FARM D

Forum for Agricultural Risk Management in Development

WEBINAR SERIES

Presentation of the Uganda Risk Assessment Study by the Platform for Agricultural Risk Management (PARM)

By Jesus Anton, Jan Kerer, Herbert Talwana and Charles Mukama

Washington DC, United States, November 11th , 2015

Platform for Agricultural Risk Management

Agricultural Risk Assessment Study

Uganda

PARM

PLATFORM FOR AGRICULTURAL RISK MANAGEMENT

WHAT IS PARM?

FARM-D Webinar Series, 11th November 2015

PARM **OBJECTIVES**

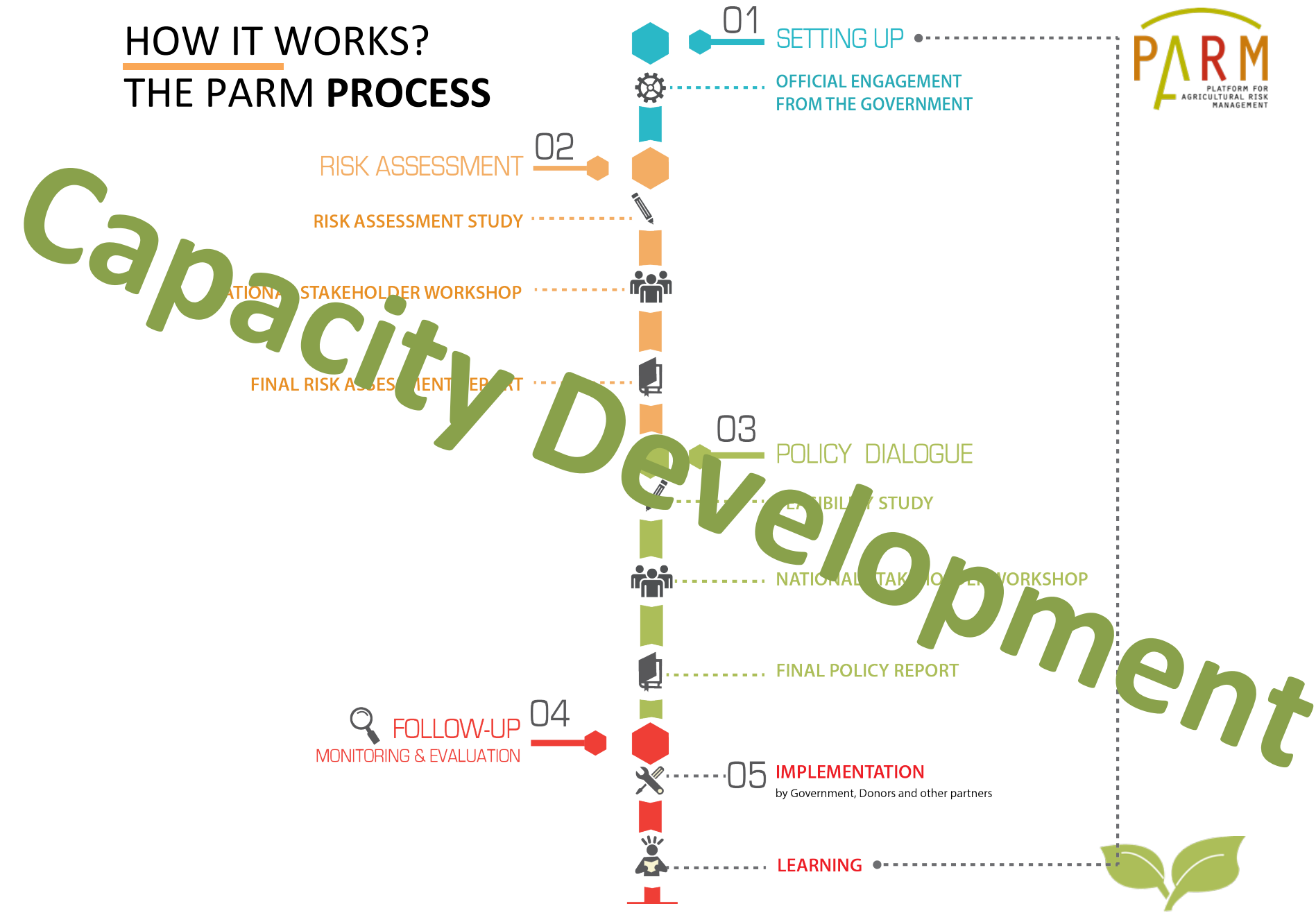
GENERAL. To contribute to sustainable agricultural growth, reduce food insecurity, and improve livelihoods of rural and poor farming households in selected developing countries.

