



Risk Assessment

Mozambique

Agricultural Risk Profile



What are the key findings?

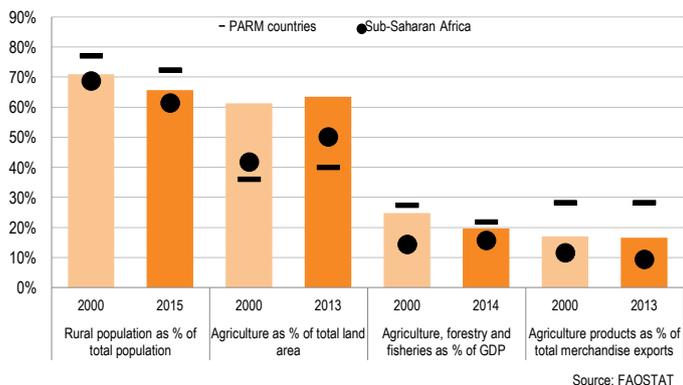
- ▶ The analysis suggests that output price risks are slightly greater than production risks, although both are quite high.
- ▶ Climatic disasters occur relatively more frequently than in other PARM countries.
- ▶ Droughts have been observed to be the most important agricultural risk.
- ▶ Rice, maize, sweet potatoes and sesame seeds are most affected by yield losses.
- ▶ Cassava, meat and cashew nuts are most affected by output price risks.
- ▶ The price of imported inputs appears a risk, along with a depreciating currency.
- ▶ Political stability has deteriorated markedly since 2008.

What are agricultural risks?

Agricultural risks are uncertain events that cause farmers significant financial loss or other adverse outcomes. They are different from constraints, which are predictable and constant limitations. Risks can negatively affect rural employment and assets, increase food insecurity, and lead to inefficient private and public sector investment. The purpose of the profile is to provide a high-level quantitative analysis of selected risks. It uses a common methodology, drawing on easily available information. As annual national averages are used, local and seasonal variations cannot be observed. This may underestimate production risks as compared to output price risks. The scope of the analysis is also limited by the lack of output data for livestock products. For Mozambique local price data was available only for the period 1993-2007. A detailed country risk assessment requires a much fuller investigation.

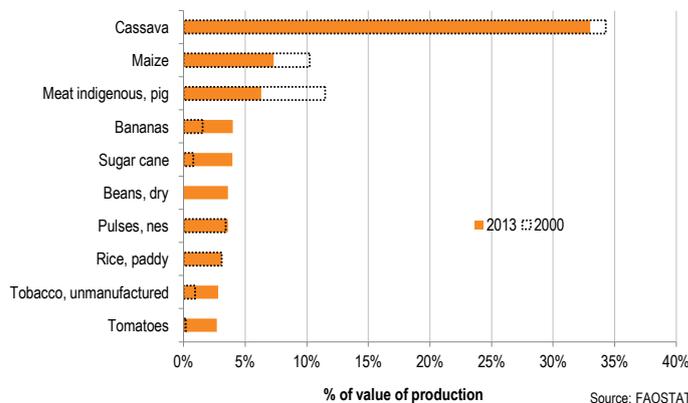
What role does agriculture play?

Two-thirds of the total population of 28 million is rural, around the African average. Agriculture occupies 64% of the land area, more than in most. Agriculture's contribution to GDP and exports is also around the African average at around 20%.



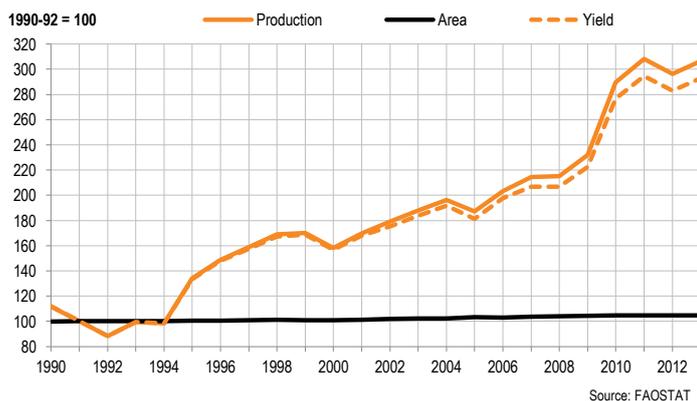
What products are most important?

