Coffee Sector Production and Primary Processing Risks

This table has been prepared as part of the World Bank's Agriculture Global Practice Discussion Paper on improving the risk management and access to finance in the coffee sector. It provides an overview of the major risks facing primary production and processing, along with an assessment of the frequency and impact of risk.

Types of Risk and/or Constraint	Probability	Impact	Potential Mitigation	Required Support Environment	Macro linkages	Value Impact
Production – Field						
Climate Change Impact	Confirmed	Considerable to critical	GAP and adequate information	Good farmer organization and education	Sustainability Programs	Higher costs Lower incomes Withdrawal from coffee farming
Severe weather events, i.e. droughts, floods etc. (1) [1]	Probable	Considerable to critical	GAP and Early Warning Systems	Weather stations and insurance	State supportive	Severe sudden losses Switch to other crops
Erratic Rainfall (2)	High	Moderate to considerable	GAP, Irrigation, Early Warning Systems	Weather stations and insurance Finance irrigation equipment Water availability	Varieties research State supportive	Higher costs Lower yield/quality Switch to other crops
Unseasonal Rainfall during flowering	Occasional	Variable	None	None	None	Lower yield

[1] Numbers behind some of the headings refer to comments on the possible effects of intercropping at the end of this section.

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Planting unselected varieties (3)	Occasional	Variable to considerable	Research and Extension Services	Experimental and demonstration farms/plots	Sustainability programs Trade support	Lower yield, quality and income
Lack of suitable (selected) planting material (4)	Occasional	Variable	Private or public seed nurseries	Finance purchase of planting material. Subsidize cost.	Good sector organization. Private initiatives. NGO's	Lower yield, quality and income
Insufficient or inadequate irrigation (5)	Occasional	Variable to considerable	GAP and Irrigation equipment	Finance irrigation equipment	State supportive Availability of water	Erratic flowering and flowering/maturation Lower yield, quality and income
Incorrect fertilization (6)	Occasional	Variable	GAP, Research and Extension Services	Good farming education. Access to soil (and leaf) analysis	Sustainability programs	Higher costs. In extreme cases water pollution
Pests/Disease (7)	High	Moderate to critical if of the 'Black Swan' type	GAP, Research, Extension. Early Warning Systems	Adequate funding of Research and Extension Sanitary harvesting	State supportive Sustainability Programs	Higher cost. Lower yield, quality and income, at times severe
Ageing Tree Park	Probable	Considerable to critical	GAP Adequate Research and Extension Services	Good farming education. Access to appropriate seed and seedlings. Renewal finance Spread replacement	Good Sector Organization Sustainability Programs Informed banking system.	Higher risk of Pest and Disease outbreak Lower yield, quality and income. In the end a failing coffee industry.

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No renewal strategy, i.e. no pruning, stumping or replanting cycle. (8)	Probable	Considerable to critical	GAP. Reliable long-term land ownership. On-farm nurseries	Availability of appropriate seed and seedlings. Renewal finance. Spread stumping/replacement	Long-term State policy. Sustainability programs	Higher risk of Pest and Disease outbreak Lower yield, quality, and income. In the end a failing coffee industry.
Poor erosion control, shade management, weeding etc. (9)	Probable	Variable	GAP, Training, Demonstration Plots, Extension	Good farming education	Sustainability programs	Lower yields, quality and incomes.
Inter-cropping (10)	Occasional	Can be positive or negative, depending on level of expertise	Research and Extension Services	Good farming education and extension advice. Availability of appropriate planting material.	Sustainability Programs. Markets or trade outlets unless for own consumption.	Competition for water and nutrients. Higher risk of pests and disease. Possibly lower yield and quality.
Theft	Occasional	Variable	Trade controls	Good Sector organization	State intervention	Direct loss
No or Poor Quality Inputs	Occasional	Variable to considerable	Farmer organization Trade Controls	Sector organization. Seasonal finance. Use of mulch, compost, waste and manure	State supportive	Lower yield and quality
Input Price Volatility	Probable	Variable to moderate	Farmer organization	Sector organization. Bulk buying	State supportive	Inability to budget. Variable production costs.

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Inadequate Yields	Probable	High	GAP. Adequate Research and Extension Services Demonstration farms/plots	Adequate funding of Research and Extension. Farmer education.	State supportive. Sustainability Programs.	Low farmer incomes. Switching to other crops
No or expensive labour	Probable	Variable	GAP and Tree Management. Mechanization	Extension and Farmer education Investment Finance Good farm management	Sustainability Programs	Reducing farmer incomes
No (affordable) finance	Probable	Moderate to considerable	Access to Micro Finance, Savings and Loans, etc	Good Farmer organizations	Good Sector organization. State, Trading and Banking Sector supportive	Excessively high costs or, unable to invest. Often unable apply inputs or harvest when required = lower yields, quality and income
No Formal Land Ownership	Probable	Variable	Formalised ownership structures, not only title deeds. Know own land boundaries.	Good Sector organization. Micro Finance Schemes and other NGO support	Informed banking sector. State intervention. Cadastral survey	Limits access to finance, yet formalized land tenure not necessarily an effective security. Also results in breaks in plantings and investment. Impedes long-term strategy