SPECIFIC. Strengthen agricultural risk management (ARM) in selected developing countries, in a holistic manner and on a demand-driven basis.

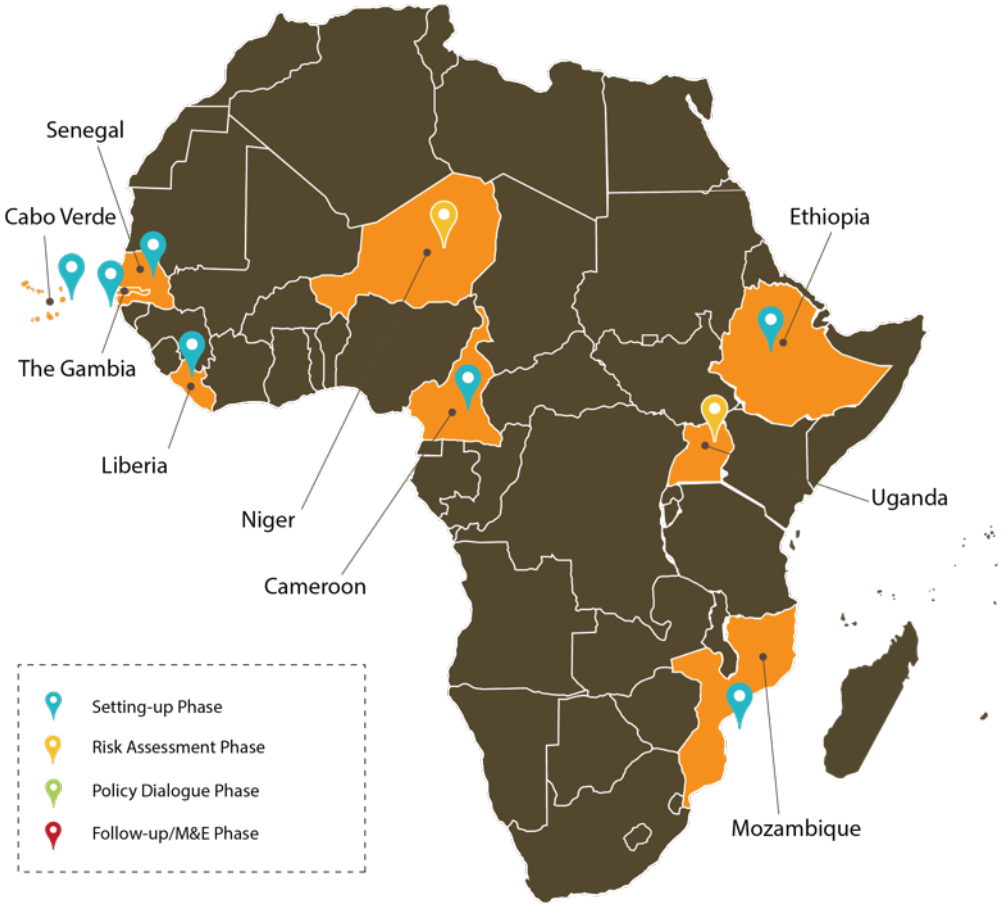
ARM becomes an institutional component of agricultural policy in beneficiary Least Developed Countries (LDCs) and Low and Middle Income Countries (LMICs) and interested Regional Economic Communities (RECs) and African Union (AU).

1. Demand for qualified ARM services from governments and RECs/AU satisfied
2. Awareness and use of holistic ARM increased
3. Coordination among ARM practitioners increased
4. Enhanced institutional capacities and synergies between stakeholders
5. Emergence of local expertise and availability of training facilities on ARM

HOW IT WORKS?
THE PARM **PROCESS**



WHERE WE OPERATE



PARM is currently focusing on sub-Saharan Africa but may expand its geographical scope to other regions in the future. The main selection criteria are based on:

- Commitment of the government to Agricultural Risk Management (ARM) and the status of the Comprehensive Africa Agriculture Development Programme (CAADP) implementation
- Diversity in agro-climatic zones, language blocks, and socio-economic standing.

The current selected countries are: Cabo Verde, Cameroon, Ethiopia, Liberia, Mozambique, Niger, Senegal, The Gambia and Uganda.

WHY IS RISK ASSESSMENT IMPORTANT

Rigour

- analysis to understand what it is known about agricultural risks

Process

- in order to match risk perceptions with facts

Setting priorities

- ARM is a system
- and definition of responsibilities

METHODOLOGICAL CHALLENGES

- Quantify risks, not only at disasters
  - Farm, household or district level risks are important
- Missing data and information
  - Identification of info gaps
- Representing the risk with a reduced number of parameters
  - frequency,
  - severity
  - extreme case scenario.

