Food and Agriculture Organization of the United Nations

FOOD CHAIN CRISIS
EARLY WARNING BULLETIN

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

No. 31
April–June 2019

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.

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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 15).

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

RIFT VALLEY FEVER (RVF)

In **Eastern Africa**, Rift Valley Fever is predicted to spread due to conflicts, the lack of veterinary services, and the informal cross-border movement of livestock. In addition, according to the FAO RVF Monitoring/ Early Warning tool, suitable environmental conditions for vector amplification are predicted to persist in small and localized areas in southern Kenya and in the United Republic of Tanzania. Kenya is still considered under threat: in the past year, the country was affected by an important RVF epidemic that involved both humans and domestic animals. In addition, Uganda, South Sudan and Rwanda were also affected by RVF during the past year.

Considering the current environmental conditions, which are suitable for vector amplification, the above-average rainfall for the forecast period, and the potential informal marketing of infected animals from Eastern African countries, RVF is likely to occur in southeastern Saudi Arabia. The country was greatly affected by the disease in 2000 and 2010.

In **South Africa**, according to the FAO RVF Monitoring/Early Warning tool, the predicted environmental suitability for vector amplification and the potential risk of RVF occurrence during this forecast period are considered moderate in Madagascar, Malawi, Mayotte, Mozambique and Zimbabwe.

FALL ARMYWORM (FAW)

In **southern Asia**, FAW was reported in India in July 2018. By January 2019, it had spread to Bangladesh, China, Myanmar, Sri Lanka and Thailand, while it is supposed to be present in Viet Nam and Malaysia. During this forecast period, FAW is expected to spread to new areas within these countries and to neighbouring countries.

AFRICAN SWINE FEVER (ASF)

ASF continues to be reported in the region. **China** (where the disease has been present since August 2018), **Mongolia** (January 2019) and **Viet Nam** (February 2019) are currently reporting outbreaks in domestic pigs and cases in wild boar. The risk of ASF spread is considered high within China, Mongolia, Viet Nam and other East and Southeast Asian countries. ASF has potentially devastating consequences for animal health and food security, especially if it were to spread to other countries in Southeast Asia. In recent months, there have been numerous detections of the ASF virus in pork samples brought to other countries in the region (such as Australia, Japan and the Republic of Korea).

OVERVIEW FORECAST FOR THE PERIOD APRIL–JUNE 2019

During the period April to June 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 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 (droughts, extreme weather events, flooding, heavy rains, heat waves, the El Niño-Southern Oscillation – ENSO –,changes in vegetation cover, water temperature, etc.), human behaviour (cultural practices, conflicts and civil insecurity, trade, etc.) and natural disasters.

In relation to food security, and according to the last "Crop prospects and food situation" report (January to March 2019), FAO estimates that, globally, 40 countries (31 in Africa, eight in Asia, and one in Americas) are in need of external assistance for food. Persisting conflicts continue 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-two plant and forest pests and diseases, locusts and animal and aquatic diseases were monitored and forecasted by FAO experts for the period April to June 2019, among them **twenty-seven** pests and diseases are forecasted to be of **moderate** to **high** likelihood of occurrence as shown in table 3. A total of **275** forecasts were conducted in **119** countries.

OVERVIEW FORECAST FOR THE PERIOD APRIL–JUNE 2019

TABLE 3: Food Chain Crisis threats monitored and forecasted for April–June 2019

Continent	FCCs Threats	Plant pests and diseases	Forest pests and diseases	Locusts	Animal diseases	Aquatic diseases
AFRICA	16	Fall armyworm (FAW) Tomato leaf miner Banana Fusarium wilt disease Banana bunchy top disease Wheat rust	Blue gum chalcid Red gum lerp psyllid Bronze bug Polyphagous shot hole borer	Desert locust Migratory locust Red locust	Rift Valley fever (RVF) Foot and mouth disease (FMD) *Peste des petits ruminants* (PPR) Avian influenza (AI)	-
AMERICAS	2	-	Bark beetles	-	-	Tilapia lake virus (TiLV)
ASIA	17	Fall armyworm (FAW) Banana fusarium wilt disease Wheat rust	Boxwood blight Boxwood moth Dry cone syndrome Western conifer seed bug	Desert locust Migratory locust Italian locust Moroccan locust	African swine fever (ASF) Rift valley fever (RVF) Avian influenza (AI) Foot and mouth disease (FMD) *Peste des petits ruminants* (PPR)	Tilapia lake virus (TiLV)
EUROPE	8	Wheat rust	Pine processionary moth Bark beetles	Italian locust Moroccan locust	African swine fever (ASF) Lumpy skin disease (LSD) *Peste des petits ruminants* (PPR)	-
TOTAL by FCC category		5	10	5	6	1

REGIONAL OVERVIEW FORECAST FOR THE PERIOD APRIL–JUNE 2019

AFRICA

In Africa, 117 FCC events in 47 countries were forecasted, comprising plant pests and diseases, locusts, animal and aquatic diseases, and forest pests. The likelihood of their 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**, for most countries, the forecast period (April–June) coincides with the major growing period of maize. This means that the maize crop will be at risk. Unless appropriate action is taken, the likelihood of pest spread and damage will be high, because the pest will have full access to the susceptible maize crop, its preferred host.
  - In **North Africa**, FAW may move through the Nile Valley from the Sudan to Egypt.
  - In **West Africa**, FAW is established in all 15 countries. The forecast period will coincide with the start of the maize season in most of them. Therefore, FAW populations that have survived the dry season are likely to amplify.
  - In **Southern Africa**, during the forecasting period, most countries in the subregion will be in the end-growing season. Therefore, there is a likelihood of FAW amplification and spread.
  - In **Central Africa**, the likelihood of FAW spread and amplification varies from moderate to high, depending on the availability of the host plant, whether the growing season will start or will be underway, whether the growing season will end or whether it will be harvest period.
- In **North Africa**, **Tomato leaf miner** will develop further due to the above-average temperatures that occurred in March. The risk of **Wheat rust** will increase in the forecasted period in Egypt; due to the favourably conditions of wet winter and wind activity that are higher than average. For the other countries in North Africa, reports showed the spread of rust diseases at variable rates.
- In **Eastern Africa**, **Cassava brown streak** and **mosaic diseases** continue to affect countries, and might amplify where weather conditions will be favourable.
- In **Central Africa**, **Banana bunchy top disease** continues to be present and may escalate.

LOCUSTS

- In **Eastern Africa**, the **Desert Locust** situation will improve along the Red Sea coast because of the control operations undertaken, the drying weather conditions, and the movement of adult groups and possibly some small swarms to the Nile Valley in northern Sudan, where they are likely to breed before summer.
- In **North Africa**, small-scale breeding of **Desert Locust** will occur in the northwest area, south of the Atlas Mountains; no significant Desert Locust developments are expected.
- In **Southern Africa**, after fledging, **Red Locust** adults could form groups and small swarms from May onwards as vegetation will dry out or be burnt.

REGIONAL OVERVIEW FORECAST FOR THE PERIOD APRIL–JUNE 2019

AFRICA

- In Madagascar, hopper development of the third generation of the **Malagasy Migratory Locust** will end from mid-April, and adult groups and swarms are expected to form. In the absence of regular surveys, proper monitoring and related timely control operations of local concentrations, the locust situation is deteriorating, which could lead to another major crisis.

ANIMAL DISEASES

- **Rift Valley fever (RVF)**

  - **Eastern Africa**: precipitation forecasts for April–June 2019 predict average and below-average rainfall. Weak El Niño conditions are likely to continue throughout spring (probability of approximately 80 percent) and summer (probability of approximately 60 percent) of 2019 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 small and localized areas in southern Kenya and in the United Republic of Tanzania. For these countries, the potential risk of RVF occurrence and spread is considered moderate. In particular, Kenya is still considered to be under threat: in the past year, the country was affected by an important RVF epidemic that involved both humans and domestic animals. Currently, the disease is still reported in Nyandarua and Muranga counties, in the country's Central region. In addition, Rwanda, South Sudan and Uganda were also affected by RVF in the past year. Conflicts, a lack of veterinary services, and the informal cross-border movement of livestock – also due to the informal marketing of infected animals from affected countries – can facilitate the spread of RVF within and beyond the eastern Africa region, particularly in the Arabian Peninsula.

  - **Southern Africa**: precipitation forecasts for April–June 2019 predict average and below-average rainfall across most of the region, except in southern Zambia and central Mozambique. Weak El Niño conditions are likely to continue throughout spring (probability of approximately 80 percent) and summer (probability of approximately 60 percent) of 2019 in the Northern Hemisphere. In the past few months, the whole region was characterized by prolonged dry conditions. Exceptional floods and heavy rainfall events have recently hit southern Malawi and northern-central Mozambique. 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 moderate in Madagascar, Malawi, Mayotte, Mozambique and Zimbabwe; low in Zambia; and negligible in the rest of the region.

  - **West Africa***:* precipitation forecasts for April–June 2019 predict average and below-average precipitation, particularly in Senegal and southern Mauritania. According to the FAO RVF Monitoring/Early Warning tool, suitable environmental conditions for vector amplification are predicted in small and localized areas along the Senegal River, between Senegal and Mauritania and in central Mali. The last RVF infection in the region was reported in Mauritania in January 2019. For Mauritania and Mali, the potential risk of RVF occurrence and spread is considered low during the forecast period.

REGIONAL OVERVIEW FORECAST FOR THE PERIOD APRIL–JUNE 2019

AFRICA

- **Avian influenza (AI)**
  - In countries where **H5N1** and **H5N8 Highly Pathogenic Avian Influenza (HPAI)** viruses are circulating, the overall risk is considered low to moderate during the forecast period.
  - In **North Africa**, **H5N1 HPAI**, **H9N2 Low Pathogenic Avian Influenza (LPAI)**, and **H5N8 HPAI** outbreaks are expected to continue to circulate in Egypt from April to June 2019. A novel reassortant **H5N2** strain was identified in Egypt in late December 2018. To date, there have been no further reports of this strain, and it still necessary to confirm whether its behaviour is similar to that of other H5 strains and whether it will establish in Egyptian poultry populations.
  - In **West Africa**, **H5N8 HPAI** reemerged in the last months of 2018 in Nigeria, posing a risk to the poultry industry in this country and introducing the potential for its spread into neighbouring ones. The risk of the disease occurring during the forecast period is considered moderate.
  - In **Central and Eastern Africa**, **H5N8 HPAI** virus reports have ceased, and the risk for the April to June 2019 period is considered low.
  - In **Southern Africa**, **H5N8 HPAI** reports are continuing in South Africa. In January 2019, the virus was detected for the first time in Namibia, in a population of jackass penguins on Halifax Island. This was the first HPAI event to ever be reported in the country. Given the ongoing outbreaks in the area and the approaching of the cold season in the Southern Hemisphere, the risk for the April–June 2019 forecast period is considered moderate.
- **Foot-and-mouth disease (FMD), serotype O**
  - In **Southern Africa**, 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).
  - In **North and West Africa** (in particular, Guinea, Guinea-Bissau, Mauritania and Sierra Leone) several outbreaks of FMD serotype O were reported in July–October 2018. The virus observed appears to be genetically very close to the virus that has been circulating in Algeria since 2014 (serotype O, topotype EA3). The disease is likely to spread further within the infected countries and in the whole 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 kept 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, which are considered endemic for PPR. The disease is likely to spread through informal small ruminant movement and pastoralism along border areas, and to be introduced in neighbouring Malawi, Mozambique and Zambia.

REGIONAL OVERVIEW FORECAST FOR THE PERIOD APRIL–JUNE 2019

AFRICA

FOREST PESTS AND DISEASES

In **Eastern Africa**, **Blue gum chalcid**, **Bronze bug** and **Red gum lerp psyllid** insect pests are likely to continue to spread, causing severe damage in eucalyptus plantations. The application of biological control agents to reduce these insect pest populations are in progress in some countries.

