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**RAPID AGRICULTURAL SUPPLY CHAIN
RISK ASSESSMENT (RapAgRisk)**

**Methodological Guidelines
Volume 2**

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**Revised Draft
June 13, 2008**

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Overview of Methodological Guidelines

Volume 2 of the Rapid Agricultural Supply Chain Risk Assessment provides a series of methodological guidelines to support assessment teams throughout all stages of assessment planning, implementation and follow up. The guidelines follow the framework and approach set out in the conceptual paper (Volume 1 – Narrative Text). The subsections are organized as follows:

Annex 1 Baseline Information includes guidelines to facilitate a baseline information exercise at the initial stages of the Rapid Agricultural Supply Chain Risk Assessment. The baseline information exercise informs preliminary field work and consultations, and provides background material to feed into final report preparations. The exercise involves an initial literature review and data collection exercise.

Annex 2 Supply Chain Situation Analysis includes guidance notes and graphical illustrations to facilitate the supply chain situation analysis that takes place at the initial stage of the RapAgRisk (Component 1). A summary matrix identifies key areas of investigation in defining the overall supply chain context. A series of case study illustrations outline how the supply chain can be visualized across a number of different dimensions e.g. overall linkages, stakeholders, production processes, spatial distributions. Templates are also provided to facilitate supply chain cost structure simulations, where information is available.

Annex 3 Identification and Characterization of Risks provides guidance notes for the identification and characterization of risk factors to be considered in the supply chain assessment (Component 2). The annex covers risks related to weather, price, food safety, logistics and infrastructure, policy, labor and the environmental. Each section is organized to detail (i) definition and scope of key risks (ii) direct and indirect risk impacts (iii) indicators (iv) analytical steps and (v) information required to assess risk management practice and capacity. These notes are illustrative and should not be considered a ‘straight jacket’ that all assessment teams need to follow.

Annex 4 Interview Guidelines includes semi structured interview guidelines for consultations among supply chain stakeholders (Components 2 and 3). The objective of these interviews is to assess stakeholder perceptions on risk exposure and mitigation/management strategies throughout different stages of the supply chain, as well as in supply chain support services. The interview guidelines are organized to extract perspectives from each stakeholder on the potential problems they encounter at particular stages of production, processing or distribution, and to identify opportunities to address the operational constraints and issues arising.

Annex 5 Tables and Templates includes a number of report templates and illustrative tables to organize assessment information. This is designed to support stakeholder workshop exercises, as well as feeding into final reporting (Components 3 and 4).

Annex 6 Final Report Template provides a standardized outline for the structure of the final assessment report. This should be followed by the assessment team when preparing final documentation.

Annex 7 Assessment Planning Matrix outlines the key components, sequences, tasks and resources that are required throughout different stages of the assessment process.

Annex 1 Baseline Information

Introduction

Annex 1 includes guidelines to facilitate a baseline information exercise at the initial stages of the Rapid Agricultural Supply Chain Risk Assessment. The baseline information exercise informs preliminary field work and consultations, and provides background material to feed into final report preparations. The exercise involves an initial literature review and data collection exercise. For the selected supply chain it is assumed that information can be gathered from readily available quantitative and qualitative sources within the sector of operation.

Annex 1.1 outlines key themes and lines of inquiry to be taken into account during the initial literature review. The selected themes are designed to familiarize assessment team members with the broad range of issues covered by RapAgRisk including supply chain situation analysis, risk assessment (covering risk exposure, expected loss) and risk management options. Given the multidimensional and cross cutting nature of the RapAgRisk, the lines of inquiry focus on key information requirements and how to prioritize different aspects of the literature. For the topics outlined, key sources of information will include existing sub sector studies, analyses and country reports, as well as initial interviews with key informants.

Annex 1.2 outlines basic reference data requirements for the initial stages of the RapAgRisk. The annex describes key indicators to characterize the sector and key risk categories main. The annex also identifies the most relevant information sources and time periods to consider.

Annex 1.1 Major Themes and Lines of Inquiry in Literature Review

Annex 1.1 describes the key themes and lines of inquiry to be considered during the initial literature review. The selected themes and lines of inquiry are included to familiarize assessment team members with the broad range of issues covered by the RapAgRisk.

Major Themes and Lines of Inquiry

1. Supply Chain Performance

- Volume and value of commodity production and trends over time
- Indicators of farmer and processor productivity
- Indicators of market integration
- Quality profile of marketed commodity
- Cost and price competitiveness
- Indicators of trade performance (imports, exports, market shares).

2. Supply Chain Structure, Dynamics and Integration

- Number of key supply chain participants: private, producer organizations.
- Defining characteristics of supply chain participants: large versus small, established versus new, concentrated versus dispersed.
- Main production regions, broad patterns of geography and spatial distributions in production.
- Role of commercial farmers (small, medium and large), presence of producer / cooperative organizations.
- Extent of service provision amongst private and public sector entities i.e. technical assistance, capacity building and education.
- Role, presence and prominence of government i.e. degree of public sector interventions, level of tariff and non-tariff barriers imposed, scale of public-private initiatives.
- Role of the financial sector / financial flows, level of lending and insurance and main recipients.
- Level and nature of vertical integration (e.g. extent of contracting, flow of information at different stages) and horizontal integration (e.g. consolidation patterns between similar entities)

3. Commodity characteristics and significance to economic and rural sector

- Commodity specific characteristics that impact upon supply chain performance e.g. handling, food safety requirements, and seasonality
- Importance of the commodity relative to the wider domestic agricultural sector
- National and international price trends, fluctuations/peaks and correlation of commodity prices.
- Share consumed domestically (rural versus urban) and exported
- Significance of regional / cross border trade flows of outputs significant

4. Drivers of Change in Supply Chain & Agri Food System

- Domestic Enabling Environment: Competitiveness (exit/entry conditions, incentives/subsidies for production units by size, tax considerations). Regulation and enforcement (e.g. tax code, property rights, resource management). Trade policy barriers.
- International Enabling Environment: International trade regulations and treaties, other international protocols, policies, regulations of nationals and trading blocs. Extent to which international trade agreements, conventions impact on commodity performance
- Market Dynamics/Technology: Patterns in food safety and quality assurance; product differentiation and innovation, lower logistical costs

- Market structure / Firm Management: Consolidation of supply chain structure in recent years e.g. information sharing, bulk buying. Presence of clear 'leader' driving supply chain dynamics.
- Input Market: Demand for physical factor inputs (i.e. seeds, chemicals fertilizer), how this has changed in recent years.
- Specific contextual factors: Consumer tastes, dietary diversity requirements.

5. *Identifying risks and understanding their severity*

- Major bottlenecks and recurrent risks identified in literature.
- Extent to which the following risks addressed in the literature: price, weather, logistics and infrastructure, food safety and quality, environment and labor standards, policy and institutions.
- Where 'risk' factors are not directly addressed, can this be understood through the analysis of related concepts e.g. production and market constraints, uncertainty.
- Nature of the main risks with respect to supply chain performance: covariate or idiosyncratic/major, minor or transient.
- Spatial distribution of risk i.e. geographic localization, *micro*, *meso* and *macro* impact.
- Correlations or patterns between risks/bundles of risks.
- Primary transaction points where risks occur, type of supply chain actor typically affected.
- Major gaps in the literature on evident risk aspects.

6. *Vulnerability, Risk Exposure and Uncertainty*

- Extent to which exposure and expected losses from different risk factors are quantified in the literature.
- Extent to which the literature identifies vulnerable/at risk areas, groups.
- Conceptual / methodological incorporation of vulnerability and risk.
- If 'vulnerability' is not specifically addressed, is it possible to understand this through the analysis of underlying concepts i.e. capacity to address risks, expected losses.

7. *Risk Management Interventions, Capacity and Practice-*

- Ex-ante risk management interventions in place, or previously been applied and nature of interventions (risk prevention/reduction, reducing exposure to risks, risk mitigation; formal/informal). Parts of the supply chain where interventions most relevant.
- Ex-post risk management interventions are in place, or previously been applied and nature of interventions (relief programs, safety nets/ formal, informal). Parts of the supply chain where such interventions most relevant.
- Location of risk management efforts i.e. micro, meso and macro.
- Recent trends in the design of risk management interventions e.g. public versus private interventions
- Experiences (anecdotal/documentated) in operationalising risk management interventions e.g. timing and scale of interventions, targeting, institutional and policy constraints.
- Main actors in the design of risk management efforts i.e. national (private, public), international (private, donor etc)

8. *Related Initiatives in Risk Assessment*

- Related initiatives that may inform risk assessment and risk management practices e.g. household or area based risk assessment; hazard vulnerability assessments, financial risk assessment

9. *Specific Poverty aspects*

- Poverty aspects related to the overall supply chain assessment.
- How literature deals with the role of smallholder farmers, hired farm labor, non-farm rural labor, urban labor, SME's.

Annex 1.2 Baseline Data - List of Initial Indicators

Baseline data should be gathered in advance of the field exercise in order to provide the study team with preliminary information for a supply chain contextual analysis and initial understanding of tentative risks.

The following table outlines a set of initial indicators to be considered. It should be noted:

- **Time Series Data:** Time series data should be collected for up to ten years where possible. This should be achievable for commodity market, macroeconomic indicators and risk factors. More recent and current information related to the supply chain structure and enabling environment may only be available.
- **Sources of information:** Indicative information sources are outlined in the second column. At national level a range of sources may be considered, including – but not limited to - existing household surveys, sub sector studies; firm-level surveys; policy analyses; project background documents examining structure/performance of input/output markets or financial system status. Ministries of Trade, Enterprise, Agriculture and Export Promotion Agencies should be considered in compiling such information. The triangulation and cross checking of data is recommended.

<i>Indicators</i>	<i>Source</i>
Commodity Market Indicators (Domestic and International)	
Domestic Commodity Price (per bag/ \$ per MT) International Commodity Price (per bag / \$ per MT) Total Production (MT) Total Area Planted (HA) Total Yield (HA/MT) Total Supply to Domestic Market Total Supply to Export Market Total Exports by destination country Total Value of Production Total Value as a share of national agricultural exports & imports Share of World Production (MT)	National Sources, WB Global Development Finance WB Global Development Finance MoA, Export Promotion Agencies, Industry Association, Crop Board National Sources– MoA, Export Promotion Agencies, Crop Board National Sources – MoA, Export Promotion Agencies, Crop Board National Sources / FAO STAT National Sources / FAO STAT National Sources – MoA, Export Promotion Agencies, Crop Board National Sources – Export Promotion Agencies, Crop Board FAO STAT
Macroeconomic Data	
Domestic interest rate Nominal Exchange Rates Real Exchange Rates Rate of Inflation Gross Domestic Product Total Exports f.o.b. (free on board) Total Imports c.i.f. (costs, insurance, freight)	IMF International Financial Statistics IMF International Financial Statistics IMF International Financial Statistics IMF, International Financial Statistics, Central Bank World Bank, World Development Indicators IMF Directions of Trade IMF Directions of Trade

<i>Indicators</i>	<i>Source</i>
<i>Supply Chain Structure</i>	
Number of small farmers, medium sized Number of farms, processing companies and/or trading companies Number of processing facilities Number of key production areas and marketing centers Final markets for primary and secondary products Supply Chain Cost structures	National Sources – Farming Organizations, MoA. National Sources – Ministry of Trade, Crop Boards National Sources – Ministry of Trade, Enterprise National Sources - MOA National Sources – Export Promotion Agency National Sources - Farming / Industry organizations
<i>Enabling Environment</i>	
Logistical Performance Index (LPI) Financial flows and insurance devoted to supply chain Taxes as a percentage of domestic retail value Taxes as a percentage of total exports (f.o.b.)	World Bank, Transport Department National Sources – Financial intermediaries, Central Bank National Sources – MOA National Sources - Ministry of Trade, Industry Association
<i>(Initial) Risk Data</i>	
Average Daily Rainfalls and Temperatures	See Annex 3.1
Average retail price for key fertilizers (local currency per kg/bag)	See Annex 3.2
Average farm gate price, domestic / into-factory price for focal commodity (\$ per MT)	See Annex 3.2
Seasonal variability in prices	See Annex 3.2
Number and frequency of pest or disease outbreaks affecting focal commodity	See Annex 3.3
Number of product consignment rejections (pre export, external)	See Annex 3.3
Logistics costs as a percent of shipment value	See Annex 3.4
Presence of restrictions on physical goods movements	See Annex 3.5
Imposition of price controls on commodities, products, and input	See Annex 3.5
Taxes/subsidies as share of input value	See Annex 3.5

Annex 2 Supply Chain Situation Analysis

Introduction

Annex 2.1 summarizes the main areas of investigation to undertake in defining the overall supply chain sector context. The table outlines five key categories of information to consider including (i) Role and Significance of focal commodity in national economy and rural sector (ii) Demand and market context (iii) Structural patterns, relationships and spatial distributions (iv) Government, policies and institutions and (v) recent performance and cost structures. For each category some key lines of inquiry, information sources and rationale are explained.

Annex 2.2 provides a series of graphical illustrations to map different aspects of the supply chain. These illustrations allow the assessment team to depict different activities, actors, and relationships among segments of the chain, and the interactions between producers and intermediaries. Information gathered here provides an understanding of the sourcing, production, and delivery segments within the commodity sector, as well as the different dimensions through which a supply chain can be viewed.

Examples 1-4 include graphical illustrations of the physical supply chain, focusing on overall supply chain linkages (example 1), stakeholders (example 2), domestic and international industry structures (example 3), and production processes (example 4). Examples 5 - 7 provide spatial illustrations of the supply chain, based on simple software and more detailed GIS technology. The spatial maps bring into focus often overlooked role of geography in supply chain analysis, taking into account different ecological zones and physical characteristics which may not be apparent from the previous illustrations.

Annex 2.3 provides some templates to highlight supply chain cost structures. Example 1 provides an illustrative cost structure for a sample commodity and considers the unit costs of production, post harvest, transport/shipping and customs. Example 2 provides a more detailed example of farm production budgets, which may be used to simulate the impact of variations in input costs, price and yield on farming revenue.

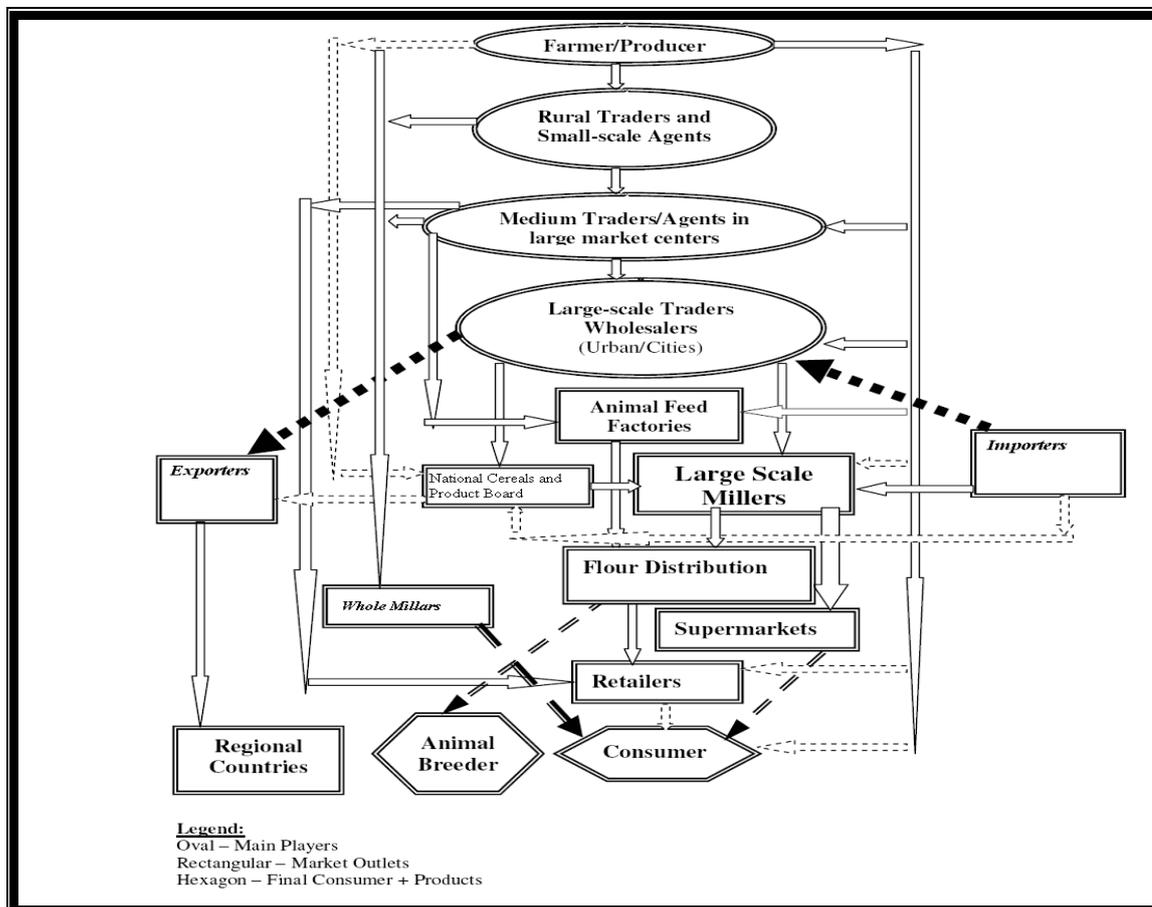
The material gathered for the supply chain context is used to inform field exercises and consultations, and also provides critical reference material for the final reporting.

Annex 2.1 Supply Chain Sector Context – Key Areas of Investigation

Areas of Investigation	Components	Mode of Inquiry	Reasons for Investigation
Role and Significance in National Economy and Rural Sector	<ul style="list-style-type: none"> - Share of (food) crop in staple food consumption - Share of exports/agricultural exports - Importance in sub-regional development - Share of tax revenue - Estimated employment in primary production and processing 	<ul style="list-style-type: none"> - National and industry statistics 	<ul style="list-style-type: none"> - To understand the relative importance of the crop in rural and national economy e.g. in terms of employment, revenue creation. - To understand terminal markets for food crop i.e. rural, urban, international markets.
Demand & Market Context	<ul style="list-style-type: none"> - Annual and seasonal consumption, growth and market shares - Price levels and trends (Farm gate, wholesale and retail) - Commodity imports and impact on domestic market - Consumer preference trends (rural, urban, socio-economic, domestic/international) 	<ul style="list-style-type: none"> - International Trade Databases - Food Balance Sheets, - National commodity production, price and trade reports / forecasts - Key informant interviews 	<ul style="list-style-type: none"> - Strength and seasonality of demand affects production, market flows. - International market conditions influence comparative advantage.
Structural Patterns, Relationships and Spatial Distributions	<ul style="list-style-type: none"> - Supply Chain participants: types (private, producer organizations), numbers, and geographic distributions. - Broad patterns in geography of production, prominent agro-ecological zones - Financial flows: lending and insurance - Information flows: upstream, downstream; mechanisms - Product flows: Final markets for primary, secondary products - Public and private sector service providers of technical assistance, capacity building, and education 	<ul style="list-style-type: none"> - Commodity Studies - Key informant interviews 	<ul style="list-style-type: none"> - Food system structure influences conduct of participants, which in turn affects performance. Spatial distributions can illustrate physical distribution of risk.
Government / Policies / Institutions	<ul style="list-style-type: none"> - <i>Trade Policy</i>: Tariff/Non tariff barriers (trends, extent) - <i>Competition</i>: Exit/entry conditions in market; Incentives/subsidies for production - <i>General Policy and Regulatory issues</i>: Governance, tax enforcement, property right enforcement, - <i>Physical infrastructure</i> - transport, marketplaces, storage and processing facilities, communications 	<ul style="list-style-type: none"> - Commodity Studies - Country Competitiveness Reports 	<ul style="list-style-type: none"> - Regulatory environment affects the behavior and incentives of food system participants. - Infrastructural constraints constitute bottlenecks to food system.
Recent Performance and Costs Structures	<ul style="list-style-type: none"> - Earnings, productivity of farmers and processors - Productivity in representative year - Underlying structure of costs, prices, and margins - Volume, value and trade trends 	<ul style="list-style-type: none"> - Commodity Studies - Key informant interviews 	<ul style="list-style-type: none"> - Performance and costs structure provide an indication of commodity performance, identifies 'normal' years and deviations.

Annex 2.2 Sample Supply Chain Sectoral and Spatial mappings¹

Example 1: Supply Chain Sector Map – Kenyan Maize Sector



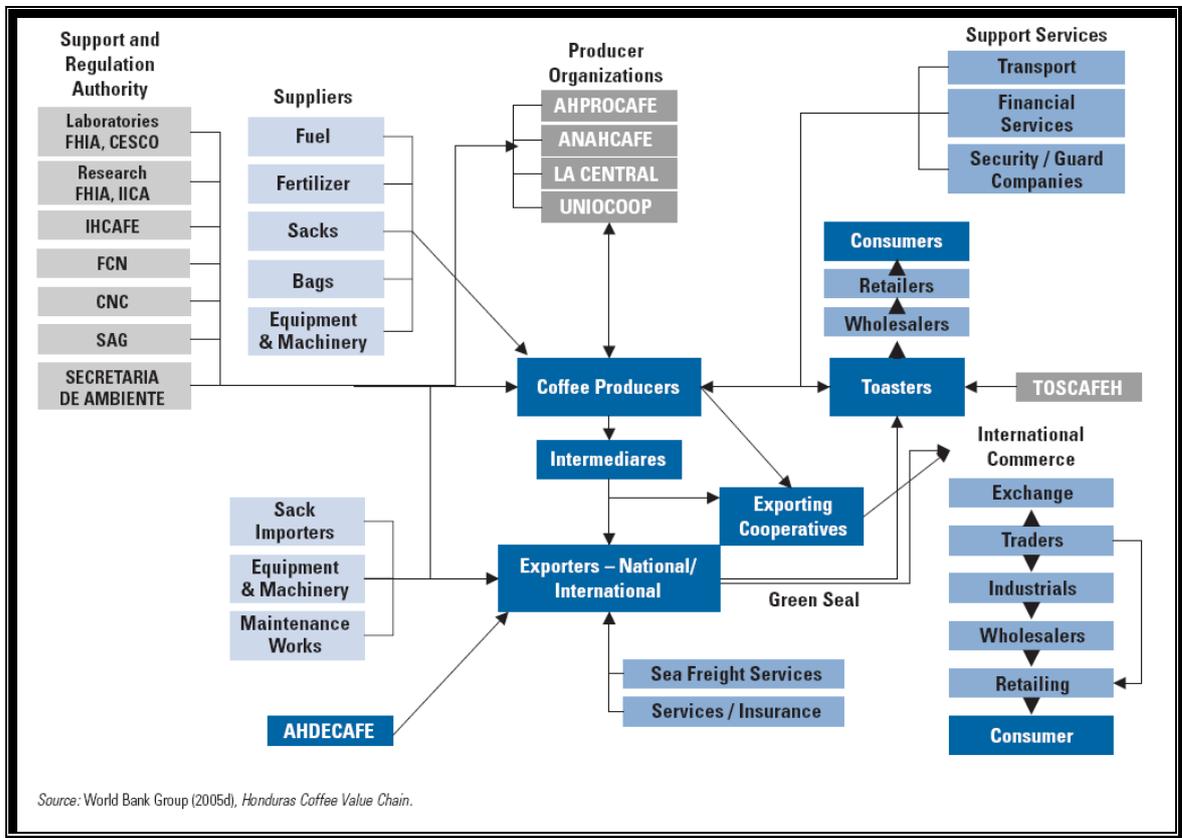
Source: Nayemeino D, B. Kigiri & Njuki (2003)

Note:

Example 1 illustrates a standard supply chain of the maize sector in Kenya. The figure charts the physical flows of maize between key players of the supply chain, taking into account the final markets and consumers for the product.

