TO DAKAR

Location incurred	Item description	%	FCFA/Kg	% Farm gate price	% Final Sales Price	Borne by
Farm	Losses during drying and shelling	5.14%	8.96	8.06%	5.14%	Farmer
Farm	Fees for use of de-shelling machine		12.50	11.24%	7.17%	Farmer
Farm	On farm storage losses	8.00%	13.23	11.89%	7.59%	Farmer
Farm	On farm bagging and sewing		3.29	2.95%	1.88%	Farmer
Farm-Zegoua	On farm loading charges		0.39	0.35%	0.23%	Farmer
Farm-Zegoua	Farm to consolidation transport cost		6.57	5.91%	3.77%	Farmer

(10km)						
Farm-Zegoua	Losses in transit farm to consolidation	0.47%	0.71	0.64%	0.41%	Farmer
Zegoua	Producer sales price		111.25			
Zegoua	Unloading fee		0.50	0.45%	0.29%	Trader
Zegoua-Sikasso	Consolidation-Sikasso Transport costs		5.00	4.49%	2.87%	Trader
Zegoua-Sikasso	Losses in transit consolidation-Sikasso	1.50%	2.27	2.04%	1.30%	Trader
Zegoua	Loading fee		0.50	0.45%	0.29%	Trader
Sikasso	Collector sales price		120.78			
Sikasso	Unloading fee		0.50	0.45%	0.29%	Trader
Sikasso	Cleaning to remove impurities		2.00	1.80%	1.15%	Trader
Sikasso	Storage in Sikasso-1.5 months		1.02	0.92%	0.59%	Trader
Sikasso	Storage losses in Sikasso	1.38%	2.06	1.85%	1.18%	Trader
Sikasso	Purchase of sack in Sikasso (single use)		2.50	2.25%	1.43%	Trader
Sikasso	Filling and sewing		0.50	0.45%	0.29%	Trader
Sikasso	Loading fee		0.50	0.45%	0.29%	Trader
Sikasso	Agent fee to find truck		0.25	0.22%	0.14%	Transporter
Sikasso-Dakar	Sikasso to Dakar transport costs		21.25	19.10%	12.19%	Trader
Sikasso-Dakar	Losses in transit Sikasso-Dakar	0.98%	1.45	1.30%	0.83%	Trader
Sikasso-Dakar	Official costs		0.91	0.82%	0.52%	Trader
Sikasso-Dakar	Official costs		2.01	1.81%	1.15%	Transporter
Sikasso-Dakar	Informal costs		5.60	5.03%	3.21%	Trader
Sikasso-Dakar	Informal costs		1.58	1.42%	0.91%	Transporter
Dakar	Unloading fee		0.50	0.45%	0.29%	Trader
Dakar	Storage in Dakar		2.67	2.40%	1.53%	Trader
Dakar	Storage losses in Dakar	2.50%	3.64	3.27%	2.09%	Trader
Dakar	Sales price		174.38			

Source: Field interviews and calculations

The following table presents these costs summarized by cost type:

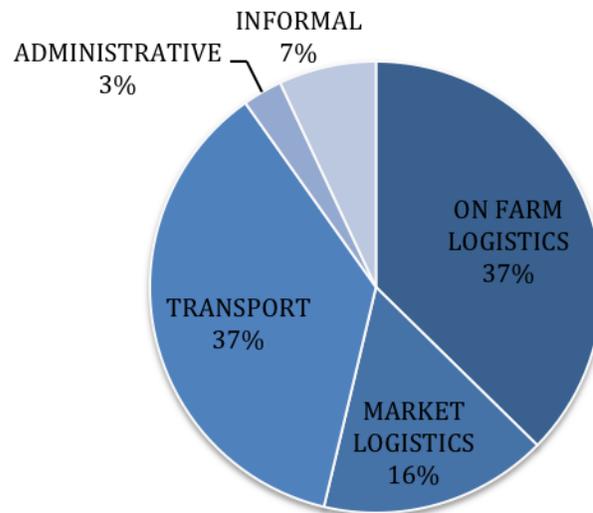
SUMMARY OF TRANSPORT AND LOGISTICS COST PER KG OF MILLET/SORGHUM TRAVELING BETWEEN SIKASSO AND DAKAR

	FCFA/Kg	% Farm gate price	% Final Sales Price
ON FARM LOGISTICS	38.38	34%	22%
MARKET LOGISTICS	16.89	15%	10%
TRANSPORT	37.51	34%	22%
ADMINISTRATIVE	2.93	3%	2%
INFORMAL	7.18	6%	4%
<b>Total transport and logistics costs</b>	<b>102.88</b>	<b>92%</b>	<b>59%</b>

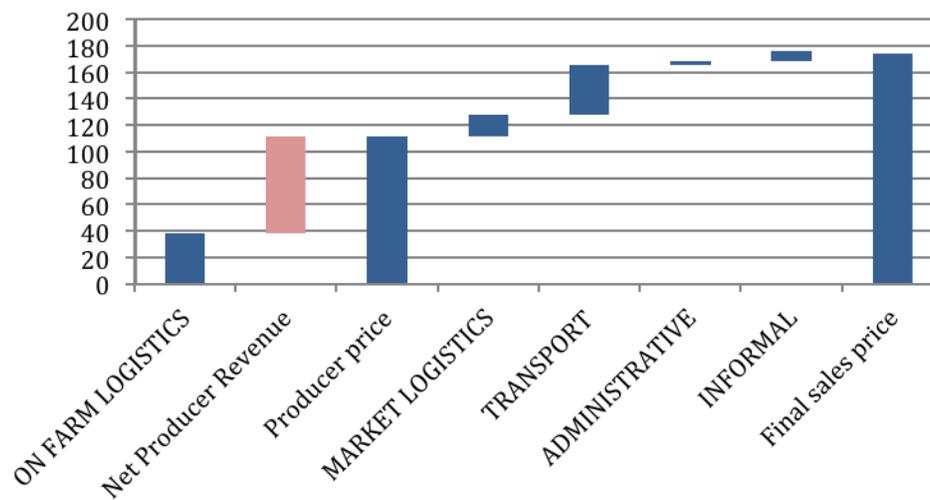
The total transport and logistics costs account for 102.88 FCFA/Kg of millet/sorghum traveling from Sikasso to Dakar, which equates to 92% of farm gate price and 59% of final end market price.

As can be seen from the pie chart below, the most important drivers of transport and logistics costs are on farm logistics costs, which represent 37% of the total costs, and transport costs, which represent 37% of the total costs.

COMPONENTS OF TOTAL TRANSPORT AND LOGISTICS COSTS



STEP CHART OF TRANSPORT AND LOGISTICS COSTS BY CATEGORY



Please note that Net Producer Revenue does not take into account other production costs.

### 3.2.2 PHYSICAL LOSSES

Cost Category	Item description	Observed loss	Indicative weight of sack	Cumulative loss
ON FARM LOGISTICS	Losses during drying and shelling	5.14%	0.95	5.14%
ON FARM LOGISTICS	On farm storage losses	8.00%	0.87	12.73%
TRANSPORT	Losses in transit farm to consolidation	0.47%	0.87	13.14%
TRANSPORT	Losses in transit consolidation-Sikasso	1.50%	0.86	14.44%
MARKET LOGISTICS	Storage losses in Sikasso	1.38%	0.84	15.62%
TRANSPORT	Losses in transit Sikasso-Dakar	0.98%	0.84	16.46%
MARKET LOGISTICS	Storage losses in Dakar	2.50%	0.81	18.54%
<b>Total</b>				<b>18.54%</b>

Total physical losses along the corridor amount to 18.54%. The main driver of these losses are storage losses, particularly on farm storage losses.

## 3.3 EXTRA COST ANALYSIS

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

### 3.3.1 ON FARM LOGISTICS

The following table summarizes the extra costs identified in the on farm logistics category.

COST ANALYSIS FOR THE ON FARM LOGISTICS CATEGORY

ON FARM LOGISTICS	Observed %	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Losses during drying and shelling	5.14%	8.96	6.98	1.99
Fees for use of de-shelling machine		12.50	2.50	10.00
On farm storage losses	8.00%	13.23	3.31	9.92
On farm bagging and sewing		3.29	2.85	0.44
On farm loading charges		0.39	0.39	
<b>Total</b>		<b>38.38</b>	<b>16.03</b>	<b>22.35</b>

**Losses during drying and shelling** are observed to be 5.14%. In discussions with value chain leaders on the IICEM project, the achievable level of losses during this post harvest handling is 4%, which is monetized to a cost of 6.98 FCFA/Kg.

**Fees for use of de-shelling machine** Farmers stated that high costs for the rental of de-shelling machines was a major problem, particularly for millet and sorghum, for which a high price was charge due to the intricacy of the de-shelling process. Observed costs are 12.50 FCFA/Kg.

Farmers stated that they would like to buy their own machines, but at around 1,250,000 FCFA<sup>12</sup>, the cost is prohibitively expensive. Based on calculation methodology in this category from the ATP Maize Transport and Logistics assessment<sup>13</sup>, the following table summarizes the computation of optimized cost. This is based on the assumption that 10 farmers could collaborate to purchase the shelling machine together.

ESTIMATE OF OPTIMIZED COST OF DE-SHELLING

Per Kg cost of de-shelling machine		Unit	Source
Cost of de-shelling machine	1,250,000.00	FCFA	Field interviews
# of farmers collaborating on ownership	10	#	Consultant estimate
Cost per farmer	125,000.00	FCFA	Calculation
Number of years of use	5	Years	Field interviews & consultant estimate
Cost per farmer per year	25,000.00	FCFA	Calculation
Kg de-shelled per farmer per year	10,000	Kg	Field interviews
Cost per Kg	2.50	FCFA/Kg	Calculation

Based on this calculation, an optimized cost for mechanical de-shelling is 2.50 FCFA/Kg.

<sup>12</sup> Source: Interview with farm equipment trader in Bamako

<sup>13</sup> ATP Maize transport and logistics assessment, David Schacht.

**On farm storage losses** are observed to be 8%. In discussions with value chain leaders on the IICEM project, the achievable level of losses during this on farm storage is 2%, which is monetized to an optimized cost of 3.31 FCFA/Kg.

**On farm bagging and sewing costs** are observed to be 3.29 FCFA/Kg, which includes the cost of an empty sack (250 FCFA) and 0.79 FCFA/kg in filling and sewing costs. As noted above, the research team observed instances of use of automatic handheld sewing machines, which produced a high quality seam in no more than a few seconds, could be purchased for 150,000 FCFA and last approximately 2 years. A prudent estimate of 150 bags sewn per week results in a per Kg cost of 0.10 FCFA (See table).

ESTIMATED PER KG COST OF HANDHELD SEWING MACHINE

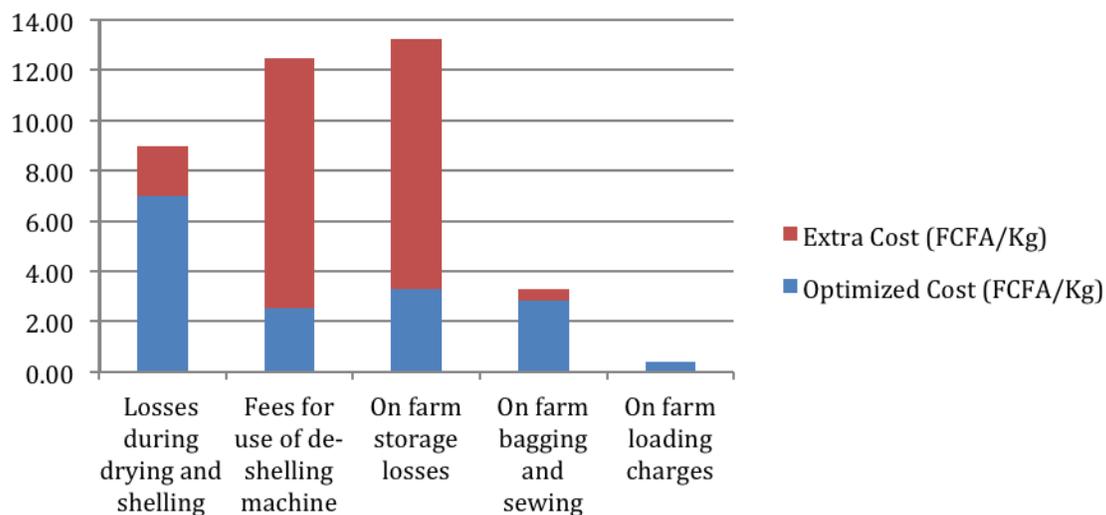
Per Kg cost of handheld sewing machine	Unit	Source
Cost of sewing machine	150000.00 FCFA	Field interviews
Years of use	2.00 Years	Field interviews
Amortized cost per week	1442.31 FCFA/Week	Calculation
Uses per week	150 #	Consultant estimate
Cost per 100kg bag	9.62 FCFA/100Kg	Calculation
Cost per kg	0.10 FCFA/Kg	Calculation

Based on the cost of loading a 100kg sack, 0.5 FCFA/kg, it can be assumed that filling and sewing a sack (a much less strenuous and less skilled job) is no more than 0.25 FCFA/kg.

In total, the assumed optimized cost for filling and sewing a bag on farm should be  $0.25+0.1=0.35$  FCFA/kg, plus the bag cost of 2.5 FCFA/Kg.

**On farm loading charges** there is no basis for estimating extra costs for this item.

EXTRA COSTS IN THE ON FARM LOGISTICS CATEGORY



Extra costs amount to 22.35 FCFA/Kg, out of 38.38 FCFA/Kg of total on farm logistics costs. In other words, 58% of on farm logistics costs are considered to be extra costs.

### 3.3.1.1 MARKET LOGISTICS

The following table summarizes the extra costs identified in the market logistics category.

COST ANALYSIS FOR THE MARKET LOGISTICS CATEGORY

MARKET LOGISTICS	Observed %	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Loading and unloading		2.50	2.50	
Cleaning to remove impurities		2.00	0.00	2.00
Storage in Sikasso- 1.5 months		1.02	0.82	0.20
Storage losses in Sikasso	1.38%	2.06	0.00	2.06
Purchase of sack in Sikasso (single use)		2.50	0.00	2.50
Filling and sewing		0.50	0.00	0.50
Storage in Dakar		2.67	2.13	0.53
Storage losses in Dakar	2.50%	3.64	0.00	3.64
<b>Total</b>		<b>16.89</b>	<b>5.45</b>	<b>11.44</b>

**Loading and unloading** no basis for estimating extra costs for this item

**Cleaning to remove impurities** to achieve the best price premium and meet the demands of buyers, impurities should be negligible, and there subsequently would be no need for the trader to remove them before sale.

**Storage in Sikasso** Prices quoted in Sikasso are for storage facilities that are not purpose built, not adequately ventilated, and infested with rodents. Modern large-scale warehousing facilities were not readily available in the market. A discount of 20% has been assumed as a proxy for potential reduced costs if a higher volume of product is stored and a commercial storage market is developed.<sup>14</sup>

**Losses in storage in Sikasso** The research team observed instances of use of simple storage techniques such as aeration pallets and insecticides which can bring storage losses down to a negligible level. Thus, an optimized loss level at this stage in the value chain is 0%.

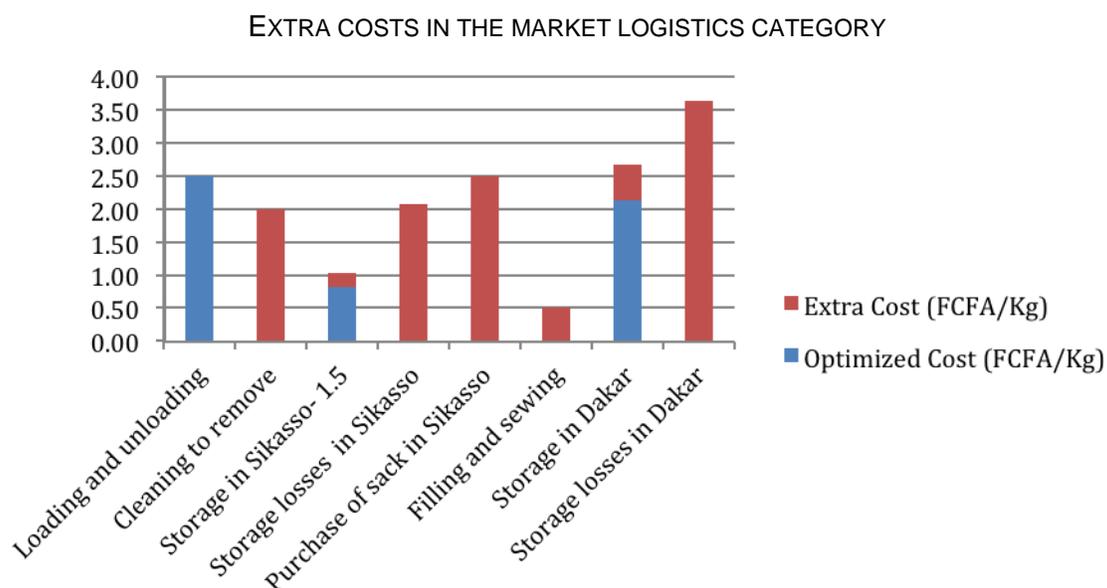
**Purchase of sack/filling and sewing** In an optimized scenario there should be no need to re-bag sacks again after leaving the farm. Ideally, one bag would be used only once and throughout entire export operation. Therefore these costs are considered as extra costs.

**Storage in Dakar** Prices quoted in Dakar are for storage facilities that are not purpose built, not adequately ventilated, and infested with rodents. Modern large-scale warehousing facilities were not readily available in the market. A discount of 20% has been assumed as a proxy for

<sup>14</sup> See ATP Maize Transport and Logistics assessment, Dave Schacht.

potential reduced costs if a higher volume of product is stored and a commercial storage market is developed.<sup>15</sup>

**Losses in storage in Dakar** The research team observed instances of use of simple storage techniques such as aeration pallets and insecticides which can bring storage losses down to a negligible level. Thus, an optimized loss level at this stage in the value chain is 0%.



Extra costs amount to 11.44 FCFA/Kg, out of 16.89 FCFA/Kg of total market logistics costs. In other words, 68% of market logistics costs are considered to be extra costs.

### 3.3.1.2 TRANSPORT

The following table summarizes the extra costs identified in the transport category.

**COST ANALYSIS FOR THE TRANSPORT CATEGORY**

TRANSPORT	Observed %	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Farm to consolidation transport cost (10km)		6.57	0.52	6.05
Losses in transit farm to consolidation	0.47%	0.71	0.00	0.71
Consolidation-Sikasso Transport costs		5.00	3.26	1.74
Losses in transit consolidation-Sikasso	1.50%	2.27	0.00	2.27

<sup>15</sup> See ATP Maize Transport and Logistics assessment, Dave Schacht.

Agent fee to find truck		0.25	0.00	0.25
Sikasso to Dakar transport costs		21.25	21.25	0.00
Losses in transit Sikasso-Dakar	0.98%	1.45	0.00	1.45
<b>Total</b>		<b>37.51</b>	<b>25.03</b>	<b>12.47</b>

**Farm to consolidation transport cost** Observed costs in this category are 6.57 FCFA/Kg, for an assumed 10km journey from farm to consolidation point (Zegoua). This transit is undertaken in 5 to 10 T trucks. As can be seen from the table below, the cost per Kg/Km for this segment are extremely high in comparison with subsequent segments.

TRANSPORT COSTS PER KG/KM

Segment	KM	FCFA/Kg	FCFA/Kg/KM
Farm to consolidation transport cost	10	6.57	0.657
Transport costs consolidation-Sikasso	96	5.00	0.052
Sikasso to Dakar transport costs	1,700	21.25	0.013

This could be caused by several plausible reasons including short distance and small shipments leading to low economies of scale, relative bargaining power of farmers, and low supply of trucks. While many transporters and farmers cited poor quality of roads as a major determinant of price over these segments, price and road quality data did not support this posit.<sup>16</sup>

Taking the transport cost per Kg/Km from consolidation to Sikasso of 0.052 as a proxy for a more efficient transport, the implied optimized cost for the farm to consolidation segment is 0.52 FCFA/Kg.

