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FOOD CHAIN CRISIS EARLY WARNING BULLETIN



*Forecasting threats to the food chain
affecting food security in countries and regions*

No. 32

July–September 2019

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NOTE TO THE READER

The purpose of the FCC (Food Chain Crisis) Early Warning Bulletin is to inform FAO and other international organizations, countries, scientific experts, and decision makers of on forecast threats to animal and plant health and food safety having a potential high impact on food and nutrition security for the three months ahead. These threats are transboundary animal and plant pests and diseases including forest pests and aquatic diseases, and food safety threats.

The bulletin contains official and unofficial information from various sources that has been collected and analysed by FAO experts.

The FCC Early Warning Bulletin is a product of collaboration between the Intelligence and Coordination Unit of the Food Chain Crisis Management Framework (FCC-ICU), the FAO Emergency Prevention System (EMPRES) for transboundary animal and plant pests and diseases and food safety threats, the FAO Global Early Warning System for transboundary animal diseases, including zoonoses (GLEWS), and the Global Information and Early Warning System (GIEWS). FCC-ICU coordinates and produces the bulletin.



FOOD CHAIN CRISIS FORECASTING METHODOLOGY

Transboundary animal and plant pests and diseases, including forest pests and aquatic diseases, and food safety threats are raising public awareness due to their potential high impact on food security, human health, livelihoods, and trade. These threats have highlighted the need to predict such threats in a comprehensive and integrated manner, oriented to the whole food chain. Predicting threats will allow timelier implementation of preventive and control measures, and thus will reduce their impact and limit their geographic spread.

The FAO Food Chain Crisis-Intelligence and Coordination Unit (FCC-ICU) has developed an integrated forecasting approach to assess the likelihood of occurrence of threats to the food chain (FCC threat) for the upcoming three months. Based on this approach and on the availability of FAO data, a number of forecast events are presented at country level. Data are collected, analysed, and further presented in this quarterly FCC Early Warning Bulletin see country section, page 16). The food safety threats will be included in the future bulletins.

The likelihood of occurrence of an FCC threat in a country is defined according to the result of the assessment of two main epidemiological parameters:

- Parameter 1: likelihood of introduction of the threat from another country and its further spread within the country (calculated as shown in table 1), and
- Parameter 2: likelihood of its re-emergence (amplification) within the country, if a threat is already present in the country.

Based on a conservative approach, the likelihood of occurrence of the threat will be considered equal to the higher level of the two parameters.

TABLE 1: Crossing table of likelihood of introduction and likelihood of spread (Parameter 1)

		Level of likelihood of spread			
		0	1	2	3
Level of likelihood of introduction	0	0	0	0	0
	1	1	1	1	2
	2	1	1	2	2
	3	2	2	2	3

The likelihood of occurrence, the likelihood of introduction, the likelihood of spread, and the likelihood of re-emergence of a FCC threat can be rated as Nil, Low, Moderate, or High, as shown in table 2.

TABLE 2: FCC likelihood scale

Likelihood	Definition
Nil (0)	Very unlikely
Low (1)	Unlikely
Moderate (2)	Likely
High (3)	Highly likely



HIGHLIGHTS

■ EQUID DISEASES IN AFRICA

In Central and West Africa, since November 2018, significant mortalities in equids (horses and donkeys) have been reported in several countries, due to different diseases (Equine Influenza, African horse sickness, Strangles, Anthrax, Glanders and Pneumonia). The countries affected are Burkina Faso, Cameroon, Chad, Ghana, Mali, Niger, Nigeria and Senegal. Equine Influenza is occurring in Mali, Nigeria and Senegal; in the latter country, at the end of May 2019, a total of 755 outbreaks had been reported in 12 regions out of 14, with 56 858 cases and 5 712 deaths, and an at-risk population of 1 027 963 equids. The disease is also suspected to be present in Cameroon and the Gambia. African horse sickness outbreaks have been reported in Cameroon, Chad and Ghana; Strangles events have been reported in Burkina Faso, Mali, Niger and Senegal. Events of Anthrax have reported in Burkina Faso, while Glanders and Pneumonia have been reported in Mali. As of 4 June 2019, increasing disease outbreaks and heavy mortalities affecting equids (horses and, mainly, donkeys) continue to be observed. These events are of concern because the diseases continue to spread in these countries, having a huge impact on equid populations. These animals, particularly donkeys, play a key role in agriculture, transport and food security in this region and their loss is problematic for the resilience of the local pastoral population.

In North and Eastern Africa, Equine Influenza was reported in Sudan, and African horse sickness in Ethiopia.

■ FALL ARMYWORM (FAW) IN ASIA

FAW has been reported in India and Yemen since July 2018. In January 2019, it has been confirmed in Bangladesh, Myanmar, Sri Lanka, Thailand, China, Lao, Nepal, Viet Nam and, more recently, in the Republic of Korea.

During this forecast period, FAW is expected to amplify within these countries and to continue spreading to other countries in the east and to the south of the region.



OVERVIEW FORECAST FOR THE PERIOD JULY–SEPTEMBER 2019

During the period July to September 2019, Food Chain Crisis (FCC) threats are expected to occur in Africa, the Americas, Asia and Europe, where they may persist within a country, spread to neighbouring countries, remain latent, or re-emerge or amplify.

The dynamics and likelihood of the occurrence of FCC threats depend on a number of risk factors or drivers. These include agro-ecological factors (intensive farming systems, deforestation, overgrazing, etc.), climate change and variability (droughts, extreme weather events, flooding, heavy rains, heat waves, the El Niño-Southern Oscillation – ENSO –), changes in vegetation cover, water temperature, human behaviour (cultural practices, conflicts and civil insecurity, trade, etc.) and natural disasters.

In relation to food security, and according to the latest *Crop prospects and food situation* report (covering the period July–September 2019), FAO estimates that globally, 41 countries (31 in Africa, nine in Asia, and one in the Americas) are in need of external assistance for food. Persisting conflict continues to be the dominant factor driving high levels of severe food insecurity. Weather shocks have also adversely affected food availability and access. FCC threats can compound food insecurity in fragile countries stricken by weather shocks and conflicts.

MAIN FOOD CHAIN THREATS

Thirty-three plant and forest pests and diseases, locusts and animal and aquatic diseases were monitored and forecasted by FAO experts for the period July to September 2019. A total of **284** forecasts were conducted in **122** countries.



OVERVIEW FORECAST FOR THE PERIOD JULY–SEPTEMBER 2019

TABLE 3: Potential food chain threats¹ forecasted for the period July–September 2019

Continent	FCCs Threats	Plant pests and diseases	Forest pests and diseases	Locusts	Animal diseases	Aquatic diseases
AFRICA	17	<ul style="list-style-type: none"> ■ Fall armyworm (FAW) ■ Tomato leaf miner ■ Cassava mosaic disease (CMD) ■ Cassava swollen shoot disease ■ Banana fusarium wilt disease ■ Banana bunchy top disease 	<ul style="list-style-type: none"> ■ Blue gum chalcid ■ Red gum lerp psyllid ■ Bronze bug ■ Polyphagous shot hole borer 	<ul style="list-style-type: none"> ■ Desert locust ■ Migratory locust ■ Red locust 	<ul style="list-style-type: none"> ■ Rift Valley fever (RVF) ■ Foot-and-mouth disease (FMD) ■ <i>Peste des petits ruminants</i> (PPR) ■ Avian influenza (AI) 	-
AMERICAS	2	-	<ul style="list-style-type: none"> ■ Bark beetles 	-	-	<ul style="list-style-type: none"> ■ Tilapia lake virus (TiLV)
ASIA	15	<ul style="list-style-type: none"> ■ Fall armyworm (FAW) ■ Banana fusarium wilt disease ■ Wheat rust ■ Rice blast disease 	<ul style="list-style-type: none"> ■ Boxwood blight ■ Boxwood moth ■ Charcoal disease ■ Dry cone syndrome ■ Western conifer seed bug 	<ul style="list-style-type: none"> ■ Desert locust ■ Moroccan locust 	<ul style="list-style-type: none"> ■ African swine fever (ASF) ■ Foot-and-mouth disease (FMD) ■ <i>Peste des petits ruminants</i> (PPR) 	<ul style="list-style-type: none"> ■ Tilapia lake virus (TiLV)
EUROPE	5	-	<ul style="list-style-type: none"> ■ Pine processionary moth ■ Bark beetles 	-	<ul style="list-style-type: none"> ■ African swine fever (ASF) ■ Lumpy skin disease (LSD) ■ <i>Peste des petits ruminants</i> (PPR) 	-
TOTAL by FCC category		8	11	4	6	1

¹ Moderate-high likelihood



REGIONAL OVERVIEW FORECAST FOR THE PERIOD JULY–SEPTEMBER 2019

AFRICA

In Africa, 147 FCC events in 50 countries were forecasted, comprising plant pests and diseases, locusts, animal and aquatic diseases, and forest pests. The likelihood of occurrence varies from Low to High. The following FCC events have significant regional implications:

PLANT PESTS AND DISEASES

■ **Fall Armyworm (FAW)** – *Spodoptera frugiperda*

- In **Eastern Africa**, the presence of FAW has now been confirmed in all countries except Djibouti. In some Eastern African countries, the forecast period coincides with the major maize-growing season, while in others, it coincides with the maize- and sorghum-harvesting season. The time between the two growing seasons in most countries of the subregion is not long enough to regulate the numbers of FAW populations, which are high. FAW will most likely continue its development on alternative hosts and spread further, unless appropriate action is taken.
- In **North Africa**, Egypt has officially reported the presence of FAW in maize fields in southern Egypt. As Sudan had reported the introduction of the pest in 2017, the Nile Valley may be considered the probable route of introduction into Egypt. Maize – the main host crop – has been planted since April/May in southern Egypt and Sudan. Maize represents the main feeding source for the pest which increases the risk of damage.
- In **Southern Africa**, the presence of FAW was initially reported in some countries at the end of 2016. It is now present throughout the entire Southern African subregion, although the pest has not yet been reported in Lesotho. Although the pest attacks several crops, it is more prominent on maize. In the 2018/2019 cropping season, the pest continued to cause serious damage to maize and other cereals. FAW damage compounded crop losses arising from the impact of the drought-like conditions that prevailed across certain countries in the subregion. The forecast period coincides with limited off-season production of maize and other crops in some countries. Given that the season of the forecast period is accompanied by high temperatures, a favourable environment exists for moderate to high amplification of the pest.
- In **West Africa**, maize will be in the growing and harvesting stages in most countries; therefore, there will be a high risk of FAW amplification during the forecast period, supplemented by moderate to high risks of new introduction into southern Mauritania and southern Algeria.

■ In **East Africa**, **Cassava mosaic virus** and **Cassava brown streak virus** continue to affect the countries and may amplify where weather conditions are favourable. **Tomato leaf miner** (*Tuta absoluta*) infestations vary with the season. Insect pest populations and infestation levels are likely to be relatively low across countries in the subregion during this forecast period, because it generally coincides with the main rainy season, during which there is limited tomato production. Tomato is mainly produced under irrigation during the warm dry season, and these conditions happen to be favourable for the pest to flourish.

■ In **Southern Africa**, **Tomato leaf miner** (*Tuta absoluta*) is present in all countries except Madagascar and Mauritius. The pest has continued to cause serious damage to tomato crops in the subregion. Tomato is an important cash crop grown by both smallholder and large-scale farmers. The tomato value chain supports the livelihoods and food security of a large number of people. The forecast period is characterized by high



REGIONAL OVERVIEW FORECAST FOR THE PERIOD JULY–SEPTEMBER 2019

AFRICA

temperatures and widespread cultivation of tomato. These factors could favour amplification of the pest. In **North Africa**, **Tomato leaf miner** (*Tuta absoluta*) will continue to affect the Near East region with variable degrees of severity, according to temperature. In North Africa, the above-average temperatures prevailing in April and May may favour the development of the pest.

- In **Central Africa**, **Banana bunchy top disease** persists and may escalate.

LOCUSTS

- In **Eastern Africa**, adult groups of **Desert Locust** and, possibly, a limited number of small swarms from spring breeding areas in Arabia are likely to arrive in the interior of Sudan in July and breed, causing desert locust numbers to increase; small-scale breeding will occur in the West Lowlands of Eritrea. With vegetation burning, **Red Locust** will aggregate into swarms in the remaining suitable areas. If not controlled, they are likely to escape outbreak areas and invade and damage cultivated areas.
- In **Southern Africa**, the **Migratory Locust** situation remains serious in Madagascar. Adult populations of the third generation that have escaped control operations will form swarms and may move towards certain areas of crop production, where they will mate and lay eggs. The hatchlings of this fourth generation may also damage crops and pastures.
- In **West Africa**, small-scale breeding will cause desert locust numbers to increase slightly in the North Sahel between Mauritania and Chad; there is a low risk that a few groups or small swarms may appear in eastern Chad in July from spring breeding areas in Arabia.
- In **North Africa**, no significant **Desert Locust** developments are expected.

ANIMAL DISEASES

■ Rift Valley fever (RVF)

- **East Africa**: precipitation forecasts for July–September 2019 predict average and above-average rainfall in western Kenya, western Ethiopia, southeastern South Sudan and Uganda. Weak El Niño conditions are likely to continue throughout summer 2019 (with a probability of approximately 70 percent) in the Northern Hemisphere. According to the FAO RVF Monitoring/Early Warning tool, it is predicted that suitable environmental conditions for vector amplification will persist in certain areas of central Kenya, particularly in Muranga, Nyandarua and Nyeri counties, as well as areas in proximity of Mount Kenya. The latest RVF outbreaks were reported in December 2018–January 2019 in Muranga and Nyandarua counties. For these areas, the risk of RVF occurrence is considered moderate.

Suitable environmental conditions for vector amplification are also predicted in wide areas in Burundi, central-western Ethiopia, Rwanda, southeastern South Sudan and southeastern Uganda. These areas are considered to be at moderate risk.

- **South Africa**: precipitation forecasts for July–September 2019 predict average and below-average rainfall across most of the region. In the past few months, the entire region was characterized by prolonged dry conditions. Exceptional floods and heavy rainfall events hit southern Malawi and northern-central Mozambique



REGIONAL OVERVIEW FORECAST FOR THE PERIOD JULY–SEPTEMBER 2019

AFRICA

in March 2019, while heavy rainfall affected central-eastern South Africa in April–May 2019. According to the FAO RVF Monitoring/Early Warning tool, the predicted environmental suitability for vector amplification and the potential risk of RVF occurrence are considered low to moderate in central-eastern South Africa, central Mozambique (at the border with Malawi), southeastern Zimbabwe and central Botswana.

- **West Africa:** precipitation forecasts for July–September 2019 predict average and below-average precipitation, particularly in Senegal and Mauritania. According to the FAO RVF Monitoring/Early Warning tool, suitable environmental conditions for vector amplification are predicted along the Senegal River between Senegal and Mauritania, across the irrigation areas nearby Dakar and Thies, as well as along the Casamance river in southern Senegal. In the Gambia, suitable environmental conditions are predicted along the river Gambia, and in central Mali, along the irrigation areas in the Segou region. The last RVF infection in the region was reported in Mauritania in January 2019. For the region, the potential risk of RVF occurrence and spread is considered low during the forecast period, while along the Senegal River, it is considered moderate.

■ Avian influenza (AI)

- **H5N1 and H5N8 Highly Pathogenic Avian Influenza (HPAI)** viruses may cause new outbreaks in some countries; however, overall, the risk is considered low for the forecast period, given the observed seasonality of the disease. H9N2 Low Pathogenic Avian Influenza (LPAI) is considered endemically circulating in many African countries, causing losses to poultry production. Since LPAI viruses are not notifiable to the OIE, the data available is scarce.
- In **North Africa**, circulation of H5N1 HPAI, H5N8 HPAI and H9N2 LPAI is expected to continue in Egypt at a lower intensity during the period July–September 2019.
- In **West Africa**, H5N8 HPAI has re-emerged in the last months of 2018 in Nigeria. However, the risk of occurrence of the disease for the period July–September 2019 is considered low.
- In **Central and Eastern Africa**, reports of H5N8 HPAI virus have ceased, and the risk for the period July–September 2019 is considered very low.
- In **Southern Africa**, reports of H5N8 HPAI virus have ceased in South Africa and Namibia. Despite the cold season approaching in this hemisphere, as the last outbreaks were observed in April 2019 (South Africa) and June 2019 (Namibia), the risk for the period July–September 2019 is considered low.

■ Equid diseases

- In **Central and West Africa**, since November 2018, significant mortalities in equids (horses and donkeys) have been reported in West and Central African countries due to different diseases (Equine Influenza, African horse sickness, Strangles, Anthrax, Glanders and Pneumonia). The countries affected are Burkina Faso, Cameroon, Chad, Ghana, Mali, Niger, Nigeria and Senegal. Equine Influenza is occurring in Mali, Nigeria and Senegal; in the latter country, at the end of May 2019, a total of 755 outbreaks had been reported in 12 regions out of 14, with 56 858 cases and 5 712 deaths, and an at-risk population of 1 027 963 equids. The disease is also suspected to be present in Cameroon and the Gambia. African horse sickness outbreaks have been reported in Cameroon, Chad and Ghana; Strangles events have been reported in



REGIONAL OVERVIEW FORECAST FOR THE PERIOD JULY–SEPTEMBER 2019

AFRICA

Burkina Faso, Mali, Niger and Senegal. Events of Anthrax have reported in Burkina Faso, while Glanders and Pneumonia have been reported in Mali. As of 04 June 2019, increasing disease outbreaks and heavy mortalities affecting equids (horses and, mainly, donkeys) continue to be observed. These events are of concern because the diseases continue to spread in these countries, having a huge impact on equid populations. These animals, particularly donkeys, play a key role in agriculture, transport and food security in this region and their loss is problematic for the resilience of the local pastoral population.

- In **North and Eastern Africa**, Equine Influenza was reported in Sudan, and African Horse Sickness in Ethiopia.

