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Alerts on threats to the food chain
affecting food security in countries and regions

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 on the forecast of 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 collected and analyzed 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 leads and coordinates the bulletin.

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FCC FORECASTING METHODOLOGY

Transboundary animal and plant pests and diseases, including forest pests and aquatic diseases, and food safety threats are raising public awareness for their potential impact on food security, human health, livelihoods, and trade. These threats have raised the recognition of the need to predict such threats in a comprehensive and integrated manner, oriented at 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.

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 upon availability of FAO data, a number of forecast events are presented at country level. Data are collected, analyzed, and then presented in a table format (see country table, p.13) in the quarterly FCC Early Warning Bulletin.

The **Likelihood of occurrence of a 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, in case 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)	Impossible
Low (1)	Unlikely
Moderate (2)	Likely
High (3)	Highly likely

GLOBAL OVERVIEW

During the period July-September 2016, Food Chain Crisis (FCC) threats are expected to occur in the regions of Africa, Americas, Asia, and Europe.

The dynamics of the FCC threats depend on a number of risk factors/drivers including agro-ecological factors (e.g. intensive farming systems, deforestation, overgrazing, etc.), climatic changes (e.g. droughts, heavy rains, heat waves, changes in vegetation cover, etc.), human behavior (e.g. cultural practices, conflicts and civil insecurity, trade, etc.) and natural disasters.

FCC threats, as forecasted for the period of July-September 2016, will be either persisting within a country or possibly spreading to neighboring countries, or will be latent and will re-emerge/amplify at a certain time.

FCC Threats

As of June 2016, FCC threats forecasted for the upcoming three-month period July-September 2016, comprise 29 different animal and plant pests and diseases, aquatic diseases, and forest pests and diseases:

🔍 **Animal and zoonotic diseases:** African swine fever, Foot-and-mouth disease, Highly pathogenic avian influenza, Lumpy skin disease, Middle East respiratory syndrome coronavirus, peste des petits ruminants and Rift Valley fever.

🔍 **Aquatic diseases:** Acute hepatopancreatic necrosis disease, *Enterocytozoon hepatopenaei*, Epizootic ulcerative syndrome.

🔍 **Locusts:** Desert Locust, Italian Locust, Migratory Locust, Moroccan Locust.

🔍 **Plant diseases:** Banana bunchy top disease, Banana fusarium wilt disease, Banana xanthomonas wilt disease, Wheat stem rust disease.

🔍 **Forest pests and diseases:** Bark beetles, Blue gum chalcid, Boxwood blight, Boxwood moth, Bronze bug, Chestnut gall wasp, Dry cone syndrome, Pine processionary moth, Red gum lerp psyllid, Oak charcoal disease, Western conifer seed bug.

Other regional/global threats

Zika virus

The current strain of the mosquito-borne Zika virus, first affecting Chile (Easter Islands in 2014) then Brazil (2015) and now numerous countries in the Americas, is not known to affect livestock. However, watering facilities and livestock water-pits increase opportunities for mosquito (*Aedes sp.*) habitats. For keeping mosquito breeding low in such facilities, FAO recommends that animal drinking water containers, are emptied, cleaned, and scrubbed twice weekly.

Widespread alarm over the current outbreak of Zika will likely see a dramatic increase in the use of pesticides to control mosquito populations or their larvae in water, at least in the short term. If pesticides are used, then it is important that it should be the right types and in the right manner. More information is available at: <http://www.fao.org/zika-virus/en/>.

GLOBAL OVERVIEW

Zika virus continues to spread geographically to areas where competent vectors (*Aedes sp.*) are present. Although a decline in cases of Zika infection has been reported in some countries or in some parts of countries, vigilance needs to remain high.

At this stage, based on the evidence available, WHO does not see an overall decline in the outbreak.

More information is available at: <http://www.who.int/emergencies/zika-virus/situation-report/30-june-2016/en/>.

Ebola virus disease

Guinea and Liberia declared the end of the most recent outbreak of Ebola virus disease (EVD) on 1 and 9 June 2016, respectively. The performance indicators suggest that Guinea, Liberia and Sierra Leone still have variable capacity to prevent, detect and respond to new outbreaks.

