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# SPECIAL REPORT

## FAO/WFP CROP AND FOOD SECURITY ASSESSMENT MISSION TO SWAZILAND

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## ABBREVIATIONS AND ACRONYMS

AEZ	Agro-Ecological zones
AGOA	African Growth and Opportunity Act
CBS	Central Bank of Swaziland
CFSAM	Crop and Food Security Assessment Mission
CSI	Coping Strategy Index
CSO	Central Statistical Office
DVLS	Department of Veterinary and Livestock Services
EA	Enumeration area
EU	European Union
FAO	Food and Agriculture Organisation
FCS	Food Consumption Score
GDP	Gross Domestic Product
ha	Hectare
HDI	Human Development Index
HH	Household
ISP	Input Support Programme
LZ	Livelihood Zones
MEPD	Ministry of Economic Planning
MMAC	Maize Marketing Advisory Committee
MoA	Ministry of Agriculture
MoF	Ministry of Finance
NMC	National Maize Corporation
NMS	National Meteorological Services
RDA	Rural Development Area
SACU	Southern African Customs Union
SNL	Swazi Nation Land
SVAC	Swaziland Vulnerability Assessment Committee
t	Tonne
TDL	Title Deed Land
UNDP	United Nations Development Programme
US	United States of America
USD	United States Dollar
VAC	Vulnerability Assessment Committee
ZAR	South Africa Rand
WFP	World Food Programme
WRSI	Water Requirements Satisfaction Index

## HIGHLIGHTS

- Despite favourable rains at the start of the 2014/15 cropping season, an extended dry period between January and March 2015, a critical maize crop development stage, resulted in widespread crop losses and reduced yields, mainly affecting the less productive agro-ecological zones.
- Reflecting mostly the impact of rainfall deficits, national maize production in 2015 is estimated at 81 623 tonnes, 31 percent below the bumper 2014 output and 6 percent lower than the five-year average.
- At the subnational level, maize harvests in the agro-ecological zones of the Lowveld and Lubombo Plateau are about half of their average levels. However, average harvests in the more productive Highveld and Middleveld regions averted a steeper production decline at the national level.
- A worsening of pasture conditions is expected in the second half of 2015, despite some respite from improved rains in April and May. As a result, there is a concern for livestock conditions until the normal seasonal start of rains in October 2015.
- The total cereal import requirement in the 2015/16 marketing year (May/April) is estimated at 137 701 tonnes, comprising of 43 000 tonnes of white maize (for human consumption), 45 000 tonnes of yellow maize (for feed), about 26 000 tonnes of wheat and approximately 24 000 tonnes of rice. Although maize imports by the National Maize Corporation are expected to meet the estimated requirements, tighter regional maize supplies and rising prices in South Africa, the country's main source of grains, could put upward pressure on domestic maize prices.
- The poor rainfall season of 2014/15 has negatively impacted on the food security situation of a large number of vulnerable people. Overall, the high dependence on rainfed maize production in marginal areas, the very low income levels of rural small holders, poorly integrated food markets, and high import prices of food and agricultural inputs, together with the pervasive effects of high rates of HIV-AIDS among wage earners, are the main drivers of food insecurity and exacerbate households' vulnerability.
- Therefore, the poor cropping season of 2014/2015, though not particularly remarkable at the national level, had a clear impact on food security and disrupted five consecutive years of declining rates of food insecurity.
- An estimated 50 000 people (5.5 percent of the population) are now severely food insecure and in need of assistance, with another 18 percent moderately food insecure. This 23.5 percent overall food insecurity is in sharp contrast with the very low 3 percent registered in 2014.
- The Lubombo region has the highest rates of food insecurity. About 11.3 percent of the population is classified as severely food insecure and a further 28.2 percent were assessed to be moderately food insecure. Furthermore, the duration of households' maize stocks registered sharp decreases, notably in the Lubombo Plateau region, where stocks for human consumption declined from five to two months. The Shiselweni region is also affected by low maize stocks, but to a lesser degree, while household stock levels in the remaining two regions remained more or less unchanged.
- Markets play a major role in the supply of maize to households and nearly one-third of the rural population has high or very high expenditure on food, particularly in the Lubombo and Shiselweni regions. Accordingly, households have little capacity to respond to the combined effects of production shortfalls and increased market prices, and can quickly fall further into food insecurity.
- Chronic malnutrition remains a grave concern in Swaziland, affecting one out of four children under five years, and is more pronounced in rural areas and among orphans and vulnerable children.
- The near certainty of a moderate to strong El Niño event during the end of 2015, likely to extend into 2016, and current seasonal forecast information, raises concerns that the 2015/2016 cropping season may also be characterized by poor seasonal rains. The Government needs to give this scenario serious consideration in view of the potential impact on food security.

## 1. OVERVIEW

An FAO/WFP Crop and Food Supply Assessment Mission (CFSAM) visited the country from 11 to 22 May 2015 at the invitation of the Government of Swaziland to estimate the 2014/15 maize production and assess the food security situation. The invitation was prompted following an extended dry period between January and March 2015 that raised serious concerns over the impact on 2015 maize production, particularly in the agro-ecological zones of the Lowveld and Lubombo Plateau.

The Mission's findings were based on four main data sources:

1. Institutional meetings with government agencies (the Ministry of Agriculture (MoA), the Central Statistics Office (CSO), the National Meteorological Services (NMS), the National Disaster Management Agency (NDMA), the Ministry of Finance (MoF), the Ministry of Economic Planning (MEPD) and the Central Bank of Swaziland (CBS)), parastatal organizations (the National Maize Corporation (NMC)), NGOs (Technoserve), UN and international agencies (FAO, WFP, UNDP and the EU), and major milling companies (Swaziland Milling Ltd and Feedmaster).
2. Structured interviews with 14 Agricultural Extension Offices, out of a total of 17 nationally, in addition to field visits in the 14 Rural Development Areas (RDAs).
3. Household survey covering nine thematic areas: basic characteristics; assets and WASH; agriculture production; livestock conditions; revenue; consumption patterns; food consumption score & dietary diversity; coping strategy index and shocks; and child health and nutrition. The sampling frame was designed in collaboration with the CSO, using a two-tier identification process, and was representative at the national level. Cluster sampling was first applied to the four agro-ecological zones (AEZs). The second-tier identification stage was through purposeful randomized sampling, where the identification of the enumeration area (EA) as well as the number of sites selected were given proportional weights relating to the population density in the AEZs. In total, 40 sites were randomly selected, with ten households randomly identified within each site, yielding a total of 400 households; however, the actual number of households covered only reached 385 due to time-constraints in the field. The CFSAM enumerators were trained for two days prior to the survey to familiarize themselves with the questionnaire, interview techniques as well as the use of Android tablets. A pilot test of the tool was conducted before the survey implementation to further familiarize the enumerators with the tool and to address/correct any issues and concerns the enumerators may have had with the tool (see full details in section 5.1).
4. Market survey: structured interviews with traders in four key market centres.

Despite the favourable rains at the start of the 2014/15 cropping season (October-June), an extended dry period between January and March 2015, a critical maize crop development stage, resulted in widespread crop losses and reduced yields, mainly impacting the less productive agro-ecological zones of the Lowveld and Lubombo Plateau. Water stress on crops was the main determinant of maize production in 2014/15, while other factors such as pests and diseases, and plantings delays in localised areas, were of relatively minor importance.

The good early rains and more than sufficient availability of seeds encouraged a near-1 percent expansion in 2014/15 maize plantings, maintaining a similar area to the well above-average level of the previous year. However, the dry spell caused a sharp reduction in yields, notably in the Lowveld and Lubombo Plateau AEZs, as well as resulting in a low harvested/planted area ratio. The average national maize yield is estimated at 1.2 tonnes per hectare, and resulted in a national maize production estimated at 81 623 tonnes, 31 percent below the bumper 2014 output and 6 percent lower than the average.

The country's total maize requirement is estimated at 172 170 tonnes, including just over 109 000 for human consumption. Given the 2015 maize harvest of 81 623 tonnes, this results in an import requirement of 87 547 tonnes for the 2015/16 marketing year (May/April), comprising of 43 000 tonnes of white maize (for human consumption) and 45 000 tonnes of yellow maize (for feed). At this level, aggregate maize imports in 2015/16 are forecast to be 20 and 10 percent higher than the previous year and the five-year average, respectively. Total cereal import requirements are estimated at 137 701 tonnes, of which wheat and rice account for about one-third.

Livestock conditions at the time of the Mission were generally satisfactory. However, a worsening of pastures is expected in the second half of 2015 due to the overall seasonal rainfall deficits, despite some respite from improved precipitation in April and May. As a result, there is a concern about livestock conditions until the normal start of seasonal rains in October 2015. Findings from the household survey already indicate a deteriorating situation, with one-third of households reporting worse livestock body conditions in May 2015 compared to the corresponding month in 2014.

The sharp decrease in 2015 maize production negatively impacted on the food security situation of a large number of vulnerable people. Overall, the high dependence on rainfed maize production, especially in marginal areas, the very low income levels of rural small-holders and poorly integrated food markets, together with high import prices of food and agricultural inputs, are main drivers of food insecurity and exacerbate households' vulnerability to shocks. These characteristics are reflected in the type of shocks households reported, with rainfall deficits the most common, especially in Shiselweni and Lubombo Plateau regions. In contrast, most households in the wetter and more productive regions of Manzini and Hhohho reported no shocks affecting their food security status.

The poor 2014/15 cropping season largely reversed the food security gains that had been achieved in the previous five years. An estimated 5.5 percent of the population are now classified as severely food insecure, compared to a low of 3 percent that were assessed to be food insecure (severe and borderline) in 2014. As expected (given the weather linkages) the situation is markedly worse in the drier region of the Lubombo Plateau, where the rate of severe food insecurity reached 11.3 percent (with a further 28.2 percent classified as moderately food insecure). Shiselweni has the same rates as the overall country while the wetter, wealthier regions of Hhohho and Manzini have a somewhat more favourable situation.

The majority of interviewed households (70 percent) were described as farming households, of which, however, only 10 percent derived their main source of income from agriculture or agro-pastoralism, with salaried work the most common source of livelihood. This renders farming more as an important source of food, rather than a source of income. The reduced 2015 maize production resulted in a general decrease in households' stocks, with the most pronounced decline estimated in the Lubombo region (covering 2 months of a household's consumption, down from 5 months in 2014). Stock levels in the rest of the country were at more manageable levels.

Results from the survey indicate that nearly half of rural households spend approximately 50 percent of their income on food, while nearly one third of sampled households had a high (65-75 percent) or very high (>75 percent) proportion of income spent on food. Lubombo Plateau and Shiselweni have the largest prevalence of households with high and very high expenditure on food (about 40 percent), while the proportion is somewhat lower in Hhohho, estimated at 25 percent. Such large proportions of income spent on food implies that households have limited capacity to respond effectively to the combined effects of reduced household stocks and increased food prices, and consequently can quickly fall further into food insecurity.

Households' coping strategies mostly revolve around caloric restrictions. Again the Lubombo Plateau is the region where the use of coping strategies is the highest, closely correlating with the elevated levels of food insecurity. The use of coping strategies was at a seven-year minimum at the time of the CFSAM survey as it is a lagged indicator and the survey took place earlier (closer to harvest) than those of previous years. However, the use of coping strategies is expected to rise later in the year.

Given the vulnerability of households to weather related production shocks, it is of paramount importance that the Government seriously considers the scenario of another potential poor cropping season in 2015/2016, in consideration of the presence of an El Niño weather phenomenon, which is historically associated with reduced rainfall levels compared to the average. A second poor cropping season, especially if it has a regional scope, could have serious implications for food security, particularly for households in the Lubombo Plateau and Shiselweni regions.

## **2. SOCIO-ECONOMIC CONTEXT**

### **2.1 General**

The Kingdom of Swaziland is a small landlocked country, with a total land area of 17 364 square kilometres. The country is bordered by the Republic of South Africa and Mozambique. It is a predominantly rural society, with most of the population dependent on subsistence agriculture for their livelihoods. It has a dual land tenure system consisting of Swazi Nation Land (SNL), which constitutes about 60 percent of the total land area and is held in trust by the King and allocated to households by traditional chiefs on his behalf, and Title Deed Land (TDL) which is freehold and owned mainly by companies (sugarcane, forestry, citrus and pineapple plantations) as well as by some individuals. Production on TDL is market-oriented and uses modern technology and irrigation, while production on SNL is largely subsistence-oriented and rain-dependant. Agriculture's contribution to Gross Domestic Product (GDP) is currently estimated at around 11 percent. TDL contributes about 80 percent to the agricultural sector while around 10 percent comes from SNL, with the remaining contribution from livestock and forestry. The other sectoral contributions to GDP in 2014 are as follows: tertiary (services) 54 percent and secondary (manufacturing) 35 percent<sup>1</sup>.

