



# Rapid Loss Appraisal Tool (RLAT)

for agribusiness value chains

User guide for maize

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## Abbreviations

ACi	African Cashew initiative
APHLIS	African Postharvest Losses Information System
BLE	German Federal Office for Agriculture and Food
BMZ	German Federal Ministry for Economic Cooperation and Development
CFS	Committee on World Food Security
FAO	Food and Agriculture Organization of the United Nations
FSDAM	Food Security and Development of Agricultural Markets
GIZ	Gesellschaft für Internationale Zusammenarbeit GmbH
HLPE	High Level Panel of Experts on Food Security and Nutrition
MOAP	Market-Oriented Agriculture Programme
NAREN	Sector Project Sustainable Agriculture
NGO	Non-governmental organisation
NRI	Natural Resources Institute
PHFLA	Post-harvest fish loss assessment methodology
RLAT	Rapid Loss Appraisal Tool for agribusiness value chains
VC	Value chain
USAID	United States Agency for International Development
WRI	World Resources Institute

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## Preface and acknowledgements

The Rapid Loss Appraisal Tool for agribusiness value chains has been developed by the Sector Project Sustainable Agriculture (NAREN), implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). Three of German development cooperation's agricultural programmes supported the piloting of the tool in Ghana, namely the Market-Oriented Agriculture Programme (MOAP) and African Cashew initiative (ACi), both in Ghana, and the programme on Food Security and Development of Agricultural Markets (FSDAM) in South Sudan.

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# 1. Introduction

## 1.1 Addressing food losses: a sustainability imperative

Losses and inefficiencies along agribusiness value chains (VC) are a major impediment to rural development, food security and sustainable growth and, hence, to rural transformation in developing countries. The most common causes for food loss in developing countries are the generally weak economic infrastructure and largely inappropriate practices employed at all stages in the VC – from input procurement, through farming and harvesting, to processing and trading. The resulting quantitative and qualitative losses seriously affect livelihoods and food security. Additionally, contamination with mycotoxins – especially aflatoxin, the presence of which is largely due to the very same factors that cause food losses – presents a severe problem for consumer health and livestock productivity. Food losses imply the waste of scarce resources (such as labour, land, financial means, water, energy and other inputs) invested in the production and handling of food that does not ultimately become available for improving food security, increasing rural incomes and creating employment opportunities. As a result, resources are wasted that could have otherwise been used to produce more of the same type of food, to cultivate other crops or to breed other animals (lost opportunities).

To sum up, reducing food losses would not only make more food available and reduce overall food costs; it would also contribute to making agricultural and rural development more sustainable given the impact of food losses on the three dimensions of sustainability:

- **social equity**, which refers to the likely positive impacts on food security if food losses along agribusiness VCs are reduced;
- **economic viability**, which refers to the opportunities for making agribusiness VCs more lucrative and competitive that result from the reduction of food losses;
- **environmental sustainability**, which refers to the possibilities of reducing the waste of natural resources that have initially been used for producing, trading and processing agrifood products and that are ultimately lost and thus not available for consumption or other intended purposes.

## 1.2 Developing a rapid appraisal tool

In recognition of the need to reduce food losses, various studies were carried out around the world during and prior to the 1980s. Although these studies provided useful results, the subsequent implementation of projects based on their findings did not result in the sustainable adoption of improved technologies and intended lasting impacts on loss reduction. Recognising that opportunities for agriculture-based growth and food security are being lost, governments, development organisations and increasingly also the private sector are now revisiting the issue and looking for solutions to reduce losses.

In the aftermath of the 2008 and 2011 food price crises, methodologies have been developed and studies commissioned to analyse and quantify food losses. These will not only provide a solid basis for policymaking on food security, but will also bring food security up the agenda, making it a primary objective. The Food and Agricultural Organization

of the United Nations (FAO), for example, published estimates of national aggregates of post-harvest losses for selected agrifood VCs in several countries. To create awareness and instigate change, the Save Food Initiative (set up by Messe Düsseldorf and the FAO) published the study *Global food losses and food waste*, which contains key facts and figures on food losses at the global scale. The FAO, through the SmartFish programme, also developed and piloted an innovative post-harvest fish loss assessment methodology (PHFLA) for measuring and monitoring post-harvest fish losses. In addition, as part of the EU-funded African Postharvest Losses Information System (APHLIS) project, the Natural Resources Institute (NRI) and German Federal Office for Agriculture and Food (BLE) have developed a post-harvest loss calculator that uses existing national post-harvest loss data to determine cumulative percentages of weight losses for cereals.

Due to the lack of an appropriate and standardised loss assessment methodology, quality data for sound decision-making are still not available. Farmers, traders, processors, and donors planning assistance programmes have found the research-oriented methodologies to be too time-consuming and expensive, and the highly aggregated data these methodologies produce has failed to provide the guidance required for project and business decision-making. The demand among decision-makers for the identification of appropriate solutions and planning of actions to make change happen on the ground therefore still remains unmet. As such, the report of the Committee on World Food Security's (CFS) High Level Panel of Experts (HLPE), *Food losses and waste in the context of sustainable food systems*, highlights the need to identify hotspots as leverage points and to develop practical solutions as a way to reduce losses.

GIZ commissioned the design and piloting of the Rapid Loss Appraisal Tool for agribusiness value chains (RLAT) with the aim of producing a 'lean' and easily manageable methodology that would provide hands-on strategic orientation to those developing realistic and realisable measures for sustainable food loss reduction. The methodology is designed to serve as a pre-screening for further in-depth studies and to identify leverage points for reducing losses at the various value chain stages – from farming, through handling and processing, to retail trade. RLAT's

developers based the tool around a set of tried-and-tested participatory approaches and tools that draw on GIZ's experience of using rapid appraisal methods and on others' experiences of assessing losses (APHLIS, PHFLA, recent studies on food losses implemented by GIZ in Kenya and Nigeria, and GIZ's ValueLinks methodology for VC development and rapid and participatory appraisal methods). The tools and approaches have been simplified for rapid implementation at the local level, enabling users to quickly and systematically collect information, assess stakeholder perceptions of food losses, and triangulate the findings using fast-track multiple evaluation methods that make it possible to confirm the results without undertaking representative sample surveys.

While the RLAT methodology works alongside the FAO's Methodology on Food Loss Assessments (2014, unpublished), the two do differ: RLAT is a fast-track appraisal tool that provides sufficiently accurate information for informed decision-making, whereas the FAO methodology aims to turn out a scientific database. RLAT can also be used as a prior step (pre-screening) to undertaking the FAO methodology and one that lays the foundations for more in-depth studies.

## 1.3 About this user guide

The purpose of the RLAT is to provide a sufficiently accurate pre-screening tool for identifying intervention points along agribusiness VCs, working out incentives for VC operators and proposing measures to reduce pre- and post-harvest losses. The tool supports the design of concrete interventions that have the primary aim of improving food security at the subsistence level, either on farms or in communities, and the secondary aim of upgrading specific VCs.

The tool supports:

- the pre-screening of qualitative and quantitative food losses and their hotspots (critical loss points) in local/regional VCs, including self-consumed food;
- the identification of leverage points for reducing food losses along VCs (pre- and post-harvest) and the gathering of sufficient evidence for initiating interventions;

- the identification of information gaps to support the planning of more detailed studies on losses and their impacts, on possible loss reduction measures as well as on incentives that would engage private and public sector stakeholders in addressing food losses.

The whole RLAT guide is divided into two publications that together, provide information on the requirements and use of RLAT as well as ready-to-use instruments, measures and materials:

- **The user guide** covers how to use RLAT, providing definitions and contextual information and explaining the structure of RLAT with the support of didactic and preparative remarks.
- **RLAT in practice: toolbox for maize**  
Points 2 and 3: Using the example of maize in Ghana, these sections explain the implementation of the participatory field methods and biophysical measurement process in detail. The tools provided here comprise ready-to-use instruments and well-known participatory methods such as transect walks and loss perception rankings, and they can be adapted for use with other crops and local situations. These sections also provide: proposals for workshop programmes; checklists for focus group meetings; guidance for the assessment of aflatoxin prevalence at different stages in the VC; sampling methods and biophysical measurements to back up the results of stakeholder workshops and focus group discussions; and guidance on information gathering, documentation and evaluation.

Points 4 and 5: Using maize as an example, these sections provides hands-on material for conducting facilitation in the field and for documenting and assessing the findings. Note that systems for electronic data collection, analysis and output have not yet been developed.

This guide is particularly useful for existing VC projects that have a focus on reducing food loss and food waste along the chain as well as for professionals and stakeholders working in this domain. Given that this guide provides hands-on support materials, the use of RLAT does not require scientists; technicians can quite easily manage the appraisal. RLAT explicitly serves the needs of local or regional practitioners and not those of macroeconomic policymakers.

RLAT's development and first implementation focused on maize. However, the tool's process structure and supporting material can be applied to other crop and livestock value chains. This guide therefore aims to show the reader how to approach food losses using participatory methods and biophysical measurements. Note that this guide is not a static manual: users are therefore personally responsible for the ensuring that the process is implemented in a flexible, site-specific and appropriate manner. While the process steps are generic and applicable to any VC, the participatory instruments and toolbox (checklists, data collection and evaluation sheets, etc.) must be adapted to specific commodities and contexts (e.g. agro-ecological zones or VC framework conditions). The adaptation of the tool requires excellent knowledge of the VC in question and should be performed by proficient VC experts.

