Thematic report – 25 April

AFRICA
Fall Armyworm Outbreaks

	Not required	Low	Moderate	Significant	Major
Need for international assistance			X		
	Very low	Low	Moderate	Significant	Major
Expected impact		X			

Crisis impact

Update since 23 March: The further spread of Fall Armyworm was observed in Ethiopia, Kenya, Malawi, Tanzania, and Zimbabwe in March. Damage from existing outbreaks was also sustained in Rwanda, Uganda, and Zambia. While further outbreaks are expected only in northern Tanzania in the coming months, all countries are advised to continue monitoring diligently and to apply appropriate preventative measures. Although the Fall Armyworm season is expected to end in June, long-term impacts are expected for affected countries, and neighbouring countries should also remain diligent. (Lancaster 05/04/2017; Reuters 13/04/2017)

Outbreaks of Fall Armyworm, *Spodoptera frugiperda,* were reported in Botswana, DRC, Ghana, Kenya, Malawi, Namibia, South Africa, Swaziland, and Zambia. Regionally, around 330,000 hectares of staple crops, especially maize, have been affected. The remaining southern African mainland countries remain at high risk.

The severity of the impact on regional crop production is yet to be established. The damage caused by the infestation depends on the stage at which the pest attacked the plant. Crops that were infested during the early stages of crop development, in late December, had to be replanted, while those infested later in their growth seem to have recovered without intervention.

Households dependent on maize production as well as El Niño-affected families are particularly vulnerable to this new shock as they have already been exhausting their coping mechanisms due to sustained drought, livelihood loss, and food insecurity.

Anticipated scope and scale

Given that Fall Armyworms can affect almost all types of crops, especially maize and cereal, the loss of agricultural production, the main source of income, and food for households in many countries in the region is likely to impact on the food security situation.

It is also highly likely that other neighbouring provinces and/or countries will be affected, given the high speed at which the worms spread.

Priorities for humanitarian intervention

Food security is a concern in many of the affected countries. Disruptions to food availability or access may compound food insecurity.

Livelihoods: Agriculture is an important source of income for much of the rural population in the affected countries. Crop damage is a concern and livelihood assistance is a major priority.

Humanitarian constraints

The Fall Armyworm problem is compounded by how new the pest is to the region, its resistance to commonly used pest control chemicals, and the rainy season, which reduces the effectiveness of chemical operations.

Limitations

Regular updates on the impact on crops as armyworms are spreading in different areas are needed to assess the extent of damages and potential needs of the population.

Information on the impact of Fall Armyworms on water supplies is also missing.

Regional overview

Economic impact

Agricultural products from countries with confirmed outbreaks could face import bans as the armyworm is classified as a quarantine pest, resulting in lower revenues (Reuters 30/01/2017).

Vulnerable groups

Farmers: Households dependent on maize production for access to income are expected to be particularly affected by crop damage. Farmers are likely to be disproportionately impacted by the outbreak as they will not be able to afford the expensive counter-measures, such as USD10/hectare chemical costs (FAO 24/02/2015).

Households affected by El Niño: El Niño-induced drought has affected approximately 40 million people in southern Africa, including around 23 million who are in urgent need of humanitarian assistance. The most affected countries are Mozambique, Zimbabwe, Madagascar, Lesotho, Malawi, Swaziland, Angola, and Zambia. Families in many parts of the region have been exhausting their remaining food stocks earlier than usual due to poor or failed harvests. More than 50% of the population in six countries in the region rely on agriculture for employment. The armyworm outbreak will further exacerbate their vulnerability (OCHA 16/08/2016).

Aggravating factors

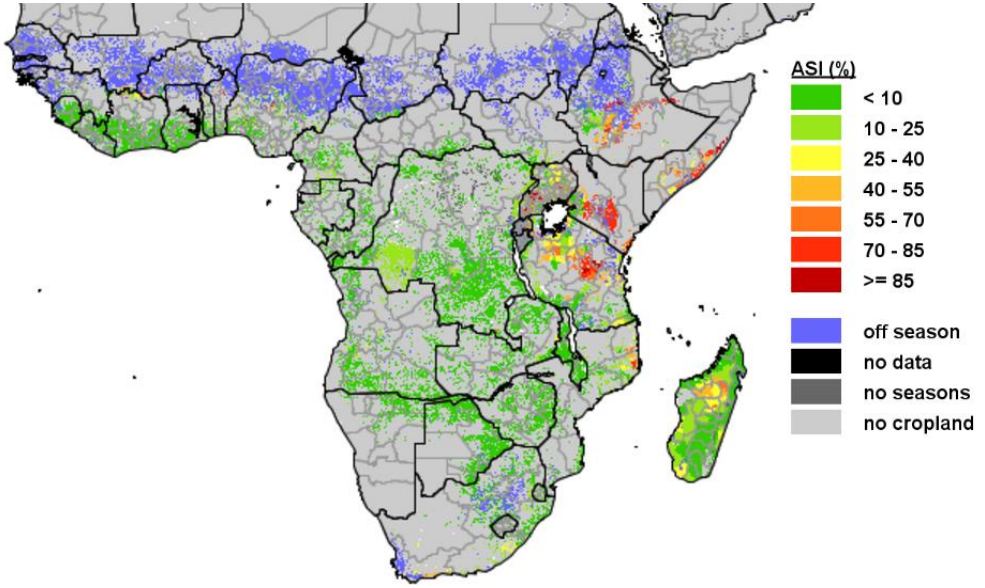
Resistance to pesticide: This strain of Fall Armyworm, collected from maize in North Florida, has shown resistance to commonly used insecticides. (Pesticide Biochemistry and Physiology 01/1991). It seems to have also developed some resistance to current chemical pesticides, limiting the effects of the ongoing response (RFI 27/02/2017).

Rains: The affected region is in the middle of the rainy season. Incessant rainfall is reducing the effectiveness of the chemical applications in some areas (FEWSNET 28/02/2017).