**Consolidation to Sikasso transport costs** The observed transport cost for this 96km segment is 0.052 FCFA/Kg/Km. Benchmark price figures from Teravanithorn and Rallaband (2008)<sup>17</sup> suggest that average transport prices for long distances (1000+ km) in West Africa per kg/km are 0.034 FCFA.<sup>18</sup> Transport costs for this segment are likely elevated for the same reasons as above, market inefficiency and lack of economies of scale. Taking this transport cost per Kg/Km over long distances in West Africa as a proxy for a more efficient transport market for this 96 Km distance, the implied optimized cost for the farm to consolidation segment is 3.264 FCFA/Kg.

**Sikasso to Dakar transport costs** The observed transport cost for this segment is 0.013 FCFA/Kg/Km. Benchmark price figures from Teravanithorn and Rallaband (2008)<sup>19</sup> suggest that this is price is actually quite low in comparison with other markets. For example, according to their study transport prices in Western Europe are approximately 0.024 FCFA/Kg/Km<sup>20</sup>, and in

<sup>16</sup> Through the course of the study, data on transport prices between various localities were collected and the respondents also questioned on the average road quality along these routes. No correlation was found between poor quality of road and high transport price, when viewed on a per FCFA/Km basis.

<sup>17</sup> Teravanithorn and Rallaband, Transport Prices and Costs in Africa, The World Bank, 2008

<sup>18</sup> In source, prices are shown in USD, translated at an exchange rate of 475 FCFA/\$.

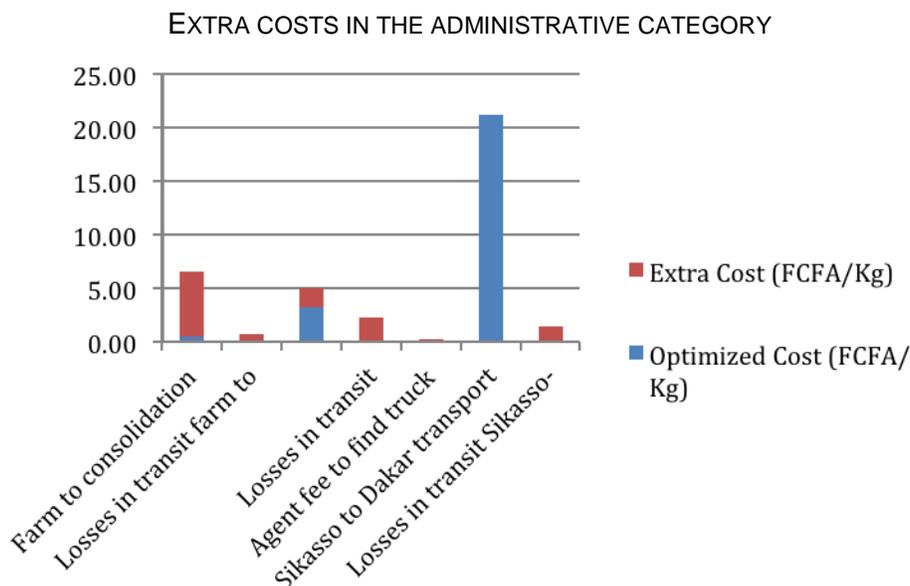
<sup>19</sup> Teravanithorn and Rallaband, Transport Prices and Costs in Africa, The World Bank, 2008

<sup>20</sup> In source, prices are shown in USD, translated at an exchange rate of 475 FCFA/\$.

the US are 0.019 FCFA/Kg/Km<sup>21</sup>. Therefore, we find that there are no extra costs in this category.

**Losses in transport** Losses in transport are as a result of poor handling, poor packaging and poor trucks. All losses in transport are considered unnecessary and therefore extra costs.

**Agent fee to find truck** This is considered to be an inefficient and unnecessary actor, which could be eliminated with improved market information, for example, a freight exchange/information center.



Extra costs amount to 12.47 FCFA/Kg, out of 37.51 FCFA/Kg of total transport costs. In other words, 33% of transport costs are considered to be extra costs.

### 3.3.1.3 ADMINISTRATIVE

The following table summarizes the extra costs identified in the market logistics category.

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<sup>21</sup> In source, prices are shown in USD, translated at an exchange rate of 475 FCFA/\$.

COST ANALYSIS FOR THE ADMINISTRATIVE CATEGORY

ADMINISTRATIVE	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Municipal tax	0.23	0.23	0.00
Unloading/parking	0.10	0.10	0.00
Customs fees	0.38	0.06	0.32
Passavant	0.06	0.00	0.06
EMAS	0.50	0.00	0.50
Lettre de Voiture	0.03	0.03	0.00
CMTR	0.13	0.00	0.13
Syndicat des Voitures	0.03	0.03	0.00
Cert of Origin	0.04	0.00	0.04
Road tolls	0.30	0.30	0.00
Weigh station fine	1.15	1.15	0.00
<b>Total</b>	<b>2.93</b>	<b>1.89</b>	<b>1.04</b>

**Municipal taxes** are not considered to be extra costs, however, they do entail an additional layer of harassment delay along the route, to be discussed in the recommendations section.

**Unloading/parking** is not considered to be an extra cost, it is a legitimate fee for use of the market area in Dakar.

**Customs fees** which include statistical taxes and inspection fees are observed to be 0.38 FCFA/Kg in total (see section on administrative costs above for more detail). Statistical taxes are considered to be an extra cost as evidence shows that data is not effectively collected. Inspection fees include a 2 hour minimum inspection and overtime fees for inspections outside regular working hours. An optimized scenario of an efficient 1 hour inspection with no extra charges for overtime, results in an optimized cost for this category of 0.06 FCFA/Kg.

**Passavant** This document is no longer required under ECOWAS, but still applied by customs agents. As it is no longer legal, it is considered an extra cost.

**EMAS** This charge for use of the port in Dakar does not apply to trucks transporting millet and sorghum being sold in the Dakar market as they will not use the port. It is therefore an extra cost.

**Lettre de Voiture** This a legitimate cost and not considered to be an extra cost.

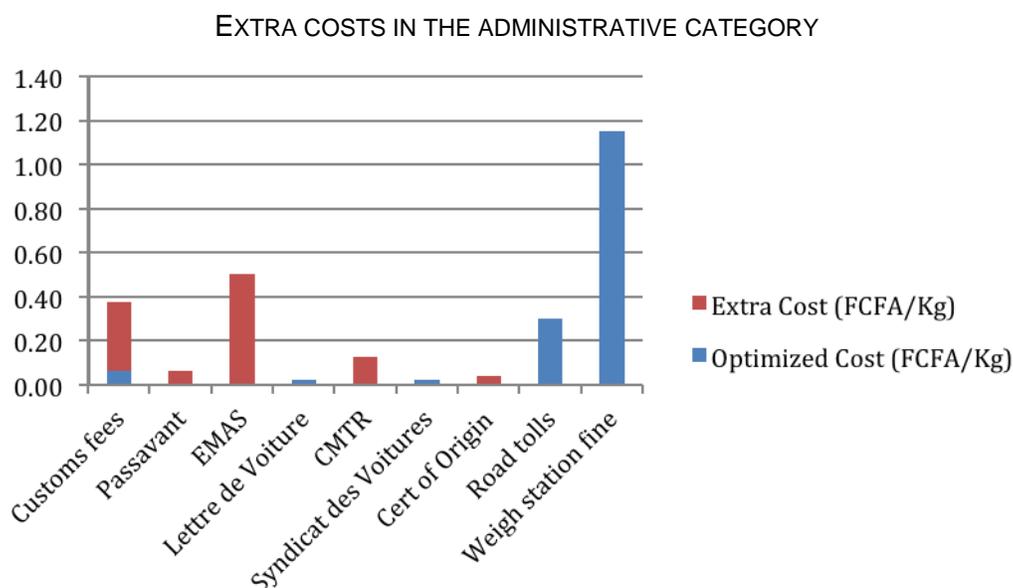
**CMTR** This charge is widely felt to be irrelevant as the CMTR provides few tangible benefits to drivers, it is therefore considered an extra cost.

**Syndicat des Voitures** Drivers felt that a valuable service was provided for this fee, therefore it is not considered to be an extra cost.

**Certificate of Origin** This is considered to be an extra cost as it is not legal under ECOWAS.

**Road tolls** are not considered to be extra costs, and are important in financing road maintenance, consistent with the user pays principle.

**Weigh station fines** are not considered to be extra costs, and are important in discouraging truck overloading.



Extra costs amount to 1.04 FCFA/Kg, out of 2.93 FCFA/Kg of total administrative costs. In other words, 36% of administrative costs are considered to be extra costs.

### 3.3.1.4 INFORMAL

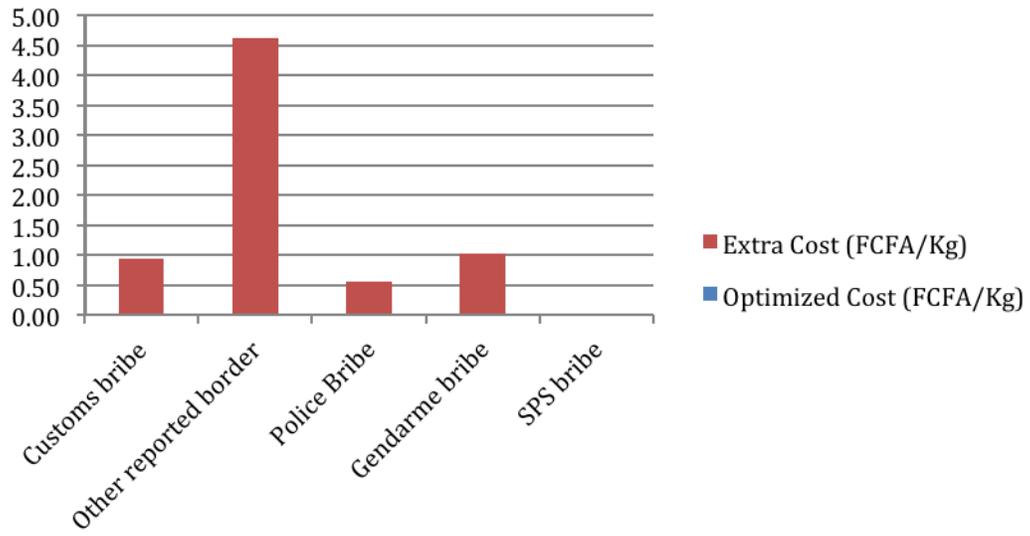
The following table summarizes the extra costs identified in the informal category.

**COST ANALYSIS FOR THE INFORMAL CATEGORY**

INFORMAL	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Customs bribe	0.95	0.00	0.95
Other reported border bribes	4.63	0.00	4.63
Police Bribe	0.56	0.00	0.56
Gendarme bribe	1.02	0.00	1.02
SPS bribe	0.03	0.00	0.03
<b>Total</b>	<b>7.18</b>	<b>0.00</b>	<b>7.18</b>

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

### EXTRA COSTS IN THE INFORMAL CATEGORY



Extra costs amount to 100% of informal costs.

# 4. TRANSPORT COSTS ALONG THE KOUTIALA-BOBO DIOULASSO-OUAGADOUGOU CORRIDOR

## 4.1 TRANSPORT COSTS OBSERVED

In this section, observed transport and logistics costs for millet along the Koutiala-Bobo-Ouagadougou corridor are detailed and described in detail. They are subsequently analyzed. As explained in section 1 above, the transport and logistics costs have been grouped into 5 categories for the purpose of analysis.

### 4.1.1 ON FARM LOGISTICS

On farm logistics costs observed include:

<b>COST CATEGORY</b>	<b>EXAMPLES OF COSTS OBSERVED</b>
<b>ON FARM LOGISTICS</b> All formal and informal transport and logistics charges incurred by producers post-harvest, including but not limited to drying, shelling, cleaning, bagging, and on farm storage and handling costs	<ul style="list-style-type: none"><li>- On farm loading charges</li><li>- On farm losses due to improper storage</li><li>- On farm shelling services</li><li>- On farm bagging services</li></ul>

#### 4.1.1.1 LOSSES AND COSTS DURING SHELLING AND DRYING

Post harvest, typically the millet is dried outside on a tarpaulin, and in Koutiala the key cause of loss during drying was cited as insects. Producers also cited theft during the outdoor drying process as an important cause of loss, up to 10%, but this has not been included as a transport and logistics cost in this analysis as it is idiosyncratic.

After drying, the millet and sorghum is de-shelled mechanically. Farmers in Koutiala cited that a manually operated hand cranked machine produced less losses than a fully mechanized one as it gave the operator more control, but losses still occurred by the machine destroying some of the grains. No data on the cost of the machine usage was obtainable, therefore as proxy, the machine cost data collected in Sikasso is used.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA /KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM	LOSSES DURING DRYING	1.00%	1.66	1.46%	1.00%	FARMER
FARM	LOSSES DURING SHELLING	2.00%	3.29	2.89%	1.98%	FARMER
FARM	FEES FOR USE OF DE-SHELLING MACHINE		12.50 <sup>22</sup>	10.99%	7.52%	FARMER

#### 4.1.1.2 ON FARM STORAGE LOSSES

As in the Sikasso region, of the producers interviewed in the Koutiala region during this study, all used fairly modern, brick built storage facilities on their farms and cited lower storage losses than observed in Sikasso. Please see the pictures below. However, significant losses still occur mainly caused by rodents, insects and moisture.



The producers interviewed who had implemented simple measures to prevent these losses, namely use of wooden pallets for aeration and the application of insecticides to the



warehouse, along with best practice techniques such as keeping bags away from the walls, had been able to significantly reduce their losses to a negligible level. The example in the picture below is a farmer, as leader of the local producer cooperative, who had a contract in place with the World Food Program to supply millet. The WFP had provided financing



<sup>22</sup> As no data on charges for use of de-shelling machine were available in Koutiala, the figure obtained in Sikasso was used as a proxy.

to build the warehouse, training on best practice storage techniques, and high quality bags and sewing machines. This warehouse was exemplary and the farmer reported zero losses, see pictures.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA /Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM	LOSSES DURING STORAGE	3.00%	4.84	4.25%	2.91%	FARMER

#### 4.1.1.3 ON FARM BAGGING AND SEWING

The producers interviewed in the Koutiala region purchased plastic sacks and sewing materials, and hired assistance to manually fill and sew bags. 100 kg sacks in Koutiala cost 225 FCFA each, filling and sewing costs 0.50 FCFA per bag.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA/Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM	ON FARM BAGGING AND SEWING		2.75	2.42%	1.65%	FARMER

#### 4.1.1.4 ON FARM LOADING CHARGES

Of all the producers interviewed in Koutiala who used a truck to transport their millet/sorghum from farm to consolidation market, an average fee of 0.50 FCFA is charged to load each 100kg sack onto the truck.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA/Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM	ON FARM LOADING		0.50	0.44%	0.30%	FARMER

### 4.1.2 MARKET LOGISTICS

Market logistics costs observed include:

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
<b>MARKET LOGISTICS</b> All formal and informal charges for non-transport services rendered throughout the logistics process.	<ul style="list-style-type: none"> <li>- Loading and unloading charges (not including on farm loading)</li> <li>- Storage charges</li> <li>- Losses during storage</li> <li>- Cost of bags</li> <li>- Re-bagging and sewing charges</li> </ul>

#### 4.1.2.1 HANDLING FEES

Throughout Mali and Burkina Faso, the price for loading or unloading a 100kg bag was consistently quoted as 50 FCFA. This process is entirely manual, with the handler lifting the sack on his head to load it onto the truck (see right, Banzon), and carrying it on his back to unload it. Handling a 100kg sack manually is a very difficult and indelicate process, it is difficult for handlers to treat each sack with care so as not to cause rips and splits in the non-durable plastic material. For example, sacks are often dropped or thrown to the ground rather than being placed. Traders cited manual handling practices as the key cause of sack breakage, which is a main source of in transit and storage losses (discussed below). Furthermore, the manual handling process is dangerous to the handlers. Handlers we spoke to experienced severe back and neck pain, and had witnessed serious accidents occurring. The average daily wage for a handler is just 1,500 FCFA, and they may lift up to a hundred 100 kg sacks per day.



From arrival at the consolidation point to arrival in Ouagadougou, a sack will be unloaded 3 times and loaded twice.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA /Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
KOUTIALA	UNLOADING	0.50	0.44%	0.30%	TRADER
KOUTIALA	LOADING	0.50	0.44%	0.30%	TRADER
BOBO	UNLOADING	0.50	0.44%	0.30%	TRADER
BOBO	LOADING	0.50	0.44%	0.30%	TRADER
OUAGADOUGOU	UNLOADING	0.50	0.44%	0.30%	TRADER
		<b>2.50</b>	<b>2.20%</b>	<b>1.50%</b>	

#### 4.1.2.2 COSTS FOR CLEANING AND REMOVING IMPURITIES

As already noted above on the Sikasso-Dakar corridor, impurities in millet were cited by the majority of traders as a major quality problem.

Once bags arrived in Bobo, traders cleaned and re-bagged their millet for onward sale to Ouaga. Many traders complained that impurities were introduced deliberately by farmers to increase sack weight, and that impurities were placed in the middle or bottom of the sack so as to avoid detection if the sack was opened for inspection. This issue was highlighted most vehemently in Bobo Dioulasso, with traders being very mistrustful of the millet they purchased from Mali, as well as from local production zones.

As also noted above, quality issues were consistently cited as the main problem for value chain stakeholders, right up to the major buyers and processors. Larger buyers such as OPAM (Office des Produits Agricoles du Mali) and Brakina, specify quality requirements in their contracts, with maximum limits for impurities.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA/Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
BOBO	CLEANING TO REMOVE IMPURITIES	2.00 <sup>23</sup>	1.76%	1.20%	TRADER

#### 4.1.2.3 STORAGE COSTS- KOUTIALA

Traders in Koutiala utilized brick built buildings, generally with corrugated aluminum roofs to store sacks of millet while awaiting sale. The warehouses used generally appeared to be purpose built and quite well maintained. Traders with more resources were able to store for several months to time the market and wait for the best price, but generally storage was only observed to be undertaken about 2 months.

Storage prices vary less in Koutiala than in Sikasso, and are significantly cheaper (Koutiala storage costs 1.06 FCFA/Kg for 2 months, vs. 1.03 FCFA/Kg for 1.5 months in Sikasso) with little observed economies of scale for larger facilities.



LOCATION INCURRED	ITEM DESCRIPTION	FCFA/Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
KOUTIALA	STORAGE COSTS IN KOUTIALA	1.06	0.93%	0.64%	TRADER

#### 4.1.2.4 LOSSES IN STORAGE - KOUTIALA

Reported storage losses in Koutiala are quite low, this could be due to the better quality of observed warehousing facilities available. The main causes of loss during storage are rodents, insects, moisture as well as rips and holes in bags. Very few of the traders we interviewed utilized palettes or insecticides, or took other measures to control rodents. Of those traders who did use palettes and insecticides, storage losses were minimized to a negligible level.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA/Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
KOUTIALA	STORAGE LOSSES IN KOUTIALA	0.35%	0.55	0.48%	0.33%	TRADER

#### 4.1.2.5 STORAGE IN BOBO

Observed storage facilities in Bobo were similar to those in Sikasso, generally brick built with corrugated aluminum/brick roofs (see right). Prices quoted were fairly constant on a per Kg basis, and did not vary much with capacity. Storage is assumed to take place for 1 month, traders did not report long term storage of millet.