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Some comments on intercropping (1) Depending on type inter-cropping can reduce or increase damage to coffee trees from strong winds, floods, drought, etc. (2) Alternative crops may suffer less or more and could possibly replace coffee. (3) Cultivation of other crops, i.e. inter-cropping requires equal support from Research Institutes and Extension Services. (4) Production of selected planting material is important for any crops, i.e. also for intercropping. (5) Irrigation might fall short or be neglected because it might focus on the needs of either the coffee or the intercrop but possibly not adequate for both. (6) Individual fertilization of inter-crops is necessary according to their specific needs as a result of separate soil analysis. (7) Crops and inter-crops can boost or temper the outbreak of pests and disease in coffee. Separate and adequate treatment may possibly be required. (8) Over-aged or wilted inter-crops also lose their purpose and can even harm the coffee. (9) Inter-crops require regular and specific husbandry, especially with relation to shade control. (10) Producing several crops can mitigate the consequences of coffee price volatility.						
Production – Harvesting & Processing						
Harvesting errors	Probable	Moderate	Green cherry separation Quality control. Remuneration according to quality.	GAP and training.	Sustainability programs	Lower quality and value. Simultaneous harvesting with any possible intercrops complicates farm management.
Poor on-farm storage	Probable	Moderate	GAP Training	Good Farmer organization. Extension Services	Good Sector organization.	Lower quality, theft. Risk of ingress of pests, mould. Risk of

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			Investment	Investment finance	Sustainability Programs	contamination, especially if stored with any possible intercrops. Lowers value.
No or unreliable electricity supply	Occasional	Considerable	Generating equipment. Improved State infrastructure	Sector lobbying Investment finance	State intervention	Higher cost. Loss of income.
No or limited water	Occasional	Moderate to considerable	Limit water consumption Farmer education	Sector organization	Sustainability programs	Lower quality, value and income
Unseasonal rainfall – drying	High	Moderate to considerable	Early Warning Systems Drying surfaces or equipment	Weather stations Investment Finance	Sector organization	Lower quality, value and income
Theft	Occasional	Variable to considerable	Trade controls Insurance Secure mills and stores	Good Sector organization	State intervention	Direct loss
Poor or erratic Quality	Probable	Moderate to considerable	Research and Extension Quality controls and standards.	Good Sector organization Farmer education	State supportive. Sustainability Programs	Lower value, at times severely so, particularly if moisture content is excessive. Risk of

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			Price according to quality.			mould and insect infestation
Processing errors	Occasional	Variable to Considerable	Research Training Extension Services Quality control	Good Farming organization Investment finance	Sustainability Programs	Can destroy quality and value. Risk of loss of reputation. Applies equally to the handling of possible intercrops
Outdated or inappropriate equipment	Occasional	Variable to considerable	Training Extension Services	Investment finance	Equipment manufacturers	Lower yield, quality and income
High water consumption	Occasional to probable	Variable to considerable	Adapt process techniques and equipment. Water recirculation. Demonstration wet mill	Investment finance	Equipment manufacturers Sustainability programs Legislation	Impact on environment
Water pollution	Occasional to probable	Variable	GAP. Farmer education. Training. Water sanitation	Good Sector organization Finance	Sustainability programs Legislation	Impact on environment and human health
Waste management	Occasional	Variable	GAP.	Good Sector organization	Sustainability programs	Impact on environment

Types of Risk and/or Constraint	Probability	Impact	Potential Mitigation	Required Support Environment	Macro linkages	Value Impact
			Training.		Legislation	
Poor Roads/Lack of transport	Occasional to Probable	Moderate to considerable	Infrastructure investment	Good Sector organization Investment finance	State intervention	Higher costs. Limits market access. Fewer collectors often results in lower farm gate prices.
Production - Marketing						
Poor or Erratic Quality	Occasional	Variable to considerable	Quality Control Trained staff Standards	Good Sector organization	Sustainability Programs	Fewer buyers, reduced values
Excessive Moisture Content	Occasional	Variable to considerable	Training Standards Remuneration according to MC	Farmer education Moisture meters	Sector organization	Lower quality and value
Limited (farm gate) competition	Occasional to Probable	Variable	Good farmer organization Transport facilities and collection centres. Price information	Good sector organization	Trade support, Education	Low prices. No quality premium. In extreme cases: exploitation of farmers.