Cassava is by far the most important product followed by maize and pigmeat. The top ten products represent 70% of production in 2013, with all crops accounting for 87%. Production has increased for most of the top ten since 2000 with the exception of the top three.



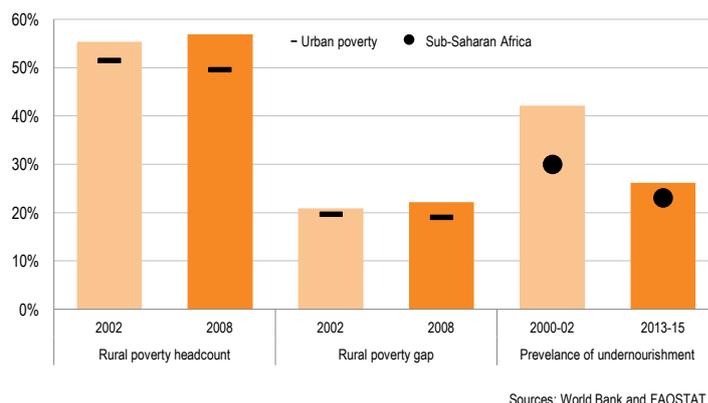
How has the sector grown?

Between 1990 and 2013, agricultural output increased by 200%, an annual increase of over 5%. This is primarily due to rising yields, with the total land area used for agriculture rising just 5%. Both livestock and crop output have grown at similar rates (6% and 5%).



How vulnerable are people to risks?

Both the rural poverty headcount and gap has increased since 2002, although the absolute number has fallen. Urban and rural poverty are at similar levels. The prevalence of undernourishment has fallen, and is now close to the African average.



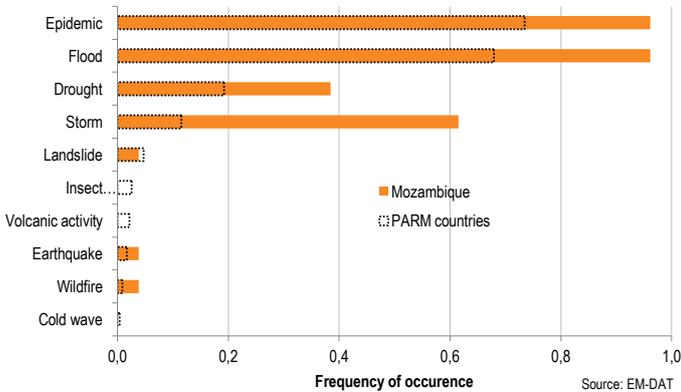
Production risks

What are production risks?

A large number of risks affect agricultural production. These include climate related events (such as droughts, floods and cyclones), outbreaks of pests and diseases, and damage caused by animals, windstorms or fire. The geographic and temporal spread of these impacts can vary significantly. Production risks are mostly associated with yield reductions but can also affect product quality.

How often do major disasters occur?

In the period 1990-2015, epidemics and floods were the most frequent disaster to affect Mozambique, occurring on average once a year. A major storm hits once every two years. In addition to all the rain, drought events also occur relatively frequently.

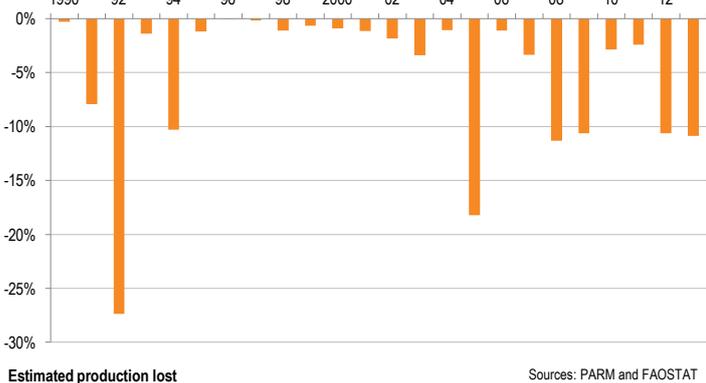


What is the likely impact of future climate change?