¹ For general information on supply chain analyses and template and case studies, see http://www.microlinks.org/ev_en.php?ID=9652_201&ID2=DO_TOPIC#vc

Example 2: Cluster Map – Interaction of Stakeholders² - Honduran Coffee Sector

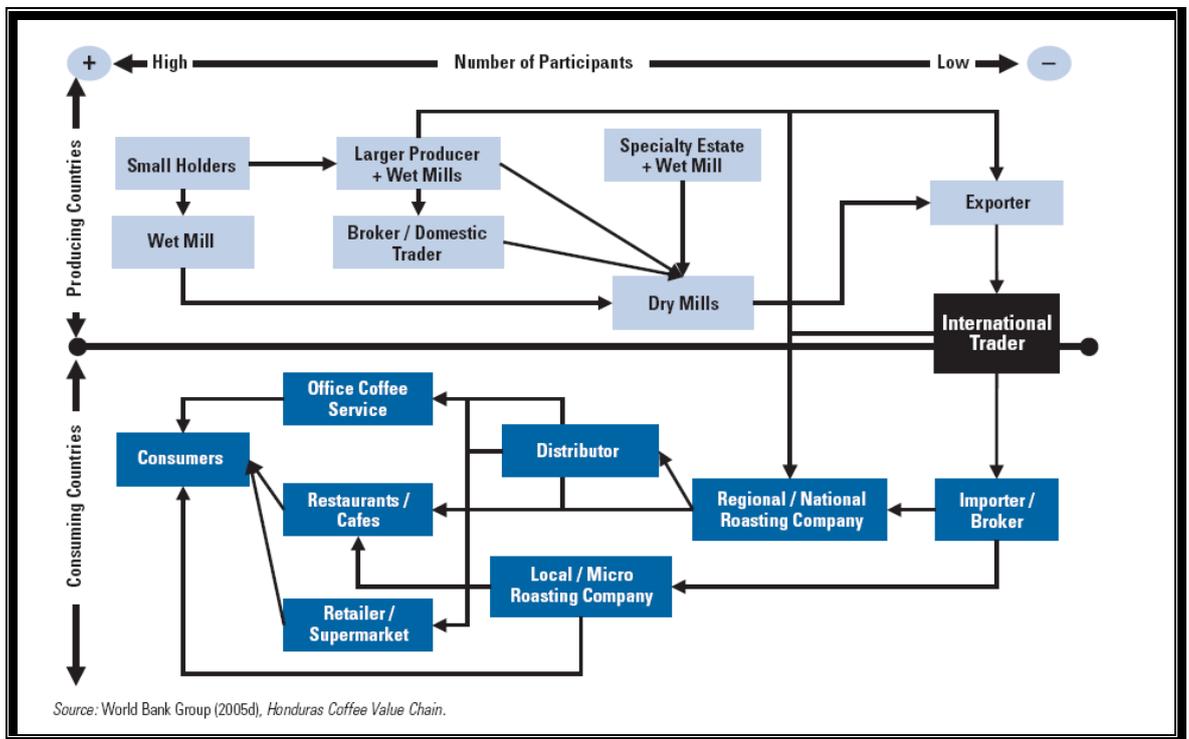


Note:

Example 2 illustrates a supply chain cluster map of the coffee sector in Honduras. The figure charts the key stakeholders of the supply chain, taking into account key support and regulatory services.

² Examples 2-4 originally included in *Multi Donor Investment Climate Advisory Service of the World Bank Group: Moving Toward Competitiveness: A Value Chain Approach 2007*

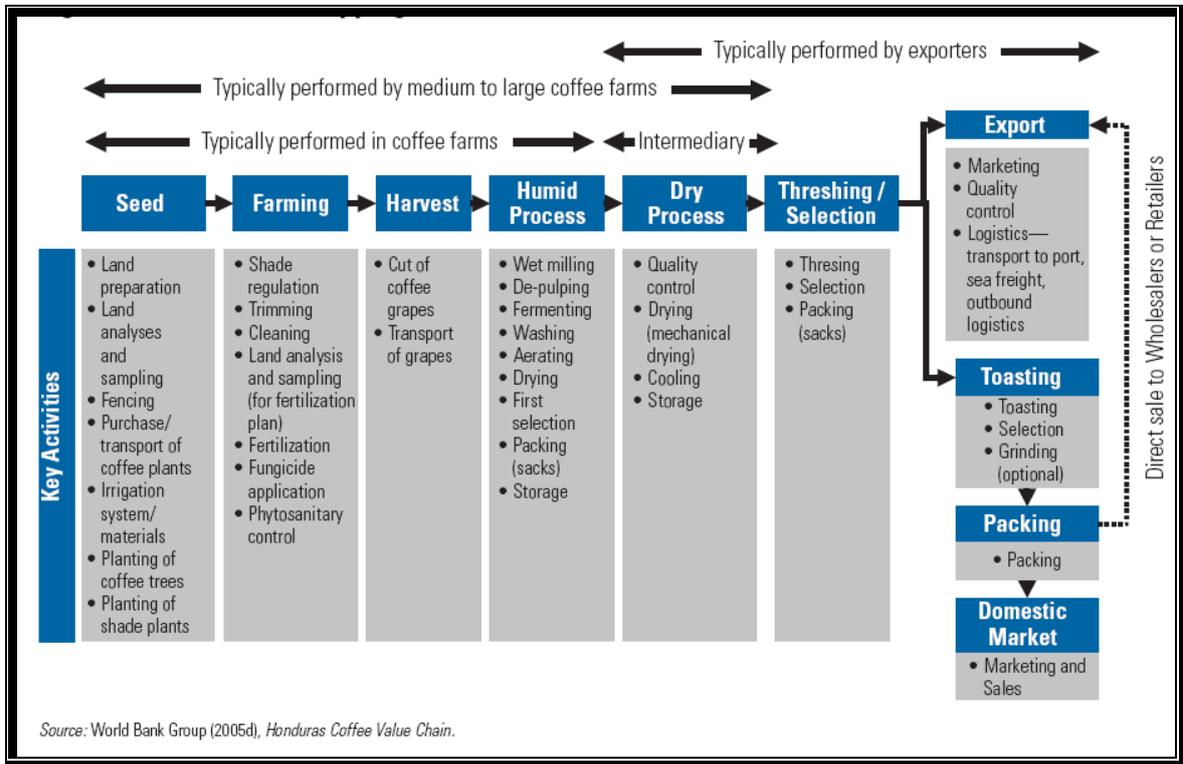
Example 3: Structure of Industry - Honduran Coffee Sector



Note:

Example 3 illustrates the structure of the supply chain for the coffee sector in Honduras. The figure shows domestic and international arrangements and the interactions between different supply chain entities.

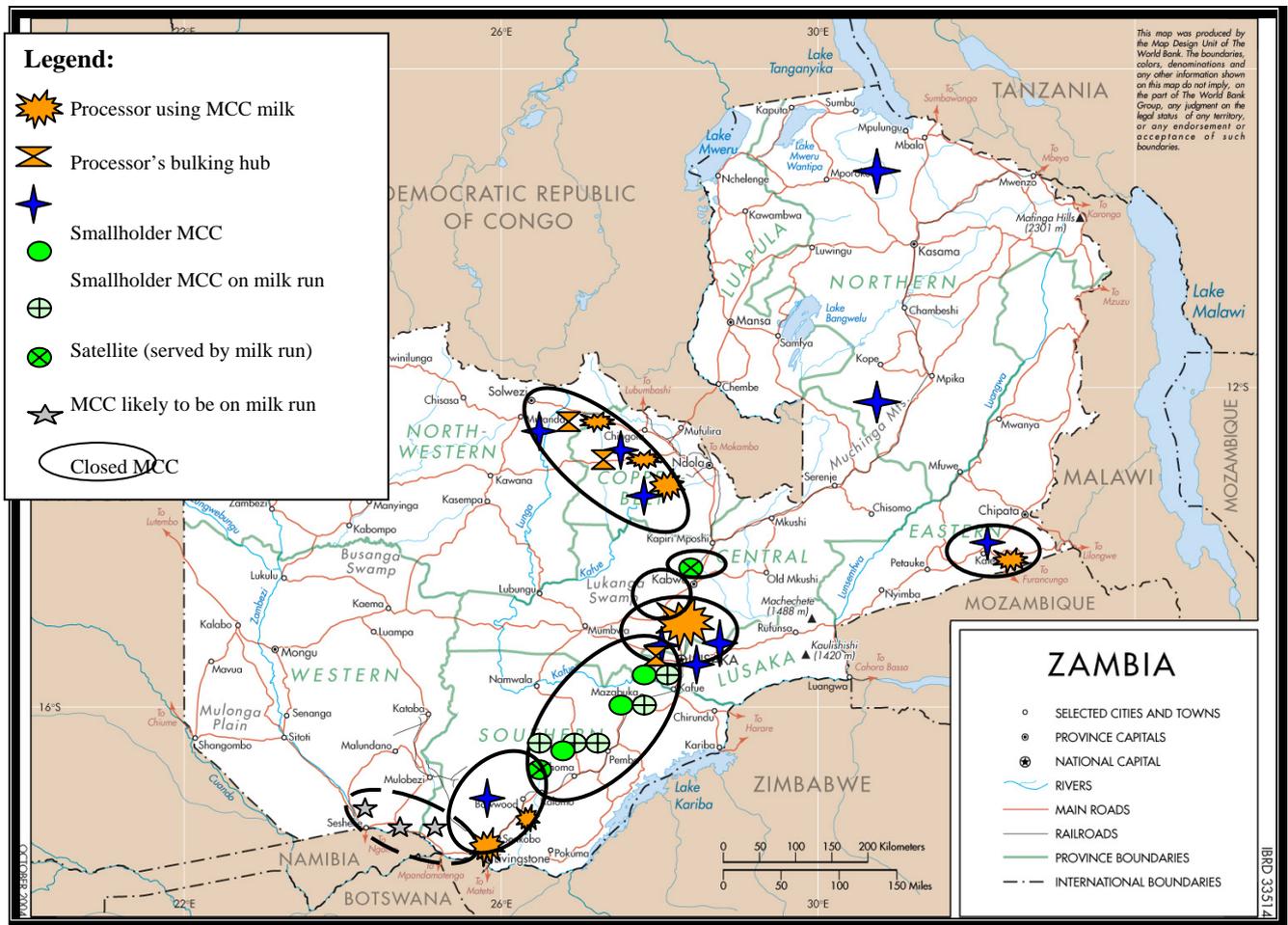
Example 4: Supply Chain Production Functions - Honduran Coffee Sector



Note:

Example 4 illustrates the production functions and activities at different stages of the coffee supply chain in Honduras. The figure also highlights what activities might be undertaken by different types of farming enterprises, and what role intermediaries play along the supply chain.

Example 5: Map of Smallholder Milk Sheds and Collection Centers.

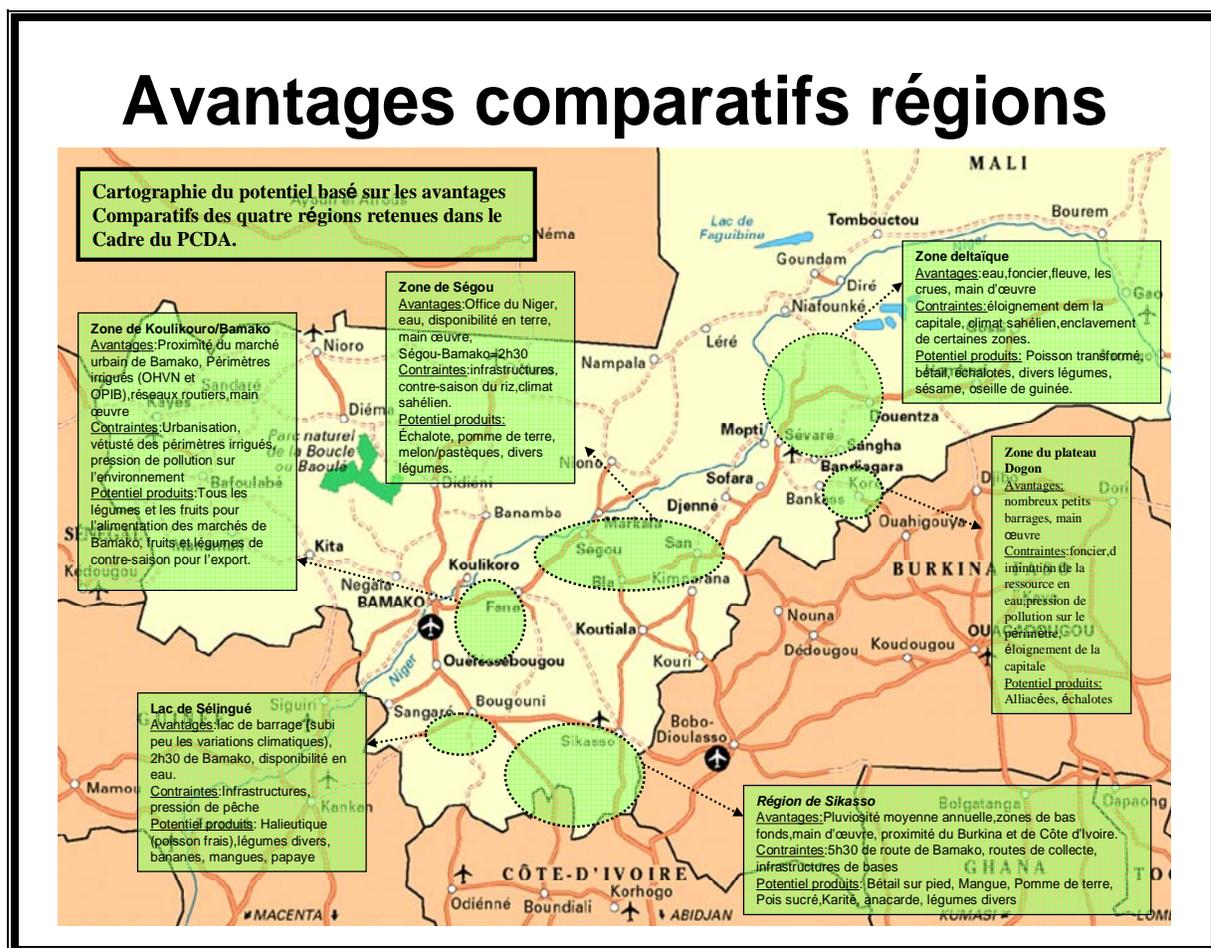


Source: Keyser (2008) – internal document *

Example 5 is a standard World Bank/ UN country map with a number of overlaid illustrations highlighting the spatial distribution of small farmer milk producers and collectors centers and milk processors in Zambia. A similar illustration could be generated for the supply chain being studied, highlighting key productive regions and players, according to a selected legend. The map can be imported into standard software (MS Word, PowerPoint) and overlaid with indicative symbols as above.

* Note – illustrative example only, map has not been reproduced to exact scale.

Example 6: Regional comparative advantages in Mali



Source: World Bank internal

Note:

Example 7 is a standard World Bank/UN country map overlaid with a series of descriptors summarizing regional advantages in Mali.

Annex 2.3 Supply Chain Cost Structures

Example 1 provides a sample cost breakdown for the production of a particular rice variety in Cambodia. The sample is provided to highlight major cost constraints along the supply chain and may be replicated through initial informant interviews or following preliminary stakeholder consultations with input suppliers, farmers, processors, service providers. The data may then be checked with CSO and other statistical data to check accuracy. It should be considered that the cost structures only provide an indicative picture, since specific costs will vary across different entities.

Example 1: Supply Chain Cost Structure for Rice in Cambodia (Dollars/Ton)

	Unit Costs \$	% Total
<u>Production</u>		
Land Preparation	14.19	9.9%
Seed	4.15	2.9%
Transporting	20.09	13.9%
Fertilizer/Manure	26.00	18.04%
Agro-chemicals	0.00	0%
Harvesting	8.03	5.6%
<i>(Sub Total)</i>		50.3%
<u>Post-Harvest</u>		
Drying	3.35	3.3%
Milling	12.25	8.5%
Interest	2.06	1.4%
Packaging	2.16	1.5%
Fees (e.g. porter, market fees)	2.16	1.5%
Levies / Services	1.27	0.9%
<i>(Sub Total)</i>		16.1%
<u>Transport/Shipping/Customs</u>		
Transport	8.51	4.5%
Port Charges	10.23	7.1%
Vessel Loading	1.40	1.0%
Customs	15.30	10.6%
Shipping	14.88	10.3%
<i>(Sub Total)</i>		33.6%
TOTAL	144.02	100%

Source: Konishi (2003) *Towards a Private Sector Led Growth Strategy for Cambodia: Value Chain Analysis*. Global Development Solutions / World Bank.

Note:

As highlighted in Example 1 the supply chain is divided into three major categories and seventeen sub categories. The three major categories include: production, post harvest and transport/shipment and customs. According to the value chain analysis, it costs approximately \$144.02 per ton to grow, process and ship this rice variety (a high value, export variety named Neang Mali) from Cambodia to Hong Kong. The supply chain analysis highlights that fertilizers/manure (18%), transportation (13.9%) and customs (10/6%) constitute the highest costs associated with export orientated rice.

Example 2 Production Budgets and Sensitivity Indicators for Price and Yield Change³

Example 2 provides a more detailed example of farm production budgets, which may be used to simulate the impact of variations in input costs, price and yield on farming revenue. The examples draw upon production budget surveys previously applied in Zimbabwe. In this instance sensitivity indicators were developed to measure vulnerability to yield and price risks for different farming enterprises based upon an analysis of current financial costs and returns to agriculture in different regions.

According to the summary table, information is collected on a broad set of financial variables in order to interpret the financial costs and profitability of different farm enterprises. The example below considers three different production scenarios (low/medium and high levels of production) for communal/resettlement farmers. The information is inputted into an excel worksheet which generates a number of key information points including total production costs, gross and net profits, and later allows for analyst to consider a few sensitivity indicators. Information included in the production budget includes:

Production Costs:

- *Cash costs before sales:* Inputs that must be paid before the crop is sold including seed, fertilizer, agro-chemicals, packing materials, coal, firewood, transport operations, wages and insurance. These costs must either be financed with seasonal credit or farm income. Examples of cash costs before sales are included under the 'input cost' category.
- *Cash deductions after sales:* include auction fees, crop levies and other marketing charges. Examples of cash deductions after sales are included under the 'input costs' category.
- *Total variable costs* are all cash costs incurred on a seasonal basis.
- *Investment costs* are measured as the annual per hectare share of the capital recover cost for each implement as described above.
- *Total production costs* include all variable or cash costs and fixed investment costs.

Farmer Income: Gross profit shows the seasonal income from each enterprise, net profit measures the ability of each activity to cover the long-term depreciation costs of fixed assets.

- *Gross profit* = total revenue – all cash costs.
- *Net profit* = total revenue – all cash costs – annualized investment costs.

Raters of Return:

- *Return to variable costs* = gross profit/total cash costs
- *Return to total costs* = net profit/total production costs

Enterprises with a high ration provide a better return to the expenditure on inputs than those with a low ratio.

Labor

In addition to the estimated number of days of family and hired labor required for each enterprise the following information is also provided

- Wage bill = days hired labor * applicable wage rate
- Gross profit per day family labor = gross profit/days family labor
- Gross profit per day total labor = gross profit/days family and hired labor

³ The material from this section is taken from Keyser (2003)

Example 1: Maize Production in Zambia

A. GENERAL DESCRIPTION							
Crop:	Maize	Irrigation:	NO	Sold to:	Domestic market	USD 1 = ZWD	55
Sector:	Communal, Resettlement	Cultivation:	Ox hire	Dist. to Mkt:	100km		
Notes:	Yield with low management based on 1996-1999 average for all Zimbabwe communal farmers (718 kg/ha) plus an adjustment factor of 15% to account for difference between national yields and those achieved in NR II. Medium management assumes 50% improvement over low management. High management based on recommended practices (Agritex, ZFU). Alternative marketing scenarios include calculation of differential transport costs.						
B. YIELD AND FARMGATE PRICE ASSUMPTIONS		LOW (local)		MED (hybrid)		HIGH (hybrid)	
	Yield (kg /ha):		825		1,250		2,000
	Average price paid at harvest (ZWD/kg):		5.76		5.76		5.76
	Average cost of grain 10 months later (ZWD/kg):		8.85		8.85		8.85
C. DIRECT INPUT COSTS		Qty ZWD/Ha		Qty ZWD/Ha		Qty ZWD/Ha	
	Price Unit						
Seed (use long-season seed if target yield > 4mt)							
	Seed - recycled (valued at op. cost)	8.85 kg	25.00 221.33		-		-
	Seed - short season hybrid	49.80 kg	-	25.00	1,245.00	25.00	1,245.00
	Seed - long season hybrid	102.80 kg	-		-		-
Fertilisers							
	Compound D (7:14:7)	629.00 bag	-	2.00	1,258.00	4.00	2,516.00
	A/N	683.50 bag	-	1.00	683.50	2.00	1,367.00
	Lime	185.00 bag	-		-		-
	Transport to farm	680.00 mt/100km	-	0.15	102.00	0.30	204.00
Herbicides							
	Dual 720	422.00 lt	-		-		-
	Atrazine 50FW	180.00 lt	-		-		-
Insecticides							
	Dipterex 2.5% granules	29.00 kg	-		-		-
	Karate	1,261.00 lt	-		-		-
Fuel/Transport							
	Ox hire	950.00 ha	1.00 950.00	1.00	950.00	1.00	950.00
	Transport to market (HRE)	680.00 mt/100km	0.83 561.00	1.25	850.00	2.00	1,360.00
Grain Bags							
	50kg bag	13.00 bag	16.50 214.50	25.00	325.00	40.00	520.00
Overheads							
	R&M buildings	400.00 year	1.00 400.00	1.00	400.00	1.00	400.00
	R&M equipment	100.00 year	1.00 100.00	1.00	100.00	1.00	100.00
Hired labour							
	Casual	40.00 day	-		-		-
Family labour							
	General tasks	40.00 day	54.00 2,160.00	72.00	2,880.00	86.00	3,440.00
Investment Costs/Depreciation							
	Basic equipment - communal, resettlement	467.00 ha	1.00 467.00	1.00	467.00	1.00	467.00
	Basic equipment - small commercial	836.00 ha	-		-		-
D. FINANCIAL INDICATORS		USD ZWD		USD ZWD		USD ZWD	
1. GROSS REVENUE (yield * price)		86.40	4,752	130.91	7,200	209.45	11,520
2. PRODUCTION COSTS							
	Cash required before sale	30.26	1,665	92.06	5,064	132.76	7,302
	Cash costs deducted after sale (levies, auction fees, transp to mkt, etc.)	10.20	561	15.45	850	24.73	1,360
	Total cash costs	40.46	2,226	107.52	5,914	157.49	8,662
	Annualised investment costs	8.49	467	8.49	467	8.49	467
	Total production costs (excl. family labour, saved seed)	48.95	2,693	116.01	6,381	165.98	9,129
3. LABOUR							
	Hired labour (days)	-	-	-	-	-	-
	Family labour (days)	54	72	72	86	86	86
	Total labour requirement (days)	54	72	72	86	86	86
	Wages, hired labour (cash cost)	-	-	-	-	-	-
	Imputed value family labour	39.27	2,160	52.36	2,880	62.55	3,440
4. FARMER INCOME							
	Gross profit (gross revenue - total cash costs)	45.94	2,527	23.39	1,287	51.96	2,858
	Return to cash expenditure (gross profit/total cash costs)		1.14		0.22		0.33
	Gross profit per day family labour	0.85	46.79	0.32	17.87	0.60	33.23
	Gross profit per day total labour	0.85	46.79	0.32	17.87	0.60	33.23
5. NET INCOME							
	Net profit (gross revenue - total production costs)	37.45	2,060	14.90	820	43.47	2,391
	Return to total cost (net profit/total production costs)		0.76		0.13		0.26
	Net income (net profit - imputed cost of family labour, imputed cost saved seed)	(5.85)	(322)	(37.46)	(2,061)	(19.07)	(1,049)
E. SENSITIVITY INDICATORS							
	Yield & percent change to gross profit = 0	301	-64%	983	-21%	1,407	-30%
	Yield & percent change to net profit = 0	398	-52%	1,080	-14%	1,504	-25%
	Price & percent change to net profit = 0	3.26	-43%	5.10	-11%	4.56	-21%

Source: Keyser (2003)

Based on this information a number of sensitivity indicators are calculated to consider the yield and price at which each enterprise returns gross/and or net profit equal to zero. This includes:

- Sensitivity Indicator 1: (Yield and percent change to gross profit = 0): The yield level and percentage change in yield resulting in a zero gross profit across each production scenario. [i.e. total cash costs/price]
- Sensitivity Indicator 2: (Yield and percent change to net profit = 0): The yield level and percentage change in yield resulting in a zero net profit across each production scenario. [i.e. total production costs/price]
- Sensitivity Indicator 3: (Price and percent change to net profit = 0): The price level and percentage price change resulting in a zero net profit across each production scenario [i.e. total production costs/yield].