■ Foot-and-mouth disease (FMD), serotype O

- In **Southern African countries**, FMD, serotype O, which re-emerged in Zambia in August 2018, is likely to continue to occur in Zambia and Malawi (in non-vaccinated areas). These events are of concern because the disease may spread from Zambia throughout the Southern Africa region, reaching countries that have never been affected by this particular serotype (e.g. Botswana, Namibia and Zimbabwe).
- In **North and West African countries** (respectively, Algeria, Libya, Morocco and Tunisia; and Guinea-Bissau, Burkina Faso, the Gambia, Guinea, Côte d'Ivoire, Mauritania, Senegal and Sierra Leone), several outbreaks of FMD, serotype O, were reported in July 2018 and January 2019. The virus observed appears to be genetically very similar to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the entire region, where the livestock is not immunized against this particular strain of the virus.

■ *Peste des petits ruminants* (PPR)

- PPR was first reported in Burundi in January 2018 and has been under control through mass vaccination. Outbreaks continued to be reported in the United Republic of Tanzania and the Democratic Republic of Congo at the end of 2018; the territories are considered endemic for PPR. The disease is likely to spread through small ruminant movements and pastoralism along border areas, and to be introduced in neighbouring Malawi, Mozambique and Zambia.

FOREST PESTS AND DISEASES

- In **Eastern Africa**, **Blue gum chalcid**, **Bronze bug** and **Red gum lerp psyllid** insect pests are likely to continue spreading, causing severe damage in eucalyptus plantations. Applications of biological control agents to reduce these insect pest populations are in progress in some countries. The Polyphagous shot hole borer is likely to spread from Southern Africa to neighbouring countries.

AQUATIC ANIMAL DISEASES

- In **Southern Africa**, Zambia is at risk of the fish disease **Epizootic Ulcerative Syndrome (EUS)** re-emerging. The United Republic of Tanzania is at risk of EUS introduction, as the disease is present in neighbouring countries (Congo and Zambia). Water temperatures during the period July–September in these countries range between 18 and 25°C, which are optimal temperatures for the development of the oomycete fungus that causes the disease.



REGIONAL OVERVIEW FORECAST FOR THE PERIOD JULY–SEPTEMBER 2019

AFRICA

- **Tilapia lake virus (TiLV)** may have a wider distribution than presently known. Based on an expert knowledge elicitation risk assessment for TiLV (<http://www.fao.org/3/CA2864EN/ca2864en.pdf>), the risk of TiLV spreading (in the absence of any controls) within a country where it is already present was found to be very high, whereas the risk of TiLV spreading from infected countries to other countries in the African region was found to be high.

High awareness and vigilance against TiLV are required in tilapia-producing countries in **Northern Africa** (which includes Egypt, the world's second-largest tilapia producer), **Eastern Africa** (which includes major tilapia-producing countries such as Kenya, Malawi, Mozambique, Sudan, the United Republic of Tanzania, Uganda, Zambia and Zimbabwe), and **Southern Africa** (which comprises major tilapia-producing countries such as Malawi, Mozambique, the United Republic of Tanzania, Zambia and Zimbabwe). A surveillance plan may be necessary to determine the geographical extent of the disease and to prepare mitigation measures to limit its spread. Appropriate diagnostic testing is encouraged when unexplained mortalities of tilapia occur; testing is particularly necessary when clinical signs similar to those reported for TiLV are present and when permissive water temperatures (between 22°C and 32°C) prevail. Public information campaigns are recommended, to advise aquaculturists on the threat posed by TiLV and on the need to report unexplained large-scale mortalities to biosecurity authorities. TiLV is likely to occur in countries where water temperatures range between 22°C and 32°C (usually between May and November in some countries). The following farmed tilapia species are susceptible: Hybrid tilapia (*Oreochromis niloticus* x *O. aureus* hybrids), Nile tilapia (*O. niloticus*), and Red tilapia (*Oreochromis* sp.).



REGIONAL OVERVIEW FORECAST FOR THE PERIOD JULY–SEPTEMBER 2019

AMERICAS

In the Americas, 6 FCC events in 6 countries were forecasted, comprising aquatic diseases and forest pests. The likelihood of occurrence varies from Low to High. The following FCC events have significant regional implications:

FOREST PESTS AND DISEASES

- Severe infestations of **Bark beetle**, in particular of the *Dendroctonus frontalis* species, are occurring in the dry corridor of **Central America**, and will continue in the pine forests of Guatemala, Honduras and Nicaragua. The pine species *Pinus caribea*, *Pinus oocarpa* and *Pinus patula*, in both natural forests and plantations, have become more vulnerable to beetle attacks because they are already stressed by prolonged drought and weakened due to poor forest management practices.

AQUATIC ANIMAL DISEASES

- Based on an expert knowledge elicitation risk assessment for **Tilapia lake virus (TiLV)** (<http://www.fao.org/3/CA2864EN/ca2864en.pdf>), the risk of TiLV spreading (in the absence of any controls) within a country where it is already present was found to be very high, whereas the risk of TiLV spreading from infected countries to other countries in the **South American** region was found to be high.

Surveillance plans, control measures and awareness campaigns are required in tilapia-producing countries. Public information campaigns are recommended, to advise aquaculturists on the threat posed by TiLV and on the need to report unexplained large-scale mortalities to biosecurity authorities. TiLV is likely to occur in countries where water temperatures range between 22°C and 32°C. The following farmed tilapia species are susceptible: Hybrid tilapia (*Oreochromis niloticus* x *O. aureus* hybrids), Nile tilapia (*O. niloticus*), and Red tilapia (*Oreochromis* sp.).

TiLV is already present in Colombia and Ecuador (according to the scientific literature), and in Mexico Peru and the United States of America (according to an OIE notification); it may become a threat to other tilapia-producing countries in Latin America and the Caribbean (LAC).



REGIONAL OVERVIEW FORECAST FOR THE PERIOD JULY–SEPTEMBER 2019

ASIA

In Asia, a total of 94 FCC events were forecasted in 42 countries, comprising plant pests and diseases, locusts, animal and aquatic diseases, and forest pests. The likelihood of occurrence varies from Low to High. The following FCC events have significant regional implications:

PLANT PESTS AND DISEASES

■ Fall Armyworm (FAW) – *Spodoptera frugiperda*

In **West Asia**, Yemen officially declared the introduction of FAW in 2018. Maize – the main host crop – has been planted since May and June in many western Asian countries. This may increase the risk of introduction to other countries, such as Saudi Arabia and Oman.

In **Southeast Asia**, FAW has been reported in most countries. It is expected to continue to spread within these countries and to uninfested countries to the east and to the south.

In **Southeast Asia**, Banana fusarium wilt disease, Tropical Race 4, is present and was recently reported in Lao People's Democratic Republic, Myanmar and Viet Nam, and may further spread and cause damage.

In **West Asia**, Rust disease outbreaks, particularly yellow rust, are likely to occur in countries receiving high amounts of precipitation.

LOCUSTS

■ In **Central Asia**, the locust situation is generally calm. Fledging of the **Moroccan Locust** has already started and most of the control operations against the pest have been completed. The **Italian Locust** and the **Migratory Locust** are currently present as hoppers forming groups and bands, which are the main targets of control operations. Fledging will start from late June, occurring in the southern to the northern Central Asian countries, and it will be followed by mating, egg-laying and natural disappearance.

In **the Caucasus**, adult populations of **Italian and Moroccan Locusts** will lay eggs and eventually disappear by the end of the forecast period.

ANIMAL DISEASES

■ Avian Influenza (AI)

Based on seasonal patterns and the increasing temperatures during this forecast period, a decrease in the numbers of **Avian Influenza** outbreaks in poultry is generally expected during the period July–September 2019. However, four main **Highly Pathogenic Avian Influenza (HPAI)** subtypes and several H5 clades are endemically circulating in West, East, South and Southeast Asia. These subtypes may cause new outbreaks during the period July–September 2019; however, overall, the risk is considered low. H9N2 Low Pathogenic Avian Influenza (LPAI) is considered to be endemically circulating in many Asian countries, causing losses to poultry production. As LPAI viruses are not notifiable to the OIE, few data are available.

- **H5N1 HPAI** continues to circulate endemically in Bangladesh, China, India, Indonesia and Viet Nam and has re-emerged in Cambodia, Lao People's Democratic Republic and Malaysia in 2018, and in Bhutan and Nepal in April–May 2019.



REGIONAL OVERVIEW FORECAST FOR THE PERIOD JULY–SEPTEMBER 2019

ASIA

- **H5N2 HPAI** is circulating in Taiwan, Province of China and was last observed in May 2019.
- The latest reports of **H5N6 HPAI** in Asia are dated March–July 2019 in Cambodia and Viet Nam, while in China, the last outbreak was observed on 30 May 2019.
- The **H5N8 HPAI** strain currently circulating emerged in China in May 2016, and has spread to Japan, India, Iran (Islamic Republic of), Nepal, the Republic of Korea, Pakistan, Israel and Kuwait (in December 2016); to Kazakhstan (in January 2017); and to Saudi Arabia (in December 2017). In 2019, H5N8 HPAI has been reported in Iraq, Pakistan and Kuwait, and in April 2019, in Israel and Iran (Islamic Republic of).

- **African swine fever (ASF)** continues to be reported in the region. Cambodia (April 2019), China (since August 2018), Democratic People's Republic of Korea (May 2019), Lao PDR (June 2019), Mongolia (January 2019) and Viet Nam (February 2019) have reported outbreaks in domestic pigs and sporadic cases in wild boar (mainly in captive wild boar).

The disease was also reported for the first time in wild boar in Jilin and Heilongjiang province in China in December 2018. As of 04 June 2019, outbreaks continue to be reported in China, Viet Nam and, more recently, in Democratic People's Republic of Korea and Lao PDR. Over the last few months, there have been numerous detections of the ASF virus in pork samples brought to countries in the region (e.g. Australia, Thailand, Republic of Korea and Japan).

The risk of ASF spreading further within the countries is considered high in countries that have already been infected, which also poses a risk of ASF introduction into other countries in East and Southeast Asia through the movement of live pigs and pork products. As the majority of pigs are produced in Asia, especially in China, the recent escalation of the ASF epidemic is likely to have devastating consequences on animal health and food security, as well as a noticeable impact on the pig industry and related businesses in the region and worldwide.

- In West Asia, **Foot-and-mouth disease (FMD)** is likely to occur. If the mitigation measures currently in place are not effective, FMD viruses are likely to continue spreading in the Middle East. Currently, serotypes O and A are circulating in Israel, while serotype O was reported in the Gaza Strip, Jordan and the West Bank in 2017; however, in these three countries, several non-typed events have occurred in 2018 and 2019. Poor vaccine matching and poor coverage of susceptible livestock are likely to increase the possibility of FMD introduction.
- **Peste des petits ruminants (PPR)** outbreaks are likely to continue to be reported in China and Israel. The last detection of the disease in China occurred in June 2018, while in Israel, several outbreaks occurred in January 2019. PPR is likely to be introduced in eastern oblasts of the Russian Federation due to the presence of the disease in neighbouring China.
- **Lumpy skin disease (LSD)** outbreaks are likely to re-emerge in Turkey (which is considered endemic for the disease) and in neighbouring Caucasian countries (that is, Azerbaijan, Armenia and Georgia), due to the increasing of temperatures, which determine favorable weather conditions for vector amplification during the forecast period. The impacts of the disease may be mitigated through the prevention measures implemented in the countries (that is, vaccination).



REGIONAL OVERVIEW FORECAST FOR THE PERIOD JULY–SEPTEMBER 2019

ASIA

FOREST PESTS AND DISEASES

- The dieback of boxwood trees (*Buxus hyrcana*), an IUCN threatened species, which is caused by **Boxwood blight** (pathogen: *Calonectria pseudonaviculata*) and the **Boxwood moth** (*Cydolima pesrpectalis*) will cause severe damage in Georgia and in the Caspian forest of Iran (Islamic Republic of), due to high pest activities in the summer.
- In Lebanon, **Dry cone syndrome** and the **Western conifer seed bug** are causing severe losses in pine nut harvest, and pest damage will continue; additionally, the activities of the Western conifer seed bug will be high, due to low precipitations and high temperatures in the summer months.
- In Turkey, the **Chestnut gall wasp** is causing damage to chestnut trees and threatening the livelihoods of local communities. It is expected that pest pressure will decrease due to pest control activities currently being undertaken. Biological control is in progress to reduce pest populations. In Iran (Islamic Republic of), a moderate incidence of Charcoal disease is likely to continue in oak forests in the Zagros area.

AQUATIC ANIMAL DISEASES

- Based on an expert knowledge elicitation risk assessment for **Tilapia lake virus (TiLV)** (<http://www.fao.org/3/CA2864EN/ca2864en.pdf>), the risk of TiLV spreading (in the absence of any controls) within a country where it is already present was found to be very high, whereas the risk of TiLV spreading from infected countries to other countries in the Asian region (including East and South Asia, which host the world's major tilapia-producing countries such as Bangladesh, China, Indonesia, Myanmar, the Philippines, Thailand and Viet Nam) was found to be high.

TiLV is likely to occur in countries where water temperatures range between 22°C and 32°C (usually between May and November). The following farmed tilapia species are susceptible: Hybrid tilapia (*Oreochromis niloticus* x *O. aureus* hybrids), Nile tilapia (*O. niloticus*), and Red tilapia (*Oreochromis* sp.).



REGIONAL OVERVIEW **FORECAST FOR THE PERIOD JULY–SEPTEMBER 2019**

EUROPE

In Europe, 37 FCC events were forecasted in 24 countries, comprising locusts and animal diseases. The likelihood of occurrence varies from Low to High. The following FCC events have significant regional implications:

LOCUSTS

In the Russian Federation, hopper development of **Italian, Migratory, and Moroccan Locusts** is in progress and control operations will continue for at least one additional month. Fledging should start in July, followed by mating and egg laying in August.

ANIMAL DISEASES

■ **African swine fever (ASF)** outbreaks and transmission are likely to continue in the affected countries (Belgium, Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Republic of Moldova, the Russian Federation and Ukraine). The introduction of the disease is likely to occur in non-affected neighbouring countries (such as the Republic of North Macedonia, Serbia and Slovakia), without ruling out longer jumps, such as those observed in Belgium or Czechia. Czechia was the first country in the EU to be officially declared free from ASF in February 2019 after no new outbreak had been found in the country since April 2018. In September 2018, the virus affected wild boar populations in Belgium. This has increased the possibility of introduction into neighbouring Western European countries (such as France, Germany and Luxembourg). In all affected countries, ASF is most likely to persist and become endemic due to the presence of wild boar populations.

■ Avian Influenza (AI)

- Two **H5 Highly pathogenic avian influenza (HPAI)** subtypes are circulating in Europe. In accordance with seasonal patterns (increasing temperatures and ceasing wild bird migration movements), the overall risk for the period July–September 2019 is considered low.
- An H3N1 LPAI virus emerged in Belgium in April 2019, causing production losses and a mortality rate in poultry of up to 60 percent. The outbreaks have been contained.
- A low risk of **H5N8 HPAI** occurrence in affected European countries exists. Since the virus has been first introduced into eastern Europe mid-October 2016, it has been detected in 30 out of 43 European countries, particularly in western and eastern Europe. In 2019, the reported number of infections has been drastically decreasing, and the disease has affected mainly domestic poultry in Bulgaria and the Russian Federation. The last detection of this strain occurred in April 2019, in Bulgaria. Nonetheless, it strain may continue to be sporadically detected during the forecasted period.
- In 2018, a local reassortant strain of the **H5N6 HPAI** virus, and thus different from the strain circulating in Asia, was detected in wild and domestic birds in Denmark, Finland, Germany, Ireland, the Netherlands, Slovakia, Sweden, Switzerland and the United Kingdom of Great Britain and North Ireland. This strain may continue to be sporadically detected during the period July–September 2019; however, these are expected to be rare events, given the increasing temperatures expected during the summer season in Europe. The last report of the H5N6 HPAI strain occurred in Denmark, in March 2019.



REGIONAL OVERVIEW **FORECAST FOR THE PERIOD JULY–SEPTEMBER 2019**

EUROPE

- On 24 June 2018, ***Peste des petits ruminants (PPR)*** was reported for the first time in Bulgaria. The disease appears to be controlled through stamping out. The risk of the disease being introduced into European countries from neighbouring infected countries is still high. In addition, PPR is likely to be introduced in eastern oblasts of the Russian Federation due to the presence of the disease in neighbouring China.
- The increasing of temperatures determines favourable weather conditions for vector amplification during the forecast period, and are compatible with the occurrence of **Lumpy skin disease (LSD)** in affected countries of southern Europe (Albania, Greece, Kosovo*, Montenegro, the Republic of North Macedonia and Serbia) and the Russian Federation. However, the disease may be mitigated through the prevention measures that are currently in place in the countries (i.e. vaccination).

** References to Kosovo shall be understood in the context of UN Security Council Resolution 1244 (1999).*

FOREST PESTS AND DISEASES

- **Bark beetle** infestations will continue to damage pine plantations in Belarus and Ukraine. The movement of beetles will increase and outbreaks are likely to occur in the summer; therefore, it will be necessary to continue monitoring pest movements and to apply silvicultural measures to remove the infested and weakened trees in the forests.
- In Albania, the **Pine processionary moth** is likely to continue causing damage in the summer.


















FOOD CHAIN CRISIS THREATS FORECASTING AT COUNTRY LEVEL

This section provides, at country level, for the upcoming three months, forecasting of FCC threats having potential high impact on food and nutrition security. It also provides, when available and appropriate, background information on other factors impacting food and nutrition security.

The country section includes countries for which information are available. This section assigns countries and areas to geographic regions on the basis of the current composition of macro geographical (continental) regions of the United Nations Statistics Division (United Nations Statistics Division – Standard Country and Area Codes Classification (M49); <http://unstats.un.org/unsd/methods/m49/m49regin.htm>).