AQUATIC ANIMAL DISEASES

- In **Southern Africa**, Zambia is at risk of re-emergence of the ***Epizootic ulcerative syndrome*** **(EUS)**, which affects fish. The United Republic of Tanzania is at risk of EUS introduction, as the disease is present in neighbouring countries. Water temperatures during the period April–June 2019 in these countries range between 18°C and 25°C, which are optimal temperatures for the development of the oomycete fungus that causes the disease.
- **Tilapia lake virus (TiLV)** may have a wider distribution than presently known. Based on an expert knowledge elicitation risk assessment for TiLV (available at **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 of and vigilance against TiLV are required in tilapia-producing countries in **northern**, **eastern** and **southern Africa**. A surveillance plan may be necessary to determine the geographical extent of the potential spread and to prepare mitigation measures. Appropriate diagnostic testing is encouraged when unexplained mortalities of tilapia occur, and is particularly necessary when clinical signs similar to those reported for TiLV and permissive water temperatures (between 22°C and 32°C) are present. 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.).

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AMERICAS

In the Americas, 21 FCC events in 10 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

In **Central America**, severe infestations of **Bark beetles** – especially the *Dendroctonus frontalis* species – are occurring in the dry corridor and will continue in the pine forests of Guatemala, Honduras and Nicaragua. In natural forests and plantations, pine species *Pinus caribea*, *Pinus oocarpa* and *Pinus patula* have become more vulnerable to infestation 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, or TiLV** (available at **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, as well as in Mexico and Peru (as per an OIE notification); it may become a threat to other tilapia-producing countries of Latin America and the Caribbean (LAC).
- The introduction of **Acute hepatopancreatic necrosis disease (AHPND)** in the *Penaeus monodon* and *Penaeus vannamei* shrimp species from infected countries to uninfected shrimp-producing LAC countries may occur, through trading of live animals (live polychaetes, clams, oysters, etc.) that are used as feed for broodstock, as well as of infected live shrimps.
- Introduction of the shrimp disease ***Enterocytozoon hepatopenaei* (EHP)** within LAC countries from infected countries is possible, through trading of live animals (live polychaetes, clams, oysters, etc.) that are used as feed for broodstock.

REGIONAL OVERVIEW FORECAST FOR THE PERIOD APRIL–JUNE 2019

ASIA

In Asia, a total of 104 FCC events were forecasted in 39 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

- In southern Asia, **Fall Armyworm (FAW) –** *Spodoptera frugiperda* **–** was reported in Bangladesh, China, India, Myanmar, Nepal, Thailand and Sri Lanka, and is supposedly present in Viet Nam and Malaysia. It will continue to spread to new areas within these countries and to neighbouring countries.
- In **Southeast Asia**, **Banana fusarium wilt disease, Tropical race 4**, has been present and was recently reported in Lao People's Democratic Republic, Myanmar and Viet Nam. The disease may further spread and cause damage.
- In **southern Asia**, **Banana fusarium wilt disease, Tropical race 4**, has been present in China, India and Pakistan. The disease may further spread and cause damage.
- In **central Asia**, **Rust disease** outbreaks, particularly of yellow rust, is likely in countries receiving a high amount of precipitation.
- In **Western Asia**, the risk of **Wheat rust** will increase in Syria and Iraq because of the favourable weather conditions.

LOCUSTS

- In **central Asia**, **Moroccan Locust** hopper development will occur in April/May, with adults appearing from late May, depending on the country. Hatching of the **Italian Locust** and of the **Migratory Locust** will start in April, with hopper development taking place in May/June. Overall, infested areas are expected to decrease in 2019.
- In **southern Asia**, the breeding of **Desert Locust** will cause hoppers to form groups and perhaps small bands in southeast Iran (Islamic Republic of); small-scale breeding in southwest Pakistan will cause locust numbers to increase slightly.
- In **West Asia**, adult groups and, possibly, a few small swarms of **Desert Locust**, will move from the Red Sea coast to the interior of Saudi Arabia; similar populations may also move from eastern Yemen to the central areas of the country. In both areas, breeding will cause locust numbers to increase.

ANIMAL DISEASES

- Considering the current environmental conditions, which are suitable for vector amplification, the above-average rainfall predicted for the forecast period, as well as the potential informal marketing of infected animals from eastern African countries, **Rift Valley fever (RVF)** is likely to occur in southeastern Saudi Arabia. The country was greatly affected by the disease in 2000 and 2010.

REGIONAL OVERVIEW FORECAST FOR THE PERIOD APRIL–JUNE 2019

ASIA

- Based on seasonal patterns and the increasing temperatures during the forecast period, a decrease in the numbers of **Avian influenza** outbreaks in poultry is generally expected over the period from April to June 2019. However, four main Highly Pathogenic Avian Influenza (HPAI) subtypes and several H5 clades are still circulating in West, East, southern, and Southeast Asia and the risk of new outbreaks occurring in affected countries can be considered low to moderate for the period April–June 2019.
  - **H5N1 HPAI** continues to be reported in China, India, Indonesia, Nepal and Viet Nam and re-emerged in Cambodia, Lao People's Democratic Republic and Malaysia in 2018.
  - **H5N2 HPAI** is circulating in Taiwan, Province of China and was last observed there in March 2019.
  - The last report of **H5N6 HPAI** in Asia dates back to February/March 2019, in China and Viet Nam.
  - The currently circulating **H5N8 HPAI** strain that emerged in China in May 2016 has spread to India, Iran (Islamic Republic of), Japan, Nepal; to Israel, the Republic of Korea, Kuwait and Pakistan (in December 2016); Kazakhstan (January 2017); and in Saudi Arabia (December 2017). In 2019, to date, H5N8 HPAI has been reported in Iran (Islamic Republic of), Kuwait and Pakistan.
- **African swine fever (ASF)** continues to be reported in the region. China (since August 2018), Mongolia (January 2019) and Viet Nam (February 2019) are currently reporting outbreaks in domestic pigs and cases of infection in wild boar. The risk of ASF spread is considered high within China, Mongolia, Viet Nam and other East and Southeast Asian countries. The disease was also first reported in wild boar in Jilin and Heilongjiang province in China, in December 2018. ASF has potentially devastating consequences for animal health and food security, especially if it spreads to other countries in Southeast Asia. In recent months, there have been numerous detections of ASF virus in samples of pork brought to countries in the region (such as Australia, the Republic of Korea and Japan).
- 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 present in Israel, and serotype A is present in the Gaza Strip, Jordan and the West Bank. Poor vaccine matching and poor coverage of susceptible livestock are likely to increase the possibility of introducing FMD.
- ***Peste des petits ruminants*** **(PPR)** is 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.

FOREST PESTS AND DISEASES

- The dieback of boxwood trees (*Buxus hyrcana*), a threatened species according to the International Union for Conservation of Nature (IUCN), caused by **Boxwood blight** (pathogen *Calonectria pseudonaviculata*) and **Boxwood moth** (*Cydelima pesrpectalis*), will cause severe damage in Georgia and in the Caspian forest of Iran (Islamic Republic of) due to high pest activities occurring in the spring.
- In Lebanon, **Dry cone syndrome** and the **Western conifer seed bug** are causing severe losses in pine nut harvest, and the pest damage will continue; additionally, the activities of the Western conifer seed bug will be high due to the emergence of overwintering larvae.

REGIONAL OVERVIEW FORECAST FOR THE PERIOD APRIL–JUNE 2019

ASIA

- In Turkey, the **Chestnut gall wasp** is causing damage to chestnut trees and threatening the livelihoods of local communities. The pest pressure is expected to decrease due to pest control activities. Biological control is in progress to reduce pest populations. In Iran, the low to 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)** (available at 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) 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.).

- The introduction or re-emergence of **Acute hepatopancreatic necrosis disease (AHPND)** in the *Penaeus monodon* and *Penaeus vannamei* shrimp species in Asia is possible, through trading, from infected countries, of live animals (live polychaetes, clams, oysters, etc.) that are used as feed for broodstock as well as of infected live shrimps.

- The introduction or re-emergence of the ***Enterocytozoon hepatopenaei* (EHP)** shrimp disease in Asia from infected countries is possible, through trading of live animals (live polychaetes, clams, oysters, etc.) that are used as feed for broodstock.

REGIONAL OVERVIEW FORECAST FOR THE PERIOD APRIL–JUNE 2019

EUROPE

In Europe, 33 FCC events were forecasted in 23 countries, comprising locusts and animal diseases. The likelihood of occurrence varies from low to high. The following FCC events have significant regional implications:

PLANT PESTS AND DISEASES

In **southern Europe**, **Rust disease** outbreaks, and particularly yellow rust, are likely in countries receiving high amounts of precipitation.

LOCUSTS

In **Eastern Europe**, in the Russian Federation, hatching of the **Italian**, **Migratory** and **Moroccan Locusts** will start from late April. Hopper development followed by fledging will start from May.

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, although further progress, such as those observed in the Czech Republic or Belgium, cannot be excluded. Czechia was the first country in the EU to be officially declared ASF-free in February 2019, as no new outbreak has been found in the country since April 2018. In September 2018, the virus was found to affect the wild boar population in Belgium. This has increased the possibility of ASF being introduced into neighbouring western European countries (such as France, Germany and Luxembourg).
- 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 April–June 2019 is considered low.
  - A low risk of **H5N8 HPAI** occurrence in affected European countries exists. Since the virus was first introduced into eastern Europe in mid-October 2016, it has been detected in 30 out of 43 European countries, particularly in western and eastern Europe. In 2018, the reported number of infections decreased drastically, and the disease affected mainly domestic poultry in Bulgaria, Italy and the Russian Federation. This strain was last detected in November 2018, in Bulgaria. Nonetheless, this strain may continue to be sporadically detected during the period April–June 2019.
  - 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 Northern Ireland. This strain may continue to be sporadically detected during the period April–June 2019, although these events are expected to be rare, given the increasing temperatures predicted during the spring season in Europe. This H5N6 HPAI strain was last reported in Ireland, in February 2019.
- On 24 June 2018, OIE was notified of the first occurrence of ***Peste des petits ruminants*** **(PPR)** in Bulgaria. The disease appears to be under control, through stamping out. The risk of European countries becoming infected due to spread from neighbouring infected countries is still very high.

REGIONAL OVERVIEW FORECAST FOR THE PERIOD APRIL–JUNE 2019

EUROPE

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 or other infected countries.

- **Lumpy skin disease (LSD)** outbreaks are likely to re-emerge in the southern European countries that are already affected (Albania, Greece, Montenegro, North Macedonia and Serbia) and the Russian Federation, due to the increased temperatures that determine favourable weather conditions for vector amplification during the forecast period. The impact of the disease can be mitigated through the control measures that are currently in place in the countries (that is, vaccination).

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 spring. Thus, it will be necessary to continue monitoring pest movement 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 spring season.

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	Nil
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
- **Nil**: an event is very unlikely to occur

FOOD CHAIN CRISIS THREATS FORECASTING AT COUNTRY LEVEL

AFRICA

ALGERIA

Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The weather conditions may favour the spread of Tomato leaf miner during this forecast period.

Context: *Tuta absoluta* has been reported in Algeria since 2008, and continues to cause yield losses in tomato and, to a lower extent, potato and eggplant. The government has recommended monitoring the pest population by means of pheromone traps and spray pesticides.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): Small-scale breeding may occur in the west and in the east of the country, and near the irrigated perimeters of Central Sahara; no significant developments are expected.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

BENIN

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): During the forecast period, the main maize season will have started. This will provide a good quantity of young leaves, which are the preferred food for FAW. FAW is likely to amplify during the forecast 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: Moderate

Forecast (April–June 2019): Maize will be at the end of its growing period and the harvesting stage will follow soon after. Therefore, there is a possibility of FAW spreading.

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.

BURKINA FASO

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (April–June 2019): FMD outbreaks are likely to continue.