The Swazi economy is closely tied to that of South Africa, from which it receives more than 90 percent of its imports, including virtually all of its cereal imports (however, wheat and rice are mostly re-exported from South Africa) and to which it sends around 70 percent of its exports. As a result, the country remains vulnerable to external shocks from South Africa, where prospects are currently muted. The Swazi currency, the Lilangeni, is pegged at par to the South African Rand, and given the high proportion of imports from

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<sup>1</sup> Ministry of Finance.

South Africa; the country is not constrained by a lack of foreign exchange. Other major trading partners are the United States and the EU, from which the country has had trade preferences for apparel (US under AGOA – recently rescinded), sugar and beef (EU).

Swaziland is classified as a lower middle income country, with a GDP per capita of USD 3 034. However it possess a Gini coefficient of 0.52 (World Bank 2013), implying a wide disparity in household incomes. Based on the Gini index for consumption per capita, and focusing on the poorest 10 percent of households, the country recorded an increase in inequality between 2000 and 2010.

Rates of poverty also still remain high, with an estimated 63 percent (2010/11) of the population living below the poverty line; however, this is 6 percentage points below the previous estimate in 2001/01. High unemployment levels and a low Human Development Index (HDI) ranking, largely attributed to the high HIV/AIDS prevalence, despite strong improvements over the past three decades, have contributed to maintaining the elevated levels of poverty. Up to 26 percent of population aged between 15 and 49 and 42 percent of pregnant women suffer from HIV/AIDS; these are the highest proportions in the world. The high prevalence rate in this age group means that it is typically the main income earners and caregivers who are affected, thus compromising a household's food security.

## 2.2 Recent macro-economic trends

Economic growth, measured by real GDP, slowed in 2014 to 2.5 percent from about 3 percent in 2013 (Table 1), averaging 2 percent over the last five years. The slowdown was mainly on account of subdued activity in the manufacturing sector, which accounts for about one-third of the economic output. Other factors contributing to the sluggish performance in 2014 include the poor performance in the mining sector, low levels of foreign direct investment and a lack of competitiveness, while reduced growth in the tertiary sector further negatively weighed on the economic output. Lessening the impact, a more buoyant performance was recorded in the agriculture sector, which registered a year-on-year growth of 4 percent in 2014 and helped maintain an overall above-average growth rate. The improved performance in the agricultural sector mostly reflects larger sugarcane and maize outputs in 2014, due to favourable weather conditions.

The economic outlook in 2015 and for 2016 remains muted, with an expected decline in receipts from SACU constraining government finances; however, growth in domestic tax receipts is expected to partly compensate for the projected decline. The tempered outlook also reflects an expected poor performance of the agricultural sector compared to the previous year, while a less favourable outlook in South Africa, which the country is closely tied to, further tones down economic prospects. Other key developments include the termination of the African Growth and Opportunity Act (AGOA) preferential trading agreement in January 2015, mainly textiles. While the contribution of the textile industry to GDP is comparatively small (3 percent), the negative consequences relate more to the potential loss of jobs, with the industry employing over 17 000 people in 2014. However, it was noted by the Mission, following interviews with the Central Bank and Ministry of Finance, that some trade loss from AGOA is expected to be partly offset by increased trade in textiles with South Africa. The loss of the AGOA market would also affect the performance of the curios, fruit canning and other agricultural products that benefited from preferential access to the United States market. In regard to the agricultural sector, the Lower Usuthu Smallholder Irrigation Project and the full implementation of the MoA's Input Support Programme (ISP) that is projected to assist just under 22 000 small-scale farmers in the 2015/16 cropping season, is expected to positively impact the agricultural sector. However, the presence of El Niño has raised concerns over a possibility another dry weather-affected cropping season in 2015/16, as the weather phenomenon tends to be associated with below-average precipitation during the rainy season (October-March) in parts of Southern Africa.

**Table 1: Swaziland – Economic indicators**

<b>Domestic economy</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Real GDP (USD billions)	4.1	4.1	3.8	3.5
Real GDP growth (percent)	-0.7	1.9	2.8	2.5
Average consumer price inflation (percent)	6.1	8.9	5.6	5.7
Gross official international reserves (USD millions)	601	741	763	691
Imports of goods (USD millions)	-1 953	-1 848	-1 692	-1 725
Debt service as percent of exports of goods and services	1.8	2.2	1.4	1.7
Average exchange rate E:USD	7.3	8.2	9.6	10.8

Source: The Economist Intelligence Unit 2015.



### 2.3 Population

The national 2015 population is estimated at 1 286 million persons, with an implicit annual growth rate of approximately 1.5 percent during the preceding five years. The population is largely rural centric, resulting in a relatively low population density of 74 people per km<sup>2</sup>. An estimated 21 percent of the population reside in urban areas, a proportion that has remained stable during the last 15 years, and projected to remain relatively static in the next 15 years. The Mission uses the mid-year population figure of 1 286 million for 2015/16 marketing year (May/April) to estimate national food requirements.

### 3. AGRICULTURAL PRODUCTION IN 2014/15

The 2014/15 cropping season (October-May) was mainly characterised by a prolonged dry period between during January and March 2015, corresponding to a critical stage in the maize crop development. Despite an overall expansion in maize plantings, the water deficits in early 2015 had a severe adverse impact on yields resulted in a reduced 2015 harvest, estimated at 81 623 tonnes, 31 percent below the above-average 2014 output. The following sections outline the main factors impacting on the 2014/15 maize crop, which accounts for virtually the total national cereal output.

#### 3.1 Overview of agro-ecological zones

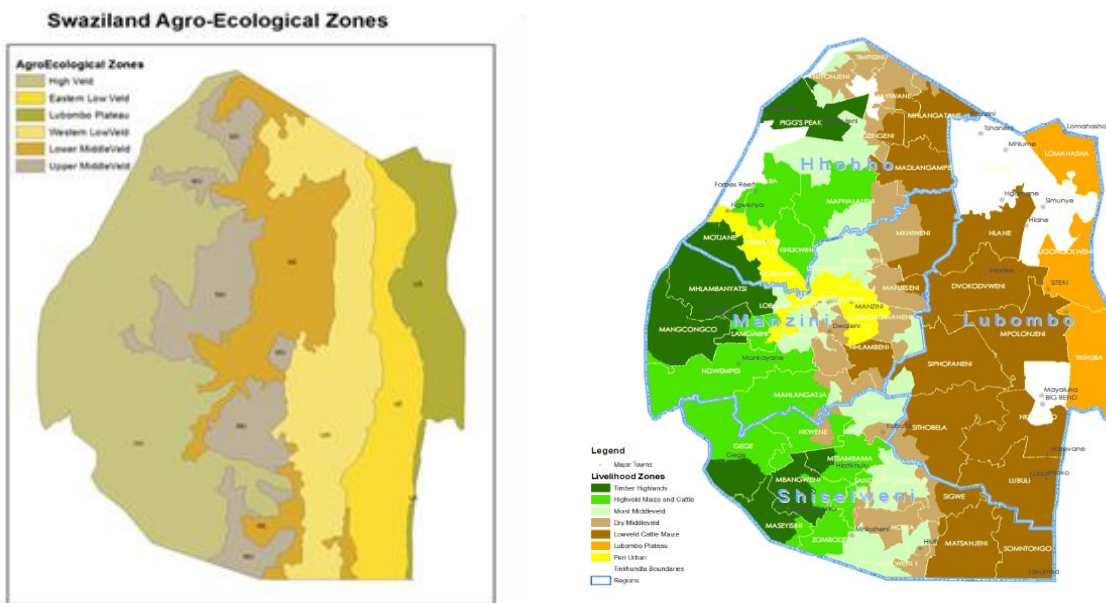
Swaziland can be divided into four major agro-ecological zones (AEZs): the Highveld, the Middleveld, the Lowveld, which occupy about one third of the country each; and the Lubombo Plateau, which represents only one tenth of the country. The Middleveld is further divided into two more narrowly defined AEZs, the moist Middleveld, with an altitude ranging between 700 and 900 m, and the dry Middleveld, between 450 and 700 m. Table 2 gives an indication of the altitude range, the long-term average rainfall and temperature characteristics of each AEZ.

**Table 2: Swaziland - Characteristics of the main agro-ecological zones**

AEZ	Altitude (metres)	Rainfall (mm)	Average temperature (°C)
Highveld	900 - 1200	700 - 1550	16
Middleveld	450 - 900	550 – 850	19
Lowveld	150 - 450	400 – 550	22
Lubombo Plateau	450 - 700	550 – 850	19

Source: MOAC 1991. Farmers' Notebook, Swaziland & FAO – AquaStat 2014.

**Map 1: Swaziland - Agro-ecological zones (left) and rural livelihood zones (right)**



Source: GIS data from AFROGEO.

Synonymous with small-scale farming in the rest of Southern Africa, maize production in SNL is almost entirely dependent on rains. Although large areas of the country possess suitable agro-climatic conditions for maize production, in the Lowveld, where about 25 percent of Swaziland maize farmers are located, conditions are unsuitable; a medium maturity maize grain crop requires between 500 and 800 mm of water<sup>2</sup> which is in excess of the region's rainfall range (see Table 2). This renders Lowveld farmers highly vulnerable to climate-induced production shocks. Maize yields in the Lowveld average less than 1 tonne per hectare and exhibit greater variability compared to the more productive Highveld and Middleveld AEZs. Similarly in the Lubombo Plateau, the maize yield variation is also high; however, the average is above 1 tonne per hectare. Based on interviews with farmers and the MoA regarding the cost of maize production, the Mission estimated that the breakeven point for a small-scale maize producer was about 2 tonnes per hectare. Given this level and the low yields recorded in the Lowveld and Lubombo Plateau, farmers, on average, would be producing at a loss.

### 3.2 Agricultural inputs

The availability of agricultural inputs (seeds and fertilisers) was generally satisfactory during the 2014/15 cropping season, with only 13 percent of households citing poor input availability. However, nearly two-thirds of households indicated that a lack of financial resources restricted improved access, ultimately deterring increased use of fertilisers. In terms of seeds, the majority of farmers used hybrid seeds, with farmers in the Lowveld preferring early-maturing maize varieties to mitigate the impact of lower rainfall volumes. Seeds were mainly sourced from markets, with only one-third of farmers retaining maize grain from the previous year's crop to use as seed. It should be noted that the large maize output in 2014 compared to previous years, may have facilitated increased retention of grain for seed in the 2014/15 cropping season. A small proportion of farmers received seeds from NGOs and government programmes.

**Table 3: Swaziland - Seed purchased and potential area planted**

	2010/11	2011/12	2012/13	2013/14	2014/15
Maize seed sales (tonnes) <sup>1/</sup>	690	1 058	1 031	1 160	1 350
Potential area planted by purchased seeds (hectares)	27 600	42 320	41 240	46 400	67 500

Sources: Farm Chemical Limited, Panar Seed Company Sales Data.

1/ Maize seed include open pollinated certified seed but excluded household retained seed.

The total quantity seed sold in the 2014/15 season would be sufficient to cover an area of approximately 67 500 hectares, using an average seeding rate of 20 kg per hectare (see Table 3). Furthermore, based on the assumption that one third of farmers used seed retained from 2014's crop, the total seed supply (retained and purchased) for the 2014/15 cropping season would be sufficient to cover an area of approximately 100 000 hectares (not taking into account left over seed and replanted areas estimated to be about 10 percent of total seed used).

The use of fertiliser is widespread, with 73 percent of the interviewed farmers applying fertiliser in the 2014/15 cropping season, a figure consistent with other recent studies that indicate a high fertiliser usage (TechnoServe). Based on the household survey, there was a near even split between the use of inorganic and organic (kraal manure) fertiliser. However, despite its prevalent use, the application of recommended quantities (particularly inorganic) is limited, restricting the attainment of desired yields.

**Table 4: Swaziland - Fertilizer sales by Farm Chemicals Ltd., 2011/12-2014/15 (tonnes)**

Fertilizers	2010/11	2011/12	2012/13	2013/14	2014/15
2:3:2 (37)	500	600	700	640	610
2:3:2 (22)	4 500	4 000	4 000	3 700	4 200
LAN	3 500	3 300	4 100	3 400	4 700
<b>Total</b>	<b>8 500</b>	<b>7 900</b>	<b>8 800</b>	<b>7 740</b>	<b>9 510</b>

Source: Farm Chemicals Ltd.