The IPCC 5th assessment report concludes that land temperatures over Africa are likely to rise faster than the global land average, particularly in the more arid regions. In Southern Africa, temperatures will rise in all seasons, with an average temperature 3.5-4°C higher than experienced in the late 20th century. Projected rainfall change over most of sub-Saharan Africa is uncertain due to complex topography. However, most models suggest a reduction in rainfall and drier conditions are likely in Southern Africa. Increasing temperatures and changes in precipitation are very likely to reduce cereal crop productivity, and could also adversely affect high-value perennial crops. Mozambique has a long coastline, and is exposed to increased risks of tropical cyclones and sea-level rise.

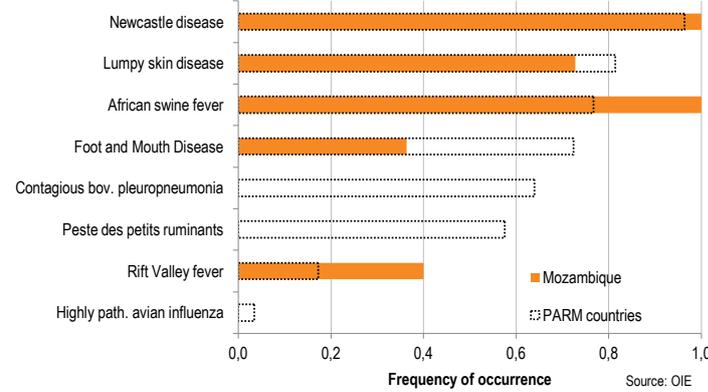
Has the risk varied over time?

Totalling the annual value of production losses for the 12 crops provides an indicative production risk profile for the period. Annual production losses averaged 7%, ranging from 0-4%. The largest estimated losses occurred in early 1992 and 2005 (over 15%).



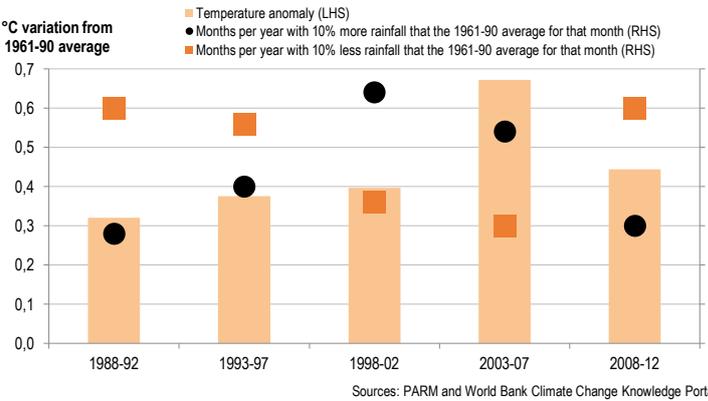
What animal diseases are present?

Of the eight animal diseases analysed over the period 2005-2015, only two (Newcastle disease and African swine fever) are endemic in Mozambique. Three diseases have either never been reported or are notified as being absent.



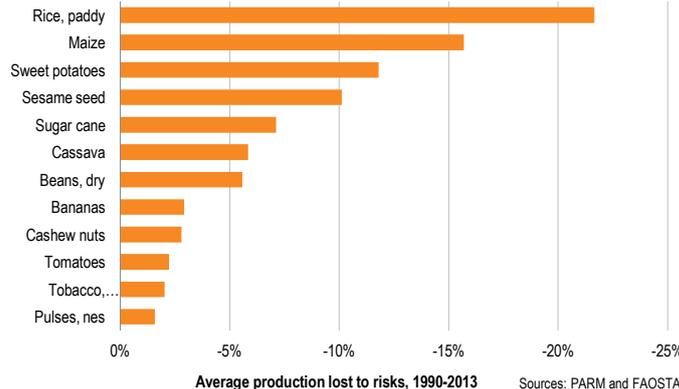
Are weather anomalies increasing?