PARM IN **UGANDA**

2014	Work on ARM started already in 2014, before the existence of PARM
June 29-July 2 2015	RAS validation workshop and CD seminar in Kampala in June 29 to July 2, 2015.
October 28 2015	Uganda RAS report was launched on October 28 in Kampala during the commemoration of the ADFNS.

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PARM

PLATFORM FOR AGRICULTURAL RISK MANAGEMENT

AGRICULTURAL RISK ASSESSMENT STUDY

FARM-D Webinar Series, 11th November 2015

RISK ASSESSMENT **STUDY**

BACKGROUND. National Steering Committee/Platform on ARM under the leadership of the Ministry of Agriculture has tasked a team to undertake an in-depth analysis of the current risk exposure of Uganda, the ongoing and planned efforts to manage risks, and to propose a systematic way to prioritize and manage risks.

The study outline:

1. **The country context**: analysis of the agricultural sector.
2. **Country risk profile**: description of the risks affecting the country.
3. **Mapping of existing Agricultural Risk Management tools and policies**: description of policies dealing with agricultural risk (DISP/ASSP), and risk management initiatives by state and non-state actors.
4. **Risk analysis**: systematic quantification of impacts and likelihood of each risk.
5. **Conclusions and recommendations**: risk prioritization and identification of current gaps in risk management landscape.

RISK ASSESSMENT AND POLICY **PROCESS**

March — August

1° country mission

2° country mission

3° country mission

Kick off → **Data collection** → **Data analysis** → **Validation** → **Report**

Review of DISP 2010/11-2014/15 → **Formulation of ASSP 2014/15-2019/20**

ASSESSMENT **METHODOLOGY**

- Main elements:
  - Collection and analysis of secondary data
  - Review of reports, newspapers, etc.
  - Expert interviews
  - Validation workshop

- Data sources:
  - Ministry of Agriculture (and commodity boards) on production
  - Office of Prime Minister on disaster events
  - Bank of Uganda on financial sector
  - Uganda National Meteorological Authority on weather
  - Private sector on prices and inputs
  - African Post Harvest Losses Information System on post harvest losses

CHALLENGES.

1. Availability and accuracy of data
2. Attribution of risk factors
3. Aggregation of results

ASSESSMENT **FACTORS**

- Two assessment parameters:
  1. Severity of risk
  2. Frequency of risk
- Combination of severity and frequency was used to derive average expected loss ratio
- Where data quality allowed, coefficient of variation (CV) was calculated, for example for price risks:

	Small shocks [-10%,-30%[			Large shocks [-30%, ∞[		
	Avg. severity (%)	Frequency (month)	Avg. Expected value	Avg. severity (%)	Frequency (year)	Avg. expected value
Maize	-21	1/ 7	-3.0	-34	1/ 8	-4.2
Coffee	-20	1/ 2.7	-7.4	-49	1/ 2.7	-18.1
Fresh Cassava	-16	1/ 4.4	-3.6	-52	1/ 8	-6.5
Matooke	-19	1/2.8	-6.8	-41	1/2.7	-15.2
Potatoes	-18	1/4	-4.5	-51	1/8	-6.4
Yellow Beans	-13	1/ 4.6	-2.8	No shocks recorded		

- Unfortunately, not for all risk factors long term data series were available

SCORING METHODOLOGY

- Main elements:
  - Severity
  - Frequency
  - Worst case
- All risks were scored based on the following scheme

Average annual losses (AAL)	Frequency of shocks	Worst case scenario (PML)	Score
very low (--) = < 1 m	very low (++) > 25 yrs RP	very low (--) = < 10 m	1
low (-) = 1 m to 5 m	low (+) = 10 yrs to 25 yrs RP	low (-) = 10 m to 50 m	2
medium 5 m to 50 m	medium = 5 yrs to 10 yrs RP	medium 50 m to 150 m	3
high (+) = 50 m to 100 m	high (-) = 2 yrs to 5 yrs RP	high (+) = 250 m to 150 m	4
very high (++) > 100 m	very high (--) = annual	very high (++) > 250 m	5