More information is available at: <http://www.who.int/csr/disease/ebola/en/>

El Niño and La Niña current situation and forecasting

The tropical Pacific Sea Surface Temperature (SST) anomaly is near zero in mid-June, indicating neutral conditions of El Niño–Southern Oscillation (ENSO).

The review of the ENSO outlooks from various sources suggests a 50-70 percent chance of La Niña developing by late July or August 2016, lasting through fall and into winter. International climate models also indicate that further cooling in the tropical Pacific Ocean is likely, suggesting sea surface temperatures will reach La Niña thresholds during fall 2016. La Niña phenomena generally affect the same regions that are affected by El Niño, with opposed climatic consequences. Areas which experienced dry conditions (below average rainfall and/or increased temperature) during El Niño tend to receive above average rainfall and in some cases cooler temperatures during La Niña.

REGIONAL OVERVIEW

AFRICA

In Africa, a total number of 46 FCC events have been forecasted including animal and aquatic diseases, locusts, plant pests and diseases, and forest pests and diseases. The likelihood of occurrence varies from Nil to High.

Animal and aquatic diseases

➤ Further spread of **H5N1 Highly pathogenic avian influenza (H5N1 HPAI)** in poultry is expected in West Africa in Nigeria, where, since its introduction in 2014, the virus has been reported in 26 states in the country, and the disease has become endemic, and in Ghana and Niger. Inadequate implementation of control measures such as rapid containment, compensation to farmers and surveillance along poultry value chains in these countries, puts neighboring countries in West and Central Africa at high risk of introduction of the virus. In Central Africa, further spread of H5N1 HPAI along poultry value chains is expected to occur in Cameroon, where the incursion of the disease has been reported in late May 2016 and where further spread is expected. In Northern Africa, H5N1 HPAI outbreaks continue to be reported in poultry in Egypt, with sporadic occurrence of human cases associated with exposure to infected poultry. This can also increase the likelihood of introduction of the virus into neighboring countries in the region (e.g. Libya, Algeria and Tunisia).

➤ The likelihood of occurrence of **Rift Valley fever (RVF)** in animals and humans has lowered due to unfavorable meteorological conditions (e.g. low-rains) in Eastern Africa. El Niño dissipated and ENSO-neutral conditions returned in June 2016. However, the occurrence of additional cases of RVF cannot be ruled out in Uganda, where the virus was detected in humans and in animals in Kabale region in April 2016, and where the virus might still be circulating.

➤ In South Africa, some vector-borne diseases activities (such as Rift Valley fever) are expected with the possible increase of rainfall before the end of 2016.

➤ Some areas in East Africa can face drought impacting in general animal production and health due to the decrease in animal feed and forage. Water scarcity in some areas will lead to more animal contact, in particular in pastoralist systems, and more contact with wildlife, which will increase the rate of transmission of transboundary animal diseases (e.g. Foot-and-mouth disease, peste des petits ruminants etc.) and potential emerging diseases.

➤ The aquatic disease **Epizootic ulcerative syndrome (EUS)** will likely spread to other parts of Western Africa (e.g. Ghana and Nigeria, which are emerging aquaculture countries) due to a number of risk factors such as heavy rainfall, flooding, poor biosecurity, movement of infected fish and birds. In addition, movements of fish (cross border and domestic) for aquaculture and ornamental fish trade are proven pathways.

REGIONAL OVERVIEW

AFRICA

In some countries outbreaks of EUS occur in wild fish first and then they spread to fish ponds. EUS will likely continue to spread to other parts of Eastern Africa (e.g. Malawi, United Republic of Tanzania).

Locusts

➤ **Desert Locust** swarms will continue to form in the interior of Yemen where they could mature and lay eggs in July if conditions remain favourable; otherwise, they will move into the Highlands or to the Gulf of Aden and continue to the summer breeding area along both sides of the Indo-Pakistan border. Continued insecurity is severely hampering survey and control efforts in Yemen.