Sale figures from Farm Chemicals Ltd (see Table 4), the only licensed importer and distributor of fertilizer, indicate increased purchases in 2014/15, up 23 percent from the previous year. The main fertilizers used for maize production in Swaziland are 2:3:2 (37) and 2:3:2 (22). Acid soils are also a constraint to crop

<sup>2</sup> FAO Water, [http://www.fao.org/nr/water/cropinfo\\_maize.html](http://www.fao.org/nr/water/cropinfo_maize.html)

production in many parts of Swaziland, especially the Highveld and the Middleveld, and hence the use of LAN (limestone ammonium nitrate) for maize is comparatively high.

To ameliorate the efficient application of fertiliser, the Government initiated an input subsidy programme (ISP) in the 2014/15 cropping season, with financial support from the Government of India. The programme's provisional number of targeted farmers stood at 21 750 farmers; however, only about 3 723 farmer received support in the 2014/15 agricultural campaign, as the programme initially focused on farmers in the more productive AEZs of Highveld and moist Middleveld. It is expected that the number of recipients will increase during the following cropping season, beginning in October, as the programme expands its target base to all regions. Under the programme, farmers only pay 50 percent of the cost of the input package, valued at SZL 4 000, which includes: 1 x 25 kg bag of maize seeds, 4 bags x 50 kg LAN fertiliser and 6 bags x 50 kg NPK (2:3:2 (37)).

**Table 5: Swaziland – Number of farmers receiving input support through the MoA ISP programme, by region**

Region	Number of recipients in 2014/15
Lubombo	475
Manzini	1 619
Hhohho	841
Shiselweni	788
<b>National</b>	<b>3 723</b>

Source: Swaziland Ministry of Agriculture.

### 3.3 Farm power

Well-timed land preparation is essential to allow planting operations to occur at the onset of effective seasonal rains. While the majority of farmers in the 2014/15 cropping reportedly planted on-time, about one-third indicated delayed plantings. Constrained access to tractors in 2014 was reportedly a significant factor contributing to the delays. About one third of respondents from the survey stated that access to tractors declined in 2014, confirmed by other agriculture surveys indicating that tractor punctuality and availability constrained crop production (TechnoServe).

The use of draught power has decreased significantly in Swaziland compared to the previous CFSAM report in 2008, when more than half of the farmers used oxen to prepare land. Approximately 80 percent of farmers interviewed by the Mission stated that they employed tractors for ploughing operations. The move towards more a mechanized agriculture sector is largely attributed to the increased availability of government tractors, a scheme that was first introduced in 1997. The tractors are available for hire through the RDAs at SZL 130 per hour; the estimated time to plough one hectare is between 2.2 and 2.5 hours. In the forthcoming 2015/16 cropping season the price is set to increase to SZL 170 per hour. Private tractor hire is also available and the cost varies between SZL 200 to SZL 300 per hour, with 116 private tractors hired in the 2014/15 cropping season. Farmers using government tractors must reserve in advance for a specified date; however, the perennial shortage of operational tractors in the government pool means that a large number of farmers who depend on mechanization for land preparation plant late; with up to 30 percent of paid tractor hours not honoured in some of 17 RDAs. The current government pool comprises of 188 tractors, of which only 118 were functioning in the 2014/15 cropping season.

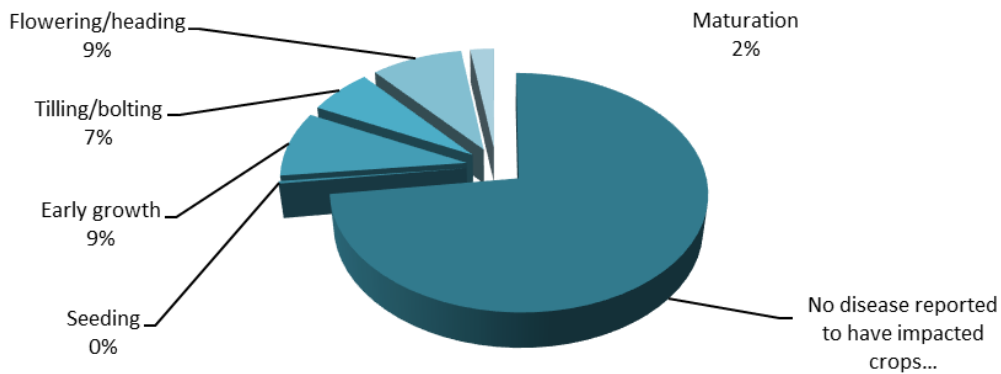
All interviewed RDAs reported that inadequate tractor maintenance was the main factor impeding their use, with only one mechanic servicing all tractors in the country, partly accounting for the reduced tractor accessibility in 2014/15. Minor repairs and maintenance are carried out on site at the RDAs, while major repairs are the responsibility of the Central Transport Authority (CTA) based in Matsapha. Improved standards of maintenance and servicing, as well as a ready supply of replacement parts could probably add significantly to the country's maize productive capacity. Furthermore, through the ISP programme the government procured an additional 132 tractors that were yet to be distributed to the RDAs. Given an expected increase in the availability of tractors for the 2015/16 cropping season, it is anticipated that a larger number of farmers will have improved access to tractors, potentially facilitating an expansion in the area planted and improving the timeliness of planting operations.

### 3.4 Pests and diseases

The prevalence of pests and diseases was limited, inflicting minimal damage on 2015 cereal crops. The most common reported pest was stalk borer, which was present in all AEZs, but with no significant cases mentioned. As can be seen from Figure 1, 73 percent of households reported no crop damage caused by

diseases or pest, while pests and diseases that were present tended to affect crops at the earlier development stages.

**Figure 1: Swaziland – Farmers reporting impact of pests/diseases and crop development stage**



Source: CFSAM 2015.

### 3.5 Planted and harvested areas

The total area planted with maize in 2014/15 is estimated at 87 164 hectares, up 1 percent from last year's high level and a significant 31 percent above the average (Table 6). The Mission's figure is based on households' estimated change in plantings (hectares) compared to the previous year. The variation was aggregated at the regional level and then applied to the CSO's 2013/14 planting figures to obtain this year's estimates. The estimates from the survey were also triangulated with data obtained from field visits and RDA interviews, and adjusted accordingly where necessary.

**Table 6: Swaziland – Area planted under maize, 2009/10-2014/15 (hectares)**

AEZ	2009/10	2010/11	2011/12	2012/13	2013/14	5-year average	2014/15	% of average
Highveld	15 062	17 662	13 677	14 508	22 243	16 630	23 266	140
Middleveld	25 389	31 163	25 273	28 091	32 615	28 506	32 408	114
Lowveld	11 690	13 583	10 416	10 934	23 258	13 976	22 852	164
Lubombo Plateau	6 193	7 936	6 698	7 727	8 638	7 438	8 638	116
<b>Swaziland</b>	<b>58 334</b>	<b>70 344</b>	<b>56 064</b>	<b>61 260</b>	<b>86 754</b>	<b>66 551</b>	<b>87 164</b>	<b>131</b>

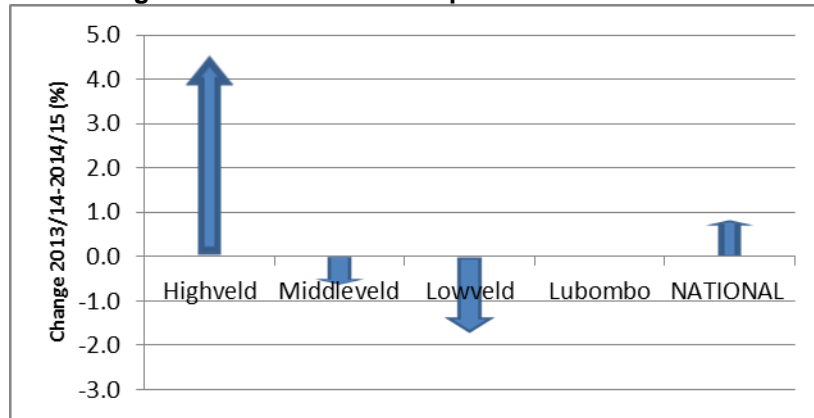
Source: CSO/MoA and CFSAM for 2014/15.

The marginal increase at the national level reflects an expansion in the Highveld that more than offset minor reductions in the Middleveld and Lowveld, while the area planted in Lubombo Plateau is estimated to have remained unchanged. The promising start of the 2014/15 rainy season, in addition to an adequate availability of seeds aided the moderate expansion and maintained the above-average level. Despite the small increase, approximately 22 percent of all farmers stated that they did not cultivate all their available arable land, with most farmers citing a lack of adequate financial resource as the main factor that impeded full land utilization.

Land availability was not cited as a major deterrent to an expansion in the area planted, with the majority of farmers owning plots ranging between 1 to 5 hectares<sup>3</sup>. However, the prevailing land tenure system, whereby all SNL land is held in trust by the King, is not wholly conducive to facilitate increased crop production. Although farmers have a strong usufruct claim to the land they farm, they cannot use it as collateral for obtaining inputs or equipment credit. The fact that the land cannot be considered a fixed asset also acts as a disincentive for farmers to improve their agriculture infrastructure, such as irrigation systems.

<sup>3</sup> Increasing maize productivity and food security in Swaziland, TechnoServe, 2013.

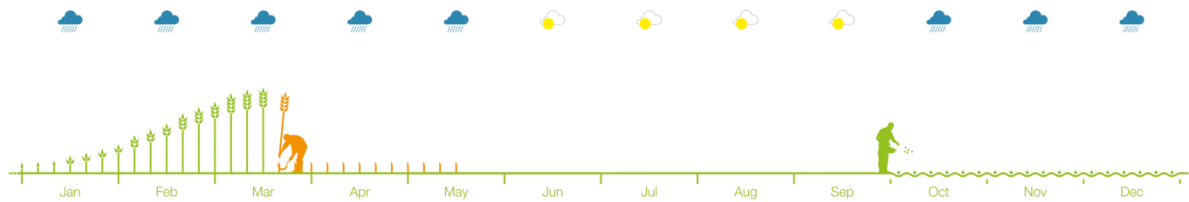
**Figure 2: Swaziland - Area planted: 2014 vs 2015**



Source: CFSAM 2015.

Most farmers indicated that planting operations occurred on time, between October and November 2014 (Figure 3), with only 2 percent of farmers planting in January, one month outside the normal planting period.

**Figure 3: Swaziland – National cropping calendar**



Source: FAO/GIEWS.

At the national level the harvested/planted area ratio was estimated at 0.8 (80 percent of the planted area was harvested). In the Lowveld and Lubombo Plateau the ratio is estimated at a low level of 0.5 and 0.6 respectively, consistent with some farmers’ statements indicating crop failure in these AEZs. The ratio for the Highveld and Middleveld is estimated at a relatively high level of 94 percent, partially compensating for the reduced ratios in the Lowveld and Lubombo Plateau.

**Table 7: Swaziland – harvested/planted area ratio by AEZ**

AEZ	Estimated area planted	Estimated area harvested	Harvest/planted area ratio
Highveld	23 266	21 925	0.94
Middleveld	32 408	30 421	0.94
Lowveld	22 852	13 291	0.58
Lubombo Plateau	8 638	4 236	0.49
<b>Swaziland</b>	<b>87 164</b>	<b>69 874</b>	<b>0.80</b>

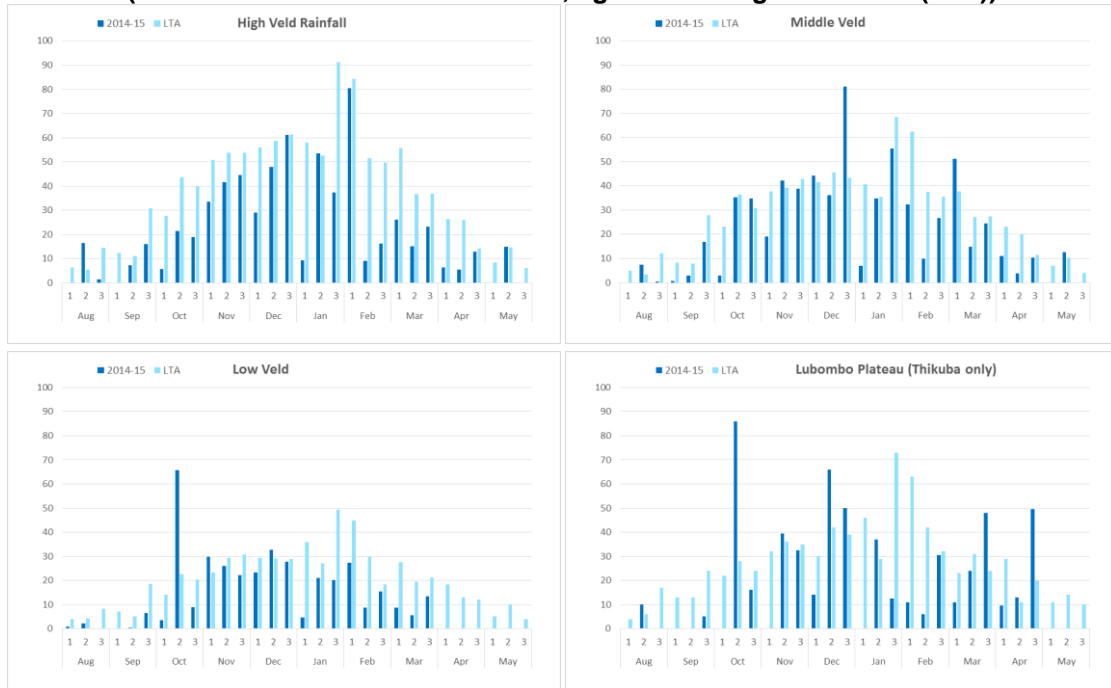
Source: CFSAM 2015.