- Risk Score = 0.75 * (Average Severity * Frequency)^0.5 + 0.25 * Worst Case

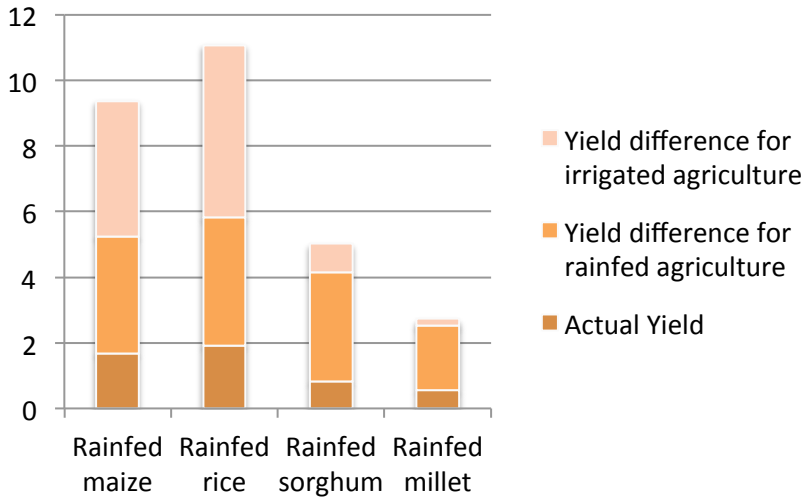
COUNTRY **CONTEXT**

- **Importance of agriculture**. Contribution to GDP (22.5%), exports (54% in 2014) and employment (70%)
- **Focus on smallholders**. 2.5 million farming households of which 90% own less than 2 acres of land each.
- **Favourable weather**. Bi-modal rainfall, abundance of water sources.
- **Diversified agriculture**. Cash crops (coffee, tea, cotton, tobacco), food crops (Bananas/matooke, cassava, maize, sweet potatoes, beans), and livestock (cattle, poultry, pigs).
- **Low growth**. Growth rate (1.5%) below average GDP growth (4.7%); low yields
- **Main constraints**: Limited access to quality inputs, low adoption of modern technology, limited access to finance, and lack of storage and market infrastructure

RISK CONTEXT. Uganda's agriculture is affected by a multitude of risks. Often, risks are inter-related and the impact is increased by the constraints that farmers face, in particular smallholders. Major risks are: inputs, weather, pests and diseases, post harvest, market, and security

INPUT RISK

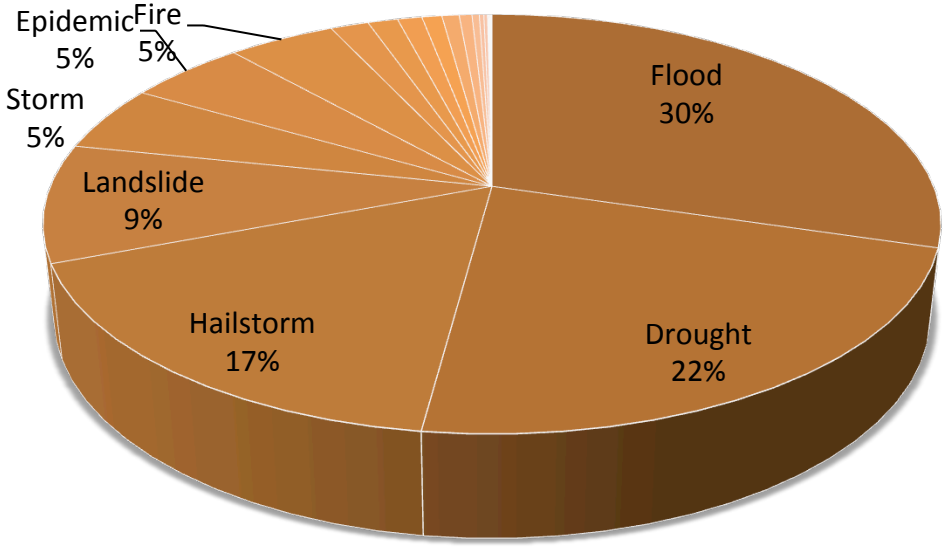
- Average yields in Uganda are well below their attainable potential.
- 90% of crops are grown using using home-saved seed and vegetatively propagated planting materials
- High reported incidence of counterfeit inputs (30% of nutrient missing in fertilizer, less than 50% authentic hybrid maize seed)
- Annually recurring problem
- USD 10.7 and USD 22.4 million annually due to counterfeit maize, herbicide and inorganic fertilizer sales