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Excessive (farm gate/Collectors/Exporters) competition	Occasional	Variable	Farmer education.	Good sector organization Supervision/monitoring	Sustainability programs	Unrealistic price promises. Quality destruction. Defaults
Lack of Working Capital/Crop finance	Probable	Variable to considerable	Well organized Audited Accounts Good Reputation	Good Sector organization. Security pledges that can be realized	Informed banking sector. State and buyer support	Unable guarantee supply = less buyer interest, lower price
Poor Roads/Lack of transport	Occasional to Probable	Moderate to considerable	Infrastructure investment	Good Sector organization Investment finance	State intervention	Higher costs. Limits market access. Shipping delays = lower revenues.
No or insufficient market information. Inability to interpret market behaviour	Probable	Variable to considerable	Trained staff 'know' coffee…. Decent communications	Good Sector and Farmer organization	Trade support, education	Lower prices, wrong decisions
Production–Prices						
Prolonged external price falls	High	Critical	Improve yields Improve quality Reduce costs	Good Sector and Farmer organization	Informed banking sector. State and buyer support.	Impossible to 'manage'. Destruction of assets. Increased poverty.

Types of Risk and/or Constraint	Probability	Impact	Potential Mitigation	Required Support Environment	Macro linkages	Value Impact
			Research and Extension		Sustainability Programs	Farmer withdrawal.
Unstable internal prices	High	Considerable to critical	Forward sales Risk Management	Good Sector and Farmer organization	Informed banking sector. State and buyer support	Unstable incomes Inability to raise finance or plan investments
Day to day external price volatility	High	Considerable to critical	Trained staff 'know' coffee…. Decent communications Risk management	Good Sector and Farmer organization	Informed banking sector. State and buyer support.	Inability to time sales. Often no relation to domestic market situation and increases chances of exploitation by intermediaries.
No clear farm gate pricing models or formulas	High	Moderate to considerable	Training, regulation, Extension.	Good Sector and Farmer organization	Final buyer/exporter support. Use of electronic media.	Farmers may be cheated on weight, moisture content, conversion ratios, defects and price.
Exchange rate volatility	Probable	Moderate to Considerable	Decent communications Risk management	Good Sector and Farmer organization	Informed banking sector. State supportive.	Increases domestic price volatility. Strengthening local currency = lower sector revenues

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Production - General						
No clarity around real cost of production (1) [2]	High	Moderate to considerable	Farmer organization. Farm accounting. Training	Good Sector and Farmer organization.	State supportive. Sustainability programs and other NGO initiatives.	Not managing costs. Inability to make informed comparisons and investment decisions.
No Financial Literacy/ do not understand difference between revenue and profit.	High	Moderate to considerable	Farmer organization. Training	Good Sector and Farmer organization.	State supportive. Sustainability programs and other NGO initiatives.	Uninformed investment decisions. Potential for financial loss if not exploitation.
Inadequate Research and Extension Services (2)	Probable	Considerable to critical	Identify priorities and set strategies. Provide resources.	Good Sector organization	State intervention. Sustainability Programs	Falling volumes and quality. Over time can mean becoming 'irrelevant' in market terms, followed by farmer withdrawal.
Interest rate risk	Probable	Moderate to considerable	Strong industry representation	Good Sector organization.	State supportive.	Rising interest rates impact directly on farm gate prices as

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			Lobbying		Informed banking system Final buyer support (occasionally)	all actors along the value chain pass this cost back. Can disadvantage domestic operators. Reduces investment.
No (neutral) price information	Probable	Variable	Easily available neutral price and market information	Training on how to analyze/interpret information Provide formal, i.e. neutral channel via Internet and Mobile Phones	State supportive. Good Sector organization.	Exploitation by middlemen. But information excesses can be equally problematic.
No long term investment finance	High	Moderate to considerable	Good farmer organization. Extension Services	Good sector organization. Demonstrate cost/benefit of crop rejuvenation	State supportive. Informed banking system. Sustainability programs.	Many unable to even afford annual replanting of small numbers of trees. Lower yields and falling quality. Increasingly uncompetitive
No weather related insurance	Probable	Moderate to considerable	Lobbying by Sector Organizations	State intervention but to date few initiatives have really taken off in coffee.	Insurance or banking companies	Loss of income. If severe (which entirely possible) may result in farmer withdrawal.
No more suitable land	Occasional	Variable to considerable	Land restructuring	Restriction of speculative land ownership	State supportive Legislation	Stagnating or decreasing yield

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No owner succession	Occasional	Variable to considerable	Education	Farmer organization	Agricultural colleges	Stagnating or decreasing yield. Probably reduces access to finance.
No crop differentiation	Occasional	Moderate	GAP and adequate information	Good farming education	Sustainability programs	Exclusive dependence on coffee
Individual coffee holdings too small to be viable	Probable to high	Variable	Land consolidation	Appropriate government and sector strategy	Realistic sustainability approaches	Coffee reduced to subsistence farming only
(1) Knowing the real cost of production and the profitability of any crop is mandatory in order to select the most adapted crops and inter-crops. (2) Inter-cropping requires specific Research and should be an integrated part of Extension Services.						