African armyworms: A different caterpillar, the African armyworm, exacerbates the food insecurity caused by Fall Armyworms. In December 2009, infestation by the African Armyworm was declared in ten regions of Tanzania - three of which were the main grain-producing regions (All Africa 31/12/2009). In January 2015, African armyworm outbreaks were reported in Zimbabwe (All Africa 01/01/2015). The same year, Malawi successfully contained an African armyworm invasion that affected seven districts (Reuters 24/01/2017). African armyworms outbreaks continue were seen in Botswana and Malawi (Stratfor 23/02/2017).

Water Stress: The map below indicates the cropped areas that are likely to experience drought. Drought will further aggravate food insecurity caused by armyworms (FAO 02/04/2017).

Agricultural Stress Index: Percentage of cropped areas suffering from water stress, April 2017



Source: FAO 02/04/2017

Potential aggravating factors

Loss of livestock: African Armyworm-related cattle poisoning can occur when recently infested pastures are grazed, resulting in cattle death (FAO 24/02/2015). Deaths among cattle grazing on recently infested pasture have been reported by herdsmen in southern Ethiopia, Somalia (where 100 cattle were reported to have died on one occasion), Kenya, and southern Africa. Speculations as to the causes of death include high cyanide levels caused by armyworm damage in some types of grasses, and ingestion of caterpillars or fungal mycotoxins on armyworm faeces (Biovision 06/03/2017).

WASH: In 2009, a caterpillar *(Achaea catocaloides)* in Liberia caused vast WASH needs due to the large volume of faeces contaminating wells and waterways in the 65 towns affected. It is unclear to what degree similar effects are likely for the current Fall Armyworm outbreak (FAO 22/01/2009).

Local and national response capacity

Intensive control operations were undertaken by farmers in the affected countries throughout January, including technical assistance from governments. Despite ongoing response, the high cost of combating armyworms poses a risk to local response capacity. This is the case in countries with higher capacity such as Kenya, where pesticides can cost USD194 per litre, as well as South Africa. (All Africa 18/04/2017; The Conversation 12/02/2017).

International response capacity

Between 14 and 16 February FAO held emergency meetings in Harare on how to stop the spread of armyworms in the region (DW 14/02/2017). Sixteen East and Southern African countries agreed on plans of action to bolster the region's response capacity to crop pests and livestock diseases, including information dissemination and effective regional coordination (FAO 16/02/2017).

FAO will support countries in implementing assessments aimed at understanding the extent and intensity of the armyworm threat to the region. Assessment efforts will be conducted in collaboration with the South African Development Community and other local partners and stakeholders. In addition, FAO has initiated the procurement of pheromone insect lure traps, used for capturing armyworm and monitoring their spread (FAO 16/02/2017). Options beyond pesticides are being investigated by FAO, such as isolating affected areas by digging trenches, using predator birds or burning infested crops (La Croix 15/02/2017).

Researchers are working to understand how this armyworm spreads and how an outbreak can be controlled in an environmentally friendly way (Kenya Daily Nation 14/02/2017).

Population coping mechanisms

Some farmers started procuring their own chemicals and seeds to supplement what the Government was providing, notably in Zambia (FEWSNET 28/02/2017). Damage to crops due to armyworms and the consequent impact on livelihoods will likely aggravate the use of negative coping strategies (Government of Zimbabwe 20/07/2016).

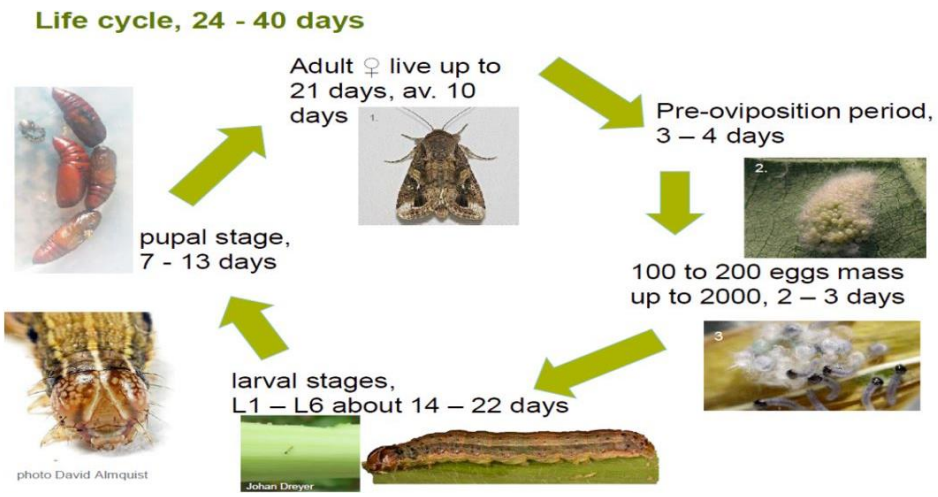
Contextual information

Fall Armyworm

Spodoptera frugiperda is a strain of Fall Armyworm native to South and Central America, but also occurring in the southern United States. The worm was first detected in Africa continent in 2016 in Nigeria, and had spread to several other West African countries and to Central Africa by April 2016 (Government South Africa 01/02/2017).

From October to December (the rainy season) the moths lay their eggs on grasses and crops. Their hatched larvae, which grow to 2–5cm, march in groups, devouring any food sources they come across. They subsequently pupate to form moths, each of which can fly up to 1,000km and lay 1,000 eggs in its 10-day lifetime (Nature 2009). This pest has a wide host range – over 100 different crops from 27 different species, including maize, rice, sorghum, soybeans, groundnuts, and potatoes (Le Monde 20/02/2017; Government South Africa 01/02/2017). As this pest is very new in Africa, very little is known on its long-term effects.

Fall Armyworm lifecycle



Source: South African Department of Agriculture, Forestry and Fisheries, 08/03/2017

Damage and losses caused by Fall Armyworm

In the United States, the Fall Armyworm ranks second among seven of the most damaging agricultural pests leading to significant economic losses. A study estimates that total losses in the US range from USD 39 million to USD 297 million annually and that related annual maize yield loss is 2% (International Maize and Wheat Improvement Center 23/02/2017). In Brazil armyworms can breed all year round, and controlling them incurs in costs estimated at USD 600 million a year (Bloomberg 16/01/2017).