<sup>23</sup> Traders in Bobo were unable to estimate their costs for cleaning their millet. The adjusted cleaning cost from Sikasso has been used as a proxy. See above, section 3.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA/Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
BOBO	STORAGE IN BOBO	0.88	0.77%	0.53%	TRADER

#### 4.1.2.6 STORAGE LOSSES IN BOBO

Traders interviewed in Bobo stated that storage losses occurred, mainly due to rodents, insects, moisture as well as holes and rips in bags. The reported rate of storage losses was 7.5%, but only if storing long term. As traders interviewed did not store long term, we have assumed a rate of 3.75%, or half of this figure, as a reasonable estimate.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA /Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
BOBO	STORAGE LOSSES IN BOBO	3.75% <sup>24</sup>	5.71	5.02%	3.43%	TRADER

#### 4.1.2.7 STORAGE IN OUAGA

Observed storage facilities in Ouaga were similar to those in Bobo, generally brick built with corrugated aluminum roofs. Storage is assumed to take place for 1 month, traders did not report long term storage of millet before onwards sale.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA /Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
OUAGADOUGOU	OUAGA STORAGE	0.69	0.60%	0.41%	TRADER

#### 4.1.2.8 STORAGE LOSSES IN OUAGA

Traders stated that while losses in storage occurred, they were unable to estimate the rate. Key causes of losses cited were rodents and rips/holes in bags. An average rate of loss of 2.41% has been assumed, taking into account reported storage losses for millet in Sikasso, Koutiala and Bobo Dioulasso.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA /Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
OUAGADOUGOU	STORAGE LOSSES IN OUAGA	2.41% <sup>25</sup>	3.49	3.07%	2.10%	TRADER

<sup>24</sup> No estimates for losses in storage were available for the reported timescale. A figure of 7.5% was given for long term storage, we have assumed half of this figure, or 3.75% for short term storage.

<sup>25</sup> No estimates for losses in storage were available for Ouaga, and average of reported losses in Koutiala, Sikasso and Bobo Dioulasso has been used as a proxy.

#### 4.1.2.9 SACKS

In addition to the on farm bagging already accounted for, we observed:

- Re-bagging in Koutiala to replace worn sacks and verify quality
- Re-bagging in Bobo to remove impurities and replace worn sacks

In Koutiala, sacks are purchased for 225 FCFA each, and in Bobo Dioulasso sacks are purchased for 200 FCFA each.

On this corridor we only observed plastic sacks, which are non durable and can easily rip or break during handling, transit and storage (see right). Exposure to the sun leads to degradation of the material. Sewing techniques, see right, lead to further rips and tears. Generally these sacks are only used once, as they are not durable enough to be re-used. As mentioned, traders cited poor quality sacks as a key cause of losses<sup>26</sup>, but are unable to source a better alternative for a reasonable price.

As previously mentioned, larger buyers such as OPAM and WFP specify particular types of bags to be used. For example, OPAM specifies the use of jute sacks (see right), which are much more durable than plastic sacks and so can be used for long term storage (more than 1 year). Unfortunately, jute sacks are very expensive (prices from 500-800 FCFA per sack were cited) so this too expensive for most traders, without contracts with larger buyers.



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<sup>26</sup> Traders were unable to attribute a value to the losses caused by poor sack quality and/or sewing methods. These losses are included within market storage losses (market logistics) and in-transit losses (transport)

LOCATION INCURRED	ITEM DESCRIPTION	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
KOUTIALA	SACKS	2.25	1.98%	1.35%	TRADER
BOBO	SACKS	2.00	1.76%	1.20%	TRADER

#### 4.1.2.10 RE-BAGGING AND SEWING CHARGES - SIKASSO

Re-bagging and sewing services are provided in both Koutiala and Bobo. Traditional sewing methodology (see right) leads to rips in the sack, and is a key cause of holes from which losses occur<sup>27</sup>.



As mentioned above in section 3, the research team observed two instances in Mali where wholesalers used portable automatic sewing machines to close bags after re-bagging. This process took just a few seconds and produced an even seam with no ripping. The wholesalers stated that this machine could be bought new for a cost of 150,000 FCFA, and generally lasted for 2-3 years.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA/KG	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
KOUTIALA	FILLING AND SEWING	0.50	0.44%	0.30%	TRADER
BOBO	FILLING AND SEWING	0.88	0.77%	0.53%	TRADER

#### 4.1.3 TRANSPORT

Market logistics costs observed include:

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
<b>TRANSPORT</b> All formal and informal charges for transport services from farm to end market	<ul style="list-style-type: none"> <li>- Transport fees/charges</li> <li>- Transport Agent Fee</li> <li>- Losses during transport</li> </ul>

<sup>27</sup> Traders were unable to attribute a value to the losses caused by poor sack quality and/or sewing methods. These losses are included within market storage losses (market logistics) and in-transit losses (transport)



#### 4.1.3.1 TRANSPORT FEES AND CHARGES

Transport fees and charges are direct fees paid to transport service providers. This price does not generally include handling, but it does include several official and informal costs paid along the road to control officials, including tolls, weigh stations, police and gendarme bribes- this is discussed in the following section.

Transport prices vary depending on the demand for transport, which is highly dependent on the crop calendar especially for cotton.

As already noted in section 3, professionalism of transporters and respect for labor rights of drivers are low.

LOCATION INCURRED	ITEM DESCRIPTION	FCFA /Kg	FCFA /Kg/Km	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM-KOUTIALA	TRANSPORT PRICE FROM FARM TO KOUTIALA	6.95 <sup>28</sup>	0.103	6.11%	4.18%	TRADER
KOUTIALA-BOBO	TRANSPORT PRICE KOUTIALA-BOBO	13.96	0.063	12.27%	8.40%	TRADER
BOBO-OUAGA	TRANSPORT PRICE BOBO-OUAGA	9.75	0.022	8.57%	5.86%	TRADER

#### 4.1.3.2 TRANSPORT AGENT FEE

Although very few traders reported any difficulty finding a truck when they needed it, several traders in Bobo cited using an agent to source vehicles for the transport of their millet/sorghum to Ouagadougou. It was not clear if this fee is paid by the trader or transporter.

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA/Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
BOBO	INTERMEDIARY TO FIND TRUCK		0.19	0.16%	0.11%	TRADER

#### 4.1.3.3 LOSSES DURING TRANSPORT

Losses during transport occur as a result of poor handling practices as well as holes in bags. Although traders in Ouaga reported losses in transit between Bobo and Ouaga, they were unable to estimate the rate of these losses. An assumed rate based on the average of losses during the previous two segments has been used.

<sup>28</sup> Several purchase zones were given by wholesalers in Koutiala. This figure represents the average price per Kg/Km (0.103Kg/Km) for the average distance traveled from purchase zone to Koutiala (67.7km).

LOCATION INCURRED	ITEM DESCRIPTION	%	FCFA /Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
FARM-KOUTIALA	LOSSES IN TRANSIT	0.38%	0.59	0.52%	0.35%	TRADER
KOUTIALA-BOBO	LOSSES IN TRANSIT	2.00%	3.11	2.73%	1.87%	TRADER
BOBO-OUAGA	LOSSES IN TRANSIT	1.19% <sup>29</sup>	1.74	1.53%	1.05%	TRADER

#### 4.1.4 ADMINISTRATIVE

As millet trade along the Koutiala-Bobo corridor is only occasional, it was difficult to collect a broad data set on administrative charges along this route. Furthermore, the traders we spoke with that undertook cross border trade at this border stated that they often did not obtain official documentation required as it was too difficult, especially because of periodic export bans. No weigh station facilities are in operation along this corridor, so trucks do not pay axel load fines.

Administrative costs observed include:

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
<b>ADMINISTRATIVE CHARGES</b> All formal and informal charges for trade facilitation services (customs, taxes, weigh stations, export documentation, and customs and forwarding agent fees)	<ul style="list-style-type: none"> <li>- Customs fees</li> <li>- Weigh station fees</li> <li>- Conseil Malien des Transporteurs Routiers</li> <li>- Entrepots Malien au Senegal</li> <li>- Road tolls</li> <li>- Municipal taxes</li> </ul>

Please note that administrative procedures/obligations for trading/transporting millet and sorghum that either did not attract a monetary cost, or were not directly related to the movement of millet and sorghum are not included.

Furthermore, as noted above, the research team observed that control procedures are very repetitive, especially at the border, with the 3 main agencies (Customs, Police and Gendarmerie) asking the same questions and for the same documents on *both* sides of the border. The agencies do not appear to be working together, procedures are overlapping and the border process is not streamlined.

##### 4.1.4.1 MUNICIPAL TAXES – BOBO DIOULASSO

Traders pay 100-125 FCFA per 100kg sack in municipal tax on exiting Bobo Dioulasso market.

<sup>29</sup> Although traders in Ouaga reported losses in transit between Bobo and Ouaga, they were unable to estimate the rate of these losses. An assumed rate of 1.19%, based on the average of losses during the previous two segments has been used.

#### 4.1.4.2 CUSTOMS FEES

As already stated in section 3 above, in interviews with customs agents at the border, they stated that the only official costs they charged were the following:

- Inspection fee of 2,500 FCFA per hour of inspection, with a minimum charge of 2 hours = 5,000 FCFA
- After hours “Travail Supplémentaire” comes into effect between 6pm and 7.30am and on weekends and holidays. This doubles the inspection fee to 5,000 FCFA per hour, with a minimum 2 hour charge = 10,000 FCFA
- Statistical tax levied to cover the cost of collecting statistical data on imports and exports of 5,000 per truck
- Fines and warnings “Proces Verbale” for customs infractions such as missing documents. These fines are codified for the different types and severity of infractions and are laid out in a handbook published by the transport ministry. The customs agents interviewed stated the fines range from 3,000 FCFA to 70,000 FCFA, and a receipt is given. In reality, however, fines are normally levied as bribes, and no official receipt is given. This practice was confirmed by the customs agents themselves. Even though they did not condone it they admitted it was commonplace. Informal charges such as this will be discussed below.

These customs fees are paid by the trader/proprietor of the goods in transit.

#### 4.1.4.3 CMTR (CONSEIL MALIEN DES TRANSPORTEURS ROUTIERS)

The CMTR was founded in 2004 and became operational in 2009. It was set up to encompass all previous professional transporting bodies and create a unified voice for the Malian transport sector. The CMTR’s main role is as interlocutor between the transport sector and the government, and its aims include promoting free circulation of goods and professionalizing the transport sector. The CMTR provides the “lettre de voiture” or transport waybill (see below left), for a fee of 1,000 FCFA and also charges a fee of 5,000 FCFA per international journey (2,500 per domestic journey). Foreign trucks entering and ending their journey in Mali, must pay 10,000 FCFA. This fee is known as “la Ristourne”.

All drivers and transporters interviewed saw no value in the CMTR ristourne payments, and did not feel a service was provided in return for the fee. CMTR representatives interviewed, including the president of the CMTR in Bamako, vehemently defended the work of the CMTR in representing the interests of the transport sector. It is widely felt, however, that the CMTR is not effective and adds little value considering the amount of money it charges. The CMTR is paid by the transporter.

#### 4.1.4.4 SYNDICAT DES CHAUFFEURS

Various “syndicats”, which are local transport unions, charge a fee of 1000 FCFA per journey. Drivers felt that this was a reasonable fee and the unions provided a useful service to them if they needed assistance or arbitration.



Paid by the transporter. See picture for example of receipt.

#### SUMMARY OF ADMINISTRATIVE CHARGES

ITEM DESCRIPTION	FCFA TOTAL	FCFA /Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
MUNICIPAL TAX	45,000	1.125	0.99%	0.68%	TRADER
OFFICIAL CUSTOMS FEES	15,000	0.375	0.33%	0.23%	TRADER
CMTR	5,000	0.125	0.11%	0.08%	TRANSPORTER
LETTRE DE VOITURE	1,000	0.025	0.02%	0.02%	TRANSPORTER
SYNDICAT DES TRANPORTEURS	1,000	0.025	0.02%	0.02%	TRANSPORTER
<b>TOTAL</b>	<b>67,000</b>	<b>1.675</b>	<b>1.47%</b>	<b>1.01%</b>	

#### 4.1.5 INFORMAL

Informal costs observed include:

COST CATEGORY	EXAMPLES OF COSTS OBSERVED
<b>INFORMAL PAYMENTS</b> Explicit bribes paid	- Bribes paid at checkpoints - Bribes paid at borders

##### 4.1.5.1 BRIBES PAID AT CHECKPOINTS AND BORDERS

As already noted in section 3 above, road harassment and corruption are widely acknowledged as a problem in West Africa. Bribes are extracted by customs, police, gendarme and SPS services at the borders along the route. The research team collected data on bribes paid between Koutiala and Bobo from two sources, however, as cross border trade on this corridor is unusual, the data was judged to be unreliable. Instead, data for this segment has been taken from the latest IRTG report.<sup>30</sup> As the IRTG reports deal with road harassment in detail, only headline figures are reported here. The report states that total bribes on the Koutiala-Bobo corridor are 140,338 FCFA, and on the Koutiala-Ouaga corridor are 207,224 FCFA, so the implied bribes paid between Bobo and Ouaga are 66,886 FCFA.

<sup>30</sup> 14ème Rapport de l'OPA/ UEMOA 1 October-31<sup>st</sup> December 2010, DRAFT Février 2011

ITEM DESCRIPTION	FCFA TOTAL	FCFA /Kg	% FARM GATE PRICE	% FINAL SALES PRICE	BORNE BY
BRIBES PAID KOUTIALA-BOBO	140,338 <sup>31</sup>	3.51	3.08%	2.11%	TRANSPORTER
BRIBES PAID BOBO-OUAGA	66,886 <sup>32</sup>	1.67	1.47%	1.01%	TRANSPORTER
<b>TOTAL</b>	<b>207,224</b>	<b>5.18</b>	<b>4.55%</b>	<b>3.12%</b>	

## 4.1.6 ITEMS NOT INCLUDED IN TRANSPORT COST ANALYSIS

### 4.1.6.1 WEIGHT DIFFERENCE

One of the main concerns of traders interviewed in Burkina Faso is that on arrival at their shop/warehouse, they find that the sacks of millet they purchased weigh less than what they thought they were purchasing. For example, the average weight difference for traders interviewed in Burkina Faso is **4.56%**, meaning that on average, for every 100 Kg sack purchased, it actually only contained 95 Kg. Although this was only reported to be a problem for millet sourced from the Bobo region, and not millet coming from Koutiala, it was such a significant concern to traders in Burkina Faso that it has been included in this transport cost analysis.

The cause of this loss is non-existent or inaccurate weighing equipment at the point of purchase. No scales were observed in rural markets in Burkina Faso, and even in Bobo Dioulasso there were very few, if any, weighing scales in the market areas. Traders also thought that it could be a deliberate ruse on the part of producers to make more money.



Conversely, in Mali, even in rural areas, many scales were visible in markets, with practically every trader having their own scale, or access to one (see picture to the right, in Sikasso). Weight difference was not reported to be a major concern for Malian traders interviewed.

<sup>31</sup> 14ème Rapport de l'OPA/ UEMOA 1 October-31<sup>st</sup> December 2010, DRAFT Février 2011, based on assumption of 40 T truck

<sup>32</sup> 14ème Rapport de l'OPA/ UEMOA 1 October-31<sup>st</sup> December 2010, DRAFT Février 2011, computed based on assumption of 40 T truck

#### 4.1.6.2 IMPURITIES

Impurities in millet cited as a major concern for traders on this corridor. These impurities are introduced at the post-harvest handling stage either through poor practices or through dishonest farmers adding material to increase sack weight. The average reported percentage of impurities was **3.00%**, however many interviewees were unable to estimate the rate. This has not been included in the transport cost analysis above because it is not a true cost, it just serves to shift margins to different value chain actors, e.g. increasing farmer margins to the detriment of the traders', or by the farmer applying a discount to the millet and sorghum he purchases as he expects a certain impurity rate. It is still, however a major logistics concern for value chain actors.



## 4.2 TRANSPORT COSTS ANALYZED

### 4.2.1 OVERALL COST DRIVERS

The transport and logistics costs for millet observed along the Koutiala-Ouaga corridor have been described in detail above, the following table summarizes these costs.

DETAILED TRANSPORT AND LOGISTICS COSTS PER KG OF MILLET TRAVELING FROM KOUTIALA TO OUAGA

Location incurred	Item description	%	FCFA /Kg	% Farm gate price	% Final Sales Price	Borne by
Farm	Losses during drying	1.00%	1.66	1.46%	1.00%	Farmer
Farm	Losses during shelling	2.00%	3.29	2.89%	1.98%	Farmer
Farm	Fees for use of de-shelling machine		12.50	10.99%	7.52%	Farmer
Farm	Losses during storage	3.00%	4.84	4.25%	2.91%	Farmer
Farm	On farm bagging and sewing		2.75	2.42%	1.65%	Farmer
Farm	On farm loading		0.50	0.44%	0.30%	Farmer
Farm price			113.75			
Farm-Koutiala	Transport price from farm to Koutiala		6.95	6.11%	4.18%	Trader
Farm-Koutiala	Losses in transit	0.38%	0.59	0.52%	0.35%	Trader
Koutiala	Unloading		0.50	0.44%	0.30%	Trader
Koutiala	Storage costs in Koutiala		1.06	0.93%	0.64%	Trader
Koutiala	Storage losses in Koutiala	0.35%	0.55	0.48%	0.33%	Trader
Koutiala	Sacks		2.25	1.98%	1.35%	Trader
Koutiala	Filling and sewing		0.50	0.44%	0.30%	Trader
Koutiala	Loading		0.50	0.44%	0.30%	Trader
Koutiala-Bobo	Transport price		13.96	12.27%	8.40%	Trader

Koutiala-Bobo						
Koutiala-Bobo	Official costs Koutiala-Bobo		0.55	0.48%	0.33%	Trader/Transporter
Koutiala-Bobo	Informal costs Koutiala-Bobo		3.51	3.08%	2.11%	Trader/Transporter
Koutiala-Bobo	Losses in transit	2.00%	3.11	2.73%	1.87%	Trader
Bobo	Unloading		0.50	0.44%	0.30%	Trader
Bobo	Sales price		130.00			
Bobo	Cleaning to remove impurities		2.00	1.76%	1.20%	Trader
Bobo	Sacks		2.00	1.76%	1.20%	Trader
Bobo	Filling and sewing		0.88	0.77%	0.53%	Trader
Bobo	Storage in Bobo		0.88	0.77%	0.53%	Trader
Bobo	Storage losses in Bobo	3.75%	5.71	5.02%	3.43%	Trader
Bobo	Intermediary to find truck		0.19	0.16%	0.11%	Trader
Bobo	Loading		0.50	0.44%	0.30%	Trader
Bobo	Sales price		140.00			
Ouagadougou	Unloading		0.50	0.44%	0.30%	Trader
Bobo-Ouaga	Transport price Bobo-Ouaga		9.75	8.57%	5.86%	Trader
Bobo-Ouaga	Losses in transit	1.19%	1.74	1.53%	1.05%	Trader
Bobo-Ouaga	Official costs Bobo-Ouaga		1.13	0.99%	0.68%	Trader
Bobo-Ouaga	Informal costs Bobo-Ouaga		1.67	1.47%	1.01%	Trader/Transporter
Ouagadougou	Ouaga Storage		0.69	0.60%	0.41%	Trader
Ouagadougou	Storage losses in Ouaga	2.41%	3.49	3.07%	2.10%	Trader
Ouagadougou	Sales price in Ouaga		166.25			Trader

Source: Field interviews and calculations

The following table presents these costs summarized by cost type:

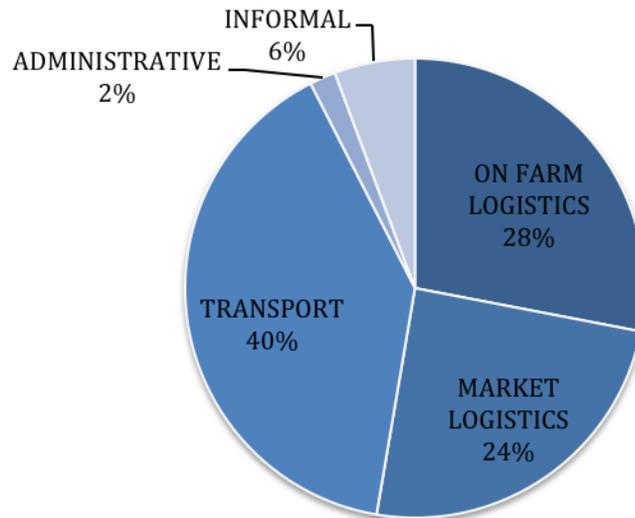
SUMMARY OF TRANSPORT AND LOGISTICS COST PER KG OF MILLET/SORGHUM TRAVELING BETWEEN KOUTIALA AND OUAGA

	FCFA/KG	% Farm gate price	% Final Sales Price
ON FARM LOGISTICS	25.54	22%	15%
MARKET LOGISTICS	22.49	20%	14%
TRANSPORT	36.28	32%	22%
ADMINISTRATIVE	1.68	1%	1%
INFORMAL	5.18	5%	3%
<b>Total</b>	<b>91.18</b>	<b>80%</b>	<b>55%</b>

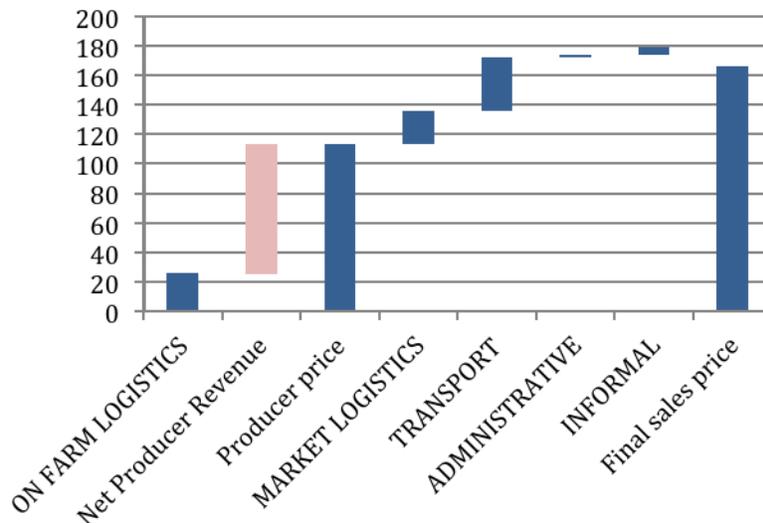
The total transport and logistics costs account for 91.18 FCFA/Kg of millet/sorghum traveling from Sikasso to Dakar, which equates to 80% of farm gate price and 55% of final end market price.