While temperature levels are higher than the 1961-1990 average, a notable peak occurred in 2003-07. There is no clear change in rainfall patterns, with the number of wetter and drier than average months in 2008-12 being similar to 1988-92.



Which crops appear most at risk?

Rice, maize, sweet potatoes and sesame seeds are the crops most affected by yield losses as estimated by the impact on production. Annual yield losses averaged over 10% of production for these crops, with an average loss of 47% once every 3 years for maize.





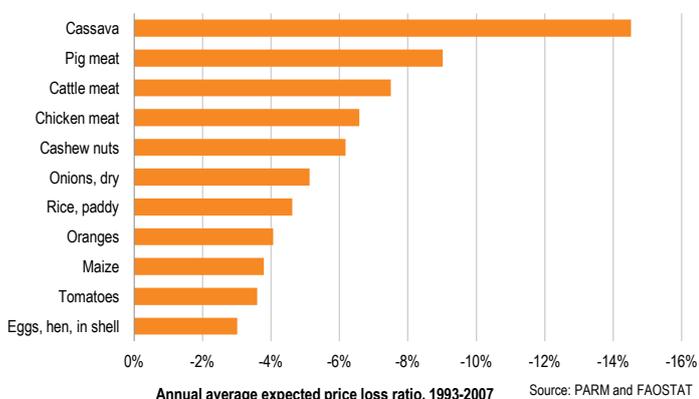
Market risks

What are market risks?

Market risks are issues that affect the price and availability of outputs and inputs. Commodity markets can have a high degree of volatility caused by changing local and global supply and demand. Producers are concerned about low prices (reducing their income); consumers are worried by high prices (raising their expenditure). Other market risks include exchange rate volatility, which can affect the price of outputs and inputs.

Which products appear most at risk?

Over the period 1993-2007, cassava, meat and cashew nuts appear to be the commodities most affected by output price risks. These products have an average annual price loss of greater than 5%, with an average loss of 36% once every 2-3 years for cassava.



How are the product and temporal risks estimated in this profile?

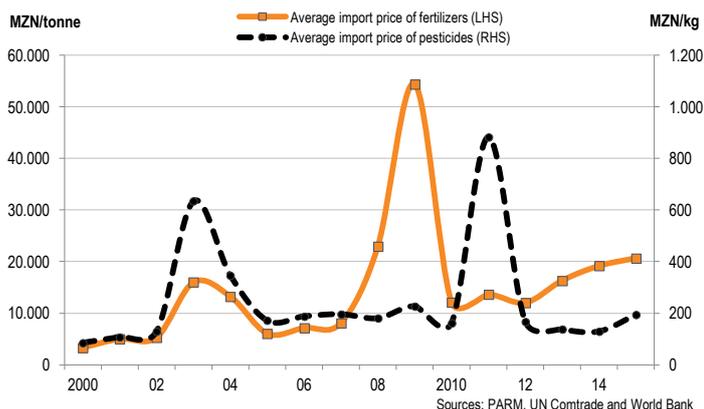
Indicative estimates of production and output price risks are calculated in a similar way. A loss threshold of 0.33 times the standard deviation below the trend value in either yield or prices is calculated to set a benchmark for identifying the losses resulting from production and market risks respectively.

To calculate product specific risk values, the average yield or price loss below the threshold level and the frequency of these occurrences are multiplied to obtain average production and price loss ratios. This is done for the 12 most important crop and livestock commodities for which data was available.

To calculate the risk profile over time, the individual loss for each respective year are added together across the crop commodities only.