Control measures

Spraying chemical insecticide has been used in response to armyworm outbreaks, although major drawbacks exist with this method. The Fall Armyworm is often inaccessible to insecticides because of their tendency to hide in the whorls and reproductive parts of the host plant, limiting the effects of spraying (The Conversation 12/02/2017).

Previous caterpillar infestations in Africa

African Armyworms were already a serious pest in Kenya, Tanzania, and surrounding countries, but when numbers are really high, as seen in 2005, their impact can be catastrophic, with larval densities exceeding 1000 per square metre and crops being destroyed in a matter of hours (Global Food Security 12/2009).

In 2009, in Liberia, a state of emergency was declared after it was invaded by a new species of caterpillar (*Achaea catocaloides*). The Ministry of Agriculture reported that up to 20,000 people left their homes after their fields were destroyed by a similar caterpillar and food at markets had more than doubled cost in surrounding areas.

Democratic Republic of Congo (DRC)

Update: No new armyworm-specific information has been found since February. Flooding has damaged maize and rice crops in Mitwaba territory, Haut-Katanga, and affected more than 30,000 landowners. It is expected that these floods, along with further armyworm spread, will continue to impact food security in the region (Radio Kapi 06/04/2017).

Since mid-December 2016, Fall Armyworms have destroyed thousands of hectares of maize and rice crops in the southeastern provinces Haut-Katanga, Haut-Lomami, Lualaba, Tanganyika and Sud Kivu (OCHA 15/02/2017). 63,000 hectares have been destroyed, which represents over 80% of maize production in the territories along the Zambian border (OCHA 15/02/2017; Straitstimes 26/02/2017). Taking into account the speed at which the worms spread, it is highly likely that other neighbouring provinces, especially Nord-Kivu, Ituri, Maniema and Kasai, are already affected. The extent of the spread would result in a significant impact on the local corn production (FEWSNET 28/02/2017).

Food and livelihoods: According to FAO, the Inspection Provinciale de l'Agriculture du Haut-Katanga and Lubumbashi University, the armyworm attack rate is above 62.5% with a crop loss rate above 40% in Haut-Katanga, which will result in a decrease in production (FEWSNET 28/02/2017). According to an FAO and Agriculture Ministry assessment in February in Kambove territory, Haut-Katanga province, over 80% of 66,000 hectares of crops have been destroyed due to armyworms (OCHA 15/02/2017). In Pweto, Kilwa area, Haut-Katanga province, more than 2,000 hectares have been destroyed (OCHA 25/02/2017).

The destruction of thousands of hectares of maize has caused local prices to triple, rising from USD10 to USD30 for 25kg (Straitstimes 26/02/2017).

If no response is organised, households in this area might face Emergency food security outcomes (IPC Phase 4), instead of Crisis (IPC Phase 3) (OCHA 25/02/2017).

The harvest for the 2016–2017 agricultural season is likely to result in below-average food stocks, which could lead to an earlier lean season, starting from September 2017 instead of October. The remaining effects of last year Zambia's restrictions on corn exports – on which the affected areas in DRC depends on over 70% - will also significantly impact the food security situation. All the affected areas will continue to face low food availability (FEWSNET 28/02/2017).

Vulnerable groups

Between 15 and 22 March, 2,000 new households were displaced in Mitwaba territory (ECHO 22/03/2017). 83,000 returnees and IDPs were already in Crisis food security as of 31 December 2016 in Pweto territory, leaving them at risk of severe food shortages (OCHA 15/02/2017).

Haut-Katanga hosts over 94,500 IDPs as of 30 November 2016 (UNHCR 30/11/2016). As of mid-February, over 35,000 IDPs, who have been displaced since mid-2016 due to clashes between Luba and Batwa communities, are in need of drinking water and health assistance in Pweto and Mitwaba (OCHA 22/02/2017).

Haut-Lomami: As of 30 November 2016, over 40,000 IDPs are hosted in Malemba Nkulu territory (UNHCR 30/11/2016).

Tanganyika: In 2016, over 234,000 people were newly displaced in Tanganyika, including 102,000 people displaced from October to December 2016. In total, 370,000 IDPs have been recorded in Tanganyika since 2009. Of these, approximately 55% live with host families (OCHA 07/02/2017).

Aggravating factors

Whitefly infestation: Whiteflies have destroyed more than 50,000 hectares of crops, including 19,000 hectares of rice in Kailo, Kasongo, Kibombo, and Pangi areas in the eastern Maniema province. Around 60% of farmers have been affected. Food scarcity could worsen in Kailo and Kibombo areas where residents are facing Emergency (IPC Phase 4) levels of food insecurity (OCHA 06/03/2017; FEWSNET 28/02/2017).

Insecurity and displacement: Fighting between armed groups and with the Armed Forces of the Democratic Republic of the Congo (FARDC) continues in a number of locations, including Nord- and Sud-Kivu, Tanganyika, and Haut-Katanga.

Pre-existing vulnerabilities

Food security: In November 2016, over 1.2 million people in Tanganyika were food insecure, including 600,000 severely food insecure. Food security is negatively impacted by frequent, repeated, and chronic displacement and conflict (OCHA 14/11/2016). In Haut-Katanga, over 738,000 people have been food insecure since August, approximately 14% of the population, due to prolonged conflict and armed violence (OCHA 16/11/2016).

Livelihoods: The fall in the Congolese franc (CDF) against the US dollar has resulted in an increase in prices across the country. Since January 2016, prices of maize in Lubumbashi market in Haut-Katanga have been highly volatile. In October 2016, maize prices across the countries were 60% higher than in October 2015, due to reduced imports from neighbouring Zambia (FAO 22/11/2017).

Response capacity

As of end of February, no response from the government or households was planned in DRC (FEWSNET 28/02/2017). The Haut-Katanga governor has visited several southern African countries to negotiate additional maize imports (Jeune Afrique 15/03/2017).