Context: FMD serotype O strain has been circulating since July/August 2018 in western African countries such as Guinea, Guinea-Bissau, Mauritania and Senegal. This has given rise to concern in western African countries, as livestock are not immunized against this strain. *FMD is a highly contagious disease affecting 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: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Early but limited rains can occur in the southern part of the country in May, allowing for land preparation and first plantings to start. Elsewhere in Burkina Faso, dry conditions prevail. FAW infestation may start in the southern part of the country during the forecast period, although still on a moderate scale.

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

BURUNDI

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): In Burundi, during agricultural season B (from March to June), maize is grown in some parts of the country and there will be sufficient maize to sustain high FAW populations. FAW is also likely to survive on alternate hosts, increasing its likelihood of survival.

Context: The presence of FAW is confirmed in all 17 provinces of the country; however, data on the incidence and the severity of damage caused by the pest are not yet available.

CABO VERDE

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): During the forecast period, there will be some irrigated maize fields. However, the main season will not have started yet. FAW is unlikely to amplify, although it will actively feed on irrigated maize crops.

Context: FAW poses a serious threat to the food security of the country as maize is the main staple food. Actions to monitor and manage the pest are ongoing through various projects. Through the project funded by the African Development Bank, the country's capacities for biological control are being strengthened, with the cooperation of EMBRAPA (the Brazilian agricultural research institution).

CAMEROON

Threat category: Plant pests and diseases

Threat name: Banana bunchy top disease (BBTD)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Spread from the initial outbreak areas is likely.

Context: The disease is already present in the southern part 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-free planting materials is critical.

CONGO

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): Maize will be in the vegetative and harvesting stages in some areas. Therefore, there will be a possibility of FAW spread, re-emergence and amplification.

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 (April–June 2019): The main maize season starts in May–June. Therefore, FAW populations are likely to amplify and spread to the entire country.

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.

DEMOCRATIC REPUBLIC OF THE CONGO

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (April–June 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are unlikely to occur.

Context: H5N8 HPAI was first reported in April 2017. The last observed outbreak occurred in December 2017. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): Maize will be in the vegetative and harvesting stages in some areas. Therefore, there will be a possibility of FAW re-emergence, amplification and spread.

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

DJIBOUTI

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): FAW is likely to be introduced into the country from neighbouring Ethiopia. Nevertheless, its spread will be limited due to arid conditions and a limited availability of its preferred host (maize).

Context: The pest is suspected, but not confirmed, to be present.

EGYPT

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): H5N1 and H5N8 Highly pathogenic avian influenza (HPAI) and H9N2 Low pathogenic avian influenza (LPAI) outbreaks are expected to continue.

Context: H5N1 HPAI is endemic in Egypt. H5N8 HPAI has been present in the country since November 2016. In addition, H9N2 LPAI is sporadically reported in the country. H5N2 HPAI was reported in ducks in December 2018. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): The situation will improve on the Red Sea coast early in the forecast period; no significant developments are expected.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): As the maize season in Egypt will start during the forecast period, there will be a high possibility of FAW introduction from the southern border. In case of introduction, there will be a high likelihood of amplification and spread.

Context: FAW was not detected in the country. However, it may be introduced from across the southern border.

Threat category: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The Low temperature may increase the likelihood of the rust disease spread.

Context: The disease continues to affect wheat every year. However, the severity and spread of the disease depend on weather conditions, the wheat varieties planted and the timely application of fungicide sprays. Yellow rust infections have been observed in several wheat fields in Egypt, and the government has recommended spraying fungicide to control the disease.

Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The weather conditions may favour the spread of Tomato leaf miner during this forecast period.

Context: *Tuta absoluta* has been reported in Egypt since 2010, and continues to cause yield losses in tomato and, to a lower extent, potato and eggplant. The government has recommended monitoring the pest population by means of pheromone traps and spray pesticides.

ERITREA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): In Eritrea, FAW is likely to be introduced into the country from neighbouring Ethiopia.

Context: The pest is suspected, but not confirmed, to be present.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): Residual populations may persist on the Red Sea coast early in the forecast period; no significant developments are expected.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

ESWATINI

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): Maize will be in the vegetative stage; thus, there will be a possibility of FAW re-emergence and amplification, as well as spread at the end of season (in May).

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

ETHIOPIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): 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. Unless concerted efforts are made to carry out routine monitoring surveys using sex pheromone traps and to warn farmers, heavy infestations may occur, with implications for grain yield.

Context: In Ethiopia, FAW attacks maize planted in all seasons: it infests maize planted in the short rainy season (*belg*) and in the main rainy season (*meher*), as well as irrigated maize. In 2018, during the main rainy season (*meher*), a total of 458 maize-growing districts (*woredas*) were affected by FAW. The pest is also infesting sorghum, another widely grown cereal crop in Ethiopia. Therefore, the pest is expected to expand to sorghum, thereby causing serious economic damage to both maize and sorghum.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): Small-scale breeding may occur in eastern areas that received recent rains.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

GABON

Threat category: Plant pests and diseases

Threat name: Banana bunchy top disease (BBTD)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Spread from the initial outbreak areas is likely.

Context: The disease is already present in the northern part 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-free planting materials is critical.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): During the forecasting period, maize will be in the vegetative and harvesting stages in some areas of the country. Therefore, there is a possibility of FAW spread, re-emergence and amplification.

Context: In late July 2017, FAW infestations were reported in the Estuaire and Haut Ogooué provinces. However, no official declaration was made by the Government and no control measures have been undertaken to date. The country is implementing a TCP-F project to map FAW distribution and to confirm the status of the country.

GAMBIA

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (April–June 2019): FMD outbreaks are likely to continue.

Context: FMD serotype O strain has been circulating since July/August 2018 in western African countries such as Guinea, Guinea-Bissau, Mauritania and Senegal. This has given rise to concern in western African countries, as livestock are not immunized against this strain. *FMD is a highly contagious disease affecting 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: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The rainy season starts in mid-June. Therefore, during the forecast period, FAW populations will be increasing on the early-planted maize.

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

GHANA

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (April–June 2019): FMD outbreaks are likely to continue.

Context: FMD serotype O strain has been circulating since July/August 2018 in western African countries such as Guinea, Guinea-Bissau, Mauritania and Senegal. This has given rise to concern in western African countries, as livestock are not immunized against this strain. *FMD is a highly contagious disease affecting 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 (April–June 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are unlikely to occur.

Context: H5N1 HPAI was last reported in the country in June 2018. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): The maize season starts at the end of March in coastal and rainforest zones. The populations of FAW will be increasing during that period, as the maize will be at its most susceptible stage.

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: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (April–June 2019): TiLV has not been reported. However, it may be introduced and spread through live fish 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 between February and May.

GUINEA

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The further spread of FMD serotype O is likely to occur within the country.

Context: FMD serotype O strain has been circulating since July/August 2018 in western African countries such as Guinea, Guinea-Bissau, Mauritania and Senegal. This has given rise to concern in western African countries, as livestock are not immunized against this strain. *FMD is a highly contagious disease affecting 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: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): FAW is likely to amplify during the forecast period, as the maize season will have started in most agro-ecological zones.

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.

GUINEA-BISSAU

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The further spread of FMD serotype O is likely to occur in the country.

Context: FMD serotype O strain has been circulating since July/August 2018 in western African countries such as Guinea, Guinea-Bissau, Mauritania and Senegal. This has given rise to concern in western African countries, as livestock are not immunized against this strain. *FMD is a highly contagious disease affecting 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: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): The maize season will start during the forecast period. FAW populations are likely to amplify.

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.

KENYA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): The forecast period (April to June) coincides with the main maize crop season. The onset of rains in western Kenya started in late February/early March, and maize planting is ongoing. Rain has not yet started east of the Rift Valley. FAW infestation is expected to be higher than in previous off-seasons. However, the damage to early-planted crops is expected to be lower, compared to that to late-planted maize.

Context: FAW has been reported in 43 counties. Generally, FAW infestation during 2019 is expected to be lower (by approximately 10 percent) compared to the same season last year, due to enhanced preparedness as a result of farmer trainings, monitoring and improved FAW management practices for early action.

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): RVF outbreaks are likely to continue to occur due to animal movement and the informal marketing of infected animals.

Context: Starting in December 2018, some RVF outbreaks 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 April–June 2019 in the region predict average and below-average rainfall. *RVF is a viral zoonosis that primarily affects animals. However, it also has the capacity to infect humans. RVF can cause significant economic losses due to death and abortion among RVF-infected livestock.*

LESOTHO

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): Maize will be in the harvesting stage. Therefore, there is a possibility of FAW spreading.

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

LIBERIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): FAW was found on maize crops in the country at the end of 2017. Recently, FAW has been causing serious damage to various vegetable crops. The populations are likely to increase during the forecast, as the main maize season will be ongoing in all agro-ecological zones.

Context: The country has been faced with serious infestations of vegetable crops (cabbages, eggplants, etc.). Although maize is not an important crop, it will be necessary to continue surveillance of FAW infestation on vegetables.

LIBYA

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): Small-scale breeding may occur in the southwest part of the country, if rains fall.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

MADAGASCAR

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The risk of RVF outbreaks is considered to be low in the northern region of the country, according to the FAO RVF monitoring/Early Warning System.

Context: In southern Africa, precipitation forecasts for April–June 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 through the Northern Hemisphere's spring 2019 (in particular, the probability is of approximately 80 percent) and summer (approximately 60 percent chance). In the past few months, the whole region has been characterized by prolonged dry conditions. Exceptional floods and heavy rainfall events recently hit southern Malawi and northern-central Mozambique. *RVF is a viral zoonosis that primarily affects animals. However, it also has the capacity to infect humans. RVF can cause significant economic losses due to death and abortion among RVF-infected livestock.*

MADAGASCAR

Threat category: Locusts

Threat name: Migratory Locust

Likelihood of occurrence: High

Forecast (April–June 2019): Adults of the third generation of the 2018/2019 rainy season should start to appear during the second half of April. An increasing number of hopper bands have been reported by various sources in February and early March. Although the reports are still unconfirmed, these adults may be expected to form groups and swarms. Therefore, the situation may be expected to deteriorate further.

Context: Madagascar is prone to frequent Migratory Locust crises that affect the livelihoods and food and nutrition security of the population. The last plague occurred from April 2012 to July 2016 and threatened 13 million persons. Since then, and according to information received from the National Anti-Locust Center during the 2016/2017 and 2017/2018 locust campaigns, the situation was calm with remission confirmed in June 2018. To date, only three bulletins were received for the 2018/2019 campaign, with delays ranging from two to four months.

Threat category: Locusts

Threat name: Red Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): Fledging will occur and immature adults will start to appear at the beginning of the forecast period.

Context: This is the other locust pest in Madagascar. It has much less frequent outbreaks than the Malagasy Migratory Locust.

MALAWI

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The further spread of FMD is likely to occur within Malawi in non-vaccinated areas.

Context: FMD serotype O strain has been circulating since July/August 2018 in western African countries such as Guinea, Guinea-Bissau, Mauritania and Senegal. This has given rise to concern in western African countries, as livestock are not immunized against this strain. *FMD is a highly contagious disease affecting 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 petits ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): PPR outbreaks are likely to occur due to 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. It is caused by a morbillivirus and 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: Moderate

Forecast (April–June 2019): The potential risk of RVF outbreaks is considered to be moderate in the southern region of the country according to the FAO RVF monitoring/Early Warning System.

Context: In southern Africa, precipitation forecasts for April–June 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 through the Northern Hemisphere's spring 2019 (in particular, the probability is of approximately 80 percent) and summer (approximately 60 percent chance). In the past few months, the whole region has been characterized by prolonged dry conditions. Exceptional floods and heavy rainfall events recently hit southern Malawi and northern-central Mozambique. *RVF is a viral zoonosis that primarily affects animals. However, it also has the capacity to infect humans. RVF can cause significant economic losses due to death and abortion among RVF-infected livestock.*

Threat category: Forest pests and diseases

Threat name: Blue gum chalcid

Likelihood of occurrence: High

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

Context: The combination of climate change, with 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 deaths of highly susceptible eucalyptus species.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Maize will be at the end of its growing period and the harvesting stage will follow soon after. Therefore, there is a possibility of FAW spreading.