The sensitivity indicators highlight the degree to which a crop is able to withstand a relatively large drop in price or yield before returning a financial loss. The Excel worksheet can also be used to simulate the effect of changing input costs on profits e.g. transport, inputs etc.

The calculation for the above indicators should be conducted on a spreadsheet with pre-set functions and calculations. For sensitivity indicators 1 and 2 the change in yields will also impact numerous input costs including transport, grain bags.

Annex 3 Risk Identification and Characterization Guides

Annexes 3.1-3.7 provide guidance notes for the identification and characterization of risk factors to be considered in the supply chain assessment. These notes are suggestive and illustrative and should not be considered a ‘straight jacket’ that all assessment teams need to follow. Assessments might involve greater or lesser attention to particular types of risk, depending upon the contexts and objectives of the work. Each of these risk type annexes is structured to provide the following information.

Guide Sub Sections	Explanation
<i>Overview</i>	<p>Definition of risk and the overall scope / main parameters to be considered in risk assessment.</p> <p>Identification of physical versus financial risks:</p> <ul style="list-style-type: none"> - <i>Physical risks</i> focus on changes in volume, quality, availability and timeliness of delivery. - <i>Financial risks</i> focus on the financial impact or profit/loss position of a supply chain participant or service provider.
<i>Examples of impacts across the supply chain</i>	<p>Differentiation between direct and indirect impacts affecting each supply chain participant</p> <ul style="list-style-type: none"> - <i>Direct impacts</i> are those that affect the immediate productive operations of the participant. - <i>Supply chain linkage impacts</i> are those that are derived from the behavior, actions, or affects of risky events on other supply chain actors (or consumers) <p>Note: In practice, it is sometimes difficult to separate direct from knock-on impacts. The distinction is useful, however, in understanding supply chain inter-dependencies and also for understanding the scope for individual action (vs. collective action) for risk management.</p>
<i>Indicators</i>	<p>Identification of indicators which can be used to proxy the frequency and/or severity of a given risk. The relevance of the listed indicators will vary among commodity sub-sectors and there may be certain indicators that are used in particular sub-sector that are not amenable to generic representation here.</p> <p>For each indicator listed, information is provided on the recommended time period of coverage, potential sources of data and an underlying rationale for the use of such an indicator.</p> <p>It is expected that information will be gathered from existing data sources, as well as stakeholder interviews.</p>
<i>Actions recommended for analysis of information</i>	<p>Identification of analytical steps that could be pursued once data and qualitative information have been gathered. These types of analysis should result in estimates of the ‘expected loss’ associated with particular risks/adverse events.</p> <p>The relevance of each recommended step will ultimately depend on the availability of data, prior analytical work, and the mix of technical skills among the assessment team.</p>
<i>Information required to assess current risk management practice and capacity</i>	<p>This section highlights different components of risk management capacity that are pertinent for the different types of risk and thereby implies dimensions/levels of capacity that assessment teams should probe.</p>

Annex 3.1 Weather Related Risks

Overview

Definition	Weather-related events that negatively affect supply chain performance and potentially impose financial and physical losses.
Scope	<p>Non-extreme weather events refer to periodic deficit and/or excess rainfall; temperature variability; hail storms and strong winds. Examples of adverse weather events include drought stress, sudden freezing temperatures, hail and wind damage, insufficient snow cover and excess moisture.</p> <p>Extreme Events refer to short-lived, violent phenomena of limited extent such as tornadoes, flash floods and severe thunderstorms to the effects of large systems such as tropical and extra tropical cyclones and the effects of prolonged drought and floods.</p>

Examples of Impacts Across Supply Chain

	<i>Direct Impacts</i>	<i>Supply Chain Linkage Impacts</i>
<i>Input Suppliers</i>	- Physical damage to inputs in storage (i.e. from temperatures or flooding)	- Reduced/uncertain demand for inputs due to projected/actual adverse weather pattern -Loan defaults on supplied inputs when farmer productivity is adversely affected
<i>Farmer</i>	- Reduced yields and marketable surplus - Reduced/uneven quality of product -Damage to crop in storage - Damage to on-farm physical infrastructure from extreme events	- Relief efforts distort market e.g. food aid leads to commercial displacement - Reduced credit availability due to weather uncertainties.
<i>Intermediaries</i>	- Unmet purchasing schedules arising from timeliness/availability of produce - Damage to storage/handling infrastructure from extreme events	-Available produce doesn't meet downstream quality requirements - Relief efforts distort market e.g. food aid leads to commercial displacement
<i>Processors</i>	- Capacity underutilization due to raw material shortfall - Increased processing costs arising from disruptions in energy/ utilities -Damage to raw material and final product inventory from extreme event	- Relief efforts distort market e.g. food aid leads to commercial displacement -Higher procurement costs to obtain alternative raw material supplies
<i>Traders</i>	- Unmet supplier orders due to insufficient availability/timeliness/uneven quality of product -Higher logistics costs as unfilled freight capacity -Damage to storage/handling/logistics infrastructure	- Relief efforts distort market e.g. food aid leads to commercial displacement -Higher procurement costs to obtain alternative product supplies

Indicators

Indicators	Definition	Period	Sources	Rationale
Cumulative rainfall during growing season	Average historical rainfall during growing seasons	10-30 Years	- Climate Explorer (Dutch Met Service) - Weather Stations - FAO	- Preliminary analysis will identify if crop water requirements are typically met by rainfall during growing seasons (mm examples) - Trend analysis, standard deviations from mean, will flag persistence of chronic risks, including likely occurrence of drought and floods
Five Day (Decadal) rainfall spreads during growing season	Average ten day rainfall spreads during growing season	10-30 Years	- Climate Explorer (Dutch Met Service) - Weather Stations - FAO	- Illustrates distribution of rainfall during the growing season, isolates dry spells and rapid rainfall patterns - Accounts for specific states of a plants development cycle i.e. biological, physiological factors
Average Daily Temperatures during growing season	Average, Maximum and minimum daily temperatures	10-30 Years	- Weather Station - FAO - EC JRC MARS	- To determine likelihood of heat and cold (frost) stress - Cumulative temperature information indicates the severity of climate variability, based on identification of average, minimum and maximum temperatures.
Number of Extreme Weather Events per year	Number of extreme weather events (affecting supply chain production and subsequent functions)	10-30 Years	- World Bank Hotspot Hazard Mapping - FAO GIEWS Food Outlooks	- Highlights exposure to extreme weather events - Determines if weather events or trends are linked to larger anomalies in climate system

Actions Required for Analysis of Information

Analysis of the above indicators should consider: (i) geo-referencing and the identification of agro climatic regions (ii) modeling rainfall data based on crop water requirements per season (iii) the selection of any weather indexes that may proxy for weather exposure.

(i) Spatially plot the supply chain and overlay with prevailing agro-climatic zones

Action	Description	Purpose	Comments
- Overlay supply chain with agro-climatic zones	Agro climatic zones are integrated spatial units, in which available climatic conditions combine to create unique environments associated with distinct farming systems, land-use and local climatology. Overlay the focal supply chain with such zones	- Delineates geographical factors impacting on agricultural producing systems, particularly in arid, semi-arid and marginal lands.	Capacity and skills to identify and geo-reference zones may be limited. If so, use existing maps and simple techniques.

(ii) Identify rainfall risk based on minimum water requirement thresholds

Action	Description	Purpose	Comment
- Identify minimum crop water requirements based on international thresholds and local knowledge	Minimum water requirement thresholds that various crops need during their growing period for successful and healthy plant development.	The approximated water requirements are rough estimates (distributed evenly) to enable interpretation of rainfall data and interpretation of rainfall risk.	The actual water requirements vary and depend critically on climate, length of growing period/crop variety, soil conditions and cultivation techniques and irrigation schedules if any. Draw upon existing models from FAO, local, and other sources. For example, consider the FAO's Water Requirements Satisfaction Indexes.

(iii) Record pertinent weather patterns in focal locations

Action	Description	Purpose	Comment
- Gather and analysis pertinent weather data affecting primary production and other supply chain functions	Analysis seasonal patterns, longer term trends, coefficients of variation, and the incidence of extreme events		- Draw upon existing analyses where possible, especially from National Met Offices, industry associations, insurance companies, etc.

(iv) Cross check extreme weather event data

Action	Description	Purpose	Comment
- Cross check whether extreme weather events are associated with larger anomalies in the climate system.	- Cross check to determine if extreme weather events coincided with years when El Niño, and its opposite state La Niña, were recorded in the equatorial Pacific.	- Determines a degree of predictability associated with extreme weather events. - Can also be used to inform forecasting against occurrence of future events.	Information available from Climate Explorer (Dutch Met. Service)

(v) Examine correlations between rainfall, temperatures, and production data

Action	Description	Purpose	Comment
- Examine correlations between weather trends and performance patterns	- Examine correlations from historical rainfall and temperature patterns against crop performance measures e.g. average yields, total production	- Takes into account seasonal and annual movements and degree of likely correlation with observable weather events.	..

Assessing Current Risk Management Capacities

Dimensions	Areas to probe
Physical infrastructure for collecting weather data	Number and distribution of weather stations Type of equipment used for weather monitoring
Presence of early warning drought information systems	Coverage of early warning information (historical, spatial) Frequency and types of analysis
Access to/use of weather information	Cost of acquiring weather information How / if weather information is used for planting date recommendations, recommendations on different needs
Farm/ Company Infrastructure and Management Practices	Irrigation/storage facilities/other farm infrastructure Storage infrastructure and inventory management practices of firms Use of weather-resilient inputs, packaging materials, etc.
Availability of insurance for farms and firms	Availability of weather/ crop/property insurance Numbers of insurance companies providing crop/weather insurance Numbers of insurance contracts (subsidized and non-subsidized)

Annex 3.2 Price Risk

Overview

Definition	Volatility or adverse movements/trends in key prices (i.e. for inputs, products, and exchange rates) that disrupt or otherwise adversely impact supply chain performance.
Scope	The assessment focuses on the risk of commodity and input price variability, as well as exchange rate fluctuations. Both long term and seasonal price movements affect business incentives and certainties across the supply chain. Price uncertainty has a direct impact on decision making related to the selection of crops/enterprises and investments which will be made in these activities. Upward and downward commodity price volatility may alter the behavior of supply chain entities, as well as consumers. Adverse or unexpected exchange rate fluctuations may alter the profitability and/or competitiveness of different activities and players. In addition to examining the economic dimensions, it is also possible to quantify direct financial price risks in commodity trading terms.

Examples of Impacts across Supply Chain

	<i>Direct Impacts</i>	<i>Supply Chain Linkage Impacts</i>
<i>Input Suppliers</i>	- Exchange rate volatility/movements impact costs of supplies/raw materials	- Commodity price uncertainty/decline reduces demand for inputs - Loan defaults for inputs due to adverse movements in commodity prices
<i>Farmers</i>	- Commodity price uncertainty/trend reduces use of inputs and reduces productivity - Farm gate prices are insufficient to recover costs of operation and transaction - Price uncertainty/decline reducing credit access - Price unpredictability results in unfavorable contract arrangements with buyers and processors	- Import substitutions leads to commercial displacement, loss of market share - Exchange rate appreciation reduces industry competitiveness and buyer demand
<i>Intermediaries</i>	- Price unpredictability results in unfavorable contract arrangements with farmers, and processors - Price uncertainty or downward movements lead to reduced access to (or higher costs for) credit	- Lack of price incentives result in reduced primary production and inability to meet downstream orders
<i>Processors</i>	- Reduced margins due to spikes in fuel, packaging or other input costs - Reduced margins due to upward movements in raw material costs - Inability to meet credit repayments	- Reduced demand if consumers shift to lower cost substitutes - Import substitution leads to commercial displacement - Exchange rate appreciation reduces industry competitiveness and buyer demand
<i>Traders</i>	- Inability to meet trade orders at pre-agreed prices without incurring loss Traders are reluctant to buy and hold commodities because of uncertainty in covering costs through future sales - Inability to meet credit repayments	- Reduced demand if consumers shift to lower cost substitutes - Import substitution leads to commercial displacement - Exchange rate appreciation reduces industry competitiveness and buyer demand

Indicators

Indicators	Definition	Period	Sources	Rationale
Average retail price for key fertilizers (Local currency per xyz kg bag)	Retail price for key fertilizers used in the production of the focal commodity	10 to 15 years	Input supply companies	Indicator of variability and predictability of input prices, which impact on farming decisions.
Average farm gate for focal commodity (\$ per MT)	Average farm gate price per metric ton of commodity (\$ per MT)	10 to 15 Years	Min of Ag; Industry association	Indicator of farm level price volatility and predictability
Average domestic or into-factory prices (\$ per MT)	Average wholesale or into-factory prices	10 to 15 years	Min of Ag; Industry association	Indicator of factor level price volatility and predictability
Seasonal variability in prices	(Maximum farm/ wholesale price) / (Minimum farm/ wholesale commodity price). Within seasonal time period.	Average patterns over 10 Years	Min of Ag; Commerce	Indicator of patterns of seasonality / variability at farm gate level and at wholesale and retail level for domestically marketed commodity
Average FOB/ comparative international price (\$ per MT)	For traded commodity the ratio between average FOB values and benchmarked international prices per metric ton	10 to 15 Years	FAO, National; Int'l commodity agency	Indicators of price trends, volatility and level of premium/discount to international prices
Real Exchange rate	Nominal exchange rate that takes the inflation differentials among the countries into account.	10 to 15 Years	Central Bank; IMF	Indicator of exchange rate level and volatility

Actions Required for Analysis of Information

(i) Compare domestic to international prices

Action	Description	Purpose	Comment
Graph domestic and world prices	Graphical illustration of commodity domestic versus international prices over twenty year period	To chart relationships between domestic and international prices	Changes in world commodity prices may not translate into domestic price changes owing to government price policies, trade restrictions, etc.

(ii) Estimate farm gate price as percentage of domestic price

Action	Description	Purpose	Comment
Farm Gate Price as Percentage of Domestic Price (or FOB price for traded commodity)	Farm Gate Price as Percentage of Domestic Price or FOB over twenty year period	Can be used to illustrate commercial power and variability through time	...

(iii) Estimate coefficient of variation of commodity price data

Action	Description	Purpose	Comment
- Examine average price data and coefficient of variation	- Estimate coefficient of variation from historical price data (standard deviation / mean) , and also for seasonal data	- Considers risk exposure through time through looking at variability in price data	Also important to consider seasonality aspects

(iv) Simulate impact of input, crop and other prices on farmer profitability

Action	Description	Purpose	Comment

- Use standardized crop budgets and simulate price changes	- Construct/use existing crop budgets and simulate various price shifts	-To estimate range of expected losses from different potential movements in prices	
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(v) Assessment of Financial Risk Position of Intermediaries ,Processors and Traders

Action	Description	Purpose	Comment
- Assess financial risk position based on financial indicators provided above	Estimation and interpretation of: <ul style="list-style-type: none"> - Break even point (BEP) - Net risk position - Mark to Market Profit and Loss Profile 	<p>Break even point (BEP): Breakeven analysis shows the minimum level of earnings which cover the costs of the operation /transaction and avoid loss</p> <p>Calculation: (total costs / volume)</p> <ul style="list-style-type: none"> - Total costs (variable + fixed) expressed in US dollars \$ - Volume (total transaction volume of inventories and/or purchase and sales commitments) expressed in pounds (lbs) <p>Net risk position: The risk of a long position is that prices will fall below the level of the purchase price committed. The risk of a short position is that prices will rise above the level of the sales price committed</p> <p>Calculation: = (total assets + unliquidated sales) -(total liabilities + unliquidated purchases)</p> <p>(+) A 'long' position describes the commercial situation where a trader holds fixed priced inventories or purchase commitments without having equal and offsetting fixed prices sales contracts. (-) A 'short' position describes the commercial situation where a trade has fixed priced sales commitments without having equal or offsetting inventories or purchase commitments.</p> <p>Mark to Market Profit and Loss Profile: The Mark to Market P & L Profile determines the market value of actual and contingent assets and liabilities to measure the price risk. A simulation to quantify the size of price risk in trading positions at any point in time.</p> <p>Calculation: (Market Difference) x Volume</p> <ul style="list-style-type: none"> - Market Difference = (BEP) – (Current Market Price) - Volume (total transaction volume of inventories and/or purchase and sales commitments) expressed in pounds (lbs) 	

Assessing Current Risk Management Capacities

Dimensions	Areas to Probe
Current approaches by governments to absorb/manage price risk:	Price stabilization, buffer stock schemes; scope and apparent impacts
Physical Market based approaches to transfer risk	Strategic timing of purchases and sales, forward contracts, minimum price forward contracts, price-to-be fixed contracts, long-term contracts with fixed or floating prices; Inter-linked contracts involving inputs, credit, and commodities (i.e. contract farming)
Financial market based approaches	Established commodity futures exchanges (i.e. futures contracts, options contract), over the counter trade between two independent counterparties (swaps, customized OTC options, commodity-linked bonds or loans); Trade finance and exchange rate hedging arrangements
Other Farm and Business Management Practices	On-farm and community storage; Company inventory management; Use of alternative production inputs and packaging materials; Enterprise diversification; Product differentiation.

Annex 3.3 Food Safety and Phytosanitary Risks

Overview

Definition	Adverse impacts on supply chain performance and/or market access due to the incidence of plant pests/diseases or the entry/presence of microbiological, chemical or other contaminants in the marketed product.
Scope	The assessment focuses on food safety hazards and their management and the incidence and management of plant pests and diseases. The scope of analysis will depend on the commodity under investigation, but may include risks associated with microbial pathogens, environmental contaminants (for example, heavy metals), naturally occurring toxins, residues from pesticides, and/or damage associated with the incidence and spread of plant pests and diseases.