As can be seen from the pie chart below, the most important drivers of transport and logistics costs are transport costs, which represent 40% of the total costs, and on farm logistics costs, which represent 28% of the total costs. Market logistics costs represent 24% of total costs.

COMPONENTS OF TOTAL TRANSPORT AND LOGISTICS COSTS FOR MILLET ON THE KOUTIALA-OUAGA CORRIDOR



STEP CHART OF TRANSPORT AND LOGISTICS COSTS BY CATEGORY FOR MILLET KOUTIALA-OUAGA



Net producer revenue does not take into account any other production costs, other than on farm logistics costs.

This graph shows that this system is loss-making ie. farm gate price + transport & logistics costs > final sales price. This graph highlights how transport and logistics cost play heavily into the decision to trade over long distances/across borders, and how price differentials between regional markets must be high enough to justify trade. As stated, traders on this corridor only occasionally engaged in cross-border transactions, when prices were high enough to justify it, and at the time of research, trade was not taking place.

## 4.2.2 PHYSICAL LOSSES

Cost Category	Item description	Observed loss	Indicative weight of sack	Cumulative loss
ON FARM LOGISTICS	Losses during drying	1.00%	99.00	1.00%
ON FARM LOGISTICS	Losses during shelling	2.00%	97.02	2.98%
ON FARM LOGISTICS	Losses during storage	3.00%	94.11	5.89%
TRANSPORT	Losses in transit	0.38%	93.76	6.24%
MARKET LOGISTICS	Storage losses in Koutiala	0.35%	93.43	6.57%
TRANSPORT	Losses in transit	2.00%	91.56	8.44%
MARKET LOGISTICS	Storage losses in Bobo	3.75%	88.13	11.87%
TRANSPORT	Losses in transit	1.19%	87.08	12.92%
MARKET LOGISTICS	Storage losses in Ouaga	2.41%	84.98	15.02%
<b>Total</b>				<b>15.02%</b>

Total physical losses along the corridor amount to 15.02%. The main driver of these losses is storage losses, particularly on farm storage losses and storage losses in Bobo Dioulasso.

## 4.2.3 EXTRA COST ANALYSIS

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

### 4.2.3.1 ON FARM LOGISTICS

The following table summarizes the extra costs identified in the on farm logistics category.

COST ANALYSIS FOR THE ON FARM LOGISTICS CATEGORY

ON FARM LOGISTICS	Observed %	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Losses during drying	1.00%	1.66	1.66	0.00
Losses during shelling	2.00%	3.29	1.65	1.65
Fees for use of de-shelling machine		12.50	2.50	10.00
Losses during storage	3.00%	4.84	3.23	1.61
On farm bagging and sewing		2.75	2.60	0.15
On farm loading		0.50		
<b>Total</b>		<b>25.54</b>	<b>11.63</b>	<b>15.41</b>

**Losses during drying** are observed to be 1.00%. In discussions with value chain leaders on the IICEM project, the achievable level of losses during this post harvest handling process is 2.00%, so no extra costs are seen in this category.

**Losses during shelling** are observed to be 2.00%. In discussions with value chain leaders on the IICEM project, the achievable level of losses during this post harvest handling process is 2.00%, so no extra costs are seen in this category.

**Fees for use of de-shelling machine** Farmers stated that the high cost of rental of de-shelling machines was a major problem, particularly for millet and sorghum, for which a high price was charge due to the intricacy of the de-shelling process. Observed costs are 12.50 FCFA/Kg. Please see section 3 above for the computation of optimized costs in this category. Based on this calculation, an optimized cost for mechanical de-shelling is 2.50 FCFA/Kg.

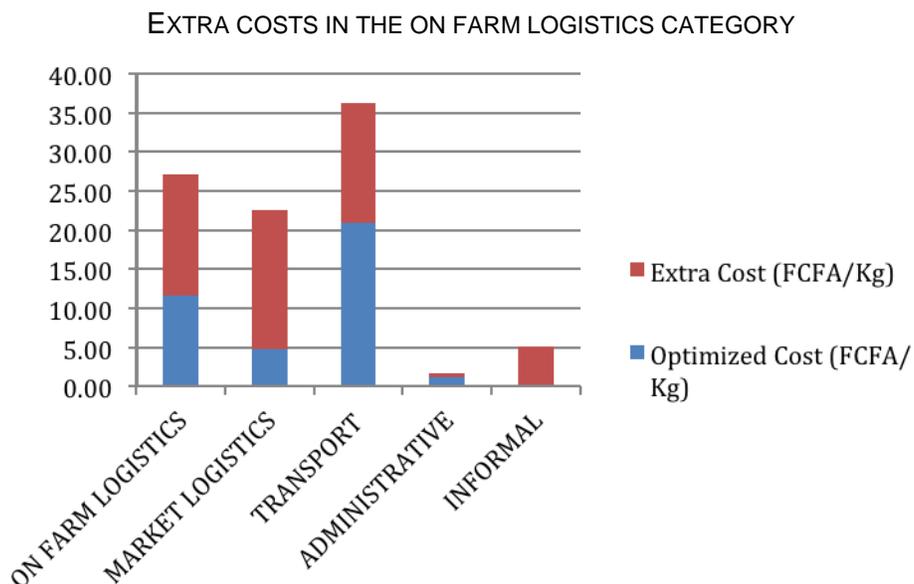
**On farm storage losses** are observed to be 3%. In discussions with value chain leaders on the IICEM project, the achievable level of losses during this on farm storage is 2%, which is monetized to an optimized cost of 3.23 FCFA/Kg.

**On farm bagging and sewing costs** are observed to be 2.75 FCFA/Kg, which includes the cost of an empty sack (225 FCFA) and 0.5 FCFA/kg in filling and sewing costs. As noted in section 3 above, the research team observed instances of use of automatic handheld sewing machines, which produced a high quality seam in no more than a few seconds, could be purchased for 150,000 FCFA and last approximately 2 years. A prudent estimate of 150 bags sewn per week results in a per Kg cost of 0.10 FCFA. Please see section 3 above for the detailed calculation of this figure.

Based on the cost of loading a 100kg sack, 0.5 FCFA/kg, it can be assumed that filling a sack (a much less strenuous and less skilled job) is no more than 0.25 FCFA/kg.

In total, the assumed optimized cost for filling and sewing a bag on farm should be  $0.25+0.1=0.35$  FCFA/kg, plus the bag cost of 2.25 FCFA/Kg.

**On farm loading charges** there is no basis for estimating extra costs for this item.



Extra costs amount to 15.41 FCFA/Kg, out of 25.54 FCFA/Kg of total on farm logistics costs. In other words, 56% of on farm logistics costs are considered to be extra costs.

### 4.2.3.2 MARKET LOGISTICS

The following table summarizes the extra costs identified in the market logistics category.

COST ANALYSIS FOR THE MARKET LOGISTICS CATEGORY

MARKET LOGISTICS	Observed %	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Loading and unloading		2.50	2.50	0.00
Cleaning to remove impurities		2.00	0.00	2.00
Storage costs in Koutiala		1.06	1.06	0.00
Storage losses in Koutiala	0.35%	0.55	0.00	0.55
Storage in Bobo		0.88	0.70	0.18
Storage losses in Bobo	3.75%	5.71	0.00	5.71
Ouaga Storage		0.69	0.55	0.14
Storage losses in Ouaga	2.41%	3.49	0.00	3.49
Sacks		4.25	0.00	4.25
Filling and sewing		1.38	0.00	1.38
<b>Total</b>		<b>22.49</b>	<b>4.81</b>	<b>17.68</b>

**Loading and unloading** there is no basis for estimating extra costs for this item

**Impurities and cleaning to remove impurities:** To achieve the best price premium and demands of buyers, impurities should be negligible, and there subsequently should be no need for the trader to remove them before sale.

**Storage in Koutiala** Prices quoted in Koutiala (1.06 FCFA/Kg) are for storage facilities that are purpose built, and have low storage losses and are relatively less expensive than storage facilities in Sikasso. The market for storage in Koutiala also appears to be fairly efficient. This thus is assumed to be an optimized cost.

**Storage in Bobo** Prices quoted in Bobo are for storage facilities that are not purpose built, not adequately ventilated, and infested with rodents. A discount of 20% has been assumed as a proxy for potential reduced costs if a higher volume of product is stored and a commercial, purpose built storage market is developed.<sup>33</sup>

**Storage in Ouagadougou** Prices quoted in Ouagadougou are for storage facilities that are not purpose built, not adequately ventilated, and infested with rodents. A discount of 20% has been assumed as a proxy for potential reduced costs if a higher volume of product is stored and a commercial purpose built storage market is developed.<sup>34</sup>

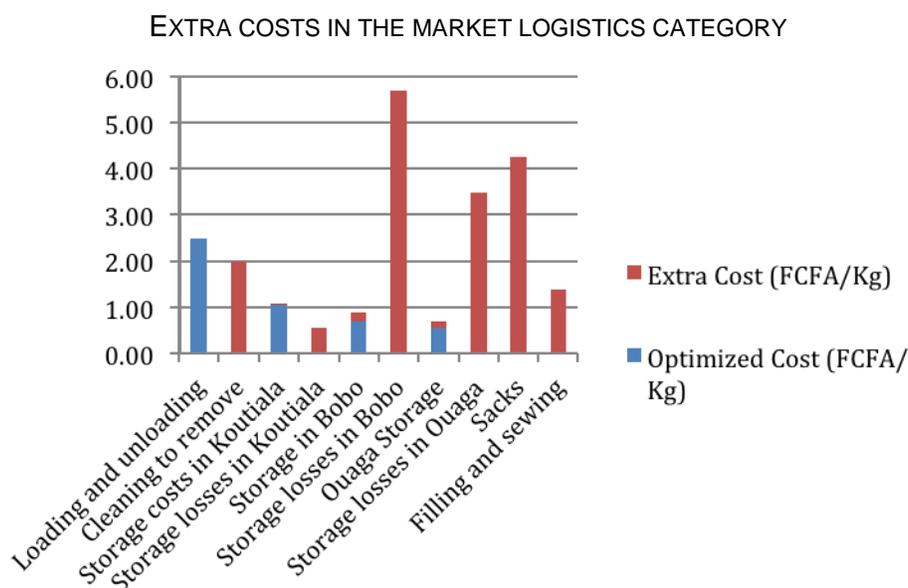
<sup>33</sup> See ATP Maize Transport and Logistics assessment, Dave Schacht.

<sup>34</sup> See ATP Maize Transport and Logistics assessment, Dave Schacht.

**Losses in storage** The research team observed instances of use of simple storage techniques such as aeration palettes and insecticides which can bring storage losses down to a negligible level. Thus an optimized loss level at this stage in the value chain is 0%.

**Weight difference** In an optimized scenario, with adequate weighing infrastructure, no weight differences should exist between point of purchase and arrival at buyer’s facility. This is therefore assumed to be an extra cost.

**Purchase of sack/filling and sewing** In an optimized scenario there should be no need to re-bag sacks again after leaving the farm. Ideally, one bag should be used only once and throughout the entire export operation. Therefore these costs are considered as extra costs.



Extra costs amount to 17.68 FCFA/Kg, out of 22.49 FCFA/Kg of total market logistics costs. In other words, 79% of market logistics costs are considered to be extra costs.

#### 4.2.3.3 TRANSPORT

The following table summarizes the extra costs identified in the transport category.

**COST ANALYSIS FOR THE TRANSPORT CATEGORY**

TRANSPORT	Observed %	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Transport price from farm to Koutiala		6.95	3.52	3.43
Losses in transit	0.38%	0.59	0.00	0.59
Transport price Koutiala-Bobo		13.96	7.48	6.48
Losses in transit	2.00%	3.11	0.00	3.11
Intermediary to find truck		0.19	0.19	0.00

Transport price Bobo-Ouaga		9.75	9.75	0.00
Losses in transit	1.19%	1.74	0.00	1.74
<b>Total</b>		<b>36.28</b>	<b>20.94</b>	<b>15.35</b>

**Farm to Koutiala transport cost** Observed costs in this category are 6.95 FCFA/Kg, for an assumed 68km journey from farm to Koutiala. This transit is undertaken in 5-10 T trucks. As can be seen from the table below, the cost per Kg/Km for this segment is extremely high in comparison with subsequent segments.

TRANSPORT COSTS PER KG/KM

Segment	KM	FCFA/Kg	FCFA/Kg/KM
Transport price from farm to Koutiala	68	6.95	0.103
Transport price Koutiala-Bobo	220	13.96	0.063
Transport price Bobo-Ouaga	446	9.75	0.022

This could be caused by several plausible reasons including short distance and small shipments leading to low economies of scale, relative bargaining power of farmers, and low supply of trucks. While many transporters and farmers cited poor quality of roads as a major determinant of price over these segments, price and road quality data did not support this posit.<sup>35</sup>

Taking the transport cost per Kg/Km for millet and sorghum traveling from consolidation to Koutiala of 0.052 as a proxy for a similar distance and perhaps a more efficient transport market using larger trucks, the implied optimized cost for the farm to consolidation segment is 3.43 FCFA/Kg.

**Koutiala to Bobo transport costs** The observed transport cost for this 220km segment is 0.063 FCFA/Kg/Km. Benchmark price figures from Teravanithorn and Rallaband (2008)<sup>36</sup> suggest that average transport prices for long distances (1000+ km) in West Africa per kg/km are 0.034 FCFA.<sup>37</sup> Transport costs for this segment are likely elevated for the same reasons as above, including market inefficiency and lack of economies of scale. Taking this transport cost per Kg/Km over long distances in West Africa as a proxy for a more efficient transport market for this 220 Km distance, the implied optimized cost for the farm to consolidation segment is 7.48 FCFA/Kg.

**Bobo to Ouaga transport costs** The observed transport cost for this segment is 0.022 FCFA/Kg/Km. Benchmark price figures from Teravanithorn and Rallaband (2008)<sup>38</sup> suggest that

<sup>35</sup> Through the course of the study, data on transport prices between various localities were collected and the respondents also questioned on the average road quality along these routes. No correlation was found between poor quality of road and high transport price, when viewed on a per FCFA/Km basis.

<sup>36</sup> Teravanithorn and Rallaband, Transport Prices and Costs in Africa, The World Bank, 2008

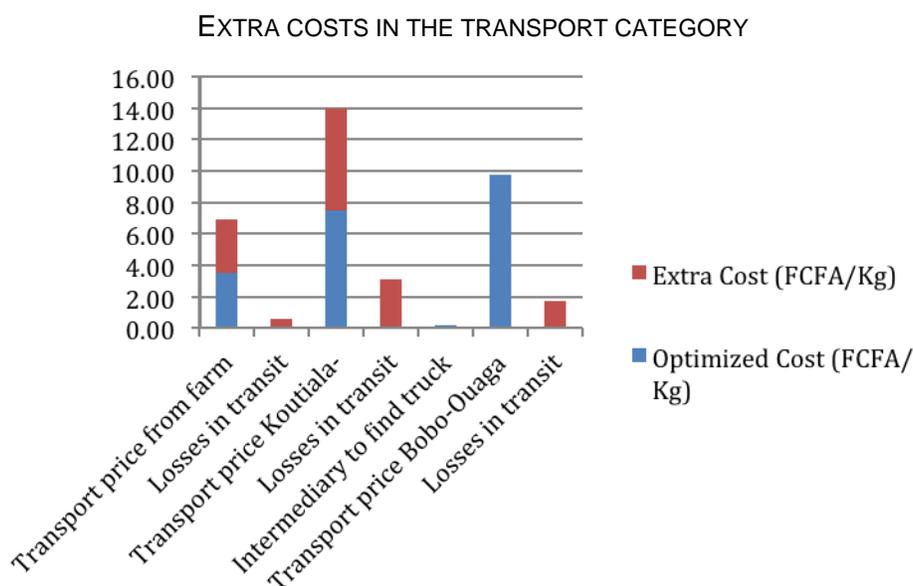
<sup>37</sup> In source, prices are shown in USD, translated at an exchange rate of 475 FCFA/\$.

<sup>38</sup> Teravanithorn and Rallaband, Transport Prices and Costs in Africa, The World Bank, 2008

this price is actually quite reasonable in comparison with other markets. For example, according to their study transport prices in Western Europe are approximately 0.024 FCFA/Kg/Km<sup>39</sup>, and in the US are 0.019 FCFA/Kg/Km<sup>40</sup>. Therefore, we find that there are no extra costs in this category.

**Losses in transport** Losses in transport are a result of poor handling, poor packaging and poor trucks. All losses in transport are considered unnecessary and are therefore, extra costs.

**Agent fee to find truck** This is considered to be an inefficient and unnecessary actor, which could be eliminated with improved market information, for example a freight exchange/information center.



Extra costs amount to 15.35 FCFA/Kg, out of 36.28 FCFA/Kg of total transport costs. In other words, 42% of transport costs are considered to be extra costs.

#### 4.2.3.4 ADMINISTRATIVE

The following table summarizes the extra costs identified in the market logistics category.

**COST ANALYSIS FOR THE ADMINISTRATIVE CATEGORY**

ADMINISTRATIVE	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Municipal tax	1.13	1.13	0.00
Official customs fees	0.38	0.06	0.32
CMTR	0.13	0.00	0.13

<sup>39</sup> In source, prices are shown in USD, translated at an exchange rate of 475 FCFA/\$.

<sup>40</sup> In source, prices are shown in USD, translated at an exchange rate of 475 FCFA/\$.