Zambia

Update: Nearly 223,000 hectares of maize, 20% of the total maize planted, were affected by armyworms as of 22 March. 87,000 hectares of short maturing varieties need to be replanted (OCHA 03/2017). The outbreak was active throughout March (FEWSNET 31/03/2017). There is a low probability that further outbreaks of armyworm will occur in Zambia from April to June, as armyworm season is coming to an end (Lancaster 05/04/2017).

Copperbelt province, parts of Western (including Luampa, Nkeyema and Kaoma districts), Southern (including Kalomo, Choma, Namwala, Mazabuka and Siavonga districts), and Eastern Province (including Nyiamba, Mambwe, and Lundazi districts) were most affected by the outbreak (FEWSNET 28/02/2017). Some districts there have fallen victim to not only armyworms, but also stalk borers and boll worms (Bloomberg 03/01/2017).

Food and livelihoods: Almost 223,000 hectares of maize crops, which forms 20% of the total maize planted, in at least 77 of the 105 districts in Zambia as 22 March (FEWSNET 31/03/2017). Pest invasion could cause farmers in affected areas to lose 30 to 40% of their crops (IIED 08/02/2017). It is still premature to conclusively indicate the extent of the damage by the armyworm outbreak in the absence of an impact assessment, since very little research has been done on the new pest in the region. Despite the armyworm/stalk borer infestation causing some damage to the maize crop, very little replanting was necessary since some of the damaged crop appeared to have recovered

(FEWSNET 28/02/2017). Most of the country is currently experiencing Minimal (IPC 1) and Stressed (IPC 2) food security outcomes, and despite the armyworm outbreaks, food security conditions are expected to improve in the medium term (FEWSNET 03/2017).

Aggravating factors

Rainy season: About 100 households in Choma, Southern province, were left homeless after flooding in the first week of February 2017. Approximately 1,500 people were affected as of 7 February. Rains are expected until the end of the rainy season in April, leaving many people vulnerable (local media 07/02/2017).

Pre-existing vulnerabilities

Food security: The Zambian Vulnerability Assessment Committee's 2016 evaluation in southern areas of the country estimated that 975,738 people are food insecure and require assistance.

Livelihoods: More than 90% of smallholders rely on maize for income and food calories. Agriculture makes up almost 10% of the economy, and about half of all employed people work on farms, mainly growing maize. Maize prices in December 2016 were 20% higher than at the same time in 2015, according to the statistics office (Bloomberg 03/01/2017).

Response capacity

Although the pests were first sighted and reported in late November, lack of an effective early warning system and an under-resourced agricultural extension service resulted in delayed interventions and infestation beyond the initial outbreak area in Copperbelt to the other provinces (FEWSNET 28/02/2017). The Government declared the outbreak a national disaster and has invested over USD 3 million in pest control. Military planes have sprayed affected areas in an attempt to halt the infestation and distributed over 106,000L of pesticides to farmers (Armyworm Network 03/03/2017). In areas where effective spraying was done, the armyworm was contained. However, the armyworm's capacity to burrow into the centre of maize plants make it difficult to control the outbreak using pesticides (IIED 08/02/2017). Since 2007, the Zambian government has spent an average of 80% of its agricultural budget supporting the production of maize (local media 06/03/2017).

Zimbabwe

Update: FEWSNET anticipated that maize production would be above average in maize-cropped areas thanks to late-planted crops (FEWSNET 31/03/2017). However, late-planted crops were reportedly attacked by armyworms in March in most parts of the country. There is a low probability that further outbreaks of armyworm will occur between April and June, as armyworm season is coming to an end (Lancaster 05/04/2017).

The presence of armyworms was first identified in Zimbabwe in early January 2017 (Reuters 11/01/2017; Armyworm Network 05/01/2017). By February, armyworms had been detected in all of Zimbabwe's ten provinces (Stratfor 24/02/2017). According to the Food and Agriculture Organisation (FAO), Zimbabwe is likely to be the hardest-hit country by armyworms in Southern Africa, with some 130,000 hectares of maize crops affected across the country (Reuters 16/02/2017). With maize being the main staple item for Zimbabweans and 4.1 million people in the country currently in need of food assistance, losses in maize production are expected to have a significant impact on food availability and intake (Fewsnet 01/03/2017).

Food and livelihoods: Decreased maize production and availability are likely to result in increased prices, affecting food access, particularly to poorer households.

Agricultural production is also the main source of livelihood for the majority of the country's rural population, employing over 60% of Zimbabweans (Ministry of Agriculture, Mechanisation and Irrigation Development. Accessed on 17/03/2017; CIA World Factbook. Accessed on 17/03/2017). Crop losses are expected to impact on income sources for households dependent on agriculture, which in turn is likely to impact on their access to goods such as food and water.

Health: Increased food insecurity as well as lack of financial resources are likely to trigger negative coping mechanisms, which often include turning to less safe sources of food and water. Allied with poor hygiene practices, these strategies often increase the risk of disease outbreak. With Zimbabwe already battling a typhoid outbreak since November 2016, additional disease outbreaks are likely to overwhelm the country's already fragile health system (ZimEye 21/11/2016; VoA 18/04/2016). 700,000 people are in need of health assistance in Zimbabwe, with lack of appropriate medicine and medical supplies widely reported (VoA 18/04/2016). In case of new disease outbreaks, medical staff may also be a concern, as patient-doctor ratio reaches up to 1:12,000, compared to the 1:200 standard recommended by the United Nations (VoA 17/05/2016).