The assessment of the likelihood of occurrence was performed using FAO data and information available at the time of preparation of this bulletin and might be subject to changes later.

Legend

Threats category	Likelihood of occurrence		
	High	Moderate	Low
Animal and zoonotic diseases			
Aquatic diseases			
Forest pests and diseases			
Locusts			
Plant pests and diseases			

■ **High:** an event is highly likely to occur

■ **Moderate:** an event is likely to occur

■ **Low:** an event is unlikely to occur



FOOD CHAIN CRISIS THREATS FORECASTING AT COUNTRY LEVEL

AFRICA

ALGERIA

Threat category: Plant pests and diseases 

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (July–September 2019): There is a low possibility for FAW introduction in the country

Context: FAW has not been reported in the country yet. Egypt has reported the pest, which means that it was able to cross the natural barrier of the Sahara desert and places North African countries at risk of FAW introduction. However, as FAW has not been reported in northern Egypt yet, the possibility of introduction to other North African countries is low.

Threat category: Plant pests and diseases 

Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The season for growing and harvesting tomato continues until June and July; warmer weather in North Africa will favour the development of Tomato leaf miner.

Context: *Tuta absoluta* has been reported in Algeria since 2008. It continues to cause yield losses, mainly in tomato, and, to a lesser extent, also in potato and eggplant. The Government has recommended monitoring the pest population with pheromone traps and spray pesticides.

Threat category: Locusts 


Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Small-scale breeding may occur near irrigated perimeters of Central Sahara; no significant developments expected

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population can be affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.

ANGOLA

Threat category: Plant pests and diseases 

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Increasing temperatures, coupled with the start of the irrigated maize production season, will moderately amplify the pest.

Context: FAW presence was first reported during the 2016/2017 season, and the pest continued to cause serious damage to the maize crop during the 2017/2018 production season.

Threat category: Plant pests and diseases 


Threat name: Tomato leaf miner

Likelihood of occurrence: High

Forecast (July–September 2019): High temperatures and the widespread production of tomato in the country is likely to favour amplification of the pest.

Context: The pest has been causing damage to the tomato crop since 2016.

BENIN

Threat category: Plant pests and diseases 

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: Benin was among the first countries to be affected by FAW in April 2016. Actions to monitor and manage the pest are ongoing through various projects.

BOTSWANA

Threat category: Plant pests and diseases 

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (July–September 2019): Although the period is characterized by increasing temperatures, the cultivation of cereals in Botswana at this time of the year is generally low, a factor that limits the spread of the pest.

Context: The presence of FAW was first reported during the 2016/2017 season, and the pest continued to cause serious damage to the maize crop during the 2017/2018 production season.



BOTSWANA

Threat category: Plant pests and diseases



Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Although high temperatures may favour spread of the pest, this will be limited by the low production of tomato: the drought-like conditions prevailing will reduce production, given the limited water availability.

Context: The pest has been causing damage to the tomato crop since 2016.

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The introduction of Foot-and-mouth disease (FMD), serotype O, from a neighbouring country is likely.

Context: FMD, serotype O outbreaks have occurred in Zambia since March 2018. The last FMD, serotype O outbreak was reported in Zambia in April 2019. These events are of concern because the disease may spread into the Southern African region, which has never been affected by this particular serotype. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade.*

Threat category: Animal and zoonotic diseases



Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Low

Forecast (July–September 2019): The potential risk of RVF outbreaks is considered low, according to the FAO RVF monitoring/Early Warning System.

Context: In southern Africa, precipitation forecasts for the period from July to September 2019 predict average and below-average rainfall across most of the region, except for southern Zambia and central Mozambique. Weak El Niño conditions are likely to continue throughout the Northern Hemisphere in spring (approximately 80 percent chance) and summer 2019 (approximately 60 percent chance). During the past months, the entire region was characterized by prolonged dry conditions. Exceptional floods and heavy rainfall events have recently hit southern Malawi and northern-central Mozambique. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to the death and abortion of RVF-infected livestock.*

BURKINA FASO

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: A TCP addressing FAW in the country is in progress and farmers are gaining familiarity with some management practices.

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in Western African countries (such as Burkina Faso, Côte d'Ivoire, the Gambia, Guinea, Guinea-Bissau, Mauritania, Senegal and Sierra Leone). The virus observed seems to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, toptype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade.*

BURUNDI

Threat category: Plant pest and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): During the forecast period, there will not be sufficient maize to sustain FAW populations. However, FAW is likely to survive on maize grown on marshes as well as on alternate hosts and continue its spread.

Context: FAW presence has been confirmed in all 17 provinces of the country; however, data on the incidence and severity of the damage are not available yet. In Burundi, maize is grown three times a year on an area estimated at 164 306 ha. The first cropping season covers the months of October to January (season A), with 77 percent of the annual maize area; the second goes from February to June (season B), with 12 percent of annual maize area; and the third from July to September (season C), with 11 percent. During season C, there is no rain, maize is grown in marshes and high temperatures prevail during the day with an average of 23°C. Environmental conditions are favourable for outbreaks of the moth.



BURUNDI

Threat category: Animal and zoonotic diseases



Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The potential risk of RVF occurrence is considered moderate given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: In West Africa, the forecasts for the period from July to September 2019 predict average and below-average precipitation across most of the region. According to the FAO RVF Monitoring/Early Warning tool, suitable environmental conditions for vector amplification will persist in localized areas. Suitable environmental conditions for vector amplification are also predicted in wide areas in Rwanda, Burundi, south-eastern Uganda and central-western Ethiopia. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to the death and abortion of RVF-infected livestock.*

CAMEROON

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (July–September 2019): Maize will not be available during the forecasting period. Therefore, there will be a low risk of FAW amplification on other host plants or weeds.

Context: The presence of the pest was confirmed in the West, Centre, Far North, Littoral and South-West Regions of the country in March 2017. Currently, six out of the 10 regions of the country are affected: Centre (Ngoumou and Bokito), South (Mbalmayo), West (Foumbot and Dschang), Littoral (Melong, Manengolé and Douala), South-West (Debuncha) and the Extreme North (Guider, Maroua). The Government has prepared a strategic control plan to control the spread of this pest.

Threat category: Plant pests and diseases



Threat name: Banana bunchy top disease (BBTD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread from the initial outbreak areas is likely.

Context: The disease is already present in southern parts of the country. The spread of Banana bunchy top disease from the initial outbreak areas is possible. The disease spreads through infected planting materials and aphids. Use of disease-clean planting materials is critical.

CENTRAL AFRICAN REPUBLIC

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Maize will be in the harvesting stage. Therefore, there will be a moderate risk of FAW amplification at the end of the maize season.

Context: In July 2017, FAW presence was confirmed within a 50-km radius of the Capital, Bangui. FAW mapping in the country is underway to reveal the current situation of the pest.

CHAD

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: In December 2016, FAW presence was first reported.

Threat category: Locusts



Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Small-scale breeding will commence in areas of recent rainfall, causing locust numbers to increase slightly. In early July, there is a low risk that a few small swarms may appear in the east from spring breeding areas in Arabia.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population can be affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.



COMOROS

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: In Comoros, an FMD, serotype O outbreak occurred in March 2019. The disease may have spread from the neighbouring United Republic of Tanzania (where it is endemic); this event is of concern because the disease can spread within Comoros itself or into neighbouring countries, such as Mozambique or Madagascar, through movement of animals. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade.*

CONGO

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (July–September 2019): Maize will not be available during the forecasting period. Therefore, there will be a low risk of FAW amplification on other host plants or weeds.

Context: In July 2017, FAW was reported in the country. The pest was identified in four maize production areas in the northern, central and southern parts of the country. It has also been observed in sugarcane. However, currently, the Government does not have a complete mapping of pest infestations, nor statistics on production losses. Smallholder farmers, experimental farms in agricultural centres and large private farms have been affected.

CÔTE D'IVOIRE

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: FAW prevalence in the country has been assessed and some regions may have not been infested by FAW yet. However, FAW is highly likely to spread to the entire country.

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in Western African countries (such as Burkina Faso, Côte d'Ivoire, the Gambia, Guinea, Guinea-Bissau, Mauritania, Senegal and Sierra Leone). The virus observed seems to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade.*

DEMOCRATIC REPUBLIC OF THE CONGO

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): In the north, the main maize season will be in the growing stage. Therefore, there will be a moderate risk of FAW amplification in this area.

Context: FAW was first reported in the country in December 2016. Actions to manage the pest are ongoing.

DJIBOUTI

Threat category: Plant pest and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): FAW is likely to be introduced into the country from neighbouring Ethiopia.

Context: The pest is suspected to be present but has not been confirmed. FAW spread will be limited because of the arid conditions prevailing and the limited availability of its preferred host (maize).



EGYPT

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): During the forecast period, many FAW host crops are cultivated, such as maize, rice, sugarcane and cotton, which increase the likelihood of spread and the hot dry summer season will encourage the dispersal of FAW moths.

Context: FAW has been officially reported on maize fields in southern Egypt in May 2019.

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: H5N1 HPAI is endemic in Egypt. H5N8 HPAI has been present in the country since November 2016. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*

Threat category: Locusts



Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Small-scale breeding may occur near farms in the Lake Nasser area and Western Desert

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population can be affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.

Threat category: Plant pests and diseases



Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The season for growing and harvesting tomato continues until June and July; warmer weather in North Africa will favour the development of Tomato leaf miner.

Context: *Tuta absoluta* has been reported in Egypt since 2010. It continues to cause yield losses, mainly in tomato, and, to a lesser extent, also in potato and eggplant. The Government has recommended monitoring the pest population with pheromone traps and spray pesticides.

ERITREA

Threat category: Plant pest and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): The pest is very likely to amplify during this forecast period.

Context: The presence of FAW was confirmed in the country in February 2018. The great efforts made by the communities and the government to manage the pest have meant that the incidence and severity of the damage caused by the pest have not been significant until now. In Eritrea, the long rainy season has already begun in most parts of the country where maize is a major crop. More maize will also be planted using irrigation, such that there will be widespread planting of maize, which is expected to sustain damage from FAW.

Threat category: Locusts



Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Low numbers of adults are likely to appear in the Western Lowlands and breed in areas that receive rainfall, causing locust numbers to increase slightly

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population can be affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.

ETHIOPIA

Threat category: Plant pest and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): The risk of damage cause by FAW may be high in this forecasting period.

Context: In 2018, approximately 150 000 ha of maize from across the country did not receive any control measures. The pest has started to infest sorghum, another widely grown cereal crop in Ethiopia. The threat, therefore, is expected to expand to sorghum too, and may cause serious economic damage to both maize and sorghum, thereby threatening the food security of more than 16 million households. The long rainy season has already begun in most parts of the country where maize is a major crop. During this period, maize will be in its seedling or active vegetative-reproductive phases. The sources of infestation are expected to be both long-distance movements from southern Ethiopia to central, north and eastern Ethiopia and larvae that might have pupated within maize- or sorghum-grown fields in previous season. Combined, they may build a high population and cause significant damage to maize and sorghum unless appropriate actions are taken.



ETHIOPIA

Threat category: Animal and zoonotic diseases



Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The potential risk of RVF occurrence is considered moderate given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: In West Africa, the forecasts for the period from July to September 2019 predict average and below-average precipitation across most of the region. According to the FAO RVF Monitoring/Early Warning tool, suitable environmental conditions for vector amplification will persist in localized areas. Suitable environmental conditions for vector amplification are also predicted in wide areas in Rwanda, Burundi, south-eastern Uganda and central-western Ethiopia. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to the death and abortion of RVF-infected livestock.*

GABON

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (July–September 2019): Maize will not be available during the forecasting period. Therefore, there will be a low risk of FAW amplification on other host plants or weeds.

Context: In late July 2017, FAW infestations were reported in the Estuaire and Haut Ogooué provinces. No control measures were undertaken by the government so far and studies are on-going to confirm the status of the country.

Threat category: Plant pests and diseases



Threat name: Banana bunchy top disease (BBTD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread from the initial outbreak areas is likely.

Context: The disease is already present in southern parts of the country. The spread of Banana bunchy top disease from the initial outbreak areas is possible. The disease spreads through infected planting materials and aphids. Use of disease-clean planting materials is critical.

GAMBIA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: The country's capacities in terms of FAW management have been strengthened through a TCP facility.

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in Western African countries (such as Burkina Faso, Côte d'Ivoire, the Gambia, Guinea, Guinea-Bissau, Mauritania, Senegal and Sierra Leone). The virus observed seems to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade.*

GHANA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: Ghana has benefited from a TCP emergency and its capacity to respond to FAW has been strengthened. The country has also developed its capacity to monitor FAW and is among the countries that regularly send data to FAMEWS.

Threat category: Plant pests and diseases



Threat name: Cassava Swollen shoot disease

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Cassava Swollen shoot disease in cassava is likely to expand.

Context: The disease is caused by a virus which is transmitted by mealybugs. Eradication and use of disease-free planting materials is key for prevention.



GHANA

Threat category: Aquatic diseases



Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (July–September 2019): TiLV has not been reported. However, it may be introduced and spread through live movements of infected hosts.

Context: There are reports of unexplained tilapia mortalities. TiLV occurs when the water temperature is between 22°C and 32°C; it has also been observed in farms with large-sized fish and a high stocking density. In Ghana, high water temperatures occur in September.

GUINEA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: The country has benefited from various projects to strengthen its capacities in FAW management. A recently signed project, which is funded by the African Development Bank and is due to start soon, includes a significant component on surveillance and management.

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in Western African countries (such as Burkina Faso, Côte d'Ivoire, the Gambia, Guinea, Guinea-Bissau, Mauritania, Senegal and Sierra Leone). The virus observed seems to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade.*

GUINEA-BISSAU

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: The country's FAW management capacity has been developed through a TCP and a project funded by the African Development Bank. Its capacities for biological control are being developed thanks to the cooperation with EMBRAPA.

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in Western African countries (such as Burkina Faso, Côte d'Ivoire, the Gambia, Guinea, Guinea-Bissau, Mauritania, Senegal and Sierra Leone). The virus observed seems to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade.*

KENYA

Threat category: Plant pest and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): The majority of the current maize crop was planted in late March and April 2019, and the maize crop will be present at various growth stages. With the cessation of the rains in June, the late-planted crop will be highly infested and losses are expected to be high.

Context: FAW has been reported in 43 counties. Generally, FAW infestation during 2019 is expected to be lower compared to the same season last year because of the enhanced preparedness resulting from farmer trainings, monitoring and improved FAW management practices for early action.



KENYA

Threat category: Plant pests and diseases

Threat name: Cassava mosaic disease (CMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread of Cassava mosaic disease (CMD) and Cassava brown streak diseases (CBSD) is likely.

Context: The disease is present in the northern part of the country on a limited scale. CMD is considered one of the most damaging diseases of cassava in Africa. It is caused by a virus, which induces chlorosis and distortions of the leaves that reduce yields. It is transmitted by infected cuttings and white flies. A similar virus disease, Cassava Brown Streak Disease (CBSD), is also likely to spread.



Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The period is mostly characterized by relatively lower temperatures, although production of tomato would be on the increase. This would induce a moderate spread of the pest.

Context: The pest was reported for the first time in Lesotho by IPPC/FAO in January 2018.



LIBYA (STATE OF)

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (July–September 2019): There is a low possibility for FAW introduction in the country.

Context: FAW has not been reported in the country yet. Egypt has reported the pest, which means that it was able to cross the natural barrier of the Sahara desert and places North African countries at risk of FAW introduction. However, as FAW has not been reported in northern Egypt yet, the possibility of introduction to other North African countries is low.



Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The potential risk of RVF occurrence is considered moderate given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: On December 2018 and January 2019, some outbreaks of RVF occurred in Nyandarua and Muranga counties, in the Central region. Both humans and animals (cattle and sheep) were reported to be infected in the area. Precipitation forecasts for the period from July to September 2019 in the region predict average and above-average rainfall, particularly in Nyandarua, Nyeri and Muranga counties, as well as areas in proximity of Mount Kenya. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to the death and abortion of RVF-infected livestock.*



Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD serotype O strain occurred again in the country in April 2019, after no reporting of the serotype since 2014. *FMD is a highly contagious disease among cattle, buffalo, sheep, and pigs that can cause a sharp drop in milk and meat production in addition to mortality in young animals. It is the most restrictive animal disease for livestock trade.*



LESOTHO

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (July–September 2019): This forecast period is characterized by low temperatures, a factor that is not favourable to the introduction of the pest.

Context: FAW has not been reported in the country yet. Although Lesotho is surrounded by South Africa, where the pest is present.



MADAGASCAR

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The period is characterized by high temperatures and the cultivation of some off-season crops, an aspect that could amplify the pest in some areas.

Context: The pest was first reported to cause damage to crops in November 2017, and its presence has since been officially confirmed.





MADAGASCAR

Threat category: Plant pests and diseases



Threat name: Tomato leaf miner

Likelihood of occurrence: Low

Forecast (July–September 2019): Although the period is characterized by relatively high temperatures that could favour spread, the pest has not yet been detected in the country.

Context: The pest has not been reported in Madagascar yet.

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Foot-and-mouth disease, serotype O, is likely to occur in the country through introduction from a neighbouring country.

Context: In Comoros, an FMD, serotype O outbreak occurred in March 2019. The disease may have spread from the neighbouring United Republic of Tanzania (where it is endemic); this event is of concern because the disease can spread within Comoros itself or into neighbouring countries, such as Mozambique or Madagascar, through movement of animals. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade.*

Threat category: Locusts



Threat name: Migratory Locust

Likelihood of occurrence: High

Forecast (July–September 2019): Adult populations of the third generation, having escaped control operations, will form swarms and can move towards certain areas of crop production, where they will mate and lay eggs. Hatchlings of this fourth generation may also damage crops and pastures. The situation is serious even though generally, this period coincides with winter, during which conditions are generally unsuitable for breeding and not as conducive to survival.