Plant pests and diseases

➤ In Central Africa, **Banana bunchy top disease** (BBTD) has affected banana production in recent years, and its impact is likely to increase. In Eastern Africa, BBTD has also impacted banana production in recent years.

➤ **Wheat stem rust** disease might develop and cause concern in certain areas in Eastern Africa.

Forest pests and diseases

➤ In Southern Africa, the likelihood of occurrence of outbreaks of the insect pest **Red gum lerp psyllid** in Eucalyptus forests is still high in some countries (Malawi, Mozambique, South Africa, and Zimbabwe).

➤ In addition, the insect pest **Blue gum chalcid** and **Bronze bug** are still a threat for Eucalyptus forests in Zambia and Zimbabwe. Both pests are also reported in Malawi where new outbreaks are likely to occur.

REGIONAL OVERVIEW

AMERICAS

In Americas, a total number of 16 FCC events have been forecasted including aquatic diseases, forest pests and diseases. The likelihood of occurrence varies from low to high.

Aquatic diseases

➤ **Acute hepatopancreatic necrosis disease (AHPND)**, also known as Early Mortality Syndrome (EMS), in shrimps (*Penaeus vannamei*) is likely to spread to Central America from live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock from infected countries through trade and live aquatic animal movement.

Forest pests and diseases

➤ A severe outbreak of the insect pest **Bark beetles** continues to affect conifer forests in Honduras. The likelihood of introduction and spread of Bark beetles to affect conifer forests in Nicaragua is still high.

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Zika virus continues to spread geographically to areas where competent vectors (*Aedes* sp.) are present. Although a decline in cases of Zika infection has been reported in some countries or in some parts of countries, vigilance needs to remain high. At this stage, based on WHO Zika weekly report of 30 June, there is no overall decline in the outbreak. The Zika virus disease is a public health emergency in Latin America and the Caribbean, affecting large communities in urban and rural areas. The disease is presenting long-term health consequences and social impact due to severe neurological effects on babies born from women infected with Zika virus, a mosquito-borne virus. Zika virus transmission has not been linked with animal species and therefore the role of wildlife and livestock species is still unknown.

REGIONAL OVERVIEW

ASIA

In Asia, a total number of 63 FCC events have been forecasted including animal and aquatic diseases, locusts, forest pests and diseases. The likelihood of occurrence varies from Nil to High.

Animal and aquatic diseases

➤ **H5 Highly pathogenic avian influenza** viruses are expected to continue circulating and possibly spread to previously unaffected countries in Eastern and Southeast Asia. The circulation of **H7N9 Low pathogenic avian influenza** will continue to occur in China, possibly at a lower intensity. So far, after three seasons of circulation, the virus has not spread outside China or reported by any other country in Asia. The presence of poultry trade (formal and informal) between China and neighboring countries might still be considered a risk factor for facilitating cross border spread.

➤ **Middle East respiratory syndrome coronavirus (MERS-CoV)** in humans as well as the detection of the virus in camels in Saudi Arabia and other countries in the Middle East are likely to continue because of surveillance efforts. Dromedary camels in the Middle East are considered to be the major reservoir for the virus from which humans sporadically become infected through zoonotic transmission. Critical gaps remain in the knowledge of many epidemiological aspects of MERS-CoV related to the transmission, spill over, persistence and further spread of the disease in animal populations, and dynamics of transmission at the animal-human interface.

➤ Possible incursion of **peste des petits ruminants (PPR)** from endemic countries, to non-endemic countries in Eastern Europe and Central Asia, as it has been observed for the first time in Georgia in January 2016.

➤ Increased risk of spread of **Lumpy skin disease (LSD)** from areas in the Middle East to areas in the Caucasus, Europe and Central Asia facilitated by animal movement and by the favorable weather condition for the vector.

➤ Risk of spread of **Acute hepatopancreatic necrosis disease (AHPND)**, also known as Early Mortality Syndrome (EMS) in shrimp species *Penaeus monodon* and *Penaeus vannamei* to Islamic Republic of Iran and to Iraq from live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.