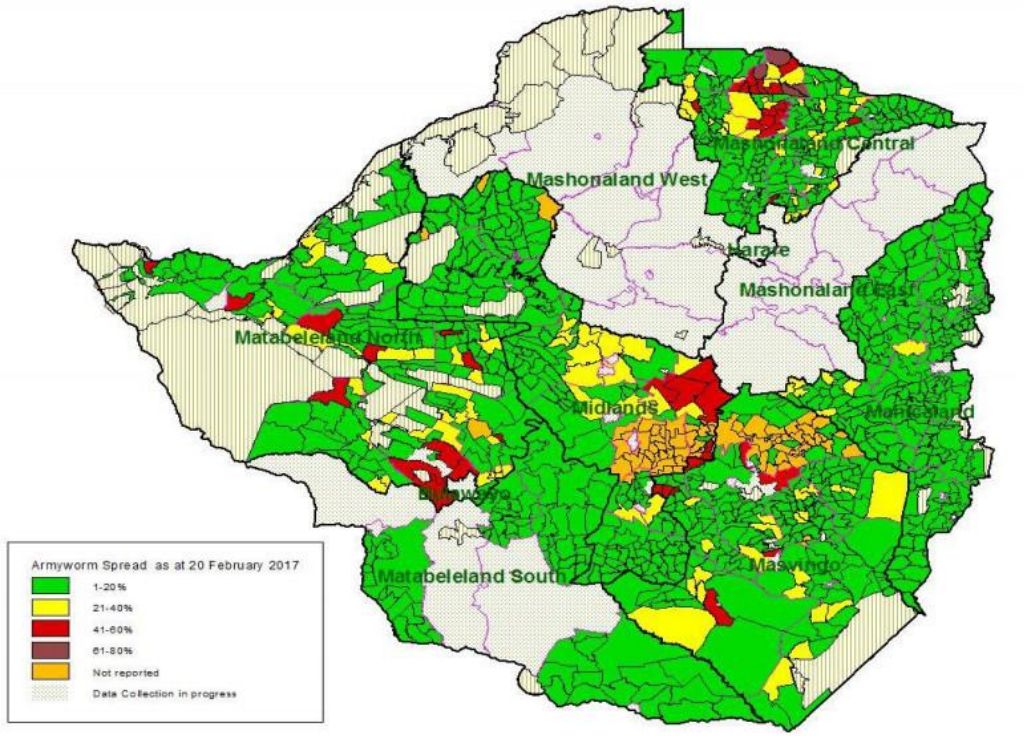


Figure 1: Fall Armyworm distribution across maize crops. Source: Ministry of Agriculture 24/02/2017.

Aggravating factors

Concurrent threats to agriculture: Other pests have been observed impacting on maize and sorghum crops, particularly beetles attacking maize leaves at Lusutu Irrigation Scheme in Lupane, Matabelaland North. The extent of spread of the beetles is still being assessed (Ministry of Agriculture, Mechanisation and Irrigation Development 24/02/2017).

2016 drought: Zimbabwe experienced a year-long drought throughout 2016. Prior to the armyworm outbreak, food insecurity was already forecasted to worsen during 2017, with the worst-affected areas in Masvingo, Matabelaland North and Mashonaland Central experiencing Emergency (IPC Phase 4) outcomes between February and May (OCHA 30/11/2017; Fewsnet 30/10/2016).

Pre-existing vulnerabilities

Some 80% of Zimbabwe's rural population is concentrated in maize-producing regions that are vulnerable to erratic rainfall (Ministry of Agriculture, Mechanisation and Irrigation Development. Accessed on 17/03/2017). Further challenges to production, such as armyworms, are likely to impact on livelihoods and food availability.

Tropical Storm Dineo caused crop damage in February (Fewsnet 31/1/2016; OCHA 30/11/2016). Severe losses were observed particularly in Tsholotsho, Manicaland North province (All Africa 20/02/2017). Most of the areas facing Crisis (IPC3) food security outcomes are located in southern provinces, currently affected by rainfall and flooding (Fewsnet 01/03/2017). Further obstacles to food availability and access in these areas are likely to impact negatively on food security for households.

Response capacity

The government has issued Cypermethrin and Carbarylm, two types of insecticides (Armyworm Network 03/03/2017).

Population coping mechanisms

According to the latest vulnerability assessment conducted in Zimbabwe, emergency, crisis and stress livelihood-based coping strategies are all being implemented by households in the country. Emergency strategies include begging, selling last female breeding livestock and selling house or land, while crisis strategies include selling productive assets, reducing food expenditure and withdrawing children from school. Stress strategies, in use by 14% of the population, include spending savings on goods, borrowing money and selling household assets or more livestock than normal. Damage to crops due to armyworms and its impact on livelihoods are likely to aggravate the use of negative coping strategies (Government of Zimbabwe 20/07/2016).

Benin

More than 33,000 hectares have been reportedly destroyed by Fall Armyworms according to the Ministry of Agriculture, which amounts to 44,500 tons of production lost – 3.4% of the forecasted national production for 2016–17 (Agro Afrique de l'Ouest 03/10/2016).

Botswana

Armyworms have been reported in Botswana's southern district, in Betesankwe and Mosi villages in particular, which is especially worrying as these two areas form the bread basket of the country (Mwegi 17/02/2017).

Ethiopia

Update: Fall armyworms were detected in Ethiopia in early April. As of 13 April, 10,700 hectares of cropland across Oromia and SNNP regions had been affected (OCHA 10/04/2017; Reuters 13/04/2017). In total, there are 224,700 hectares of cropland in SNNPR has been planted for the *belg* season, which lasts from March to April (OCHA 10/04/2017)

Chemical spraying and other traditional measures are underway to control the crop infestation (OCHA 10/04/2017).

Ghana

In February, botanists in Ghana found evidence of two species of Fall Armyworm in the country (Kenya Daily Nation 14/02/2017). Armyworms have invaded and destroyed maize farms in Somanya in the Eastern region and nearby communities (local media 31/05/2016).

Kenya

Update: The country's 'bread basket', the Rift Valley, has been affected by armyworms (Capital FM 07/04/2017). 13 of the 47 counties in the country have been affected: Baringo, Bungoma, Busia, Kakamega, Kericho, Kwale, Makueni, Nakuru, Nandi, Taita-Taveta, Trans-Nzoia, and Uasin Gishu. (All Africa 07/04/2017; The Star 13/04/2017; Standard Media 19/04/2017; Newvision 20/04/2017).