Context: Madagascar is prone to frequent Migratory Locust crises that affect the livelihoods as well as the food and nutrition security of the population. The last plague occurred from April 2012 to July 2016 and threatened 13 million persons. According to the national bulletins, the situation deteriorated in spring, when abundant precipitation created favourable conditions for locust development. Dense populations infested over 350,000 ha in April, forming swarms and hopper bands.

Threat category: Locusts



Threat name: Red Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Immature adult populations, which will be mobile during the winter period, will mature at the beginning of the rainy season and breed.

Context: The Red Locust pest (one of two in Madagascar) has much less frequent outbreaks than the Malagasy Migratory Locust. Nevertheless, during last spring, dense populations of this species accompanied those of Migratory Locusts, requiring intensive control operations.

MALAWI

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): High temperatures, coupled with widespread off-season maize production, will favour amplification of the pest.

Context: The presence of FAW was first reported during the 2016/2017 main rainy season (November–March). The pest has caused serious damage to maize across the country, off-season irrigated maize (April–October) and other crops, such as wheat. The government declared a state of disaster because of the pest in the 2017/2018 rainfed cropping season (November–March).

Threat category: Plant pests and diseases



Threat name: Tomato leaf miner

Likelihood of occurrence: High

Forecast (July–September 2019): The period is characterized by widespread production of tomato. Coupled with the high temperatures characteristically prevailing, amplification of the pest can be anticipated.

Context: The pest has been causing damage to tomato since 2016.

Threat category: Forest pests and diseases



Threat name: Blue gum chalcid

Likelihood of occurrence: High

Forecast (July–September 2019): Outbreaks of the Blue gum chalcid insect pest are highly likely to continue occurring in eucalyptus nurseries and plantations.

Context: Blue gum chalcid continues to cause severe damage in nurseries and young eucalyptus plantations in Malawi. Blue gum chalcid (*Leptocybe invasa*) is a major insect pest of young eucalyptus trees and seedlings.



MALAWI

Threat category: Forest pests and diseases



Threat name: Red gum lerp psyllid

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Red gum lerp psyllid is likely to spread in eucalyptus plantations.

Context: The combination of climate change, the general decline of forest conditions and the occurrence of Red gum lerp psyllid continues to damage plantations and small woodlots in Malawi. Red gum lerp psyllid (*Glycaspis brimblecombei*) nymphs and adults feed on sugar-rich phloem. Excessive feeding pressure causes premature leaf drop. Extensive and repeated defoliation events caused by psyllid weaken trees and cause premature death in the highly susceptible eucalyptus species.

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The further spread of Foot-and-mouth disease (FMD) is likely to occur within Malawi in non-vaccinated areas.

Context: FMD serotype O outbreaks has been occurred in Zambia since April 2018. Last FMD, serotype O, outbreak was reported in Zambia in February 2019. These events are of concern because the disease may spread into the Southern Africa region, which has never been affected by this particular serotype. *FMD is a highly contagious disease among cattle, buffalo, sheep, and pigs that can cause a sharp drop in milk and meat production in addition to mortality in young animals. It is the most restrictive animal disease for livestock trade.*

Threat category: Animal and zoonotic diseases



Threat name: Peste des petit ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Peste des petits ruminants (PPR) outbreaks are likely to occur through possible introduction from neighbouring countries.

Context: To date, no outbreaks of PPR have been officially reported in the country. PPR outbreaks continue to occur in the neighbouring United Republic of Tanzania and Democratic Republic of Congo, which are considered endemic for the disease. *PPR is a highly contagious disease affecting sheep and goats which is caused by a morbillivirus. It is considered to be one of the most damaging livestock diseases in Africa.*

Threat category: Animal and zoonotic diseases



Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Low

Forecast (July–September 2019): The potential risk of RVF outbreaks is considered low, according to the FAO RVF monitoring/Early Warning System.

Context: In southern Africa, precipitation forecasts for the period from July to September 2019 predict average and below-average rainfall across most of the region, except for southern Zambia and central Mozambique. Weak El Niño conditions are likely to continue throughout the Northern Hemisphere in spring (approximately 80 percent chance) and summer 2019 (approximately 60 percent chance). During the past months, the entire region was characterized by prolonged dry conditions. Exceptional floods and heavy rainfall events have recently hit southern Malawi and northern-central Mozambique. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to the death and abortion of RVF-infected livestock.*

Threat category: Locusts



Threat name: Red Locust

Likelihood of occurrence: Moderate

Forecast (July–September 2019): With vegetation burning, locusts will aggregate into swarms in the remaining suitable areas. If not controlled, they are likely to escape outbreak areas and invade and damage cultivated areas.

Context: Red Locust plagues pose a major threat to agriculture in southern Africa. Failure to control locust outbreaks during the early stages of development can result in highly mobile swarms, which invade agricultural areas and can cause major crop damage.

MALI

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: A TCP project, which is nearing completion, has helped the country to develop its capacity for FAW surveillance and management.



MALI

Threat category: Locusts



Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Low numbers of locusts are likely to persist in the Adrar des Iforas of the north and breed on a small scale with the onset of the summer rains, causing locust numbers to increase slightly

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population can be affected by this voracious insect. Desert locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.

Threat category: Animal and zoonotic diseases



Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The potential risk of RVF occurrence is considered moderate given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: In West Africa, the forecasts for the period from July to September 2019 predict average and below-average precipitation across most of the region. According to the FAO RVF Monitoring/Early Warning tool, suitable environmental conditions for vector amplification are probable in central Mali, along the irrigation areas in the Segou region. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to death and abortion of RVF-infected livestock.*

MAURITANIA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (July–September 2019): There is a low possibility for FAW introduction in the country.

Context: FAW has not been reported in the country yet. Egypt has reported the pest, which means that it was able to cross the natural barrier of the Sahara desert and places North African countries at risk of FAW introduction. However, as FAW has not been reported in northern Egypt yet, the possibility of introduction to other North African countries is low.

Threat category: Plant pests and diseases



Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The season for growing and harvesting tomato continues until June and July; warmer weather in North Africa will favour the development of Tomato leaf miner.

Context: *Tuta absoluta* has never been officially reported in Mauritania, and no reports on any of the international databases (e.g. CABI, EPPO). But some journal reports have discussed the complain of farmers from the pest.

Threat category: Locusts



Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Small-scale breeding will occur in the south and central areas with the onset of the summer rains, causing locust numbers to increase slightly

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population can be affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.

Threat category: Animal and zoonotic diseases



Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The potential risk of RVF occurrence is considered moderate given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: The last RVF infections reported in Mauritania occurred in livestock in January 2019. In West Africa, the forecasts for the period from July to September 2019 predict average and below-average precipitation across most of the region. According to the FAO RVF Monitoring/Early Warning tool, suitable environmental conditions for vector amplification will persist in small and localized areas along the Senegal River between Senegal and Mauritania. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to the death and abortion of RVF-infected livestock.*



MAURITIUS

Threat category: Plant pests and diseases 

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (July–September 2019): Although the period is characterized by increasing temperatures, there is generally low cultivation of maize on Mauritius Rodriguez Island at this time of the year, thus limiting spread of the pest.

Context: FAW was first reported on Mauritius Rodriguez Island in March 2019.

Threat category: Plant pests and diseases 

Threat name: Tomato leaf miner

Likelihood of occurrence: Low

Forecast (July–September 2019): The pest has not yet been reported in the country. However, there is a slight possibility of it being introduced from the African mainland.

Context: The pest has not been reported in Mauritius yet.

MOROCCO

Threat category: Plant pests and diseases 

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (July–September 2019): There is a low possibility for FAW introduction in the country.

Context: FAW has not been reported in the country yet. Egypt has reported the pest, which means that it was able to cross the natural barrier of the Sahara desert and places North African countries at risk of FAW introduction. However, as FAW has not been reported in northern Egypt yet, the possibility of introduction to other North African countries is low.

Threat category: Plant pests and diseases 

Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The season for growing and harvesting tomato continues until June and July; warmer weather in North Africa will favour the development of Tomato leaf miner.

Context: *Tuta absoluta* has been reported in Morocco since 2008. It continues to cause yield losses mainly in tomato, and, to a lesser extent, also in potato and eggplant. The Government has initiated a control programme to monitor the pest population with pheromone traps and spray pesticides.

MOZAMBIQUE

Threat category: Plant pests and diseases 

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): High temperatures, coupled with some off-season maize production, will favour a moderate amplification of the pest.

Context: The presence of FAW was first reported during the 2016/2017 season. It continued to cause damage to maize in the 2017/2018 rain-fed production season from November to March.

Threat category: Plant pests and diseases 

Threat name: Tomato leaf miner

Likelihood of occurrence: High

Forecast (July–September 2019): The period is characterized by widespread production of tomato. Coupled with the high temperatures characteristically prevailing, amplification of the pest can be anticipated.

Context: The pest has been causing damage to tomato crops since 2016.

Threat category: Plant pests and diseases 

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread of Fusarium wilt disease, Tropical Race 4 (TR4), on banana is likely.

Context: Tropical race 4 (TR4) of the Fusarium wilt fungus has affected two farms in the Nampula province and further spread is possible. The disease is soil-borne and cannot be eradicated once it becomes established in the soil. It attacks banana plants of all ages, initially appearing with a yellowing of the leaves and then causing wilting and plant death. Infected planting materials, water and the movement of infested soil particles with shoes, tools, and vehicles play a major role in spread. The fungus remains viable in soil for decades; therefore, speedy containment is critical.

Threat category: Forest pests and diseases 

Threat name: Red gum lerp psyllid

Likelihood of occurrence: Low

Forecast (July–September 2019): Red gum lerp psyllid outbreaks are likely to continue occurring in eucalyptus plantations.

Context: Monitoring of the pest spread is in progress. Red gum lerp psyllid (*Glycaspis brimblecombei*) nymphs and adults feed on sugar-rich phloem. Excessive feeding pressure causes premature leaf drop. Extensive and repeated defoliation events caused by psyllid weaken trees and cause premature death in the highly susceptible eucalyptus species.



MOZAMBIQUE

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Foot-and-mouth disease, serotype O, is likely to occur in the country through introduction from a neighbouring country.

Context: In Comoros, an FMD, serotype O outbreak occurred in March 2019. The disease may have spread from the neighbouring United Republic of Tanzania (where it is endemic); this event is of concern because the disease can spread within Comoros itself or into neighbouring countries, such as Mozambique or Madagascar, through movement of animals. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade.*

Threat category: Animal and zoonotic diseases



Threat name: Peste des petit ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Peste des petits ruminants (PPR) outbreaks are likely to occur through possible introduction from neighbouring countries.

Context: To date, no outbreaks of PPR have been officially reported in the country. PPR outbreaks continue to occur in the neighbouring United Republic of Tanzania and Democratic Republic of Congo, which are considered endemic for the disease. *PPR is a highly contagious disease affecting sheep and goats which is caused by a morbillivirus. It is considered to be one of the most damaging livestock diseases in Africa.*

Threat category: Animal and zoonotic diseases



Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Low

Forecast (July–September 2019): The potential risk of RVF outbreaks is considered low, according to the FAO RVF monitoring/Early Warning System.

Context: In southern Africa, precipitation forecasts for the period from July to September 2019 predict average and below-average rainfall across most of the region, except for southern Zambia and central Mozambique. Weak El Niño conditions are likely to continue throughout the Northern Hemisphere in spring (approximately 80 percent chance) and summer 2019 (approximately 60 percent chance). During the past months, the entire region was characterized by prolonged dry conditions. Exceptional floods and heavy rainfall events have recently hit southern Malawi and northern-central Mozambique. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to the death and abortion of RVF-infected livestock.*

Threat category: Locusts



Threat name: Red Locust

Likelihood of occurrence: Moderate

Forecast (July–September 2019): With vegetation burning, locusts will aggregate into swarms in the remaining suitable areas. If not controlled, they are likely to escape outbreak areas and invade and damage cultivated areas.

Context: Red Locust plagues pose a major threat to agriculture in southern Africa. Failure to control locust outbreaks during the early stages of development can result in highly mobile swarms, which invade agricultural areas and can cause major crop damage.

NAMIBIA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (July–September 2019): Although the high temperatures prevailing can favour pest spread, most parts of Namibia are experiencing severe drought-like conditions, which will limit opportunities for off-season maize production. This will limit amplification of the pest.

Context: The presence of FAW was first reported during the 2016/2017 season. It continued to cause damage to the maize crop in the 2017/2018 rain-fed production season from November to March.

Threat category: Plant pests and diseases



Threat name: Tomato leaf miner

Likelihood of occurrence: Low

Forecast (July–September 2019): Although the high temperatures prevailing can favour pest spread, most parts of Namibia are experiencing severe drought-like conditions, which limit opportunities for irrigated tomato production. This will limit amplification of the pest.

Context: The pest has been causing damage to tomato crops since 2016.



NAMIBIA

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The introduction of Foot-and-mouth disease (FMD), serotype O, from a neighbouring country is likely.

Context: FMD, serotype O outbreaks have occurred in Zambia since March 2018. The last FMD, serotype O outbreak was reported in Zambia in April 2019. These events are of concern because the disease may spread into the Southern African region, which has never been affected by this particular serotype. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade.*

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5N8 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are unlikely to occur.

Context: In January 2019, the H5N8 HPAI virus occurred for the first time in Namibia in a population of jackass penguins on Halifax Island. This is the first HPAI event ever to affect the country. Between February–June 2019, three additional H5N8 HPAI events were reported in other small islands in the coastal area of the country. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*

NIGER

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: Maize is not a particularly important crop in Niger. However, FAW is present and infestation has been observed on sorghum and millet, which are staple foods for the country.

Threat category: Locusts



Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Small-scale breeding will occur in Tamesna and central pasture areas with the onset of the summer rains, causing locust numbers to increase slightly

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population can be affected by this voracious insect. Desert locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.

NIGERIA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: Capacities for FAW management have been strengthened through the implementation of various projects. However, more efforts will be required as the country is one of the most important producers of maize in the region.

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: The H5N1 HPAI virus has been circulating in Central and West Africa since December 2014, and Nigeria was the most affected country, with over 790 outbreaks reported in domestic birds across 26 states. However, the most recent outbreak of H5N1 HPAI was reported at the end of May 2017. H5N8 HPAI has been spreading globally, following bird migratory routes, since November 2016. In Nigeria, 18 outbreaks of H5N8 HPAI were reported between November 2016 and April 2019 (Bauchi, Edio, Kano, Nassarawa, Ogun and Plateau States). *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans..*



NIGERIA

Threat category: Aquatic diseases



Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (July–September 2019): TiLV has not been reported. However, it may be introduced and spread through live movements of infected hosts.

Context: TiLV occurs when the water temperature is between 22°C and 32°C, and it has been observed in farms with large-sized fish and high stocking density. Where unexplained mortalities of tilapia occur, appropriate diagnostic tests should be done. This is particularly necessary when clinical signs similar to those reported for TiLV and permissive temperatures are present.

RWANDA

Threat category: Plant pest and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Throughout agricultural season B (from March to June), maize is grown in limited parts of the country. Maize harvesting will occur in July; however, high FAW populations may survive on alternate hosts and continue to spread. In September, the sowing of maize and sorghum for agricultural season A will start and high FAW populations will pose a serious threat to the young maize seedlings.

Context: Fall Armyworm has infested all 30 districts of the country.

Threat category: Forest pests and diseases



Threat name: Bronze bug

Likelihood of occurrence: High

Forecast (July–September 2019): The Bronze bug insect pest is highly likely to spread in eucalyptus plantations.

Context: The results of a survey conducted to identify damage caused by the Bronze bug indicate that this insect pest poses a serious threat to eucalyptus forestry in Rwanda. The Bronze bug (*Thaumastocoris peregrinus*) is a sap-sucking insect pest native to Australia. It is currently infesting eucalyptus plantations in Europe, southern Africa and South America. Severe infestations of this pest result in leaf senescence, leaf loss, thinning tree canopies and branch dieback.

Threat category: Forest pests and diseases



Threat name: Blue gum chalcid

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Blue gum chalcid is likely to spread further in eucalyptus nurseries and plantations.

Context: The pest is currently causing severe damage in eucalyptus nurseries, woodlots and plantations. Pest management options are being provided to farmers. These include good nursery hygiene practices to reduce the pest population.

Blue gum chalcid (*Leptocybe invasa*) is a major insect pest of young eucalyptus trees and seedlings.

Threat category: Animal and zoonotic diseases



Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The potential risk of RVF occurrence is considered moderate given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: In Western Africa, the forecasts for July-September 2019 predict average and below-average precipitation across most of the region. According to the FAO RVF Monitoring/ Early Warning tool, suitable environmental conditions for vector amplification will persist in localized areas. Suitable environmental conditions for vector amplification are also predicted in wide areas in Rwanda, Burundi, south-eastern Uganda and central-western Ethiopia. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to death and abortion of RVF-infected livestock.*

SENEGAL

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: Maize is not particularly important in Senegal. However, the country's capacity for surveillance of FAW must be developed, as the pest may infest other cereal crops that are of importance for the country.



SENEGAL

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in Western African countries (such as Burkina Faso, Côte d'Ivoire, the Gambia, Guinea, Guinea-Bissau, Mauritania, Senegal and Sierra Leone). The virus observed seems to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade.*

Threat category: Animal and zoonotic diseases



Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The potential risk of RVF occurrence is considered moderate given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: In West Africa, the forecasts for the period from July to September 2019 predict average and below-average precipitation across most of the region. According to the FAO RVF Monitoring/Early Warning tool, suitable environmental conditions for vector amplification will persist in small and localized areas along the Senegal River between Senegal and Mauritania, across the irrigation areas near Dakar and Thies towns, as well as along the Casamance river in southern Senegal. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to the death and abortion of RVF-infected livestock.*

SEYCHELLES

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (July–September 2019): FAW amplification will be limited by the lower production of maize in the country.