Lettre de voiture	0.03	0.03	0.00
Syndicat des transporteurs	0.03	0.03	0.00
<b>Total</b>	<b>1.68</b>	<b>1.24</b>	<b>0.44</b>

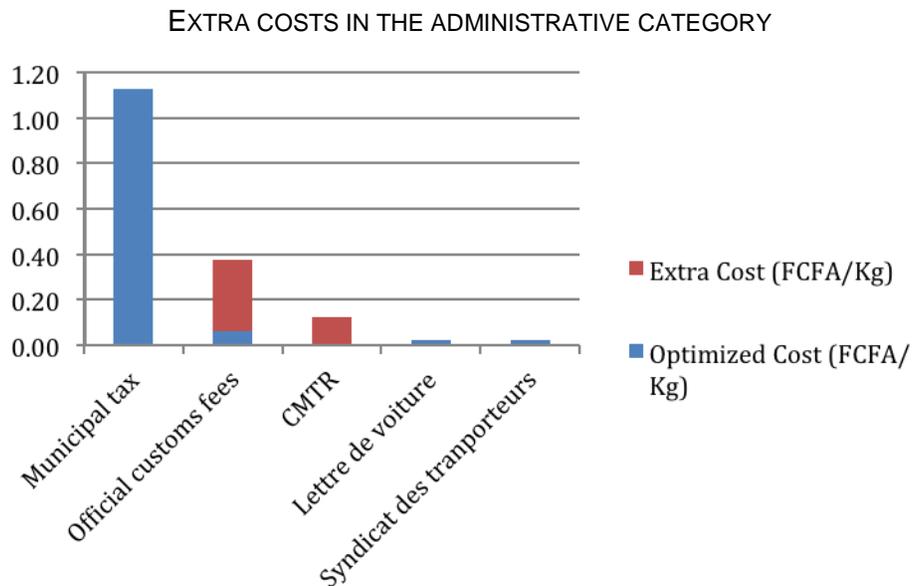
**Municipal taxes** are not considered to be extra costs.

**Customs fees** which include statistical taxes and inspection fees are observed to be 0.38 FCFA/Kg in total (see section on administrative costs above for more detail). Statistical taxes are considered to be an extra cost as evidence shows that data is not effectively collected. Inspection fees include a 2 hour minimum inspection and overtime fees for inspections outside regular working hours. An optimized scenario of an efficient 1 hour inspection with no extra charges for overtime, results in an optimized cost for this category of 0.06 FCFA/Kg.

**Lettre de Voiture** This a legitimate cost and not considered to be an extra cost.

**CMTR** This charge is widely felt to be irrelevant as the CMTR provides few tangible benefits to drivers, it is therefore considered an extra cost.

**Syndicat des Voitures** Drivers felt that a valuable service was provided for this fee, therefore it is not considered to be an extra cost.



Extra costs amount to 0.44 FCFA/Kg, out of 1.68 FCFA/Kg of total administrative costs. In other words, 26% of administrative costs are considered to be extra costs.

#### 4.2.3.5 INFORMAL

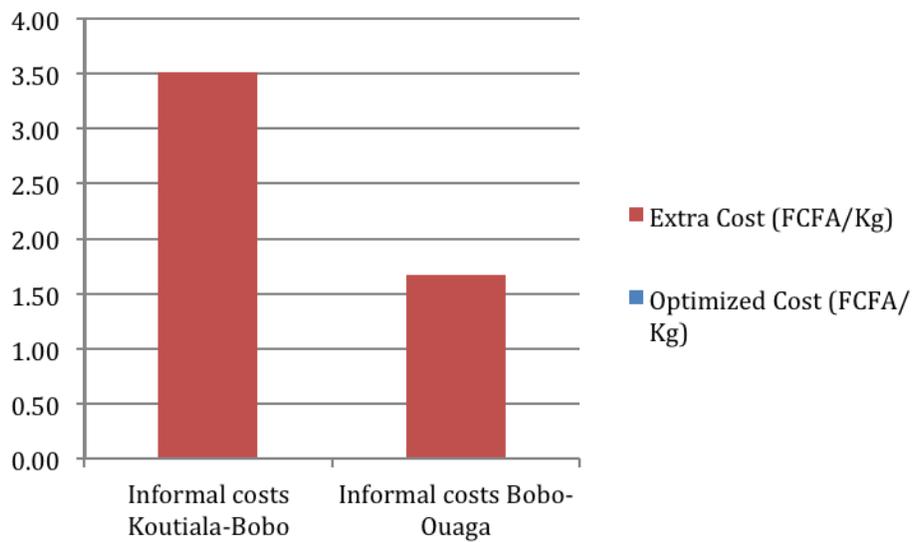
The following table summarizes the extra costs identified in the informal category.

COST ANALYSIS FOR THE INFORMAL CATEGORY

INFORMAL	Observed Cost (FCFA/kg)	Optimized Cost (FCFA/Kg)	Extra Cost (FCFA/Kg)
Informal costs Koutiala-Bobo	3.51	0.00	3.51
Informal costs Bobo-Ouaga	1.67	0.00	1.67
<b>Total</b>	<b>5.18</b>	<b>0.00</b>	<b>5.18</b>

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

EXTRA COSTS IN THE INFORMAL CATEGORY



Extra costs amount to 100% of informal costs.

# 5. CONCLUSIONS

## 1. Constrained by high transport costs and periodic export bans, cross-border flows of millet and sorghum along the corridors are highly price dependent.

Although this study called for an assessment of transport and logistics costs for millet and sorghum along the Bobo Dioulasso – Sikasso – Bamako – Dakar corridor, no trade in these products was observed between Bobo Dioulasso and Sikasso, with traders stating that the price differential between the markets was insufficient to cover the high perceived transport costs and produce an adequate margin. This lack of price differential was supported by Iso-Price maps recently compiled by the West Africa Trade Hub. Traders also cited periodic export bans on cereals as a further key reason they did not engage in cross border trade, and sourced their millet/sorghum from local production zones. Conversely, the research team did observe trade in *millet* from Koutiala to Bobo-Dioulasso. Traders in both Koutiala and Bobo Dioulasso stated that when prices were right, they would *occasionally* engage in cross border trade in this direction, with onwards trade to Ouagadougou.<sup>41</sup> In addition, Trade between Sikasso and Dakar was observed to be common, with prices in Dakar high enough to incentivize this westbound trade.

For completeness, this study has assessed transport and logistics costs along 2 separate corridors: for Millet and Sorghum between Sikasso and Dakar, and Millet between Koutiala and Ouagadougou.

## 2. Transport and logistics costs represent 57%<sup>42</sup> of end market price. Extra costs observed represent 33%<sup>43</sup> of end market price.

The following table highlights the main findings from the transport and logistics cost analysis:

KEY FINDINGS FROM TRANSPORT AND LOGISTICS COST ANALYSIS

	KM	Total transport & logistics costs	% Producer price	% Final sales price	Extra costs	% Extra costs over observed costs	% Extra costs of final sales price
Millet/Sorghum:							
Sikasso-Dakar	1806	102.88	92%	59%	54.48	53%	31%
Millet: Koutiala-Ouaga	734	91.18	80%	55%	58.83	60%	35%
<b>Average</b>	<b>1270</b>	<b>97.03</b>	<b>86%</b>	<b>57%</b>	<b>56.66</b>	<b>56%</b>	<b>33%</b>

<sup>41</sup> Trade was not taking place at the time of the research, and an analysis of total transport and logistics costs along the corridor showed that trade at observed prices would be loss-making.

<sup>42</sup> An average over the 2 corridors studied

<sup>43</sup> An average over the 2 corridors studied

With transport and logistics costs representing an average of 57% of final end market price, it is not surprising that cross border trade in millet and sorghum is constrained, with trade only taking place on the basis of high enough price differentials between markets to cover these high costs.

Furthermore, an analysis of extra costs (i.e. the portion of observed cost that is considered unnecessary, unjustified or too expensive) shows that an average of 56% of total observed transport and logistics costs are extra costs, and that 33% of the end market price is represented by extra costs

Transport and logistics inefficiencies are thus extremely significant, and improving the efficiency of the transport and logistics chain represents huge potential for enhancing economic incentives for intraregional trade and increasing regional price arbitrage. In the face of rising fears about food insecurity and vulnerability to external price shocks, this finding is tremendously important.

### 3. On farm logistics represent up to 37%<sup>44</sup> of total transport and logistics costs.

ON FARM LOGISTICS COSTS

On Farm Logistics	Observed costs	% total observed costs	% Producer price	% Final sales price	Extra Costs	% Extra costs over observed costs
Millet/Sorghum: Sikasso-Dakar	38.38	37%	34%	22%	22.35	58%
Millet: Koutiala-Ouaga	25.54	28%	22%	15%	15.41	60%

On farm logistics costs are driven by losses during drying, shelling and storage, and fees for the use of mechanical de-shelling equipment, in addition to on farm bagging and handling. Furthermore, this category includes impurities introduced during post-harvest handling. In total, these costs represent up to 34%<sup>45</sup> of the farmer's sale price. While improved production practices and increased yields are important, it is also clear that improved post harvest handling techniques and access to better on farm logistics equipment would also result in improved farmer incomes, better quality product and lower end market prices as up to 60%<sup>46</sup> of on farm logistics costs were found to be inefficient.

### 4. Transport costs represent up to 40%<sup>47</sup> of total transport and logistics costs.

TRANSPORT COSTS

Transport	Observed costs	% total observed costs	% Producer price	% Final sales price	Extra Costs	% Extra costs over observed costs
Millet/Sorghum: Sikasso-Dakar	37.51	36%	34%	22%	12.47	33%
Millet: Koutiala-Ouaga	36.28	40%	32%	22%	15.35	42%

<sup>44</sup> For millet and sorghum on the Sikasso-Dakar corridor

<sup>45</sup> For millet and sorghum on the Sikasso-Dakar corridor

<sup>46</sup> For millet on the Koutiala-Ouaga corridor

<sup>47</sup> For millet on the Koutiala-Ouaga corridor

Transport costs are driven by direct prices paid for transport services, losses during transit and fees for transport agents used to procure trucks. Over longer distances (i.e. between Sikasso and Dakar, and between Bobo Dioulasso and Ouagadougou) transport prices were found to be relatively low in comparison with global benchmarks.<sup>48</sup> However, over shorter distances, transport prices were found to be high, especially between farm and consolidation point, where on a Kg/Km basis costs were up to 50 times higher than over longer distances.<sup>49</sup> Transport prices were found to be seasonal, based on crop calendars which dictate the demand for trucking services. Furthermore, significant physical losses in transit occur, which are mainly caused by handling practices as well as poor quality bags. Up to 42%<sup>50</sup> of transport costs were found to be extra costs. Therefore, reducing transport costs and losses in transit, as well as improving trucking market information availability, could have a significant effect on the efficiency and competitiveness of the value chain.

**5. Market logistics costs represent up to 25%<sup>51</sup> of total transport and logistics costs.**

Market Logistics	Observed costs	% total observed costs	% Producer price	% Final sales price	Extra Costs	% Extra costs over observed costs
Millet/Sorghum: Sikasso-Dakar	16.89	16%	15%	10%	11.44	68%
Millet: Koutiala-Ouaga	22.49	25%	20%	14%	17.68	79%

Market logistics costs are mainly driven by handling fees, storage costs and losses, and rebagging. Market storage losses were shown to be avoidable by implementing simple and cheap techniques to improve aeration and reduce pests, but are still occurring on a widespread basis. Extra costs in market storage<sup>52</sup>, represent up to 13%<sup>53</sup> of total observed transport and logistics costs. Rebagging, which takes place to verify quality, remove impurities as well as replace worn sacks should also be an avoidable cost given efficient post harvest handling and on-farm bagging using higher quality sacks which are durable enough to survive throughout the value chain. Overall, a very significant portion, up to 79%<sup>54</sup>, of market logistics cost are considered to be extra costs, and improvements in market logistics processes and infrastructure have great potential to improve efficiency in the transport and logistics chain.

**6. Informal costs represent up to 7%<sup>55</sup> of total transport and logistics costs.**

<sup>48</sup> Global benchmarks were sourced from Teravanithorn and Rallaband: Transport Prices and Costs in Africa, The World Bank 2008.

<sup>49</sup> For Millet and Sorghum traveling from farm to consolidation (Zegoua)

<sup>50</sup> For millet on the Koutiala-Ouaga corridor

<sup>51</sup> For millet on the Koutiala-Ouaga corridor

<sup>52</sup> Includes the portion of storage cost considered too expensive, and all storage losses in market zones.

<sup>53</sup> For millet on the Koutiala-Ouaga corridor

<sup>54</sup> For millet on the Koutiala-Ouaga corridor

<sup>55</sup> For millet and sorghum on the Sikasso-Dakar corridor

INFORMAL COSTS

Informal	Observed costs	% total observed costs	% Producer price	% Final sales price	Extra Costs	% Extra costs over observed costs
Millet/Sorghum: Sikasso-Dakar	7.18	7%	6%	4%	7.18	100%
Millet: Koutiala-Ouaga	5.18	6%	5%	3%	5.18	100%

Informal costs, i.e. bribes extracted along the corridors at checkpoints and at borders by customs, police, gendarme and SPS operatives, make up only a small portion of observed costs and end market price, but are 100% inefficient in terms of the extra cost analysis. Of particular note are the high level of bribes extracted at the border, with customs agents citing export bans (whether they are actually in place or not) to traders as a means to extract illicit payments. Among the many widely acknowledged ills of road corruption in this region, these informal costs pose a highly visible and divisive barrier to trade, and act as a deterrent to cross border trade, especially when misinformation is given about the existence of export bans. Furthermore, since both legal and illegal trucks are made to pay bribes irrespective of their documentation or truck maintenance, for example, this disincentivizes good quality transport service operations, and creates additional inefficiencies.

**7. Administrative costs represent up to 3%<sup>56</sup> of total transport and logistics costs.**

Administrative costs

Administrative	Observed costs	% total observed costs	% Producer price	% Final sales price	Extra Costs	% Extra costs over observed costs
Millet/Sorghum: Sikasso-Dakar	2.93	3%	3%	2%	1.04	36%
Millet: Koutiala-Ouaga	1.68	2%	1%	1%	0.44	26%

Although administrative costs make up just 2-3% of total transport and logistics cost, inefficiencies in this category need to be addressed. The main driver of administrative costs on the Sikasso-Dakar corridor is weigh station fines, which arise due to truck overloading. While this is not considered an extra cost, the root cause of the practice of overloading must be addressed. There are several procedures/ administrative costs that need to be reviewed and perhaps eliminated. For example, the CMTR extracts fees from transporters, but they do not see any value-add for this charge. Furthermore, EMAS extracts fees from traders at the Mali-Senegal border, when their products will never use the port in Dakar. Moreover, these costs and procedures add additional layers of bureaucracy to trade, increasing the burden on traders and transporters, and reducing incentives to engage in legal trade.

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<sup>56</sup> For millet and sorghum on the Sikasso-Dakar corridor

**8. Quality and reliability represent a significant barrier to increased intra-regional trade.**

Throughout the value chain, and especially in the end markets of Dakar and Ouagadougou, traders stated that poor quality and unreliability of regionally sourced grain was a significant problem. In Dakar, for example, traders stated a preference for imported cereals (from Asia, for example), citing cereals sourced from Mali to be low quality, with many impurities. Major buyers, such as OPAM in Mali, have specific quality clauses in their contracts with wholesalers. Major processors, such as Brakina breweries, also have stringent quality demands, and only contract with selected trusted suppliers. Quantitative analysis shows that up to 3%<sup>57</sup> of millet and sorghum is made up of impurities, and quality concern entails further costs due to the need to inspect, clean and re-bag the grain. Furthermore, reliability concerns, particularly in Burkina Faso arise from the lack of adequate weighing equipment, and as the study observed, lead to weight differences on purchase of up to 4.56%<sup>58</sup>. This weight difference was the most widely cited problem for traders interviewed. The potential market for regionally produced products could be greatly expanded if quality and reliability could be enhanced through improved post-harvest handling practices, improved hygiene, better logistics equipment and procedures, and by formalizing trade in the sector.

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<sup>57</sup> For Millet Koutiala-Ouaga

<sup>58</sup> For Millet Koutiala-Ouaga



# 6. RECOMMENDATIONS

## 6.1 RECOMMENDATIONS

### 1. Assistance with procurement of on farm logistics equipment

A key driver of cost, losses and reduced quality of millet and sorghum is lack of access to good quality market logistics equipment, including de-shelling machines and weighing equipment. Farmers stated that, particularly in the case of de-shelling machines, they would like to be able to procure this equipment but did not have the means.

- Pilot access to finance for farmers

E-ATP could pilot access to finance programs for farmers to procure de-shelling machinery. Cost savings could be extremely significant (see sections 3 and 4) above). Simple business plans could be put in place for either individual purchase (for larger scale farmers), or group purchase, perhaps by producer cooperatives. Financing could be secured on the asset, and/or through a warehouse receipts scheme (see below recommendation 9).

- Partnership with equipment provider

The research team identified an equipment supplier in Bamako<sup>59</sup> with capability for export regionally. E-ATP could work with equipment providers such as this, to supply equipment to regional producers on a bulk or low cost basis. E-ATP could seek out further equipment suppliers, perhaps going directly to the equipment producers.

### 2. Producer capacity building

Quality issues are a significant problem for traders in the millet and sorghum value chain, and an important constraint to expanded intra-regional trade. Traders cited they would be willing to pay a significant premium for better quality products. On farm storage losses are also significant, but easily avoidable.

- Training on post harvest handling

Simple measures such as drying grains out on a tarpaulin, protecting them from pests and ensuring no impurities are accidentally introduced would be beneficial alongside awareness building on the potential price premiums that could be obtained by implementing these practices (and ending the widely cited practice of farmers adding weight to bags deliberately). Any producer training already being implemented by the project should include this element.

- Capacity building for cooperatives to encourage formal contracting with buyers

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<sup>59</sup> Contact details will be separately shared with the E-ATP team.

Major buyers in the region set specific quality demands in their contracts with their suppliers, however contracting is not the status quo amongst the majority of value chain actors, particularly producers. The research team observed one successful example of a producer cooperative that was able to secure a contract to supply cereals to a wholesaler, which included quality clauses. Formally introducing buyer led demands on producers in this way is one solution to the quality and unreliability problem.

- Training on best practice storage techniques

Storage best practices such as use of palletes to improve aeration, application of insecticides to reduce insects and controlling rodents were observed to reduce on farm storage losses by a significant amount. Training on these simple and easy to implement practices, as well as the potential benefits of employing them could reduce storage losses to an acceptable level. Further research into the costs of implementing these measures (amortized palette and insecticide cost, for example) vs. potential cost savings should be carried out.

### **3. Assistance with procurement of weighing equipment in market areas: pilot program in Bobo Dioulasso**

Lack of weighing equipment is a major cause of extra costs. This problem was observed to be particularly significant in Bobo Dioulasso and surrounding production areas, but may well be a problem in other areas of the region.

- Access to finance (on an individual/market level)

E-ATP could pilot an access to finance programs for certain market areas in the Bobo-Dioulasso region such as Bama, Banzon and Bobo Dioulasso itself. Cost and efficiency savings could be extremely significant (see section 4) above). Simple business plans could be put in place for either individual purchase (by market traders), or collective purchase, perhaps by the market association. Financing could be secured on the assets, and/or through a warehouse receipts scheme (see below recommendation 9).

- Awareness building on use of standard weights to ensure weighing accuracy

In conjunction with procurement of weighing equipment, the use of standard weights should also be encouraged. This was observed to be standard practice in markets visited in Mali, where traders would prove the accuracy of their scales to buyers by using standard 5-10Kg weights. This is a very cheap and easy method of improving reliability and buyer confidence.

- Partnership with equipment supplier

The research team identified an equipment supplier in Bamako<sup>60</sup> with capability for export regionally. E-ATP could work with equipment providers such as this, to

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<sup>60</sup> Contact details will be separately shared with the E-ATP team.

supply weighing equipment to regional markets on a bulk or low cost basis. E-ATP could seek out further equipment suppliers, perhaps going directly to the equipment producers.