USD1 million has been allocated to mitigate the outbreak in Kakamega and Trans-Nzoia alone (The East African 13/04/2017). Cost is a big concern: the cheapest pesticide to treat 0.4 hectares costs 20,000 Kenyan shillings or USD194 (All Africa 18/04/2017).

A survey carried out from June to August 2016 in Embu and Kisii counties showed Fall Armyworm infestation. Scientists from the University of Nairobi reported sightings of damage to maize crops due to armyworms in Machakos county (International Maize and Wheat Improvement Center 23/02/2017).

Malawi

Update: Prices are expected to drop in the coming months as a result of a promising harvest, despite the armyworm infestation (OCHA 03/2017). Armyworm attacks continued on maize crops in Karonga and Muzuzu agricultural development divisions. There is a low probability that further outbreaks of armyworm will occur in Malawi between April and June, as armyworm season is coming to an end (Lancaster 05/04/2017).

Armyworms have been reported in all 28 districts of Malawi as of early January. An estimated 35,000 hectares of crops have been affected as of mid-March (2% of area planted to cereals), including 4,000 hectares of crop in Lower Shire livelihood zone, in Southern province around Thyolo city, and 1,500 hectares of maize under Kasungu Agriculture Development Division, in Central province around Kasungu city (FAO 16/02/2017; FEWSNET 03/03/2017; 17/03/2017). According to FEWSNET, the impact of armyworms was mostly found to be minimal on this year's crop production and the pests are reported to be under control. The Ministry has responded by distributing pesticides and insecticides to affected areas, which upon spraying are managing to contain the infestation. However, further armyworm damage this season could dampen the good harvest prospects currently anticipated (FEWSNET 03/03/2017). Malawi's maize crop was devastated last year by the regional drought. About 6.5 million Malawians, more than a third of the population, are dependent on food aid until this year's harvest in March (WFP 09/02/2017). The Ministry of Agriculture, Irrigation and Water Development in Malawi has intensified control efforts by conducting monitoring exercises, providing pesticides to the affected areas, as well as carrying out awareness campaigns (FEWSNET 17/03/2017).

Mozambique

Update: There were no reports of new armyworm outbreaks for Mozambique in March. There is a low probability that further outbreaks will occur in Mozambique between April and June, as armyworm season is coming to an end (Lancaster 05/04/2017).

Armyworm outbreaks have been reported in Buzi, Gorongoza and Chissua districts, all located in central Mozambique (The Southern Times 06/03/2017; Diario de Noticias 05/03/2017). Damage to agricultural production, particularly maize, are likely to be aggravated should a locust outbreak occur. Red locust swarms were forecast for January–March, and have been reported in Mozambique, though on a low scale (USAID 30/01/2017; UOL 15/02/2017; Diario de Noticias 05/03/2017). Decreased production capabilities pose a risk to food security in the affected regions, particularly Tete, where the use of negative coping strategies was already been reported. In Chissua 2, Tete, residents have reportedly limited food intake to one meal per day (Diario de Noticias 05/03/2017).

Namibia

Update: At least 50,000 hectares of maize and millet crops and 20,700 households across Kavango, Ohangwena, Omusati, Oshikoto, Otjozopjupa, and Zambezi regions have been affected by armyworms (OCHA 03/2017; UNICEF 20/02/2017). In Oshikoto region, it is estimated that between 50 and 60% of the harvest will be lost due to the outbreaks (New Era 28/03/2017). It is expected that food supplies will decrease in the medium term as a result (UNICEF 20/02/2017). A good harvest is expected of 69,000 metric tons of maize, according to the Namibia Agronomic Board (The Namibian 10/04/2017).

Farmers reported an outbreak of armyworms in northern Namibia, in Omusati, Ohangwena, Kavango East and Kavango West regions on 19 January (Government of Namibia, 19/01/2017). Maize and millet are the most affected crops and as of mid-February, a total of around 50,000 hectares have reportedly been damaged by the spread of armyworms (Reuters Africa 15/02/2017).

Nigeria

Government authorities have reported that armyworms have caused damaged across the country, describing the outbreak as a threat to national food security and maize production in the country (Agro News Nigeria 07/02/2017). In October 2016, the Nigeria Agricultural Quarantine Service confirmed 100% infestation of farms by armyworms in the three senatorial districts of Benue State (Agro News Nigeria 20/10/2016). As of February 2017, 22 states have been affected by the caterpillar (Agro News Nigeria 07/02/2017). Maize is already becoming scarcer in the market, leading to a 35% price increase within the last three months. As of 22 February, a ton of maize costs N175, 000, against N130, 000 in November 2016 (Business Day 23/02/2017). The government mandated the International Institute for Agricultural Research to develop an armyworm-resistant variety of maize (Agro News Nigeria 07/02/2017).

Rwanda

Update: As of 5 April, 108 sectors of the country's 416, in 23 of 30 districts, have been affected by armyworms. An estimated 15,700 hectares of maize and sorghum have been impacted, 24.7% of the country's total planting area for the two crops (New Times 19/04/2017).

Field equipment and pesticides have been distributed to curb the outbreak, and the army has provided support for transporting supplies (New Times 19/04/2017).

South Africa

As of 4 February, the Department of Agriculture has confirmed an armyworm outbreak in South Africa. Damage to maize crops has been reported Limpopo, North West, and Free State provinces (eNCA 04/02/2017). Although cold weather, rains and resilient genetically modified crops (GMO) have limited the damage caused by the outbreak, armyworms have continued to spread within South Africa (eNCA 27/02/2017). At the end of February, the presence of armyworms was reported in the eastern province of KwaZulu-Natal. In addition to maize crops, armyworm-associated damage to potato farms has also been reported in Limpopo (Times Live 28/02/2016).

Swaziland

Suspicions of an armyworm outbreak in Swaziland were raised in early February (Swazi Observer 06/02/2017). The outbreak was confirmed on 16 February (Swazi Observer 16/02/2017). The Ministry of Agriculture states that the damage appears to be extensive, but has not made any more precise estimates (Swazi Observer 03/03/2017).