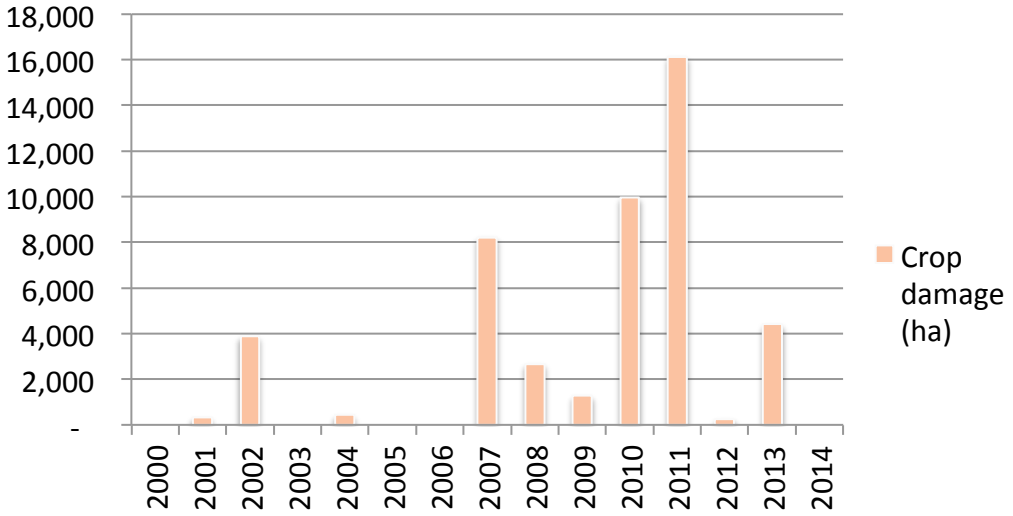


The actual cost of fake inputs is, likely, much higher than the figures reported here, as many farmers shy away from using improved seeds due to the many incidents of fake inputs, thus, lowering their revenue potential.

WEATHER RISK

TYPES OF WEATHER RISK. Uganda is affected by a range of weather events. The most common events are floods, droughts, hailstorms, landslides, and storms.





TRENDS. The database of OPM shows an increased number of events in the past ten years. However, a major reason for this trend is simply improved data collection and analysis

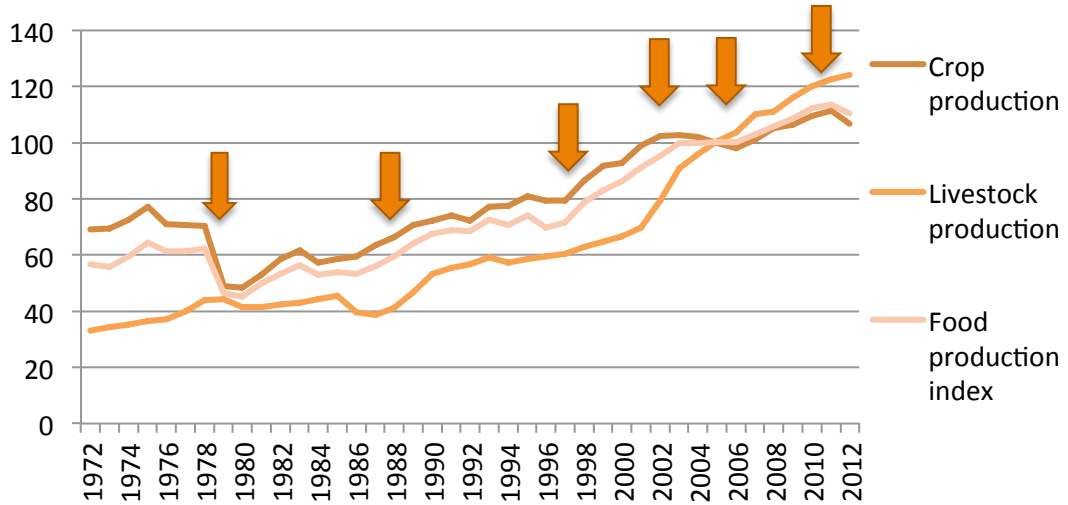
WEATHER RISK: **DROUGHT**

FREQUENCY. Droughts has been the natural risk with the most devastating and wide-spread impact in Uganda. Small-scale events (rainfall deficit) are reported on an annual basis.

Large scale events (with more than 25,000 people affected) occurr on average every 5.3 years. 2010/11 worst drought in 60 years

SEVERITY. The economic impact of recent droughts has been very substantial - average losses in past 10 years: USD 44 million p.a.

In particular the 2010/11 drought has caused massive economic losses for food crops, cash crops, and livestock; highest single-event loss of USD 683 million



WEATHER RISK: **OTHER NATURAL RISKS**

FREQUENCY. The most frequent natural risk in Uganda is flooding (771 events). The return period for floods that affected, at least, 25,000 people is 2.8 years.

Of the 5 other major hazards (i.e. hailstorms, thunderstorms, landslides, fires, and epidemics), only hailstorms occur with a similar frequency as floods.

SEVERITY. The average annual cost of floods is only USD 166,270. This figure might be too low: based on FAO/WFP the 2007 alone caused loss of production in Amuria and Katakwi districts of 48,583 ha (app. value of USD 4.6 million) compared to USD USD 597,211 based on PMO data.