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

Threat category: Locusts

Threat name: Red Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): As vegetation will dry out and will start to be burned, immature adults may form groups and maybe swarms from May, in the outbreak areas where significant adult populations were reported before the onset of the rainy season. However, as no reports of hopper bands were received, the phenomenon will occur on a smaller scale than previously expected.

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: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (April–June 2019): FMD serotype O outbreaks are likely to occur due to possible virus introduction from neighbouring countries.

Context: FMD serotype O strain has been circulating since July/August 2018 in western African countries such as Guinea, Guinea-Bissau, Mauritania and Senegal. This has given rise to concern in western African countries, as livestock are not immunized against this strain. *FMD is a highly contagious disease affecting 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 (April–June 2019): The potential risk of RVF occurrence is considered to be low due to suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals

Context: In Western Africa, the forecasts for April–June 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 and in central Mali. *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.*

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): The FAW population is already building up on off-season maize and is likely to amplify during the forecast period, as the main maize season will start in April.

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: Low

Forecast (April–June 2019): Low numbers of locusts are likely to persist in the Adrar des Iforas in the north.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

MAURITANIA

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (April–June 2019): FMD serotype O outbreaks are likely to occur due to possible virus introduction from neighbouring countries.

Context: The last FMD outbreaks in Mauritania were officially reported in August/October 2018. An initial analysis of the FMD serotype revealed that this strain is close to the one that has been circulating in Algeria since 2014 (serotype O, topotype EA3). There is concern in western African countries as livestock are not immunized against this strain. *FMD is a highly contagious disease affecting 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 (April–June 2019): The potential risk of RVF occurrence is considered to be low due to 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 western Africa, the forecasts for April–June 2019 predict average and below-average precipitation. *RVF is a viral zoonosis that primarily affects animals. However, it also has the capacity to infect humans. RVF can cause significant economic losses due to death and abortion among RVF-infected livestock.*

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): Significant activity is unlikely to occur.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

MAYOTTE

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The potential risk of RVF outbreaks is likely to continue to occurr according to the FAO RVF monitoring/Early Warning System.

Context: In southern Africa, precipitation forecasts for April–June 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 through the Northern Hemisphere's spring 2019 (in particular, the probability is of approximately 80 percent) and summer (approximately 60 percent chance). In the past few months, the whole region has been characterized by prolonged dry conditions. Exceptional floods and heavy rainfall events recently hit southern Malawi and northern-central Mozambique. *RVF is a viral zoonosis that primarily affects animals. However, it also has the capacity to infect humans. RVF can cause significant economic losses due to death and abortion among RVF-infected livestock.*

MOROCCO

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): Small-scale breeding may occur in the Western Sahara and along the southern side of the Atlas Mountains.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

MOROCCO

Threat category: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The Low temperature with the higher levels of precipitation may increase the likelihood of the rust disease spread.

Context: Reports from 2017 have shown an increasing risk of yellow rust caused by *Puccinia striiformis* occurring in wheat, probably because of the evolution of new strains. Morocco reported a higher-than-average spread of wheat rust, also recording new strains of the pathogenic fungi.

Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The weather conditions may favour the spread of Tomato leaf miner during this forecast period.

Context: *Tuta absoluta* has been reported in Morocco since 2008, and continues to cause yield losses in tomato and, to a lower extent, potato and eggplant. The government has recommended monitoring the pest population by means of pheromone traps and spray pesticides.

MOZAMBIQUE

Threat category: Animal and zoonotic diseases

Threat name: Peste des petit ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): PPR outbreaks are likely to occur due to 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. It is caused by a morbillivirus and 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: Moderate

Forecast (April–June 2019): The potential risk of RVF outbreaks is considered to be moderate in the northern-central region of the country according to the FAO RVF monitoring/Early Warning System.

Context: In southern Africa, precipitation forecasts for April–June 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 through the Northern Hemisphere's spring 2019 (in particular, the probability is of approximately 80 percent) and summer (approximately 60 percent chance). In the past few months, the whole region has been characterized by prolonged dry conditions. Exceptional floods and heavy rainfall events recently hit southern Malawi and northern-central Mozambique. *RVF is a viral zoonosis that primarily affects animals. However, it also has the capacity to infect humans. RVF can cause significant economic losses due to death and abortion among RVF-infected livestock.*

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Spread of Fusarium wilt disease Tropical race 4 (TR4) of 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 has become 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 and 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, meaning that speedy containment is critical.

Threat category: Forest pests and diseases

Threat name: Red gum lerp psyllid

Likelihood of occurrence: Low

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

Context: 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 deaths of highly susceptible eucalyptus species. 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 deaths of highly susceptible eucalyptus species.

MOZAMBIQUE

Threat category: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of AHPND may occur from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals – such as polychaetes, clams and oysters – that are used as feed for broodstock.

Context: Mozambique is home to shrimp species that are susceptible to AHPND. A strong awareness of shrimp diseases is present in the country, and there has been improved awareness of AHPND over time.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Maize will be at the end of its harvesting stage. Therefore, there will be a possibility of FAW spreading.

Context: The presence of FAW was first reported during the 2016/2017 season. From then, it continued to cause damage to the maize crop in the 2017/2018 rainfed production season (from November to March).

Threat category: Locusts

Threat name: Red Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): The situation is similar to that of Malawi.

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: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): H5N8 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are likely to occur.

Context: In January 2019, the H5N8 HPAI virus was first detected in Namibia in a population of Jackass penguins on Halifax Island. This was the first HPAI event in the country's history. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): Maize will be in the vegetative stage; thus, there will be a high possibility for FAW re-emergence and amplification, as well as spread at the end of season (in June).

Context: The presence of FAW was first reported during the 2016/2017 season. From then, it continued to cause damage to the maize crop in the 2017/2018 rainfed production season (from November to March).

NIGER

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (April–June 2019): There will be no or few maize fields during the forecast period, as the maize season starts in July. Therefore, FAW will continue to develop on various hosts. However, its spread is unlikely to occur.

Context: It must be noted that maize is not particularly important 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: Low

Forecast (April–June 2019): Low numbers of locusts are likely to persist in the Air Mountains in the north.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

NIGERIA

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks in poultry may occur.

Context: H5N1 HPAI virus has been circulating in Central and West Africa since December 2014. Nigeria was the most affected country, with over 790 outbreaks reported in poultry 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, ten outbreaks of H5N8 HPAI were reported between November 2016 and February 2019 (Bauchi, Kano, Nassarawa, Ogun and Plateau States). *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): The major maize season has already started in almost all agro-ecological zones. Therefore, there will be maize crops all over the country, and FAW populations are very likely to amplify.

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: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (April–June 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 pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): In agricultural season B (from March to June), maize is grown in some parts of the country, and there will be sufficient maize to sustain high FAW populations.

Context: FAW has infested all 30 districts of the country.

Threat category: Forest pests and diseases

Threat name: Bronze bug

Likelihood of occurrence: High

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

Context: The results of a survey to identify damage done by the Bronze bug indicate that this insect pest poses a serious threat to eucalyptus forestry in Rwanda. Bronze bug (*Thaumastocoris peregrinus*) is a serious sap-sucking insect pest native to Australia. It is 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 (April–June 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. Options to manage the pest are being provided to farmers, including good nursery hygienic practices to reduce the pest population. Blue gum chalcid (*Leptocybe invasa)* is a major insect pest of young eucalyptus trees and seedlings.

SENEGAL

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The further spread of FMD serotype O is likely to occur in the country.

Context: FMD serotype O strain has been circulating since July/August 2018 in western African countries such as Guinea, Guinea-Bissau, Mauritania and Senegal. This has given rise to concern in western African countries, as livestock are not immunized against this strain. *FMD is a highly contagious disease affecting 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.*

SENEGAL

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Low

Forecast (April–June 2019): The potential risk of RVF occurrence is considered to be low due to suitable environmental conditions for vector amplification, animal movement and informal marketing of infected animals

Context: In Western Africa, the forecasts for April–June 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 and in central Mali. *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.*

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): Maize season starts in May in most zones. FAW is likely to amplify during the forecast period.

Context: It must be noted that 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.

SIERRA LEONE

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The further spread of FMD serotype O is likely to occur within the country.

Context: FMD serotype O strain has been circulating since July/August 2018 in western African countries such as Guinea, Guinea-Bissau, Mauritania and Senegal. This has given rise to concern in western African countries, as livestock are not immunized against this strain. *FMD is a highly contagious disease affecting 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: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): FAW has been reported in all regions of the country. The maize season starts in January for swamps and in May for uplands maize. During the forecast period, FAW populations are likely to amplify.

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

SOMALIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): April to June marks the start of the main rainy season (*Gu*) in Somalia and farmers across the country will be planting their cereal crops. Maize and sorghum will be in season; therefore, the risk of FAW infestation will be high.

Context: FAW is now fully established across the country. However, farmers have neither adequate knowledge nor resources to manage the pest in their crops. FAO has started to train famers on physical control, as a pilot, and the potential of this initiative is yet to be quantified. In the recently completed impact assessment exercise (funded by FAO) targeting maize, the Government of Rwanda has indicated that 173 333 ha were affected with a yield loss estimated at 88 MT, that is, 22 percent of the expected yield under normal conditions. The households affected were estimated to be 3 million. Based on the impact assessment, the impact on sorghum is much lower compared to that on maize.

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): Significant activity is unlikely to occur.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

SOUTH AFRICA

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): H5N8 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are likely to occur.

Context: In June 2017, H5N8 HPAI virus was first detected in South Africa. Since then, additional outbreaks and infections have been observed in both wild and domestic birds, in seven different regions of the country. The last outbreaks were reported in February 2019. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Plant pests and diseases

Threat name: Banana bunchy top disease (BBTD)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Spread from the initial outbreak areas is likely.

Context: Recently, the disease has been reported to be present in the country, and spread from the initial outbreak areas is possible. The disease spreads through infected planting materials and aphids. Use of disease-free planting materials is critical.

Threat category: Forest pests and diseases

Threat name: Polyphagous shothole borer (PSHB)

Likelihood of occurrence: High

Forecast (April–June 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 occurring in the summer.

Context: PSHB is an ambrosia beetle of the Curculionidae family. The insect pest has a mutualistic relationship with the fungal pathogen species *Fusarium euwallace*, which is introduced into the larval gallery by the females and acts as the primary food source of both adults and larvae. The growth of the *F. euwallaceae* fungus, and of other fungi, 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 serious economic impact has been seen in avocado production in Israel, where PSHB is now described as a serious threat to the industry. It was first reported 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 Africa countries. Early survey and destruction of heavily infested trees would help to reduce PHSB local populations and spread.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): Maize will be in the vegetative stage; thus, there will be a possibility of FAW re-emergence and amplification, as well as spread at the end of season (in June).

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

SOUTH SUDAN

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): April to June period is the main crop-growing season in the country. Maize and sorghum will be widely cultivated and FAW infestation is expected to be high.

Context: In South Sudan, the pest has been reported countrywide.

SUDAN

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Adult groups and, possibly, a limited number of small swarms may move from the Red Sea coast to the Nile Valley and breed.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Although the sorghum and maize season will start at the end of the forecast period, there will be a moderate likelihood of FAW amplification on other hosts, such as wheat.

Context: FAW is spreading in the Sudan, along the Nile Valley. The last detection was in Dungola (less than 400 km from the Egyptian border).

TOGO

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (April–June 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are unlikely to occur.

Context: H5N1 HPAI was first reported in Togo in August 2016. The last outbreak in the country occurred in March 2018. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): During the forecast period, FAW is likely to reemerge and amplify as the main maize season starts in March in some zones.

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: Wheat rust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The likelihood of spread may increase in this forecast period due to the favourable weather conditions.