### 3.6 Rainfall

The rainfall pattern during the growing season of 2014/2015 conformed to the overall regional pattern – a reasonable start to the season followed by dry spells resulting in pronounced rainfall deficits during the tasselling and grain filling; critical yield formation stages of the maize crop.

The AEZ average rainfall for the season and the long term mean (Figure 4) clearly shows the 2014/15 cropping season to have had persistently below average rainfall particularly from January onwards. Monthly rainfall data for individual stations (September-March) presented in Table 8 as colour coded percentages of the long-term average, clearly illustrates how extensive and pronounced the rainfall deficits became from January onwards.

**Figure 4: Swaziland - Average rainfall over the AEZ  
(dark blue: 2014-15 season rainfall, light blue: long-term mean (LTA))**



**Table 8: Swaziland - Monthly rainfall amounts expressed as the ratio of the long-term average (%)**

AEZ	Station	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Highveld	Mahamba RDA	55	27	78	85	35	46	104
Highveld	Mbabane	62	59	71	106	87	79	51
Highveld	Motshane	21	6	50	69	23	29	25
Highveld	Ngwempisi	46	70	79	25	0	41	16
Highveld	Ntfontjeni	18	30	86	73	71	62	56
Highveld	PiggsPeak	63	66	96	94	60	75	62
Lubombo	Thikuba	10	138	70	117	33	35	106
Lowveld	Bigbend	28	144	79	113	50	45	19
Lowveld	Kalanga	0	130	81	227	32	102	82
Lowveld	Madlangampisi	29	303	56	103	55	17	28
Lowveld	Mananga	7	36	53	70	30	0	0
Lowveld	Mhlume	9	0	170	10	24	40	18
Lowveld	Nkalashane	0	70	56	133	13	116	28
Lowveld	Nsoko	66	194	160	72	52	88	11
Lowveld	Siphofaneni	9	180	74	68	5	25	140
Lowveld	Sithobela	51	167	116	109	132	88	56
Middleveld	Hluthi RDA	90	30	84	90	53	24	99
Middleveld	Luve	41	117	108	177	155	39	156
Middleveld	Magiwane	14	27	62	127	41	36	109
Middleveld	Malkerns	31	60	123	248	101	153	26
Middleveld	Matsapha	22	53	24	19	74	0	0
Middleveld	Sandleni RDA	73	199	103	178	27	40	319
Middleveld	SouthernRDA	73	108	113	96	65	69	52

Note: Shading for severe deficits (<50 percent of average) within November to March (after planting and early development).

The impact of these rainfall patterns can be translated into impacts on yield by means of the WRSI (Water Requirements Satisfaction Index), a model that estimates up to what point the water requirements of a growing crop are satisfied.

The model takes as input 10 daily rainfall amounts and 10 daily estimates of potential evapotranspiration (essentially a measure of the water demand imposed on the crop by the environment in which it grows). It calculates a running comparison of the water available to crops with the water requirement of the crop along its development period. At the end of the crop growing period, the total water available for crops and the total requirement are calculated and their ratio derived. The result is a numerical index which varies from 100 in case the crop had its requirements fully satisfied to 0 in the (unrealistic) case of no rainfall; values close to 50 (only 50 percent of the requirement is met) imply crop failure. Average crop performance is expected for a WRSI of about 94-80.

The WRSI model was implemented in a spreadsheet and fed with data from 23 stations in Swaziland (data courtesy of the Swaziland Meteorological Department and collected by Mission from RDA offices). The model was run for maize crops with 120, 130 and 140 days development cycles – the 120 day variety was run for Lowveld and Lubombo Plateau locations, the 130 day for the Middleveld locations, the 140 day for High Veld locations, in accordance with the longer varieties being used in the wetter locations.

**Table 9: Swaziland - Maize WRSI values at end of development period**

AEZ	Station	WRSI	Classification
Highveld	Mahamba RDA	65	Mediocre
Highveld	Mbabane	100	Optimum
Highveld	Motshane	74	Mediocre
Highveld	Ngwempisi	46	Failure
Highveld	Ntfontjeni	92	Average
Highveld	PiggsPeak	100	Optimum
Middleveld	Hluthi RDA	67	Mediocre
Middleveld	Luve	77	Mediocre
Middleveld	Magiwane	73	Mediocre
Middleveld	Malkerns	100	Optimum
Middleveld	Matsapha	61	Mediocre
Middleveld	Sandleni	67	Mediocre
Middleveld	SouthernRDA	87	Average
Lubombo Plateau	Thikuba	72	Mediocre
Lowveld	Bigbend	58	Poor
Lowveld	Kalanga	64	Mediocre
Lowveld	Madlangampisi	66	Mediocre
Lowveld	Mananga	33	Failure
Lowveld	Mhlume	43	Failure
Lowveld	Nkalashane	73	Mediocre
Lowveld	Nsoko	60	Poor
Lowveld	Siphofaneni	35	Failure
Lowveld	Sithobela	69	Mediocre

100: Optimum	99-95: Good	95-80: Average	80-60: Mediocre	60-50: Poor	<50: Failure
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Source: CFSAM 2015.

Table 9 shows the WRSI values obtained at the end of the season for the stations in the dataset. In spite of considerable variability within each zone, the model clearly shows worse crop performance for the locations in the Lowveld and better performance in the Highveld.

The WRSI outputs can be translated into indicative impacts on crop yields, by means of a simple function. The function relates the reduction in yield (ratio of the current yield by a reference yield) to the WRSI:

$$\frac{Y_a}{Y_m} = 1 - Ky * (1 - WRSI)$$

Ky is the yield response factor – FAO advises a value of 1.25 to be used on a seasonal basis; to apply the above, WRSI values for a maize variety with 130 days development cycle was used for all regions for simplicity. Then the AEZ level WRSI values were derived by taking the median of the location values. For Ym, the reference yield, the 90th maize yield percentile from a 22 year AEZ yield series was chosen.

**Table 10: Swaziland – Indicative maize yields based on WRSI analysis**

	HV	LV	MV
WRSI	83	62	73
Ym	2.08	1.60	1.84
Yield reduction	0.79	0.52	0.66
Yield estimate	1.65	0.83	1.22

Source: CFSAM 2015.

The WRSI adjusted yields reflect the weather conditions that each AEZ faced during 2014/2015. The Highveld has a relatively modest reduction in yield, while the most severe is for the Lowveld (there is only a single location for the Lubombo Plateau, and consequently is not included in the WRSI yield calculation).

### 3.7 Yields

The final regional yields used to calculate production were based on the following three data sources:

- 2015 household survey.
- Mission’s agro-meteorological analysis.
- Swaziland Meteorological Department yield forecasts.

This data was assessed in conjunction with information gathered from field visits and interviews held with the RDAs, to ensure consistency and corroborate the survey and agro-meteorological findings. As presented in Table 10, yields in the Highveld and Middleveld are the highest in the country, mirroring the more favourable rainfall performance in 2014/15, while considerably lower yields are estimated in the Lowveld and Lubombo Plateau, where even small rainfall deficits will severely constrain yield potential, given the regions’ rainfall range and maize crop water requirement. The national yield was derived by calculating a weighted average of regional yields based on the 2015 area harvested, resulting in a national yield of 1.2 tonnes per hectare.

**Table 11: Swaziland – 2014/15 maize yields (t/ha) by agro-ecological zones (AEZ)**

AEZ	Yield (t/ha)
Highveld	1.5
Middleveld	1.3
Lowveld	0.6
Lubombo Plateau	0.6
<b>National</b>	<b>1.2</b>

Source: CFSAM 2015.

It is important to note that the 2015 yields were calculated based on the area harvested, and not the planted area, as is the case with estimates from the MoA. As a result, the Mission’s estimated yields are not directly comparable with data from the MoA and CSO. However, in order to provide a comparison with the historical series, and to illustrate the low productivity in 2015, the yield was also calculated using the planted area. Based on this calculation the national yield stands at 0.9 tonnes per hectare, compared to an average of 1.3 tonnes per hectare and a high of 1.4 tonnes per hectare in 2014.

### 3.8 Production

National maize production in 2015 is estimated at 81 623 tonnes, 31 percent below the bumper harvest of 2014 and 6 percent lower than the five-year average. The sharp year-on-year contraction is mainly the result of a reduction in yields following the rainfall deficits in the second half of the cropping season. However, well-above average plantings, despite a low area harvested/planted ratio in parts of the country, partly offset the impact of reduced yields and prevented a steeper national production decline.



**Table 12: Swaziland - Maize production on SNL by AEZ, 2009/10–2014/15 (tonnes)**

Production	2009/10	2010/11	2011/12	2012/13	2013/14	5-year average	2014/15	% of average
Highveld	26 056	36 437	31 315	31 440	38 821	32 814	32 887	100
Middleveld	32 646	33 127	32 056	32 738	48 097	35 733	39 548	111
Lowveld	12 001	12 532	9 273	12 994	19 081	13 176	6 646	50
Lubombo	4 365	2 589	2 774	4 762	12 872	5 472	2 542	46
<b>National</b>	<b>75 068</b>	<b>84 685</b>	<b>75 418</b>	<b>81 934</b>	<b>118 871</b>	<b>87 195</b>	<b>81 623</b>	<b>94</b>

Source: CSO/MoA and CFSAM for 2014/15.

Regionally, production is unevenly distributed, with 2015 outputs in the Highveld and Middleveld accounting for nearly 90 percent of the national harvest, slightly higher than the average proportions. Given the skewed geographic distribution, the significant declines in Lowveld and Lubombo Plateau had a more limited impact on the national production outcome. The latter regions will still consequently require increased maize supplies to bridge the larger deficit in 2015/16.

### 3.9 Other crops

In addition to maize, which is grown by over 80 percent of farming households, other main crops grown include beans, groundnuts and sweet potatoes. Farmers in the Highveld and Middleveld had the most diversified crop group, with less variability in Lubombo Plateau. Differences in accessibility to both the input and consumer markets account for part of the inter-regional variation in crop production, with stronger links to the largest urban markets of Mbabane and Manzini for farmers in the Highveld and Middleveld.

The Mission noted that the adoption of sorghum, and other more drought-tolerant crops was limited. The lack of reliable markets and preference for maize as food restricted the up-take of other crops, including sorghum. Other crops such as cassava, which would be more appropriate than maize in drier areas such as the Lowveld, need to be promoted and supported as a part of the crop diversification strategy. However, it was indicated that production of potatoes, mainly sweet potatoes, has increased; water requirements for potatoes are lower than maize.

### 3.10 Livestock

Livestock forms an integral component of the agriculture sector and livelihood systems in Swaziland, with households deriving both income and food from their animals. The most recent estimates for cattle numbers is from 2014, with a population estimated at 620 032, about 1 percent lower than the level of 2013. Populations of pigs, goats and sheep remained relatively unchanged, however, the chicken population is estimated to have increased by approximately 0.5 million in 2014 (Table 13).

Despite the country exporting beef products, domestic production does not satisfy national consumption and the country remains a net beef importer. High cost of production is cited as the main barrier to increased production by small-scale farmers (Annual Report, 2014, Department of Veterinary and Livestock Services).