Examples of Impacts Across Supply Chain

	Direct Impacts	Supply Chain Linkage Impacts
<i>Input Suppliers</i>	<ul style="list-style-type: none"> - Restrictions on the sale/distribution of certain inputs 	<ul style="list-style-type: none"> - Loan defaults when farmer production affected by plant pest/disease or by product rejections -Uncertain/unpredictable demand for crop protection products
<i>Farmers</i>	<ul style="list-style-type: none"> - Reduced yields and quality arising from pest/disease outbreak -Product rejections due to hygiene/food safety concerns 	<ul style="list-style-type: none"> - Loss of market share due to import/supplier substitutions - Reduced access to particular market channels -Reduced downstream demand for 'problematic' products -Added costs/required adjustments to obtain/assure compliance with buyer standards
<i>Intermediaries</i>	<ul style="list-style-type: none"> - Product rejections due to food safety/quality concerns -Added costs of screening and tracing raw materials 	<ul style="list-style-type: none"> - Loss of market share due to import/supplier substitutions - Reduced access to particular market channels -Reduced downstream demand for 'problematic' products
<i>Processors</i>	<ul style="list-style-type: none"> - Increased wastage of raw materials and products -Added cost to develop/maintain quality and food safety management system -Product rejections, recalls and fines -Costs associated with overzealous inspectors 	<ul style="list-style-type: none"> - Increased costs and/or reduced supply of raw materials -Additional costs to certify compliance with buyer requirements
<i>Traders</i>	<ul style="list-style-type: none"> - Product/consignment rejections -Unfulfilled trade orders and harmed reputation -Costs of overzealous inspectors 	<ul style="list-style-type: none"> - Increased costs and/or reduced supply of product - More stringent/costly documentary requirements

Indicators

Indicators	Definition	Period	Sources	Rationale
Pest or disease outbreaks affecting focal commodity	Frequency, magnitude and distribution of pest or disease outbreaks	15 Years	- Commodity agency - MOA Plant Protection Dept - University research faculty	- Illustrates the periodicity and severity of pest and disease outbreaks
Reported domestic health incidents attributed to commodity	Total number of reported public health incidents linked to commodity per year	15 Years	- Ministry of Health	- Trend analysis will determines scale of public health concerns attributed to commodity per year - High incidence indicates poor capacities in water, sanitation and basic hygiene.
Value and volume of commodity sales, according to grade.	Total value and volume of commodity sales according to quality grade classification.	5 to 10 Years	- Commodity agency - Export Promotion Agencies - Ministry of Trade/ Agriculture	- Illustrates level of product differentiation within the supply chain. - Points to incidence of discounts and premiums over time.
Pre-export product consignment rejections	Total number and volume of consignments rejected by national inspectors	Annual for 5 to 10 Years	-Commodity agency -MOA Plant Protection or other inspectorate agency	-Indication of incidence of product wastage or need for re-grading/re-packing and product treatment (i.e. fumigation)
External product consignment rejections	Total number and volume of consignments rejected by foreign trading authorities	5 to 15 Years	- Commodity agency - MOA Plant Protection Dept -Foreign market agencies	- Indicates magnitude/severity of 'lost trade' or additional costs

Actions Required for Analysis of Information

(i) *Sort data according to productive zones, and geo-reference*

Action	Description	Purpose	Comment
Disaggregate data	- Disaggregate data according to zones of production and geo-reference.	- Delineates spatial differences impacting upon phytosanitary and food safety concerns.	- National Export Promotion Agency - Export Promotion Agencies

(ii) *Identify frequency, magnitude and impact of disease and pest outbreaks*

Action	Description	Purpose	Comment
Quantify the frequency, scale and impact of pertinent pests and diseases	Determine frequency and scale of disease and pest outbreaks based on gathered information Estimate the impact on yields, national/locational production, and quality based on available information.	Illustrates severity and magnitude of pest / disease outbreaks	Ministry of Agriculture National Export Promotion Agency FAO

(iii) *Identify frequency, magnitude and impact of product consignment rejections/interceptions on food safety and/or phytosanitary grounds*

Action	Description	Purpose	Comment
Quantify the frequency, scale and impact of consignment	Determine frequency and scale of interceptions/rejections based on	Illustrates the periodicity and severity of trade disruptions	Ministry of Agriculture National Export Promotion Agency

interceptions and rejections by national and foreign authorities	gathered information Highlight the impact on future market access, inspectorate oversight (costs), needed mitigation measures, etc.	and points to weaknesses in risk management measures.	FAO
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(iv) Compare data trends across similar contexts

Action	Description	Purpose	Comment
Compare data to regional trends, or trends across similarly trading economies	Comparative analysis at regional or cross country level	Comparative information to determine similarities and divergences in experience	National Export Promotion Agencies Ministries of Education Export Promotion Authorities

Assessing Current Risk Management Capacities

Dimensions	Areas to Probe
National food safety and plant health regulation and policies	Identification of international and national regulations applying to commodity, codes of practice, guidelines and other recommendations. Contextual information on the regulatory environment, degree of enforcement
Capacities for risk analysis and surveillance	Breadth and depth of pest/disease surveillance and reporting system for the focal commodity. Breadth and depth of food safety monitoring/surveillance system for focal commodity.
Farm and firm management practices	Programs in place for training in 'good agricultural practices' for the focal commodity. Application of integrated pest management for the focal commodity. Application of recognized quality and food safety management systems at company level, including record-keeping and product traceability
Firm/Farm Infrastructure	Characterization of physical facilities for commodity/raw material handling, storage, processing, packing, etc. Facilities for worker and product hygiene at the farm level.
Capacities for safety and quality assurance	Facilities, equipment, and supporting management systems for laboratory testing of products. System of accreditation in place for assessors, certifiers, testers, etc. System in place to inspect pertinent pack-houses and processing facilities and the product being prepared for sale.

Annex 3.4 Logistical and Infrastructural Risk

Overview

Definition	Supply chain bottlenecks in transport, communications and utilities which impact upon the availability, costs and timely delivery of agricultural commodities and inputs.
Scope	<p>Logistical and infrastructural risks influence the costs of undertaking supply chain functions, and may adversely affect product quality, inhibit certain commercial relationships, and/or impact intra-supply chain bargaining power.</p> <p>Transport bottlenecks refer to the quality of physical infrastructure services such as road, rail, waterways, port services and interfaces. Related to this, institutional issues such as customs inspection and clearance, document processing and red tape are also significant. Communications bottlenecks refer to the quality of information technology infrastructure, which determines the efficiency of business transactions (e.g. administrative processing), uptake of market information (e.g. to ensure access to collection points, transaction points). Utility bottlenecks refer to the quality of energy infrastructure and services e.g. power supplies, telephone, and internet services. Logistical and infrastructural risks are important to determine cost competitiveness. While costs and timeliness are key factors, supply chain participants are primarily concerned with the overall reliability of transport, communication and utility services.</p>

Examples of Impacts across Supply Chain

	Direct Impacts	Supply Chain Linkage Impacts
Input Suppliers	<ul style="list-style-type: none"> - Sales affected by disrupted or untimely imports of raw materials or finished input products -Sales affected by disrupted or untimely delivery of inputs to local distribution depots - Physical damage to inputs in storage or transit 	<ul style="list-style-type: none"> - Increased loan defaults arising from logistical bottlenecks experienced by farmers
Farmers	<ul style="list-style-type: none"> - Produce deterioration/non-marketability due to disruptions in transport access/service -Inability to meet strict product delivery schedules -Disruption of post-harvest practices requiring reliable energy/water results in product (quality) loss 	<ul style="list-style-type: none"> - Late availability of inputs affects timely planting and/or effectiveness of input use -Poor physical accessibility limits buyer competition and farmer capacity for negotiation -Downstream logistics bottlenecks result in reduced demand -Pilferage of delivered product
Intermediaries	<ul style="list-style-type: none"> - Deterioration/loss of commodity inventory due to mishandling, power failures, etc. - Inability to meet delivery schedules -Damage to own vehicles from degraded roads - Pilferage arising from weak logistics management 	<ul style="list-style-type: none"> - Reduced access to credit due to transport and logistics problems
Processors	<ul style="list-style-type: none"> -- Deterioration/loss of raw material inventory due to mishandling, power failures, etc. -Product wastage/quality deterioration due to power failures - Inability to meet delivery schedules -Damage to own vehicles from degraded roads 	<ul style="list-style-type: none"> - Capacity underutilization due to disruptions in the delivery of raw materials - Pilferage arising from weak logistics management
Traders	<ul style="list-style-type: none"> - Wastage/deterioration of stored product -Inability to meet supply schedules -Product quality loss in transit leads to consignment rejections by trade partner - Complex customs clearance delays transactions and increases costs 	<ul style="list-style-type: none"> - Loss/pilferage of products in transit

Indicators

Indicators	Definition	Period	Sources	Rationale
Percentage commodity sales distributed to rural/urban/export markets per year	Total commodity amounts sold per annum to rural, urban and export markets	Most recent	- Commodity agency - Export Promotion Agencies - Ministry of Trade/ Agriculture	- Preliminary analysis will indicate the level of logistical and infrastructural requirements of supply chain
Logistics costs as a percent of shipment value	Total logistics costs including freight, port expenses, border clearance, warehousing, in-country transit	Most recent	- Interviews	- Trends and comparative analysis will indicate variability in cost structure, highlighting the overall reliability of logistics/infrastructure.
Total time to process an export transaction	Total time to process clear exporting procedures	Most recent	- Interviews	- Indicates extent of transaction points involved in trading
Total amount of product shrinkage/ pilferage as a percent of overall production or trade	Inventory recorded but not on hand, due to theft, loss or accounting error.	Most recent	- Interviews	- Indicates quality of logistics control
Days lost because of power failures per year / month	Number of business days lost owing to power failures	Most recent	- Interviews	- Illustrates bottlenecks caused by inefficient energy infrastructure

Actions Recommended for Analysis of Information

(i) Spatial Mapping of Supply Chain and Pertinent Infrastructure

Action	Description	Purpose	Comments
Spatial Mapping of the supply chain in relationship to existing infrastructure capacity, transport networks, etc.	Apply gathered information to spatial mapping exercise	To understand spatial and geographic factors	Depicts whether the supply chain is dispersed or concentrated and its position vis-à-vis prevailing infrastructure.

(ii) Annual/Seasonal Mapping of Supply Chain and Pertinent Infrastructure

Action	Description	Purpose	Comments
Mapping of supply chain functions over the course of a year or season	Construct annual calendar containing key functions related to input supply, primary production, and subsequent transformation, storage, and marketing.	To understand possible competition/overlap of infrastructure and especially transport/freight requirements with other industries in the country.	

(iii) Logistical Cost Analysis

Action	Description	Purpose	Comments
Analysis 'typical' logistical costs as a share of product value, contrast regional differences, and highly the periodicity and level of spikes in such costs	Calculation of logistical costs in relation to product value.	Illustrate prominence of logistical costs and implications of cost increases for competitiveness and profitability	..

Assessing Current Risk Management Capacities

Dimensions	Areas to Probe
Customs Controls Regulation and Enforcement	Efficiency and effectiveness of the clearance process by customs and other border control agencies; transparency on customs requirements etc.
Quality of Transport	Roads, total network (km) (thousands); Railroad network, competence in the local logistics industry (e.g., transport operators, customs brokers); Domestic logistics costs (e.g., local transportation, terminal handling, warehousing; Ease and affordability of shipments arrangements; Timeliness of shipments in reaching destination.
Utilities and IT infrastructure	Costs and availability of utility supplies, ability to track and trace shipments.

Annex 3.5 Policy Risks

Overview

Definition	Policy risks refer to regulatory and operational decisions by governments/government entities which either (a) curtail supply chain participation and disrupt physical, financial or information flows or (b) unexpectedly alter the ‘rules of the game’ for supply chain entry and activity.
Scope	In the context of agricultural supply chains, policy risks relate to the broad business environment (i.e. the ‘ease of doing business’) as well as to specific rules, regulations, and incentive structures pertaining to the particular commodity and set of related industries. Some attention would be given to the former, yet emphasis will be placed on the latter. For internationally traded commodities, the policy risks may relate to the decisions/actions of the national government, to the government of the trading party, or both. Decisions/actions by local governmental entities and by public commercial entities may also create risks/uncertainties for supply chain participants. Specific areas of concern include (i) trade restrictions e.g. bans on imports/exports; controls on the movement of physical goods (ii) price controls (iii) restrictive licensing, (iv) public marketing measures that crowd out private sector activities (e.g. export trading, SOE processes, stockholding), and (v) tax and subsidy policies.

Examples of Impacts Across Supply Chain

	<i>Direct Impacts</i>	<i>Supply Chain Linkage Impacts</i>
<i>Input Suppliers</i>	<ul style="list-style-type: none"> - Import restrictions and/or taxes limit availability/increase costs of inputs, reducing sales and scope for market development - Competition from (subsidized) public enterprises 	<ul style="list-style-type: none"> - Financial loss from government policy of credit default relief/holiday, etc (i.e. following ‘disaster’; leading up to elections) -(Changing) input subsidy policies may expand or contract sales opportunities
<i>Farmer</i>	<ul style="list-style-type: none"> -Shifts in input subsidy policies and commodity (price) support policies impacts profitability 	<ul style="list-style-type: none"> - Availability, quality, and cost of inputs affected by trade and tax policies -Available sales outlets affected by intermediary licensing
<i>Intermediaries</i>	<ul style="list-style-type: none"> - Opportunities limited by restrictive licensing or exclusivity arrangements (i.e. for cooperatives) -Periodic/non-transparent commodity taxation by local government entities --Opportunities limited by inter-district/inter-state product movement controls 	<ul style="list-style-type: none"> - Procurement arrangements of public sector marketing entities
<i>Processors</i>	<ul style="list-style-type: none"> - Competition/market non-contestability from public enterprises -Profitability affected by subsidization/taxation of competing products --Imposed price controls for staple foods -Restrictions on/changes in company ownership rules 	<ul style="list-style-type: none"> - Opportunities limited by preferences of government procurement programs -Commodity inventory purchase and release policies of state enterprises
<i>Traders</i>	<ul style="list-style-type: none"> - Business opportunity or commitment undermined by import or export ban -Restrictive licensing and/or trade permit system inhibits forward contracting -Export taxes reduce competitiveness/profitability -Competition from public trading entity or publicly released inventories 	<ul style="list-style-type: none"> -Trade agreements/disputes alter market opportunities and access

Indicators

<i>Indicators</i>	<i>Definition</i>	<i>Period</i>	<i>Sources</i>	<i>Rationale</i>
Restrictions on physical movements of goods	- Frequency, longevity and restrictiveness of physical good movements	Current	Interviews	-Can be used to identify potential disruptions to internal procurement and distribution.
Restrictions on imports and exports	- Frequency, longevity and restrictiveness of trade controls	Current	Interviews; Ministry of Trade	- Can be used to identify potential disruptions to international trading.
Imposition of price controls on commodities, products, and input	- Frequency, longevity and restrictiveness of price controls	Current	- Interviews ; Ministry of Trade/Industry/ Agriculture	- May affect profitability of certain production and marketing activities.
Exclusivity arrangements in procurement and sales	-Presence and quantitative significance of restricted commercial opportunities	Current and recent past	-Interviews	-Exclusivity arrangements may expand and contract over time, leading to reduced competition and accountability for insiders and reduced opportunities for others.
Local/national taxes as share of product value	- Total taxes and mandatory contributions paid by farmers and businesses as share of FOB or retail value	Annual, 5 year period	- Industry Association; Interviews	More of a cost burden than a risk, although significant changes in taxation create uncertainties for pricing.
Taxes/subsidies as share of input value	-Share of representative retail cost of input which is comprised of taxes and subsidies	Current; plus time series	-MOA -Interviews	Illustrates direct role of policy interventions in input pricing.
Time to obtain necessary business licenses	- Length of time to secure necessary business licenses e.g. for exporting, supply of inputs	Current period	- Regulatory agency - Interviews	Indicator on policy related risks and the nature of license restrictiveness.
Time to obtain investment/lending approvals	- Length of time to secure lending at each stage of the production process	Current period	- Finance Institutions - Interviews	Indicator on institutional related risks considers nature of investment approvals and transparency of approval processes.
Share of parastatal SOE's in pertinent markets	- Market share of state enterprises in different business functions/supply chain stages	Current period	- Industry agency	Indicator on potential unfair competition.

Actions Required for Analysis of Information

(i) Tax and Subsidy Policy Analysis

Action	Description	Purpose	Comments
Analyze impact of pertinent taxes and subsidies on the costs and prices of key inputs and the marketed/traded commodity.	Analysis of tax/subsidy component of input and output prices.		Draw upon analysis from recent public expenditure review. Otherwise, industry associations tend to analyze some data.

(ii) Policy Impact on Market/Supply Chain Structure

Action	Description	Purpose	Comments
Analyze impact of market entry/preference rules and SOE activity on competitive and supply chain structure	Analysis of how government policies influence the competitive structure and market contestability	Scope for private risk management measures may be limited if government policies strongly inhibit sustained supply chain relationships	Draw upon existing subsector policy analyses. Gauge if/how SOE activity is deterring private investment and relationship building

(iii) Determine Supply Chain Significance of General ‘Enabling Environment’ Factors

Action	Description	Purpose	Comments
Analyze the significance of general ‘enabling environment’ factors for investment in/competitiveness of/exposure to policy risk within the focal supply chain	Cross reference information/ratings from WB’s ‘Doing Business Index’ and other general competitiveness and policy analysis comparisons	Some generic policy/ institutional matters may be a more significance source of risk than sub-sector specific policies.	

Assessing Current Risk Management Capacities

<i>Dimensions</i>	<i>Areas to Probe</i>
Legal Framework	Laws governing import/export, processing etc are clearly defined and easy to use (law is published in official language, laws pertaining to foreign involvement in industry do not discriminate against citizens); Legal framework fosters efficient market for agricultural inputs (laws regulating sale and distribution of inputs allow for competitive sourcing, certification of quality, minimal input tariffs); laws governing quarantine and food safety arrangements provide clear and reasonable set of rules; laws concerning licensing fulfill legitimate regulatory purposes; licenses do not pose restrictions in term of crops of crop cycles; Progressive tax laws (i.e. transparent taxes, incentives)
Property Rights	Property and intellectual rights are protected; absence of political or institutional bias with respect to priority access for services, inputs.
Business Management Practices	Effective cost accounting systems to understand the implications of changing taxes and subsidies. Transfer pricing arrangements to mitigate the impacts of changing taxation. Product and market diversification to mitigate against the effects of restrictions for any one product/market.
Industry Representation/Lobbying	Producer and industry organizations advocate for policy predictability and transparency and for policy changes that serve constituent interests.

Annex 3.6 Labor Related Risks

Overview

Definition of Risk	The risk that the supply chain's capacity to deliver quality products in sufficient volume is disrupted by labor market conditions, or involves labor-related practices that are not acceptable to downstream retailers or consumers.
Scope	With regard to labor, there are two dimensions. One is actual risks faced by farmers/firms in relation to labor availability, expertise, (ill) health, etc. The second relates to labor standards and thus the acceptance of the supply chain's (final) products in the market place. Labor standards consider norms and practices primarily related to employment conditions, occupational safety, freedom of association and the use of child as well as bonded labor. For some commodities, the prevailing standards for labor impact the reputation (and market access) of the supply chain.

Examples of Impacts Across Supply Chain

	<i>Direct Impacts</i>	<i>Supply Chain Linkage Impacts</i>
<i>Input Suppliers</i>	- Pilferage of product and/ property damage by workers	-
<i>Farmers</i>	- Insufficient/poor quality labor supply (e.g. seasonally) - Ill health or injury to workers disrupts production - Loss of work days due to strikes/disruptions by in event of worker strikes -Pilferage of inputs or product by workers	-Use of child labor prevents access to certain market channels -Increased documentary requirements on labor practices
<i>Intermediaries</i>	- Ill health or injury to workers disrupts operations -Pilferage of product by workers Increased costs owing to labor compliance/ costs at farm level	- Increased documentary requirements on labor practices of farmers being sourced from
<i>Processors</i>	- Ill health or injury to workers disrupts production - Insufficient, poor quality labor supply (seasonality) - Pilferage of product and/ property damage by workers	-Increased documentary requirements regarding own labor practices and occupational safety -Added costs to compliance with downstream labor standards -Increased documentary requirements on labor practices of farmers being sourced from
<i>Traders</i>	- Unfulfilled trade orders owing to labor market disruptions - Pilferage of product and/ property damage by workers	-Increased documentary requirements on labor practices of farmers and firms from whom product is sourced

Indicators

<i>Indicators</i>	<i>Definition</i>	<i>Period</i>	<i>Sources</i>	<i>Rationale</i>
% of farm laborers under the age of 18, under the age of 15	Percentage amount of farm laborers under employed under the age of 15, 18.	Most recent, historical if available	- Informant Interviews - Ministry of Trade/Agric.	Indicator to determine use of child labor. The information could be used as a departing point to examine the nature of employment (hard, light labor); exposure to hazardous work (e.g. handling of pesticides), and to check how workers are documented.
# of serious injuries and fatalities per year in the sector	Number of serious injuries and fatalities per year arising in the focal sector/company.	Most recent, historical if available	-Ministry of Health or Labor Informant Interviews	Indicator of occupational safety and health. The information could be used as a departing point to examine job hazards, facilities and emergency preparedness.
# of days lost to strikes at farm, processing level in last year	Number of days lost to official strikes at farm and processing level in last year	Most recent, year	- Informant Interviews - Ministry of Labor	Indicator of labor market conditions, disruptions to business activity.

Average daily wage for farm and firm workers	Average daily wage rate for skilled and unskilled farm laborers	Most recent, historical if available	- Informant Interviews - Ministry of Labor	Indicator of labor costs can be used as a departure point to examine worker remuneration. Compare with prevailing minimum wages.
Labor turnover rates at farm and processor level	Ratio of number of employees that leave a firm through attrition, dismissal, or resignation during a period to the number of employees on payroll during the same period	Most recent, historical if available	- Informant Interviews - Ministry of Industry	Indicator of ability of enterprises to retain workforce and flexibility of labor laws.
Worker misconduct (i.e. theft; property damage)	Incidence/frequency/severity of these events.	Most recent, historical if available	- Informant Interviews	Indicator of losses attributable through negligence of labor force
#/proportion of trading/processing firms with certified 'ethical'/CSR program	# of certified companies	Currently; recent years	Industry association; program certifiers	Indicator of extent to which international compliance and credibility concerns are being acted upon

Actions Required for Analysis of Information

(i) Draw Upon Available Labor Audits

Action	Description	Purpose	Comments
Draw upon and summarize existing industry labor 'audits'	- Periodic or selected such audits may be available from public and/or private sources. Synthesize the main findings.	- Highlight potential hotspots and draw attention to estimated costs	Care must be taken to not compromise confidentiality of company-specific information.

(iv) Gauge the 'Labor Standards Reputation' of the Supply Chain

Action	Description	Purpose	Comments
Characterize whether labor terms, conditions and standards are deemed to be a competitive asset or liability for the supply chain	- Determine how downstream buyers regard the labor conditions of the focal industry -Gauge demand for certified/audited programs and current status	- To determine whether labor conditions constitute minor or serious commercial risks (or opportunities for differentiation)	...