Context: The disease continues to affect wheat every year. However, the severity and spread of the disease depend on weather conditions, the wheat varieties planted and the timely application of fungicide sprays.

Threat category: Plant pests and diseases

Threat name: Tomato leaf miner

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The weather conditions may favour the spread of Tomato leaf miner during this forecast period.

Context: *Tuta absoluta* has been reported in Tunisia since 2008, and continues to cause yield losses in tomato and, to a lower extent, potato and eggplant. The government has initiated a control programme to monitor the pest population by means of pheromone traps and spray pesticides.

UGANDA

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (April–June 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are unlikely to occur.

Context: In January 2017, H5N8 HPAI virus was first detected in the country, in wild birds. This was the first HPAI introduction in this African subregion since 2008. The disease was last reported in the country in May 2017. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): In Uganda, within the first week of March, most parts of the country have received rain. By April, many farmers will have planted maize. Given the widespread availability of the maize crop, FAW infestation is forecasted to be high in all the 121 districts of the country.

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

UNITED REPUBLIC OF TANZANIA

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): RVF outbreaks are likely to occur due to animal movement and the informal marketing of infected animals from high-risk areas in neighbouring countries.

Context: Precipitation forecasts for April–June 2019 in the region predict average and below-average rainfall. *RVF is a viral zoonosis that primarily affects animals. However, it also has the capacity to infect humans. RVF can cause significant economic losses due to death and abortion among RVF-infected livestock.*

Threat category: Forest pests and diseases

Threat name: Blue gum chalcid

Likelihood of occurrence: Moderate

Forecast (April–June 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.

UNITED REPUBLIC OF TANZANIA

Threat category: Aquatic diseases

Threat name: Epizootic ulcerative syndrome (EUS)

Likelihood of occurrence: Low

Forecast (April–June 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 May-June 2019 will range from 18°C to 25°C, which are optimal for the development of the oomycete fungus responsible for the disease.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): Maize will be in the vegetative and harvesting stages in some areas; thus, there will be a possibility of FAW spread, re-emergence and amplification.

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

Threat category: Locusts

Threat name: Red Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): The situation is similar to that of Malawi.

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.

ZAMBIA

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The further spread of FMD serotype O is likely to occur within the country.

Context: From April/May 2018, FMD serotype O outbreaks have been detected in Zambia. These events are of concern because the disease may spread from Zambia into southern Africa, which has never been affected by this particular topotype. *FMD is a highly contagious disease affecting 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 (April–June 2019): PPR outbreaks are likely to occur due to possible introduction from neighbouring countries.

Context: The last PPR detection in the country occurred in December 2017 (see OIE WAHIS interface). 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. It is caused by a morbillivirus and 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 (April–June 2019): The potential risk of RVF outbreaks is considered to be low, according to the FAO RVF Monitoring/ Early Warning System.

Context: In southern Africa, precipitation forecasts for April–June 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 through the Northern Hemisphere's spring 2019 (in particular, the probability is of approximately 80 percent) and summer (approximately 60 percent chance). In the past few months, the whole region has been characterized by prolonged dry conditions. Exceptional floods and heavy rainfall events recently hit southern Malawi and northern-central Mozambique. *RVF is a viral zoonosis that primarily affects animals. However, it also has the capacity to infect humans. RVF can cause significant economic losses due to death and abortion among RVF-infected livestock.*

Threat category: Forest pests and diseases

Threat name: Blue gum chalcid

Likelihood of occurrence: Moderate

Forecast (April–June 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 to reduce insect populations are in progress. Introduction of biological control agents to reduce Blue gum chalcid populations is in progress. Blue gum chalcid (*Leptocybe invasa*) is a major insect pest of young eucalyptus trees and seedlings.

ZAMBIA

Threat category: Forest pests and diseases

Threat name: Red gum lerp psyllid

Likelihood of occurrence: Moderate

Forecast (April–June 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 deaths of highly susceptible eucalyptus species.

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (April–June 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 (April–June 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.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Maize will be at the end of its vegetative stage and the harvesting stage will soon follow. Therefore, there will be a possibility of FAW re-emergence and amplification, as well as spread.

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

Threat category: Locusts

Threat name: Red Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): The situation is similar to that of Malawi.

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: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The potential risk of RVF outbreaks is considered to be moderate in the southern region of the country according to the FAO RVF monitoring/Early Warning System.

Context: In southern Africa, precipitation forecasts for April–June 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 through the Northern Hemisphere's spring 2019 (in particular, the probability is of approximately 80 percent) and summer (approximately 60 percent chance). In the past few months, the whole region has been characterized by prolonged dry conditions. Exceptional floods and heavy rainfall events recently hit southern Malawi and northern-central Mozambique. *RVF is a viral zoonosis that primarily affects animals. However, it also has the capacity to infect humans. RVF can cause significant economic losses due to death and abortion among RVF-infected livestock.*

Threat category: Forest pests and diseases

Threat name: Red gum lerp psyllid

Likelihood of occurrence: Moderate

Forecast (April–June 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 are in progress to reduce pest populations.

ZIMBABWE

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (April–June 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: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Maize will be at the end of its vegetative stage and the harvesting stage will soon follow. Therefore, there will be a possibility of FAW re-emergence and amplification, as well as spread.

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

AMERICAS

BRAZIL

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (April–June 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.

COLOMBIA

Threat category: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of AHPND may occur from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals – such as polychaetes, clams and oysters – that are used as feed for broodstock.

Context: Strong awareness of shrimp AHPND is present in the country.

Threat category: Aquatic diseases

Threat name: *Enterocytozoon hepatopenaei* (EHP)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of EHP from other countries is possible, although unlikely, through trading of live aquatic animals – such as polychaetes, clams and oysters – that are used as feed for broodstock.

Context: Strong awareness of EHP is present in the country.

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (April–June 2019): TiLV has been reported in the scientific literature (Kembou Tsofack *et al*. 2017). Mitigation measures are in place.

Context: TiLV occurs when the water temperature is between 22°C and 32°C. It has been observed in farms with large-sized fish and a high stocking density.

COSTA RICA

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (April–June 2019): TiLV has not been reported in Costa Rica. 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.

ECUADOR

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (April–June 2019): There have been no further reports since it was first reported in the literature in 2014 (Ferguson *et al*. 2014, Bacharach *et al*., 2016).

Context: TiLV has been reported in the scientific literature. The disease 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.

GUATEMALA

Threat category: Forest pests and diseases

Threat name: Bark beetles

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Bark beetles (mainly *Dendroctonus frontalis*) damage to pine plantations is likely to continue.

Context: Silvicultural practices to reduce pest populations are in progress. Training of foresters on prevention and management practices is underway. 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.

Threat category: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of AHPND is possible, although unlikely, from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals – such as polychaetes, clams, and oysters – that are used as feed for broodstock.

Context: Strong awareness of shrimp AHPND is present in the country.

HONDURAS

Threat category: Forest pests and diseases

Threat name: Bark beetles

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Bark beetles (mainly *Dendroctonus frontalis*) outbreaks, causing heavy losses in pine plantations, are likely to occur and will continue to be reported.

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. In general, the pest attacks stressed trees.

Threat category: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of AHPND is possible, although unlikely, from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals – such as polychaetes, clams, and oysters – that are used as feed for broodstock.

Context: Strong awareness of shrimp AHPND is present in the country.

Threat category: Aquatic diseases

Threat name: *Enterocytozoon hepatopenaei* (EHP)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of EHP is possible, although unlikely, from other countries through trading of live aquatic animals – such as polychaetes, clams and oysters – that are used as feed for broodstock.

Context: Strong awareness of EHP is present in the country.

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (April–June 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; 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.

MEXICO

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Moderate

Forecast (April–June 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.

NICARAGUA

Threat category: Forest pests and diseases

Threat name: Bark beetles

Likelihood of occurrence: High

Forecast (April–June 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.

Threat category: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of AHPND is possible, although unlikely, from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals – such as polychaetes, clams, and oysters – that are used as feed for broodstock.

Context: Strong awareness of shrimp AHPND is present in the country.

Threat category: Aquatic diseases

Threat name: *Enterocytozoon hepatopenaei* (EHP)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of EHP is possible, although unlikely, from other countries through trading of live aquatic animals – such as polychaetes, clams and oysters – that are used as feed for broodstock.

Context: Strong awareness of EHP is present in the country.

PANAMA

Threat category: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of AHPND is possible, although unlikely, from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals – such as polychaetes, clams, and oysters – that are used as feed for broodstock.

Context: Strong awareness of shrimp AHPND is present in the country.

Threat category: Aquatic diseases

Threat name: *Enterocytozoon hepatopenaei* (EHP)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of EHP is possible, although unlikely, from other countries through trading of live aquatic animals – such as polychaetes, clams and oysters – that are used as feed for broodstock.

Context: Strong awareness of EHP is present in the country.

PERU

Threat category: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of AHPND is possible, although unlikely, from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals – such as polychaetes, clams, and oysters – that are used as feed for broodstock.

Context: Strong awareness of shrimp AHPND is present in the country.

Threat category: Aquatic diseases

Threat name: *Enterocytozoon hepatopenaei* (EHP)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of EHP is possible, although unlikely, from other countries through trading of live aquatic animals – such as polychaetes, clams and oysters – that are used as feed for broodstock.

Context: Strong awareness of EHP is present in the country.

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (April–June 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.

ASIA

AFGHANISTAN

Threat category: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Wheat yellow rust outbreaks are likely as per the seasonal pattern.

Context: The disease is a recurrent threat to wheat. 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: Moderate

Forecast (April–June 2019): Hopper development and fledging should occur in April, and some adult groups and swarms may form in May. The scale of infestations is expected to be lower than in 2018.

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 the rural populations. This species is one of the three locust pests in Central Asia. The Italian Locust is also present in the country; however, it has not been reported as a pest in the past two years.

ARMENIA

Threat category: Locusts

Threat name: Italian Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): Hatching, followed by hopper development, should start by the second half of May.

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 the rural populations. The Italian Locust is one of the two locust pests present in the Caucasus and the only locust pest in Armenia.

AZERBAIJAN

Threat category: Locusts

Threat name: Moroccan Locust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Hatching will occur in April and be followed by hopper development and fledging, with likely formation of adult groups. The scale of infestations is expected to be higher than in 2018.

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 the rural populations. The Moroccan Locust is one of the two locust pests in the Caucasus.

BANGLADESH

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (April–June 2019): TiLV has not been reported in the country. However, it is likely to be introduced and 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. 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.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): The availability of FAW host plants during the forecasting period will increase the likelihood of FAW re-emergence and amplification.

Context: FAW has been recently reported in the country.

CAMBODIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF is very likely to occur due to its possible introduction from China or Viet Nam.

Context: In Asia, ASF was first reported in China, in domestic pigs, in August 2018. In October 2018, the disease was also reported in Yunnan province, averagely only 150–300 km away from neighbouring Lao PDR, Myanmar, Thailand and Viet Nam. On 19 February 2019, the disease was first reported in neighbouring Viet Nam. Due to the several connections between China, Viet Nam and neighbouring countries (through associated routes, or TARs, illegal imports of food, movement of workers in and out of China, etc.), there is a high risk of the disease spreading towards East and Southeast Asia. The spread of ASF from China 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 can cause high mortality. No vaccines are currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): H5N1 Highly pathogenic avian influenza (HPAI) outbreaks are likely to occur.

Context: In 2018, seven outbreaks caused by the virus were reported in six different provinces; the latest occurred in August 2018. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans. The Khmer New Year festivity, which falls in April, increases poultry demand and movements.*

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): There is a high likelihood of the introduction of FAW from neighbouring countries by April. The pest will probably spread throughout maize-growing areas.

Context: FAW has not yet been reported in the country. However, recently, it has reported in surrounding countries.

CHINA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF outbreaks are very likely to continue to occur.