## 2. The Rapid Loss Appraisal Tool (RLAT)

### 2.1 Definition of 'losses' and of the RLAT's scope

Despite the long history and abundance of studies on food losses, significant differences exist in the definitions they use and their scope of application along value chains. 'A value chain is an economic system that can be described as a sequence of related business activities (functions) from the provision of specific inputs for a particular product to primary production, transformation and marketing, up to the final sale of the particular product to the consumer' (Springer-Heinze, 2008).

In developing countries, post-harvest losses occurring in the VC from harvest to distribution are known as '**food losses**', whereas food wasted on the consumption side (in households, gastronomy and catering) is referred to as '**food waste**'. The High Level Panel of Experts on Food Security and Nutrition (HLPE), on the other hand, also distinguishes between quantitative and qualitative losses, stating that:

'**Food losses**' refers to a decrease, at all stages of the food chain prior to the consumer level, in mass, of food that was originally intended for human consumption, regardless of the cause.

'**Food waste**' refers to food appropriate for human consumption being discarded or left to spoil at the consumer level – regardless of the cause.

'**Food quality loss or waste**' refers to the decrease of a quality attribute of food (nutrition, aspect, etc.) linked to the degradation of the product, at

all stages of the food chain from harvest to consumption. (HLPE, 2014)

However, by focusing on post-harvest losses, the often substantial losses generated during production often go unobserved. This is an omission; particularly in view of the fact that inappropriate husbandry practices and prevailing unfavourable circumstances like economic infrastructure directly translate into losses in the form of depressed yields or are a root cause of losses that only become visible and generate losses at the trading, processing or distribution stages of the VC (e.g. low yields in processing, rejection due to quality problems or aflatoxin contamination).

Furthermore, the large majority of existing methodologies and studies look at food losses through the prism of food security, so their focus is usually on food that is lost for direct human use. However, this viewpoint fails to take into consideration an important fact: many agricultural products that are not directly consumed by human beings often do not end up being wasted. Instead, by-products and produce that are not used to feed humans (e.g. due to intended dual uses as food and feed, to minor quality problems or to the lack of a market or buyer) may end up being used as feed or fuel, and VC operators, particularly smallholders, do not perceive these alternative uses to be losses.

Taking a broader look at food losses – by including pre-harvest operations and framework conditions as well as other possible uses beyond that of human food – is imperative when aiming to provide practitioners with a tool that supports informed

technology and investment decisions targeting loss reduction. RLAT therefore takes a holistic view on food losses, both for food security purposes and for checking the viability of strategies for upgrading VCs that form part of rural economic development. It is also important to point out that, compared to other studies and methodologies, RLAT explicitly serves the needs of local or regional practitioners and not those of macro-economic policymakers.

To summarise, the definition of food losses employed in the RLAT features the following characteristics:

- RLAT adopts a chain-wide approach that includes pre- and post-harvest losses because narrowing down the scope to post-harvest losses would not serve the needs of VC development. RLAT considers that farm-level conditions and the application or non-application of good agricultural practices (e.g. choice of varieties, method of land preparation, soil conditions, waterlogging, weeding, fertilisation, plant protection, etc.) are just as decisive as the post-harvest stages when it comes to losses and, hence, the viability of the VC.
- RLAT factors in both quantitative losses and qualitative losses. Quantitative losses refers to weight losses in the form of a reduction of the physical substance (e.g. spillage and spoilage, loss in weight, and the loss of products or winnowed impurities). Qualitative losses refers to reductions in the marketability/market value of products due to their abnormal external appearance (e.g. discoloration, damage due to bruising or wilting, etc.) or an alteration of the internal quality (e.g. organoleptic properties, nutritive values, food safety, etc.) due to insect or pest infestation,

contamination with foreign matter, mechanical damage, insufficient drying or inappropriate storage, etc.

- RLAT considers both crop and livestock products to be for 'human consumption and other uses' because dual-purpose production decisions reflect farmers' subsistence and/or entrepreneurial reasoning. Possible dual utilisation at the trade and processing stages influences buyers' decisions to reject products (loss) or sellers' decisions to recycle or reuse products (no loss) that have been rejected as food but that can be used for other purposes.
- RLAT does not consider alternative uses, the use of by-products and natural weight/volume reduction as losses. Alternative uses and the use of by-products refer to the repurposing of produce as feed or fuel. Natural weight/volume reduction refers to losses arising from natural physical alterations (e.g. due to the drying and processing of raw material to create semi-finished or finished products respectively).
- RLAT has primarily been developed to target food losses along food value chains, but it may also be adapted for assessing losses along agricultural non-food value chains.

To conclude, RLAT supports the assessment of losses along agribusiness VCs — from production, harvesting and handling, through aggregation, wholesale trade and processing, all the way up to retailing. Assessing waste occurring at the consumption level is not part of the tool. The following table provides an overview of the definition of losses used for the purposes of RLAT.

**Table 1.**  
Definition of losses used for the purposes of RLAT

Source: adapted from WRI (2015)

Plant and animal based products intended for food, feed or other uses				
Food/feed		Inedible/not used for main purpose		
• Pre-harvest losses		• e.g. maize stems		
• Harvest losses				
• Transport losses				
• Storage losses				
• Processing losses (incl. drying)				
• Marketing losses				
Food/feed for consumption	<b>LOSSES</b>	By-products		
<b>Absolute losses</b>	<b>Animal feed</b>	<b>Organic fertilizer</b>	<b>Bioenergy</b>	<b>Other users</b>

## 2.2 Further selected loss dimensions considered in the RLAT: lost opportunities, aflatoxin risk assessment and economic losses

RLAT supports the identification of two types of losses that can be distinguished by the time lag between cause and effect:

- **Immediate loss effects** are directly felt at the moment they occur — e.g. spillage; damage caused by hail, pests or diseases; or spoilage when corn breaks during shelling.
- **Lost opportunities** are the result of inappropriate practices or unfavourable framework conditions in the upstream stages of the VC that only materialise as losses in a downstream stage of the VC.

Lost opportunities are a result of food quality problems or food safety hazards in early VC operations that result in downstream losses in the VC. Lost opportunities increase the unit costs of cultivating crops, breeding animals or bringing food and feed to market. This, in turn, makes food and feed more expensive for consumers and less remunerative for producers, traders and processors. Furthermore, lost opportunities weaken the competitiveness of VCs due to higher unit production and transaction costs and lower quality. Consequently, products featuring a high level of lost opportunities have a weak competitive position compared to imported and/or substituted products.

Lost opportunities comprise, among others, depressed yields that only become visible at harvest time or, later, during processing. Furthermore, symptoms may appear in the downstream stages of the VC that have their root causes upstream.

RLAT considers aflatoxin risk assessments to be an essential part of a comprehensive loss appraisal on crops that are susceptible to aflatoxin contamination (such as maize) and integrates them accordingly. The FAO estimates that around 25 percent of the world's grain harvest is contaminated with aflatoxin. Contaminated grain is usually consumed in developing countries, leading to serious negative effects on human health and other related impacts. To understand the true extent of losses and to be able to find viable solutions, the underlying hypothetical losses

need to be determined. By using proxies for potential aflatoxin contamination (e.g. grain moisture, harvest periods, storage conditions), RLAT supports the systematic assessment of risks that may lead to aflatoxin contamination along VCs.

RLAT also considers that all types of pre- and post-harvest losses ultimately translate into economic losses:

- **Quantitative losses** translate into economic losses either when farm households have to spend money to substitute losses in weight and/or volume to satisfy their subsistence needs or when lost produce along the VC reduces operators' profits at any stage of the VC.
- **Qualitative losses** translate into economic losses when products are no longer marketable or cannot be sold in higher-value market segments (i.e. produce is rejected by customers for quality reasons meaning that premium prices cannot be achieved and/or price discounts need to be applied).
- **Economic losses** refer to lost income opportunities resulting from low prices prevailing shortly after harvesting, when a lack of storage facilities or an immediate need for money urges producers to sell their produce immediately.

Estimating economic losses requires the careful consideration of possible differences or inaccuracies in weights and measures. Since prices in many developing countries are set using traditional measurement units (often volume instead of weight), conversion rates for deriving metric values and the extent to which the definition of traditional units varies must be known in order to be able to estimate the economic effects of quantity or quality losses. Maize in Ghana is a case in point: 'Price per bag was often found to be an inaccurate measure throughout the marketing process as bags tend to be larger at the farm gate (up to 135 kg) with traders and middlemen taking commissions in grain rather than cash. Quality premiums are usually applied in this manner, as high-quality maize may be bagged in 100 kg bags, while lesser quality maize may be bagged up to 135 kg. Though informal, this is a structured and accepted practice, and is not considered skimming by players in the marketing chain' (USAID, 2012).