#### **4. Pilot partnership in branding high quality, accurately weighed products**

Low quality and reliability have been identified as significant issues and constraints to increased regional trade, with buyers along the value chain stating they would be willing to pay a premium for high quality and reliable supply. The research team has identified two potential partners interested in investing in the production of high quality, zero impurity, accurately weighed cereals for sale to mass markets. These cereals would be packaged in attractively designed sacks, with clear information on the quality and accurate weight of the product inside, to communicate that this is a premium product. Expansion and scaling up of initiatives like this regionally would help to disseminate the message to the bottom of the value chain that quality and reliability is important and that buyers are willing to pay a premium.

- Pilot partnership with animal feed processor

An animal feed producer based in Ouagadougou, already has a business a plan to produce bags of high quality maize, electronically weighed in specially branded bags. The bags he has designed are branded “Mais pur, 0% impurities, 50 kg”. He has plenty of space and capacity in his existing warehouse to implement this, and since he already produces his animal feed in special bags, he has the right supply connections to implement this initiative (for instance he has an existing business relationship with a bag maker/printer). He even has idle machinery. He stated the only thing he is lacking is financing and business support.<sup>61</sup>

- Pilot partnership with Wholesaler

A wholesaler based in Ouagadougou, expressed interest in expanding her existing cereals cleaning and re-bagging operations in a similar vein to the above animal fee processor. E-ATP already has a good working relationship with this wholesaler.<sup>62</sup>

#### **5. Business plan/feasibility for introduction of lower sack weights to market**

Manual handling of 100kg sacks is not only difficult and dangerous to the handlers, but also means that the non-durable, stuffed full sacks are not treated delicately and often break open or rip as a result. For example, they are normally thrown/dropped down to the ground rather than being placed.

E-ATP could work with existing contacts in the sack producing sector (such as Embal Mali) to explore the feasibility of introducing a wider range of lower sack weights to the grain sack market. E-ATP could work to facilitate linkages between sack producers and

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<sup>61</sup> Contact details will be separately shared with the E-ATP team.

<sup>62</sup> Contact details will be separately shared with the E-ATP team.

handlers, such that handler could sell sacks (of lower weight) straight to traders in markets.

## **6. Partnerships in jute sacks/feasibility study**

Poor quality, non durable sacks are cheap to buy but lead to many extra costs in the value chain including physical loss of product and the need to re-bag to replace worn out sacks. They are typically only used once. Many traders cited jute sacks as a better alternative, but stated that they were prohibitively expensive. For example, a plastic sack costs around 200-250 FCFA, in comparison with a jute sack at 600-800 FCFA. However, jute sacks are more durable, and if used from the beginning of the value chain could negate the need for re-bagging and could be re-used several times. They are also more suitable for long term (1 year +) storage.

- Feasibility study

E-ATP could conduct a feasibility study on the introduction of jute sacks (possibly of lower weight, see recommendation 5) to the millet and sorghum market, looking at market interest, ways to reduce consumer cost, and suitability for millet and sorghum.

- Partnership with buyers

OPAM insists that its suppliers use jute sacks, and sells these to wholesalers as part of their contract. Wholesalers re-bag their millet and sorghum into the specially provided bags before delivery to OPAM. This was the only instance where jute sacks were observed to be in use for millet and sorghum on the corridors studied. This was only made possible because the cost of the jute sacks was built into the price paid by the buyer. On the other hand, we also observed a producer who had a contract with the WFP, and they directly provided the requisite good-quality, branded sacks.<sup>63</sup> Other larger buyers may be interested in this type of arrangement. E-ATP should work with its network of buyers in the region to assess their willingness to implement buyer-led initiatives such as these.

## **7. Assistance with procurement of in-market portable sewing machines**

Traditional sewing methods are not only expensive, but also are a key cause of rips in sacks from which losses occur. The research team observed two instances of use of portable automatic sewing machines (known as bag closing machines) which produced a much better seal to the sacks. Sections 3 & 4 above shows that portable sewing machines could also be very cost effective, reducing costs to traders for this service.

- Partnership with equipment supply companies

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<sup>63</sup> Please note that these were not jute sacks, but high grade plastic sacks

The bag closing machines observed were made by the following companies (both based in India):<sup>64</sup>

- Daichi
- Citizen

E-ATP could seek to partners with these suppliers to encourage them to sell directly to market operators, perhaps by negotiating standard contracts.

- Access to finance

E-ATP could pilot an access to finance programs for certain market areas in the region to encourage the purchase of these devices. Cost and efficiency savings could be extremely significant (see section 3 and 4) above). Simple business plans could be put in place for either individual purchase (by market traders), collective purchase by a group of traders, or even an entrepreneur who wishes to sell this service to market operators (perhaps handlers could also provide this service). Financing could be secured on the assets, and/or through a warehouse receipts scheme (see below recommendation 9).

## **8. Training on best practice storage techniques for market traders**

Unnecessary storage losses are occurring in market areas.

- Training and awareness building on best practice storage techniques

Storage best practices such as use of palettes to improve aeration, application of insecticides to reduce insects and controlling rodents were observed to reduce on market storage losses to a negligible level. Training on these simple and easy to implement practices, as well as the potential benefits of employing them could reduce storage losses to an acceptable level. Further research into the costs of implementing these measures (amortized palette and insecticide cost, for example) vs. potential cost savings should be carried out.

- Partnerships with buyers

The research team observed one instance where the WFP had provided financing to build a purpose-built warehouse, provided palettes and insecticides (as well as good quality sacks), and given training on best practice storage techniques (such as storing bags away from walls) to a supplier who had contracted with them. This is a good example of a buyer led initiative to ensure high quality storage of products in their supply chain, improve quality and reliability. E-ATP should work with its network of larger buyers to assess their willingness to participate in similar initiatives.

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<sup>64</sup> A brief internet search turned up the following website, which lists many other companies which could supply this type of bag closing equipment: <http://catalogs.indiamart.com/products/portable-bag-closer-machine.html>

## 9. WRS pilot expansion

ATP has piloted a Warehouse Receipts Scheme in Ghana, and a need was observed for this type of scheme along the corridors observed during this study. This scheme would be applicable not only because high quality, purpose built warehousing is scarce, but also because it could improve access to credit to purchase equipment such as de-shelling machines, weighing scales and portable bag sewing machines as recommended above.

## 10. Pilot market information and export promotion centers

### ○ Traders

Traders expressed difficulty in obtaining appropriate export documentation, lack of information on the existence of export bans and among those who did not already engage in cross border trade, a lack of knowledge about where to begin. In addition, while cell phones and personal networks make finding information on pricing much easier than previously, on a large scale basis, information on average pricing at various regional markets is difficult to obtain.

E-ATP could pilot the implantation of market information centers that could provide this information to traders, as well as the required documentation. These centers could also provide training and information on best practice storage and handling techniques, as well as advice on contracting- such as providing pro-forma contracts.

These centers could be set up as a PPP, with a private sector operator providing this service. A feasibility study into whether these centers could be self sustaining, for example through user fees, could be done.

### ○ Transporters

Truckers were often confused or unaware of their obligations regarding appropriate documentation for their vehicles and their rights and obligations for various payments (official and non official) per journey. Market information centers could also provide advice and documentation for transporters.

## 11. Professionalization of the transport sector, training for drivers on their rights

Lack of professionalism and informality in the transport sector is a key cause of inefficiency. Lack of respect for labor rights mean that drivers and other operatives are not treated fairly, and lack of awareness of drivers of their rights with respect to control officials perpetuates the problem of road harassment.

A fully formal and professional transport sector is a long way from happening, but E-ATP should focus where possible on improving awareness of the issues through its information dissemination and advocacy activities (such as IRTG/OPA and Borderless), with particular focus on reaching out to drivers and those who are on the front lines of trucking services.

Furthermore, a key cost driver in the administrative cost category is axle load fines, due to overloading. ATP should continue with efforts to eliminate this problem, including

pursuing the PPP recommendation for reduced truck axel weight highlighted in the ATP maize transport and logistics assessment.

## **12. Advocacy for streamlining border and control procedures**

Border and control procedures are repetitive and not streamlined. At the border, the various agencies such as Customs, Gendarme, and Police do not work together coherently, with the same checks and procedures being repeated many times over. For example a driver may be asked for his *lettre de voiture* or truck papers by each agency, on *both* sides of the border. Advocacy to streamline procedures, for better division of responsibility at borders (each agency checking separate things), would be worthwhile.

Furthermore, along the road municipal taxes are extracted as a separate checkpoint, this could be collected at toll booths to remove this additional stop/slowdown for trucks.

## **13. Advocacy for review of certain official costs**

The following official charges were found to be of questionable value and should be reviewed, perhaps eliminated. E-ATP should advocate for this.

- CMTR “ristourne”
- EMAS (Entrepots Malien au Senegal)
- Travail supplementaire
- Statistical taxes

The existing application of the Passavant at the border, and the use of Certificates of Origin should be eliminated as these are not legal under ECOWAS.

## **14. Expansion of intra-regional “bourse” trade fairs**

Bourses were highlighted by several value chain stakeholders as an extremely effective means of building formal supply/customer relationships. ATP already sponsors these events, but should consider expanding them within the region or increasing their frequency.

## **6.2 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.

## **6.3 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.

# ANNEX A: OBJECTIVES OF THE STUDY, METHODOLOGY AND ASSUMPTIONS

## OBJECTIVES

The millet/sorghum 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.

- Identify the primary inefficiencies in the millet/sorghum and rice 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 prices in the end market;
- Identify public and private opportunities to improve procedures and technologies to address glaring inefficiencies in the millet/sorghum and rice 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 millet/sorghum and rice transport and logistics procedures and challenges in West Africa and share with all team members for their input<sup>65</sup>

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<sup>65</sup> See Annex B

- Meet with the E-ATP management team and the technical team both in Accra and Ouagadougou in the beginning of the field work and at the end of the field work
- Design a **survey instrument** and conduct a **survey** to estimate the cost of transporting millet/sorghum along the Bobo-Sikasso-Bamako-Dakar corridor and to analyze the relationships among producers, processors, traders, transport operators, forwarding agents, customs and control agencies, and other market intermediaries active in the target corridors<sup>66</sup>
- Conduct **field research** to administer questionnaires to producers, traders, agents and other stakeholders to collect data for millet/sorghum 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 millet/sorghum value chain along key corridors
  - Package of best practices in value chain logistics developed and recommended for millet/sorghum value chain

## METHODOLOGY

### SECONDARY RESEARCH

The *Desk Review*<sup>67</sup> preceded field research and was performed in December 2010 and January 2011, principally by lead field researcher Laura Jane Busch, with comments and revisions provided by the CARANA and ATP teams. This review of the most relevant research and publications on the millet/sorghum 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 *Survey Instrument*.<sup>68</sup>

### PRIMARY RESEARCH

The primary research was conducted in January and February 2011 by two teams, from E-ATP and the USAID Integrated Initiatives for Economic Growth in Mali (IICEM) project. The study's field research responsibilities were divided between these two projects, with the E-ATP team focusing on the corridors east of Bamako (to Bobo Dioulasso) and the IICEM team focusing on the corridors to the west of Bamako (to Dakar). Data and interview notes were subsequently shared to allow each project to focus on its own report deliverables.

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<sup>66</sup> See Annex C

<sup>67</sup> See Annex B

<sup>68</sup> See Annex C

- The 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 Bouraima Zoringe in Bobo Dioulasso and from Drissa Traore in Southeast Mali.

The team conducted 85 interviews during a 17 day field mission between January 27 and February 13 2011 in the following principle locations:

- Ouagadougou, Burkina Faso
  - Bobo Dioulasso, Burkina Faso
  - Koloko/Heremakono: Burkina Faso/Mali border
  - Sikasso, Mali
  - Koutiala, Mali
  - Koury/Faramana: Mali/Burkina Faso border
  - Segou, Mali
  - Niono, Mali
  - Bamako, Mali
- The IICEM field research team comprised of Salihou Guiro (Task Manager and Lead Field Researcher) and 3 data collection assistants. The team conducted 47 interviews during a 8 day field mission between January 28 and February 5 2011 in the following principle locations:
    - Bamako, Mali
    - Kayes, Mali
    - Kaolack, Senegal
    - Dakar, Senegal

As far as possible the Survey Instrument<sup>69</sup> was used to guide 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 Survey Instrument questions to solicit specific data points and facilitate an open conversation about challenges and constraints to increased intra-regional commerce.

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<sup>69</sup> See Annex C

## 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 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. For example, Teravinthorn and Raballand (2008) provide benchmark estimates for per ton kilometer charges for transport costs. 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 millet and sorghum value chain studied.

TABLE 1- CATEGORIES AND TYPES OF COSTS OBSERVED

<b>COST CATEGORY</b>	<b>EXAMPLES OF COSTS OBSERVED</b>
<b>ON FARM LOGISTICS</b> All formal and informal transport and logistics charges incurred by producers post-harvest, including but not limited to drying, shelling, cleaning, bagging, and on farm storage and handling costs	- On farm loading charges - On farm losses due to improper storage - On farm shelling services - On farm bagging services
<b>MARKET LOGISTICS</b> All formal and informal charges for non-transport services rendered throughout the logistics process.	- Loading and unloading charges (not including on farm loading) - Storage charges - Losses in storage - Cost of bags - Re-bagging and sewing charges
<b>TRANSPORT</b> All formal and informal charges for transport services from farm to end market	- Transport fees/charges - Transport Agent Fee - Losses during transport
<b>ADMINISTRATIVE CHARGES</b> All formal and informal charges for trade facilitation services (customs, taxes, weigh	- Customs fees - Weigh station fees - Conseil Malien des Transporteurs

stations, export documentation, and customs and forwarding agent fees)	Routiers - Entrepots Malien au Senegal - Road tolls - Municipal taxes
<b>INFORMAL PAYMENTS</b> Explicit bribes paid	- Bribes paid at checkpoints - Bribes paid at borders

The categories capture the majority of the costs during the field research from the farm-gate to the market of final destination. When possible, copies of actual receipts were collected for formal fees<sup>70</sup>, and multiple sources were sought for all discussion of fees charged without corresponding services, informal fees or average bribes paid.

### VARIETIES

Several different varieties of millet and sorghum are traded in the region. This report does not differentiate between different varieties as no difference in transport or logistics costs was observed between different varieties. All price values are based on averages.

### CURRENCY

All prices and costs are shown in CFA Francs (FCFA). It was deemed pointless to translate these prices and costs in US dollars as all transactions observed along the corridors occurred in FCFA, as well as to avoid any distortions in data and subsequent analysis as a result of currency fluctuations.

### PRICES AND COSTS

Prices differences between millet and sorghum were observed during this study. The following table shows the observed prices in FCFA along the Sikasso-Dakar corridor for millet and sorghum:

TABLE 2 – OBSERVED PRICES FOR MILLET AND SORGHUM

	<b>FARM GATE PRICE (ZEGOUA)</b>	<b>SIKASSO PRICE</b>	<b>DAKAR PRICE</b>
MILLET	117.5	127.5	174.38
SORGHUM	105.00	114.06	174.38
<b>AVERAGE</b>	<b>111.25</b>	<b>120.78</b>	<b>174.38</b>

For the purpose of analysis on the Sikasso-Dakar corridor, **this study uses an average price for millet and sorghum**, as shown in the table. On the Koutiala-Ouaga Corridor we only analyze the flow of millet, so an average is not necessary in this section.

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<sup>70</sup> See pictures throughout report

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.

Prices and costs can vary significantly for millet/sorghum throughout the year, and data was collected on seasonal high and low prices. Where a range was given, the annual average quoted price was used.

Where a percentage was given for physical losses, for example percentage losses in storage, this percentage was multiplied by the final end market value of the product lost to arrive at a monetized cost for this loss. These percentages were adjusted to take into account cumulative losses throughout the logistics chain.

In the rare instance that a data point was unobtainable, for example losses during drying at a certain production location, an estimate based on values observed at similar locations was used as a proxy. Please see footnotes in these instances.

All costs and prices are presented on per kg basis to ensure comparability.

### *UNITS OF WEIGHT*

Along the corridors studied the standard unit of weight is the kilogram, all actors were familiar with this unit of measurement and used it in their day to day transactions.

- In retail markets, especially those close to production zones, millet and sorghum is often sold by volume, based on a old tin (shown above, Bama Market), a “boite” or “tasse” of 2 or 3 kg depending on the market.
- Retailers in larger markets sell by the kilo using small scales (see left,



market)



- Wholesale is conducted, in by 100kg sack (See right, Bobo Dioulasso)

sell by the kilo using Sikasso main



all cases observed,

# ANNEX B: DESK REVIEW

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

## MILLET AND SORGHUM: OVERVIEW

As a principle staple food product for millions of West Africans and one of vital importance to the region's economy, the millet/sorghum value chain has been identified by USAID as a growth priority.

Millet and Sorghum are grown primarily under low-input cropping systems by smallholder farmers, and are often described as “poor people’s crops.”<sup>71</sup> They are, however, rich in energy, protein, vitamins, and minerals, and therefore sustain a significant portion of the world’s population. While millet is produced primarily for food, sorghum is grown both for food and as a feed grain. Among leading staples, sorghum and millet rank fifth and sixth<sup>72</sup> respectively as the most important cereal crops in terms of production and area planted.<sup>73</sup> Due to their hearty, drought-tolerant nature, both millet and sorghum are well adapted to cultivation in areas that are subject to low rainfall, extreme temperatures, and poor soils, and they require shorter growing seasons relative to other cereal grains. Additionally, both millet and sorghum can be stored over long periods of time with minimal losses due to spoilage, helping households to survive on reserves during drought years.<sup>74</sup> Therefore, millet and sorghum represent vital crops to addressing food security needs for many at-risk communities, particularly in West Africa across the Sahelian region.