Context: In Asia, ASF was first reported in China, in domestic pigs, in August 2018. As of 27 March 2019, 118 ASF outbreaks has been reported in 28 provinces. In addition, on 16 November 2018, the disease was also detected in a wild boar in Jilin province, close to the border with the Democratic People's Republic of Korea, and in Heilongjiang province. This fact enhances the likelihood of ASF spreading to neighbouring countries because of the movement of wild boars. An ASF Contingency Plan and Emergency Response Level II is under implementation in the country. The spread of the disease within the country would have devastating consequences for animal health, food safety and food security not only at national, but also at global level, and it would raise the possibility of the disease spreading to neighbouring countries in East and Southeast Asia. *ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. No vaccines are currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Peste des petits ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): PPR outbreaks are likely to continue to occur in the country.

Context: PPR is reported yearly in China. In particular, in 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 Africa.*

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): H5 and H7 HPAI and LPAI virus outbreaks in poultry, as well as cases in humans (although sporadic), are expected to continue.

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 poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

CHINA

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Spread of Fusarium wilt disease Tropical race 4 (TR4) of banana is likely.

Context: Fusarium wilt Tropical race 4 (TR4) has been reported recently and further spread is possible. The disease is soil-borne and cannot be eradicated once it has become 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 and 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, meaning that speedy containment is critical.

Threat category: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (April–June 2019): AHPND re-emergence may occur. However, its spread will be limited by biosecurity.

Context: AHPND is already present in the country. Passive surveillance and mitigation measures are in place.

Threat category: Aquatic diseases

Threat name: *Enterocytozoon hepatopenaei* (EHP)

Likelihood of occurrence: Low

Forecast (April–June 2019): EHP re-emergence may occur. However, its spread will be limited by biosecurity.

Context: EHP is already present in the country. Active and passive surveillance and mitigation measures are in place.

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (April–June 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.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): There will be high likelihood of FAW progressively spreading to the Northeastern region

Context: Recently, FAW has been reported in the country (in southwest China).

DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF is very likely to occur due to possible introduction from China.

Context: In Asia, ASF was first reported in China, in domestic pigs, in August 2018. In addition, on 16 November 2018, the disease was also detected in a wild boar in Jilin province, close to the border with the Democratic People's Republic of Korea. This fact enhances the likelihood of ASF spreading to neighbouring countries because of the movement of wild boars. Due to the several connections between China and neighbouring countries (through associated routes, or TARs, illegal imports of food, movement of workers in and out of China, etc.), there is a high risk of the disease spreading towards East and Southeast Asia. The spread of ASF from China 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 can cause high mortality. No vaccines are currently available.*

GAZA STRIP

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The further spread of FMD serotype O is likely to occur.

Context: An FMD serotype O outbreak was last observed in a western Asian country in February 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: Forest pests and diseases

Threat name: Boxwood blight

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Boxwood blight will continue to be present and is likely to increase activity, due to the increased humidity and temperature conditions prevailing from April to June.

Context: Monitoring of the disease spread 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 (April–June 2019): The moth has three to four generations per year in Georgia. The larvae will have high activity from April to June, and the moth's flight season is likely to start in late April- middle of 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*), native to eastern Asia, is highly destructive and defoliates boxwood trees. When the day-length drops below approximately 13.5 hours, the larvae will "diapause" (the dormant stage of a developing insect) so that they can overwinter in a web spun on *Buxus* leaves. In this state, larvae can survive temperatures as low as -30°C.

Threat category: Locusts

Threat name: Italian Locust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Hatching, followed by hopper development, should start by mid-May. The scale of infestations is expected to be higher than in 2018.

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 the rural populations. The Italian Locust is one of the two locust pests present in the Caucasus and in the country.

Threat category: Locusts

Threat name: Moroccan Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): Hatching should occur in May and will be followed by hopper development and fledging during the forecast period.

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 the rural populations. The Italian Locust is one of the two locust pests present in the Caucasus and in the country.

INDIA

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are likely to occur.

Context: H5N1 HPAI was last reported in wild crows in February 2019. Since November 2018, 18 H5N1 HPAI outbreaks have been reported in wild and domestic birds. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Spread of Fusarium wilt disease Tropical race 4 (TR4) of banana is likely.

Context: Fusarium wilt Tropical race 4 (TR4) has been reported recently and further spread is possible. The disease is soil-borne and cannot be eradicated once it has become 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 and 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, meaning that speedy containment is critical.

Threat category: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Wheat yellow rust outbreaks are likely as per the seasonal pattern.

Context: The disease is a recurrent threat to wheat. Highlands in the north-west part of the country may be affected. 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: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of AHPND is possible, although unlikely, from affected countries through trading and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals – such as polychaetes, clams, and oysters – that are used as feed for broodstock.

Context: Good surveillance and biosecurity measures are in place. Strong awareness of shrimp diseases is present in the country.

INDIA

Threat category: Aquatic diseases

Threat name: *Enterocytozoon hepatopenaei* (EHP)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of EHP from other countries through live animals (live polychaetes, clams, oysters, etc.) that are used as feed for broodstock is possible, although unlikely.

Context: Good surveillance and biosecurity measures are in place. Strong awareness of shrimp diseases is present in the country.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): FAW is likely to amplify in the infested areas during the forecast period, and to continue moving towards northern states.

Context: FAW was reported in July 2018. It then spread in several districts.

INDONESIA

Threat category: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of AHPND from affected countries is possible, although unlikely, through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals – such as polychaetes, clams, and oysters – that are used as feed for broodstock.

Context: Surveillance for AHPND, as well as a strong awareness of shrimp diseases, is present in the country. Many small-scale producers are present.

Threat category: Aquatic diseases

Threat name: *Enterocytozoon hepatopenaei* (EHP)

Likelihood of occurrence: Low

Forecast (April–June 2019): Introduction of EHP from other countries through live animals (live polychaetes, clams, oysters, etc.) that are used as feed for broodstock is possible, although unlikely.

Context: Strong awareness of shrimp diseases is present in the country.

IRAN (ISLAMIC REPUBLIC OF)

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): H5 Highly pathogenic avian influenza outbreaks in poultry are likely to occur.

Context: The last official H5N1 and H5N6 HPAI detections occurred in the country in January 2018. The H5N8 HPAI virus, which has been spreading globally following wild bird migratory routes since November 2016, has been detected in wild and domestic birds in eight governorates in the country. This serotype was last reported in February 2019. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Wheat yellow rust outbreaks are likely as per the seasonal pattern.

Context: The disease is a recurrent threat to wheat. 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: Desert Locust

Likelihood of occurrence: High

Forecast (April–June 2019): Hopper groups and bands will form, giving rise to adult groups and perhaps a few small swarms.

Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

Threat category: Forest pests and diseases

Threat name: Boxwood blight

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Boxwood blight will continue to be present. However, its spread will increase from April to June due to increasing temperatures and high humidity characterizing this period.

Context: Boxwood blight was first reported in the country 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.

IRAN (ISLAMIC REPUBLIC OF)

Threat category: Forest pests and diseases

Threat name: Boxwood moth

Likelihood of occurrence: High

Forecast (April–June 2019): The moth has three to four generations per year in Iran. The larvae will have a high level of activity from April to June, and the moth's flight season is likely to start in late April-middle of May.

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 the Islamic Republic of Iran 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" (the dormant stage of a developing insect) so that they 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: Low

Forecast (April–June 2019): Oak charcoal disease (which is caused by the pathogen *Biscogniauxia mediterranea*) will display low activity during the forecast period, due to low temperatures and sustainable forest health management activities.

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.

IRAQ

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks in poultry may occur.

Context: H5N8 HPAI, which has been spreading globally following wild bird migratory routes since November 2016, was last detected in the country in March 2019. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The Low temperature with the higher levels of precipitation may increase the likelihood of the rust disease spread.

Context: The disease continues to affect wheat every year. However, the severity and spread of the disease depend on weather conditions, the wheat varieties planted and the timely application of fungicide sprays. Yellow rust infections have been observed in several wheat fields in Iraq.

ISRAEL

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (April–June 2019): FMD serotype O outbreaks are still likely to occur, although a vaccination campaign is ongoing.

Context: FMD serotype O outbreaks occur sporadically in the country. FMD was last reported in the country in February 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 disruptive animal disease for livestock trade.*

Threat category: Animal and zoonotic diseases

Threat name: Peste des petits ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): PPR outbreaks are likely 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; however, 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 Africa.*

JAPAN

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF is very likely to occur due to possible introduction from China.

Context: In Asia, ASF was first reported in China, in domestic pigs, in August 2018. Due to the several connections between China and neighbouring countries (through associated routes, or TARs, illegal imports of food, movement of workers in and out of China, etc.), there is a high risk of the disease spreading towards East and Southeast Asia. The spread of ASF from China 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 can cause high mortality. No vaccines are currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (April–June 2019): H5N6 Highly pathogenic avian influenza (HPAI) outbreaks are unlikely to occur.

Context: Since November 2017, a new reassortant strain of H5N6 HPAI has been circulating in the region (in particular, in Japan, the Republic of Korea, and Taiwan, Province of China). The last event in the country was observed in March 2018. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

JORDAN

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The further spread of FMD serotype O is likely to occur.

Context: FMD serotype O was last reported in the region in February 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.*

KAZAKHSTAN

Threat category: Locusts

Threat name: Italian Locust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Hatching, followed by hopper development, should start in late April. The scale of infestation is expected to be lower than in 2018.

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 the 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: Moderate

Forecast (April–June 2019): Hatching and hopper development should start in May.

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 the 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: Moderate

Forecast (April–June 2019): Hatching should occur in April and will be followed by hopper development. Attention should be paid to southern oblasts, where an outbreak occurred in spring 2018.

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 the rural populations. This species is one of the three locust pests present in Central Asia and in the country.

KYRGYZSTAN

Threat category: Locusts

Threat name: Italian Locust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Hatching, followed by hopper development, should start in late April.

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 the rural populations. This species is one of the three locust pests present in Central Asia and in the country.

KYRGYZSTAN

Threat category: Locusts

Threat name: Moroccan Locust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Hatching, hopper development and fledging will occur successively during the forecast period. The scale of infestation is expected to be lower than in 2018.

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 the rural populations. This species is one of the three locust pests present in Central Asia and in the country.

LAO PEOPLE'S DEMOCRATIC REPUBLIC

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF is very likely to occur due to its possible introduction from China or Viet Nam.

Context: In Asia, ASF was first reported in China, in domestic pigs, in August 2018. In October 2018, the disease was also reported in Yunnan province, averagely 150–300 km from neighbouring Lao PDR, Myanmar, Thailand and Viet Nam. On 19 February 2019, the disease was first reported in neighbouring Viet Nam. Due to the several connections between China, Viet Nam and neighbouring countries (through associated routes, or TARs, illegal imports of food, movement of workers in and out of China, etc.), there is a high risk of the disease spreading towards East and Southeast Asia. The spread of ASF from China 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 can cause high mortality. No vaccines are currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are likely to occur.

Context: The country is considered endemic for H5N1 HPAI. Since November 2017, a new reassortant strain of H5N6 HPAI has been circulating in the region (in particular, in Japan, the Republic of Korea, and Taiwan, Province of China). *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Spread of Fusarium wilt disease Tropical race 4 (TR4) of banana is likely.

Context: Fusarium wilt Tropical race 4 (TR4) has been reported recently and further spread is possible. The disease is soil-borne and cannot be eradicated once it has become 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 and 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, meaning that speedy containment is critical.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): There will be a high likelihood of FAW amplification on host plants during this forecast period.

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

LEBANON

Threat category: Forest pests and diseases

Threat name: Dry cone syndrome

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Dry cone syndrome will continue to cause damage to pine plantations (*Pinus pinea*).

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.

Threat category: Plant pests and diseases

Threat name: Western conifer seed bug

Likelihood of occurrence: High

Forecast (April–June 2019): It is likely that Western conifer seed bug will display high activity due to increasing temperatures from April to June. Oviposition on stone pines will start during the late spring, and the first generation will go through the larval stage until late June-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: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF is very likely to occur due to its possible introduction from China or Viet Nam.