**Table 2. Selected specific loss dimensions considered in the RLAT**

Specific loss dimensions considered in RLAT	Description	Possible measures to approximate losses
<b>Immediate losses</b>	Occurrence and felt effects in the same VC stage (e.g. losses due to: pest damage during production or storage, product leakage during harvest, transportation, storage in perforated bags, inappropriate handling, insect damage, microbial spoilage, etc.).	Triangulation <sup>1</sup> combining: <ul style="list-style-type: none"> <li>• an inquiry into perceptions undertaken in workshops, focus groups and key informant meetings;</li> <li>• physical assessment using the farm transect walk methodology, and biophysical measurement using the market transect walk methodology.</li> </ul>
<b>Lost opportunities</b>	Occurrence and felt effects at different stages in the VC (e.g. inappropriate production, handling or processing practices or weak infrastructure upstream of the value chain resulting in depressed yields in farming/processing, high levels of rejection, or consumer health problems at a downstream stage of the value chain).	Loss appraisal along the entire value chain, including tracing back losses to identify their causes upstream in the VC using the methods described above.
<b>Aflatoxin risk</b>	Aflatoxin contamination is not visible. In unregulated markets, sanctions for contamination are rarely applied, although price discounts may be negotiated when produce has a high moisture content, which can indicate a risk of aflatoxin contamination. In regulated markets, consumers reject the produce or buy it at a discounted price, or food safety inspectors withdraw it from the market.	Triangulation combining: <ul style="list-style-type: none"> <li>• an inquiry into stakeholder perceptions undertaken in workshops, focus groups and key informant meetings;</li> <li>• assessment using proxies<sup>2</sup> (e.g. humid harvest conditions, bad storage conditions, insufficient drying, etc.) combined, where possible, with physical measurements such as of moisture content (e.g. maize with a moisture content below 12.5% has a low aflatoxin risk) and/or number of discoloured grains (still to be tested).</li> </ul>

1 Triangulation is a method for obtaining realistic results by using more than one – commonly three or more – approaches, investigators and/or sources for collecting information. By cross-checking the various results, findings can be confirmed or called into question (plausibility check). The reason for doing this is that findings are more likely to be robust if different approaches/sources lead to similar results.  
 2 Usually, a proxy is an approximate value that can be used to represent a figure in a calculation. In the context of the RLAT, a proxy is a qualitative description of a (visible or measurable) condition of a product (e.g. moisture content) that can be used in calculations.

### 2.3 Principles and challenges that guide the use of the RLAT

The RLAT, as an approach for expediting information collection, applies an action research methodology that employs a range of participatory instruments. These participatory approaches ensure that the tool builds on the local knowledge and hands-on experience of VC operators, on other stakeholders' familiarity with how the VC is functioning on the ground, and on the expertise of key specialists from relevant disciplines. One of the RLAT's core princi-

ples is that participants become active agents in the investigation process. RLAT facilitators are outsiders who moderate roundtables, workshops and focus group discussions that guide the practitioners tasked with collecting and analysing loss-relevant information and with sharing their experiences on suitable solutions. To be able to learn from and with local people and other VC stakeholders in this way requires the field-research phase to be systematically and solidly prepared and the facilitators to maintain a self-critical awareness of their behaviours, attitudes and responsibilities.

If the RLAT is to be used proficiently and its results are to be sufficiently reliable, the following factors are required: familiarity with participatory methods and instruments, excellent moderation and communication skills, interpersonal and cultural sensitivity, a deep knowledge of how the value chain functions in reality, an ability to quickly ascertain and digest situations and an unbiased approach to assessing findings and drawing out conclusions.

Facilitators need to be flexible enough to adapt to the different situations and settings in which the tools are deployed and they need to be aware of the possible challenges that can arise in the field that may impact on findings.

The social and/or cultural distance between facilitators and participants resulting from their different backgrounds can also impact on how the tool is deployed. For example, while facilitators may try hard to 'hand over the pen' and put themselves in the role of the moderator rather than the professional, it cannot be guaranteed that participants will automatically accept any such modification in roles or be open to taking the lead (Krummacher, 2004; Chambers, 1994). Participation is often influenced by people's perceptions as to the purpose of the project, by who else is participating, by where the session takes place and by what its outcome may be. In some cases, people adapt their expressed needs and expectations according to the facilitator present and her or his expected objectives, as well as to the project at hand and its objectives. This kind of subconscious modification must be factored into the analysis and interpretation of information.

The dynamics of group discussions are also challenging. Group discussions are mostly perceived by participants to be a formal and public event due to the number and variety of people involved and the relation between facilitator and participant. The presence of diverse actors in these dialogues and the fact that they do not take place independent of local decision-making structures and politics means that discussions struggle to be informal, authority-free and rational. (Krummacher, 2004; Schönhuth, 1998). The level to which the community in question is familiar with the democratic principles of free speech is also a key issue influencing these dialogues. The upside is that introducing these principles presents an opportunity to include formerly margin-

alised groups in the dialogue process. The downside, however, is that such groups' inclusion places high communicational demands on the facilitator. The overriding caveat here is that, when discussions adopt a formal public character, people participate differently and there is a risk that unequal power structures and differences within the group will be masked.

RLAT mainly works with stakeholders' perceptions about critical quantitative and qualitative loss points (hotspots) along VCs. Given that group dynamics inherently influence the outcome of discussions and that individuals perceive losses differently, the RLAT methodology uses a step-wise approach that involves key experts in roundtable discussions and VC stakeholders in workshops, focus groups and individual meetings.

When working with perceptions, it should be considered that scientists and projects on the one hand and VC operators on the other sometimes define/perceive losses differently. RLAT users may not be able to understand perceptions and to quantify losses according to the perceived or actual situation of the VC. For example, eating patterns may differ greatly from region to region, which means that products rejected in one place due to informal or formal standards are still marketable or even highly prized in other places (e.g. broken rice in Senegal). Cultural aspects must therefore be taken into account when assessing losses.

To ensure optimal implementation, the RLAT processes need to be guided by 'optimal ignorance' and 'appropriate imprecision'. Optimal ignorance refers to strictly focusing data collection on what is worth knowing with respect to the subject at hand. In this way, the collection of irrelevant data is avoided. Appropriate imprecision is where the degree of exactness required for results is reduced to what is necessary for approximating losses, identifying the causes of problems and deriving suitable solutions. This has advantages not only for data collection but also for participants, as their time is not wasted.

For the rapid appraisal, it is recommended to triangulate the perceptions of various stakeholders using a cascaded participatory approach in tandem with sample measurements. This will provide sufficiently reliable results that can be used to generate potential



The following examples of applying RLAT to maize in Ghana highlight the challenges arising in relation to the perception of losses:

- Production, harvest and post-harvest losses on the farm are often incorrect or even not considered because many farmers are not aware of their actual losses and less so about lost opportunities.
- Producer households often fail to clearly distinguish on-farm harvest and post-harvest losses from their subsistence consumption. When losses and subsistence consumption are both understood as ‘produce not reaching markets’, calculated losses end up being over-estimated.
- Contrary to received wisdom, farmers reported that on-farm storage is not a major concern, whereas transport problems due to weak infrastructure are far more likely to generate losses, especially during the major rainy season. Transportation, which has been neglected in most studies undertaken to date, is therefore a potential loss hotspot.
- Spillage at the trade level is not always an issue of inappropriate handling; sometimes it is intentional. Spilled grains are either collected and cleaned by poor people for personal consumption or on-selling (representing a kind of corporate social responsibility performed by traders) or they serve as payment for loading, unloading and re-bagging services.

solutions for reducing losses or, where required, to plan more in-depth studies.

When planning a rapid appraisal, it is important to ensure that stakeholders will be available to participate in the workshops, focus groups and individual meetings. The scheduling of a rapid appraisal should, as far as is possible, take into consideration the limited availability of VC operators during the main production season. To ensure relevant stakeholders are able to participate in planned meetings and workshops, it is therefore essential to remain flexible.

As such, it may be necessary to implement the rapid appraisal in tranches, instead of during a single and strictly limited time frame.

Since RLAT does not use representative sampling methods, special attention must be paid to the existence and significance of the seasonal, spatial and process-related variability of losses when planning the schedule, selecting locations and deciding on the sub-chains of national VCs to be examined. Losses in a certain season (rainy or dry) may, for example, vary from one year to the next. In this respect, the effects of climate change, such as changing rain patterns, are playing an increasingly important role. Process-related variability refers, for instance, to the differences in losses recorded by subsistence-oriented production systems that only market surplus produce, market-oriented smallholder production, and large-scale plantations. It can be presumed that each of these three will experience different causes and levels of losses along the VC. Finally, geographical factors need to be considered because losses often vary widely within countries depending on climatic and soil conditions, proximity to markets, infrastructure and other conditions.

When applied in a competent and unbiased way, RLAT helps to expose the real causes of losses and provides reliable results for deriving potential solutions and planning measures to reduce these losses. However, care must be taken not to confuse symptoms with causes. Past experience shows that symptoms are all too often misinterpreted as sources of losses, which leads to measures being designed that fail to tackle the root causes of problems. As a result, solutions are not sustainable, investments are misdirected and losses persist.

### 3. Process steps of the RLAT

The tool comprises three consecutive and interdependent phases and 10 process steps. Sequential appraisals of loss hotspots realised by different sets of VC stakeholders make it possible to survey, compare, triangulate and scrutinise perceptions about losses. Finally, inconsistencies or discrepancies in the loss-perception data collected through the different activities undergo a plausibility check (i.e. are discussed by experts). The aim of this check is to formulate a shared view of the prevalence of losses along the VC and to provide realistic loss figures.