Tanzania

Update: Armyworm outbreaks are likely to continue in northern Tanzania between April and June, when the armyworm season ends. Outbreaks were reported in Coastal (Bagamoyo, Charinzi, Kibaha, Mukuranga districts), Lindi, Morogoro, and Tanga regions in March (Lancaster 05/04/2017).

In February, armyworms were reported in the border areas of Ruvuma and Mbeya, located in southern Tanzania (Armyworm Network 11/03/2017). As of 16 March, damages to hundreds of hectares of maize planted earlier in the year in the western region of Rukwa have also been reported. Nkasi district, in Rukwa, is particularly affected, as many households in the region depend on maize for access to income and food (Coastweek 16/03/2017). The worms are said to have come into Tanzania from neighbouring Zambia (Coastweek 16/03/2017). The government has announced the purchase of some 15,000L of pesticides to curb the outbreak (Coastweek 16/03/2017).

Uganda

Update: Up to 40% of maize crops were attacked in 20 central and western Ugandan districts. Sugarcane fields were also damaged (OCHA 31/03/2017). As of April, 20,000 hectares of crops in Iringa, Lindi, Iranga, Manyara, Morogoro, Pwani, and Rukwa regions

have been destroyed by armyworms. While this represents a small percentage of total cropped area, it will significantly impact the food security of poor households (FEWSNET 04/2018).

Up to 15% of the maize production could be lost, costing USD193 million (Newvision 20/04/2017; Capital FM Kenya 20/04/2017). As a result, USD6.85 million has been allocated by the government to help purchase pesticides, but this will not cover all affected farmers (The East African 13/04/2017; All Africa 19/04/2017).

On 14 March the Ministry of Agriculture, Animal Industry and Fisheries confirmed the outbreak of armyworms in Luweero district (Uganda Radio 16/03/2017). The Ministry of Agriculture, Animal Industry and Fisheries has tasked a private company to conduct a trial on insecticides that can combat the outbreak (Uganda Radio 16/04/2017).

Information gaps and needs

- In South Africa, information about the impact on commercial maize production is lacking.
- Information on the extent of damages and consequent impact on production is lacking.
- Regular updates on the impact on crops as armyworms spread in different areas are needed to assess the extent of damages and potential needs of the population.
- Information on the impact of Fall Armyworms on water supplies is also missing.

Lessons learned

Integrated Pest Management is recommended as it is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, host plant resistance, chemical control, pheromone traps, habitat manipulation, modification of cultural practices, use of resistant varieties and diversification of farming systems (International Maize and Wheat Improvement Center 23/02/2017).

Communication and Forecasting

- Risks to pest control include lack of information about armyworms and how to control an outbreak. Lack of guidance from the government has already led to rumours and false information on how to deal with the caterpillar in Zimbabwe (DW 28/02/2017).
- Early detection is key to manage the infestation. The Fall Armyworm needs to be controlled during the early days of its life to reduce the rate of recurrence. The Fall Armyworm can have 10 to 12 cycles, which can last over a few years, unlike African Armyworms, which have only 6 cycles, and can continue recurring even after a first spray (Southern African Times 23/01/2017).
- A community-based forecasting system, including collecting data on rainfall, presence of vegetation and moth trapping, can enable farmers to predict armyworm outbreaks (DFID 28/06/2006).

Pheromone trap

Tanzania has a network of pheromone traps set up as monitoring devices to attract the moths as soon as they appear (Nature 2009).

Use of pesticide

Spraying chemical insecticide has been used in response to armyworm outbreaks, such as in Tanzania (Nature 2009). However, insecticide control options should only be attempted in extreme situations (i.e. 100% of the plants are infested and they are less than 75cm high) (Penn State College of Agricultural Sciences 09/2012). Major drawbacks indeed exist with this method:

- Cost: Insecticides are expensive and many poor farmers are unable to afford the costs (FAO 24/02/2015).
- Strict safety procedures: Spraying large areas of food crops and pastures with insecticides is undesirable, as safety procedures are not well known and protective clothing is rarely used to avoid risk of exposure to pesticides and pesticide poisoning (FAO 24/02/2015). Animals can be poisoned by drinking water contaminated with insecticide. Many pesticides, even at low concentrations, may have the potential to injure crops for which they are not labelled (Penn State College of Agricultural Sciences 2017).
- **Lack of availability:** Pesticides are not always available when required, particularly in subsistence cropping systems (FAO 24/02/2015).
- Inaccessibility: The Fall Armyworms are often inaccessible to insecticides because of their tendency to hide in the whorls and reproductive parts of the host plant (The Conversation 12/02/2017).

If spraying is deemed necessary, late afternoon or early evening spraying is recommended to maximise the effects of the pesticides, as armyworms are nocturnal feeders (Agriculture Victoria 06/1995). Biopesticides tend to be effective against a much narrower range of species than chemicals, which is good for the environment. But it means that they can only be used for a limited number of pests, often making them more expensive than chemicals (The Conversation 12/02/2017).