Context: In Asia, ASF was first reported in China, in domestic pigs, in August 2018. In October 2018, the disease was also reported in Yunnan province, averagely 150–300 km from neighbouring Lao PDR, Myanmar, Thailand and Viet Nam. On 19 February 2019, the disease was first reported in neighbouring Viet Nam. Due to the several connections between China, Viet Nam and neighbouring countries (through associated routes, or TARs, illegal imports of food, movement of workers in and out of China, etc.), there is a high risk of the disease spreading towards East and Southeast Asia. The spread of ASF from China 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 can cause high mortality. No vaccines are currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (April–June 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are unlikely to occur.

Context: H5N1 HPAI was first detected in the country in 2006 and re-emerged in March 2017. The last occurrence was observed in August 2018. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Aquatic diseases

Threat name: Acute hepatopancreatic necrosis disease (AHPND)

Likelihood of occurrence: Low

Forecast (April–June 2019): The last reported outbreak was in 2014. Therefore, the likelihood of re-emergence is low.

Context: Monitoring and active surveillance systems have been established.

Threat category: Aquatic diseases

Threat name: Enterocytozoon hepatopenaei (EHP)

Likelihood of occurrence: Low

Forecast (April–June 2019): The likelihood of re-emergence is low.

Context: EHP is already present in the country. It was last reported in September 2018 in Malaysia; since then, no new mortalities have been observed. Monitoring and active surveillance systems have been established.

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (April–June 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/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 (as experienced for example in Israel); it has also been observed in farms with large-sized fish and a high stocking density.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): There is a high likelihood for of FAW being introduced from neighbouring countries in the north by April, and of the pest spreading throughout maize-growing areas.

Context: FAW has not yet been reported in the country. However, recently, it has been reported in surrounding countries.

MONGOLIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF outbreaks are very likely to continue to occur

Context: In Asia, ASF was first reported in China, in domestic pigs, in August 2018. The affected area included Inner Mongolia, which is close to the border with Mongolia. It must be highlighted that there is a high risk of the disease spreading towards Mongolia. In January 2019, rumours of ASF outbreaks in Mongolia were reported. As of 01 March 2019, a total of 11 ASF outbreaks were confirmed in seven regions of the country. The spread of ASF from China 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 can cause high mortality. No vaccines are currently available.*

MYANMAR

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF is very likely to occur due to its possible introduction from China or Viet Nam.

Context: In Asia, ASF was first reported in China, in domestic pigs, in August 2018. In October 2018, the disease was also reported in Yunnan province, averagely 150–300 km from neighbouring Lao PDR, Myanmar, Thailand and Viet Nam. On 19 February 2019, the disease was first reported in neighbouring Viet Nam. Due to the several connections between China, Viet Nam and neighbouring countries (through associated routes, or TARs, illegal imports of food, movement of workers in and out of China, etc.), there is a high risk of the disease spreading towards East and Southeast Asia. The spread of ASF from China 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 can cause high mortality. No vaccines are currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are likely to occur.

Context: The country is considered endemic for H5N1 HPAI. Since November 2017, a new reassortant strain of H5N6 HPAI has been circulating in the region (in particular, in Japan, the Republic of Korea, and Taiwan, Province of China). *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Spread of Fusarium wilt disease Tropical race 4 (TR4) of banana is likely.

Context: Fusarium wilt Tropical race 4 (TR4) has been reported recently and further spread is possible. The disease is soil-borne and cannot be eradicated once it has become 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 and 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, meaning that speedy containment is critical.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): During the forecast period, maize will be in the vegetative stage in some areas; therefore, there will be a possibility of FAW spread, re-emergence and amplification.

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

NEPAL

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks in poultry may occur.

Context: H5N1 HPAI was last reported in the country in March 2019. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

OMAN

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): Small-scale breeding is expected in northern, interior and coastal areas that receive rainfall. However, locust numbers will remain low.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (April–June 2019): FAW has low likelihood to be introduced to the country from Yemen.

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

PAKISTAN

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): H5N8 Highly pathogenic avian influenza (HPAI) 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 been detected only in January 2018. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Plant pests and diseases

Threat name: Banana fusarium wilt disease

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Spread of Fusarium wilt disease Tropical race 4 (TR4) of banana is likely.

Context: Fusarium wilt Tropical race 4 (TR4) has been reported recently and further spread is possible. The disease is soil-borne and cannot be eradicated once it has become 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 and 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, meaning that speedy containment is critical.

Threat category: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Wheat yellow rust outbreaks are likely as per the seasonal pattern.

Context: The disease is a recurrent threat to wheat. 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: Desert Locust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Small-scale breeding is expected in Baluchistan and in interior and coastal areas, which may be supplemented by populations from SE Iran

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

PHILIPPINES

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF is very likely to occur due to its possible introduction from China or Viet Nam.

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 150-300 km far, on average, from neighbouring Myanmar, Thailand, Laos and Viet Nam. On 19 February 2019 the disease was first reported in neighbouring Viet Nam. Due to the several connections among China, Viet Nam and neighboring countries (e.g. through associated routes (TARs), illegal imports of food, movement of workers moving in and out of China, etc..), a high risk of spread of the disease towards East and Southeast Asia has to be highlighted. Spreading of ASF from China 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 can cause high mortality. So far, no vaccines are available.*

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Moderate

Forecast (April–June 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 (as experienced for example in Israel); 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: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF is very likely to occur due to possible introduction from China.

Context: In Asia, ASF was first reported in China, in domestic pigs, in August 2018. In addition, on 16 November 2018, the disease was also detected in a wild boar in Jilin province, close to the border with the Democratic People's Republic of Korea. This fact enhances the likelihood of ASF spreading to neighbouring countries because of the movement of wild boars. Due to the several connections between China, Viet Nam and neighbouring countries (through associated routes, or TARs, illegal imports of food, movement of workers in and out of China, etc.), there is a high risk of the disease spreading towards East and Southeast Asia. The spread of ASF from China 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 can cause high mortality. No vaccines are currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (April–June 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are unlikely to occur.

Context: The H5N6 HPAI virus was first detected in the country in October 2016, with the last reported outbreaks occurring in April 2017. Since November 2017, a new re-assortant strain of H5N6 HPAI has been circulating in the region (Japan, the Republic of Korea, and Taiwan, Province of China). The last occurrence of this serotype in the country was detected in March 2018. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

SAUDI ARABIA

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Low

Forecast (April–June 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks in poultry are unlikely to occur.

Context: Since November 2016, H5N8 HPAI has been spreading globally, following bird migratory routes. The virus was first detected in the country in December 2016. The last outbreak occurred in July 2018. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Animal and zoonotic diseases

Threat name: Rift Valley fever (RVF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): RVF outbreaks are likely to occur due to suitable environmental conditions for vector amplification and informal marketing of infected animals from neighboring African countries

Context: Considering the current suitable environmental conditions for the vector amplification, above-average rainfall for the forecasted period, as well as potential informal marketing of infected animals arriving from the eastern African countries, Rift Valley Fever (RVF) is likely to occur in east-southern Saudi Arabia. The country was highly affected form the disease already in 2000 and 2010. *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.*

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Adult groups, and possibly a limited number of small swarms, will move from the Red Sea coast to the central interior and breed.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

SAUDI ARABIA

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: Low

Forecast (April–June 2019): FAW has low likelihood to be introduced to the country from Yemen.

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 (April–June 2019): As maize will be available during this period, there will be a high possibility of FAW re-emergence and amplification.

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

SYRIAN ARAB REPUBLIC

Threat category: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The Low temperature with the higher levels of precipitation may increase the likelihood of the rust disease spread.

Context: The disease continues to affect wheat every year. However, the severity and spread of the disease depend on weather conditions, the wheat varieties planted and the timely application of fungicide sprays.

TAJIKISTAN

Threat category: Locusts

Threat name: Italian Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): Hatching, followed by hopper development. should start in April.

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 the 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: Moderate

Forecast (April–June 2019): Hatching, hopper development and fledging will occur successively during the forecast period. The scale of infestation is expected to be lower than in 2018.

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 the rural populations. This species is one of the three locust pests present in Central Asia and in the country.

THAILAND

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF is very likely to occur due to its possible introduction from China or Viet Nam.

Context: IN Asia, ASF was first reported in China, in domestic pigs, in August 2018. In October 2018, the disease was also reported in Yunnan province, averagely 150–300 km away from neighbouring Lao PDR, Myanmar, Thailand and Viet Nam. On 19 February 2019, the disease was first reported in neighbouring Viet Nam. Due to the several connections between China, Viet Nam and neighbouring countries (through associated routes, or TARs, illegal imports of food, movement of workers in and out of China, etc.), there is a high risk of spread of the disease towards East and Southeast Asia. The spread of ASF from China 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 can cause high mortality. No vaccines are currently available.*

Threat category: Aquatic diseases

Threat name: *Enterocytozoon hepatopenaei* (EHP)

Likelihood of occurrence: Low

Forecast (April–June 2019): EHP re-emergence may occur. However, it will be limited by biosecurity measures.

Context: EHP has been present in the country since 2016. Active and passive surveillance are in place.

THAILAND

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Moderate

Forecast (April–June 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 (as experienced for example in Israel); 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.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): Maize may be available by the end of the forecasting period; in this case, the likelihood of FAW re-emergence and amplification will increase.

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

TURKEY

Threat category: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Wheat yellow rust outbreaks are likely as per the seasonal pattern.

Context: The disease is a recurrent threat to wheat and outbreaks are likely particularly in the southeastern 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 (April–June 2019): The Chestnut gall wasp population will have limited activity in chestnut trees due to pest control measures and 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: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Wheat yellow rust outbreaks are likely as per the seasonal pattern.

Context: The disease is a recurrent threat to wheat. 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: Moderate

Forecast (April–June 2019): Hopper development and fledging should occur in April, and some adult groups may form in May. The scale of infestation is expected to be lower than in 2018.

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 the rural populations. This species is one of the three locust pests present in Central Asia and in the country.

UZBEKISTAN

Threat category: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Wheat yellow rust outbreaks are likely as per the seasonal pattern.

Context: The disease is a recurrent threat to wheat. 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: Italian Locust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Hatching, followed by hopper development, should start in April.

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 the rural populations. This species is one of the three locust pests present in Central Asia and in the country.

UZBEKISTAN

Threat category: Locusts

Threat name: Migratory Locust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Hatching and hopper development should start in May in the Aral Sea area, in the western part of the country.

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 the 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: Moderate

Forecast (April–June 2019): Hatching, hopper development and fledging will occur successively during the forecast period. The scale of infestation is expected to be higher than in 2018.

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 the rural populations. This species is one of the three locust pests present in Central Asia and in the country.

VIET NAM

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF outbreaks are very likely to continue to occur

Context: The disease was first reported in Viet Nam in February 2019. As of 27 March 2019, more then 500 outbreaks had been reported in 23 administrative areas in the country. In Asia, ASF was first reported in China, in domestic pigs, in August 2018. Due to the several connections between China, Viet Nam and neighbouring countries (through associated routes, or TARs, illegal imports of food, movement of workers, etc.), there is a high risk of the disease spreading towards East and Southeast Asia. *ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. No vaccines are currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Avian influenza (AI)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): H5 Highly pathogenic avian influenza (HPAI) outbreaks are expected to continue.

Context: H5N1 and H5N6 HPAI outbreaks have reported in the country for the past few years. Since November 2017, a new reassortant strain of H5N6 HPAI has been circulating in the region (in particular, in Japan, the Republic of Korea, and Taiwan, Province of China). The last occurrences of H5N6 HPAI in the country were in March 2019. *HPAI is a highly contagious disease causing high mortality in poultry, resulting in severe production losses that have an impact on food security and trade. Some AI viruses can affect humans.*

Threat category: Aquatic diseases

Threat name: Tilapia lake virus (TiLV)

Likelihood of occurrence: Low

Forecast (April–June 2019): TiLV has not been officially 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; 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.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): There is high likelihood of FAW introduction from neighbouring countries by April, and of its spread throughout maize-growing areas.