Table 3 provides an outline of RLAT’s overall structure for assessing losses along VCs. Note that the list should be adapted to each individual case, as performing some activities may not be necessary, the sequence may have to be changed or further activities may need to be considered depending on the local context.

**Table 3. RLAT process steps for assessing losses along a particular value chain (with references to the RLAT toolbox)**

Process steps	Relevant tools
<b>Phase 1: Preparation — essential groundwork</b>	
<b>1. Scheduling the rapid appraisal</b> <ul style="list-style-type: none"> <li>• Initiating the implementation of an RLAT for a particular VC</li> <li>• Scheduling the field-research phase to ensure smooth implementation</li> </ul>	<b>Participatory methods:</b> sampling methods, key expert roundtable, stakeholder workshops, focus group meetings
<b>2. Training of RLAT users/facilitators</b> <ul style="list-style-type: none"> <li>• Inculcating the knowledge and skills required for the proficient use of the RLAT, with a special focus on developing an understanding of RLAT principles</li> </ul>	The entire set of participatory methods, checklists and forms provided in the toolbox
<b>3. Desktop study</b> <ul style="list-style-type: none"> <li>• Reviewing secondary data on quantitative and qualitative losses</li> <li>• Assessing the framework conditions (policies, infrastructure, laws, etc.)</li> <li>• Finalising the VC map so that it features all the VC functions in detail</li> </ul>	<b>Checklists:</b> general data, farmer focus group meeting, trader focus group meeting, processor meeting

Process steps	Relevant tools
<b>Phase 2: Participatory assessments</b>	
<b>4. Key expert roundtable (one day)</b> <ul style="list-style-type: none"> <li>Analysing loss hotspots (critical loss points) along the VC</li> <li>Validating the results of the desktop study</li> </ul>	<b>Checklists:</b> general data, farmer focus group meeting, trader focus group meeting, processor meeting <b>Participatory methods:</b> loss hotspot analyses, key expert roundtable
<b>5. Stakeholder workshop (one-day workshop)</b> <ul style="list-style-type: none"> <li>Collecting the loss perceptions of workshop participants</li> <li>Assessing loss hotspots (critical loss points) along the VC</li> <li>Validating the results of the key expert roundtable</li> </ul>	<b>Checklists:</b> general data, farmer focus group meeting, trader focus group meeting, processor meeting <b>Participatory methods:</b> loss hotspot analysis, stakeholder workshop
<b>6. Focus group meetings with VC operators</b> <ul style="list-style-type: none"> <li>Assessing the loss perceptions of VC operators</li> <li>Validating workshop results on the ground ('ground truthing')</li> </ul>	<b>Participatory methods:</b> transect walk, loss categories and ranking matrix <b>Checklists:</b> general data, farmer focus group meeting, trader focus group meeting, processor meeting <b>Data collection sheets and evaluation sheets:</b> general data, farmer focus group meeting, trader focus group meeting, processor meeting, biophysical measurements
<b>7. Key informant meetings (where required to support the findings)</b> <ul style="list-style-type: none"> <li>Validating/complementing the results of the preceding process steps</li> </ul>	Tools from the aforementioned list selected according to specific needs for validating/complementing the results of the preceding steps
<b>Phase 3: Follow-up — derived findings</b>	
<b>8. Assessment of results</b> <ul style="list-style-type: none"> <li>Triangulating different results (plausibility check)</li> <li>Outlining aggregated results</li> </ul>	<b>Forms for documenting results:</b> cumulative loss matrix, aflatoxin risk assessment
<b>9. Conclusions and recommendations</b> <ul style="list-style-type: none"> <li>Drawing conclusions from the final assessment of the cumulative loss matrix/aflatoxin risk appraisal</li> </ul>	<b>Forms for documenting results:</b> cumulative loss matrix, summary aflatoxin risk assessment (also, if required, data collection sheets and roundtable and stakeholder workshop reports)
<b>10. Reporting</b> <ul style="list-style-type: none"> <li>Consolidating the findings of the RLAT exercise in a concise report</li> <li>If required, creating a presentation to inform potential users and/or raise public awareness</li> </ul>	<b>Forms for documenting results:</b> reporting structure and contents, cumulative loss matrix, aflatoxin risk assessment (also, if required, data collection sheets and roundtable and stakeholder workshop reports)

### 3.1 Implementing the RLAT: timing and resource requirements

#### Timing

Although this loss appraisal tool is defined as rapid, when planning an RLAT survey care must be taken to allow sufficient time for implementation. RLAT is meant to accelerate the appraisal of losses along agribusiness VCs, but the participatory approaches involved are carried out in real-life contexts, which places limits on how fast the fieldwork can be performed. Remember that providing genuine results requires sufficient time.

The length of time required for a rapid loss appraisal of agribusiness value chains as a whole and for each of the process steps varies according to the availability of facilitators and participants for the various events, the complexity and geographical coverage of the VC in question, and the extent to which external factors influence losses along the VC.

While the average field-research phase of a typical RLAT takes about two weeks, it is nevertheless recommended to set aside a month for this activity. The extra flexibility this affords will make it easier to manage time constraints imposed by participant availability, to factor in transport times and, in particular, to allow for intermediate assessments to be carried out along the RLAT process. Table 4 provides an idea of the length of time required for each process step.

When scheduling meetings and workshops, the availability of stakeholders must always be considered. For instance, it may be difficult to secure the participation of VC operators during their peak working times. For producers, traders and processors, this would most obviously be during the major season, at the point the major-season harvest coincides with work to prepare the fields for the following minor season. This crossover period is witnessed in many regions of Ghana by the trucks fully laden with maize queuing outside markets or processing plants. The survey should ideally take place at the time when losses become a ubiquitous problem, such as during the major rainy season. In short then, the RLAT survey must either be scheduled outside of peak season or be implemented in a very structured and time-efficient way.

#### Resource requirements

The selection of the crop/livestock product does not form part of the RLAT process. With regard to the overall development objective of rural transformation and the specific objectives of improving food security, fostering rural development and accelerating the growth of the agribusiness sector, this selection should be guided by the following criteria: the VC's importance for food security, the VC's relevance for rural and agribusiness development, the assumption that losses along the VC are fairly substantial, and the data available on the VC (sufficiently detailed VC mapping and existing VC analyses). Usually, the project interested in implementing the rapid loss-appraisal will perform the selection.

To cut down on the resources required (time, staff and expenses for workshops and expert meetings) for preparing and carrying out a rapid loss appraisal, it is recommended to integrate RLAT into existing VC projects. Mapping a VC in sufficient detail requires time and resources that are not considered in this RLAT user guide. Therefore, projects requesting the rapid appraisal are expected to provide a sufficiently detailed VC map upfront, which can then be used for the desktop study, preparing the hotspot analysis, and identifying key experts and participants for the workshops and meetings. Drawing on RLAT users' existing expertise and familiarity with the actual situation of the value chain is essential when it comes to identifying critical loss points, analysing findings and drawing out recommendations. It also helps to reduce the risk of misinterpreting the causes for losses (provided users' views on the VC are unbiased). The RLAT can also be used to build a loss-specific focus into overall VC analyses and mapping. This supports the development of holistic strategies for upgrading VCs, which, in turn, makes investments in improved technologies along VCs more sustainable. Embedding RLAT in existing projects also ensures that results get properly used.

In the main, the task of scheduling a rapid loss appraisal initially falls to the project and/or partner organisation interested in carrying out the RLAT survey. A coordination team composed of project and/or partner staff should be set up. Its members should know the VC in question and its relevant stakeholders very well and should have a sufficient understanding of loss-relevant issues to be able to

start the RLAT process. If the project/partner staff have the required expertise, the team can implement the rapid appraisal. If not, external experts will need to be brought in to reinforce the internal team or take over full responsibility for the implementation of the RLAT survey. Usually, external experts are brought in early on, when the process steps are being planned.

It is recommended to structure the RLAT delivery team with two senior project staff members or consultants supported by a junior expert for documentation and other support tasks. Ideally, the team should possess a blend of complementary knowledge (e.g. of the current status of the VC, from farm to fork, and of agribusiness economics) and skills (e.g. in workshop moderation and the use of other

participatory tools). While project/partner staff are usually responsible for initiating the RLAT process (process step 1), the RLAT team is responsible for implementing the RLAT process steps 2 to 10 as well as some aspects of process step 1. Besides first-hand knowledge of the VC, command of the local language (translation should be considered only as a secondary solution) and experience working with participatory approaches are essential when recruiting staff or consultants to implement an RLAT appraisal.

Until local or regional knowledge on implementing RLAT surveys is developed, international expertise will need to be brought in. Table 4 provides a rough idea of the tasks and estimates of the time required of the RLAT team and experts.