The severity of all other natural risks is low compared to droughts: for example, annual losses are USD 68,377 for hailstorms, and USD 20,973 for thunderstorms.

PEST & DISEASE RISK: CROPS

FREQUENCY. Outbreaks of pests and diseases are part of agriculture.

Some pests and diseases have caused losses for many years already (for example wilt on coffee and bananas), while new diseases are emerging (e.g. MLND).

With the onset of climate change, which has extended warm temperatures to new regions, Uganda is bound to see pest-related problems spread to even wider areas since warmer temperatures are expected to both encourage the spread of pests into new areas as well as render some plants more susceptible to their effects

SEVERITY. The economic impact of pest and diseases does not only include the direct yield loss (or weight loss in case of post harvest losses) but also opportunity cost and expenditure incurred to control the pests and diseases.

Crop	Estimated Annual Loss
Bananas	USD 35 - 200 million
Cassava	USD 60 - 80 million
Cotton	USD 10 million
Coffee	USD 8 million
Total	**USD 113-298 million**

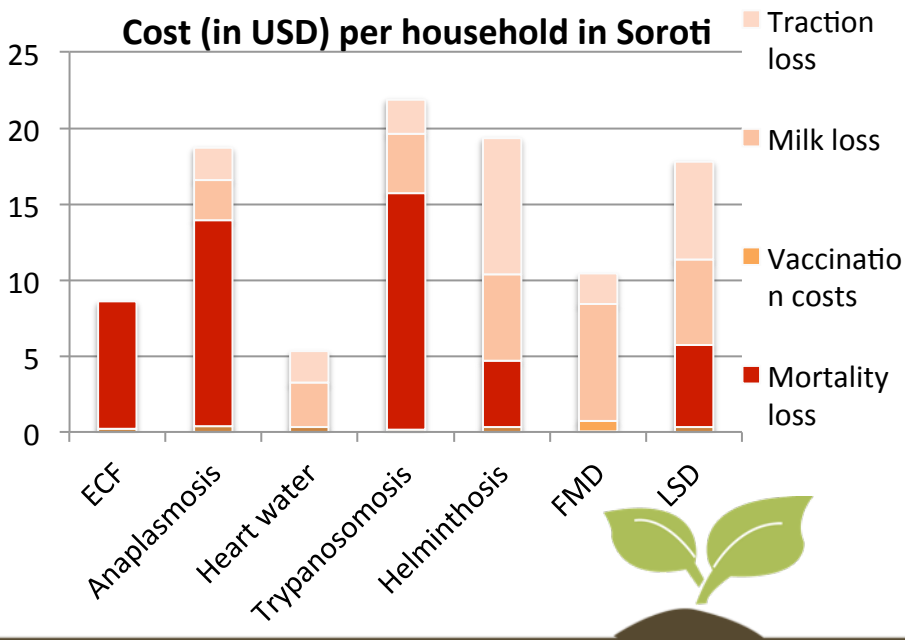
PEST & DISEASE RISK: LIVESTOCK

FREQUENCY. Livestock is always threatened by diseases. But the occurrence is often linked to other risk, such as droughts (which are more pronounced in the north).

SEVERITY. Livestock in all areas of Uganda is affected. But the cost per TLU varies per agro-climatic zone: USD 14.27 in semi-humid agro-pastoral system, USD 5.31 humid mixed crop-livestock system and USD 7.62 semi-arid pastoral system.

The economic cost for diseases in cattle estimated at USD 76.5 million p.a.

The economic impact of diseases on farming households are diverse: farmers incur cost for disease control, treatment, and vaccination. Direct losses are associated with animal mortality, reduced milk production, and use of animal for traction.