Assessing Current Risk Management Capacities

Areas to Assess	Notes
National Labor Legislation and Policies	Cross check on existence and enforcement of national labor laws regulations related to occupational health and safety, labor (age/organization/remuneration). Also including applicable industry codes of practice for labor and existence of certified firms or farms. Key indicators on standards include adherence to ILO standards covering freedom of association, child labor, forced labor and non discrimination; as well as national standards on hours of work, contractual safeguards and occupational/health safety.
Industry Code of Practice	Explore presence of industry-specific protocol addressing terms and conditions for workers and specifying other purposes and objectives. Examine current arrangements for inspections/ensuring compliance with this code and the penalties for non-compliance.
Company level Initiatives	Examine initiatives undertaken by individual companies to improve worker performance, reduce staff turnover, reduce the incidence of injury, and/or receive favorable recognition (e.g. 'Fairtrade')

Annex 3.7 Environmental Related Risks

Overview

Definition of Risk	Environmental related risk refers to the any event arising from supply chain functions which impacts negatively upon the agricultural ecosystem and ultimately affects overall supply chain performance.
Scope	<p>The supply chain risk assessment draws particular focus on a number of environment- related risks including:</p> <ul style="list-style-type: none"> ▪ <i>Natural resource depletion:</i> Unsustainable resource use can threaten local biodiversity and undermine a range of agriculture based environmental services e.g. provisioning services (food, freshwater, genetic resources), regulating services (climate, disease, water purification). This is particularly relevant in the production of oil palm, soy and sugar. ▪ <i>Water Discharge and Solid Waste:</i> Poor water discharge, effluence and waste from farms and firms can lead to localized contaminants and visual nuisance. This is particularly relevant in horticulture, coffee and sugar. ▪ <i>Agrochemical usage and discharge:</i> Improper pesticide and fertilizer usage can contaminate ground and water surfaces, as well as expose workers and harm final consumers. <p>Environmental risks can affect future productivity, worker health or downstream market access (where protocols' for environmental management are in place). Environmental risks directly affect the supply chain in a single growing season and / or production cycle. They can also have systemic impacts on decision making and productivity and market options. Thus, one should consider (i) the incidence/severity of environmental damage from current practices, and (ii) if and how certain practices and outcomes affect the marketability (and reputation) of the supply chain's product(s).</p>

Examples of Impacts across Supply Chain

	<i>Direct Impacts</i>	<i>Supply Chain Linked Impacts</i>
<i>Input Suppliers</i>	<ul style="list-style-type: none"> - Increased transaction costs to ensure compliance with international standards on agrochemical usage - Reduced demand for inputs which fail to meet environmental standards (e.g. pesticide labeling, pesticide handling) 	<ul style="list-style-type: none"> - Unsustainable farming practices eventually lead to reduced market opportunities for input suppliers
<i>Farmers</i>	<ul style="list-style-type: none"> - Environmental degradation undermines ecosystem and productivity - Inefficient waste and water discharge adversely affects worker health/safety and/or product quality 	<ul style="list-style-type: none"> - Added cost to comply with downstream buyer environmental management standard - Change/loss of market opportunities due to consumer rejection of products deemed to be environmentally damaging
<i>Intermediaries</i>		<ul style="list-style-type: none"> - Uncertainty regarding future supplies due to downstream concerns about environmental damage in production - Change/loss of market opportunities due to consumer rejection of products deemed to be environmentally damaging
<i>Processors</i>	<ul style="list-style-type: none"> - Inefficient waste and effluent discharge management create bottlenecks in processing operations and/or community/regulatory backlash - Investment costs to mitigate environmental impacts 	<ul style="list-style-type: none"> - Added cost/reduced availability of locally produced raw materials where environmental degradation reduces productivity - Weak environmental management prevent compliance with buyer requirements and thus reduced market access - Change/loss of market opportunities due to consumer rejection of products deemed to be environmentally damaging
<i>Traders</i>	<ul style="list-style-type: none"> - Inability to meet trade orders with sufficient product meeting environmental standards 	<ul style="list-style-type: none"> - Uncertainty regarding future supplies due to downstream concerns about environmental damage in production - Change/loss of market opportunities due to consumer rejection of products deemed to be environmentally damaging

Indicators

<i>Indicators</i>	<i>Definition</i>	<i>Period</i>	<i>Sources</i>	<i>Rationale</i>
Waste product as % of volume throughput for farms and firms	Discarded material as share of production	Most recent year; time series if possible	Interviews Past case studies Local research	High waste levels are indicative of environmental spillovers and possibly missed opportunities for capturing additional value.
% of firms/farms that screen/treat effluent	Commonality of this practice by representative farms/firms	Most recent, historical if available	- Environmental agency; Environmental auditor/advisors; Interviews	Indicator on level of pollution, mitigation strategies employed.
% use of agrochemicals approved / legal under international protocols	Use of legal/approved agrochemical inputs, as defined under international protocols e.g.	Current period	- Interviews - Pesticide control agency	To identify most common and least common/ older and newer form of pesticides. Defined according to FAO / WHO International Code of Conduct on the Distribution and Use of Pesticides.
# of reported pesticide poisonings from farms in focal sector	Number of reported pesticide poisonings that can be attributed to commodity production	Most recent year; historical if available	- Ministry of Health; Agro-chemical industry; Pesticide control agency	Indicator of human impact from pesticides. The information could be used as a departing point to examine acute/chronic toxicity and contamination of groundwater (drinking water)
% of pesticide containers that are collected by manufacturers	Percentage of pesticide containers that are collected by manufacturers	Most recent, historical if available	- Pesticide control agency; Agro-chemical industry	Indicator of pesticide disposal. The information could be used as a departing point to examine other means of container disposal. Low rate may point to environmental, human health impact risks.
# of firms fined/penalized for breaking environmental control or compliance codes	Total number of farms or business enterprises fined for failure to comply with environmental standards e.g. waste disposal, resource use	Most recent, historical if available	- Environmental protection agency	Indicator on efficient resource use and management. Historical trends can determine the degree of enforcement / prioritization amongst responsible agencies.
Forested area (or designated fragile area) cleared for new plantings of focal commodity	Area of designated type of forested (or fragile) area cleared	Recent years	Forest authority; Environmental protection agency	Indication of potential adverse impact on biodiversity or other cause of environmental damage
Markets/market channels closed due to environmental concerns	Incidence and commercial magnitude of closed market access due to downstream concerns about environmental impacts/practices	Current and recent years; Future possibilities	Interviews; Industry organizations; Int'l standards setting organizations	Indication of commercial risk associated with sub-standard environmental management practices.

Actions Required for Analysis of Information

(i) Draw Upon Available Environmental Audits

Action	Description	Purpose	Comments
Draw upon and summarize existing industry environmental 'audits'	- Periodic or selected such audits may be available from public and/or private sources. Synthesize the main findings.	- Highlight potential hotspots and draw attention to estimated costs	Care must be taken to not compromise confidentiality of company-specific information.

(ii) Draw Upon Available Satellite Data to Highlight Potential Large-scale Impacts

Action	Description	Purpose	Comments
Cross check satellite data	- Secure satellite images on local environment	- To determine extent of deforestation and erosion attributable to plantings	..

(iii) Highlight Estimated Losses/Impacts Associated with One/Few Selected Environmental Risks

Action	Description	Purpose	Comments
Focus on one/few selected risks for elaboration	- Attempt to quantify the presence and implications of at least one type of pertinent risk.	- To provide an illustration of the order of magnitude of existing problems	This assessment will not provide a thorough environmental audit of a sector. Selectivity of focus is thus essential.

(iv) Gauge the 'Environmental Reputation' of the Supply Chain

Action	Description	Purpose	Comments
Characterize whether environmental management is deemed to be a competitive asset or liability for the supply chain	- Determine how downstream buyers regard the environmental performance/footprint of the focal industry	- To determine whether environmental dimensions constitute minor or serious commercial risks (or opportunities for differentiation)	...

Assessing Current Risk Management Capacities

Areas to Assess	Notes
National environmental regulation and policies	Environmental laws and regulations pertinent to the focal sector; institutions (capacity) for the enforcement of such laws/regulations; environmental screening for investment approvals, issuance of resource concessions, etc.
Environmental impact assessment and surveillance	Requirement/implementation of environmental risk assessments and the routine monitoring of environmental impacts/hazards
Infrastructure	For treatment of wastes/effluents/water; for environmental testing, etc.
Farm and other enterprise management systems	Systems for monitoring firm/farm level wastes/effluents/water and energy use and for reducing these and other environmental impacts. Application of recognized/certified environmental management practices.
Industry protocols and national programs	For application of 'better management practices', IPM; safe pesticide use/storage, etc.

Annex 4 Semi Structured Interview Guidelines

Overview

Annex 4 includes semi structured interview guidelines for consultations among supply chain stakeholders. The objective of these interviews is to assess stakeholder perceptions on risk exposure and mitigation/management strategies throughout different stages of the supply chain, as well as in supply chain support services.

The interview guidelines are organized to extract perspectives from each stakeholder on the potential problems they encounter at particular stages of production, processing or distribution, and to identify opportunities to address the operational constraints and issues arising. Service providers will complement these findings by providing different levels of analysis, ranging from broad supply chain overviews (e.g. government ministries for agriculture, planning; crop boards) to specific technical expertise (e.g. pesticide specialists, transporters). The focus for stakeholder interviews is outlined in the Table below.

Supply Chain Entity	Focus
Input Providers	
Farmers	- Role in Supply Chain: What are you doing?
Buyers	- Trends & Variability: What is a normal year? What can go wrong?
Processors	- Why are problems encountered? What are the effects? What is the severity
Traders (for exports)	- Relationship with other supply chain participants? How are problems affected through upstream / downstream relationships?
Domestic Wholesalers & Retailers	- How do you manage and respond to problems? How effective have actions been?
Government Officials - Crop Board, State Enterprises, Ministry of Agriculture/Planning	- What could be done in the future, and by whom?
Financial Institutions	-Broad overview on supply chain structure, problems of greatest magnitude, major bottlenecks and opportunities for response
Farming organizations	- Details on credit access, risk assessment in credit financing
Transporters	- Details on farming systems, structures and pertinent production risks, nature of extension services
Technical Specialists	- Details on transport, infrastructure and logistics.
	- Details on specific bottlenecks e.g. input sourcing (e.g. pesticide use, seed supplies); customs and excise clearance procedures.

The guidelines provide a series of leading questions and lines of inquiry. These are designed to provide an overall structure to the interview. It is not expected that the interviewer will strictly follow each line of inquiry. Further instructions are outlined at the start of each interview guideline.

Annex 4.1 *Input Supplier Interview Guidelines*

Introduction

The aims of the interview are to assess input supplier perceptions about the risks they face in the supply chain, and to examine how these risks and possible negative impacts could be managed more effectively. Input supplies are considered as physical inputs used for production of goods and services used by direct participants in the supply chain, e.g., seeds and fertilizer for farmers.

The interview is divided into five sections:

Part 1 is structured to gather information on the specific role of the input supplier within the supply chain, and the relative importance of involvement in the supply chain in terms of overall enterprise performance. The questions were prepared to help understand the demand for and delivery of inputs and the causes of variability that affect supply chain performance. The section should pay particular attention to the following dimensions: significance of candidate commodity, scale of enterprise, seasonality.

Part 2 is structured to examine the risk exposure of the input supplier related to sourcing, producing and marketing of input supplies. The questions were prepared to help understand the *nature, frequency and severity* of different risky events, to characterize the impacts, and to estimate the value of expected losses arising from the risky events. In this section the interviewer should probe using the main risk categories outlined in Annex 3.

Part 3 considers risk linkages with other (downstream and upstream) supply chain participants and brings into focus the transmission of different risks along the supply chain. The section provides the interviewer with an opportunity to identify input supplier perceptions on the risks, impacts, and expected losses faced by other supply chain participants.

Part 4 of the interview focuses on what is being done by the input supplier to manage key risks (i.e., risk management strategies). This considers actions before a risky event is manifested (ex-ante/pro-active), as well as actions after the risk has been manifested (ex-post, coping, reactive). The questions consider the costs (opportunity and real) and effectiveness of actions taken by input suppliers, as well as other actors including public, private commercial, banking and insurance organizations. The assessment team should attempt to elicit perceptions on how input suppliers “share” the management of risks and outcomes, as well as exploring ideas on ways to more effectively manage risks/impacts by greater cooperation.

Part 5 of the interview concludes by identifying gaps, and future opportunities to address risks, risk management and vulnerabilities.

In undertaking the interview it should be noted:

- The guidelines provide a series of leading questions and lines of inquiry, which are designed to provide an overall structure to the interview. It is not expected that the interviewer will strictly follow each line of inquiry, nor be limited in the realms of inquiry.
- The interviewer should probe on a number of key risks which might be expected to impact more at the input supplier level (See Appendix 3). This includes risks related to prices of inputs and outputs, policy (e.g., import restrictions, subsidies), environment and food safety.
- The findings from this interview should be documented and summarized in Illustrative Annex 5.1.

Profile

#	Question	Note: Issues to probe
1.	Contact Person & Title	..
2.	Address and Geographic Location	
3.	Contact Details	..
4.	Year Established	..
5.	Type of ownership	% by government, public, domestic individual/ company, foreign individual/company, general public
6.	Previously a state enterprise	If yes, when privatized
7.	Number of Employees	Permanent and temporary (seasonal)

Part I: Role in Supply Chain: What are you doing?

#	Lines of Inquiry	Note: Issues to Probe
8.	Describe input supply activities in relation to the commodity.	Type of inputs supplied, Importance of commodity in overall market for input supplies
9.	What is the average level of input supplies and revenue in an average year for the given supply chain?	Inputs supplies to supply chain measured in tons
10.	How has input supply and revenue varied in the last five years for given supply chain?	Can variability be directly attributed given risk(s).
11.	How would you describe your position in the domestic market with respect to the given supply chain?	Dominant, major, important regional, relatively small
12.	Where are inputs sourced from?	Domestically, imported
13.	What farmers/farming organizations do you supply in the chain?	Number of farms Approximate share of small, large farms
14.	How many agents/distribution centers do you have? What is the geographic spread of these centers?	Own distribution centers versus agents, and/or public access markplaces
15.	What quality, licensing specifications are required?	How is quality certified? By whom?
16.	How are sales financed? How are purchases financed?	Credit institutions, lending from processors etc.
17.	How do government subsidies or credit guarantees affect business?	Perceived as “opportunity” or “threat” that increases or decreases risks, decisions, outcomes?

Part 2: What can go wrong?

#	Lines of Inquiry	Note: Issues to Probe
18.	In broad terms, what are the main sources of risk that you face in: <ul style="list-style-type: none"> - Sourcing of inputs? - Storing and Handling of inputs? - Sales/Marketing of inputs? 	Probe against specific risk factors in Annex 3 e.g.: weather, price, logistics, policy restriction, environment,
19.	What are the direct negative impacts that potentially arise from these risks?	See Annex 3. e.g. E.g. direct impacts of policy risks include competition from subsidized enterprises.
20.	What are the three main types of risk that most concern your business enterprise?	Ranking of potential problem areas Determination of severity
21.	Of the risks identified what are their frequency?	Often/seldom, seasonal, annual. Temporal

		impacts
22.	How would you describe the potential severity of impact and expected losses arising from major risks?	Expected loss – minimal, low, medium, high, very high
23.	Overall, are underlying conditions in the supply chain, and your position in particular, deteriorating/ improving in recent years? Have you kept any records to track this?	Check for available records and request Perceptions versus records
Note:	<i>Interviewer may wish to probe specific risk aspects related to:</i> <ul style="list-style-type: none"> - <i>policy aspects: input subsidies, import restrictiveness, importing of inputs</i> - <i>special partnership arrangements with farmer organizations and other intermediaries.</i> 	

Part 3: Relationship with other supply chain participants?

#	Lines of Inquiry	Note: Issues to Probe
24.	Do you have regular input supply arrangements? With whom?	Formal, informal arrangements
25.	How are supply chain problems influenced by buyers/ buying relationships?	Formality of contracting, length of trading relationships, small versus large enterprises
26.	How are supply chain problems influenced by commercial relationships?	Role of farmers, SMEs, farmer organizations, cooperatives, donors/ngos
27.	What business relationships (if any) exist with processors, traders, retailers?	Contract farming, vertical integration, guaranteed sales contracts
28.	What spillover effects (i.e., linked impacts) do input supply problems have on the wider supply chain?	Perception of risk transmission across supply chain

Part 4: How do you manage and respond to problems?

#	Lines of Inquiry	Note: Issues to Probe
29.	What is being done to address risk-related problems in advance of a risky event? How long have these actions been in place?	Ex ante strategies : a) asset and enterprise diversification, b) compensation arrangements, c) lessening involvement in supply chain (e.g.. migration/reduce production)
30.	What is done to address negative impacts after a risky event?	Ex post strategies.
31.	How effective have actions been? What actions have been most effective? Least effective? Why?	a) Ex-ante b) Ex-post
32.	What interventions have been supported by public sector ‘agents’ (including donors/ngos) to manage input supply problems?	Public sector versus market based actions. Ex ante v. ex post.
33.	How effective have public interventions been? Which are more/less effective?	Timing, targeting, delivery aspects
34.	What has recent experience illustrated about input supplier capacity to withstand major deviations, disruptions, and disasters in the supply chain?	Ability to manage risk on own versus need for external “partners”
35.	What information sources, if any, are used to assess the potential frequency/magnitude / severity of problems?	Early warning information, price tracking, local knowledge
36.	How would you describe overall access to credit and insurance? What are the benefits/costs from credit and/or insurance?	Availability, affordability of credit and timely/“fair” payment of insurance

Part 5: What could be done in the future, and by whom?

#	Lines of Inquiry	Note: Issues to Probe
37.	What are the main lessons learned from past experiences in risk management?	
37.	What options could be explored to manage input supply related problems more effectively? By input suppliers? By others?	..
38.	What are the perceived potential options for managing problems jointly with other supply chain actors?	..
39.	What roles might private and public sector actors play, including donors and NGOs?	..

Annex 4.2 Farmer Interview Guidelines

Introduction

The aims of the interview are to assess farmer perceptions on the risks that they face in the supply chain, and to examine how these risks and negative impacts could be managed more effectively.

The assessment team should aim to cover a mixed sample of representative farming entities covering (i) small (ii) medium and (iii) large scale farmers. Within this continuum there may still be considerable differentiation within groups, which should also be accounted for. For example some small farmers (possibly in different regions) may have low input (e.g., limited inputs, family labor) versus high input use (e.g. moderate input use, hire labor). The level of commercialization may also vary among medium/large enterprises and regions in the country.

Depending on the farming entity in question the following interview schedule will need to be adapted. For example, small scale community enterprise interviews may often be conducted in informal contexts, in larger groups and with different levels of information availability and documentation.

All interviews should cover five main areas, as outlined in the interview schedule:

Part 1 is structured to gather information on the specific role of the farming entity within the supply chain, and the relative importance of the supply chain to overall farming enterprise performance. The questions are devised to characterize the nature of production in the sector; price, yield and revenue patterns; access to input and output markets. The section should pay particular attention to the following dimensions: significance of candidate commodity, scale of enterprise, seasonality

Part 2 is structured to examine the risk exposure of the farming entity related to its supply chain sourcing, producing and marketing functions. The questions were prepared to understand the *nature, frequency and severity* of different risky events; to characterize the impacts; and to estimate the value of expected losses arising from the risky events. In this section the interviewer should probe using the main risk categories outlined in Annex 3. The interviewer should also explore underlying trends related to changing production patterns and the relative importance of the crop vis-à-vis other farming alternatives

Part 3 considers risk linkages with other (downstream and upstream) supply chain participants and brings into focus the transmission of different risks along the supply chain. The section provides the interviewer with an opportunity to identify the level of integration and established relationships within the supply chain, as well as farmer perceptions on the risks, impacts, and expected losses faced by other supply chain participants.

Part 4 of the interview focuses on what is being done by farming entities to manage key risks (risk management strategies). This considers actions before a risky event is manifested (ex-ante/pro-active), as well as actions after the risk has been manifested (ex-post, coping, reactive). The questions consider the costs (opportunity and real) and effectiveness of actions taken by farmers (and farming organizations), as well as other actors including public, private commercial, banking and insurance organizations. The assessment team should attempt to elicit perceptions on how farmers “share” the management of risks and outcomes, as well as exploring ideas on ways to more effectively manage risks/impacts by greater cooperation. Interviewers should also elicit information on past efforts to manage risk and how this might be changing over time)

Part 5 of the interview concludes by identifying gaps and future opportunities to address risks, risk management and outstanding vulnerabilities.

In undertaking the interview it should be noted:

- The guidelines provide a series of leading questions and lines of inquiry, which are designed to provide an overall structure to the interview. It is not expected that the interviewer will strictly follow each line of inquiry.
- The interviewer should probe a number of risks which might be expected to impact more at farm level (See Appendix 3). This includes risks related to price, weather, labor and environmental quality.
- The findings from this interview should be documented and summarized in Illustrative Annex 5.1.

Introduction: Profile

#	Question	Note: Issues to probe
1	Name	..
2	Contact Details	..
3	Geographic Location	..
4	Type of Enterprise	Family owned, small scale, modern commercial, agri-industrial
5	Number/ Type of Employees	% Permanent, Temporary; % Family, Own versus Hired

Part 1: Role in Supply Chain: What are you doing?

#	Lines of Inquiry	Note: Issues to Probe
6	Briefly describe your production activities in relation to the supply chain?	Crops cultivated (% area or value), Total area farmed & owned (ha),
7.	What is your average level of production and revenue in a given year? What have been the trends in recent years?	Price, yield, and (gross) revenue trends Check for records. May be available in annual reports, for larger farmers
8	What is the significance of the commodity in overall production and in terms of annual crop rotations?	Crop rotation calendar, seasonal scheduling
9	What is your reliance on household versus hired labor? Is there a seasonal dimension to this?	
10	What inputs do you use? Where do you source inputs from?	Fertilizer, seeds, pesticides Reliability, quality, utilization
11	What type of irrigation is in use?	Furrow, drip, overhead etc;
12	Briefly describe farming assets and level of technological adoption?	Infrastructure, investments
13	What are the factors which motivate planting of crop? What are the alternatives?	Return to assets vs. risk management Substitute, complementary goods
14	What access do you have to local markets and traders? What is the distance from the nearest trading centre?	Formal versus informal markets
15	Are you a member of a farming cooperative/organization? What are the primary benefits of this relationship?	Is membership a “pre-condition” for participation in the supply chain?

Part II: What can go wrong?

#	Lines of Inquiry	Note: Issues to Probe
16.	In broad terms, what are the main sources of risk that you face in? <ul style="list-style-type: none"> - Sourcing inputs? - Production? - Sales/Marketing of goods? 	<i>Nature of risk</i> Probe against specific risk factors impacting on farm level e.g.: weather, price, environment, labor standards, logistics, operational
17	What are the direct negative impacts that potentially arise from these risks?	See Annex 3. e.g. direct impacts of policy risks include competition from subsidized enterprises.
18.	In summary, what are the three main sources of risk that most concern your business enterprise?	Ranking of potential problem “areas”
19.	Of the risks identified what are their frequency?	Often/seldom, seasonal, annual.

		Temporal impacts?
20	How would you describe the potential severity of impact and expected losses arising from major risks?	Expected loss – minimal, low, medium, high, very high
21	Overall, are underlying conditions in the supply chain, and your position in particular, deteriorating/ improving in recent years? Have you kept any records to track this?	Check for available records and request
Note:	<i>Interviewer may wish to probe specific risk aspects related to:</i> <ul style="list-style-type: none"> - seasonality dimensions - contracting arrangements - direct impacts of weather and environmental factors 	

Part 3: Relationship with other supply chain participants?

#	<i>Lines of Inquiry</i>	Note: Issues to Probe
22	Do you have regular input procurement arrangements? With whom? How effective are existing input arrangements?	Timely provision of inputs, cost factors, logistics issues. Formality of arrangements
23	Do you have fixed selling (contract) arrangements with processors or other intermediaries? How often are these negotiated?	Formality of contracting, length of trading relationships. Logistics issues.
24	How are transport requirements met? How effective are transport facilities?	Availability, affordability, dependability
25	What feedback mechanisms/ interactions (if any) exist with traders and retailers?	Shared concerns related to Environmental, labor, food safety
26	What spillover effects (i.e., linked impacts) do farm level production problems have on the wider supply chain? Which entities are most impacted	Impacts of production/supply shortfalls, labor constraints etc

Part 4: How do you manage and respond to problems?