**Table 4. Resources required for implementing an RLAT (expert days)<sup>a</sup>**

Tasks for the RLAT team	Days <sup>b</sup> Seniors <sup>c</sup>	Days Junior	Tasks for the expert	Days <sup>d</sup>
<b>Process step 1: scheduling the RLAT</b>	4	4		
<b>Process step 2: training</b>	4	2		2 <sup>e</sup>
<b>Process step 3: desktop study</b>	4	0	Advice on structure and content	1
<b>Process step 4: key expert roundtable</b> (including the preparation and capitalisation of results)	4	2	Advice on the design and capitalisation of results (in the beginning, possibly participation in this workshop)	1–2
<b>Process step 5: stakeholder workshop</b> (including the preparation and capitalisation of results)	4	4	Advice on the design and capitalisation of results (in the beginning, possibly participation in this workshop)	1–2
<b>Process step 6: focus group meetings</b> (including the preparation and capitalisation of results)	6–12	3–6	Advice on the design and capitalisation of results (in the beginning, possibly participation in this workshop)	1–3
<b>Process step 7: key informant meetings</b> (including the preparation and capitalisation of results)	0–4	0–2		0
<b>Process step 8: assessment of results</b>	2	1		0
<b>Process step 9: conclusions and recommendations</b> (including the preparation/facilitation of a debriefing meeting)	4	2	Advice on analysing, summarising and presenting findings	2
<b>Process step 10: reporting</b>	6		Review of the report and feedback	2
<b>TOTAL expert days</b>	<b>38–48</b>	<b>18–23</b>		<b>10–14</b>

<sup>a</sup> Additional days required by the project/partner staff for initiating/supporting the process are not included in the calculation.

<sup>b</sup> These are estimated days and may differ according to needs.

<sup>c</sup> The combined number of days allocated for two senior staff or consultants.

<sup>d</sup> The support required from the international expert will decrease over time with the consolidation of local/regional project staff/consultant capacities.

<sup>e</sup> This figure does not include time for international travel.

In addition to the human resource requirements (including honorariums, allowances and travel costs) mentioned in the above table, the following cost items need to be considered:

- venue hire and the provision of light refreshments (roundtable, workshop, possibly debriefing);
- travel and accommodation for some participants (roundtable, workshop, debriefing);
- refreshments for the focus group meetings (if required);
- communications (scheduling of events, copying presentations and final report);

- materials and supplies (workshop materials, moisture meter, weighing scale, household sieve, plastic bags, UV light and viewing cabinet, and the shipping of samples to a laboratory).

## 3.2 Preparation

### 3.2.1 Process step 1: scheduling the rapid appraisal

A large range of activities and items need to be prepared before field-research work can be scheduled and participants for the workshops, focus groups and individual meetings invited. The following table indicates the kind of things that need to be prepared in advance.

**Table 5. Process step 1: scheduling the rapid appraisal**

Purpose	The process for implementing a rapid loss appraisal for a particular agribusiness value chain is initiated and the remaining process steps are scheduled to ensure the smooth implementation of the RLAT
Activities	<ul style="list-style-type: none"> <li>• Select a value chain, decide on the objective, survey the scope and geographical zone</li> <li>• Form a team for initiating and coordinating the RLAT process</li> <li>• Identify relevant partner organisations as co-organisers (where relevant)</li> <li>• Establish an initial schedule and initial budget and secure funding</li> <li>• Draft the terms of reference (ToR) for RLAT facilitators</li> <li>• Select facilitators competent for moderating the RLAT (project staff, partner staff or consultants)</li> <li>• Train the RLAT facilitators (if necessary)</li> <li>• Prepare a detailed programme for the implementation of the RLAT process steps               <ul style="list-style-type: none"> <li>· Establish criteria for selecting the informants (workshops, focus group and expert meetings)</li> <li>· Establish a (realistic) time frame for implementing the process steps</li> <li>· Select venues for the workshops, focus group and key informant meetings at or close to VC operators' locations (see the relevant participatory methods and checklists in the toolbox)</li> <li>· Decide on the conditions of participation (e.g. travel costs for workshop participants)</li> <li>· Finalise the budget</li> <li>· Draft the programmes for the key expert roundtable and stakeholder workshops</li> <li>· Draft and send event invitation letters</li> <li>· Contact focus groups to create awareness on the topic and ask for cooperation</li> <li>· Finalise the schedule for the implementation of the field-research phase</li> </ul> </li> </ul>

<b>Purpose</b>	The process for implementing a rapid loss appraisal for a particular agribusiness value chain is initiated and the remaining process steps are scheduled to ensure the smooth implementation of the RLAT
<b>Toolbox</b>	<ul style="list-style-type: none"> <li>• Sampling methods</li> <li>• Key expert roundtable</li> <li>• Stakeholder workshops</li> <li>• Focus group meetings</li> </ul>
<b>Responsibility of</b>	RLAT coordination team (project and/or partner staff, probably external experts/consultants)
<b>Required expertise</b>	Project/partner staff or consultants who are familiar with the VC in question and loss issues in general, and are, at best, already familiar with the RLAT methodology
<b>Required inputs</b>	Contract for external consultants
<b>Required support</b>	Advice from project/partner staff, experts or external people who know the VC, and stakeholders involved in the selection of the survey zone and relevant focus groups

### 3.2.2 Process step 2: training of RLAT users and facilitators

To train up users and facilitators in the RLAT methodology, two days of participatory training are recommended. The training should run through all the RLAT process steps, including the moderation of

workshops and meetings, and should seek to build participants' capacities for analysing and structuring the information gathered and for capitalising the results. For a while following the initial training, users should be handheld by experts who have mastered the tool.

**Table 6. Process step 2: training of RLAT users and facilitators**

<b>Purpose</b>	Users and facilitators acquire the skills required to implement RLAT through training that focuses in particular on inculcating an understanding of the principles of RLAT and the proficient use of the RLAT toolbox
<b>Activities</b>	<ul style="list-style-type: none"> <li>• Assess users' and facilitators' training needs in terms of the planned application of the RLAT</li> <li>• Identify/contract a trainer/expert conversant in the RLAT methodology</li> <li>• Implement a two-day practice-oriented training programme based on the contents of this guide</li> </ul>
<b>Toolbox</b>	The entire set of participatory methods, checklists and forms provided in the toolbox
<b>Participants</b>	Future RLAT users and facilitators
<b>Responsibility of</b>	The project-based RLAT coordination team
<b>Required expertise</b>	A trainer who is familiar with the RLAT (project/partner staff or consultant)
<b>Required inputs</b>	A two-day training programme for RLAT users and facilitators

### 3.2.3 Process step 3: desktop study

Desktop studies (secondary research) involve the compilation and/or synthesis of information derived

from existing sources. In the case of RLAT, the main purpose of the desktop study is to develop an understanding of the structures of the selected VC, the product flows and the processes at each stage of the

VC (called 'functions' in GIZ's ValueLinks methodology<sup>3</sup>) where losses may be occurring. Secondary research can provide a preliminary overview of potential loss points, quantitative and qualitative losses and potential causes (at the level of VC operators, of services and of framework conditions) and it can also indicate potential solutions.

The desktop study is an obligatory step that must be conducted prior to the commencement of the rapid appraisal's field-research phase. By determining what is already known and what supplementary information is required, the desktop study informs the planning of the workshops, focus group and key informant meetings, and also the selection of relevant participants. The loss data gathered through the secondary research is then cross-checked in hot-

spot analyses, which are conducted in the key expert roundtable, stakeholder workshops and focus group meetings.

It is, however, important not to assume that secondary data is always relevant or correct, and RLAT users must work to remove any biased views about what is happening on the ground from their appraisal. Even if secondary research provides loss data for a given VC in a given geographical area, the RLAT may produce different results due to variances in how losses are defined (secondary data often only refer to post-harvest losses), varying conditions from one place to another, or omissions in data collection (e.g. the importance of losses occurring during transportation is often underestimated or even neglected).

<sup>3</sup> Springer-Heinze, A. (2008), ValueLinks Manual: The Methodology of Value Chain Promotion, First Edition, p. 9, available at: <http://www.valuelinks.org/index.php/material/manual>

**Table 7. Process step 3: desktop study**

<b>Purpose</b>	Existing loss-relevant data and related information for the VC in question are compiled and assessed for cross-checking in the workshops, focus group and key informant meetings
<b>Activities</b>	<ul style="list-style-type: none"> <li>• Perform a rapid review of secondary data on quantitative and qualitative losses (if possible, including a description of the data collection/analysis methods that focuses in particular on the VC functions considered)</li> <li>• Perform a rapid assessment of loss-relevant framework conditions (policies, infrastructure, etc.) and VC services</li> <li>• Examine the VC map closely and identify and detail the functions at the different VC stages</li> <li>• Finalise the VC map featuring all the VC functions in detail</li> <li>• Review secondary sources regarding potential causes for losses and possible solutions</li> <li>• Collect further loss-relevant information (e.g. formal/informal quality and food safety standards; traditional weights and measures and their respective conversion factors)</li> </ul>
<b>Sources of information</b>	Internet research, project reports, sector policy documents, reports of national, regional and international research institutions and NGOs, etc.
<b>Toolbox</b>	<ul style="list-style-type: none"> <li>• Checklist for the farmer focus group meeting</li> <li>• Checklist for the trader focus group meeting</li> <li>• Checklist for the processor meeting</li> </ul>
<b>Responsibility of</b>	RLAT users/facilitators
<b>Required expertise</b>	Knowledge of the RLAT methodology, proficiency in rapid desk research
<b>Required inputs</b>	Information sources (e.g. reports of projects and of public and private sector organisations, official statistics)
<b>Required support</b>	Access to information sources

### 3.3 Field-research phase

The participatory field research will take approximately five to ten days. While two days are required for the roundtable and the workshop, the focus group and key informant meetings may take longer in situations where survey zones are far away or difficult to access, where facilitators lack sufficient background information on the VCs, or where people are not aware of or forthcoming about losses.