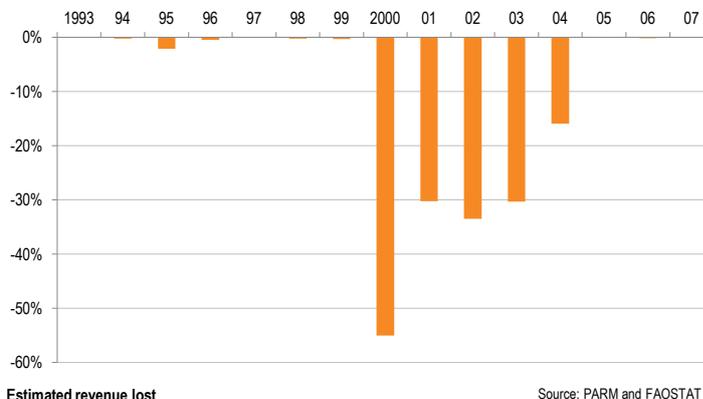
How variable are input prices?

Variations in annual average import prices suggest farmers face input price risks. Since 1995 import prices have risen by 15% or more at least once every three years for both fertilizers and pesticides.



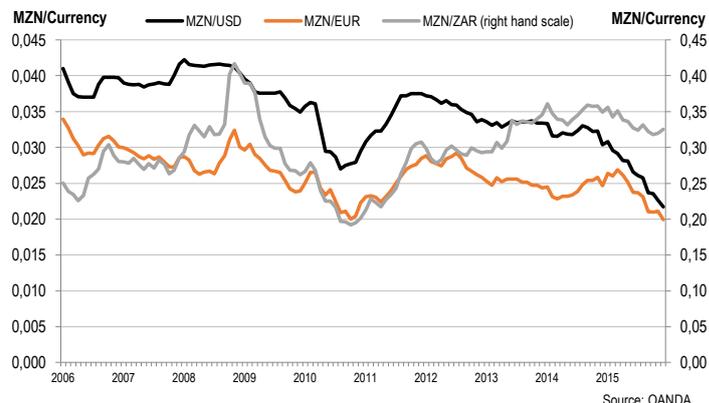
Has price risk changed over time?

Totalling the estimated revenue lost due to output price risks for crop commodities provides an indicative market risk profile for the period. The average annual revenue loss is 12%. Almost all these losses occurred in 2000-04 when prices for cassava fell dramatically.



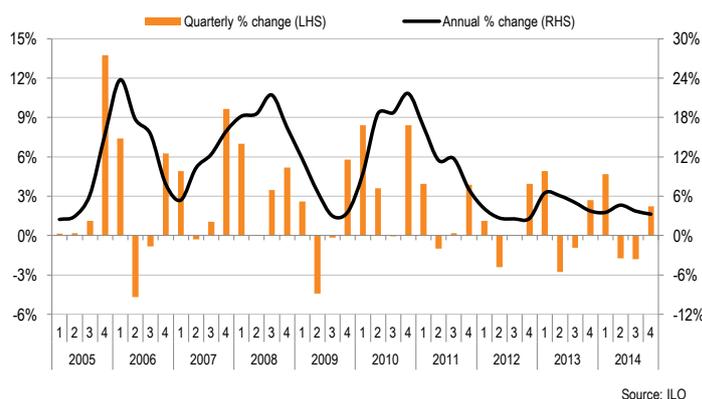
Is there an exchange rate risk?

The Mozambique metical (MZN), has depreciated against the USD and Euro but strengthened against the South African rand, it's second most important export market. There have been variations around these trends, indicating some exchange rate risks.



Do food prices vary for consumers?

Over 2005-14, the food component of the consumer price index recorded an average annual increase of 10%. The highest annual rate of 24% was recorded in March 2006. Prices have risen more slowly since 2010 but fluctuate to the same extent.



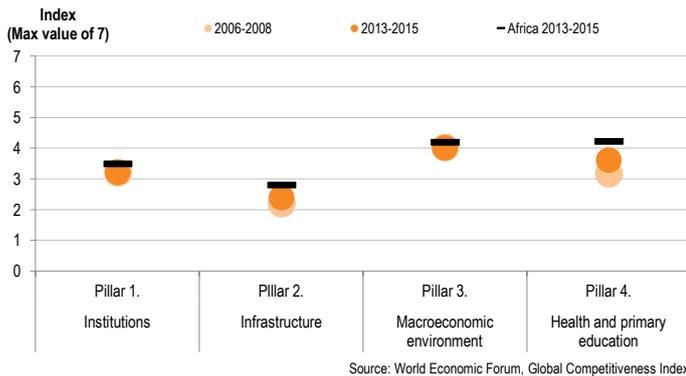
Macro level risks

What are macro level risks?