POST HARVEST RISK

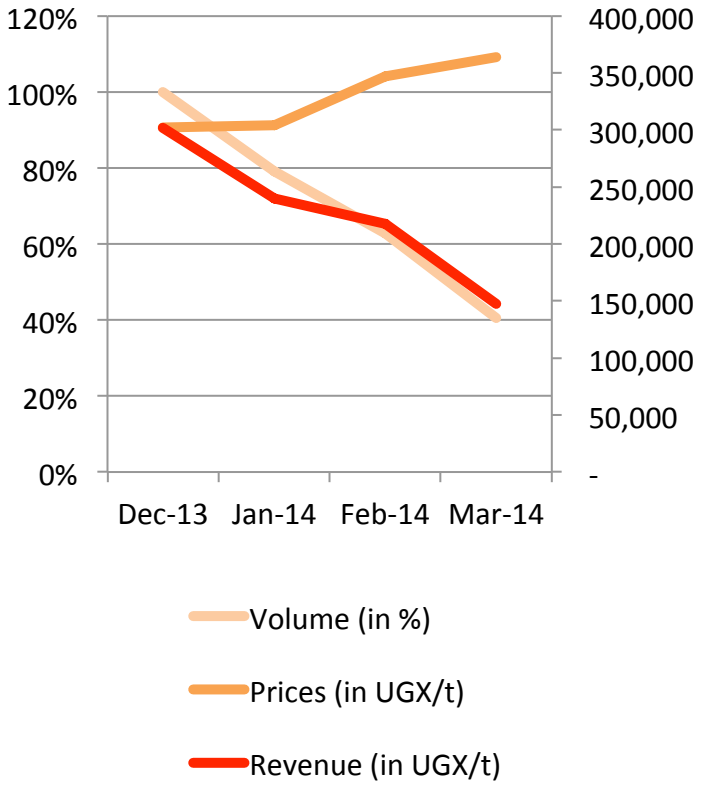
FREQUENCY. Losses are fairly constant over the years (in particular wheat and barley). 17.39% probability that post-harvest losses are 10% higher than the long-term average (5.75 return period) in wetter years

Losses are concentrated: only 21.5% of maize growers are affected. Risk is higher for smallholder farmers.

The vast majority of losses derives from maize (72.34% on average).

SEVERITY. in 2012, 18.3% of harvest lost (0.62 million tonnes of 3.4 million tonnes) was lost. Average weight losses of wheat and barley 12-13%, maize 17-25%, millet, rice, and sorghum 12-24% (APHLIS).

The average annual revenue loss is USD 97,179,571.



MARKET RISK

Prices vs. Yields. Variability of prices is larger than the variability of yields for all commodities. Food staples (e.g. cassava, maize and groundnuts) remain in the medium to low range of both price and yield variability.

Crops at risk. Export commodities (coffee, tea) have higher price variability compared to most food crops.

Inter-annual vs. intra-annual variability Inter-annual variability larger than intra-annual (seasonal): more than double in the case of coffee and cassava; only slightly larger for maize and beans.

Seasonal behavior. Maize and beans prices have a strong seasonal behavior around the long and short rainy seasons of Uganda: main price peaks occur in May and prices are more than 25% higher than in the troughs. Coffee has no clear seasonality because prices are determined in the international market.

MARKET RISK

FREQUENCY. Inter-annual price variability is a major concern for all major food crops and cash crops.

Coffee has experienced shocks of up to 49% every 3 years. Matooke/ banana are similarly affected while cassava, maize, and potatoes have seen smaller shocks in recent years.

SEVERITY. Average annual loss to the agricultural sector in Uganda has been USD 262,226,144

58.75% of losses by Matooke/ banana farmers. Losses for coffee, cassava, maize, and potatoes are in the range of USD 19.2 million to USD 31.2 million each. No major losses were recorded for beans.

SECURITY RISK

FREQUENCY. The risk of a return of the LRA on large scale is contained for the time being.

The security situation in Karamoja has improved significantly due to the disarmament and a strong development effort. Still, the situation remains fragile and cattle raids still occur.

SEVERITY. The cost of the LRA insurgency for the years 1986-2005 is estimated at USD 1.7 billion, or USD 85 million annually.

In Karamoja, from 2003 to 2010 2,054 incidents took place that claimed 3,027 lives and resulted in 133,111 cattle raided. Losses to pastoralist range from USD 1.9 million to 3.1 million p.a.