#	<i>Lines of Inquiry</i>	Note: Issues to Probe
27	What is being done to address problems in advance of a risky event? How long have these actions been provided?	Ex ante – investments in infrastructure, technology, management practices, financial instruments, organizational arrangements.
28	What is done to address problems after a risky event?	Ex post strategies - reallocation of assets, sales of assets, seek employment/migration, transfers etc.
29.	How effective have actions been? What actions have been most effective? Least effective? Why?	a) Ex-ante b) Ex-post
30.	Who typically provides these actions?	Self-made decisions, decisions by farmer organizations, formal versus informal mechanisms,
31.	What interventions have been supported by public sector ‘agents’ (including donors/ngos) to manage problems?	Public sector versus market based actions. Ex ante v. ex post.
32	How effective have public interventions been? Which are more/less effective?	Timing, targeting, delivery aspects
33	What has recent experience illustrated about farmer capacity to withstand major deviations, disruptions, and disasters in the supply	Ability to manage risk on own versus need for external

	chain?	“partners”
34	What information sources, if any, are used to predict/assess the potential frequency/magnitude / severity of problems?	Early warning information, price tracking, local knowledge
35	How would you describe overall access to credit and insurance? What are the benefits/costs from credit and/or insurance?	Availability, affordability of credit and timely/“fair” payment of insurance

Part 5: What could be done in the future, and by whom?

#	<i>Lines of Inquiry</i>	Note: Issues to Probe
36.	What are the main lessons learned from past experiences in risk management?	
37.	What options could be explored to manage production problems more effectively? By farmers? By others?	Opportunities and constraints
38.	What are the perceived potential options for managing problems jointly with other supply chain entities?	..
39.	What roles might private and public sector actors play, including donors and NGO’s.	..

Annex 4.3 Market Intermediary Interview Guidelines

Introduction

The aims of the interview are to assess intermediary buyer perceptions on the risks that they face in the supply chain and to examine how these could be managed most effectively. Intermediary buyers include small and medium scale broker trading entities, cooperatives, producer based entities, NGOs, agents for exporters or processors.

The interview is divided into five sections:

Part 1 is structured to gather information on the specific role of the buyer as an intermediary within the supply chain and to identify the relative importance of the supply chain to overall enterprise performance. The section should pay particular attention to the following dimensions: significance of candidate commodity, scale of enterprise, seasonality.

Part 2 is structured to examine the risk exposure of buyer intermediaries related to supply chain sourcing, storage/handling and marketing functions. The questions were devised to understand the *nature, frequency and severity* of different risky events; to characterize the impacts; and to estimate the value of expected losses arising from the risky events. In this section the interviewer should probe using the main risk categories outlined in Annex 3.

Part 3 considers risk linkages with other (downstream and upstream) supply chain participants and brings into focus the transmission of different risks along the supply chain. The section provides the interviewer with an opportunity to identify the level of integration and established relationships within the supply chain, as well as buyer perceptions on the risks, impacts, and expected losses faced by other supply chain participants.

Part 4 of the interview focuses on what is being done by buyers to manage key risks (risk management strategies). This considers actions before a risk event is manifested (ex-ante/pro-active), as well as actions after the risk has been manifested (ex-post, reactive). The questions consider the costs (opportunity and real) effectiveness of actions taken by processors and actors including public, private commercial, banking and insurance organizations.

Part 5 of the interview concludes by identifying gaps and future opportunities to address risks, risk management and outstanding vulnerabilities.

In undertaking the interview it should be noted:

- The guidelines provide a series of leading questions and lines of inquiry, which are designed to provide an overall structure to the interview. It is not expected that the interviewer will strictly follow each line of inquiry.
- The interviewer should probe a number of risks which might be expected to impact buyers most specifically (See Appendix 3. This includes, for example, risks related to price, food safety, and transport).
- In the case of buyers, the interviewer may find it most helpful to focus on dyadic / sub-chain relations between producers and buyers, buyers and processors.
- The findings from this interview should be documented and summarized in Illustrative Annex 5.1.

Introduction: Profile

#	Question	Note: Issues to probe
1	Company Name	..
2	Contact Person & Title	..
3	Address and Geographic Location	
4	Contact Details	..
5	Year Established	..
6	Number of Employees	Permanent and temporary (seasonal)

Part 1: Role in Supply Chain: What are you doing?

#	Lines of Inquiry	Note: Issues to Probe
7	Briefly describe your position and prominence in the supply chain?	Small, medium, large buyer. Private, NGO entity.
8	Do you purchase as an agent on behalf of another entity (e.g. exporter, processor), or on own accord	Buying on own behalf or as agent.
9	What is the significance of the commodity in your overall portfolio? How many other commodities do you purchase and trade?	Mix of commodities, significance of supply chain commodity.
10	What seasonal aspects affect buying activities?	Seasonal variability.
11	Describe buying trends in the last 5 years? How are purchasing patterns different now to when they were before?	Sales revenue records Contracting arrangements
12	Average annual sales turnover. Share of local sales versus export sales turnover?	Also check annual report
13	Where are your main operations, trading centers and markets?	Spatial dimensions, geographic spreads
14.	Describe your system for coordinating product sourcing and sales? How much flexibility do you have in terms of selecting goods?	E.g. purchase based on specific orders, purchase according to availability
15	How are purchasing prices set?	According to market, negotiated
16	What are your buying volume requirements?	Quantity per year, Time period (seasonality, continuous). Preferred/minimum lot size
17	What types of quality specifications are required, if any?	Quality attributes (color, moisture, dirt), food safety. Environmental aspects
18	What is your storage and transportation capacity? Are these facilities adequate for enterprise activities?	...

Part 2: What can go wrong?

#	Lines of Inquiry	Note: Issues to Probe
19.	Describe the typical risks incurred in <ul style="list-style-type: none"> - Sourcing products? - Storage/Transportation? - Sales/Marketing of goods to processors/traders? 	<i>Nature of risk</i> Probe against specific risk factors impacting processors e.g. price, transport, food quality, environment
20.	What are the direct negative impacts that potentially arise from these risks?	See Annex 3. e.g. E.g. direct impacts of transport related risks, policy issues may be relevant
21.	What are the three main sources of risk that most concern your business enterprise?	Ranking of potential problem areas
22	Of the risks identified what are their frequency?	Often/seldom, Seasonal, annual. Temporal impact

23.	How would you describe the potential severity of impact and expected losses arising from major risks?	Expected loss – minimal, low, medium, high, very high
24.	Overall, are underlying conditions in the supply chain, and your position in particular, deteriorating/ improving in recent years? Have you kept any records to track this?	Check for available records and request
Note:	<i>Interviewer may wish to probe specific risk aspects related to:</i> - Price risks and related contracting arrangements	

Part 3: Relationship with other supply chain participants?

#	<i>Lines of Inquiry</i>	Note: Issues to Probe
25.	Do you have regular procurement relationships with farmers? Do you buy on a period spot price basis or set prices?	Procurement: Domestic (own farm, intermediaries), international. Formal v. Informal.
26.	Do you have regular sales relationships with processors?	Marketing aspects. Formal v. Informal.
27.	Describe transport costs and availability of suitable transport connections?	Market access etc.
28.	What spillover effects do buyer problems have on the wider supply chain?	..
29.	To what extent are buying activities affected by government policy regulations	Restrictions on trade, physical goods, rice controls

Part 4: How do you manage and respond to problems?

#	<i>Lines of Inquiry</i>	Note: Issues to Probe
30	What is being done to address problems in advance of a risky event? How long have key actions been in place?	Ex ante – interlinked contracts, insurance
31	What is done to address problems after a risky event?	Ex post strategies
32	Who typically provides these actions?	Buyers, third parties
33	How effective have interventions been? What actions have been most effective? Least effective? Why?	a) Ex-ante b) Ex-post
34	What interventions have been supported by public sector ‘agents’ (including donors/ngos) to manage problems?	...
35	Who are the main providers of the above interventions?	Government, NGO Extension services etc.
36	How effective have public interventions been?	Timing, targeting, delivery aspects
37	What has recent experience illustrated about farmer capacity to withstand major deviations, disruptions, and disasters in the supply chain?	Ability to manage on own versus need for ‘external partners’
38	What information sources, if any, are used to assess the potential magnitude / severity of problems?	Early warning information, price tracking, local knowledge
39	How would you describe overall access to credit and insurance? What are the benefits/costs from credit and/or insurance?	Availability, affordability of credit and timely/“fair” payment of insurance

Part 5: What could be done in the future, and by whom?

	<i>Lines of Inquiry</i>	Note: Issues to Probe
40.	What are the main lessons learned from past experiences in risk management?	
41.	What options could be explored to manage buyer-related problems more effectively? By buyers? By others?	Opportunities and constraints
42.	What are the potential options for managing problems jointly with other supply chain entities?	..
43.	What roles might private and public sector actors play, including donors and NGO’s.	..

Annex 4.4 Processor Interview Guidelines

Introduction

The aims of the interview are to assess processor perceptions on the risks that they face in the supply chain and to examine how these could be managed most effectively. The interviews should aim to cover a representative sample of processors including large, medium and small scale entities.

The interview is divided into five sections:

Part 1 is structured to gather information on the specific role of the processor within the supply chain and to identify the relative importance of the supply chain to overall enterprise performance. The questions were devised to understand the significance of a given crop within the agro-processing sector. The section should pay particular attention to the following dimensions: significance of candidate commodity, scale of enterprise, seasonality.

Part 2 is structured to examine the risk exposure of processors related to supply chain sourcing, processing and marketing functions. The questions were devised to understand the *nature, frequency and severity* of different risky events; to characterize the impacts; and to estimate the value of expected losses arising from the risky events. In this section the interviewer should probe using the main risk categories outlined in Annex 3.

Part 3 considers risk linkages with other (downstream and upstream) supply chain participants and brings into focus the transmission of different risks along the supply chain. The section provides the interviewer with an opportunity to identify the level of integration and established relationships within the supply chain, as well as processor perceptions on the risks, impacts, and expected losses faced by other supply chain participants.

Part 4 of the interview focuses on what is being done by processors to manage key risks (risk management strategies). This considers actions before a risk event is manifested (ex-ante/pro-active), as well as actions after the risk has been manifested (ex-post, reactive). The questions consider the costs (opportunity and real) effectiveness of actions taken by processors and actors including public, private commercial, banking and insurance organizations.

Part 5 of the interview concludes by identifying gaps and future opportunities to address risks, risk management and outstanding vulnerabilities.

In undertaking the interview it should be noted:

- The guidelines provide a series of leading questions and lines of inquiry, which are designed to provide an overall structure to the interview. It is not expected that the interviewer will strictly follow each line of inquiry.
- The interviewer should probe a number of risks which might be expected to impact processors most specifically (See Annex 3. This includes, for example, risks related to price, food safety, and transport.
- The findings from this interview should be documented and summarized in Illustrative Table 1 Annex 5.1.

Introduction: Profile

#	Question	Note: Issues to probe
1	Company Name	..
2	Contact Person & Title	..
3	Address and Geographic Location	
4	Contact Details	..
5	Year Established	..
6	Type of ownership	% by government, public, domestic individual/ company, foreign individual/company, general public
7	Previously a state enterprise	If yes, when privatized
8	Number of Employees	Permanent and temporary (seasonal)
9	Main operations and procurement/purchasing areas	..
10	Description of main assets	May be available from annual report

Part 1: Role in Supply Chain: What are you doing?

#	Lines of Inquiry	Note: Issues to Probe
11	Briefly describe the steps that you undertake in the processing of the supply chain commodity?	Form and steps involved in processing
12	Describe your overall production activities, and the relative importance of the supply chain commodity to your enterprise. How has this changed in recent years?	Mix of commodities. If processor is engaged in other sectors.
13.	Describe your processing trends in the last 5 years in relation to the supply chain commodity? What have been the main products and uses?	Processing production levels. Sales Revenues. Query for records. Check seasonal impacts.
14	Share of processed goods for local, domestic versus export markets?	Also check annual report
15.	How would you describe your position in the domestic market?	Dominant, major, important regional, relatively small
16	What are your key target markets/ market segments?	Differentiations of market segments according to different commodity qualities/standards.
17.	What are your crop/ raw material volume requirements?	Quantity per year, Time period (seasonality, continuous). Preferred/minimum lot size
18.	What types of quality specifications are required for traders and retailers?	Quality attributes (color, moisture, dirt), food safety. Environmental aspects
19.	Describe your system for coordinating input sourcing, production and sales? How much flexibility do you have in terms of selecting goods	E.g. produce, then sell; produce for specific orders; inventory for specific orders; produce for season /annual orders, real time matching.
20	How are purchasing prices set?	According to market, negotiated

Part 2: What can go wrong? How badly?

#	Lines of Inquiry	Note: Issues to Probe
21	What are the main sources of risk that you face? - Sourcing crops? - Processing? - Sales/Marketing of goods?	<i>Nature of risk</i> Probe against specific risk factors impacting processors e.g. price, transport, food quality, environment
20.	What are the direct negative impacts that potentially arise from these risks?	See Annex 3. e.g. E.g. direct impacts of environmental, food safety risks may be relevant.
21.	What are the three main sources of risk that most concern your business enterprise?	Ranking of potential problem areas
22	Of the risks identified what are their frequency?	Often/seldom, Seasonal, annual. Temporal impact
23.	How would you describe the potential severity of impact and expected losses arising from major risks?	Expected loss – minimal, low, medium, high, very high
24.	Overall, are underlying conditions in the supply chain, and your position in particular, deteriorating/ improving in recent years? Have you kept any records to track this?	Check for available records and request
Note:	<i>Interviewer may wish to probe specific risk aspects related to:</i> - Environmental risks, waste and effluent management - Food quality and plant health aspects	

Part 3: Relationship with other supply chain participants?

#	Lines of Inquiry	Note: Issues to Probe
25.	Do you have regular buying relationships? Do you purchase on a period spot price basis or set prices?	Procurement: Domestic (own farm, intermediaries), international
26.	Do you have regular selling relationships?	Marketing arrangements
27.	Have you provided any financial or technical support to farmers or other intermediaries to strengthen procurement?	Seed supply, input, credit provision, extensions, operations, sales, etc.
28.	Describe transport costs and availability of suitable transport connections?	Market access etc.
29.	What spillover effects do agro-processing problems have on the wider supply chain?	..

Part 4: Managing Problems and Capacity

#	Lines of Inquiry	Note: Issues to Probe
30.	What is being done to address problems in advance of a risky event? How long have these actions been in place?	Ex ante – insurance, warehousing receipts, early warning information
31.	What is done to address problems after a risky event?	Ex post strategies.
32.	Who has provided these interventions?	Agro processors, third parties
33.	How effective have interventions been? What actions have been most effective? Least effective? Why?	a) Ex-ante b) Ex-post
34.	What interventions have been supported by public sector ‘agents’ (including donors/ngos) to manage problems?	...
35.	Who are the main providers of the above interventions?	Government, NGO Extension services etc.
36.	How effective have public interventions been?	Timing, targeting, delivery aspects
37.	What has recent experience illustrated about processor capacity to withstand major deviations, disruptions, and disasters in the supply	Ability to manage on own versus need for ‘external partners’

	chain?	
38.	What information sources, if any, are used to assess the potential magnitude / severity of problems?	Early warning information, price tracking, local knowledge
39	How would you describe overall access to credit and insurance? What are the benefits/costs from credit and/or insurance?	Availability, affordability of credit and timely/"fair" payment of insurance

Part 5: What could be done in the future, and by whom?

#	<i>Lines of Inquiry</i>	Note: Issues to Probe
40.	What actions could be supported to manage processing related problems more effectively?	Opportunities and constraints
41.	What are the potential options for managing problems jointly with other supply chain entities?	..
42.	What roles might private and public sector actors play?	..

Annex 4.5 Trader Interview Guidelines

Introduction

The aims of the interview are to assess trader perceptions on the risks that they face in the supply chain and to examine how these could be managed most effectively. The interviews should aim to cover a representative mix of large, medium and small scale business entities.

The interview is divided into five sections:

Part 1 is structured to gather information on the specific role of the trader within the supply chain and to identify the relative importance of the supply chain to overall enterprise performance. The questions were devised to understand the significance of a given crop for traders. The section should pay particular attention to the following dimensions: significance of candidate commodity, scale of enterprise, seasonality.

Part 2 is structured to examine the risk exposure of traders related to supply chain sourcing, storage/handling and marketing functions. The questions were devised to understand the *nature, frequency and severity* of different risky events; to characterize the impacts; and to estimate the value of expected losses arising from the risky events. In this section the interviewer should probe using the main risk categories outlined in Annex 3.

Part 3 considers risk linkages with other (downstream and upstream) supply chain participants and brings into focus the transmission of different risks along the supply chain. The section provides the interviewer with an opportunity to identify the level of integration and established relationships within the supply chain, as well as trader perceptions on the risks, impacts, and expected losses faced by other supply chain participants.

Part 4 of the interview focuses on what is being done by traders to manage key risks (risk management strategies). This considers actions before a risk event is manifested (ex-ante/pro-active), as well as actions after the risk has been manifested (ex-post, reactive). The questions consider the costs (opportunity and real) effectiveness of actions taken by traders and actors including public, private commercial, banking and insurance organizations.

Part 5 of the interview concludes by identifying gaps and future opportunities to address risks, risk management and outstanding vulnerabilities.

In undertaking the interview it should be noted:

- The guidelines provide a series of leading questions and lines of inquiry, which are designed to provide an overall structure to the interview. It is not expected that the interviewer will strictly follow each line of inquiry.
- The interviewer should probe a number of risks which might be expected to impact traders most specifically (See Annex 3. This includes, for example, risks related to price, policy, and transport).
- The findings from this interview should be documented and summarized in Illustrative Annex 5.1.

Introduction: Profile

#	Question	Note: Issues to probe
1	Company Name	..
2	Contact Person & Title	..
3	Address and Geographic Location	
4	Contact Details	..
5	Year Established	..
6	Number of Employees	Permanent and temporary (seasonal)
7	Ownership Structure	Public, private
8	Link to international company	Subsidiary etc

Part 1: Role in Supply Chain: What are you doing?

#	Lines of Inquiry	Note: Issues to Probe
9	Briefly describe your trading functions and the significance of the crop to your commercial activities?	Mix of commodities, significance of supply chain commodity.
10	How would you describe you position in the domestic market?	Dominant, major, important regional, relatively small
11.	Describe your buying and trading trends in the last 5 years? How are patterns different now to when they were before?	Sales revenue records
12	Average annual sales turnover. Share of local sales versus export sales turnover?	Also check annual report
13	What is the significance of seasonal aspects to trading activities?	Seasonal variability in relation to supply chain
14	Where are your main operations, trading centers and markets?	..
15	What quality specifications are required?	Quality attributes (color, moisture, dirt), food safety. Environmental aspects
16	How are purchasing prices/selling prices and margins set.	According to market, negotiated
17	What is you storage capacity?	Adequacy of capacity.
18	What are your transportation requirements and arrangements?	Owned, rented.

Part 2: What can go wrong?

#	Lines of Inquiry	Note: Issues to Probe
19.	Are underlying conditions deteriorating in recent years? Have you kept any records to track this?	Check for records
20.	Describe the typical risks incurred in <ul style="list-style-type: none"> - Sourcing inputs? - Storage/Transportation? - Sales/Marketing of goods? 	<i>Nature of risk</i> Probe against specific risk factors impacting processors e.g. price, transport, food quality, environment
21.	What are the direct negative impacts that potentially arise from these risks?	See Annex 3. e.g. direct impacts of transport, policy risks may be relevant.
22.	What are the three main sources of risk that most concern your business enterprise?	Ranking of potential problem areas
23	Of the risks identified what are their frequency?	Often/seldom, Seasonal, annual.

		Temporal impact
24.	How would you describe the potential severity of impact and expected losses arising from major risks?	Expected loss – minimal, low, medium, high, very high
25.	Overall, are underlying conditions in the supply chain, and your position in particular, deteriorating/ improving in recent years? Have you kept any records to track this?	Check for available records and request. To what extent can this be attributed to certain risks.
Note:	<i>Interviewer may wish to probe specific risk aspects related to:</i> <ul style="list-style-type: none"> - Logistical constraints - Border controls - National restrictions/quotas on exports - Market access restrictions by destination countries - Need for/challenge of product traceability 	

Part 3: Relationship with other supply chain participants?

#	<i>Lines of Inquiry</i>	Note: Issues to Probe
26.	Do you have regular procurement relationships with processors?	Procurement: Domestic (own farm, intermediaries), international
27.	Do you have regularized sales relationships with retailers?	Marketing aspects?
28.	Describe transport costs and availability of suitable transport connections?	Market access etc.
29.	What spillover effects do trader problems have on the wider supply chain?	..
30.	To what extent are trading activities affected by government policy regulations	Restrictions on trade, physical goods, rice controls

Part 4: Managing Problems and Capacity

#	<i>Lines of Inquiry</i>	Note: Issues to Probe
31	What is being done to address problems in advance of a risky event? How long have these actions been in place?	Ex ante – interlinked contracts, insurance
32	What is done to address problems after a risky event?	Ex post strategies
33	Who typically provides these actions?	Traders, third parties
34	How effective have interventions been? What actions have been most effective? Least effective? Why?	..
35	What interventions have been supported by public agents to counteract processing problems, including donors/ NGOs	...
36	Who are the main providers of the above interventions?	Government, NGO Extension services etc.
37	How effective have public interventions been?	Timing, targeting, delivery aspects
38	What has recent experience illustrated about vulnerabilities and resilience to withstand major shocks? Minor disruptions?	Ability to manage on own versus need for 'external partners'
39	What information sources, if any, are used to assess the potential magnitude / severity of problems?	Early warning information, price tracking, local knowledge
40	How would you describe overall access to credit and insurance? What if any are the major barriers to credit access?	Availability, affordability of credit

Part 5: What could be done in the future, and by whom?

#	<i>Lines of Inquiry</i>	Note: Issues to Probe
41.	What actions could be supported to manage trading related problems more effectively?	Opportunities and constraints
42.	What are the perceived potential options for managing problems jointly with other supply chain entities?	..
43.	What roles might private and public sector actors play?	..

Annex 4.6 Domestic Wholesale & Retail Guidelines

Introduction

The aims of the interview are to assess domestic wholesalers and retailers on their perceptions on the risks that they face in the supply chain and to examine how these could be managed most effectively. The interviews should aim to cover a representative example of wholesale and retailers business entities who are engaged in the distribution of the focal commodity throughout the country.

The interview is divided into five sections:

Part 1 is structured to gather information on the specific role of the retailer within the supply chain and to identify the relative importance of the supply chain to overall enterprise performance. The questions were devised to understand the significance of a given crop for domestic retailers. The section should pay particular attention to the following dimensions: significance of candidate commodity, scale of enterprise, seasonality.

Part 2 is structured to examine the risk exposure of wholesale domestic retailers related to supply chain sourcing, storage/handling and marketing functions. The questions were devised to understand the *nature, frequency and severity* of different risky events; to characterize the impacts; and to estimate the value of expected losses arising from the risky events. In this section the interviewer should probe using the main risk categories outlined in Annex 3.

Part 3 considers risk linkages with other (downstream and upstream) supply chain participants and brings into focus the transmission of different risks along the supply chain. The section provides the interviewer with an opportunity to identify the level of integration and established relationships within the supply chain, as well as retailers perceptions on the risks, impacts, and expected losses faced by other supply chain participants.

Part 4 of the interview focuses on what is being done by wholesale domestic retailers to manage key risks (risk management strategies). This considers actions before a risk event is manifested (ex-ante/pro-active), as well as actions after the risk has been manifested (ex-post, reactive). The questions consider the costs (opportunity and real) effectiveness of actions taken by retailers and actors including public, private commercial, banking and insurance organizations.