Millet and sorghum are cultivated on more than 21 million hectares across West Africa and account for more than 70% of all cereal production in the region<sup>75</sup>. According to FAO data collected for the period of 2000-2005, millet/sorghum provides more than 500 calories per day per capita in at least five West African countries and represents more than one-third of total calorie intake in Burkina Faso, Mali, and Niger. In Burkina Faso alone, their combined consumption of 154.3 kg/capita/year accounts for nearly half of all calories consumed, with Mali coming in just behind at 107.4 kg/capita/year.<sup>76</sup> Both Burkina Faso and Southern Mali are high production zones of millet, but Senegal—another high production zone—was found by FAO to have a combined consumption of only 41 kg/capita/year, falling behind both Nigeria and Gambia. In contrast, the millet deficit zones of West Africa are northern regions of Mali, Niger,

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<sup>71</sup> Millet/Sorghum Promoting Regional Food Security Thru Trade: Prospects for Value Chain Development, E-ATP, May 2010

<sup>72</sup> FAOSTAT 2010

<sup>73</sup> Millet/Sorghum Promoting Regional Food Security Thru Trade: Prospects for Value Chain Development, May 2010

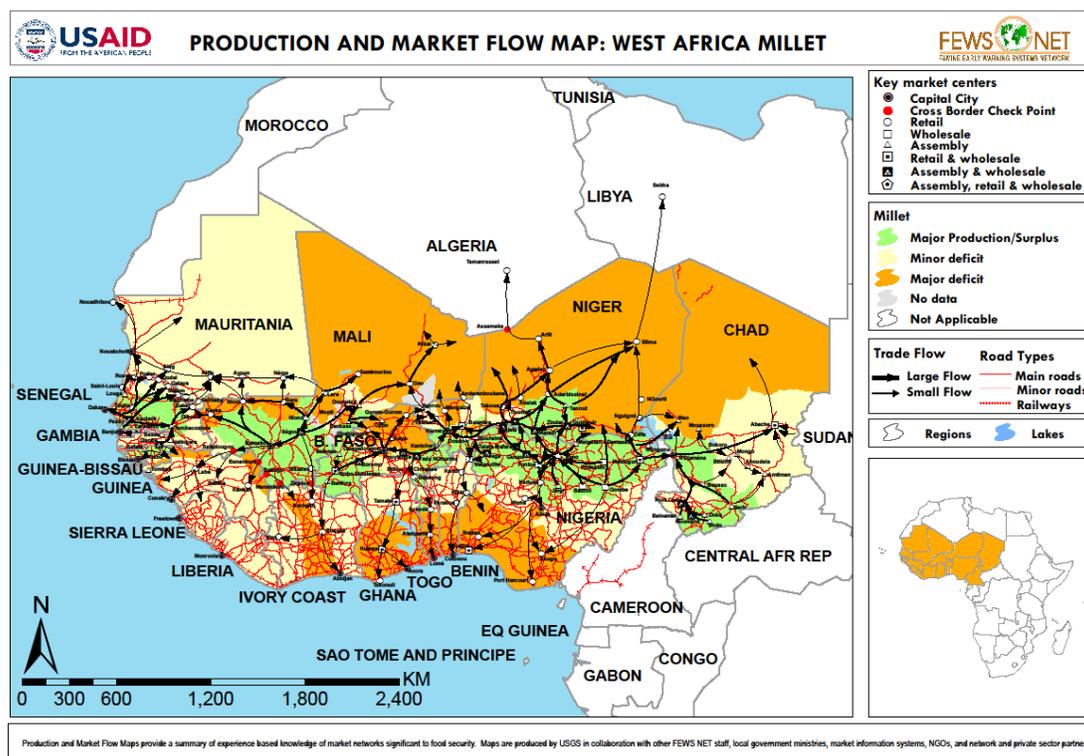
<sup>74</sup> Millet/Sorghum Promoting Regional Food Security Thru Trade: Prospects for Value Chain Development, E-ATP, May 2010

<sup>75</sup> FAOSTAT

<sup>76</sup> Millet/Sorghum Promoting Regional Food Security Thru Trade: Prospects for Value Chain Development, E-ATP, May 2010

and Chad, and the southern regions of Togo, Benin, Ghana, and the central region of Cote d'Ivoire.<sup>77</sup>

The map below, produced by FEWSNET, shows the key surplus and deficit zones in the region and the major trade flows.



### WEST AFRICA MILLET SURPLUS AND DEFICIT ZONES<sup>78</sup>

In general, the cereals are consumed as a whole grain, but they can also be pounded or ground into flour and sold as a semi-processed good. Millet/sorghum is commonly viewed across West Africa as a subsistence crop, and therefore, its production is primarily oriented toward harvesting sufficient quantities to meet household demands for the coming year.<sup>79</sup> However, it is also important to note that a significant portion of the sorghum produced in West Africa is consumed as a malted beer. This, along with the crop's many other functions (it is widely used in the construction of hut walls, fences and thatches and it can also be used to make brooms, mats, baskets, hats, and other household objects) make it not only a staple food product used for human consumption, but also a commodity that can be sold as a cash crop. Additionally,

<sup>77</sup> Famine Early Warning Systems Network (FEWSNET)

<sup>78</sup> Famine Early Warning Systems Network (FEWSNET)

<sup>79</sup> Millet/Sorghum Promoting Regional Food Security Thru Trade: Prospects for Value Chain Development, E-ATP, May 2010

millet/sorghum has a long tradition of being an important source of animal feeder and fuel, which represents a large potential market for millet/sorghum producers and traders.<sup>80</sup>

Since approximately 80-85% of the cereal produced in West Africa is consumed by the members of the producing household, it wasn't until recently that producers started to consider growing a marketable surplus of millet/sorghum.<sup>81</sup> However, that 15-20% of millet/sorghum that is exported generally flows from net surplus production to deficit areas, and the trade flows predominantly west to east, or east to west.<sup>82</sup>

As is the case with many cereals in the region, the West African millet/sorghum market is characterized by extreme market price volatility and price shocks are common. This is often due to draughts or floods causing deficits in the affected regions, which are often met by government subsidies and international exports and food aid. National and multilateral food security programs designed to address food shortfalls account for the vast majority of millet/sorghum trade in the region.<sup>83</sup> Unfortunately, West African traders themselves have not yet fully seized the opportunity for regional price arbitrage, since a very small share of the total regional output in any given production zone is exported across borders.<sup>84</sup> Therefore, intra-regional trade represents a significant economic opportunity for producers to expand their market shares, increase their incomes, and create substantial competition for millet/sorghum importers external to the region, reducing the likelihood of price shocks.

## TRANSPORT AND LOGISTICS CONSTRAINTS

There are great potential benefits of expanding regional trade; to producers and consumers, as well as the improvement of food security in the region. However, significant constraints exist, especially relating to transport and logistics which 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 the identified corridors are pervasive, characterized by high costs, long transit times, uncertainty, and corruption.<sup>85</sup> 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<sup>86</sup>. 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

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<sup>80</sup> Millet/Sorghum Promoting Regional Food Security Thru Trade: Prospects for Value Chain Development, E-ATP, May 2010

<sup>81</sup> FAO, 2009

<sup>82</sup> Millet/Sorghum Promoting Regional Food Security Thru Trade: Prospects for Value Chain Development, E-ATP, May 2010

<sup>83</sup> Millet/Sorghum Promoting Regional Food Security Thru Trade: Prospects for Value Chain Development, E-ATP, May 2010

<sup>84</sup> Millet/Sorghum Promoting Regional Food Security Thru Trade: Prospects for Value Chain Development, E-ATP, May 2010

<sup>85</sup> West Africa Trade Hub Tema-Ouaga Transport and Logistic Report, 2010

<sup>86</sup> Transport Prices and Costs in Africa : A Review of the Main International Corridors, Teravaninthorn & Raballand, The World Bank, 2009

uncertainty than along a transport corridor of comparable distance (Newark-Chicago) in the USA.<sup>87</sup>

Several studies have highlighted the specific transport and logistics issues affecting cereal trade in West Africa. These issues include:

- poor road conditions;
- inadequacies in storage, handling, equipment and vehicles;
- lack of standardization of weights, measure and quality grading
- underdeveloped logistics and trucking services; and
- road harassment and delays at border checkpoints.

These issues are discussed in further detail below.

### **Road infrastructure:**

Poor road infrastructure leads to higher vehicle operating costs per kilometer, which are in turn passed onto freight customers through higher road usage costs. In addition, poor roads lengthen travel times which add to time delays and the increased risk of spoilage and damage to the crop, resulting in loss of revenue at the destination market.<sup>88</sup> Many studies highlight capital investment to improve physical road infrastructure as a key recommendation for reducing transport and logistics costs for coarse grains, as well as for other agricultural commodities. In fact, a USAID study on Mali's trade and development states that Mali's undeveloped infrastructure is a major reason for its lack of competitiveness in global markets.<sup>89</sup>

Further research on the extent to which poor road infrastructure affects transport costs for millet and sorghum relative to other factors would be useful in terms of gaining insight into the scope and scale of required capital investment, and which infrastructure policy improvements could be prioritized and implemented.

### **Storage infrastructure and handling processes:**

Inadequate storage facilities and handling procedures are another major cost driver, allowing for the degradation and spoilage of the commodity, and severely decreasing the competitiveness of the product. According to the ATP Millet and Sorghum Value chain assessment, in West Africa, the poor storage infrastructure necessary for the preservation of millet/sorghum along the corridor contributes to high marketing costs and greatly impedes the flow of goods.<sup>90</sup> Furthermore, according to the USAID Maize Value Chain Assessment report, approximately

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<sup>87</sup> West Africa Trade Hub Tema-Ouaga Transport and Logistic Report, 2010

<sup>88</sup> The Role of Transportation & Logistics in International Trade, The Developing Country Context, TESS 2003

<sup>89</sup> USAID Mali Trade Development Program, 2002

<sup>90</sup> Millet/Sorghum Promoting Regional Food Security Thru Trade: Prospects for Value Chain Development, E-ATP, May 2010

30% of maize is lost post harvest, mostly at the farmer level, and the majority of farmers sell soon after harvest, when prices are lowest (unable to time the market), due to a lack of on-farm storage and cash flow needs.

Storage systems are mostly traditional and with limited aeration in the hot and humid climate. In addition, farmers often do not follow technical recommendations for fumigation, and as a result weevils and fungi account for most of the losses. Furthermore, underdeveloped warehousing facilities along the value chain<sup>91</sup> coupled with delays in transit times contribute further to spoilage problems.

In transit, the sacks used for the cereals are often old and worn resulting in a high degree of spillage, especially at transfer points.<sup>92</sup> The loading and unloading of the sacks at truck transfer points is operated informally and is often a slow, inefficient and poor service. Arrivals and departures at transfer points are typically unscheduled which can lead to delays and inefficiencies in transfers, in addition lack of service standards results in poor/rough handling which causes degradation of the sacks and spillage.

Further research into the costs and causes of inadequate storage and handling of millet and sorghum along the value chain is necessary to inform the interventions needed to remove these logistics barriers to trade, reduce losses and improve efficiency.

### **Standard measures and grading**

A lack of standardized process/system and little access to equipment for weighing and grading the crops is another impediment to regional trade, as this promotes a lack of harmonization of standard weights and measurements and quality norms.<sup>93</sup>

Evidence from the forthcoming ATP maize transport and logistics cost study shows that, particularly as the primary production and collection stage of the value chain, standard weight and measures are not often used, resulting in low transparency in transactions and reduced efficiency.

Furthermore, unprocessed grains will often contain a relatively high percentage of impurities. For example, anecdotal evidence shows that cereals trades in Mali have up to 18% impurity. Quality control is largely ad-hoc, and often results in multiple re-bagging at each market for the purchaser to observe the quality of the cereal he is purchasing.

Introducing a standard system of measurement, and accompanying market infrastructure (weigh stations) as well as a differential pricing based on a standardized grading system for crop quality may have a positive impact. Consumers could discern the quality of the crop they are buying (this could be especially important for processors), and producers would have the incentive to make investments to improve efficiency and quality standards in order to obtain a higher price for their crop.

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<sup>91</sup> The Role of Transportation & Logistics in International Trade, The Developing Country Context, TESS 2003

<sup>92</sup> Maize Value Chain Assessment ATP Draft Technical Report No.1, September 2008

<sup>93</sup> Millet/Sorghum Promoting Regional Food Security Thru Trade: Prospects for Value Chain Development, E-ATP, May 2010

A paper by CIRAD notes that poor rice production processes in West Africa do not allow domestic product to match the quality of imported rice in terms of homogeneity and cleanliness. Consumers are ready to pay for a higher price for imported clean and well packed rice<sup>94</sup>. Improved quality of millet and sorghum in the region could represent a significant income and production growth opportunity, and more research in this area is important. Furthermore, more research into the effects of the lack of standardized weights/measure and their interaction with producer and consumer prices along the value chain would inform potential interventions in this equipment and process along the corridor.

### **Lack of formalization**

Cereals value chains in West Africa suffer from widespread organizational deficiencies: lack of cooperation among actors, a tendency to operate independently, lack of strong farmer groups, trade associations and top-down professional bodies. These organizational deficiencies increase the cost of doing business, discourage investment and otherwise hamper the potential for greater horizontal and vertical integration which could be an engine for growth<sup>95</sup>. 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

### **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 recent study by the West Africa Trade Hub (Ghana Gap analysis) indicates that these protocols are often not being well implemented in practice.<sup>96</sup>

Overloading of trucks is a highly visible characteristic road transport in West Africa. In addition to causing damage to commodities in transit, overloading leads to road infrastructure degradation which in turn has an effect on efficiency of truck operations (as mentioned above): delays, spoilage, damage to vehicles and higher transport costs. Axle load legislation has gone some way to reducing overloading problems, however, a review of the World Bank Teravaninthorn & Raballand study by the West Africa Trade Hub shows that transport prices have increased significantly (more than 70% in some cases) since the introduction of the legislation, now that trucking operatives cannot overload their vehicles to reduce costs.<sup>97</sup> In addition, given the stricter legislation, truckers may offer higher bribes to officials to let their overloaded trucks pass the weight inspections, leading to further increased costs passed on in the price charged to service users.

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

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<sup>94</sup> CIRAD Rice imports in West Africa

<sup>95</sup> ATP Analysis of Millet/Sorghum Value Chain in West Africa

<sup>96</sup> Gap Analysis, ECOWAS Free Trade Area. Ghana, West Africa Trade Hub 2010

<sup>97</sup> Appraisal of World Bank's Report on Road Transport prices and costs in Africa, Case of West Africa, West Africa Trade Hub, 2009

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.<sup>98</sup>

A study by the West Africa Trade Hub on T&L in the cashew value chain notes that a key cost driver is fragmentation in the trucking market between farm and processor.<sup>99</sup> 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 vehicle related costs along the value chains, and the interaction between vehicle standards, informality, service procurement and contracting, overloading, road damage, breakdowns, inefficiencies, delays, spoilage, 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:**

According to the Bamako-Dakar corridor cost analysis (which studied the rice and cotton value chains), eighty percent of all Mali-bound traffic from Dakar, moves along the corridor by road. Since the trucking industry in Senegal is dominated by a large number of very small operators, who own and operate an obsolete trucking fleet, most of the traffic (≈90%) to Mali is carried on Malian trucks. Rail used to play a much more important role in transport along the corridor. However, management missteps and lack of investment have greatly deteriorated rail infrastructure, reducing its capacity and reliability, and thus its share of Malian traffic.

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 can result 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.<sup>100</sup>

According to the World Bank study, the trucking industry has low levels of productivity, low levels of competition between fleet operators, and high rates of collusion (cartels) which significantly drive up the prices and reduces quality of service. The study finds that profit markups of trucking companies are excessively high.<sup>101</sup> 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.

Several studies, including the West Africa Trade Hub report on transport and logistics along the Tema-Ouaga corridor note that structural imbalances in the freight market lead to difficulties in

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<sup>98</sup> Onion Transport and Logistics Study along the Madaoua-Accra Corridor, ATP West Africa, 2010

<sup>99</sup> Transport and Logistics in the Cashew Value Chain, West Africa Trade Hub 2009

<sup>100</sup> The Role of Transportation & Logistics in International Trade, The Developing Country Context, TESS 2003

<sup>101</sup> Transport Prices and Costs in Africa : A Review of the Main International Corridors, Teravaninthorn & Raballand, The World Bank, 2009

finding a loading for the return trip from the transport destination.<sup>102</sup> This structural imbalance leads to lower fleet efficiency and capacity utilization and higher costs to the fleet customers.

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.

### **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 studies including the TESS study on transport and logistics. Besides slowing down the movement of goods from source to markets, these activities represent illicit taxes that raise the cost of doing business and impact ultimately on the overall volume of trade.

Many studies, including the aforementioned study on trade in Mali, have highlighted that harassment of traders and transporters by police and local authorities is a pervasive issue in West Africa. Further, the Dakar-Bamako corridor cost analysis notes that the corridor is presently regarded as one of the worst in the region, particularly in terms of the number of control posts, delays, and police harassment related to arbitrary inspections and demands for bribes.<sup>103</sup>

Illegitimate rent seeking and harassment along transport corridors represents a serious and highly visible constraint to trade in the region. Most informal payments are paid either by forwarders and truckers and are included in the price they quote to traders, or by the traders themselves who may ride along with the truckers. As maize is a common commodity, bribes are often taken in kind, i.e. an amount of maize will be extorted in place of a monetary bribe.

For instance, the West Africa Trade Hub study on transport and logistics along the Tema-Ouagadougou corridor found that bribes paid at road barriers represent up to 8.2% of transport costs, and notes that informal costs are a much bigger problem than just the costs of the bribes themselves because of the delays and uncertainty they generate<sup>104</sup>. The report on Mali trade notes that official taxes account for 22 percent of total transport costs, and illicit taxes add another seven to ten percent<sup>105</sup>. Furthermore the World Bank study finds that bribes (paid to “middlemen” at formal and informal checkpoints) constitute up to 10% of variable costs to transporters.<sup>106</sup> According to the West Africa Trade Hub Tema-Ouaga report, customs agents collect the highest portion of the bribes.

It is known that truckers and traders transporting agricultural products pay even more in bribes than those transporting other commodities. This is because bribes paid to avoid delays at checkpoints are more likely as the potential for payload spoilage means that transit is more urgent. Secondly, as mentioned above, agricultural traders are less likely to utilize formal

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<sup>102</sup> West Africa Trade Hub Tema-Ouaga Transport and Logistic Report, 2010

<sup>103</sup> Dakar-Bamako corridor costs analysis

<sup>104</sup> West Africa Trade Hub Tema-Ouaga Transport and Logistic Report, 2010

<sup>105</sup> USAID Mali Trade Development Program, 2002

<sup>106</sup> Transport Prices and Costs in Africa : A Review of the Main International Corridors, Teravaninthorn & Raballand, The World Bank, 2009

trucking operators to transport their products, so they are more likely to be using illegal, unlicensed, overloaded and poorly maintained trucks which means that higher bribes will be paid to pass without impediment through checkpoint inspections.

Road barriers, blocks and control points also represent a significant cost driver in terms of delays, according to the West Africa Trade Hub report. On the road between Tema and Ouagadougou, truckers will be stopped at about 36 points, where they will be delayed by an average of 4 hours, representing up to 6% of the total time spent on the corridor.<sup>107</sup> For agricultural commodities, delays are a particularly important issue as they have a limited shelf life (although for grains it is longer than other agricultural products), and can easily spoil particularly because it is very susceptible to exposure to moisture and pests while in transit. Furthermore, traders are also often under pressure to deliver on time to buyers with whom they have agreements, lest risk dissolution of their valuable business partnerships.

To reduce costs and delays at customs point and border crossings, several studies including the TESS report and the West Africa Trade Hub Tema-Ouaga report, recommend reducing corruption, simplification of procedures (for example, document harmonization), training, and computer automation as well as implementing bilateral and regional transit corridor rights.<sup>108</sup> Further research into road harassment in terms of its causes and effects on the value chain will inform more specific interventions.

## **Overall**

Expansion in intra-regional trade in millet and sorghum is an important opportunity for economic growth in West Africa and reduction in the risk of price shocks and food security problems. 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 millet and sorghum value chain will be necessary to undertake targeted interventions to reduce inefficiency and costs, and improve quality and volume traded.

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<sup>107</sup> West Africa Trade Hub Tema-Ouaga Transport and Logistic Report, 2010

<sup>108</sup> The Role of Transportation & Logistics in International Trade, The Developing Country Context, TESS 2003



# ANNEX C: SURVEY INSTRUMENT

## Guide d'Enquête sur les coûts de Transport et de Logistique des Céréales

**E-ATP**

**IICEM**

**Riz, Mil & Sorgho, Mais**

Notez que ce guide d'enquête n'est pas un questionnaire écrit, mais  
seulement un guide pour l'intervieweur

Cette enquête est menée par le projet Initiatives Intégrées pour la Croissance Economique au Mali (IICEM) et le projet Extended Agribusiness and Trade Promotion (E-ATP), financés par l'USAID. Le but de l'enquête est d'évaluer les coûts de manutention post-récolte et de transport liés au déplacement des céréales des zones de production aux marchés de consommation. En identifiant les pratiques actuelles de manutention et de transport, les projets cherchent à déterminer les moyens de réduire les coûts exorbitants de transport et de logistique, et d'accroître ainsi la valeur marchande du produit aux producteurs tout en réduisant les coûts pour les consommateurs.

Merci

## Les Producteurs

**Mil/sorgho   Mais   Riz (Encercler)**

**Précisez l'unité de mesure : tasse, sac, kilo, tonne !!!**

Lieu et Corridor  
Nom de famille  
Prénom  
Homme/Femme  
Date  
Contact email/numéro de téléphone

### Prix et Volume

- Prix de vente de vos céréales juste après la récolte-produit abondant sur le marché (Précisez l'unité)
- Prix de vente de vos céréales pendant les autres saisons- produit moins abondant sur le marché (Précisez l'unité)
- Pourcentage de votre production de céréales vendue% / stockés%
- Quel est le volume de céréales que vous avez vendu depuis Juillet 2010?