Locusts

➤ **Desert Locust** swarms will form in the interior of Yemen where they will mature and lay eggs in July if conditions remain favourable; otherwise, they will move to the Gulf of Aden and continue to the summer breeding area along both sides of the Indo-Pakistan border. Continued insecurity is severely hampering survey and control efforts in Yemen.

REGIONAL OVERVIEW

ASIA

As life cycles of the three locust pests Italian, Migratory and Moroccan Locusts present in Central Asia will come to an end during the considered period, the likelihood of their occurrence is moderate to low in Caucasus and Central Asia.

Forest pests and diseases

➤ Dieback of boxwood trees (*Buxus hyrcana*), IUCN threatened species, caused by **Boxwood blight** (pathogen *Calonectria Pseudonaviculata*) continues to be reported in the Caspian forest of the Islamic Republic of Iran. The spread of the disease has been reported in neighboring countries such as Azerbaijan and Georgia.

➤ **Boxwood moth** and **Boxwood blight** are causing diebacks of native boxwood species in Georgia and surrounding regions.

➤ **Chestnut gall wasp** is causing heavy damages to chestnut trees and threatening livelihoods of local communities in Turkey.

➤ **Dry cone syndrome** and **Western conifer seed bug** are continuing to cause damages in pine plantations (*Pinus pinea*) in Lebanon.

REGIONAL OVERVIEW

EUROPE

In Europe, a total number of 19 FCC events have been forecasted including animal diseases and forest pests. The likelihood of occurrence varies from low to high.

Animal diseases

➤ **African swine fever** (ASF) outbreaks and transmission is likely to continue in the affected countries (Russian Federation, Ukraine, Poland, Estonia, Lithuania and Latvia) where the virus is becoming endemic in wild boar populations and sporadically transmitted to domestic pigs through feeding and other infected material. This increases the possibility of incursion into neighboring countries (e.g. Romania) via live animal and animal product movement and trade along pig value chains, and transmission through infected carcasses of deaths wild boars overwintering.

➤ Since its re-emergence in northern Greece in early April 2016, **Lumpy skin disease** (LSD) has been spreading northward, with incursion and further spread in Bulgaria, in Former Yugoslav Republic of Macedonia, and in Serbia. The risk of further spread of LSD within the affected countries and incursion into neighboring countries should be considered high and can be facilitated by the presence of weather conditions suitable for vector amplification.

Locusts

➤ As life cycles of the three locust pests **Italian, Migratory and Moroccan Locusts** present in Europe will come to an end during the considered period, the likelihood of their occurrence is moderate to low in the region.

Forest pests

➤ Dieback of boxwood trees (*Buxus hyrcana*), IUCN threatened species, caused by **Boxwood blight** (pathogen *Calonectria Pseudonaviculata*) continues to be reported in the Caspian forest of the Islamic Republic of Iran. The spread of the disease has been reported in neighboring countries such as Azerbaijan and Georgia.

➤ **Pine processionary moth** continues to cause heavy damages to pine forests in Albania.

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More detailed information on FCC threats forecasts at country level is available under the FCC threats forecasting at country level section.

FCC THREATS FORECASTING AT COUNTRY LEVEL

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

The list of country names refers only to countries for which information is available. The country table 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				
Plant pests and diseases				
Locusts				
Forest 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 impossible to occur