During the field-research phase, the information collected and the appropriateness of the tools must be continually assessed. If necessary, further meetings will need to be organised or the tools adapted to respond to the capacities of stakeholders and their willingness to share information. Identifying these needs to adapt the approach and RLAT process largely depends on the skills and experience of the users/facilitators.

**Table 8. Process step 4: key expert roundtable**

<b>Purpose</b>	The loss perceptions of key experts from different disciplines are assessed for the VC in question and existing loss-relevant information (results of the desktop study) is validated and supplemented
<b>Activities</b>	<ul style="list-style-type: none"> <li>• Validate the data collected in the desktop study</li> <li>• Identify critical loss points along the VC using a hotspot analysis</li> <li>• Complement secondary data on quantitative and qualitative losses along the VC</li> <li>• Discuss the potential causes of loss and, where possible, identify which of these are most likely</li> <li>• Discuss possible solutions for reducing losses at the different VC stages</li> <li>• Collect information on traditional weights and measures</li> <li>• Collect information on formal and informal grading standards</li> <li>• Discuss issues related to quality and food safety (especially aflatoxin)</li> <li>• Gather information for adapting the RLAT approach to local conditions</li> </ul>
<b>Toolbox</b>	<ul style="list-style-type: none"> <li>• Loss hotspot analysis</li> <li>• Key expert roundtable</li> <li>• Checklist for the farmer focus group meeting</li> <li>• Checklist for the trader focus group meeting</li> <li>• Checklist for the processor meeting</li> </ul>
<b>Participants</b>	A balanced cohort of selected, highly qualified and/or experienced key experts from different disciplines who are relevant to the loss debate in general and to the selected agribusiness VC in particular. Participants' differing views that may affect the collection and validation of data and the formulation of conclusions must be considered.
<b>Responsibility of</b>	RLAT users/facilitators
<b>Purpose</b>	The loss perceptions of key experts from different disciplines are assessed for the VC in question and existing loss-relevant information (results of the desktop study) is validated and supplemented
<b>Required expertise</b>	<ul style="list-style-type: none"> <li>• Moderation skills</li> <li>• Acquaintance with the value chain in question</li> <li>• An understanding of the potentially diverse viewpoints of different experts</li> <li>• Knowledge of the RLAT methodology and proficiency in using rapid appraisal instruments</li> </ul>
<b>Required support</b>	Support staff for preparing and implementing the roundtable

#### 3.3.1 Process step 4: key expert roundtable

The main objective of the key expert roundtable is to bring together highly qualified and/or experienced people from different disciplines who are relevant to the loss debate in general and to the selected agribusiness VC in particular. When determining the cohort of participants, care must be taken to balance potentially differing views that may affect the collection and validation of data and the formulation of conclusions.

When it comes to developing the agenda, alongside programming focused presentations (objective-setting and keynotes), ensure to build in sufficient time for interactive discussions, the validation of existing loss data, the identification of critical loss points using loss hotspot analyses (see table below), the discussion of loss perceptions, and the working up of a realistic assessment of quantitative and qualitative losses.

The agenda will usually entail the following topics:

- **Presentations**
  - Introduction to the rapid loss appraisal tool (RLAT).
  - Introduction to the loss hotspot analysis along value chains.

- **Three working groups**
  - Validation of the results of the desktop study and assessment of loss hotspots (critical loss points) along the pre-harvest VC functions.
  - Validation of the results of the desktop study and assessment of loss hotspots (critical loss points) along the post-harvest VC functions.
  - Collection of information that is essential for the field-research phase (e.g. traditional measures, formal and informal grades/standards, issues related to aflatoxin prevalence and awareness).

NB: the agenda must be treated as flexible so that it can be adapted to specific conditions such as key experts' specific areas of knowledge on the VC in question.

The loss hotspot analysis is an effective tool for triggering discussions among participants on different loss perceptions in specific VC functions. In this way, it facilitates a common understanding of critical loss points along a particular VC. The following table provides an overview of the categories discussed in a loss hotspot analysis.

**Table 9. Loss hotspot analysis (this table is used both to present the method and visualise the results)**

Source: authors' own, adapted from Springer-Heinze, A. and Finkel, T. (2012)

VC Function (cf. VC map)	immediate effect	Likely later effect	Relevance (0-3)	Importance (0-3)	Hot spot (6-9)
Input supplies	Loss occurrence & effect at same VC stage	Missed opportunities	Probability of event (0-3) "How many people suffer?"	Severity of event (0-3) "How many people suffer?"	Hot spot if "Relevance x importance" = 6 or 9
• ...					
Harvest					
• ...					
Aggregation					
• ...					
Transport					
• ...					
Same approach for Wholesale Trade, Processing, Retail Trade					

### 3.3.2 Process step 5: stakeholder workshop

The second participatory step, the stakeholder workshop, is used to validate and further complement the results of the key expert roundtable and desktop study. Participants predominantly come from the survey zone and, together, should constitute a balanced cohort of practitioners from the farming, trading and processing stages of the VC and also from public and private advisory services, local authorities, development programmes and other

relevant organisations. This is essential for collecting sufficiently diverse views on the actual situation of losses occurring along the VC in question. These different perceptions on food losses will enrich the discussion and facilitate the identification of critical loss points.

If participants are to successfully get to grips with the hotspot analysis concept, they must have a sufficient level of understanding of VC linkages and functions and, in particular, must be able to distin-

**Table 10. Process step 5: stakeholder workshop**

<b>Purpose</b>	The loss perceptions of a broader group of VC stakeholders are assessed for the VC in question and these are then compared with and added to the results of the key expert roundtable (validation)
<b>Activities</b>	<ul style="list-style-type: none"> <li>• Collect the loss perceptions of workshop participants</li> <li>• Discuss and assess loss hotspots (critical loss points) along the VC</li> <li>• Validate and complement the results of the key expert roundtable (hotspots)</li> <li>• Supplement the data on quantitative and qualitative losses along the VC collected so far</li> <li>• Discuss the potential causes of loss and, where possible, identify which of these are most likely</li> <li>• Discuss possible solutions for reducing losses at the different stages of the VC</li> <li>• Collect loss-relevant local knowledge and/or location-specific solutions</li> <li>• Validate information on traditional weights and measures (if necessary)</li> <li>• Validate information on formal and informal grading standards (if necessary)</li> <li>• Discuss issues related to quality and food safety (especially aflatoxin)</li> <li>• Gather information for adapting the toolbox to local conditions</li> </ul>
<b>Toolbox</b>	<ul style="list-style-type: none"> <li>• Loss hotspot analysis</li> <li>• Stakeholder workshop</li> <li>• Checklist for the farmer focus group meeting</li> <li>• Checklist for the trader focus group meeting</li> <li>• Checklist for the processor meeting</li> </ul>
<b>Participants</b>	A representative mix of the diverse stakeholders of the value chain in question (producers, intermediaries/aggregators, traders, and small-, medium- and large-scale processors)
<b>Responsibility of</b>	RLAT users/facilitators
<b>Purpose</b>	The loss perceptions of a broader group of VC stakeholders are assessed for the VC in question and these are then compared with and added to the results of the key expert roundtable (validation)
<b>Required expertise</b>	<ul style="list-style-type: none"> <li>• Moderation skills</li> <li>• Acquaintance with the value chain in question</li> <li>• Understanding of the potentially diverse viewpoints of stakeholders of different stages in the VC (and the ability to exploit this diversity in order to produce realistic results)</li> <li>• Knowledge of the RLAT methodology and proficiency in using rapid appraisal instruments</li> </ul>
<b>Required support</b>	Support staff for preparing and implementing the workshop

guish between obvious symptoms and underlying causes of losses. Also, to ensure the results of these activities are realistic, the proficient moderation of workshops and guidance of working group sessions is essential.

The moderation method (used in both plenary and working groups) and the presentations must be adapted to participants' practical backgrounds. Practitioners usually have an excellent understanding of the realities on the ground, but scientific language

and theory-laden presentations and discussions will not help to draw this out.