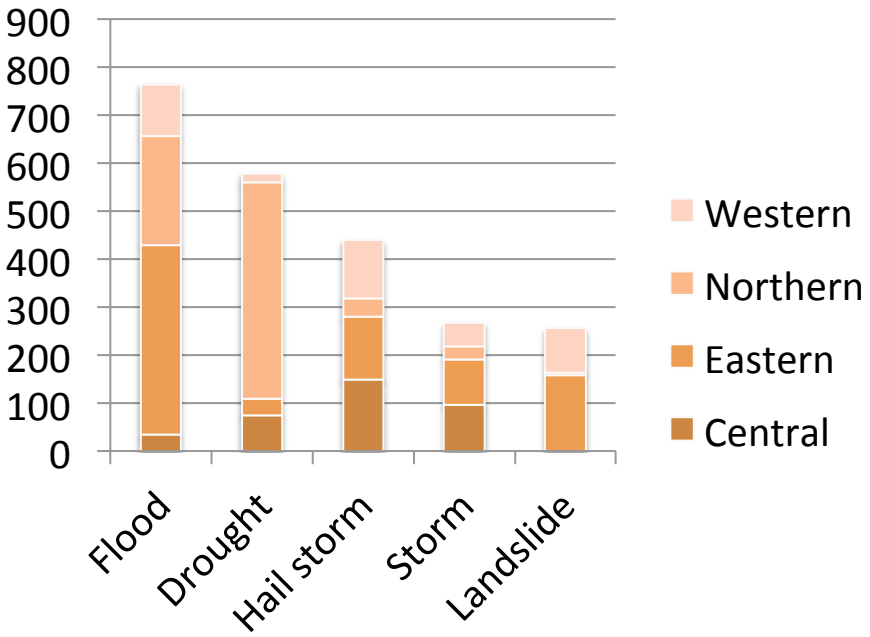
REGIONAL DISTRIBUTION OF RISK

RISK ZONES. A number of risks a **spread evenly across the country** (market price risk or input risk).

Other risks, are present all over Uganda but **vary according to crops grown, and climatic and production conditions** (pest and diseases)

Natural risks are sometimes **concentrated in certains regions**, for example droughts a more likely in the North, while flooding is a mostly confined to the East and North.

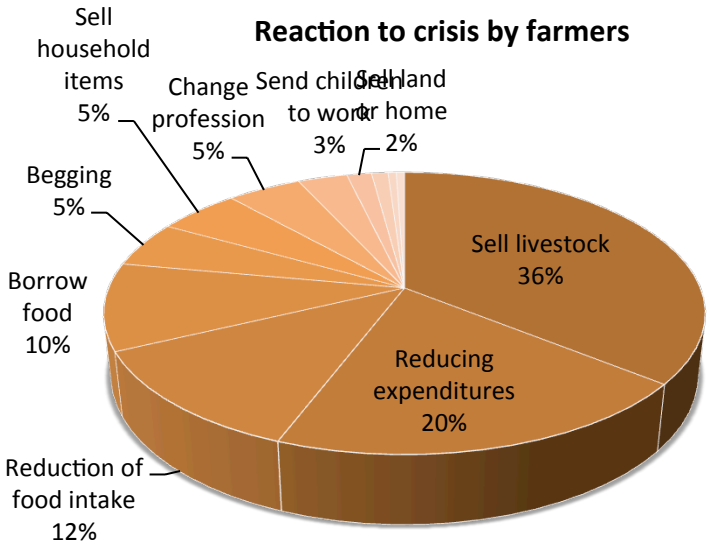
Some risks are **confined in specific locations**, such as cattle raiding in the Karamoja region.



IMPACT OF RISK

IMPACT ON FARMERS. (Smallholder) farmers face severe consequences from risks. Farmers are, for example, forced to reduce food consumption

The impact of shocks often permanently damages the farmers' capacity to generate income: for example, the sale of livestock and land means reduced income sources for the future..



IMPACT ON GOVERNMENT. The government is hit by shocks in two ways: reduced income (from taxes) and increased expenditure for emergencies.

The overall economic impact of agricultural risk is estimated to amount to USD 606 million to USD 804 million per year. Based on an agricultural GDP of USD 5.71 billion, losses therefore amount to between 10.61% and 14.08% of total annual production, that is between 2.3% and 3.1% of the GDP of Uganda.

RISK **SEVERITY & FREQUENCY**

Overview on risk frequency and severity for Uganda

Risk	Average Severity	Average Frequency	Worst Case Scenario	Score
Crop pest & diseases	very high	very high	very high	5.00
Post harvest loss	very high	very high	high	4.75
Price risk food & cash crops	very high	high	high	4.35
Livestock pest & diseases	high	very high	medium	4.10
Droughts	medium	medium	very high	3.50
Counterfeit inputs	medium	very high	low	3.40
Karamoja cattle raids	low	high	very low	2.37
Floods	very low	high	very low	1.75
Hailstorms	very low	high	very low	1.75
Thunderstorms	very low	high	very low	1.75
All other natural risks	very low	high	very low	1.75
Northern Uganda insurgency	very low	very low	medium	1.50

WAY **FORWARD**

- Improved **insitutional framework**: inclusion of ARM in ASSP, ARM housed in MAAIF with dedicated people
- Targeted **budget allocations**: inclusion of risk aspects into budget allocations
- Increased **capacity**: provision of skills at regional level to analyze and manage risks (farmer organizations, extension messages)
- Improved **data collection and analysis/information systems** (linked to inputs, markets, etc.)
- **Cost-benefit analysis of different risk management tools** (e.g. concerning animal health)
- Improved **financial sector risk management** (banking, insurance)
- **Pricing mechanisms** (commodity trading, warehousing)
- **Storage facilities** (farm level and at market level)
- …

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