Context: FAW was first reported in maize in August 2017 and after sample analyses, its presence was officially confirmed.

Threat category: Plant pests and diseases



Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Increasing temperatures and the widespread production of tomato in the country is likely to favour a moderate amplification of the pest.

Context: The pest has been causing damage to tomato crops since 2016.

SIERRA LEONE

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: The country's capacity for FAW management and surveillance must be strengthened.

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O has been circulating since July 2018 in Western African countries (such as Burkina Faso, Côte d'Ivoire, the Gambia, Guinea, Guinea-Bissau, Mauritania, Senegal and Sierra Leone). The virus observed seems to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). Further spread of the disease is likely to occur within the infected countries and in the whole region, where livestock is not immunized against this particular strain of the virus. Animal mobility is the main risk factor in the spread of FMD in the region. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade.*



SOMALIA

Threat category: Plant pest and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): In July, FAW will have access to maize and sorghum in almost all growing areas in the country and infestations are expected to be high. Starting in August, maize and sorghum harvesting will occur in Shabelle and Juba valleys, Bay, Bakool and Somaliland; however, FAW populations are likely to survive on alternate hosts and continue their spread.

Context: FAW is now fully established across the country; however, farmers have neither adequate knowledge nor resources to manage the pest in their crops.



SOUTH AFRICA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): High temperatures, coupled with irrigated maize production, will favour amplification of the pest.

Context: The presence of FAW was first reported during the 2016/2017 season. The pest caused serious damage to maize across the country, throughout the 2017/2018 cropping season (November–March). South Africa has institutional response capacities that are expected to moderate the impact of the pest in the short term.



Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: High

Forecast (July–September 2019): High temperatures and the widespread production of tomato in the country is likely to favour amplification of the pest.

Context: The pest has been causing damage to tomato crops since 2016.



Threat category: Plant pests and diseases

Threat name: Banana bunchy top disease (BBTD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread from the initial outbreak areas is likely.

Context: The disease has been reported in the country recently and spread from the initial outbreak areas is possible. The disease spreads through infected planting materials and aphids. Use of disease-clean planting materials is critical.



Threat category: Forest pests and diseases

Threat name: Polyphagous shothole borer (PSHB)

Likelihood of occurrence: High

Forecast (July–September 2019): The Polyphagous shothole borer (PSHB) insect pest is highly likely to spread in fruit orchards, urban landscapes and plantation forests due to the warmer temperatures prevailing in the summer.

Context: PSHB is an ambrosia beetle in the *Curculionidae* family. The insect pest has a mutualistic relationship with the fungal pathogen species *Fusarium euwallacei*, which is introduced by female beetles into the larval gallery and acts as the primary food source of both adults and larvae. *F. euwallacei* and other fungi the growth of which causes dieback of host trees due to clogging of the xylem vessels. PSHB is a highly polyphagous species and has a wide range of host trees and shrubs. The most severe economic impacts have been seen in avocado production in Israel, where PSHB is now described as a serious threat to the industry. It was reported for the first time in South Africa in early 2017, and by July 2018 it was reported to have spread to all major cities of South Africa and to the neighbouring southern African countries. Early survey and destruction of heavily infested trees would help to reduce local populations of PSHB and its spread.



Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Low

Forecast (July–September 2019): The potential risk of RVF outbreaks is considered low, according to the FAO RVF monitoring/Early Warning System.

Context: In southern Africa, precipitation forecasts for the period from July to September 2019 predict average and below-average rainfall across most of the region, except for southern Zambia and central Mozambique. Weak El Niño conditions are likely to continue throughout the Northern Hemisphere in spring (approximately 80 percent chance) and summer 2019 (approximately 60 percent chance). During the past months, the entire region was characterized by prolonged dry conditions. Exceptional floods and heavy rainfall events have recently hit southern Malawi and northern-central Mozambique. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to the death and abortion of RVF-infected livestock.*





SOUTH AFRICA

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): H5N8 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are unlikely to occur.

Context: In June 2017, H5N8 HPAI virus was reported for the first time in South Africa. Since then, additional outbreaks and infections have been observed, both in wild and domestic birds, in seven different regions of the country. The last outbreaks were reported in April 2019. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*

SOUTH SUDAN

Threat category: Plant pest and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): According to the climate conditions and maize growing season, the risk of FAW damage in this forecast period is very likely to occur.

Context: In South Sudan, the pest has been reported countrywide and appears to have become fully established across the country. However, farmers have high expectations of the use of quick control measures, especially chemical pesticides. Farmers continue to lack knowledge and perform effective management of the pest in their crops. The period from April to June is the main crop-growing season in South Sudan. The rains were generally delayed in all zones of the country. There were sporadic rains in March in some parts of the Green Belt. There were no rains in April, but they resumed in May. FAW presence is reported in Eastern, Central and Western Equatoria, where the first season of maize planting has occurred. Maize planted in March/April escaped FAW infestation; however, those planted in May are severely infested. FAW infestation is expected to be high in maize and sorghum planted from June to August due to potential build-up of FAW. Normally, in July and August, rains are heavy in the country and may reduce the impact of the pest on crops. The impact of the rains on FAW and other factors will be closely monitored during the second planting season. In 2018, several reports on FAW damage to maize and sorghum were received from across the country where planting has occurred on both first- and second-season crops. Parts of the Green Belt were the most affected areas, with 30 percent of the maize and sorghum fields affected and pest infestation levels of 30 to 80 percent.

Threat category: Animal and zoonotic diseases



Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The potential risk of RVF occurrence is considered moderate given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: In Eastern Africa, the forecasts for July–September 2019 predict average and below-average precipitation across most of the region. According to the FAO RVF Monitoring/Early Warning tool, suitable environmental conditions for vector amplification will persist in localized areas. Suitable environmental conditions for vector amplification are also predicted in wide areas in Rwanda, Burundi, south-eastern Uganda, south-eastern South Sudan and central-western Ethiopia. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to death and abortion of RVF-infected livestock.*

SUDAN

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): As the maize-growing season has started, the risk of damage by FAW is increasing.

Context: FAW was officially reported in Sudan in 2017.

Threat category: Plant pests and diseases



Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The season for growing and harvesting tomato continues until June and July; warmer weather in North Africa will favour the development of Tomato leaf miner.

Context: *Tuta absoluta* has been reported in Sudan since 2012. It continues to cause yield losses mainly in tomato, and, to a lesser extent, also in potato and eggplant. The Government has initiated a control programme to monitor the pest population with pheromone traps and spray pesticides.



SUDAN

Threat category: Locusts



Threat name: Desert Locust

Likelihood of occurrence: High

Forecast (July–September 2019): Adult groups and perhaps a few small swarms may arrive in the interior from spring breeding areas in Arabia and breed, causing locust numbers to increase.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population can be affected by this voracious insect. Desert locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.

SWAZILAND

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): High temperatures, coupled with the off-season maize production, will favour amplification of the pest.

Context: The presence of FAW was first reported during the 2016/2017 season. The pest caused serious damage to sorghum, millet and maize across the country, throughout the 2017/2018 season.

Threat category: Plant pests and diseases



Threat name: Tomato leaf miner

Likelihood of occurrence: High

Forecast (July–September 2019): High temperatures and the widespread production of tomato in the country is likely to favour amplification of the pest.

Context: The pest has been causing damage to tomato crops since 2016.

TOGO

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Maize will be in the growing and harvesting stages. Therefore, there will be a high risk of FAW amplification during the forecasting period.

Context: A project funded by the African Development Bank will start soon and will focus on FAW monitoring, surveillance and management.

TUNISIA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (July–September 2019): There is a low possibility for FAW introduction in the country.

Context: FAW has not been reported in the country yet. Egypt has reported the pest, which means that it was able to cross the natural barrier of the Sahara desert and places North African countries at risk of FAW introduction. However, as FAW has not been reported in northern Egypt yet, the possibility of introduction to other North African countries is low.

Threat category: Plant pests and diseases



Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The season for growing and harvesting tomato continues until June and July; warmer weather in North Africa will favour the development of Tomato leaf miner.

Context: *Tuta absoluta* has been reported in Tunisia since 2008. It continues to cause yield losses mainly in tomato, and, to a lesser extent, also in potato and eggplant. The Government has initiated a control programme to monitor the pest population with pheromone traps and spray pesticides.

UGANDA

Threat category: Plant pest and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): Maize and sorghum are important crops in the region that hosts FAW and infestations of these widespread crops are expected to be high.

Context: In Uganda, presence of the pest is confirmed in all 121 districts (100 percent of the territory).

Threat category: Plant pests and diseases



Threat name: Cassava mosaic disease (CMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread of Cassava mosaic disease (CMD) is likely.

Context: The disease is already present in the country and might escalate. CMD is considered one of the most damaging diseases of cassava in Africa. It is caused by a virus, which causes chlorosis and distortions of the leaves that reduce yields. It is transmitted by infected cuttings and white flies. A similar viral disease, Cassava Brown Streak Disease (CBSD), is also likely to spread.



UGANDA

Threat category: Animal and zoonotic diseases



Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The potential risk of RVF occurrence is considered moderate given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: In West Africa, the forecasts for the period from July to September 2019 predict average and below-average precipitation across most of the region. According to the FAO RVF Monitoring/Early Warning tool, suitable environmental conditions for vector amplification will persist in localized areas. Suitable environmental conditions for vector amplification are also predicted in wide areas in Rwanda, Burundi, south-eastern Uganda and central-western Ethiopia. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to the death and abortion of RVF-infected livestock.*

UNITED REPUBLIC OF TANZANIA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): High temperatures, coupled with the offseason maize production, will favour amplification of the pest.

Context: The presence of FAW was first reported during the 2016/2017 season, and the pest continued to cause damage to maize during the 2017/2018 production season (November–March).

Threat category: Plant pests and diseases



Threat name: Tomato leaf miner

Likelihood of occurrence: High

Forecast (July–September 2019): High temperatures and the widespread production of tomato in the country is likely to favour amplification of the pest.

Context: The pest has been causing damage to tomato crops since 2016.

Threat category: Plant pests and diseases



Threat name: Cassava mosaic disease (CMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread of Cassava mosaic disease (CMD) and Cassava brown streak diseases (CBSD) is likely.

Context: The disease is already present in the country and might escalate. CMD is considered one of the most damaging diseases of cassava in Africa. It is caused by a virus, which induces chlorosis and distortions of the leaves that reduce yields. It is transmitted by infected cuttings and white flies. A similar virus disease, Cassava Brown Streak Disease (CBSD) is also likely to spread.

Threat category: Aquatic diseases



Threat name: Epizootic ulcerative syndrome (EUS)

Likelihood of occurrence: Low

Forecast (July–September 2019): EUS is likely to occur in the United Republic of Tanzania, due to the confirmed presence of the disease in the neighbouring Democratic Republic of the Congo and Zambia.

Context: Water temperatures in July–September 2019 will range from 24°C to 29°C, which are partially suitable for the development of the oomycete fungus responsible for the disease.

Threat category: Forest pests and diseases



Threat name: Blue gum chalcid

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Blue gum chalcid is likely to spread in eucalyptus nurseries and plantations.

Context: This pest continues to cause damage in eucalyptus nurseries, woodlots and plantations. Blue gum chalcid (*Leptocybe invasa*) is a major insect pest of young eucalyptus trees and seedlings.

Threat category: Animal and zoonotic diseases



Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The potential risk of RVF occurrence is considered moderate given the presence of suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals.

Context: Precipitation forecasts for the period from July to September 2019 in the region predict average and above-average rainfall. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to the death and abortion of RVF-infected livestock.*



UNITED REPUBLIC OF TANZANIA

Threat category: Locusts



Threat name: Red Locust

Likelihood of occurrence: Moderate

Forecast (July–September 2019): With vegetation burning, locusts will aggregate into swarms in the remaining suitable areas. If not controlled, they are likely to escape outbreak areas (mainly, the Ikuu-Katavi plains) and invade and damage cultivated areas.

Context: Red Locust plagues pose a major threat to agriculture in southern Africa. Failure to control locust outbreaks during the early stages of development can result in highly mobile swarms, which invade agricultural areas and can cause major crop damage.

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): High temperatures, coupled with the offseason maize production, will favour amplification of the pest.

Context: The presence of FAW was first reported during the 2016/2017 season, and the pest continued to cause damage to maize during the 2017/2018 production season (November–March).

Threat category: Plant pests and diseases



Threat name: Tomato leaf miner

Likelihood of occurrence: High

Forecast (July–September 2019): High temperatures and the widespread production of tomato in the country is likely to favour amplification of the pest.

Context: The pest has been causing damage to tomato crops since 2016.

ZAMBIA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): High temperatures, coupled with the irrigated maize production season, will favour amplification of the pest.

Context: The presence of FAW was first reported during the 2016/2017 season, and the pest continued to cause damage to maize during the 2017/2018 production season (November–March).

Threat category: Plant pests and diseases



Threat name: Tomato leaf miner

Likelihood of occurrence: High

Forecast (July–September 2019): High temperatures and the widespread production of tomato in the country is likely to favour amplification of the pest.

Context: The pest has been causing damage to tomato crops since 2016.

Threat category: Plant pests and diseases



Threat name: Cassava mosaic disease (CMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Cassava mosaic virus is likely to continue to spread.

Context: Cassava Mosaic Virus is already present in the country. It was found to be widespread in six provinces in 2014 and is likely to escalate further. CMD is considered one of the most damaging diseases of cassava in Africa. It is caused by a virus, which causes chlorosis and distortions of the leaves that reduce yields. It is transmitted by infected cuttings and white flies. A similar viral disease Cassava Brown Streak Disease (CBSD) is also likely to spread.

Threat category: Aquatic diseases



Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (July–September 2019): TiLV has not been reported. However, it may be introduced and spread through live movements of infected hosts.

Context: TiLV occurs when the water temperature is between 22°C and 32°C, and it has been observed in farms with large-sized fish and high stocking density. Where unexplained mortalities of tilapia occur, appropriate diagnostic tests should be done. This is particularly necessary when clinical signs similar to those reported for TiLV and permissive temperatures are present.

Threat category: Aquatic diseases



Threat name: Epizootic ulcerative syndrome (EUS)

Likelihood of occurrence: Low

Forecast (July–September 2019): Further spread of EUS to other parts of the country is possible (although unlikely), through heavy rainfall, flooding, poor biosecurity and movement of infected fish or birds.

Context: Water temperatures during the reporting period will range from 18°C to 25°C, which are optimal for the development of the oomycete fungus responsible for the disease.



ZAMBIA

Threat category: Forest pests and diseases



Threat name: Blue gum chalcid

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread of the Blue gum chalcid insect pest is likely to continue in eucalyptus nurseries and plantations.

Context: Pest management activities based on silvicultural practices, breeding programmes and quarantine measures are in progress to reduce insect populations. Biological control agents to reduce Blue gum chalcid populations are currently being introduced. Blue gum chalcid (*Leptocybe invasa*) is a major insect pest of young eucalyptus trees and seedlings.

Threat category: Forest pests and diseases



Threat name: Red gum lerp psyllid

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread of Red gum lerp psyllid is likely to continue in eucalyptus plantations.

Context: Pest management activities based on silvicultural practices are in progress. Red gum lerp psyllid (*Glycaspis brimblecombei*) nymphs and adults feed on sugar-rich phloem. Excessive feeding pressure causes premature leaf drop. Extensive and repeated defoliation events caused by psyllid weaken trees and cause premature death in the highly susceptible eucalyptus species.

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The further spread of Foot-and-mouth disease (FMD), serotype O, is likely to occur within the country.

Context: FMD, serotype O outbreaks have occurred in Zambia since March 2018. The last FMD, serotype O outbreak was reported in Zambia in April 2019. These events are of concern because the disease may spread into the Southern African region, which has never been affected by this particular serotype. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade.*

Threat category: Animal and zoonotic diseases



Threat name: Peste des petit ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Peste des petits ruminants (PPR) outbreaks are likely to occur through possible introduction from neighbouring countries.

Context: The last antibody PPR detection in the country occurred in December 2017 (OIE WAHIS). PPR outbreaks continue to occur in the neighbouring United Republic of Tanzania and Democratic Republic of Congo, which are considered endemic for the disease. *PPR is a highly contagious disease affecting sheep and goats which is caused by a morbillivirus. It is considered to be one of the most damaging livestock diseases in Africa.*

Threat category: Locusts



Threat name: Red Locust

Likelihood of occurrence: Moderate

Forecast (July–September 2019): With vegetation burning, locusts will aggregate into swarms in the remaining suitable areas. If not controlled, they are likely to escape outbreak areas and invade and damage cultivated areas.

Context: Red Locust plagues pose a major threat to agriculture in southern Africa. Failure to control locust outbreaks during the early stages of development can result in highly mobile swarms, which invade agricultural areas and can cause major crop damage.

ZIMBABWE

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): High temperatures coupled with irrigated maize production will favour amplification of the pest.

Context: The presence of FAW was first reported during the 2016/2017 season, and the pest continued to cause damage to maize during the 2017/2018 production season (November–March).



ZIMBABWE

Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: High

Forecast (July–September 2019): High temperatures and the widespread production of tomato in the country is likely to favour amplification of the pest.

Context: The pest has been causing damage to tomato crops since 2016.



Threat category: Forest pests and diseases

Threat name: Red gum lerp psyllid

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread of Red gum lerp psyllid is likely to continue in eucalyptus plantations.

Context: Pest management activities based on the application of biological control agents to reduce pest populations are in progress. Blue gum chalcid (*Leptocybe invasa*) is a major insect pest of young eucalyptus trees and seedlings.



Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): The introduction of Foot-and-mouth disease (FMD), serotype O, from a neighbouring country is likely.

Context: FMD, serotype O outbreaks have occurred in Zambia since March 2018. The last FMD, serotype O outbreak was reported in Zambia in April 2019. These events are of concern because the disease may spread into the Southern African region, which has never been affected by this particular serotype. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production, in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade.*



Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Low

Forecast (July–September 2019): The potential risk of RVF outbreaks is considered low, according to the FAO RVF monitoring/Early Warning System.