**Table 13: Swaziland – 2013 livestock population by region**

Region	Total cattle	Beef cattle	Dairy cattle	Pigs	Chickens	Goats	Sheep
Hhohho	126 543	124 733	1 810	11 140	520 757	79 685	3 614
Manzini	174 686	172 789	1 897	10 778	1 612 696	123 686	4 855
Lubombo	175 197	174 904	293	5 778	199 517	130 419	2 318
Shiselweni	143 606	142 687	919	12 112	213 373	107 347	5 196
<b>Total</b>	<b>620 032</b>	<b>615 113</b>	<b>4 919</b>	<b>39 808</b>	<b>2 546 343</b>	<b>441 137</b>	<b>15 983</b>

Source: Department of Veterinary and Livestock Services, Annual Report 2014.

At the time of the CFSAM assessment in May, livestock conditions across most of the country were reported to be generally satisfactory, with rains in late April/May providing some relief to pastures, after the prolonged dry spell that retarded biomass development earlier in the year. However, of the estimated 70 percent of households who own livestock, less than 5 percent of households stated that livestock conditions had improved in 2015 compared to the previous year, approximately 57 percent indicated that conditions had

remained unchanged and 38 percent reported a worsening of body conditions relative to 2014. Furthermore, the Department of Veterinary and Livestock Services (DVLS) of the MoA had indicated that there has been an increase in the slaughter rate this year reflecting farmers' anticipation of the negative impact of the 2015 dry spell, as they look to offload stock.

A rapid assessment conducted by the DVLS in March 2015 indicated that pasture conditions and water availability ranged from fair to poor across most of the county, with only a few locations possessing adequate vegetation and water supplies to sustain livestock through the winter period<sup>4</sup>. The drier parts of Middleveld and Lowveld showed signs of overgrazing and land degradation as a result of high stock rates. Consistent with the DVLS assessment, the household survey findings showed the highest proportion of households indicating a worsening of livestock conditions in 2015 in the Lowveld.

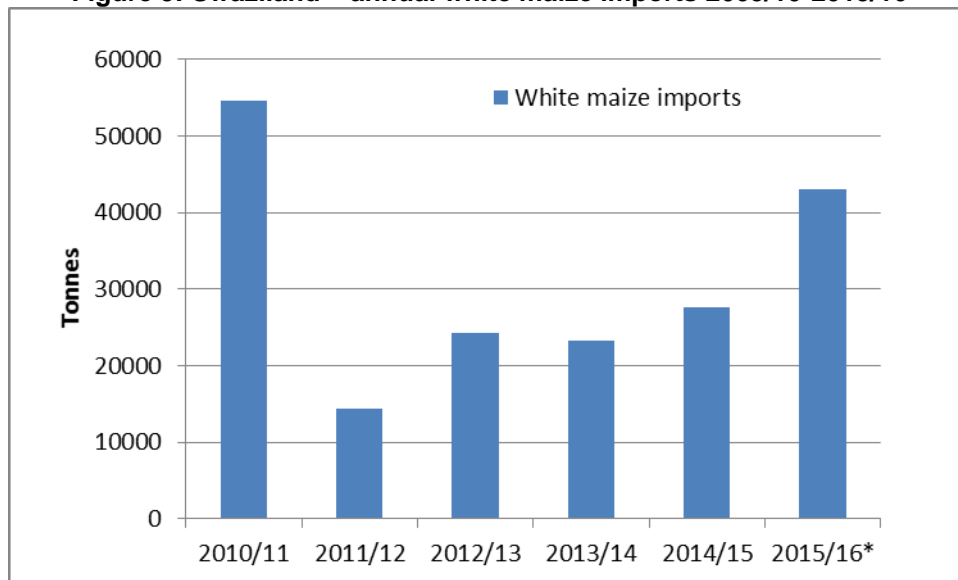
#### 4. PRICES AND MARKETS

##### 4.1 Market structure and current situation

The white maize<sup>5</sup> market is operated under a regulated system, governed by the National Maize Corporation (NMC) parastatal. The primary mandate of the NMC is to guarantee a competitive market for farmers, effectively operating as a buyer of last resort, and providing sufficient maize supplies to satisfy national demand. The NMC is also the only institution authorised to import white maize grain, which is mostly sold to the three large-scale millers (Ngwane, Universal and Sivuno). Maize meal imports are prohibited, with wholesalers only allowed to purchase domestically milled products. The NMC also manages the national reserves, with four silos located in each administrative region.

At the start of the marketing year in April, an annual domestic maize purchase price is established by the Maize Marketing Advisory Committee (MMAC), of which the NMC is a member. The 2015/16 price increased to SZL 2 575 per tonne from SZL 2 435 per tonne, largely in response to higher production costs. Maize farmers can sell their supplies at one of the four NMC silos. However, the large distances involved to transport their produce and the relatively small quantities of surplus supplies means that profitability is small or negligible, and therefore farmers often opt to sell in the informal market, mainly to homesteads in their locality. In addition, the NMC charges the cost of fumigating and drying to the farmer, further increasing transactions costs. On average, the NMC's annual local purchases account for approximately 5 percent of total human consumption.

**Figure 5: Swaziland – annual white maize imports 2009/10-2015/16**



Source: South African Grain Information Service (SAGIS) and CFSAM 2015 for 2015/16.

\* Estimated white maize import requirement for 2015/16.

<sup>4</sup> It should be noted that the livestock assessment was conducted prior to the late rains in May; however, the CFSAM observations and interviews with the RDA confirmed the poor pasture conditions and expectations of a negative impact on livestock conditions later in the year.

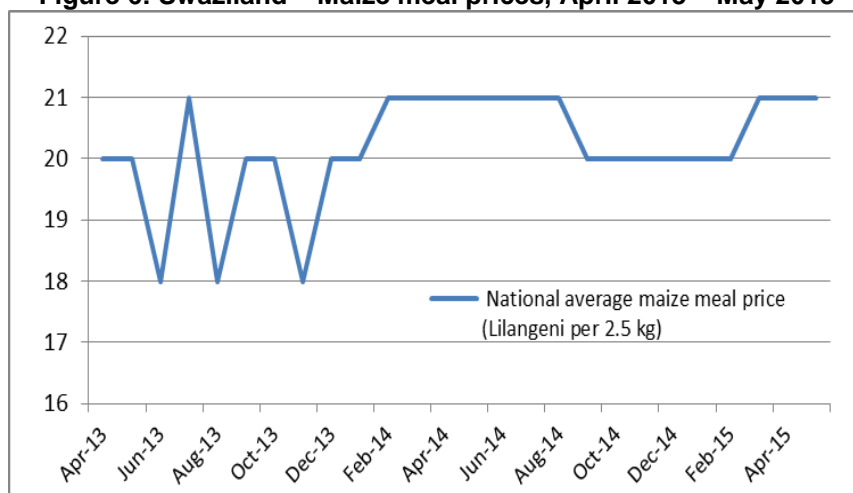
<sup>5</sup> White maize is used for human consumption, while yellow maize is mainly used as feed.

Swaziland is a net-importer of maize, and virtually all imports are sourced from the main regional exporter, South Africa. Between the 2010/11 and 2014/15 marketing years, annual white maize imports ranged between 14 000 and 56 000 tonnes, with the 2015/16 import requirement estimated at 43 000 tonnes. The NMC purchases maize from South Africa at the spot price. Currently, the NMC does not engage in price hedging, which potentially limits the country's ability to efficiently manage price risks.

As well as establishing a purchase price for domestic producers, the NMC fixes a retail price for white maize grain, set at SZL 3 375 per tonne in 2015/16. With rising prices in South Africa - in June 2015 the wholesale price of South African white maize was ZAR 2 886 per tonne, up 45 percent from its year earlier value - and the fixed selling price, this potentially increases the possibility of NMC operating at a loss. Similarly, under the fixed price structure consumers would not necessarily immediately benefit from decreasing prices in South Africa, until prices are revised by the MMAC.

Given the regulated price structure, there is limited variation in the national average maize meal price. As illustrated in Figure 6, prices have remained generally stable since the start of 2014. However, despite the stability, prices are generally higher than comparable South African maize meal products.

**Figure 6: Swaziland – Maize meal prices, April 2013 – May 2015**



Source: CSO.

#### 4.2 Cereal supply/demand balance, 2015/16

The forecast supply and demand situation for the 2015/16 marketing year (April/March) is presented in Table 14 and is based on the following assumptions:

- The Mission uses a mid-year population for 2015/16 of 1 286 million, based on an implicit annual growth rate of 1.5 percent, taken from the UN Population Statistic projections.
- Opening (carryover) stocks are estimated at 3 000 tonnes, with 2 000 tonnes held by the NMC and the remaining volume estimated to be held by millers and households. Closing stocks are estimated to remain at the same level.
- Maize production in 2015 is estimated at 81 623 tonnes, 31 percent below the previous year's bumper output and 6 percent lower than the average.
- The annual per capita consumption rates are based on historical apparent consumption levels derived from GIEWS cereal balances. At the national level, these rates are: 85 kg of (white) maize, 20 kg of wheat and 19 kg of rice.
- Feed use consists of yellow maize imported from South Africa. Based on annual import rates, 2015/16 feed consumption is estimated at 45 000 tonnes.
- Post-harvest losses are estimated at 16 percent for maize at the national level. Virtually all rice and wheat are imported, and hence no post-harvest losses were calculated.
- The seed rate for maize is estimated at 20 kg per hectare, and with the 2015/16 area planted expected to remain close to the above average level of 2014/15, total seed use is estimated at 1 800 tonnes.

**Table 14: Swaziland - Cereal supply/demand balance for 2015/16 (May/April)**

	<b>Maize</b>	<b>Wheat</b>	<b>Rice</b>	<b>Total cereals</b>
<b>Total domestic supply</b>	<b>84 623</b>	<b>1 000</b>	<b>1 000</b>	<b>86 623</b>
Opening stocks	3 000	1 000	1 000	5 000
Total production	81 623	-	-	81 623
<b>Total domestic utilization</b>	<b>172 170</b>	<b>26 720</b>	<b>25 434</b>	<b>224 324</b>
Food use	109 310	25 720	24 434	159 464
Feed use	45 000	-	-	45 000
Seed use	1 800	-	-	1 800
Losses and other uses	13 060	-	-	13 060
Exports	-	-	-	-
Closing stocks	3 000	1 000	1 000	5 000
<b>Estimated import requirements</b>	<b>87 547</b>	<b>25 720</b>	<b>24 434</b>	<b>137 701</b>

Source: CFSAM 2015.

Total maize utilization for the 2015/16 marketing year (April/March) is estimated at 172 170 tonnes against an estimated domestic availability of 84 623 tonnes, consisting of 81 623 tonnes production and 3 000 tonnes stocks. This results in an import requirement of 87 547 tonnes for 2015/16, comprising of about 43 000 tonnes of white maize (for human consumption) and 45 000 tonnes of yellow maize (for feed). At this level, aggregate maize imports are forecast 20 and 10 percent above 2014/15 and the five-year average respectively. Total cereal import requirements are estimated at 137 701 tonnes, of which about one third is wheat and rice.

As in previous marketing years, imported maize supplies are expected to be sourced only from South Africa, with approximately 9 000 tonnes already imported between May and June 2015. However, reduced 2015 harvests in most countries of the subregion is expected to result in increased demand for South African supplies. Furthermore, export availabilities of white maize from South Africa in 2015/16 are projected to decline by nearly 17 percent, owing to a sharp 30 percent production decrease in 2015. As a result, South African wholesale white maize prices have increased by 37 percent between January and June 2015, and were 57 percent higher than their levels of a year earlier, as markets reacted to the tighter supply outlook. This has increased importing costs compared to the previous year, and may led to an upward revision of grain and maize meal prices in Swaziland if the increases persist. However, despite the reduced supplies, it is expected that South African exports will still be sufficient to cover the needs of Swaziland.

NMC is the sole importer of white maize and has already placed contracts to import about one third of the estimated national requirement. While national requirements are expected to be fully met, the reduced production in the Lowveld and Lubombo Plateau resulted in higher requirements in these regions, and therefore increased supplies are needed to bridge their larger supply gap.

## **5. HOUSEHOLD FOOD SECURITY SITUATION**

### **5.1 Methodology**

In May 2015 a Team composed of FAO and WFP Officers and supported by the Swazi Government conducted a crop and food security assessment mission (CFSAM) in Swaziland. The assessment was composed of a household (HH) survey complemented with a market survey and a number of key informant interviews. Specifically the CFSAM HH survey covered 385 HHs country-wide, while the market survey covered 4 prime markets across the country and the key informant interviews related to in-depth discussions on agriculture activity with 14 Agriculture Extension Officers covering 14 of the country's 17 RDAs (Rural Development Areas) – see Overview.