Macro level risks cover unexpected changes in the broader economic environment in which agriculture occurs. It can include changes in government or business regulations, fiscal and monetary policy settings, external trade restrictions, political instability, corruption, regional conflict and domestic unrest.

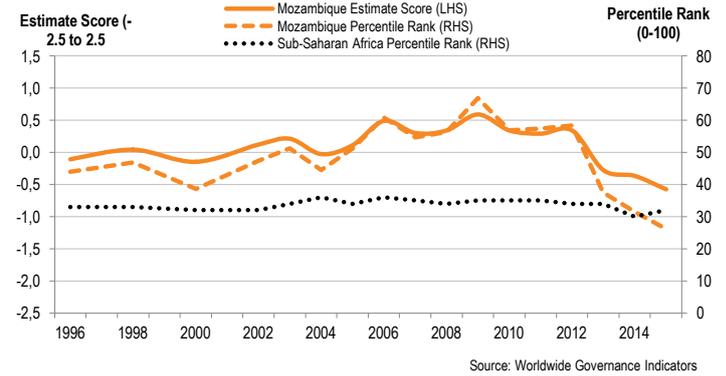
Are basic requirements in place?

Index scores for the basic requirement pillars place Mozambique just below the African average across all four pillars. Index scores have lifted for all four, particular for health and primary education but further efforts are still needed.



Is the political environment stable?

Mozambique generally scores above the Sub-Saharan Africa average in the political stability and absence of violence index. Its ranking has deteriorated markedly since 2009, falling from a percentile ranking of 67 to 26, its lowest ranking of the index.



Overall risk assessment

The PARM process

A detailed risk assessment is carried out as part of the PARM process, in partnership with NEPAD and the relevant African government. It is a rigorous consultation process involving a risk assessment report drafted by international and local experts, followed by a national validation workshop with the participation of stakeholders including farmers, private sector companies and government. Risks are identified at a detailed level, e.g. droughts, raids, etc.

In the case of Mozambique, the World Bank made a risk assessment study in 2015. Drought was observed to be the most important agricultural risk, ahead of flooding which has a higher probability of occurrence. The southern region is more exposed to international price volatility. Macro level risks are considered weak but stable, and therefore not much of a risk.

What are the main agricultural risks?

The analysis suggests that overall output price risks are slightly greater than production risks, though both are relatively high compared to other PARM countries. While production risks occur more frequently, their average severity is not as large as the extent of revenue losses associated with output price risks.

RISK	VARIABLE	AVERAGE FREQUENCY	AVERAGE SEVERITY	WORST-CASE SCENARIO
PRODUCTION	RAW SCORE	0.35	-20%	-60%
	RISK LEVEL	● HIGH	● MEDIUM	● VERY HIGH
OUTPUT PRICE	RAW SCORE	0.33	-30%	-56%
	RISK LEVEL	● HIGH	● HIGH	● VERY HIGH

What are the linkages between risks?

Managing risks in agriculture is particularly challenging, as many risks are highly correlated, resulting in whole communities being affected at the same time. Impacts on yield that are widespread and have a significant impact on total market supply can have profound effects on market prices. In Mozambique, droughts are an example of a risk that can trigger others, aggravating some pests and diseases (additional production risks), leading to spikes in food prices (market risks) and exchange rate risks if export restrictions are imposed.

What is PARM? The Platform for Agricultural Risk Management (PARM), an outcome of the G8 and G20 discussions on food security and agricultural growth, is a four-year multi-donor partnership between developing nations and development partners to make risk management an integral part of policy planning and implementation in the agricultural sector. PARM operates a process to achieve this through risk assessment, policy dialogue, tools assessment and capacity development.

PARM Secretariat International Fund for Agricultural Development (IFAD)

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