Context: In southern Africa, precipitation forecasts for the period from July to September 2019 predict average and below-average rainfall across most of the region, except for southern Zambia and central Mozambique. Weak El Niño conditions are likely to continue throughout the Northern Hemisphere in spring (approximately 80 percent chance) and summer 2019 (approximately 60 percent chance). During the past months, the entire region was characterized by prolonged dry conditions. Exceptional floods and heavy rainfall events have recently hit southern Malawi and northern-central Mozambique. *Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans, causing significant economic losses due to the death and abortion of RVF-infected livestock.*



Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (July–September 2019): TiLV has not been reported. However, it may be introduced and spread through live movements of infected hosts.

Context: TiLV occurs when the water temperature is between 22°C and 32°C, and it has been observed in farms with large-sized fish and high stocking density. Where unexplained mortalities of tilapia occur, appropriate diagnostic tests should be done. This is particularly necessary when clinical signs similar to those reported for TiLV and permissive temperatures are present.





AMERICAS

GUATEMALA

Threat category: Forest pests and diseases



Threat name: Bark beetles

Likelihood of occurrence: High

Forecast (July–September 2019): Bark beetles (mainly *Dendroctonus frontalis*) are likely to continue causing damage to pine plantations. The high summer temperatures and low precipitation levels during the summer are likely to weaken the pine trees and make them susceptible to bark beetle attacks.

Context: Silvicultural practices to reduce pest populations are in progress. Training of foresters on prevention and management practices is ongoing. The adults and larvae of *Dendroctonus* spp. are bark-feeding. The flight activities of *D. frontalis* are almost continuous throughout the year in Mesoamerica. Generally, the pest attacks stressed trees.

HONDURAS

Threat category: Forest pests and diseases



Threat name: Bark beetles

Likelihood of occurrence: High

Forecast (July–September 2019): Outbreaks of Bark beetle (mainly *Dendroctonus frontalis*) causing heavy losses in pine plantations are likely to occur and will continue to be reported. The high summer temperatures and low precipitation levels prevailing from July to September are likely to weaken the pine trees and make them susceptible to bark beetle attacks.

Context: Bark beetles affect approximately 500 000 ha of conifer forests in Honduras. Training of foresters on prevention and management practices is in progress. The adults and larvae of *Dendroctonus* spp. are bark-feeding. The flight activities of *D. frontalis* are almost continuous throughout the year in Mesoamerica. Generally, the pest attacks stressed trees.

NICARAGUA

Threat category: Forest pests and diseases



Threat name: Bark beetles

Likelihood of occurrence: High

Forecast (July–September 2019): It is highly likely that Bark beetles (mainly *Dendroctonus frontalis*) will continue to cause damage in pine plantations.

Context: Pest management activities based on silvicultural practices are in progress. The adults and larvae of *Dendroctonus* spp. are bark-feeding. The flight activities of *D. frontalis* are almost continuous throughout the year in Mesoamerica. In general, the pest attacks stressed trees.

MEXICO

Threat category: Aquatic diseases



Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): TiLV outbreaks were first observed in July 2018. The disease may spread through live movements of infected hosts.

Context: TiLV occurs when the water temperature is between 22°C and 32°C; it has also been observed in farms with large-sized fish and a high stocking density. TiLV is already present in Mexico. It was first observed in July 2018.

PERU

Threat category: Aquatic diseases



Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (July–September 2019): TiLV is likely to occur.

Context: TiLV occurs when the water temperature is between 22°C and 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. TiLV is already present in the country. It was first observed in November 2017. A second outbreak was reported in December 2017.

UNITED STATES OF AMERICA

Threat category: Aquatic diseases



Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (July–September 2019): All clinically ill fish were depopulated. Exposed fish in the same tanks will either depopulated or sent to terminal markets.

Context: TiLV occurs when the water temperature is between 22°C and 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. TiLV is already present in the country. It was first observed in November 2018.



ASIA

AFGHANISTAN

Threat category: Locusts



Threat name: Moroccan Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Adult populations, having escaped hopper control operations, will lay eggs (which will hatch in spring 2020) and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests in Central Asia. The Italian Locust is also present in the country but was not reported as a pest in 2018-2019.

ARMENIA

Threat category: Locusts



Threat name: Italian Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Adult populations will mate and lay eggs (which will hatch in 2020). Some very limited infestations may have to be controlled.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. The Italian Locust is one of the two locust pests in the Caucasus.

AZERBAIJAN

Threat category: Plant pests and diseases



Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Wheat yellow rust outbreaks are likely in highlands receiving high levels of precipitation.

Context: The disease poses a recurrent threat to wheat and outbreaks are likely, particularly in the southeast part of the country if rainfall is high. The disease particularly infects the leaves, reducing photosynthesis and grain weight. Excess rains support disease development. Regular surveys and timely actions are essential.

Threat category: Locusts



Threat name: Moroccan Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Adult populations, having escaped hopper control operations, will lay eggs (which will hatch in spring 2020) and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. The Moroccan Locust is one of the two locust pests in the Caucasus.

BANGLADESH

Threat category: Plant pests and diseases



Threat name: Rice blast disease

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread of Rice blast disease around the Tangail district is likely

Context: This is the most serious disease of rice caused by the fungus *Magnaporthe oryza*. The fungus favours wet seasons and infects the crop at all stages including tillering, causing severe yield and quality losses. Use of clean seeds, surveillance and timely sprays are critical for disease control.

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5N1 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: The last events of H5N1 HPAI in Bangladesh occurred in May 2018 in domestic birds, and in December 2018 in wild crows. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*

BHUTAN

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5N6 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: H5N1 HPAI have been reported in Bhutan since 2010. The last event of H5N1 HPAI in domestic birds occurred in April 2019. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*

CAMBODIA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW introduction from Thailand and Viet Nam.

Context: FAW has not been reported in the country yet.



CAMBODIA

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) outbreaks are very likely to continue to occur.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018, and then in Viet Nam in February 2019. ASF was first reported in domestic swine in Cambodia on 3 April 2019. As of 25 June 2019, five outbreaks were reported in Ratanakkiry province only. First ASF outbreaks occurred also in Lao People's Democratic Republic on 20 June 2019. Because of the value-chain links of swine and their products among the countries in the region (for example through associated routes (TARs), illegal imports of food, movement of people), there is a high risk of ASF spread towards East and Southeast Asia. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. To date, no vaccine is available.*

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: In March 2019, H5N6 HPAI was first observed in Cambodia. In 2018, seven outbreaks of H5N1 HPAI were reported in six different provinces; the latest occurred in August 2018. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*

CHINA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW amplification and spreading to eastern China during the forecasting period.

Context: By June 2019, *Spodoptera frugiperda* has spread in most province in China (20 provinces - 333,000 hectares of crops), including Yunnan, Guangxi, Guizhou, Guangdong, Hunan, Hainan, Fujian, Zhejiang, Hubei, Sichuan, Jiangxi, Chongqing, and Henan provinces.

Threat category: Plant pests and diseases



Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread of Fusarium wilt disease, Tropical Race 4 (TR4), on banana is likely.

Context: Fusarium wilt disease, Tropical Race 4 (TR4), has been reported recently and further spread is possible. The disease is soil-borne and cannot be eradicated once it becomes established in the soil. It attacks banana plants of all ages, initially appearing with a yellowing of the leaves and then causing wilting and plant death. Infected planting materials, water, and movement of infested soil particles with shoes, tools and vehicles play a major role in spread. The fungus remains viable in soil for decades; therefore, speedy containment is critical.

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) outbreaks are very likely to continue to occur.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. As of 25 June 2019, 138 ASF outbreaks have been reported in 32 provinces out of 34. In addition, in late November 2018, the disease was also detected in wild boar in Jilin province, close to the borders with the Democratic People's Republic of Korea, and in Heilongjiang province. This fact enhances the likelihood of spread of ASF to neighbouring countries due to wild boar movement. An African Swine Fever Contingency Plan and Emergency Response Level II is under implementation in the country. Further spread of the disease within the region would have devastating consequences for animal health, food safety, and food security. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccine is available.*

Threat category: Animal and zoonotic diseases



Threat name: Peste des petits ruminants (PPR)

Likelihood of occurrence: Low

Forecast (July–September 2019): Peste des petits ruminants (PPR) outbreaks are unlikely to continue to occur in the country.

Context: PPR is reported yearly in China. In particular, between January and June 2018, the disease occurred in the North-Eastern and Eastern provinces of the country. *PPR is a highly contagious disease affecting sheep and goats. It is caused by a morbillivirus and is considered to be one of the most damaging livestock diseases in Asia.*



CHINA

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5 and H7 HPAI and LPAI virus outbreaks in poultry, as well as cases in humans (although sporadic), are expected to remain at low levels.

Context: Several serotypes of HPAI and LPAI viruses are circulating and being detected in China. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*

Threat category: Aquatic diseases



Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (July–September 2019): TiLV has not been reported in China. However, it may be introduced and spread through live movements of infected hosts.

Context: Active surveillance and mitigation measures are in place. TiLV occurs when the water temperature is between 22°C and 32 °C; it has also been observed in farms with large-sized fish and a high stocking density. Where unexplained mortalities of tilapia occur, appropriate diagnostic tests should be done. This is particularly important when clinical signs similar to those reported for TiLV and permissive temperatures are present.

DEMOCRATIC PEOPLE’S REPUBLIC OF KOREA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW introduction specially with the first report of FAW at Republic of Korea.

Context: FAW was not reported in the country yet.

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) outbreaks are very likely to continue to occur.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. The disease was first reported in domestic swine in the Democratic People’s Republic of Korea (DPRK) on 23 May 2019, in Chagang-Do province. Because of the value-chain links of swine and their products among the countries in the region (for example, through associated routes (TARs), illegal imports of food, movement of people), there is a high risk of further ASF spread in East and Southeast Asia, and in particular to the Republic of Korea (ROK). *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccine is available.*

GAZA STRIP

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Foot-and-mouth disease (FMD), serotype O, is likely to occur.

Context: FMD, serotype O, was last reported in the region in March 2019, in Israel. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production in addition to mortality in young animals. It is the most disruptive animal disease for livestock trade.*

GEORGIA

Threat category: Locusts



Threat name: Italian Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Adult populations, having escaped hopper control operations, will lay eggs (which will hatch in spring 2020) and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. The Italian Locust is one of the two locust pests in the Caucasus and in the country.



GEORGIA

Threat category: Forest pests and diseases



Threat name: Boxwood blight

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Boxwood blight will continue to be present and is likely to increase activity, due to the rising humidity and temperatures prevailing from April to June.

Context: Monitoring of the spread of the disease is in progress. Boxwood blight (also known as box blight) is a widespread fungal disease caused by the pathogen *Calonectria pseudonaviculata*, affecting boxwood trees.

Threat category: Forest pests and diseases



Threat name: Boxwood moth

Likelihood of occurrence: High

Forecast (July–September 2019): In Georgia, the moth has three to four generations per year. The larvae will display a high level of activity from April to June. The flight season of the moth is likely to start from late April to mid-May.

Context: As part of the Integrated Pest Management (IPM) programme, biopesticide Btk (*Bacillus thuringiensis kurstaki*) and pheromone traps are being used to protect the native boxwood species. Boxwood moth (*Cydalima perspectalis*), which is native to eastern Asia, is highly destructive and defoliates boxwood trees. When the day-length drops below approximately 13.5 hrs, the larvae will “diapause” (enter the dormant stage of a developing insect) so that they can overwinter in a web spun on Buxus leaves. In this state, the pest can survive temperatures as low as - 30°C.

INDIA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW amplification during the forecasting period.

Context: The Fall Armyworm (FAW) has been detected for the first time in the Indian subcontinent in mid-May 2018 in maize fields in Karnataka. On 30 July 2018, the Indian Council of Agricultural Research issued a warning that the pest, a caterpillar known as FAW, *Spodoptera frugiperda*, had reached the subcontinent. So far, it has been detected in roughly 70 percent of maize crops in Chikkaballapur in southern Karnataka state, and reports suggest that it has also spread to Tamil Nadu and Telangana.

Threat category: Plant pests and diseases



Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread of Fusarium wilt disease, Tropical Race 4 (TR4), on banana is likely.

Context: Fusarium wilt disease, Tropical Race 4 (TR4), has been reported recently and further spread is possible. The disease is soil-borne and cannot be eradicated once it becomes established in the soil. It attacks banana plants of all ages, initially appearing with a yellowing of the leaves and then causing wilting and plant death. Infected planting materials, water, and movement of infested soil particles with shoes, tools and vehicles play a major role in spread. The fungus remains viable in soil for decades; therefore, speedy containment is critical.

Threat category: Locusts



Threat name: Desert Locust

Likelihood of occurrence: High

Forecast (July–September 2019): Adult groups and perhaps a few small swarms may arrive in Rajasthan from spring breeding areas in southwestern Asia and Arabia and breed, causing locust numbers to increase.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population can be affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5N1 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: The last recorded event of H5N1 HPAI in wild crows occurred in March 2019. Since November 2018, 21 H5N1 HPAI outbreaks were reported in wild and domestic birds. HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.

INDONESIA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW introduction if it reaches eastern China during the forecasting period.

Context: FAW has not been reported in the country yet.



INDONESIA

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) is very likely to occur through possible introduction from affected countries in the region.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. On 19 February 2019, the disease was first reported in neighbouring Viet Nam and on 22 March 2019, in Cambodia and on 20 June 2019 in Lao People's Democratic Republic. Because of the value-chain links of swine and their products among the countries in the region (for example through associated routes (TARs), illegal imports of food, movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. Further spread of ASF within the region would have devastating consequences for animal health, food safety and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccine is available.*

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: The country is considered endemic for H5N1 HPAI. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*

IRAN (ISLAMIC REPUBLIC OF)

Threat category: Plant pests and diseases



Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Wheat yellow rust outbreaks are likely in highlands receiving high levels of precipitation.

Context: The disease poses a recurrent threat to wheat and outbreaks are likely, particularly in the southeast part of the country if rainfall is high. The disease particularly infects the leaves, reducing photosynthesis and grain weight. Excess rains support disease development. Regular surveys and timely actions are essential.

Threat category: Forest pests and diseases



Threat name: Boxwood blight

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Boxwood blight will continue to be present; however, its spread will increase from July to September due to the increasing temperatures and high levels of humidity.

Context: In the country, Boxwood blight was reported for the first time in 2012. Currently, approximately 50 000 ha of boxwood forest are affected by the disease. Pest management activities in selected areas are in progress. Boxwood blight (also known as box blight) is a widespread fungal disease caused by the pathogen *Calonectria pseudonaviculata*, affecting boxwood trees.

Threat category: Forest pests and diseases



Threat name: Boxwood moth

Likelihood of occurrence: High

Forecast (July–September 2019): In Iran, the moth has three to four generations per year. The larvae will display high activity from July to September and the spread of the moth likely to increase.

Context: The first introduction of Boxwood moth was reported in August 2016; since then, the native boxwood forests have been under threat. Early action, such as pheromone trapping for monitoring and treatment using biopesticide Btk (*Bacillus thuringiensis kurstaki*), is required to reduce further spread. FAO organized a visit from Georgia to Iran (Islamic Republic of) to share experiences on Btk application and on the use of pheromone traps. When the day-length drops below approximately 13.5 hrs, the larvae will "diapause" (enter the dormant stage of a developing insect) so that it can overwinter in a web spun on *Buxus* leaves. In this state, it can survive temperatures as low as -30°C. Boxwood moth (*Cydalima perspectalis*), native to eastern Asia, is highly destructive and defoliates boxwood trees.

Threat category: Forest pests and diseases



Threat name: Charcoal disease

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Oak charcoal disease (caused by the pathogen *Biscogniauxia mediterranea*) will continue to affect oak trees during the forecast period due to the high temperatures and low levels of precipitation prevailing.

Context: In the Zagros region, the decline of Oak charcoal disease began in 2012 and has continued. Operations to minimize the impact of the disease and abiotic stresses are in progress. The disease has a negative impact on the livelihoods of nomadic people and watershed management.



IRAN (ISLAMIC REPUBLIC OF)

Threat category: Locusts



Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Spring breeding will end in July and infestations not detected or treated will form groups and perhaps a few small swarms that will move to the Indo-Pakistan summer breeding areas.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population can be affected by this voracious insect. Desert locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: The last H5N1 and H5N6 HPAI event in the country was officially reported in January 2018. The H5N8 HPAI virus, which has been spreading globally since November 2016, following wild bird migratory routes, has been reported in wild and domestic birds in eight governorates in the country. The last reporting of this serotype was in April 2019. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*

IRAQ

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5N8 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: H5N8 HPAI, which has been spreading globally since November 2016, following wild bird migratory routes, was last reported in the country in March 2019. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*

ISRAEL

Threat category: Plant pests and diseases



Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Low

Forecast (July–September 2019): Spread of Fusarium wilt disease, Tropical Race 4 (TR4), on banana is possible.

Context: The disease is a soil-borne and cannot be eradicated fully once established in the soil. It attacks banana plants of all ages, initially appearing with a yellowing of the leaves and then causing wilting and plant death. Infected planting materials, water, and movement of infested soil particles with shoes, tools, and vehicles play a major role in spread. It remains viable in soil for decades, so speedy containment is critical. The disease has been reported recently in the country. Necessary measures have been taken and the infection spots have been fenced out and quarantined. Despite this escape may be possible.

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Foot-and-mouth disease (FMD), serotype O, outbreaks are likely to continue to occur.

Context: FMD, serotype O, outbreaks occur sporadically in the country. FMD was last reported in the country in March 2019. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production in addition to mortality in young animals. It is the most restrictive animal disease for livestock trade.*

Threat category: Animal and zoonotic diseases



Threat name: Peste des petits ruminants (PPR)

Likelihood of occurrence: Low

Forecast (July–September 2019): Peste des petits ruminants (PPR) outbreaks are unlikely to continue to occur in the country.