Part 5 of the interview concludes by identifying gaps and future opportunities to address risks, risk management and outstanding vulnerabilities.

In undertaking the interview it should be noted:

- The guidelines provide a series of leading questions and lines of inquiry, which are designed to provide an overall structure to the interview. It is not expected that the interviewer will strictly follow each line of inquiry.
- The interviewer should probe a number of risks which might be expected to impact wholesale domestic retailers most specifically (See Annex 3. This includes, for example, risks related to price, policy, and transport.
- The findings from this interview should be documented and summarized in Illustrative Annex 5.1.

Introduction: Profile

#	Question	Note: Issues to probe
1	Company Name	..
2	Contact Person & Title	..
3	Address and Geographic Location	
4	Contact Details	..
5	Year Established	..
6	Number of Employees	Permanent and temporary (seasonal)

Part 1: Role in Supply Chain: What are you doing?

#	Lines of Inquiry	Note: Issues to Probe
7	Briefly describe your retail functions and the significance of the supply chain commodity to your commercial activities?	Mix of commodities handled, number of product lines ..
8	How would you describe your position in the domestic market?	Dominant, major, important regional, relatively small
9.	Describe retail trends in the last 5 years? How are retail patterns different now to when they were before?	Sales revenue records
10	Average annual sales turnover. Share of local sales versus export sales turnover?	Also check annual report
11	What is the impact of seasonal factors on retail activities?	Seasonal variability.
12	What quality specifications are required?	Quality attributes (color, moisture, dirt), food safety. Environmental aspects
13	How are purchasing prices set?	According to market, negotiated
14	How many trading centers and / or regional areas do you serve?	Spatial distribution, geographic aspects
15	What is the degree or policy regulation concerning trading, movement of physical goods?	Export restrictions, taxes, levels of inspection, restriction of movement
16	What are your storage capacity and transport arrangements?	..

Part 2: What can go wrong?

#	Lines of Inquiry	Note: Issues to Probe
17	Describe the typical risks incurred in Sourcing inputs? Storage/Transportation? Sales/Marketing of goods?	Nature of risk Probe against specific risk factors impacting processors e.g. price, transport, food quality, environment
18.	What are the direct negative impacts that potentially arise from these risks?	See Annex 3. e.g. direct impacts of transport, policy risks may be relevant.
19.	What are the three main sources of risk that most concern your business enterprise?	Ranking of potential problem areas
20	Of the risks identified what are their frequency?	Often/seldom, Seasonal, annual. Temporal impact
21.	How would you describe the potential severity of impact and expected losses arising from major risks?	Expected loss – minimal, low, medium, high, very high

22.	Overall, are underlying conditions in the supply chain, and your position in particular, deteriorating/ improving in recent years? Have you kept any records to track this?	Check for available records and request. To what extent can this be attributed to certain risks.
Note:	<i>Interviewer may wish to probe specific risk aspects related to:</i>	
	<ul style="list-style-type: none"> - Matters of licensing and inspection - Food safety and hygiene - Theft of inventory 	

Part 3: Relationship with other supply chain participants?

#	<i>Lines of Inquiry</i>	Note: Issues to Probe
23.	Do you have regular buying arrangements? Do you buy on a period spot price basis or set prices?	Procurement: Domestic (own farm, intermediaries), international
24.	Do you have regular sales relationships with retailers?	Marketing and Distribution
25.	Describe transport costs and availability of suitable transport connections?	Market access etc.
26.	What spillover effects do retailer problems have on the wider supply chain?	..

Part 4: Managing Problems and Capacity

#	<i>Lines of Inquiry</i>	Note: Issues to Probe
27	What is being done to address problems in advance of a risky event? How long have these actions been in place?	Ex ante – interlinked contracts, insurance
28	What is done to address problems after a risky event?	Ex post strategies
29	Who has typically provided these actions?	Retailers, third parties
30	How effective have interventions been? What actions have been most effective? Least effective? Why?	..
31	What interventions have been supported by public agents to counteract processing problems?	...
32	Who are the main providers of the above interventions?	Government, NGO Extension services etc.
33	How effective have public interventions been?	Timing, targeting, delivery aspects
34	What has recent experience illustrated about vulnerabilities and resilience to withstand major shocks? Minor disruptions?	Ability to manage on own versus need for ‘external partners’
35	What information sources, if any, are used to assess the potential magnitude / severity of problems?	Early warning information, price tracking, local knowledge
36	How would you describe overall access to credit and insurance? What if any are the major barriers to credit access?	Availability, affordability of credit

Part 5: What could be done in the future, and by whom?

#	<i>Lines of Inquiry</i>	Note: Issues to Probe
37.	What actions could be supported to manage distribution related problems more effectively?	Opportunities and constraints
38.	What are the perceived potential perceived options for managing problems jointly with other supply chain entities?	..
39.	What roles might private and public sector actors play?	..

Annex 4.7 Government Official Interview Guidelines

The aim of the questionnaire is to assess government official perceptions on the main types of risks affecting overall supply chain participants and supply chain stakeholders alike, and to examine the role of the public sector in improving risk management effectiveness. It should be noted that the interview guidelines are targeted to government officials who are not technical specialists yet have a broader ‘big picture’ perspective. These could be officials in export promotion agencies/ministry of trade/planning units of MOA; regional/local government officials.

The first part of the interview is structured to gather information on the significance of the supply chain in relation to national economic objectives and to examine the role of government as service providers. The questions examine the significance of the commodity as a source of production, employment and state revenue; and the role of government in providing direct and indirect support services to the supply chain.

The second part of the interview focuses on the idiosyncratic nature of risks for different supply chain participants and supply chain stakeholders; and the type of constraints facing public sector intermediaries in the process.

The final part of the interview focuses on what is being done within the public sector to manage key identified risks (risk management strategies). The role of the public sector and public sector intermediaries in the provision of ex ante and ex post risk management interventions is explored.

The final part of the interview concludes by identifying gaps and future opportunities to address risks and outstanding vulnerabilities.

In undertaking the interview it should be noted:

- The guidelines provide a series of leading questions and lines of inquiry, which are designed to provide an overall structure to the interview. It is not expected that the interviewer will strictly follow each line of inquiry, nor that the interviewees will be positioned to answer each line of inquiry.
- The interview guidelines could be adapted to target different government officials/ public entities including for example representatives from state crop boards, state enterprises, Ministries of Agriculture/Planning etc
- The interviewer may wish to focus on a number of risks related directly to the role and involvement of the public sector i.e. policy and institutional related risk (Refer to Annex 3.5)
- The findings from this interview should be documented and summarized in Illustrative Annex 5.2.

Introduction: Profile

#	Question	Note: Issues to probe
1	Name and title of official	..
2	Designation	E.g. Ministry of Agriculture, Crop Board
3	Province/District	..

Part I: National Significance of Supply Chain and Role of Government as Service Provider

#	Lines of Inquiry	Note: Issues to Probe
4	What is the significance of the commodity in relation to national economic objectives?	Poverty reduction, growth/employment, foreign exchange
5	What is the significance of the commodity in terms of state revenue, employment, regional development?	..
6	What is the nature of public sector presence in the sector?	State owned enterprises
7	What direct actions, if any, has the government adopted to promote supply chain performance?	E.g. Subsidies. Research Extension. Laboratories.
8	What indirect actions or 'enabling environment' factors impact upon supply chain performance?	E.g. price, trade controls, legal framework, roads, communications

Part 2: Perceptions of Risks, Expected Losses facing supply chain entities and the public sector

#	Question	Note: Issues to Probe
9	Broadly described, what are the main types of risk which impact on the overall performance of the supply chain?	Probe against key risks in Annex 3
10.	What are the key risks impacting at different stages of the supply chain? <ul style="list-style-type: none"> - input suppliers - farmers - processors - processors - traders and retailers 	Differentiation of risks across different supply chain entities
11	Does risk exposure vary across different regions, productive zones?	Regional prioritization
12.	What are the three main risks that are prioritized from the public perspective?	Ranking of potential problem areas
13.	What are the main direct impacts and expected losses that are of concern occurring to supply chain participants from public perspective?	<i>Expected losses e.g.</i> effects on input demand, production, trading relationships
14	What are the main spillover impacts of concern to public sector stakeholders and supply chain service providers	Expected losses e.g. food safety issues, labor shortages , financial defaults
15.	Are underlying conditions deteriorating/ improving in recent years? To what extent can this be attributed to changing risk factors?	Check for recorded information e.g. price, rainfall, logistic trends.

Part 3: Risk Management Priorities and Approaches

#	Question	Note: Issues to Probe
14	What is being done within the public sector to address key risks before they occur? How long have these actions been provided?	Ex ante : extension services, insurance, policy assistance
15.	What is done within the public sector to address problems after a risky events?	Ex post strategies - short term policy measures, transfers
16.	How effective have actions been? What actions have been most effective? Least effective? Why?	Timing, targeting, delivery aspects..
17.	What, if any, lessons have come from experience in providing extension services?	..
18.	What risk management alternatives are under consideration, if any e.g. financial instrument support, technology development, organization and institutional arrangements.	..
19.	How would you describe overall access to credit and insurance? What are the major constraints of concern to the public sector?	Availability, afford ability
20.	How would you describe overall access to insurance? What if any are the major barriers?	Types of insurance, providers

Part 4: Response Recommendations

#	Question	Note: Issues to Probe
21.	What options could be supported by the public sector to enhance supply chain performance and manage risks more effectively?	..
22.	What are constraints in considering risk management instruments?	
23.	What are the potential options for managing problems jointly with different supply chain entities?	..
24.	What roles might private sector actors play?	..

Annex 4.8 Technical Specialist Interview Guidelines

The aim of the interview is to gauge technical specialist perceptions on specific risks affecting overall supply chain performance and to examine how these could be managed most effectively.

Technical specialists may include individuals from specialized government agencies (i.e. plant health, food safety environment protection), as well as other experts with knowledge of key risk factors e.g. meteorologists, insurance specialists etc.

The following guidelines offer broad lines of inquiry to structure any interviews with technical specialists. These will have to be tailored by the assessment team to fit with the specific topical area.

The first part of the interview is structured to gather information on the nature, frequency and severity related to the particular risk.

The second part of the interview focuses on risk management practices and strategies related to the particular risk.

The final part of the interview concludes by identifying gaps and future opportunities to address risks and outstanding vulnerabilities.

In undertaking the interview it should be noted:

- The guidelines provide a series of leading questions and lines of inquiry, which are designed to provide an overall structure to the interview. It is not expected that the interviewer will strictly follow each line of inquiry.
- The guidelines have been drafted to minimize confusion in terminology. However the team should be familiar with the conceptual paper and framework, to ensure key areas are effectively probed.
- Annex 3 outlines a number of risk identification and characterization templates, which may help to inform the interview.
- The findings from this interview should be documented and summarized in Illustrative Appendix 5.2.

Introduction: Profile

#	Question
1	Company Name
2	Name(s) and Title(s) of interviewee
3	Address and Geographic Location
4	Contact Details

Part I: Nature/Incidence and Severity of Particular Problems?

#	Lines of Inquiry
5	What are the pertinent problems facing different supply chain players in this commodity?
6	Which supply chain players are most affected e.g. input suppliers, farmers, processors, firms, traders, retailers?
7	How widespread are the identified risks??
8	What is the level/pattern/frequency of incidence?
9	What players in the supply chain are most affected?
10	What are the implications/damages due to this problem---i.e. affect on yields, on tree crop longevity; on quality; on nearby resources/communities; on market access/trade; on consumers?
11	What indicators/data are available to quantify the extent of the problem or its adverse impact?
12	What evidence that these problems are more/less prevalent; more/less difficult to manage?

Part II: Managing Problems and Risks

#	Lines of Inquiry
13	What measures are commonly taken by farmers/firms/other supply chain players to reduce the risks associated with these problems? To otherwise mitigate their impact? Cope with the impacts?
14	What is the evidence of the effectiveness of these measures?
15	Do farmers/firms act independently, or do they draw upon support services from the private sector and/or government. Describe the nature of these services?
16	What measures/programs/policies/regulations does government deploy to address these problems?
17	What institutions are involved? What levels of resources are dedicated to this?
18	What capacities are evident to implement these measures/enforce the policies?
19	What are pertinent externally financed programs in this area?
20	What are the available indicators/data/other evidence on the effectiveness and/or limitations of these interventions?
21	What lessons can be learned from the implementation of on-going programs/policies?
22	What are examples of effective public-private collaboration in managing identified risks?
23	What is the role of technology and technical innovation in addressing risks?

Part III: Gaps/Opportunities/Future

#	Question
23	Taking the private and government measures combined, what gaps remain in terms of managing identified risks?
24	What are new and emerging issues or issues that will likely pose challenges to this industry in the upcoming years?
25	What opportunities are there to better manage existing risks or to address the emerging issues?
26	What would be priority next steps (in relation to legal/regulatory reform; capacity building, etc.)

Annex 4.9 *Financial Institutions*

The aim of the interview is to assess finance intermediary perceptions on credit risks throughout the supply chain, spillover risks affecting lenders and measures to improve risk management services within finance institutions.

Part 1 of the interview is structured to gather information on the significance of the supply chain to the financial sector and the nature of credit lending allocated to the supply chain.

Part 2 of the interview addresses the significance of credit lending to different supply chain entities. Part 2 of the interview also addresses finance intermediary perceptions on the main risks that impact upon supply chain participants and supply chain service providers.

Part 3 of interview is structured to understand credit risk management practices and strategies adopted by institutions working in the sector, including credit risk evaluation approaches and different financial instruments to ameliorate supply chain risks.

The final part of the interview concludes by identifying gaps and future opportunities to address risks and outstanding vulnerabilities.

In undertaking the interview it should be noted:

- The guidelines provide a series of leading questions and lines of inquiry, which are designed to provide an overall structure to the interview. It is not expected that the interviewer will strictly follow each line of inquiry.
- The findings from this interview should be documented and summarized in Illustrative Appendix 5.2.

Introduction: Profile

#	Question	Note: Issues to probe
1	Name of Institution and Contact Information	..
2	Name(s) of person participating in interview	..
3	Year of incorporation	
4	Type of institution? Regulated or Unregulated?	<i>Regulated:</i> Finance cooperative Commercial or bank government, <i>Unregulated:</i> NGO, financial cooperative, community bank.
5	Size of agricultural portfolio	Total portfolio, gross non-performing loans (%) borrowers
6	Number of branches	..
7	Number of employees	..

Part I: Significance of Supply Chain and Role as Supply Chain Service Provider

#	Lines of Inquiry	Note: Issues to Probe
8	What is the size of lending to the commodity / supply chain sector.	Share of commodity sector lending % of agricultural lending
9	What have been the trends in lending to the sector over the last five years?	Check for financial records
10	What are the main types of loans to the sector?	Short term, long term, collateral
11	What is the approximate share of lending allocated across different supply chain entities? Are their explicit norms followed in this regard e.g. types of clients	% Breakdown for input supplies, farmers, processors, processors, , traders and retailers
12	What are the general lending purposes?	Crop production, farm equipment, agribusiness warehouse receipt financing, loans against forward contract, factoring

Part 2: Perceptions of Risks, Expected Losses facing supply chain entities and financial intermediaries

#		Note: Issues to Probe
13.	What are the key risks impacting at different stages of the supply chain? - input suppliers - farmers - processors - processors - traders and retailers	Differentiation of risks across different supply chain entities
14	Does risk exposure vary across different regions, productive zones?	Regional prioritization
15	Broadly described, what are the main types of risk impacts which affect the supply chain?	<i>Expected losses e.g.</i> effects on input demand, production, trading relationships
16	What are the main spillover impacts of concern to financial intermediaries	Financial defaults, declining loan demands, uncertainty etc.
17	Are underlying conditions deteriorating/ improving in recent years? To what extent can this be attributed to changing risk factors?	Check for recorded information e.g. price, rainfall, logistic trends.

Part 3: Managing Problems and Capacity

#	Question	Note: Issues to Probe
18.	What are the typical lending requirements?	Minimum property size, mortgage of land, house, assets; loan payment agreement, borrower has life/health insurance, borrower has asset/crop insurance
19.	What type of limits are imposed on lending	Limits to agricultural sector concentration, geographical concentration, ban on financing specific activities
20.	What other policies/practices are supported by the institution to manage risk?	Facilitation of crop/weather insurance, price hedging, specialized risk ratings, lending in kind, provision/facilitation of technical advice
21.	What if any risk transfer tools are in use?	Use of credit derivatives, securitization
22.	How effective have actions been? What actions have been most effective? Least effective? Why?	..
23.	What risk management alternatives are under consideration?	..

Part 4: Response Recommendations

#	Question	Note: Issues to Probe
24.	What have been the major lessons learned in previous risk management activities	
25.	What options could be supported to enhance supply chain performance and manage credit risks more effectively?	..
26.	What are the major constraints in considering financial risk management instruments?	
27.	What are the potential options for managing problems jointly with different supply chain entities?	..

Annex 4.10 *Farmer Organizations*

The aim of the interview is to assess farm organization officials on their perceptions of the main types of risks affecting small farmers within the supply chain performance, to assess risks facing farmer organizations directly and to examine how these could be managed most effectively.

Part 1 of the interview is structured to gather broad information on the role of the farmer organization as a service provider within the supply chain and to elicit further information on representative farmers.

Part 2 of the interview focuses on the idiosyncratic nature of risks for different supply chain participants and supply chain stakeholders; and the type of constraints facing public sector intermediaries in the process.

Part 3 of the interview focuses on what is being done by farmers and farmer organizations alike to manage key identified risks (risk management strategies). Perceptions related the role of public and private agents are explored in relation to the provision of ex ante and ex post risk management interventions is explored.

The final part of the interview concludes by identifying gaps and future opportunities to address risks and outstanding vulnerabilities.

In undertaking the interview it should be noted:

- The guidelines provide a series of leading questions and lines of inquiry, which are designed to provide an overall structure to the interview. It is not expected that the interviewer will strictly follow each line of inquiry.
- The interviewer should probe a number of risks which might be expected to impact more at farm level (See Appendix 3). This includes risks related to price, weather, labor and environmental quality.
- The guidelines have been drafted to minimize confusion in terminology. However the team should be familiar with the conceptual paper and framework, to ensure key areas are effectively probed.
- The findings from this interview should be documented and summarized in Illustrative Appendix 5.2.

Introduction: Profile

#	Question	Note: Issues to probe
1	Name and title of official	..
2	Name of Organizations	
3	Number of Members	
4	Number of Branches	
5	Province(s)/District(s)	..
6	History of Organization	Year established, stability.

Part I: Relationship to Supply Chain

#	<i>Lines of enquiry</i>	<i>Note: Issues to Probe</i>
7	Briefly describe the role of the organization and the type of activities which are supported?	Year Established Overview of Services: Extension, technical assistance, lending support
8	Role in input procurement? Inputs procured, sourced from?	Input types and sources
9	Role in commodity selling/trading?	Contract arrangements and relationships
10	Describe the breakdown of membership in your organization. What is the national representativeness of the organization?	..
11	What is the share of small holder farmers in the production system? What is the spatial distribution?	..
12	What are the incentives for smallholders in producing the commodity? What are the alternatives?	Investment return v. risk mitigation Substitute, complementary goods

Part 2: Perceptions of Risks, Expected Losses facing farming entities and the farmer organization

#	Question	Note: Issues to Probe
13	Broadly described, what are the main types of risk which impact on the overall performance of farmers? - smallholder - medium sized - agro industrial type enterprises	<i>Nature of risk</i> Probe against specific risk factors impacting on farm level e.g.: weather, price, environment, labor standards
14.	Describe the typical risks incurred in - Sourcing inputs? - Production? - Sales/Marketing of goods?	<i>Frequency of risk</i> – seasonal, annual etc.
15	Are underlying conditions deteriorating/ improving in recent years? Have you kept any records to track this?	Check for any records on rainfall, yields etc.
16	How are risks transmitted across different regions, productive zones?	Spatial distribution/ Regional aspects
17	What are the three main risks that are perceived from the farmer organization's perspective?	
18	What are the direct impacts that might be expected / of concern from farmers perspective?	<i>Expected losses</i> i.e. effects on input demand, production, trading relationships
19	What if any risks are faced by the farmer organization in supporting the commodity chain?	Review as per line of inquiry above.

Part 3: Managing Problems and Capacity

#	<i>Lines of enquiry</i>	Note: Issues to Probe
20	What is being done by the farming organization to address problems in advance of a risky event? How long have these actions been provided?	Ex ante – Enterprise/ livelihood, crop diversification
21	What is done by the farming organization to address problems after a risky event?	Ex post strategies -
22	To what extent have actions joint actions been undertaken with government or private sector entities? Describe?	Recent patterns. Public sector v. market based actions. Type of instruments
23	What separate actions are being undertaken by other actors?	Self interventions, government officials, formal v. informal actions
24.	How effective have these interventions been? What have been the main lessons?	Timing, targeting, delivery aspects
25	What has recent experience illustrated about small farmer's capacity to withstand major shocks? Minor disruptions?	Ability to withstand shocks versus need for 'external' partners
26	What information sources, if any, are used to assess the potential magnitude / severity of problems?	Early warning information, price tracking, local knowledge
27	How would you describe overall access to credit? What if any are the major barriers to credit access?	Availability, affordability of credit
28	How would you describe overall access to insurance? What if any are the major barriers?	Types of insurance, providers

Part 4: Response Recommendations

#	Question	Note: Issues to Probe
29.	What key lessons have been learned by the organization related to risk and risk management?	
30.	What options could be supported to enhance supply chain performance and manage risks more effectively?	..
31.	What are constraints in considering risk management instruments?	
32.	What are the potential options for managing problems jointly with different supply chain entities?	..
33.	What roles might private sector actors play?	..

Annex 4.11 Transporters Interview Guidelines

The aim of the questionnaire is to assess transporter perceptions on the potential problems arising from transport related risks across the supply chain and to examine how these could be managed most effectively. The interviews should aim to cover a range of representative transport providers including: logistics managers, truckers, shipping companies, rail company's, air and sea freight providers.

The first part of the interview is structured to gather information on the *nature, frequency and severity* of transport related risks facing participants at different stages of the supply chain, as well as affecting transporters directly.

The second part of the interview focuses on what is being done to manage key transport risks (risk management strategies). This considers actions before a risk event (*ex-ante/pro-active*), as well as any actions after the transport risks manifest (*ex-post, reactive*).

The final part of the interview concludes by identifying gaps and future opportunities to address risks and outstanding vulnerabilities.

In undertaking the interview it should be noted:

- The guidelines provide a series of leading questions and lines of inquiry, which are designed to provide an overall structure to the interview. It is not expected that the interviewer will strictly follow each line of inquiry.
- The interview focuses on transport related risk only, and provides an opportunity to elaborate on the information requirements and indicators outlined in Annex 3.4.
- The findings from this interview should be documented and summarized in Illustrative Table 1, Annex 5.2.