Context: FAW has not yet been reported in the country. However, recently, it has been reported in surrounding countries.

WEST BANK

Threat category: Animal and zoonotic diseases

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

Likelihood of occurrence: Moderate

Forecast (April–June 2019): The further spread of FMD serotype O is likely to occur.

Context: FMD serotype O was last reported in the region in February 2019 (in Israel). The last occurrence in West Bank was reported in September 2018; however, the serotype was not typed. *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.*

YEMEN

Threat category: Locusts

Threat name: Desert Locust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Adult groups and, possibly, a limited number of small swarms will move from the eastern region of the country to Hadhramaut and Sabatyn areas, and breed.

Context: Numerous Desert Locust (*Schistocerca gregaria*) populations pose 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 are at risk of being affected by this voracious insect. Desert Locusts are potentially the most dangerous locust pests due to the swarms' ability to fly quickly over long distances.

Threat category: Plant pests and diseases

Threat name: Fall armyworm (FAW)

Likelihood of occurrence: High

Forecast (April–June 2019): The sorghum and maize season will start during the forecast period; this will increase the possibility of FAW amplification and spread.

Context: FAW was reported in the country in July 2018.

EUROPE

ALBANIA

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): LSD outbreaks are likely to occur due to favourable weather conditions for the vectors during the forecast period.

Context: First detected in June 2016, LSD caused almost 850 outbreaks, affecting 32 counties. Throughout 2017, outbreaks continued to be detected; however, they were not officially reported. Implementation of an emergency vaccination campaign has started. LSD is a severe disease, transmitted by vectors, which affects mainly cattle. It causes important meat and milk production losses.

Threat category: Forest pests and diseases

Threat name: Pine processionary moth

Likelihood of occurrence: Moderate

Forecast (April–June 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 be warmed by sunlight. The larvae abandon the nest during the night to feed, except when the temperature is too low.

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

BELARUS

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): ASF outbreaks are likely to occur due to possible virus introduction from neighbouring countries.

Context: ASF has not been reported in Belarus. Informal and uncontrolled animal movements and poor biosecurity conditions in pig farms at the borders are risk factors for ASF introduction into unaffected areas. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are currently available.*

Threat category: Forest pests and diseases

Threat name: Bark beetles

Likelihood of occurrence: High

Forecast (April–June 2019): Bark beetles (mainly *Ips spp*.) may have up to three generations per year in warmer sites of Europe; the flight of the second generation likely to start in July and August and that of the third generation in early September. During winter months, low temperatures cause the bark beetles' activity to decline. From mid-April, bark beetles start to fly and may infest trees, weakening them.

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 a significant economic impact in plantations.

BELGIUM

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF outbreaks are likely to continue to occur.

Context: In September 2018, two dead wild boars were found to be positive to ASF in Étalle (province of Luxembourg). As of 11 March 2019, a total of 614 wild boars have been found to be infected in Luxembourg province only. This was the first introduction of the disease into the country and into Western Europe. Wild boar population density is the most important factor in the spread of the disease in a country. ASF is most likely to persist and become endemic due to the presence of wild boar populations that interact with susceptible domestic species. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are currently available.*

BULGARIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): ASF outbreaks are likely to continue to occur.

Context: In the country, ASF was first reported in August 2018. Since then, additional events have been reported in wild boars (most recently, in February 2019). *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are currently available.*

BULGARIA

Threat category: Animal and zoonotic diseases

Threat name: Peste des petit ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): PPR outbreaks are likely to occur.

Context: On 24 June 2018, PPR was notified for time ever in Bulgaria. The disease seems to be controlled through stamping out. The risk of European countries infection from neighboring infected countries 9I.e. Turkey) is still very high. *PPR is a highly contagious disease affecting sheep and goats, it's caused by a Morbillivirus and is considered to be one of the most damaging livestock diseases in Africa.*

CZECHIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Low

Forecast (April–June 2019): ASF outbreaks are likely to continue to occur.

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

ESTONIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): ASF outbreaks are likely to continue to occur.

Context: Since the first introduction of ASF into the country in September 2014, the disease continues 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 currently available.*

FRANCE

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF outbreaks are likely to occur due to possible virus introduction from neighbouring countries.

Context: In September 2018, two dead wild boars were found to be positive to ASF in Étalle (province of Luxembourg), where the disease continues to be reported. This was the first introduction of the disease into western Europe. Wild boar population density is the most important factor in the spread of the disease in a country. ASF is most likely to persist and become endemic due to the presence of wild boar populations that interact with susceptible domestic species. In particular, the French territory close to the infected area 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 currently available.*

Threat category: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Wheat yellow rust outbreaks are likely as per the seasonal pattern.

Context: The disease is a recurrent threat to wheat. The disease particularly infects the leaves, reducing photosynthesis and grain weight. Excess rains support disease development. Regular surveys and timely actions are essential.

GERMANY

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF outbreaks are likely to occur due to possible virus introduction from neighbouring countries.

Context: In September 2018, two dead wild boars were found to be positive to ASF in Étalle (province of Luxembourg), where the disease continues to be reported. This was the first introduction of the disease into western Europe. Wild boar population density is the most important factor in the spread of the disease in a country. ASF is most likely to persist and become endemic due to the presence of wild boar populations that interact with susceptible domestic species. In particular, the French territory close to the infected area 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 currently available.*

GREECE

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Low

Forecast (April–June 2019): LSD outbreaks are likely to occur due to favourable weather conditions for the vectors during the forecast period. However, the risk may be mitigated by the control measures in place in the country (that is, vaccination).

Context: The last observed outbreak of LSD in Greece related to a second wave of infection and occurred in late November 2016, Subsequently, two new outbreaks occurred in regions that had not been affected by the disease before: in February 2017, LSD was reported 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. Nonetheless, new outbreaks can be expected for the upcoming season, as it is favourable for vectors. LSD is a severe disease, transmitted by vectors, which affects mainly cattle. It causes important meat and milk production losses.

HUNGARY

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): ASF outbreaks are likely to continue to occur.

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

ITALY

Threat category: Plant pests and diseases

Threat name: Wheat rust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Wheat yellow rust outbreaks are likely as per the seasonal pattern.

Context: The disease is a recurrent threat to wheat. The disease particularly infects the leaves, reducing photosynthesis and grain weight. Excess rains support disease development. Regular surveys and timely actions are essential.

LATVIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): ASF outbreaks are likely to continue to occur.

Context: ASF continues to be regularly reported in 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 currently available.*

LITHUANIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): ASF outbreaks are likely to occur.

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

LUXEMBOURG

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: High

Forecast (April–June 2019): ASF outbreaks are likely to occur due to possible virus introduction from neighbouring countries.

Context: On 13 September 2018, two dead wild boars were found to be positive to ASF in Étalle (province of Luxembourg), in neighbouring Belgium. ASF continues to be reported in Luxembourg province only. This was the first introduction of the disease into Western Europe. The 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 important factor in the spread of the disease in a country. ASF is most likely to persist and become endemic due to the presence of wild boar populations that interact with susceptible domestic species. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are currently available.*

MONTENEGRO

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): LSD outbreaks are likely to occur due to favourable weather conditions for the vectors during the forecast period. However, the risk may be mitigated by the control measures in place in the country (that is, vaccination).

Context: The disease was first detected in April 2016. Since then, LSD has spread in 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. Nonetheless, new outbreaks can be expected for the upcoming season, as it is favourable for vectors. LSD is a severe disease, transmitted by vectors, which affects mainly cattle. It causes important meat and milk production losses.

NORTH MACEDONIA

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): LSD outbreaks are likely to occur due to favourable weather conditions for the vectors during the forecast period. However, the risk may be mitigated by the control measures in place in the country (that is, vaccination).

Context: Detected for the first time in July 2016, LSD caused almost 170 outbreaks, affecting 21 municipalities. After another outbreak in September 2016, two further 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. Nonetheless, new outbreaks can be expected for the upcoming season, as it is favourable for vectors. LSD is a severe disease, transmitted by vectors, which affects mainly cattle. It causes important meat and milk production losses.

POLAND

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): 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 currently available.*

REPUBLIC OF MOLDOVA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): ASF outbreaks are likely to continue to occur.

Context: Since the first introduction of ASF into the country, reported to have occurred in November 2016, ASF was continually reported until October 2018, in both wild and domestic pigs. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are currently available.*

ROMANIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): ASF outbreaks are likely to continue to occur.

Context: In the country, ASF was first detected in July 2017. The last event occurred in March2019. *ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. No vaccines are currently available.*

RUSSIAN FEDERATION

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): 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 March 2019. *ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. No vaccines are currently available.*

Threat category: Animal and zoonotic diseases

Threat name: Peste des petits ruminants (PPR)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): PPR outbreaks are likely to occur due to possible introduction from neighbouring countries.

Context: The country has never experienced PPR, although the disease is occurring in China's northeastern provinces, which are close to the border 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 Africa.*

RUSSIAN FEDERATION

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): LSD outbreaks are likely to occur, due to favourable weather conditions.

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

Threat category: Locusts

Threat name: Italian Locust

Likelihood of occurrence: Moderate

Forecast (April–June 2019): Hatching and hopper development should start in May. The scale of infestation is expected to be lower than in 2018.

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 the 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: Migratory Locust

Likelihood of occurrence: Low

Forecast (April–June 2019): Hatching and hopper development should start in May.

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 the 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: Moderate

Forecast (April–June 2019): Hatching should occur in May and will be followed by hopper development.

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 the rural populations. This species is one of the three locust pests present in Central Asia and adjacent areas, as well as in the country.

SERBIA

Threat category: Animal and zoonotic diseases

Threat name: Lumpy skin disease (LSD)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): LSD outbreaks are likely to occur due to favourable weather conditions for the vectors during the forecast period. However, the risk may be mitigated by the control measures in place in the country (that is, vaccination).

Context: In June 2016, LSD was first observed in a backyard farm in Pcinja district. Since then, 223 outbreaks have been officially reported in 12 districts. The last observed outbreak occurred in October 2016. Since then, there have been no new outbreaks. An emergency vaccination campaign has been implemented. Nonetheless, new outbreaks can be expected for the upcoming season, as it is favourable for vectors. LSD is a severe disease, transmitted by vectors, which affects mainly cattle. It causes important meat and milk production losses.

SLOVAKIA

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

ASF outbreaks are likely to occur due to 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 Czechia, Poland and Ukraine. Informal and uncontrolled animal movements and poor biosecurity conditions in pig farms at the borders pose a risk to disease introduction. *ASF is a highly contagious viral disease of swine, both domestic and wild, which can cause high mortality. No vaccines are currently available.*

UKRAINE

Threat category: Animal and zoonotic diseases

Threat name: African swine fever (ASF)

Likelihood of occurrence: Moderate

Forecast (April–June 2019): 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 March 2019. *ASF is a highly contagious viral disease of swine, both domestic and wild, which causes high mortality. No vaccines are currently available.*

UKRAINE

Threat category: Forest pests and diseases

Threat name: Bark beetles

Likelihood of occurrence: High

Forecast (April–June 2019): Bark beetles (mainly *Ips spp*.) may have up to three generations per year in warmer sites of Europe; the flight of the second generation likely to start in July and August and that of the third generation in early September. During winter months, low temperatures cause the bark beetles' activity to decline. From mid-April, bark beetles start to fly and may infest trees, weakening them.

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 a significant economic impact in plantations.

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 (FAOTERM).
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 (FAOTERM).
Outbreak	A recently detected pest population, including an incursion, or a sudden significant increase of an established pest population in an area (FAOTERM).
Zoonosis	Any disease or infection which is naturally transmissible from animals to humans (FAOTERM).

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/Internationa_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.1, March 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/

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