The HH data collected by the CFSAM is representative at the national level only. Nevertheless, regional figures are provided as indicative of the subnational situation, being evaluated in the context of previous surveys and the situation as observed during field visits.

The CFSAM HH survey uses a two-tier HH identification process. First, cluster sampling was used to identify the 6 Agro-Ecological Zones (AEZs, shown in Map 1, Section 3.1) to be covered by the survey. AEZs were chosen rather than Livelihood Zones (LZs) as AEZs follow administrative boundaries and are easier for reporting and for proposing intervention areas.

The second-tier identification process was through purposeful randomized sampling where the identification of the enumeration area (EA) as well as the number of sites selected was given proportional weight to the population density in that AEZs, ensuring the CFSAM data was proportionally representative at national level. Swaziland's Central Statistics Office (CSO) was instrumental in providing support in randomly selecting the sites to visit.

The CFSAM HH survey was composed of six teams of four people. Each team was allocated a vehicle with a driver and a list of pre-designated EAs to be covered. Forty (40) sites were randomly selected by CSO, with ten households randomly selected in each site, yielding a total of 400 households. The actual number covered reached 385. Table 15 shows the breakdown of sites and households by region.

**Table 15: Swaziland – Number of sites and households sampled by CFSAM 2015**

Region	Number of Sites	Households (interviewed/planned)
Hhohho	11	117/110
Manzini	12	112/120
Shiselweni	9	79/90
Lubombo	8	77/80
<b>TOTAL</b>	<b>40</b>	<b>385/400</b>

Source: CFSAM 2015.

CFSAM enumerators were trained for two days prior to the survey familiarizing themselves with the questionnaire, interview techniques as well as on the use of the Android operated tablets through which they would collect the survey data. A pilot test of the tool was conducted prior to the survey to familiarize the enumerators further with the tool and to address/correct any issues and concerns enumerators may have had with the tool.

The 2015 Swaziland CFSAM HH Questionnaire covered 9 sections: HH Characteristics, Assets and WASH, Agriculture Production, Livestock, HH Revenue, HH Consumption Patterns, Food Consumption Score & Dietary Diversity, Coping Strategy Index & Shocks, and Nutrition. The sections and questions in the questionnaire were aligned with Swaziland's Vulnerability Assessment Committee (VAC) Reports to ensure data collected by the CFSAM could be compared with data provided from the VAC reports.

Prior to the 2015 CFSAM a number of food security assessments had already been conducted in Swaziland (Table 16). Food security analysis in this section of the report is based on a consolidated dataset consisting of data from the Annual VAC Reports dating back from 2006 to 2014, data from CFSAMs undertaken in 2007 and 2008 and an in-depth analysis of the maize sector in Swaziland conducted by Technoserve (a consulting firm) in 2013.

**Table 16: Swaziland – List of datasets used for the food security analysis**

Data	Date
VAC 2006	July 2006
VAC 2007	June 2007
CFSAM 2007	23 May 2007
CFSAM 2008	4 July 2008
VAC 2008	July 2008
VAC 2009	July 2009
VAC 2010	July 2010
VAC 2011	July 2011
VAC 2012	July 2012
Increasing maize productivity and food security in Swaziland - Technoserve	June 2013
VAC 2013	July 2013
VAC 2014	July 2014
Rapid Assessment Final Report	March 2015

Source: CFSAM 2015.

## 5.2 Food security context for 2014/15

### **Main drivers of food insecurity:**

The general food security situation for Swaziland until the next harvest in early 2016 will be mostly influenced by the fall in maize production across the country due to poor performance of the rainfall season (see section 3.8). However, the food security impact of this drop in maize production is much enhanced by a variety of other more longstanding effects:

A large proportion of the population (70 percent), live in rural areas and has a high dependence on small-scale rain-fed farming for staple food supply. Poorly integrated food markets, the high price of agricultural inputs and food imports and the very low incomes of rural small holders, enhance their exposure to climate shocks and magnify the role of climate as a driver of food insecurity. Therefore, spatial patterns of food insecurity are tied to those of climate (itself largely determined by topography).

### **Climate and Topography:**

Swaziland has seven different livelihood zones, which by and large reflect the country's four main agro-ecological zones (Map 1 above). Most of the country's farmers live in the Middle-Veld compared to the other regions (Highveld, Lowveld and Lubombo Plateau).

Even though most of the country's smallholder farmers practice rain-fed agriculture, production levels vary considerably across the country. In general, the nation's wetter western-highlands and upper middle-veld tend to produce abundant harvests and higher yields of maize (2 t/ha and above), easily exceeding the typical HH's annual maize requirement of 510 kg (estimated at about 85 kgs per person per year). Therefore, the Highveld and Upper Middleveld areas tend to be food secure areas.

In contrast, as one moves eastwards to the drier, low-lying areas, annual maize harvests deliver smaller yields up to the point that in the Lowveld many farmers repeatedly mentioned frequent maize crop failures. Moving further eastward on to the Lubombo Plateau maize harvests do increase as this region receives higher levels of precipitation; still, yields in this region lead to production levels on average below the annual requirements and HHs tend to be net food buyers.

The fact that most Swazi smallholders show little crop diversification and depend mainly on maize is another contributor to the food security situation: maize has significant water requirements and high sensitivity to water shortages during key stages of its development. In some areas of the country, seasonal rainfall amounts may fall consistently below requirements or have a significant likelihood of dry spells during the key stages.

### **Crop production in 2015:**

The poor performance of the 2014/2015 rainfall season (see section 3.6), led to a drop in Swaziland's maize production relative to last year and the five-year average. Although the aggregate drop is small compared to the average, there are significant sub-national variations, with much larger shortfalls in production being verified in the more marginal and food insecure areas.

### **HIV-AIDS:**

HIV-AIDS disproportionately affects main income earners and caregivers. This is revealed by the high infection rates in the 15-49 age group (26 percent). This contributes toward poverty and a greater vulnerability of households to production and/or price shocks through decline of income and decreased crop production and livestock (from lower labour availability)

### **Main shocks affecting HHs in 2015:**

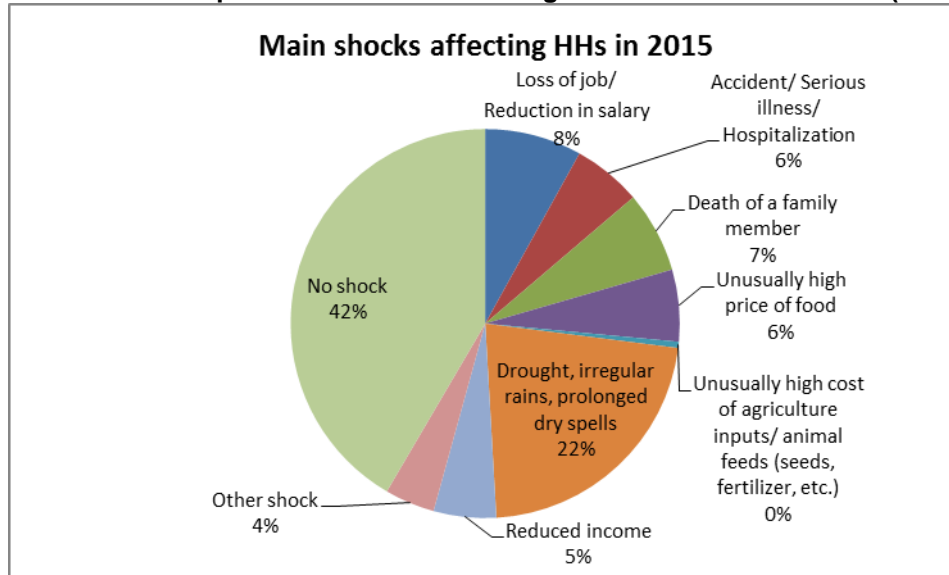
The pie chart in Figure 7 below highlights the shocks affecting HHs in 2015. About 42 percent of respondents reported no shocks affecting their livelihoods in 2015; however two thirds of these were located in Hhohho and Manzini, regions where the 2014/15 season rainfall was better and not too far from the maize crop requirements.

The shock most frequently mentioned by households was droughts and erratic rains with 22 percent; the majority of these households are found in the Shiselweni and Lubombo regions, most affected by poor

rainfall performance. Income related shocks (loss of job, reduced income, high food prices) were cited by 19 percent of respondents.

The relative ranks of shocks have remained similar during the past few years, showing the importance of climate factors in household food security, complemented by poverty related issues. Illness and death issues (together accounting for 13 percent) mostly reflect the underlying HIV-AIDS effects on households.

**Figure 7: Swaziland – Proportion of shocks affecting households in 2014-2015 (national level)**



Source: CFSAM 2015.

### 5.3 Livelihood profile

Livelihood profiles are instrumental in illustrating food security dynamics in a country. In the CFSAM HH survey, HHs were asked to list their most important source of income. Income sources were then grouped into the following nine main livelihood groups:

- Agriculturalist: growing and sale of cereal and other crops.
- Agro-pastoralist: sale of livestock and livestock products.
- Unskilled labour: includes both agricultural and non-agricultural work.
- Trader: small business activities and non-agriculture related petty trade.
- Salaried work and skilled labour.
- Artisan.
- Pensioner/retiree.
- Others: includes aid external to the HH (kinship, borrowing, food assistance, remittances).

An overview of the main livelihood groups and how they are distributed across the country is presented in Table 17. Analysis of variations in food security indicators across these livelihood groups is included in the following sections.

**Table 17: Swaziland - percent reporting the following livelihood group as their primary income source**

Region	Agriculturalist	Agro-Pastoralist	Unskilled labour	Trader	Salaried worker	Artisan	Pensioner/Retiree	Other
Hhohho	2.7	0.9	12.4	16.8	48.7	0.9	13.3	4.4
Manzini	8.7	2.6	4.3	13.9	46.1	2.6	11.3	10.4
Shiselweni	9.9	3.7	12.3	13.6	34.6	0.0	14.8	11.1
Lubombo	1.4	6.9	22.2	16.7	19.4	1.4	16.7	15.3
<b>National</b>	<b>5.7</b>	<b>4.2</b>	<b>11.7</b>	<b>15.1</b>	<b>39.0</b>	<b>1.3</b>	<b>13.5</b>	<b>9.6</b>

Source: CFSAM 2015.

It is evident from Table 17 that at the national level most (39 percent) HHs derive their primary income from salaried work. The next most important income groups are traders with 15 percent, pensioners at 13.5 percent and unskilled labour at 11.7 percent. HHs dealing primarily in agriculture and agro-pastoralism cover only 10 percent of the population.

Adding unskilled labour (which includes both agricultural and non-agricultural manual work), it is feasible to estimate that not more than 22 percent of the population derives its main income from agriculture. This is a low figure seeing that 70 percent of Swazi are known to be farmers; this suggests that most farmers do not cultivate enough to meet their HH needs and therefore depend on other sources of income or put another way, farming is an important source of staple food for households which depend on other activities for income.

Table 17 also looks at the variation across the country. Even if the data is not statistically representative it gives some indication of what trends may look like in the region.

Shiselweni and Lubombo make up the large majority (3.7 and 6.9 percent) of agro-pastoralist activities, as these are the areas of the country where cattle grazing takes place. In Manzini and Shiselweni, 8.7 and 9.9 percent, respectively, of households reported that agriculture was the main HH income source, while only 2.7 percent of households in HHohho derived their main income from agriculture. Lubombo registers only a small minority of agriculturalist households (1.4 percent) as the region's lower rainfall volumes make it difficult to cultivate. It also has the lowest rate of households engaged in salaried work and the highest for unskilled work, reflecting lower economic development. Salaried work rates are highest in HHohho and Manzini (48.7 percent and 46.1 percent respectively), as these regions are home to the two largest cities in the country (Mbabane and Manzini).

#### 5.4 Recent food security situation and evolution

The household food security status is determined by three components:

1. Food consumption, based on dietary diversity and food frequency.
2. Food access, based on access to markets, the share of food expenditure and the reliability and sustainability of income activities pursued by the HH.
3. Coping strategies derived from the frequency and severity of different coping strategies employed by HHs.

Based on these factors, HHs are classified into one of three categories: severely food insecure, moderately food insecure and food secure. The first two levels grouped together are referred to as 'food insecure' for short.