Introduction: Profile

#	Question	Note: Issues to probe
1.	Name of Company	..
2.	Contact Details	..
3.	Province/District	..
4.	Type of Operation	Air, sea, rail, road.
5.	Type of Ownership	..
6.	Year Established	..
7.	Size, Composition and Capacities of Fleet	E.g. Refrigerated lorries
8.	Employees	Permanent, temporary, nature of work

Part I: Role in Supply Chain: What are you doing?

#	Question	Note: Issues to Probe
9.	What is your main area of business and nature of services provided.	Products carried/ancillary services offered e.g. insurance Local, Long-haul, cross border, international transportation.
10	How would you describe your position in the market?	Dominant, major, important regional, relatively small
11	What is your operational / geographic area of transport coverage?	Spatial elements, relevant for ground transporters
12	What is the annual volume of freight carried?	Number of containers (by shipment) or TN-km (if available by trucker), otherwise gross tonnage, number of trips and average length
13	How do seasonal factors affect the level of operations and kinds of transport services required?	...
14	Have business objectives changed or been substantially modified in recent years? Why?	...
15	Are you a member of any regional, national or international associations, transport/transit conventions?	..

Transport Trends: What can go wrong for supply chain participants and transporters ? How badly?

#	Question	Note: Issues to Probe
16.	How do transport problems affect different actors in the supply chain? For which participants are transport problems most serious <ul style="list-style-type: none"> - input suppliers - buyers - farmers - processors - retailers - traders 	Nature and frequency of different transport related risks Probe different aspects highlighted in Annex 3.4 e.g. Delayed deliveries; service interruptions, logistics and energy costs, Inspections, strikes, sabotage, pilferage, capital restrictions
17.	Which actors have formalized arrangements with transporters? What is the nature of these arrangements?	..
18	What specific risks face transporters? Describe the impact and expected losses of the following aspects:	Service interruptions, energy costs, shrinkage, and regulatory

	<ul style="list-style-type: none"> - Customs controls - Physical movement controls - documentations - Formal and informal border checks - Competition in freight industry 	environment.
19	What types of problems have the greatest impact?	Ranking of Risks
20	Describe the temporal impact arising from the constraints mentioned above?	Short term v. long term, acute v. chronic; Seasonal, annual and longer term aspects
21	Are underlying conditions in the near future expected to be better, worse, the same?	..

Part II: Managing Problems and Capacity

#	Question	Note: Issues to Probe
22	What is being done by transporters to address operational constraints? How long have interventions been provided?	..
23	How effective have interventions been? What actions have been most effective? Least effective? Why?	..
24	What interventions have been supported by public agents and supply chain participants to counteract transport problems?	..
25	How effective have public interventions been?	Timing, targeting, delivery aspects
26	What has recent experience illustrated about vulnerabilities and resilience to withstand major shocks? Minor disruptions?	..
27	What information sources, if any, are used to assess the potential magnitude / severity of problems?	Early warning information, price tracking, local knowledge
28	How would you describe overall access to credit and insurance? What, if any, are the major barriers to credit access?	Availability, affordability

Part III: Response Recommendations

#	Question	Note: Issues to Probe
29.	What options could be supported to manage transport problems more effectively?	..
30.	What are the potential options for managing problems jointly with other supply chain entities?	..
31.	What roles might private and public sector actors play?	..

Annex 5 Report Templates and Sample Illustrations

Annex 5 sets out a number of report templates and illustrative tables to highlight the assessment information.

Annex 5.1 outlines a report template for interviews conducted with supply chain participants. Assessment teams should complete these summary tables, which serves a useful purpose in documenting analysis, making findings transparent. .

Annex 5.2 sets out a number of illustrations to graphically visualize risk according to supply chain entities. These tables are also further explained in the concept paper.

Annex 5.3 sets out report templates and illustrations to explain supply chain exposure as a whole to individual risks.

Annex 5.1 Summary Template for Direct Supply Chain Entities

Section 1: Profile and Summary Information			
Type of Supply Chain Entity			
Names /Title Interviewee(s)			
Key Supply Chain Functions	Sourcing:	Producing/ Processing:	Selling:
Location/ Contact Details			
Enterprise Description (size, market position, private)			
Geographic Spread / Aspects (Key markets, productive areas)			
Domestic / Export Markets			
Summary of Available Financial Info. / Records			

Section 2: Ranking of Expected Losses						
<i>Note: Plot identified risk events according to probability and potential severity of impact.</i>						
	Potential Severity of Impact					
Probability of Event		Negligible	Moderate	Considerable	Critical	Catastrophic
	Highly Probable					
	Probable					
	Occasional					
	Remote					
	Improbable					

Top Right (Priority 1) = High Expected Loss, Middle (Priority 2) = Medium Expected Loss Lower Left (Priority 3) = Low Expected Loss

Section 3: Risk Management Instruments								
<i>Risk Management Mechanisms</i>	<u>Risk 1</u>		<u>Risk 2</u>		<u>Risk 3</u>		<u>Risk 4</u>	
	(insert risk)		(insert risk)		(insert risk)		(insert risk)	
<i>Key Risk Events¹</i>	Ex Ante	Ex Post	Ex Ante	Ex Post	Ex Ante	Ex Post	Ex Ante	Ex Post
	<i>Tick to indicate presence (✓) or absence (x) of risk management mechanisms against each risk</i>							
Infrastructure								
Technology								
Management Practices								
Financial Instruments								
Relationships/ Organizations								
Policy/ Public Programs								
Additional Comments on Risk Management Instruments								
Section : Risk Management Capacity								
	<i>Scale: 1 – 5²</i>			<i>Comments</i>				
Ex-ante Risk Management Capacity	Risk 1							
	Risk 2							
	Risk 3							
	Risk 4							
Ex-Post Risk Management Capacity	Risk 1							
	Risk 2							
	Risk 3							
	Risk 4							
Additional Comments								

¹ Plot key risk events according to prioritization in section 2 (high/medium expected losses)

² Capacity Scale 1-5: (1) = Partially effective yet approaches are likely to be costly, unsustainable. (3) = effective yet mixed pattern of affordability/sustainability, (5) = very effective and high likelihood of sustainability (See concept paper)

Section 5: Vulnerability Rating²

Note: Plot identified risk events according to expected losses and capacity to manage risk.

	Capacity to Manage Risk³				
Expected Losses	1	2	3	4	5
High					
Medium					
Low					

² *Vulnerability Scale: Extremely Vulnerable (EV), Highly Vulnerable (HV), Moderate Vulnerability (MV), Low Vulnerability (LV), Limited Vulnerability (LTD). (See concept paper)*

Section 6: Lessons and Recommendations

Key Lessons Learned (List three)	
Recommended Future Actions (list three)	
Follow Up Actions Required	

Annex 5.2 Summary Templates for Supply Chain Service Providers

Section 1: Risk Identification	
Main risk events facing clients of service provider	
Direct and indirect risks facing service providers in relation to supply chain activities	
Section 2 : Risk Management and Vulnerabilities	
Ex ante and ex post risk management instruments employed by supply chain service provider to manage the above risk events?	
Types of risk management instruments available (investment, financial instruments, technology, policy/public programs, relationships/organizations etc)	
Perceived areas of vulnerability	
Perceived effectiveness and sustainability of risk management measures (by entity or third parties)	
Section 3:	
Key Lessons Learned	
Recommended Future Actions	
Follow Up Actions Required	

Annex 5.3 Template for Total Supply Chain Losses to Individual Risk Event

**Illustration: Participant Feedback Pertaining to One Risk:
Low Rainfall during Crop Germination**

Subject	Very Low	Low	Medium-Average	High	Very High
<i>Characterization of the Risk</i>					
Probability of Risky Event					Producers Input Supplier Processor
Severity of Impact	Processor	Input Supplier	Producer		
Expected Loss	Processor	Input Supplier		Producer	
Spread of Impacts	Processor	Producer Input Supplier			
<i>Risk Management Capacity</i>					
Ex-ante Risk Reduction	Processor	Input Supplier	Producer		
Ex-ante Risk Mitigation	Processor			Input Supplier	Processor
Ex-post Risk Coping		Producer	Input Supplier		Processor
Combined Ex-ante and ex-post		Producer	Input Supplier		Processor
<i>Vulnerability to Risk</i>					
Inability to Fulfill Supply Chain Objectives		Processor		Producer	
Inability to Fulfill Contracts with Support Service Providers/Receivers	Processor				Producer Input Supplier
Inability to Continue Farm/Firm Enterprise	Processor	Producer	Input Supplier		

Annex 5.4 Risk Profile Illustrations for Individual Supply Chain Entities

Illustration: mapping of risks and vulnerability for one supply chain participant:
Farmer/ Primary Producer

Table 1: Ranking of Expected Losses: “Separating the High from the Low”

Probability of Event	Potential Severity of Impact					
	Negligible	Moderate	Considerable	Critical	Catastrophic	
Highly Probable				Transport Logistics	Low Rainfall	
Probable				Input Deliveries		
Occasional			Plan disease, price fluctuations			
Remote		Food Safety				
Improbable	Labor Unrest					

Top Right (Priority 1) = High Expected Loss, Middle (Priority 2) = Medium Expected Loss, Lower Left (Priority 3) = Low Expected Loss

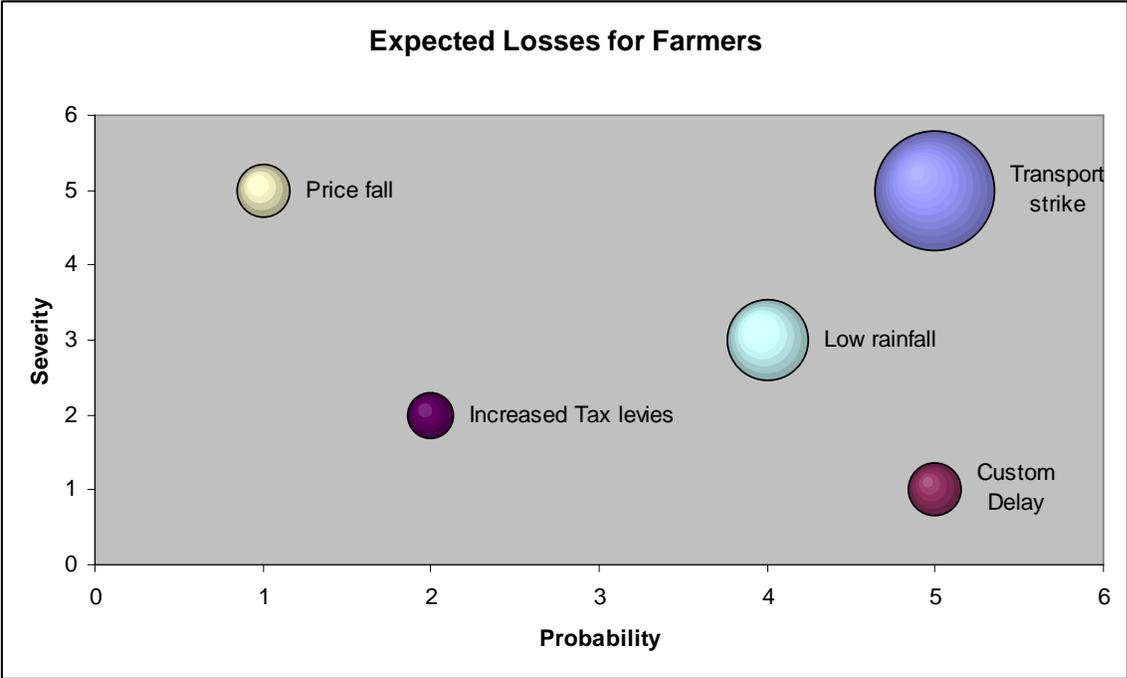
Table 2: Ranking Vulnerability – Expected Losses and Capacity to Manage Risk

Expected Losses	Capacity to Manage Risk				
	1	2	3	4	5
High	<i>Input Deliveries</i>	<i>Low Rainfall</i>			
Medium	<i>Transport</i>	<i>Plant Diseases</i>	<i>Price Fluctuations</i>		
Low		<i>Food Safety</i>			Labor Unrest

+ Capacity 1 - Partially effective yet approaches are likely to be costly, unsustainable, 3 - Effective yet mixed pattern of affordability/sustainability, 5 - Very effective and high likelihood of sustainability

Vulnerability Scale	Code	Key Characteristics
Extremely Vulnerable		High expected loss, low capacity
Highly Vulnerable		Medium-High expected loss, low-medium capacity
Moderate Vulnerability		Medium expected loss, low-medium capacity
Low Vulnerability		Low –medium expected loss, medium-high capacity

Figure 1: Graphical Illustrations on Expected Losses by Entity



Note: (1 – low, 5 – high) Size of bubble indicate magnitude of expected loss.

Annex 5.5 Risk Profile Illustrations for Collective Supply Chain

Table 1: Ranking of Expected Losses for an Individual Risk Event - E.g. Low Rainfall

Probability of Event	Potential Severity of Impact				
	Negligible	Marginal	Serious	Critical	Catastrophic
Highly Probable				Processors	Farmers
Probable				Input Deliveries	Finance Organizations
Occasional			Traders	Transporters	
Remote		Retailers			
Improbable					

Top Right (Priority 1) = High Expected Loss, Middle (Priority 2) = Medium Expected Loss, Lower Left (Priority 3) = Low Expected Loss

Table 2: Ranking Vulnerability – Expected Losses and Capacity to Manage Risk E.g. Low Rainfall

Expected Losses	Capacity to Manage Risk				
	1	2	3	4	5
High	Farmers		Finance Organizations Input Suppliers	Processors	
Medium			Transporters	Traders	
Low				Retailers	

+ Capacity 1 - Partially effective yet approaches are likely to be costly, unsustainable, 3 - Effective yet mixed pattern of affordability/sustainability, 5 - Very effective and high likelihood of sustainability

Vulnerability Scale	Code	Key Characteristics
Extremely Vulnerable		High expected loss, low capacity
Highly Vulnerable		Medium-High expected loss, low-medium capacity
Moderate Vulnerability		Medium expected loss, low-medium capacity
Low Vulnerability		Low –medium expected loss, medium-high capacity

Annex 6 Final Report Template

1. Introduction (1 Page)

This section should provide a brief description of the aims and objectives of the RapAgRisk and its main components including an indication on priority risks and recommended actions for the candidate commodity.

As part of the introduction key audiences should be recognized and the potential utility of the assessment flagged for different end users including (i) policy makers (ii) supply chain participants and (iii) donors/technical agencies/NGO's.

2. Background (6 pages, not including illustrations)

This section sets out the key information elicited through the supply chain situation analysis. It outlines the supply chain context and may also draw comparative distinctions to other related commodities.

The analysis the following five themes incorporated in Annex 2.1:

- Role and Significance of Focal Industry in the economy and rural sector
- Demand & Market Context
- Structural Patterns, Relationships and Spatial Distributions
- Government / Policies / Institutions
- Recent Performance and Costs Structures

In the analysis particular emphasis may be given to one or more of the above themes depending on local context. In particular the text should capture historical trends and recent variations within the supply chain sector. The degree to which the supply chain is affected by seasonal factors would also be an important consideration. The overall structure, changing roles and relationships among supply chain participants should be set out. In this context, recent market liberalization and public sector approaches may be relevant. Attention should also focus on the supply chains spatial dimensions, addressing important agro ecological distinctions or zones where particular economies of scale are evident. Emphasis should be placed on documenting observed supply chain performances, since this may be driven by underlying risk exposures.

To elaborate on the supply chain contextual analysis some Illustrations of the supply chain should be included (see Annex 2.3 for examples). This should include a flow chart representing the structure of the supply chain (example 1), as well as a spatial representation of important agro-ecological zones of production (examples 5-6).

Data should be presented on the following aspects of information, preferably in tabular format.

- Total value and volume of production of commodity in last five years.
- Proportion of commodity exported and consumed domestically in last five years (rural versus urban markets).
- Supply chain representative cost structure

3. Risk Identification and Impact (6 pages not including illustrations)

This section should provide an overview of the key risk events that impact upon supply chain performance, and a breakdown of the different risk exposures facing supply chain participants. At the outset of the analysis a synopsis should be made of priority risk areas which have been identified and which call for further analysis, investment or capacity building interventions.

The section should review the relevance of key risk categories to the supply chain's performance across all categories of analyzed risk i.e.

- Weather
- Price
- Food Safety and Plant Health
- Logistics and Infrastructure
- Policy
- Labor
- Environment

Within this section it will be important to document what risks affect individual supply chain entities and what risks are more cross cutting i.e. idiosyncratic versus covariate nature of risks. Information can be mapped and compared with an illustrative table charting expected losses and priorities (See Annex 5.2). Information extracted from individual interviews may also be included or added to an annex (See Annex 5.1). This section should also review the perceptions of supply chain service providers on key prioritized risks, and any risk exposure that they might face as a result of supply chain activities i.e. government officials, finance intermediaries, transporters, farmer organizations (See Annex 4.7-4.11)

The analysis should then move on to document priority risks that have the potential to disrupt overall supply chain performance. A detailed description of no more than three priority risks should be included. This should identify spatial and seasonal risk dimensions, direct and indirect risk impacts (in sourcing, production, selling), details on risk transmissions, key relationships throughout the supply chain. Tabular information may be presented for key data extracted for each risk, as overviewed in Annex 3. The key risks affecting overall supply chain performance should be documented with an illustrative table charting expected losses and priorities (See Annex 5.4).

Based on the above analysis the section could elaborate on a number of discussion points, including:

- Evident poverty dimensions arising from supply chain risk events.
- Perceptions of risk among different supply chain participants
- Impact of geographic factors and seasonal dimensions
- Service provider perspectives, impact of changing service provider dynamics.

3. Risk Management Practices, Capacity and Options (8 pages not including illustrations)

This section outlines risk management practices and capacity in the supply chain, taking into account the effectiveness, efficiency and sustainability of existing interventions among direct supply chain participants, service providers and third parties.

An overview of supply chain capacity should be provided which outlines ex ante and ex post risk management capacity in the following categories:

- Infrastructure
- Technology
- Management Practices
- Financial Instruments

- Relationships and Organizations
- Policy and Public Programs

Summary table information may also be included based on interview report templates (Annex 5.1).

A discussion on the quality of risk management strategies in place and previously applied should be included, which explains the capacity ratings applied in field exercises (1-5). This should include a discussion on the different elements of capacity including: availability, access, timing, affordability, responsibility, knowledge, effectiveness and sustainability (see concept paper).

The analysis should then examine risk management options that are relevant to the supply chain, and which have also been identified throughout consultations. This should include a discussion on the potential benefits, costs and necessary conditions for the introduction of new risk management options.

4. Vulnerability Analysis (5 pages not including illustrations)

The vulnerability analysis brings together much of the previous discussion to identify clear gaps in the prevailing approach(es) to risk management and/or circumstances where prevailing practices are unlikely to be sufficient given the potential severity of loss.

A compilation table summarizing the vulnerability of the supply chain and particular supply chain entities should be provided (See Annex 5). This should be accompanied by narrative text with a breakdown of the analysis, overview on regional perspectives and future forecasts.

Based on this analysis some observations should be made on pertinent capacity gaps, trends and lessons learned for the future. The narrative text should focus particularly on the risks identified in Sections 2 and 3 above. The text should also include the perceptions of supply chain service providers, particularly government and private sector (insurance, financial intermediaries). Some detailed discussion (or text boxes) may be included on instruments or approaches that are being considered by supply chain stakeholders, which may also inform the recommendations of the supply chain assessment.

5. Conclusions and Recommendations (3 pages maximum)

The final section concludes with a summary of the key findings and a clear set of recommendations that address future vulnerabilities to risk events. Final recommendations should cover the following aspects:

- Primary attention should be given to possible ex-ante measures to reduce, mitigate or share risks.
- Attention should be given to both formal and informal risk management options available to the different parties, although in practice, most analytical attention will likely focus on the scope for improving or supplementing formal mechanisms, including institutional and financial arrangements, technological changes, adoption of improved management practices, and/or investments in infrastructure.
- Primary attention should ordinarily be devoted to addressing areas categorized as ‘high vulnerability’, either for individual chain participants or the chain as a whole. Particular mention on the poverty aspects of the supply chain should be considered.
- The relative attention between improving upon existing approaches/instruments and laying the basis for the introduction of new approaches/instruments should be explored. Providing options and recommendations for strengthening existing arrangements would be essential. Considerations of alternative (and especially new) approaches/instruments should be detailed.
- Specific sets of messages should be conveyed for (i) policy makers (ii) supply chain participants and (iii) donors/technical agencies/NGO’s.

Annex 7 Assessment Planning Matrix

<i>Component</i>		<i>Activities</i>	<i>Tasks</i>	<i>Timing</i>	<i>Supporting Annexes</i>	<i>Lead</i>	<i>Output</i>
1	Supply Chain Situation Analysis	Pre Field Assessment	Baseline data preparation	2 – 3 in advance	Annex 1	Local consultant	Baseline data preparation
			Initial supply chain spatial & sectoral mapping	2 – 4 weeks in advance	Annex 2	Local consultant	Supply chain mapping
			Consultation scheduling	2-4 weeks in advance	..	Local consultant / assistant	Tentative mission schedule
			Initial meetings	2 weeks in advance	..	Team / Teleconference	Tentative mission schedule
		Preliminary Field Exercises and Consultations	Arrival of team / team planning	Confirmed schedule / reviewed materials
			Completion of baseline data, gaps analysis	Week 1	Annex 1	Team	Baseline data completion
			Identification of tentative risks	Week 1	Annex 3	Team	Tentative identification of key risk factors
			Initial stakeholder plenary meeting	Week 1	Annexes 1, 2, 3.	Team	Peer review of spatial and sectoral maps, discussion on risks
2	Risk Analysis	Field Visits and Stakeholder interviews	Field trips, government consultations	Week 2	Annexes 3, 4	Team	Stakeholder buy in, agreed survey sampling
			Stakeholder interviews	Week 2	Annexes 3, 4, 5	Team	Risk profile and ranking, identification of gaps
			Risk identification, characterization	Week 2-3	Annex 3	Team	Prioritization of risks, arrangement for follow ups
3	Risk Management, Vulnerability Assessment	Interview follow ups, Final Stakeholder Meetings	Review and analysis of interview materials, follow up information	Week 2-3	Annex 3, 4	Team	Materials for final workshop review
			Stakeholder prioritization of risks and vulnerabilities	Week 2-3	Annex 5	Team	Consensus on main risks and vulnerabilities
4	Recommendations & Suggested Follow Ups Actions	Wrap up meetings	Stakeholder identification of current risk management capacity & gaps	Week 2-3	Annexes 3,4,5	Team	Consensus on risk management options
		Write Up/ Recommendations	Vulnerability analysis and follow up interviews/consultations	Week 3-4	Annex 5, 6	Team	Draft Report materials, interview write ups.
		Step 6: Communication of Results	- Communication of Results	- 2 weeks after field visit	Annex 6	Team leader, plus resource person	Final report and follow ups