Context: In November 2018, a PPR outbreak occurred in the Northern district, one year after the last reported outbreak. The disease continued to be reported until January 2019. The country is endemic for the disease, but vaccination is not compulsory. *PPR is a highly contagious disease affecting sheep and goats. It is caused by a morbillivirus and is considered to be one of the most damaging livestock diseases in the Middle East.*



ISRAEL

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5N8 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: H5N8 HPAI, which has been spreading globally since November 2016, following wild bird migratory routes, was last reported in the country in April 2019. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*

JAPAN

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW introduction if it reaches eastern China during the forecasting period.

Context: FAW has not been reported in the country yet.

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) is very likely to occur through possible introduction from affected countries in the region.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. Because of the value-chain links of swine and their products among the countries in the region (for example, through associated routes (TARs), illegal imports of food, movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. Further spread of ASF within the region would have devastating consequences for animal health, food safety and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccine is available.*

JORDAN

Threat category: Animal and zoonotic diseases



Threat name: Foot-and-mouth disease (FMD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Foot-and-mouth disease (FMD), serotype O, outbreaks are likely to continue to occur.

Context: FMD, serotype O, was last reported in the region in March 2019, in Israel. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production in addition to mortality in young animals. It is the most restrictive animal disease for livestock trade.*

KAZAKHSTAN

Threat category: Locusts



Threat name: Italian Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Uncontrolled hopper populations will fledge, and adults will mate, lay eggs (which will hatch in spring 2020) and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia and in the country.

Threat category: Locusts



Threat name: Migratory Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Uncontrolled hopper populations will fledge, and adults will mate, lay eggs and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia and in the country.

Threat category: Locusts



Threat name: Moroccan Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Uncontrolled hopper populations will fledge, and adults will mate, lay eggs (which will hatch in spring 2020) and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia and in the country. Cool and wet spring hampered the hopper development; as a result, locust populations diminished.



KUWAIT

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5N8 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: H5N8 HPAI was first reported in Kuwait in January 2017 and a second outbreak occurred in February 2019. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*

KYRGYZSTAN

Threat category: Locusts



Threat name: Italian Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Uncontrolled hopper populations, which could further group, will fledge. Then, adults will mate, lay eggs (which will hatch in spring 2020) and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia.

Threat category: Locusts



Threat name: Moroccan Locust

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Adult populations, having escaped hopper control operations, will lay eggs (which will hatch in spring 2020) and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia.

LAO PEOPLE'S DEMOCRATIC REPUBLIC

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW amplification during the forecasting period.

Context: Lao PDR, survey found FAW for first time in early 2019 in Sendin Village, Naxaithong District, Vientiane Capital and at the present the outbreak is in Paklai District, Sayaboury Province and then survey found a damage from Fall Armyworm in other areas such as Vientiane Province, Oudomxay, Xiengkhouang, Borikhamxay and Savannakhet which total damage area of maize production was estimated of more than 3,300 ha.

Threat category: Plant pests and diseases



Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread of Fusarium wilt disease, Tropical Race 4 (TR4), on banana is likely.

Context: Fusarium wilt disease, Tropical Race 4 (TR4), has been reported recently and further spread is possible.

The disease is soil-borne and cannot be eradicated once it becomes established in the soil. It attacks banana plants of all ages, initially appearing with a yellowing of the leaves and then causing wilting and plant death. Infected planting materials, water, and movement of infested soil particles with shoes, tools and vehicles play a major role in spread. The fungus remains viable in soil for decades; therefore, speedy containment is critical.

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) outbreaks are very likely to continue to occur.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018, and then in Viet Nam in February 2019, in Cambodia on 3 April 2019, and in Lao People's Democratic Republic on 20 June 2019 in Salavan province. Because of the value-chain links of swine and their products among the countries in the region (for example through associated routes (TARs), illegal imports of food, movement of people), there is a high risk of ASF spread towards East and Southeast Asia. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. To date, no vaccine is available.*

LEBANON

Threat category: Forest pests and diseases



Threat name: Dry cone syndrome

Likelihood of occurrence: High

Forecast (July–September 2019): Dry cone syndrome will continue to cause damage to pine plantations (*Pinus pinea*) due to the low precipitation and high temperatures prevailing.

Context: Heavy yield losses continue to impact rural livelihoods. Yield reduction of pine nuts has been reported throughout the country. Silvicultural practices to strengthen the trees are in progress.



LEBANON

Threat category: Plant pests and diseases



Threat name: Western conifer seed bug

Likelihood of occurrence: High

Forecast (July–September 2019): Western conifer seed bug is likely to display high levels of activity due to the increasing temperatures prevailing from April to June. Oviposition on stone pines will start during the late spring; the first generation will be in the larval stage until late June and early July.

Context: Monitoring of the pest population using traps is in progress. Western conifer seed bug (*Leptoglossus occidentalis*) is an invasive insect pest that feeds mainly on conifer seeds. The nymphs and adults spend the summer on pine trees, where they use their piercing-sucking mouthparts to feed on twig and green pinecone sap. The adults will also eat fruits, seed pulp and flowers.

MALAYSIA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW introduction from Thailand and Viet Nam.

Context: FAW has not been reported in the country yet.

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) is very likely to occur through possible introduction from affected countries in the region.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. On 19 February 2019, the disease was first reported in neighbouring Viet Nam and on 22 March 2019, in Cambodia and on 20 June 2019 in Lao People's Democratic Republic. Because of the value-chain links of swine and their products among the countries in the region (for example through associated routes (TARs), illegal imports of food, movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. Further spread of ASF within the region would have devastating consequences for animal health, food safety and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccine is available.*

Threat category: Aquatic diseases



Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (July–September 2019): During the reporting period, the production cycle of tilapia will be active.

Context: TiLV is already present in the country. It was first observed in June 2017 and additional outbreaks were reported in July and October 2017 and July 2018. Monitoring and active surveillance systems have been established. TiLV occurs when the water temperature is between 22°C and 32°C; it has also been observed in farms with large-sized fish and a high stocking density.

MONGOLIA

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) is very likely to occur through possible introduction from affected countries in the region.

Context: In Asia, ASF was first reported in China, in domestic pigs, in August 2018. The affected area included the autonomous region of Inner Mongolia in China, which borders with Mongolia. In January 2019, the first outbreaks of ASF in Mongolia were reported and as of 25 June 2019, a total of 11 ASF outbreaks were confirmed in seven regions of the country. There is no information concerning surveillance in wild boar, while the extensive presence of wild boars in infected areas is well known. It is questionable if the virus is present in wild boar population in the country. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccine is available.*

MYANMAR

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW amplification during the forecasting period.

Context: Recently, FAW has been reported in the country.



MYANMAR

Threat category: Plant pests and diseases



Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread of Fusarium wilt disease, Tropical Race 4 (TR4), on banana is likely.

Context: Fusarium wilt disease, Tropical Race 4 (TR4), has been reported recently and further spread is possible. The disease is soil-borne and cannot be eradicated once it becomes established in the soil. It attacks banana plants of all ages, initially appearing with a yellowing of the leaves and then causing wilting and plant death. Infected planting materials, water, and movement of infested soil particles with shoes, tools and vehicles play a major role in spread. The fungus remains viable in soil for decades; therefore, speedy containment is critical.

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) is very likely to occur through possible introduction from affected countries in the region.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. In October 2018, the disease was reported also in Yunnan province, at 150 to 300 km from neighbouring Myanmar, Lao People's Democratic Republic and Viet Nam. On 19 February 2019, the disease was first reported in neighbouring Viet Nam and, on 22 March 2019, in Cambodia and, on 20 June 2019, in Lao People's Democratic Republic. Because of the value-chain links of swine and their products among the countries in the region (for example through associated routes (TARs), illegal imports of food, movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. Further spread of ASF within the region would have devastating consequences for animal health, food safety and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccine is available.*

NEPAL

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW amplification during the forecasting period.

Context: Recently, FAW has been reported in the country.

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5N1 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: H5N1 HPAI was last reported in the country in May 2019 in domestic birds and, for the first time, in a human. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*

OMAN

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (July–September 2019): FAW has a high capability of flying over long distances, which allows it to spread across country borders. The pest has been reported in the adjacent Yemen.

Context: FAW has not been reported in the country yet.

Threat category: Locusts



Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): A few small swarms may transit through coastal areas in July on their way from Yemen to the Indo-Pakistan summer breeding areas.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population can be affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.



PAKISTAN

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Spread of Fusarium wilt disease, Tropical Race 4 (TR4), on banana is likely.

Context: Fusarium wilt disease, Tropical Race 4 (TR4), has been reported recently and further spread is possible. The disease is soil-borne and cannot be eradicated once it becomes established in the soil. It attacks banana plants of all ages, initially appearing with a yellowing of the leaves and then causing wilting and plant death. Infected planting materials, water, and movement of infested soil particles with shoes, tools and vehicles play a major role in spread. The fungus remains viable in soil for decades; therefore, speedy containment is critical.



Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: High

Forecast (July–September 2019): Adult groups and perhaps a few small swarms may arrive along the Indo-Pakistan border from spring breeding areas in southwestern Asia and Arabia and breed, causing locust numbers to increase.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population can be affected by this voracious insect. Desert locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.



Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5N8 Highly pathogenic avian influenza outbreaks in poultry are likely to occur.

Context: In January 2019, two H5N8 HPAI outbreaks occurred in the Islamabad area, in wild birds. Previously, the disease had occurred only in January 2018. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*



PHILIPPINES

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW introduction if it reaches eastern China during the forecasting period.

Context: FAW has not been reported in the country yet.



Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) is very likely to occur through possible introduction from affected countries in the region.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. On 19 February 2019, the disease was first reported in neighbouring Viet Nam and on 22 March 2019, in Cambodia and on 20 June 2019 in Lao People's Democratic Republic. Because of the value-chain links of swine and their products among the countries in the region (for example through associated routes (TARs), illegal imports of food, movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. Further spread of ASF within the region would have devastating consequences for animal health, food safety and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccine is available.*



Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): During the forecasting period, the production cycle of tilapia will be active.

Context: TiLV occurs when the water temperature is between 22°C and 32°C; it has also been observed in farms with large-sized fish and a high stocking density. TiLV is already present in the country. It was first observed in May 2017. Monitoring and active surveillance systems have been established.



REPUBLIC OF KOREA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW amplification during the forecasting period.

Context: FAW suspected larvae were first detected at 4 corn fields in Jeju island on 14 June 2019. They were identified as *Spodoptera frugiperda* by DNA barcoding on 16 June 2019. This is the first detection of FAW in Republic of Korea.





REPUBLIC OF KOREA

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) is very likely to occur through possible introduction from affected countries in the region.

Context: ASF was reported for the first time in Asia in China, in August 2018, and first reported in domestic swine in the Democratic People's Republic of Korea (DPRK) on 23 May 2019, in Chagang-Do province. This fact enhances the likelihood of ASF spread to the Republic of Korea (ROK). Because of the value-chain links of swine and their products among the countries in the region (for example, through associated routes (TARs), illegal imports of food, movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. Further spread of ASF within the region would have devastating consequences for animal health, food safety and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccine is available.*

SAUDI ARABIA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (July–September 2019): FAW has a high capability of flying over long distances, which allows it to spread across country borders. The pest has been reported in the adjacent Yemen.

Context: FAW has not been reported in the country yet.

Threat category: Locusts



Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Spring breeding will end in the interior during July, and infestations that are not detected or treated will form adult groups. A few small swarms may move to summer breeding areas in Sudan, Yemen and India/Pakistan.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population can be affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.

SINGAPORE

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW introduction from Thailand and Viet Nam.

Context: FAW has not been reported in the country yet.

SRI LANKA

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW amplification during the forecasting period.

Context: FAW has infected maize mainly in Anuradhapura, Monaragala and Ampara districts and the pest has detected almost all the districts in the country in farm patches. The total maize cultivated land extent in these three districts are 61 010 ha and 34 856 ha are infected by the FAW. Further, it has been reported the FAW has spread to crops such as rice, tomato, millet, green gram, and some grass varieties. Out of 82 000 ha cultivated in Sri Lanka, 43,037 ha being reported infected by the FAW. The total estimated crop loss in the country is 10 percent - 25 percent.

TAJIKISTAN

Threat category: Locusts



Threat name: Italian Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Adult populations, having escaped hopper control operations, will lay eggs (which will hatch in spring 2020) and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia.

Threat category: Locusts



Threat name: Moroccan Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Adult populations, having escaped hopper control operations, will lay eggs (which will hatch in spring 2020) and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia.



THAILAND

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW amplification during the forecasting period.

Context: The Department of Agriculture (DOA) of Thailand has received a report which confirmed that FAW from the samples collected during December 2018 from maize plantation in a few sub districts of Kanchanaburi and Tak Provinces, along the border of Myanmar.



Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) is very likely to occur through possible introduction from affected countries in the region.

Context: ASF was reported for the first time in Asia in China, in domestic pigs, in August 2018. In October 2018, the disease was reported also in Yunnan province, at 150 to 300 km from neighbouring Myanmar, Lao People's Democratic Republic and Viet Nam. On 19 February 2019, the disease was first reported in neighbouring Viet Nam and, on 22 March 2019, in Cambodia and, on 20 June 2019, in Lao People's Democratic Republic. Because of the value-chain links of swine and their products among the countries in the region (for example through associated routes (TARs), illegal imports of food, movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. Further spread of ASF within the region would have devastating consequences for animal health, food safety and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccine is available.*



Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): During the forecasting period, the production cycle of tilapia will be active. Additionally, the permissive temperature range for TiLV outbreaks will be present.

Context: TiLV occurs when the water temperature is between 22°C and 32°C; it has also been observed in farms with large-sized fish and a high stocking density. TiLV is already present in the country. Monitoring and active surveillance systems have been established.



TURKEY

Threat category: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Wheat yellow rust outbreaks are likely in highlands receiving high levels of precipitation.

Context: The disease poses a recurrent threat to wheat and outbreaks are likely, particularly in the southeast part of the country if rainfall is high. The disease particularly infects the leaves, reducing photosynthesis and grain weight. Excess rains support disease development. Regular surveys and timely actions are essential.



Threat category: Forest pests and diseases

Threat name: Chestnut gall wasp

Likelihood of occurrence: Low

Forecast (July–September 2019): The Chestnut gall wasp population will have limited activity in chestnut trees due to the pest control measures adopted and the low temperatures.

Context: Pest management activities based on the application of biological control agents are in progress to reduce the populations of the insect pest. Chestnut gall wasp (*Dryocosmus kuriphilus*) is a species of gall wasp native to China. It attacks many species of chestnut, including most cultivated varieties. The galls caused by the wasp can be very damaging to the tree. They occur on the new growth of the tree, disrupting the fruiting process, and can reduce a tree's yield by up to 70 percent.



TURKMENISTAN

Threat category: Locusts

Threat name: Moroccan Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Adult populations, having escaped hopper control operations, will lay eggs (which will hatch in spring 2020) and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia.





UZBEKISTAN

Threat category: Locusts



Threat name: Italian Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Adult populations, having escaped hopper control operations, will lay eggs (which will hatch in spring 2020) and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia.

Threat category: Locusts



Threat name: Migratory Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Adult populations, having escaped hopper control operations, will lay eggs and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia.

Threat category: Locusts



Threat name: Moroccan Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Adult populations, having escaped hopper control operations, will lay eggs (which will hatch in spring 2020) and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia.

VIET NAM

Threat category: Plant pests and diseases



Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (July–September 2019): There will be a high risk of FAW amplification during the forecasting period.

Context: In early March 2019 Vietnam submitted some specimen collected in border areas to Centre for Agriculture and Bioscience International (CABI) for molecular identification of the species. It is confirmed later as FAW.

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) outbreaks are very likely to continue to occur.

Context: ASF was reported for the first time in Asia in China in domestic pigs in August 2018. The disease was then first reported in domestic pigs in Viet Nam in February 2019.

As of 25 June 2019, more than 2800 outbreaks were reported in 60 different provinces/cities out of the 63 of the country. An Emergency Response Action Plan for African Swine Fever is under implementation in the country. Due to value-chain links of swine and their products among the countries in the region (e.g. through associated routes (TARs), illegal imports of food, movement of people), there is a high risk of spread of the disease towards East and Southeast Asia. Further spread of ASF within the region would have devastating consequences for animal health, food safety, and food security, especially in those countries where biosecurity in pig farming is low, and compensation to farmers for depopulation of pigs is questionable. *ASF is a highly contagious viral disease of swine, both domestic and wild, which cause high mortality. No vaccine is available.*

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: H5N1 and H5N6 HPAI outbreaks have been reported in the country in the past few years. A new reassortant strain of H5N6 HPAI has been circulating in the region (Japan, the Republic of Korea, and Taiwan, Province of China), since November 2017. The last occurrence of H5N6 HPAI in the country was recorded in June 2019. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*



WEST BANK

Threat category: Animal and zoonotic diseases

Threat name: Foot-and-mouth disease (FMD)



Likelihood of occurrence: Moderate

Forecast (July–September 2019): Foot-and-mouth disease (FMD), serotype O, outbreaks are likely to continue to occur.

Context: FMD, serotype O, was last reported in the region in March 2019, in Israel. The last occurrence in the West Bank was recorded in March 2019; however, the serotype was not noted. *FMD is a highly contagious disease among cattle, buffalo, sheep and pigs that can cause a sharp drop in milk and meat production in addition to mortality in young animals. It is the most restrictive animal disease for livestock trade.*

YEMEN

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)



Likelihood of occurrence: High

Forecast (July–September 2019): The maize-growing season in Yemen has started. This will provide a feeding source for the pest and favour further spread.

Context: FAW was reported in Yemen in 2018.