#### **Overall food insecurity levels:**

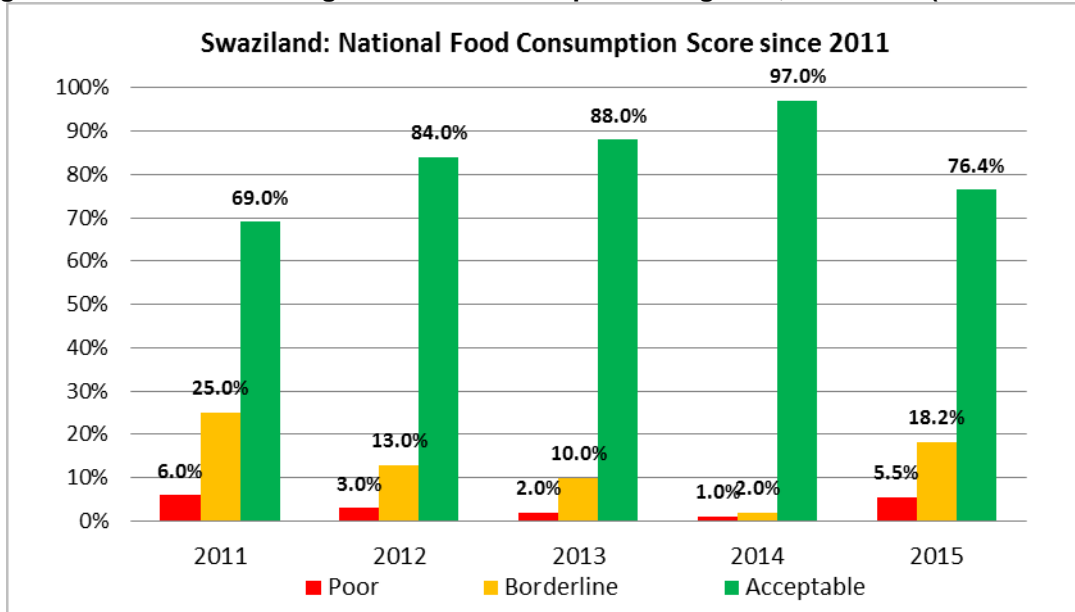
In May 2015, food insecurity levels across the country have increased compared to previous years indicating a worsening of the food security situation. Moderate food insecurity increased to 18.2 percent from a previous four-year average of 9.8 percent, acute food insecurity increased to 5.5 percent from an average of 3 percent and food secure HHs decreased to 76.4 percent from an average of 83.3 percent.

This makes clear the impact this season had on food security. The progress made since 2011 leading to lower proportions of food insecure population has been clearly interrupted and proportions of food insecure are now close to those of 2011.

This highlights the continuing vulnerability of Swaziland to weather induced shocks. A succession of seasons without significant rainfall shortages allowed progress to be made, but a single season with poor rainfall during key maize development stages was all it took to reverse the gains made in the last 5 years.



**Figure 8: Swaziland – Changes in food consumption categories, 2011-2015 (national level)**

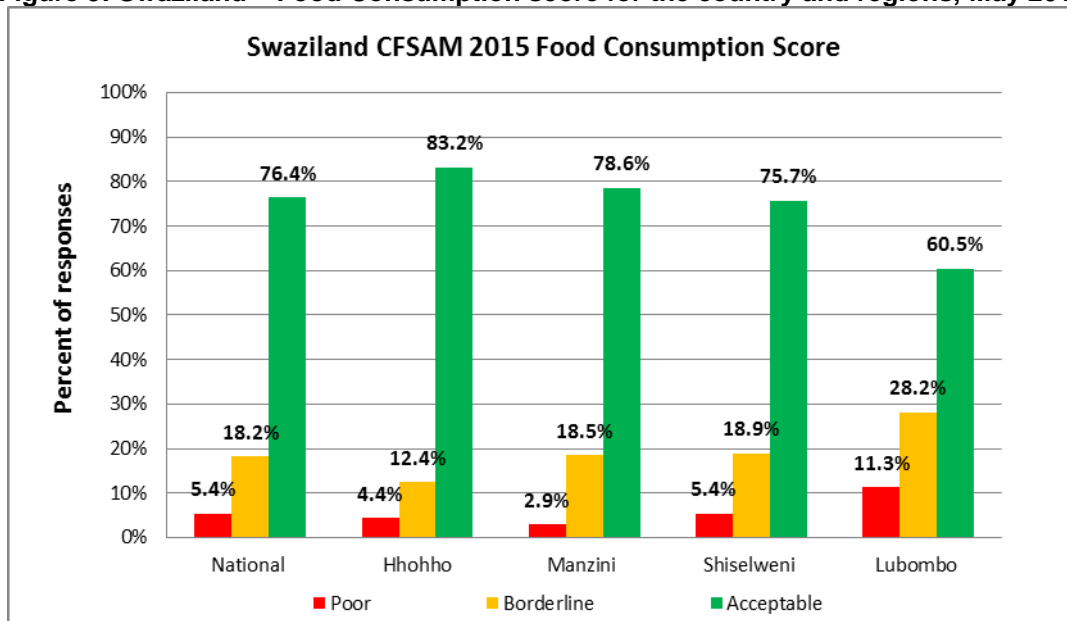


Source: CFSAM 2015.

- **Where are the food insecure**

Figure 9 depicts the regional FCS variation. Lubombo is the worst affected region with 11.3 percent of HHs falling into the poor food consumption category and 28 percent in the borderline food consumption. Shiselweni is next with 5.4 percent and 18.9 percent respectively. Hhohho and Manzini are better off, the latter being somewhat better than the national aggregated picture.

**Figure 9: Swaziland – Food Consumption score for the country and regions, May 2015**



Source: CFSAM 2015.

- **Seasonal food insecurity patterns**

Swaziland's food insecurity rates do change throughout the year. Food insecurity is at a minimum in May-June just after the maize harvest, when household stocks are full and food prices tend to be lowest. They gradually worsen until the start of the lean season in September-October, when household stocks are exhausted or reach a minimum and food prices are higher. Hence, for the next few months, a worsening of the food security situation as we move closer to the lean season is to be expected, given lower initial household maize stocks and possibly higher commodity prices.

This is underlined by survey data focusing on the amount of time that the stocks from the 2015 harvest would last the household.

Table 18 shows the expected average duration of maize harvests between 2014 and 2015. Clearly households report that the 2015 harvested maize will last less than in 2014 – nationally this difference amounts to just over 1 month (5 versus 6 months). This hides considerable regional differences – the region in Swaziland which has seen the biggest change is Lubombo where stocks are judged to last on average three months less.

**Table 18: Swaziland - Average 2014 and anticipated 2015 household maize stock duration from own production**

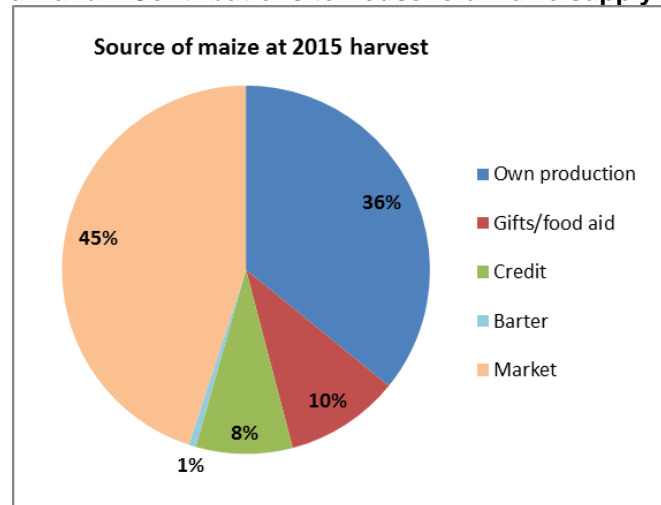
Region	Duration of household stocks 2014 (months)	Expected duration of household stocks 2015 (months)	2015 vs 2014 (percent)
Hhohho	7.4	6.0	-19
Manzini	6.4	5.1	-20
Shiselweni	5.3	5.0	-6
Lubombo	4.9	1.8	-63
<b>National</b>	<b>6.1</b>	<b>4.8</b>	<b>-22</b>

Source: CFSAM 2015.

#### 5.5 Sources of household staple food supply: markets and production

The CFSAM survey asked HHs to indicate their sources of maize over the past 30 days. The results indicate that even in the immediate post-harvest period up to 45 percent of respondents had bought their maize and only 36 percent mentioned that the maize they were consuming came from their own production.

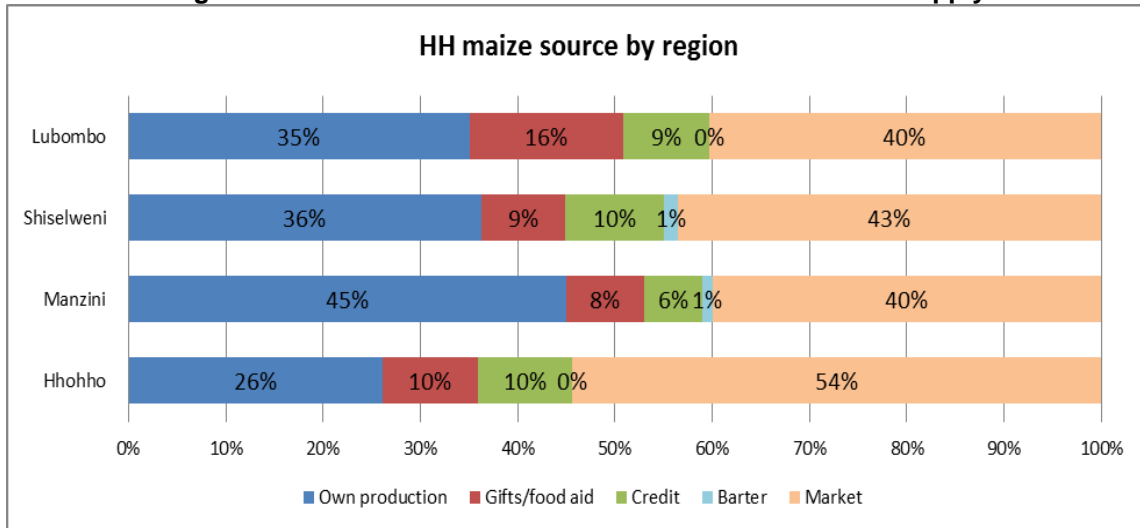
**Figure 10: Swaziland – Contributions to household maize supply (national level)**



Source: CFSAM 2015

Breaking the national level figures into results by region we see that markets account for at least 40 percent of the household maize supply, being the major supplier except in Manzini. Hhohho stands out somewhat as this proportion reaches about 55 percent - this is where salaried and informal work based livelihoods are more important and agriculture based ones less significant. It is also where markets seem to be better integrated. This reinforces the importance of markets in household food supply even soon after harvest.

**Figure 11: Swaziland – Contributions to household maize supply**



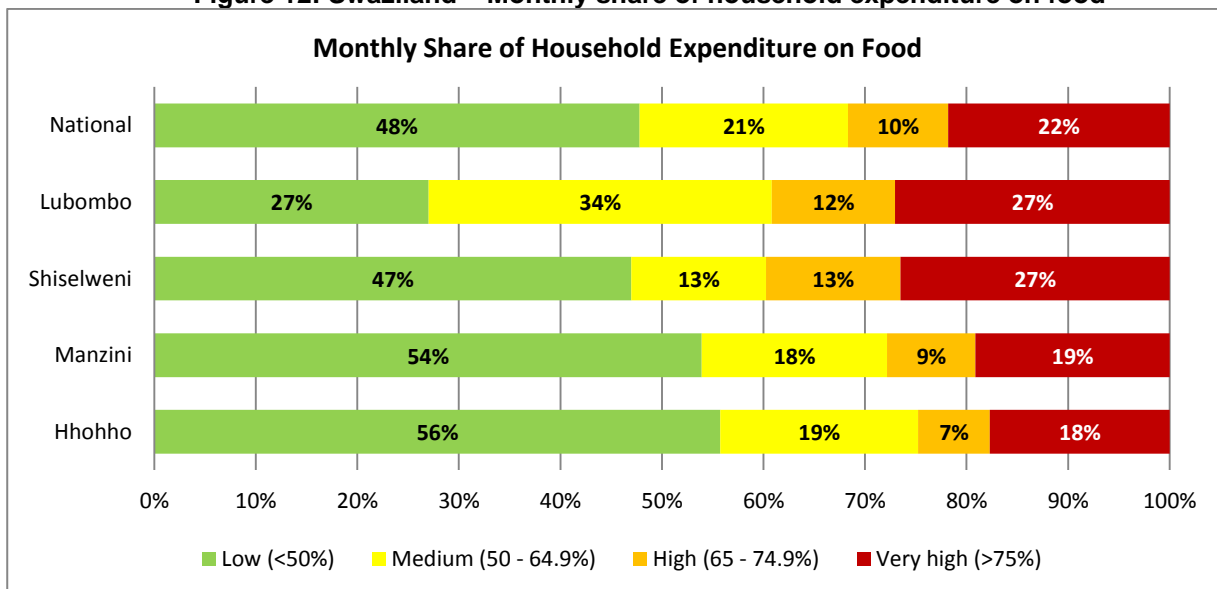
Source: CFSAM 2015.