### 3.3.3 Process step 6: focus group meetings and processor meetings

Focus group meetings are an inexpensive rapid appraisal technique used in the context of RLAT for holding guided discussions with small groups of operators from a specific stage of the VC (producers, traders, processors). Meetings with processors

**Table 11. Process step 6: focus group meetings and processor meetings**

<b>Purpose</b>	The loss perceptions of VC operators (farmers, traders, processors) are assessed for the VC in question and these are then compared with and added to the results of the preceding RLAT process steps (validation)
<b>Activities</b>	<ul style="list-style-type: none"> <li>• Collect participants' loss perceptions in the focus group/processor meetings</li> <li>• Discuss and assess loss hotspots (critical loss points) along the VC</li> <li>• Validate and add to the results of the preceding process steps (hotspots)</li> <li>• Supplement the data on quantitative and qualitative losses along the VC collected so far</li> <li>• Discuss the potential causes of loss and, where possible, identify which are the most likely</li> <li>• Discuss possible solutions for reducing losses at the different stages of the VC</li> </ul>
<b>Purpose</b>	The loss perceptions of VC operators (farmers, traders, processors) are assessed for the VC in question and these are then compared with and added to the results of the preceding RLAT process steps (validation)
<b>Activities</b>	<ul style="list-style-type: none"> <li>• Validate information on traditional weights and measures</li> <li>• Validate information on formal and informal grading standards</li> <li>• Discuss issues relating to quality and food safety to raise awareness (especially about aflatoxin)</li> <li>• Collect samples of produce from the farms/trading establishments/processing facilities in question and carry out biophysical measurements (e.g. moisture content, aflatoxin prevalence)</li> </ul>
<b>Toolbox</b>	<ul style="list-style-type: none"> <li>• Farm transect walk</li> <li>• Market transect walk</li> <li>• Loss categories and loss ranking matrix</li> <li>• Biophysical measurements and methods for aflatoxin assessment</li> <li>• Checklist for the farmer focus group meeting</li> <li>• Data collection sheet for the farmer focus group meeting</li> <li>• Checklist for the trader focus group meeting</li> <li>• Data collection sheet for the trader focus group meeting</li> <li>• Checklist for the processor meeting</li> <li>• Data collection sheet for the processor meeting</li> </ul>
<b>Participants</b>	Random groupings of individual operators working at the same stage of the VC or existing groups of farmers, traders or processors operating in the survey zone (NB: meetings with large-scale processors will usually be in the form of one-to-one interviews)

<b>Responsibility of</b>	RLAT users/facilitators
<b>Required expertise</b>	<ul style="list-style-type: none"> <li>• Facilitation skills</li> <li>• Acquaintance with the value chain in question</li> <li>• Knowledge of the RLAT methodology and proficiency in using the rapid appraisal instruments</li> </ul>
<b>Required support</b>	Support staff for preparing and implementing the meetings

are not always held as focus group meetings but can instead be one-to-one interviews (particularly when meetings involve medium- and large-scale processors).

A facilitator who knows how to use the tool as well as the specificities of the VC guides the discussion on loss perceptions and other loss-relevant questions. Combining guided discussions with participatory methods, such as transect walks or the loss categories and loss ranking matrix, is very useful for promoting discussion on and understanding of loss issues and their impacts on VC operators at different stages of the VC. In principle, focus group meetings should take place near the locations where losses usually occur (e.g. on a farm, near a field or storage facility, at a market) so that a transect walk can be undertaken. This technique enhances discussions and provides a sound footing for a realistic assessment of the product flow and critical loss points.

Focus group meetings should be scheduled as close as possible to harvest time, because the experience of losses is still fresh in participants' minds. However, during the major harvesting season and other peak times, it might be difficult to make appointments with traders, processors and farmers (especially labour-constrained small-scale farmers). The best

option is therefore to choose a date shortly after the harvest, when part of the harvested produce remains on the farm awaiting transport or is stored on the farm for later use, and other parts have already been delivered to markets and processors

To complement the findings of the focus group and processor meetings, biophysical measurements are used to quantify losses at the different stages of the VC. Field samples are examined to measure their moisture content and to ascertain the share of damaged or discoloured cobs and grains.

### 3.3.4 Process step 7: key informant meetings

Key informant meetings are used to cross-check, supplement and/or deepen information gathered in the previous process steps. They also serve to verify specific issues that (a) could not be discussed in depth during the key expert roundtable, stakeholder workshop and focus group meetings due to time constraints or (b) remained controversial and for which no common understanding could be reached.

As with focus group meetings, discussions with key informants should take place near the locations where losses usually occur so that a transect walk can be carried out.

Table 12. Process step 7: key informant meetings

<b>Purpose</b>	In cases where the preceding process steps have produced inconsistent results or left important gaps in the information, key informant meetings are organised to validate any questionable results and/or source any missing information
<b>Activities</b>	<ul style="list-style-type: none"> <li>• Conduct a qualitative interview without a predetermined checklist</li> <li>• During the meeting, frame questions so they address inconsistencies and/or information gaps identified in the preceding process steps</li> <li>• Validate and/or complement information collected in the preceding process steps</li> </ul>
<b>Toolbox</b>	There is no pre-structured outline for this process step – the format should be an open interview focusing on topics that have arisen during the preceding steps and that still need cross-checking and further clarification
<b>Participants</b>	Key informants are VC operators or experts who have either participated in earlier process steps, possess demonstrable first-hand knowledge of the VC in question and have an understanding of the actual situation of the VC or are recommended by key experts
<b>Responsibility of</b>	RLAT users/facilitators
<b>Required expertise</b>	<ul style="list-style-type: none"> <li>• Communication skills</li> <li>• Acquaintance with the value chain in question</li> <li>• Knowledge of the RLAT methodology and proficiency in using the rapid appraisal instruments</li> </ul>
<b>Required support</b>	Recommendations for identifying key informants who can possibly contribute to clearing up inconsistencies in the findings and plugging specific information gaps

## 3.4 Follow-up phase

### 3.4.1 Process step 8: assessment of results

In general, the assessment of results should be kept simple and remain strictly related to the objective and scope of the survey. It is also recommended and, indeed, necessary when preparing each subsequent process step to carry out intermediate assessments:

- during data collection activities (i.e. during the key expert roundtable, stakeholder workshop, focus group meetings and key informant interviews) in order to adapt the facilitation process so that it guides and refocuses discussions towards specific loss-relevant subjects, where required;
- immediately after collecting information in each process step to support the understanding of the information gathered and results achieved, to work out any remaining information gaps and to gather information for the next process step;
- in the preliminary analysis stage, during a break in the field-research work, to summarise the fast-track

assessments made so far and to take a step back in order to discuss lessons learned, the plausibility of perceptions, the data collected and the solutions proposed by stakeholders and to identify any remaining information gaps;

- in the final analysis to cross-check the results of the different process steps from different angles (triangulation) and the processing of the information in order to facilitate the formulation of conclusions and recommendations and the writing of the report (Schoonmaker Freudenberger, n.d.).

The assessment of the results should involve everyone who participated in the field-research work (usually facilitators and project and partner staff). In this way, the different understandings of what has been said and heard can be integrated, as can the different views on the issues at hand, which helps to prevent the biased interpretation of information.

To summarise and compare the results of the roundtable, workshops and meetings, use the cumulative loss matrix and the aflatoxin risk appraisal that are described below.

### Cumulative loss matrix

The cumulative loss matrix provides an overview of stakeholders' perceptions regarding the critical loss points and quantitative losses occurring during the different participatory process steps. The perceptions relating to loss hotspots that have been recorded in the workshops and meetings may vary significantly. Participants in the stakeholder workshop may define VC functions in more detail and may identify more hotspots than participants in the key expert work-

shop. Participants in focus group meetings may identify critical loss points that have not been raised in other workshops. This shows that loss perceptions are a relative and not an absolute means to assess losses and that further discussions are necessary in the RLAT team. If the results diverge so much that conclusions cannot be drawn, further key informant meetings or more in-depth studies may need to be carried out. These extra activities will shed more light on these differences and hone more realistic definitions of the perceived loss hotspots.

**Table 13. Process step 8: assessment of results – cumulative loss matrix**

<b>Purpose</b>	Stakeholders' perceptions regarding critical loss points and approximate loss values gathered through a multi-stage process of participatory assessments are summarised in a single table
<b>Activities</b>	<ul style="list-style-type: none"> <li>Summarise and compare the results from the roundtable, workshop and meetings</li> <li>Facilitate approaches for testing the plausibility of conforming and divergent results (triangulation)</li> <li>Identify remaining information deficiencies and gaps that require further analysis</li> <li>Identify what is needed to further adapt the approach and toolbox to local conditions</li> </ul>
<b>Toolbox</b>	<ul style="list-style-type: none"> <li>Data collection sheet for the farmer focus group meeting</li> <li>Data collection sheet for the trader focus group meeting</li> <li>Data collection sheet for the processor meeting</li> <li>Cumulative loss matrix</li> </ul>
<b>Participants</b>	Everyone who participated in the field-research activities (usually facilitators and project and partner staff)
<b>Responsibility of</b>	RLAT facilitators
<b>Required expertise</b>	<ul style="list-style-type: none"> <li>Analytical skills</li> <li>An unbiased approach</li> <li>Acquaintance with the value chain in question</li> <li>Knowledge of the RLAT methodology</li> </ul>

### Aflatoxin risk appraisal

The aflatoxin risk evaluation sheets for farmers, traders and processors support the systematic appraisal of aflatoxin contamination risks along the VC. Since aflatoxin risks are crop-specific, evaluation sheets need to be drawn up for each group of crops (e.g. cereals) and sometimes for each crop (e.g. maize).

This aflatoxin appraisal is based on the use of proxies – for example, by measuring the moisture content of maize grain with a grain moisture meter, an indi-

cation (proxy) of the risk of aflatoxin contamination can be derived.

The aflatoxin risk score is obtained by evaluating the assessment of the data collection sheets for the different focus group and processor meetings, and it is then documented in the different evaluation sheets on aflatoxin risk. These sheets must then be cross-checked with the results of the biophysical measurements (sampling and laboratory tests). They also may need to be underscored with consumption data to assess the prospective aflatoxin risk to humans.