Threat category: Locusts



Threat name: Desert Locust

Likelihood of occurrence: High

Forecast (July–September 2019): Adult groups and perhaps a few small swarms are likely to appear in the interior from spring breeding areas in Saudi Arabia; some will continue to migrate to the Indo-Pakistan summer breeding areas, while others will remain and breed, causing locust numbers to increase.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations are a threat to agricultural production in Africa, the Middle East and Asia, and have a negative impact on food security. The livelihoods of at least one tenth of the world's population can be affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to swarms' ability to fly quickly over long distances.



EUROPE

ALBANIA

Threat category: Forest pests and diseases



Threat name: Pine processionary moth

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Throughout autumn and winter, the larvae develop in a collective silk nest, protected from the cold, and usually placed in the most insulated part of the canopy to receive warmth from the sunlight. The larvae abandon the nest at night to feed, except when the temperatures are too low.

Context: Mechanical removal of nests is in progress, to manage pest populations.

Threat category: Animal and zoonotic diseases



Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): LSD outbreaks are likely to occur because of the favourable weather conditions for the vectors during the forecast period.

Context: Observed for the first time in June 2016, LSD has caused almost 850 outbreaks, affecting 32 counties. Throughout 2017, outbreaks continued to be detected but were not officially reported. An emergency vaccination campaign is being implemented. *LSD is a severe disease transmitted by vectors which affects mainly cattle, causing important meat and milk production losses.*

BELARUS

Threat category: Forest pests and diseases



Threat name: Bark beetles

Likelihood of occurrence: High

Forecast (July–September 2019): Bark beetles (mainly *Ips* spp.) may have up to three generations per year in the warmer sites of Europe. The flight of the second generation is likely to start in July and August, and that of the third generation in early September.

Context: Bark beetles are causing severe damage in pine plantations in Belarus. Sanitary felling and other silvicultural practices are in progress to reduce the insect populations. The adults and larvae of *Ips* spp. are bark-feeding, mainly attacking declining trees and freshly cut wood. Outbreaks can cause heavy tree losses and significant economic impacts for plantations.

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to occur.

Context: ASF was officially last reported in the country in 2013. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*

BELGIUM

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: In September 2018, two dead wild boars were found positive to ASF in Étalle (Luxembourg province). As of 25 June 2019, a total of 797 wild boars were found to be infected in Luxembourg province only. This represented the first introduction of the disease into the country and into Western Europe of Genotype 2 during the current epidemic. Wild boar population density is the most important factor in the spread of the disease. The disease may become endemic only in wild boar, even in the absence of pigs. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*

BULGARIA

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF was first reported in the country in August 2018. Since then, additional events were reported in wild boar (last event: March 2019). *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*

**BULGARIA**

Threat category: Animal and zoonotic diseases



Threat name: Peste des petits ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Peste des petits ruminants (PPR) outbreaks are likely to occur.

Context: On 24 June 2018, PPR was notified for the first time in history in Bulgaria. The disease appears to be controlled through stamping out. The risk of infection spreading to European countries from neighbouring infected countries (such as Turkey) continues to be very high. *PPR is a highly contagious disease affecting sheep and goats. It is caused by a morbillivirus and is considered to be one of the most damaging livestock diseases in Central Asia and the Middle East.*

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5N8 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: H5N8 HPAI was first reported in Bulgaria in domestic birds in February 2018. Since then, more than 30 events have been reported in domestic birds only. The most recent event occurred in April 2019. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*

CZECH REPUBLIC

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to occur through possible introduction from neighbouring countries.

Context: ASF was first reported in the country in July 2017. On February 2019, Czechia was the first country in the EU to be officially declared free from ASF after it had been infected in recent years. As no outbreak has been found in Czechia since April 2018, the country received the support of the EU member states to lift all restrictions in the country. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*

DENMARK

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5N6 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: H5N6 HPAI first occurred in Denmark in wild birds in February 2018. Since then, a total of 35 events have been reported in wild birds only. The most recent event occurred in January 2019. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*

ESTONIA

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: Since the first introduction of ASF into the country in September 2014, the disease continued to be regularly reported in wild and domestic pigs. The disease is considered endemic in the country and disease reports are provided only on a six-monthly basis. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*

FRANCE

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to occur through possible introduction from neighbouring countries.

Context: In September 2018, two dead wild boars were found positive to ASF in Étalle (Luxembourg province) where it continues to be reported. This represented the first introduction of the disease into Western Europe of Genotype 2 during the current epidemic. Wild boar population density is the most important factor in the spread of the disease in the country. ASF is most likely to persist and become endemic due to the presence of wild boar populations. In particular, the French territory close to infected areas in Belgium presents a high density of wild boars. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*



GERMANY

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to occur through possible introduction from neighbouring countries.

Context: In September 2018, two dead wild boars were found positive to ASF in Étalle (Luxembourg province) where it continues to be reported. This represented the first introduction of the disease into Western Europe of Genotype 2 during the current epidemic. Wild boar population density is the most important factor in the spread of the disease in the country. ASF is most likely to persist and become endemic due to the presence of wild boar populations. In particular, the French territory close to infected areas in Belgium presents a high density of wild boars. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*

GREECE

Threat category: Animal and zoonotic diseases



Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Low

Forecast (July–September 2019): LSD outbreaks are likely to occur because of favourable weather conditions for the vectors during the forecast period. However, they may be mitigated by the control measures in place in the country (vaccination).

Context: The last observed outbreak of LSD in Greece related to a second wave of infection that occurred in late November 2016. Subsequently, two new outbreaks occurred in regions previously unaffected by the disease: in February 2017, in Kerkyra, an Ionian island, and in August, in Thessalia region. No new outbreaks were observed after these events. An emergency vaccination campaign has been implemented. However, some new outbreaks can be expected for the incoming season, which is favourable to the vectors.

LSD is a severe disease transmitted by vectors which affects mainly cattle, causing important meat and milk production losses.

HUNGARY

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF was officially reported for the first time in the country in May 2018, in wild boar. The disease was last reported in April 2019. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*

KOSOVO

Threat category: Animal and zoonotic diseases



Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): LSD outbreaks are likely to occur because of the favourable weather conditions for the vectors during the forecast period.

Context: In June 2016, LSD was first observed in a backyard farm in Pcinja district, in neighbouring Serbia. Since then, 223 outbreaks were officially reported, the last of which was observed in October 2016. An emergency vaccination campaign has been implemented; however, some new outbreaks can be expected for the incoming season, which is favourable to vectors. *LSD is a severe disease transmitted by vectors which affects mainly cattle, causing important meat and milk production losses.*

LATVIA

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF continues to be regularly reported in the country in wild and domestic pigs. The last events occurred in April 2019. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*

LITHUANIA

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: Since the first ASF introduction in the country in January 2014, the disease continued to be regularly reported in wild and domestic pigs. The disease is considered endemic in the country and disease reports are provided only on a six-monthly basis. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*



LUXEMBOURG

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to occur through possible virus introduction from neighboring countries.

Context: On 13 September 2018, two dead wild boars were found to be positive to ASF in Étalle (Luxembourg province) in neighbouring Belgium. ASF continues to be reported in Luxembourg province only. This represented the first introduction of the disease into Western Europe. Spread of the disease in Western European countries, which have never experienced ASF, would have devastating consequences for the entire pig sector. Wild boar population density is the most significant factor in the spread of the disease in the country. ASF is most likely to persist and become endemic due to the presence of wild boar populations. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*

MONTENEGRO

Threat category: Animal and zoonotic diseases



Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): LSD outbreaks are likely to occur because of favourable weather conditions for the vectors during the forecast period. However, they may be mitigated by the control measures in place in the country (vaccination).

Context: The disease was first observed in April 2016. Since then, LSD spread throughout the country, causing at least 60 outbreaks in seven municipalities. The last observed outbreak occurred in October 2017. An emergency vaccination campaign has been implemented. However, some new outbreaks can be expected for the incoming season, which is favourable to the vectors. *LSD is a severe disease transmitted by vectors which affects mainly cattle, causing important meat and milk production losses.*

NORTH MACEDONIA

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to occur due to a possible introduction from neighboring countries.

Context: ASF has not been reported in the country. However, ASF has become endemic in Europe in some countries and in Bulgaria, which borders North Macedonia. Informal and uncontrolled animal movements and poor biosecurity conditions in pig farms at the borders pose a risk of disease introduction. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*

Threat category: Animal and zoonotic diseases



Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): LSD outbreaks are likely to occur due to favourable weather conditions for the vectors during the forecast period but it can be mitigated due to the control measures in place in the country (i.e. vaccination).

Context: Observed for the first time in July 2016, LSD caused almost 170 outbreaks, affecting 21 municipalities. After the outbreak in September 2016, two outbreaks were observed in northern municipalities of the country in February and April 2017. No new outbreaks were observed after those events. An emergency vaccination campaign has been implemented; however, some new outbreaks can be expected for the incoming season, which is favourable to the vectors. *LSD is a severe disease transmitted by vectors which affects mainly cattle, causing important meat and milk production losses.*

POLAND

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF continues to be regularly reported in the country in wild and domestic pigs. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*

REPUBLIC OF MOLDOVA

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: Since the first ASF introduction into the country in November 2016, ASF has been continually reported (last event: March 2019), both in wild and domestic pigs. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*



ROMANIA

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF continues to be regularly reported in the country in wild and domestic pigs. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*

RUSSIAN FEDERATION

Threat category: Locusts



Threat name: Migratory Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Having escaped large-scale control operations, hopper populations will fledge and adults will mate, lay eggs and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus jeopardizing the food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia and adjacent areas as well as in the country.

Threat category: Locusts



Threat name: Italian Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Having escaped control operations, hopper populations will fledge, and adults will mate, lay eggs (which will hatch in spring 2020) and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus the jeopardizing food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia and adjacent areas as well as in the country.

Threat category: Locusts



Threat name: Moroccan Locust

Likelihood of occurrence: Low

Forecast (July–September 2019): Having escaped control operations, hopper populations will fledge, and adults will mate, lay eggs (which will hatch in spring 2020) and eventually disappear.

Context: Locust pests attack a wide range of cultivated plants in the Caucasus and Central Asia and can cause severe damage, thus the jeopardizing food security and livelihoods of rural populations. This species is one of the three locust pests present in Central Asia and adjacent areas as well as in the country.

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF continues to be regularly reported in the country in wild and domestic pigs. The last events occurred in June 2019. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*

Threat category: Animal and zoonotic diseases



Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Lumpy skin disease (LSD) outbreaks are likely to occur because of favourable weather conditions.

Context: After its re-emergence in May 2016 in the country, LSD has spread north-, east- and westwards, affecting 20 administrative subjects and causing almost 500 outbreaks. Several outbreaks were reported in July and August 2018, most recently in March 2019. *LSD is a severe disease, transmitted by vectors which affects mainly cattle, causing important meat and milk production losses.*

Threat category: Animal and zoonotic diseases



Threat name: Peste des petits ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): Peste des petits ruminants (PPR) outbreaks are likely to occur because of possible introduction from neighbouring countries.

Context: The country has never experienced PPR, although the disease is occurring in China in the North-Eastern provinces and Western Mongolia, close to the borders with the Russian Federation. *PPR is a highly contagious disease affecting sheep and goats. It is caused by a morbillivirus and is considered to be one of the most damaging livestock diseases in Asia.*

Threat category: Animal and zoonotic diseases



Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (July–September 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are expected to remain at low levels.

Context: H5N8 HPAI first occurred in the Russian Federation in domestic birds in July 2018. In addition, several H5 HPAI events have been reported in the country, most recently in January 2019. *HPAI is a highly contagious disease causing high mortality in domestic birds. It generally results in severe production losses, loss of export markets and drastic disease control measures that include culling of infected and in-contact birds. This has an impact on food security and trade. Some avian influenza viruses can affect humans.*



SERBIA

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to occur through possible introduction from neighbouring countries.

Context: ASF has not been reported in the country. However, ASF has become endemic in Europe in some countries bordering Serbia such as Hungary, Bulgaria and Romania. Informal and uncontrolled animal movements and poor biosecurity conditions in pig farms at the borders pose a risk of disease introduction. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*

Threat category: Animal and zoonotic diseases



Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): LSD outbreaks are likely to occur because of favourable weather conditions for the vectors during the forecast period. However, they may be mitigated by the control measures in place in the country (vaccination).

Context: In June 2016, LSD was first observed in a backyard farm in Pcinja district. Since then, 223 outbreaks were officially reported in 12 districts. The last observed outbreak occurred in October 2016; since then, no new outbreaks have been reported. An emergency vaccination campaign has been implemented; however, some new outbreaks can be expected for the incoming season, which is favourable to the vectors. *LSD is a severe disease transmitted by vectors which affects mainly cattle, causing important meat and milk production losses.*

SLOVAKIA

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to occur through possible introduction from neighbouring countries.

Context: ASF has not been reported in the country. However, ASF has become endemic in Europe in some countries bordering Slovakia, such as Hungary, Poland and Ukraine. Informal and uncontrolled animal movements and poor biosecurity conditions in pig farms at the borders pose a risk of disease introduction. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*

UKRAINE

Threat category: Forest pests and diseases



Threat name: Bark beetles

Likelihood of occurrence: High

Forecast (July–September 2019): Bark beetles (mainly *Ips* spp.) may have up to three generations per year in the warmer sites of Europe. The flight of the second generation is likely to start in July and August, and that of the third generation in early September. From mid-April, bark beetles start to fly and may infest weakened trees.

Context: Bark beetles are causing severe damage in pine plantations. Sanitary felling and other silvicultural practices are in progress to reduce the insect populations. The adults and larvae of *Ips* spp. are bark-feeding, mainly attacking declining trees and freshly cut wood. Outbreaks can cause heavy tree losses and significant economic impacts for plantations.

Threat category: Animal and zoonotic diseases



Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (July–September 2019): African swine fever (ASF) outbreaks are likely to continue to occur.

Context: ASF continues to be regularly reported in the country in wild and domestic pigs. The last events occurred in June 2019. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are available.*



GLOSSARY

FCC threat	Food chain crisis (FCC) threats are transboundary animal and plant pests and diseases, including forest pests and aquatic diseases, and food safety threats, that can affect any step of the food chain, with a potential high impact on food and nutrition security. FCC threats may reach epidemic proportions by spreading within a country and to a number of countries, necessitating control/management cooperation between several countries.
Forecasting	Ability to predict future condition or occurrence of an FCC threat for the upcoming three months.
Likelihood of introduction	Chances of introduction of an FCC threat into a country, across border or to a specific area for the upcoming three months.
Likelihood of occurrence	Chances of an FCC threat to happen for the upcoming three months.
Likelihood of spread	Chances of geographical spread of an FCC threat within a country beyond its original introduction for the upcoming three months.
Likelihood of re-emergence/amplification	Chances of re-emergence/amplification (increase, breeding, etc.) of a threat already existing within a country for the upcoming three months.
Biosecurity	All the cumulative measures that can or should be taken to keep disease (viruses, bacteria, fungi, protozoa, parasites) from a farm and to prevent the transmission of disease (by humans, insects, rodents and wild birds and animals) within an infected farm to neighbouring farm (FAO TERM).
Incursion	An isolated population of a pest recently detected in an area, not known to be established, but expected to survive for the immediate future (FAO TERM).
Outbreak	A recently detected pest population, including an incursion, or a sudden significant increase of an established pest population in an area (FAO TERM).
Zoonosis	Any disease or infection which is naturally transmissible from animals to humans (FAO TERM).



INFORMATION SOURCES

TRANSBOUNDARY ANIMAL AND AQUATIC DISEASES

- African swine fever risk assessment available at <http://www.fao.org/3/i8805en/I8805EN.pdf>
- Avian influenza
 - Risk assessment: <http://www.fao.org/3/i8705en/I8705EN.PDF>
 - EMPRES - I: <http://empres-i.fao.org/eipws3g/>
 - OIE/FAO Network of Expertise on animal influenzas (OFFLU): www.offlu.net
- ECDC - Communicable disease threats report (CDTR) available at <https://ecdc.europa.eu/en/threats-and-outbreaks>
- FMD Situation Reports available at <http://www.fao.org/ag/againfo/commissions/eufmd/commissions/eufmd-home/fmd-surveillance/situation-reports/en/>
- Global Animal Disease Information System (EMPRES-i) available at <http://empres-i.fao.org/eipws3g/>
- Global Early Warning System (GLEWS) at FAO
- OIE World Animal Health Information Database (WAHID) Interface available at http://www.oie.int/wahis_2/public/wahid.php/Wahidhome/Home
- Tilapia Lake Virus (TiLV) disease card available at http://www.oie.int/fileadmin/Home/eng/International_Standard_Setting/docs/pdf/A_TiLV_disease_card.pdf

DESERT LOCUST

FAO Desert Locust Information Service (DLIS) available at www.fao.org/ag/locusts

Locusts (three species) in Caucasus and Central Asia

- Regional monthly bulletins on locust situations in CCA available at <http://www.fao.org/ag/locusts-CCA/en/1014/index.html>
- Reports of the annual Technical Workshop on Locusts in CCA available at <http://www.fao.org/ag/locusts-CCA/en/index.html>

FALL ARMYWORM

<http://www.fao.org/food-chain-crisis/how-we-work/plant-protection/fallarmyworm/en/>

WHEAT RUST DISEASE

Global wheat rust monitoring system

WEATHER FORECAST

<https://iri.columbia.edu/our-expertise/climate/forecasts/seasonal-climate-forecasts/>

<http://www.noaa.gov/weather>

THREATS TO FOOD SECURITY

FAO Crop Prospects and Food Situation – Quarterly Global Report – No.2, July 2019

GLOSSARY

- FAO Term portal: <http://www.fao.org/faoterm/en/>
- IPPC Glossary: <https://www.ippc.int/en/publications/glossary-phytosanitary-terms/>
- FAO Food Safety and Quality website - A-z index: <http://www.fao.org/food/food-safety-quality/a-z-index/biosecurity/en/>
- ACAPS: <https://www.acaps.org/>