### 5.6 Food expenditure: situation at harvest

Households spend a large proportion of their incomes on food. Nationally, 52 percent of HHs spend 50 percent or more of their incomes on food just after the harvest period. Nearly a third (32 percent) of sampled households have high (65-75 percent) or very high (>75 percent) proportion of income spent on food.

With 70 percent of HHs being farmers, these are high rates of expenditure on food especially as the CFSAM survey was conducted just after the harvest when HH maize stocks are highest. As the lean season approaches and prices of the staple increase, HH expenditure on food is expected to increase further.

**Figure 12: Swaziland – Monthly share of household expenditure on food**



Source: CFSAM 2015.

These high rates of food expenditure imply that significant numbers of households are too poor to invest in improved food cropping methods hereby constantly remaining locked in the poverty cycle and have little to no capacity to cope with production losses or price rises.

The regional picture is as expected: the regions that are most exposed to dry spells and rainfall deficits, Lubombo Plateau and Shiselweni, are the ones with higher proportions of households with high and very high expenditure on food (about 40 percent on both)

Table 19 shows the average HH expenditure on food by livelihood group. Understandably the agriculturist spends the lowest share of income on food. The livelihood group with highest proportions of income spent on food is the unskilled labour, since they may grow less of their own food and are most likely one of the poorer livelihood groups.

**Table 19: Swaziland – Food expenditure share by livelihood group**

Livelihood group	Share of HH total expenditure spent on food (mean) (percent)
Agriculturist	25.4
Agro-pastoralist	41.6
Unskilled labour	61.9
Traders	32.1
Skilled labour	45.8
Regular employee	31.9
Artisan	39.8
Pensioner/retiree	42.5

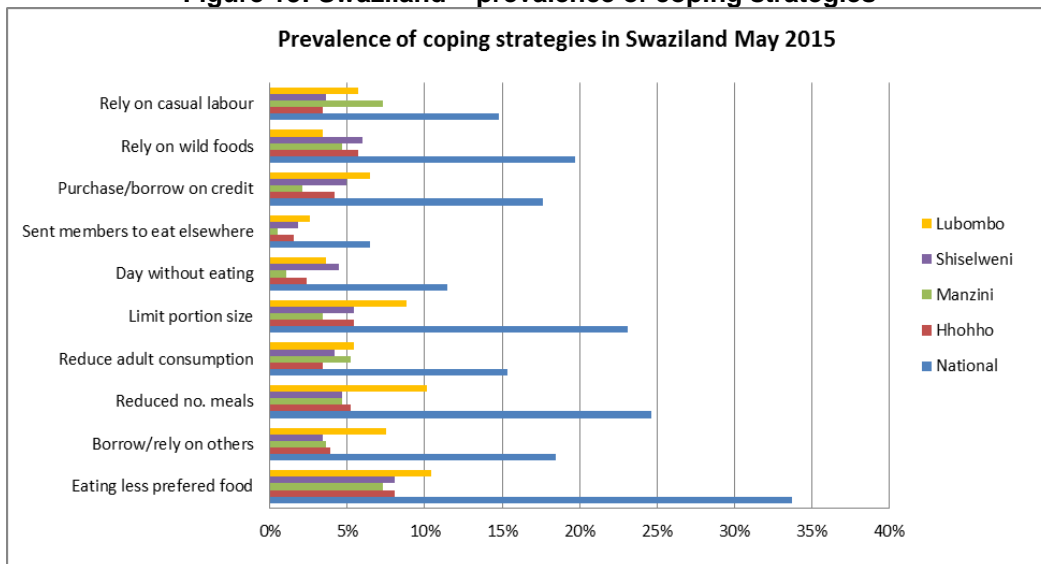
Source: CFSAM 2015.

### 5.7 Household coping strategies

The most widely adopted coping strategies involve eating less preferred foods, limiting portions and reducing meals. The least favoured (and last resort) coping strategies seem to be sending HHs members to eat elsewhere, spending entire days without eating, borrowing/relying on others and gathering wild foods. Figure 13 illustrates the coping strategy index (CSI) of Swazi HHs in May 2015.

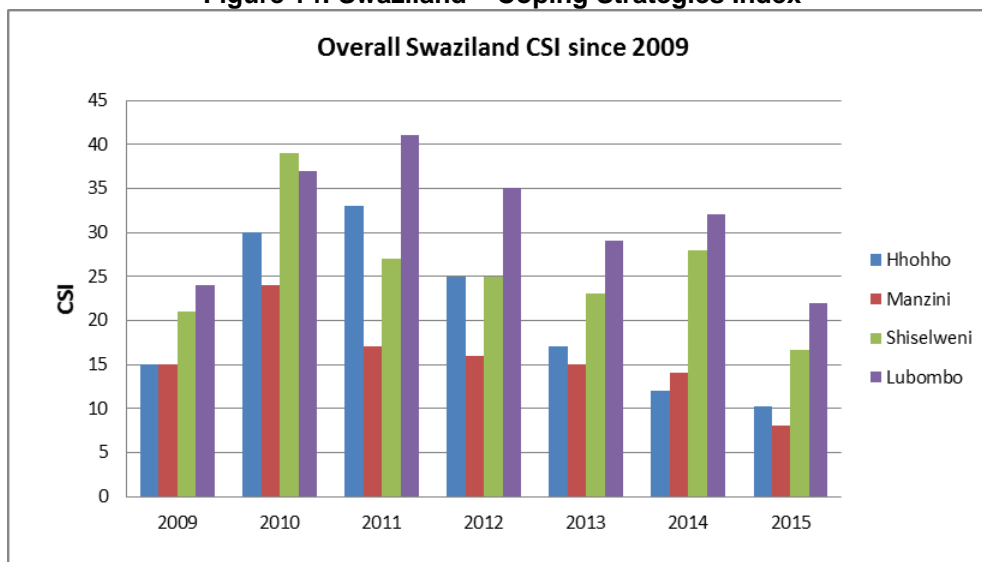
The degree of adoption of the coping strategies is seasonal and is heavily affected by trends of food availability and access. This means that more pronounced adoption of coping strategies can be expected in the lean season (October-March).

**Figure 13: Swaziland – prevalence of coping strategies**



Source: CFSAM 2015.

**Figure 14: Swaziland – Coping Strategies Index**



Source: CFSAM 2015.

Comparing Swaziland’s 2015 CSI to previous years (Figure 14), shows that the CSI is at its lowest level in six years. The low rate in 2015 is partly explained by the timing of the CFSAM survey, which took place in mid-May just after the harvest period, while the CSIs from previous years were typically collected a month later by the VAC. What this graph also explains is that even just after post-harvest (at the best time of year for the typical rural HH), adoption of coping strategies are still undertaken thereby highlighting a difficult year ahead for these HHs.

#### 5.8 Malnutrition

Chronic malnutrition is the greatest nutritional concern and a major development challenge. Stunting affects one out of four (25.6 percent) children under five years, a prevalence rate that is classified as ‘medium severity’ (WHO). Prevalence is higher among orphans and vulnerable children and in rural areas. The 2013 Cost of Hunger in Swaziland study highlighted the severe social and economic consequences of stunting – costs of 3.1 percent of GDP and clear impacts on children’s productivity and potential with dire long term consequences, beyond those of enhanced mortality and poor health.

The factors associated with stunting (poor postnatal care, HIV/AIDS, poor access to sanitation, and low maternal education) connect to underlying poverty

#### 5.9 Estimated rural food assistance requirements

The food assistance requirements have been estimated using the the food consumption score (FCS) results applied to the official United Nations Swaziland rural population figure of approximately 1 012 million people.

A proportion of 5.4 percent poor FCS (at the time of the survey) corresponds to 50,706 people that can be considered as food insecure and requiring assistance. 18.2 percent of borderline FCS corresponds to 170,989 people who risk falling into the food insecure group as the lean season approaches.

**Table 20: Swaziland – Proportion and number of people at different levels of food insecurity**

Swaziland	Poor	Borderline	Acceptable
Percent	5.4	18.2	76.4
Number	54 626	184 112	772 886

Source: CFSAM 2015.

The data per region, even if not statistically representative, shows that the region with the highest number of people in rural areas not meeting their dietary needs is in Lubombo with about 20 000 people. The other regions have broadly similar numbers (just over 9 000 for Manzini to just under 11 000 for Hhohho).

**Table 21: Swaziland – Proportion and number of people at different levels of food insecurity (disaggregated by region)**

Region	Poor	Borderline	Acceptable
Hhohho			
Percent	4	12	83
Number	12 397	35 462	240 449
Manzini			
Percent	3	19	79
Number	9 894	61 010	258 880
Shiselweni			
Percent	5	19	76
Number	9 357	35 558	142 232
Lubombo			
Percent	11	28	61
Number	22 700	57 783	125 884

Source: CFSAM 2015.

## 6. RECOMMENDATIONS

### 6.1 Markets

- (i) Investigate opportunities to promptly secure the import requirements (based on the CFSAM's food balance sheet parameters) of white maize (for human consumption) through the NMC, in consideration of expected tighter subregional supplies and lower availabilities in South Africa.
- (ii) Closely monitor subnational maize supplies in the Lowveld and Lubombo Plateau to ensure they satisfy demand.
- (iii) Investigate opportunities for NMC to open regional silos earlier than normal, given the estimated decrease in household stocks this year.
- (iv) Review possibility of opening smaller satellite silos in high maize deficit areas, to improve access for net-purchasing households from NMC silos.
- (v) Establish grain banks at communal and regional to reduce post-harvest losses. This will positively contribute to the preservation of produce, improving availability, but also cushion farmers who will sell their produce soon after harvesting to meet urgent financial needs.

### 6.2 Agriculture

- (vi) To strengthen the agricultural capacity of small-scale farmers, particularly in light of the chronic low yields in the Lowveld and Lubombo Plateau, support should focus on:
  - Scale-up support to farmers in production, marketing, post-harvest handling, grading and quality control of their produce.
  - Enhance smallholder farmers' access to market, including the reduction of transaction costs through the establishment of markets in remote areas to gather and stock excess harvest.
  - Ensure adequate supply of mechanics and spare parts to improve tractor maintenance.
  - Promotion of more drought-resistant food and cash crops, in conjunction with improving farmers' market access for these crops.
  - Continued input support to vulnerable groups in the Lowveld and the Lubombo Plateau.
- (vii) An in-depth and spatially explicit study of the climate risk associated with maize planting adapted to local varieties and current practices is required in order to provide a proper quantification of the impacts of rainfall variability and current trends upon subnational patterns of crop production and its food security impact.

### 6.3 Institutional

- (viii) Swaziland to consider applying to the African Risk Capacity (ARC) drought sovereign insurance scheme as a means for financial support during drier than average cultivation seasons.
- (ix) The National Meteorological Service should be strengthened in terms of providing improved services in the area of real time early warning and monitoring of the agricultural growing season, in coordination with the MoA's National Early Warning Unit. A wider capacity development drive is needed. Collection, availability and possibly storage of rainfall and other weather data needs to be improved, as well as strengthening accuracy of information to avoid inconsistencies with data collected at RDA level.
- (x) In-depth review of the national agriculture statistics, to promote the full integration of data analysis

and dissemination between the Ministry of Agriculture, Central Statistical Office and the Meteorological Service.

#### 6.4 Food security

- (xi) The government should ensure that the Swaziland Vulnerability Assessment Committee (SVAC) surveys are not discontinued. CFSAMs cannot serve as replacements and the accumulated information of several years of SVAC surveys constitutes a wealth of information that can inform Government policies aiming at reducing vulnerability to inter-annual variations in rainfall. UN Agencies can provide advice on streamlining and improving the efficiency of the survey.
- (xii) The Government also needs to ensure that innovations are applied that can improve the efficiency in data collection and processing, e.g. through use of mobile data collection platforms. The current mission used them successfully with minimal set-up time, strongly suggesting that sizeable benefits could be gained from a modest investment.
- (xiii) Government in conjunction with WFP and FAO should explore the appropriateness and feasibility of cash based interventions in order to support vulnerable populations.