**Table 14. Process step 8: assessment of results – aflatoxin risk appraisal**

<b>Purpose</b>	Aflatoxin risks along the VC in question are assessed, mapped and cross-checked using proxies to assess the information on production, trading and processing conditions and practices obtained in the focus group meetings
<b>Activities</b>	<ul style="list-style-type: none"> <li>Collect samples of produce from the farms/trading establishments/processing facilities in question and carry out the biophysical measurements (e.g. moisture content, aflatoxin prevalence)</li> <li>Determine aflatoxin risks by transferring answers from the data collection sheets of the different focus group meetings to the aflatoxin risk evaluation sheets</li> <li>Evaluate the relative aflatoxin risk for individuals or a group of farmers, traders or processors</li> <li>Determine aflatoxin risks using proxies (moisture levels, damaged or discoloured cobs/grains)</li> <li>Cross-check results from different sources of information (triangulation)</li> </ul>
<b>Toolbox</b>	<ul style="list-style-type: none"> <li>Aflatoxin risk evaluation sheet for the farmer focus group meeting</li> <li>Aflatoxin risk evaluation sheet for the trader focus group meeting</li> <li>Aflatoxin risk evaluation sheet for the processor meeting</li> <li>Biophysical measurements and methods for aflatoxin assessment</li> <li>Summary aflatoxin risk assessment</li> </ul>
<b>Participants</b>	Everyone who participated in the field research (usually facilitators and project and partner staff)
<b>Responsibility of</b>	RLAT facilitators
<b>Required expertise</b>	<ul style="list-style-type: none"> <li>Analytical skills and an unbiased approach</li> <li>Knowledge of the issues related to aflatoxin risks (causes and effects)</li> <li>Acquaintance with the value chain in question</li> <li>Knowledge of the RLAT methodology</li> </ul>
<b>Required support</b>	Laboratory services for realising biophysical measurements

### 3.4.2 Process step 9: conclusions and recommendations

By combining the assessment of loss perceptions and aflatoxin risks with the related causes for losses, the RLAT helps to identify possible joined-up solutions, including an initial assessment of the likelihood that VC operators will adopt improved technologies. However, the complexity of loss appraisals should not be underestimated. As illustrated in the definition of losses, the loss dimensions considered in RLAT and the principles that should guide the use of RLAT set out in Section 2, losses along agribusiness value chains are not easy to assess and different stakeholders' perceptions of losses are also inconsistent. What is needed, therefore, is the proficient use of the participatory tools provided as part of the RLAT, as well as excellent analytical skills for drawing out conclusions that reflect the actual situation of the VC and that stakeholders will understand. Recommen-

dations should be feasible for and easily adoptable by those who have to invest in improved technologies, services or infrastructure.

To draw out conclusions and make recommendations, information gathered during the different participatory process steps and assessed and summarised in the cumulative loss matrix and aflatoxin risk appraisal is assessed one last time and a number of questions considered. These include among others (from Schoonmaker Freudenberger, n.d.):

- What is the dominant pattern of losses and what are the notable variations (triangulation)?
- When and where do losses occur (e.g. seasonal, geographical)?
- What is/are the cause(s) for the losses (relationship between prevailing practices and losses)?



- Which VC stages, VC functions and VC operators are involved and how?
- Which other factors affect the losses (e.g. knowledge gaps on technologies or infrastructure issues)?
- What are the effects on upstream and downstream VC operators?
- What solutions are possible?
- How much of a loss reduction can be realistically achieved?
- What costs are involved in reducing the losses?
- What kinds of investment are required? Are they feasible?
- What cost-benefit (incentive for investors) can be expected from investments?
- What are the constraints inhibiting the adoption of improved technologies?

While qualitative conclusions can be drawn from the information gathered during the field-research phase, quantitative assessments (such as prospective investments and feasibility and cost-benefit analyses) will require more reliable data than can be collected through a rapid appraisal. Nevertheless, the conclusions will help with focusing further in-depth surveys on the leverage points identified in the RLAT process.

**Table 15. Process step 9: conclusions and recommendations**

<b>Purpose</b>	The conclusions inform the production of recommended measures for loss reduction and are drawn out from both the assessment of results and the additional information gathered during the field research (e.g. recommendations for improved technologies)
<b>Activities</b>	Guided by the above list of questions, draw conclusions from the final assessment of the cumulative loss matrix and the aflatoxin risk appraisal
<b>Toolbox</b>	<ul style="list-style-type: none"> <li>• Cumulative loss matrix</li> <li>• Summary aflatoxin risk assessment</li> <li>• Additional information from the data collection sheets</li> <li>• Additional information from the key expert roundtable and stakeholder workshop reports</li> </ul>
<b>Participants</b>	Everybody who participated in the field research (usually facilitators and project and partner staff)
<b>Responsibility of</b>	RLAT facilitators
<b>Required expertise</b>	<ul style="list-style-type: none"> <li>• Analytical skills and an unbiased approach</li> <li>• Knowledge of the framework conditions required for realising possible solutions</li> <li>• Acquaintance with the value chain in question</li> <li>• Knowledge of the RLAT methodology</li> </ul>
<b>Required support</b>	Discussing and validating the findings with the key experts who participated in the initial roundtable may be useful

**3.4.3 Process step 10: reporting**

Presenting a concise report is essential for making RLAT results accessible to the VC operators who are required to change technologies, to the VC service providers who must adapt their service offering and to policymakers and administrations that are responsible for creating an enabling environment for investment in loss reduction.

When trying to compile and encapsulate the wealth of information gathered in the field, writers need to remember that the report should only contain genuinely relevant information that directly relates to the objective of the RLAT exercise and the needs of those who will potentially use the results.

When documenting the conclusions and recommendations, it is important to clearly distinguish and explain the differences between:

- recommendations that are based on sufficiently reliable and verified findings and thus can support decision-making on loss-reduction measures;
- findings that require further substantiation (e.g. evaluation of the feasibility of proposed measures) to inform the planning of standalone loss-reduction interventions or the integration of loss-relevant actions into strategies for upgrading VCs.

Loss-relevant results arising from the key expert roundtable, stakeholder workshop, focus group and key informant meetings should, as far as possible, be presented as diagrams accompanied by concise explanations. To illustrate specific issues that have arisen during the field-research phase or possible solutions recommended by interview partners, include text boxes featuring these issues or solutions. The toolbox provides a sample report template.

**Table 16. Process step 10: reporting**

<b>Purpose</b>	The findings of the RLAT exercise and the resulting conclusions and recommendations (including, where required, recommendations for substantiating the results) are made available to potential users
<b>Activities</b>	<ul style="list-style-type: none"> <li>• Consolidate the findings of the RLAT exercise in a concise report</li> <li>• Include an executive summary that provides a very brief overview of the main results</li> <li>• Where required, develop a presentation to inform potential users or to raise public awareness</li> </ul>
<b>Toolbox</b>	<ul style="list-style-type: none"> <li>• Reporting structure and contents</li> <li>• Cumulative loss matrix</li> <li>• Summary aflatoxin risk assessment</li> <li>• Additional information from the data collection sheets</li> <li>• Additional information from the key expert roundtable and stakeholder workshop reports</li> </ul>
<b>Responsibility of</b>	RLAT facilitators
<b>Required expertise</b>	<ul style="list-style-type: none"> <li>• Excellent report writing skills</li> <li>• Analytical skills and an unbiased approach</li> <li>• Knowledge of the framework conditions for realising possible solutions</li> <li>• Acquaintance with the value chain in question</li> <li>• Knowledge of the RLAT methodology</li> </ul>
<b>Required inputs</b>	Distribution of the report/presentation of the results to relevant stakeholders
<b>Required support</b>	Support with the distribution of the report/presentation of the results to relevant stakeholders

## 4. Further development of the RLAT: adaptation to different agribusiness value chains (crops/livestock)

Both the RLAT itself and the present user guide can be applied to livestock and other crop VCs. While the process steps are directly applicable to other agribusiness chains, the participatory instruments, checklists and data collection and evaluation sheets will need to be adapted to the specific features of the produce, the actual situation of the VC and the external conditions (e.g. agro-ecological and framework conditions).

When adapting the package, consider that:

- the loss hotspot analysis, the loss categories and loss ranking matrix, and the farm and market transect walks can probably be used in their existing form;
- the checklists for focus group meetings and their corresponding data collection sheets will probably need to be adapted;
- the evaluation sheets for aflatoxin risks and the instruments for biophysical damage measurement will in most cases need to be adapted wholesale. Aflatoxin risks are crop-specific, so evaluation sheets need to be developed for each group of crops and sometimes for each crop. For example, if the RLAT is to be used for groundnuts, new aflatoxin evaluation sheets will need to be developed reflecting the fact that aflatoxin in groundnuts is mainly a pre-harvest problem, whereas aflatoxin in maize (for which the evaluation sheets have been developed) is more of a post-harvest problem.

As these kinds of adaptations have not previously been carried out, experiences to inform the development of appropriate approaches and to indicate the time and resources needed to adapt the material are lacking. Obvious sources of information and support to guide the adaptation of the tool would, however, be the key experts and VC practitioners.

To implement the RLAT surveys, it is first necessary to build the required capacities at the national or sub-regional levels. Following the RLAT training, users will initially require support and guidance from experts who have mastered the tool.

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