### Transport au Lieu de Vente

- Moyen de transport de vos céréales au lieu de vente
  - Distance du champ au lieu de vente (km)
  - Durée en heures du trajet du champ au lieu de vente
  - Combien de sacs par /camion /camionnette /charrette?
  - Combien de kilos par sac?
- 
- Frais de transport de vos céréales du champ au lieu de vente (Précisez l'unité)
  - Structure des coûts de transport des céréales:
    - Coût de l'ensachage (Précisez l'unité)
    - Coût de chargement (Précisez l'unité)
    - Coût du transport (Précisez l'unité)
    - Coût de déchargement (Précisez l'unité)

- j) Quel moyen de transport utilisez –vous pour le transport de vos céréales au lieu de vente?
- i. Utilise mon propre /camion /camionnette /charrette
  - ii. Vend les céréales sur le lieu de production aux commerçants qui ont leurs propres véhicules
  - iii. Paie un agent pour trouver un moyen de transport (prix ?)
  - iv. Demande des propositions de prix de transport à différentes sociétés
  - v. Fais transporter par un partenaire privilégié

#### Le Stockage

- k) Coût de stockage (Précisez l'unité)
- l) Méthodes de séchage, égrenage, classification, et stockage:
- i. Traditionnelle au champ (préciser le type de stockage, séchage, classification, et les matériels utilisés)
  - ii. Utilisation de méthodes modernes (préciser le type de stockage, séchage, classification, et les matériels utilisés)
  - iii. Décrivez, s'il vous plait, l'entretien de ces infrastructures (individuelles ou collectives) en termes de ventilation, nettoyage entre les récoltes, stockage des pesticides ou d'autres produits toxiques, la protection contre les insectes

#### Pertes et Impuretés

- m) Pertes de céréales en pourcentage:
- i. Juste après la récolte %
  - ii. Pendant le séchage %
  - iii. Pendant le battage ou l'égrenage %
  - iv. Pendant le stockage %
  - v. Pendant le transport %
- n) Quelles sont les causes les plus importantes de vos pertes post récolte de céréales?

3	2	1
Cause de perte très importante	Cause de perte plus ou moins importante	Cause de perte peu importante

- i. Humidité
- ii. Maladie
- iii. Insectes
- iv. Rongeurs/autres animaux
- v. Mauvais état des sacs
- vi. Mauvaise manipulation (décrivez)
- vii. Moyen de battage (décrivez le moyen)
- viii. Manque d'équipement pour le pesage et la classification
- ix. Le vol
- x. Autre (Précisez)

- o) Quel pourcentage d'impuretés est trouvé dans vos céréales \_\_\_\_\_
- p) Quelles sont les sources les plus importantes des impuretés dans vos céréales?

3	2	1
source d'impureté très importante	source d'impureté plus ou moins importante	source d'impureté peu importante

- i. Humidité

- ii. Maladie
- iii. Insectes
- iv. Rongeurs
- v. Sacs
- vi. Mauvaise manipulation (décrivez)
- vii. Moyen de battage ,d'égrenage, de séchage (décrivez le moyen)
- viii. Autres (préciser)

- q) Votre production est-elle soumise à des inspections de qualité? Expliquer
- r) Est-ce qu'il y a des différences de prix entre les céréales de bonne/mauvaise qualité ou variété?

Merci

Cette enquête est menée par le projet Initiatives Intégrées pour la Croissance Economique au Mali (IICEM) et le projet Extended Agribusiness and Trade Promotion (E-ATP), financés par l'USAID. Le but de l'enquête est d'évaluer les coûts de manutention post-récolte et de transport liés au déplacement des céréales des zones de production aux marchés de consommation. En identifiant les pratiques actuelles de manutention et de transport, les projets cherchent à déterminer les moyens de réduire les coûts exorbitants de transport et de logistique, et d'accroître ainsi la valeur marchande du produit aux producteurs tout en réduisant les coûts pour les consommateurs.

Merci

**Commerçant / Collecteur de Céréales (Encercler)**

**Mil/sorgho Mais Riz (Encercler)**

**Précisez l'unité de mesure : tasse, sac, kilo, tonne !!!**

Lieu et Corridor  
Nom de famille  
Prénom  
Homme/Femme  
Date  
Contact email/numéro de téléphone

Prix et Volume

- s) Prix de vente de vos céréales juste après la récolte-produit abondant sur le marché (Précisez l'unité)
- c) Prix d'achat de vos céréales pendant les autres saisons- produit moins abondant sur le marché (Précisez l'unité)
- d) Quantité de céréales que vous avez achetée depuis Juillet 2010

Le Transport

- e) Lieu d'achat
- f) Ville de destination
- g) Distance du lieu d'achat au lieu de vente (km)
- h) Durée en heures du trajet du champ au lieu de vente
- i) Moyen de transport
- j) Combien de sacs par /camion /camionnette /charrette?
- k) Combien de kilos par sac?
- l) Distance du lieu d'achat au lieu de vente (km)Durée en heures du trajet du champ au lieu de vente
  
- m) Comment transportez-vous les céréales du lieu d'achat au lieu de vente?
  - ix. Utilise mon propre /camion /camionnette /charrette
  - x. Les agriculteurs me livrent les céréales à mon magasin de stockage

- xi. Paie un agent pour trouver des camions (Prix ?)
- xii. Demande des propositions de prix transport à différentes sociétés
- xiii. Fais transporter par un partenaire privilégié

t) Frais de transport de vos céréales du lieu d'achat au lieu de vente (Précisez l'unité)

- u) Structure des coûts de transport des céréales:
- xiv. Coût de l'ensachage (Précisez l'unité)
- xv. Coût de chargement du /camion /camionnette /charrette (Précisez l'unité)
- xvi. Coût des services de fret (Précisez l'unité)
- xvii. Coût du déchargement de camions (Précisez l'unité)

Temps requis pour le chargement (minutes)

n) Temps nécessaire pour le déchargement (minutes)

#### Documentation et Retards

- v) Documentation administratifs (SVP expliquer chaque document et le coût)
- w) Retards sur la route (indiquer si les paiements sont faits par le transporteur ou le commerçant)
  - a) Nombre de péages routiers
  - b) Temps d'attente a chaque péage (minutes)
  - c) Nombre de points de contrôle
  - d) Délai moyen d'attente aux points de contrôle (minutes)
  - e) Délai moyen de traversée de la frontière (minutes)
  - f) Inspections Phytosanitaires
  - g) Nombre de pannes de camion
  - h) Heures de retard pour pannes de camion
  - i) Autre retard (Précisez SVP)

#### Frais administratifs

- o) Frais administratifs (SVP précisez s'ils sont payés par le commerçant ou par le transporteur)
  - i. Frais officiels (Précisez l'unité)
  - ii. Frais non officiels (Précisez l'unité)
  - iii. Frais perçus par le syndicat des transporteurs(Précisez l'unité)
  - iv. Frais sanitaires/phytosanitaires (Précisez l'unité)
  - v. Autres frais administratifs (Précisez l'unité)

#### Le Stockage

p) Coût de stockage \_\_\_\_\_ (Précisez l'unité)

- q) Méthode de stockage: (préciser le type de stockage, les matériels utilisés)
- xviii. Equipement de stockage moderne ?

xix. Equipement de stockage traditionnel ?

xx. l'entretien de ces infrastructures (individuelles ou collectives ) en termes de ventilation, nettoyage entre les récoltes, stockage des pesticides ou d'autres produits toxiques, la protection contre les insectes

### Pertes et impuretés

r) Pertes de céréales en pourcentage :

xxi. Pendant le transport %

xxii. Pendant le stockage %

s) Quelles sont les causes les plus importantes de vos pertes de céréales après l'achat/collecte?

3	2	1
Cause de perte très importante	Cause de perte plus ou moins importante	Cause de perte peu importante

- i. Humidité
- ii. Maladie
- iii. Insectes
- iv. Rongeurs
- v. Mauvais état des Sacs
- vi. Mauvaise manipulation
- vii. Autre (précisez)

t) Pertes physiques (%)

- i. dues aux pannes de camion %
- ii. dues aux pertes de temps aux postes de contrôle et aux frontières %
- iii. dues à la surcharge %
- iv. dues à la manipulation et aux trous dans les sacs %
- v. Pertes attribuables à des parasites et des maladies %
- vi. Autre (précisez) %

u) Quel pourcentage d'impuretés est trouvé dans vos céréales ?

v) Quelles sont les sources les plus importantes des impuretés après achat/collecte de vos céréales?

3	2	1
source d'impureté très importante	source d'impureté plus ou moins importante	source d'impureté peu importante

- xxiii. Humidité
- xxiv. Maladie
- xxv. Insectes
- xxvi. Rongeurs
- xxvii. Mauvais état des sacs
- xxviii. Mauvaise manipulation
- xxix. Mode de battage

xxx. Autre (précisez)

- w) Est-ce qu'il ya des inspections de qualité? Expliquez
- x) Est-ce qu'il y a des différences de prix entre les céréales de bonne/mauvaise qualité?

y) Les projets potentiels. Lequel des projets suivants serait le plus bénéfique pour la chaîne de valeur de cette céréale en termes relatifs:

3	2	1
Extrêmement Bénéfique	Assez Bénéfique	Pas bénéfique

- i. Réduction du nombre de points de contrôle le long de la route
- ii. Stations de classification
- iii. Stations de pesage
- iv. Centre de chargement et de déchargement pour camions
- v. Bourse de transport ou centre d'information sur le transport
- vi. Formation sur la bonne manipulation et ensachage des grains
- vii. Plus grande disponibilité d'offres de transport aux coûts compétitifs
- viii. Amélioration de la qualité des céréales
- ix. Autre (décrivez SVP)

Merci

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Merci

### Transporteurs

**Mil/sorgho   Mais   Riz (Encercler)**

**Précisez l'unité de mesure: tasse, sac, kilo, tonne !!!**

Lieu et Corridor

Nom de famille

Prénom

Homme/Femme

Date

Contact email/numéro de téléphone

#### Prix et Volume

- j) A quel prix transportez-vous les céréales ?
  - x. A la tonne-kilomètre (TKM)
  - xi. Forfait par kilomètre
  - xii. Forfait par kilogramme
  
- k) Nombre de voyages par mois depuis Juillet 2010
- l) Nombre de voyages avec retour à vide des camions depuis Juillet 2010
- m) Itinéraire suivi pour le transport de céréales du lieu de chargement à la ville de destination
- n) Comment trouvez-vous les clients ? (Utilisez-vous un agent ?)
- o) Signez-vous des contrats formels avec les clients ?

#### Véhicule

- p) Type de camion
- q) Est-ce que vous avez votre propre camion, ou travaillez-vous pour une entreprise qui possède le camion
- r) Connaissez-vous les règles et les règlements sur pour le fonctionnement de votre véhicule et le transport de marchandises?
- s) Charge utile du camion
- t) Pays d'immatriculation du véhicule

u) Age du véhicule

v) Frais d'exploitation :

Quels sont les frais d'exploitation les plus importants de votre véhicule ?

3	2	1
Extrêmement important	Assez important	Pas important

xiii. L'amortissement

xiv. Le carburant

xv. L'assurance

xvi. L'entretien courant

xvii. Les réparations

xviii. Les pneus

xix. Les impôts et taxes

xx. Les frais administratifs

xxi. Autres (Expliquez)

w) Estimez les frais d'exploitation par kilomètre

#### Chargement/Déchargement

x) Temps d'attente de l'arrivée du camion à son chargement (minutes)

y) Durée de chargement du camion (minutes)

z) Temps passé entre l'arrivée et le déchargement du camion dans la ville de destination

aa) Temps consacré à décharger le camion dans la ville de destination

Retards sur la route (indiquer si les paiements sont faits le transporteur ou le commerçant)

bb) Nombre de péages routiers

cc) Temps d'attente à chaque péage (minutes)

dd) Nombre de points de contrôle

ee) Délai moyen d'attente aux points de contrôle (minutes)

ff) Délai moyen de traversée de la frontière (minutes)

gg) Inspections Phytosanitaires

hh) Nombre de pannes de camion

ii) Heures de retard pour pannes de camion

jj) Autre retard (Précisez SVP)

#### Frais Administratifs

kk) Frais administratifs (SVP précisez s'ils sont payés par le commerçant ou par le transporteur)

xxii. Frais officiels (Précisez l'unité)

xxiii. Frais non officiels (Précisez l'unité)

xxiv. Frais perçus par le syndicat des transporteurs (Précisez l'unité)

xxv. Frais sanitaires/phytosanitaires (Précisez l'unité)

xxvi. Coûts des permis et licences (Précisez l'unité)

ll) Les projets potentiels. Lequel des projets suivants serait le plus bénéfique pour

l'industrie de transport des céréales en termes relatifs :

3	2	1
Extrêmement Bénéfique	Assez Bénéfique	Pas bénéfique

- xxvii. Réduction du nombre de points de contrôle le long de la route
- xxviii. Stations de classification
- xxix. Stations de pesage
- xxx. Centre de chargement et de déchargement pour camions
- xxxi. Bourse de transport ou centre d'information sur le transport
- xxxii. Formation sur la bonne manipulation et l'ensachage des grains
- xxxiii. Formation sur la maintenance des camions
- xxxiv. Formation sur la gestion des camions
- xxxv. Autre (SVP décrivez )

Merci

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Merci

### **Marché de Vente**

Lieu

Contacts de la Gestion

Observations de l'enquêteur dans le marché

- a) Nombre de camions présents
- b) Temps de chargement/déchargement (minutes)
- c) Observations sur les équipements/infrastructures
  - a) Stations de classification (de qualité)
  - b) Stations de pesage
  - c) Centre de chargement et de déchargement pour camions
  - d) Centre pour la négociation commerciale
  - e) Station d'inspection SPS
  - f) Centre pour le (ré) ensachage
  - g) Infrastructures de stockage
  - h) Autres observations
- d) Observations sur la gestion du marché

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Merci

### le Grossiste

**Précisez l'unité de mesure: tasse, sac, kilo, tonne !!!**

Lieu et Corridor  
Nom de famille  
Prénom  
Homme/Femme  
Date  
Contact email/numéro de téléphone

#### Prix et Volume

- a) Prix d'achat de vos céréales après la récolte-produit abondant sur le marché (Précisez l'unité)
- b) Prix de vente de vos céréales pendant les autres saisons- produit moins abondant sur le marché (Précisez l'unité)
- c) Quel est le volume de céréales que avez-vous acheté depuis Juillet 2010
- d) Combien de jours a-t-il fallu pour vendre les céréales dans le marché?

#### Transport

- e) D'où proviennent les céréales?
- f) Temps en minute requis pour que le camion soit déchargé
- g) Durée du trajet de la ville d'origine de vos céréales au marché
- h) Frais de transport ?

#### Pertes et impuretés

- i) Avez-vous des exigences pour les céréales que vous achetez? (e.g. la qualité, etc)
- j) Combien plus cher paieriez-vous une meilleure qualité ?
- k) Pertes de céréales en pourcentage :
  - i. Pendant le transport %
  - ii. Pourcentage des pertes pendant le déchargement%
  - iii. Pendant le stockage %
  - iv. Pourcentage des pertes pendant la vente%

l) Quelles sont les causes les plus importantes de vos pertes après achat de vos céréales?

3	2	1
Cause de perte très importante	Cause de perte plus ou moins importante	Cause de perte peu importante

- xxxvi. Humidité
- xxxvii. Maladie
- xxxviii. Insectes
- xxxix. Rongeurs
- xl. Sacs
- xli. Mauvaise manipulation
- xlii. Autre (précisez)

m) Pourcentage d'impuretés dans les céréales ?

n) Quelles sont les sources les plus importantes des impuretés dans vos céréales après vos achats?

3	2	1
source d'impureté très importante	source d'impureté plus ou moins importante	source d'impureté peu importante

- xxxviii. Humidité
- xxxix. Maladie
- xl. Insectes
- xli. Rongeurs
- xlii. Sacs
- xliii. Mauvaise manipulation
- xliv. Autre (précisez)

o) Pourcentage raisonnable des pertes et impuretés pour vous ?

#### Stockage

- p) Coût de stockage (Précisez l'unité)
- q) Méthode de stockage: (précisez le type de stockage, les matériels utilisés)
  - i. Equipement de stockage moderne
  - ii. Equipement de stockage traditionnel
- xlv. l'entretien de ces infrastructures (individuelles ou collectives) en termes de ventilation, nettoyage entre les récoltes, stockage des pesticides ou d'autres produits toxiques, la protection contre les insectes

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Merci

### le Détaillant

**Précisez l'unité de mesure : tasse, sac, kilo, tonne !!!**

Lieu et Corridor

Nom de famille

Prénom

Homme/Femme

Date

Contact email/numéro de téléphone

- r) Quantité de céréales achetée chaque mois depuis Juillet 2010?
- s) Pourcentage des pertes pendant les ventes
- t) Combien de jours a-t-il fallu pour vendre les céréales dans le marché?
- u) Prix d'achat moyen des céréales après la récolte-produit abondant sur le marché (Précisez l'unité)
- v) Prix de vente moyen des céréales les autres saisons- produit moins abondant sur le marché (Précisez l'unité)
- w) Fréquence d'achat (quotidienne, hebdomadaire, bihebdomadaire ou mensuelle)
- x) Quels sont les exigences que vous avez pour les céréales que vous achetez ? (e.g. la qualité, etc.)
- y) Pourcentage d'impuretés dans les céréales?
- z) Pourcentage raisonnable d'impureté pour vous?
- aa) Combien plus cher paieriez-vous une meilleure qualité ?

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Merci

### le transformateur/un autre acheteur

**Précisez l'unité de mesure : tasse, sac, kilo, tonne !!!**

Lieu et Corridor

Nom de famille

Prénom

Homme/Femme

Date

Contact email/numéro de téléphone

- a) Quantité de céréales achetée chaque mois depuis Juillet 2010?
- b) Prix d'achat moyen des céréales après la récolte-produit abondant sur le marché (Précisez l'unité)
- c) Prix de vente moyen des céréales les autres saisons- produit moins abondant sur le marché (Précisez l'unité)
- d) Fréquence d'achat (quotidienne, hebdomadaire, bihebdomadaire ou mensuelle)
- e) Quels sont les exigences que vous avez pour les céréales que vous achetez? (e.g. la qualité, etc.)
- f) Pourcentage d'impuretés dans les céréales?
- g) Pourcentage raisonnable d'impureté pour vous?
- h) Combien plus cher paieriez-vous une meilleure qualité?

Merci Beaucoup

Cette enquête est menée par le projet Initiatives Intégrées pour la Croissance Economique au Mali (IICEM) et le projet Extended Agribusiness and Trade Promotion (E-ATP), financés par l'USAID. Le but de l'enquête est d'évaluer les coûts de manutention post-récolte et de transport liés au déplacement des céréales des zones de production aux marchés de consommation. En identifiant les pratiques actuelles de manutention et de transport, les projets cherchent à déterminer les moyens de réduire les coûts exorbitants de transport et de logistique, et d'accroître ainsi la valeur marchande du produit aux producteurs tout en réduisant les coûts pour les consommateurs.

Merci

### La Frontière

**Précisez l'unité de mesure : tasse, sac, kilo, tonne !!!**

Lieu et Corridor

Nom de famille

Prénom

Homme/Femme

Date

Contact email/numéro de téléphone

- a) Quantité de maïs/mil/sorgho/riz traversant la frontière chaque semaine
- b) Est-ce que les camions ont la documentation requise et conformes aux normes?
- c) Quels sont les problèmes plus sérieux à la frontière ?
- d) Quels sont les documents requis pour traverser la frontière et combien coûtent-ils ?
- e) En générale, combien de temps faut-il attendre à la frontière avant traverser ?
- f) Expliquez-moi les frais non-officiels reçus
- g) Expliquez-moi les techniques d'inspection (SPS etc.)