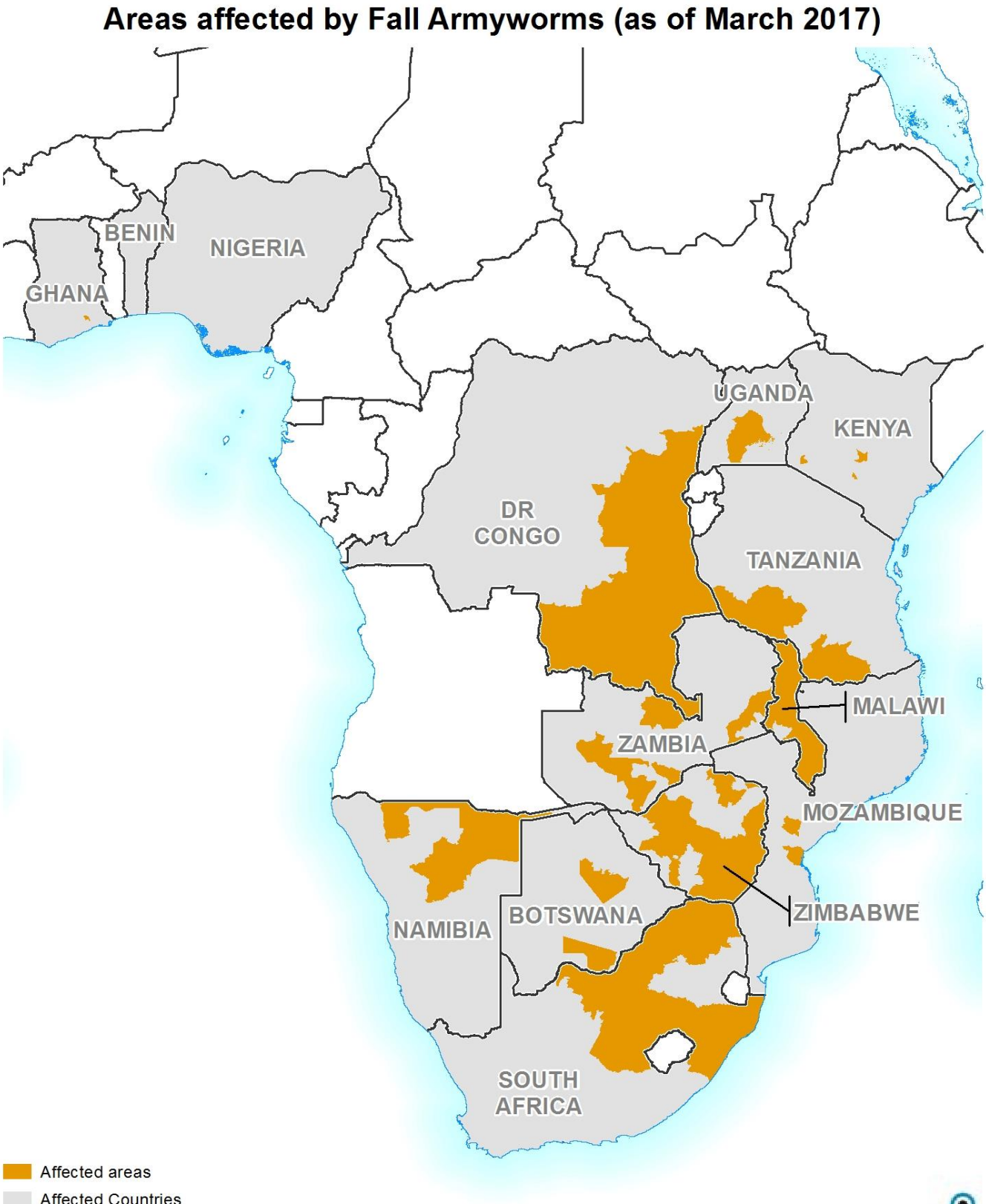
Intercropping

Research shows that Fall armyworm infestations have been reduced by 20 to 30% on maize intercropped with beans compared to maize alone (International Maize and Wheat Improvement Center 23/02/2017).

Key characteristics

Key indicators	DRC	Zambia	Zimbabwe
Total population	77,800,000 (2012)	15,000,000 (2014)	13,061,239 (2012)
% population in rural areas	64.1% (2014)	59.5% (2014)	67.6%
Gender distribution of population	50.3% Female, 49.7% Male	49.9% Female, 50.1% Male	Male: 6,280,539 (48%) Female: 6,780,700 female (52%)
State capital	Kinshasa	Lusaka	Harare
Lighting and cooking	Cooking Wood: 66.2% Charcoal: 28.9% Electricity: 4.6%	Cooking Wood: 59.4% Charcoal: 24.5% Electricity: 15.8%	Cooking Wood: 66.8% Electricity: 32.6% Other sources: 0.6%
WASH	Access to improved drinking water sources: urban: 81.1% of population, rural: 31.2% of population, total: 52.4% of population (2015) Access to improved sanitation facilities: 28.7% (2015)	Access to improved drinking water sources: 64% (2017) Access to improved sanitation facilities: 42% (2017)	Access to improved water sources: 71% Access to improved sanitation facilities: 39%. Open defecation: 37% Hand washing after using the toilet: 44% Hand washing before eating: 27% Hand washing before handling food: 24%
Health	Maternal mortality ratio: 730 deaths per 100,000 live births (2013) Infant mortality: 86.1 per 1,000 live births (2013) Under-five mortality: 118.5 per 1,000 live births (2013) Life expectancy: 59 (2014)	Maternal mortality ratio: 280 deaths per 100,000 live births (2013) Infant mortality: 55.8 per 1,000 live births (2013) Under-five mortality: 87.4 per 1,000 live births (2013) Life expectancy: 60 (2014)	Maternal mortality ratio: 443 deaths per 100,000 live births (2015) Infant mortality: 25.9 deaths per 1,000 live births (2016). Under-five mortality rate: 70 per 1,000 live births (2015) Life expectancy: 58 years (2016)
Food insecurity	5,900,000 in Crisis (IPC Phase 3) and Emergency (IPC Phase 4) Food security outcomes	976,000 people are in need of food assistance (2017)	4.1 million people are I need of food assistance (2016)
Nutrition levels	Global acute malnutrition: 8% (2015) Severe Acute malnutrition: 11% (2010) Under-fives chronic malnutrition: 42.7% (2014)	Chronic malnutrition (stunting): 40% (2013)	Global Acute Malnutrition (GAM): 4.4% (2016) Severe Acute Malnutrition (SAM): 1.9% Chronic malnutrition (Stunting): 32%
Literacy rates	Male: 78.1% Female: 50% (2015)	65% (1990)	86.5% (2015)

Map of affected area



Data Sources GADM, FEWSNET, FAO, Zimbabwe Ministry of Agriculture, Agro Afrique de l'Ouest, Ghana local media, Bostwana Mwegi, International Maize and Wheat Improvement Center, The Southern Times, Government of Namibia, Agro News Nigeria, ENCA, Swazi Observer, Armyworm Network, Uganda Radio. Map created by MapAction (March 2017)