FCC THREATS FORECASTING AT COUNTRY LEVEL

AFRICA

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Algeria	Desert Locust	Moderate	 Small groups of adults will continue to form in the Central Sahara and could move to the south.		
Angola	Foot-and-mouth disease (FMD)	Low	 Further occurrence of Foot-and-mouth disease outbreaks in the southern part of the country possibly mitigated by the undertaken vaccination campaign.	At the end of April 2016, a new outbreak of FMD has been observed in Cuando Cubanango region, where several FMD outbreaks were reported to occur between January and August 2015. The main driver responsible for the spreading of the disease was the movement of animals in search of grazing areas and watering points between the two countries.	
Benin	Avian Influenza (AI)	Moderate	 Incursion of H5N1 Highly pathogenic avian influenza (HPAI) from neighboring countries amplified by inadequate capacity to detect and control the infection in poultry.	H5N1 HPAI virus has been circulating in six countries in West Africa since December 2014. The virus has never been reported in Benin so far. Since the beginning of 2016, the virus is actively circulating in four Western Africa	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
				countries. Inadequate control measures in these countries can further facilitate regional spread.	
Burkina Faso	Avian Influenza (AI)	Moderate	 Incursion of H5N1 Highly pathogenic avian influenza (HPAI) from neighboring countries where the virus is still actively circulating.	<p>After its incursion in Nigeria in December 2014, H5N1 HPAI has been detected in Burkina Faso in February 2015 in the south western part of the country. In six months, the country reported 94 H5N1 HPAI outbreaks in 12 different regions with the last observed outbreak in July 2015. Since the beginning of 2016, the virus is actively circulating in four West African countries and in Cameroon. Inadequate control measures in these countries and illegal movement of animals could further facilitate a regional spread of the disease.</p>	<ul style="list-style-type: none"> • In spite of the generally favorable food supply situation, the country continues to host a large number of refugees from neighboring Mali; about 33 000 Malian refugees are estimated being living in the country. • About 233 300 people are estimated to be in need of food assistance according to the last “Cadre Harmonisé” analysis.
Cameroon	Banana bunchy top disease (BBTD)	Moderate	 Spread of Banana bunchy top disease which is currently present in the southern part of the country.	BBTD has already impacted banana production in recent years.	<ul style="list-style-type: none"> • The influx of refugees is persisting in Cameroon. The number of refugees from the Central African Republic (CAR) was estimated at 259 000 in mid-March 2016 and

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
					about 65 000 refugees from Nigeria have entered into the country since May 2013. Insecurity along the borders with Nigeria has led to the internal displacement of 170 000 persons. <ul style="list-style-type: none"> In February 2016, the number of food insecure people was estimated at 2.4 million, more than twice the level in June 2015. The most affected area is the Far North Region.
	Avian Influenza (AI)	High	 Occurrence of further H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry and possible incursion from neighboring countries where the virus is still actively circulating.	H5N1 HPAI has been detected in Cameroon in late May 2016. Since then, outbreaks in poultry have been reported in Central, South and West regions.	
Central African Republic	Epizootic ulcerative syndrome (EUS)	High	 Suspected Epizootic ulcerative syndrome outbreak in central and southern areas of the country.	EUS is suspected in the central and southern areas of the country. If the disease is confirmed, the outbreak will have a serious impact on the livelihoods and food security of thousands of persons who depend on fisheries in the CAR.	<ul style="list-style-type: none"> As of March 2016, 1.5 million people are estimated to be in need of urgent humanitarian assistance, 18 percent more than in April 2015. The significant tightening of food supplies has driven up prices.

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Côte d'Ivoire	Avian Influenza (AI)	Moderate	 Occurrence of further H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry and possible incursion from neighboring countries where the virus is still actively circulating.	After its incursion in Nigeria in December 2014, H5N1 HPAI has been detected in Côte d'Ivoire in April 2015. So far, the country has reported over 30 H5N1 HPAI outbreaks in four different regions. The last outbreak (officially reported) was observed in January 2016 in Abidjan. Outbreaks are currently reported in four West African countries and in Cameroon. Inadequate control measures in these countries can further facilitate regional spread.	
Democratic Republic of the Congo	Epizootic ulcerative syndrome (EUS)	High	 Further spread of Epizootic ulcerative syndrome to other parts of the country and potentially to other parts of Africa through <i>inter alia</i> heavy rainfall, flooding, poor biosecurity, movement of infected fish and possibly birds.	Several fish species were positively confirmed through PCR (polymerase chain reaction) laboratory and histology testing.	<ul style="list-style-type: none"> Floods due to torrential rains occurred in the last quarter of 2015 and in the first quarter of 2016, affecting more than 770 000 people, causing the displacement of 40 000 individuals, damaging about 5 500 hectares of crop land and destroying food stocks. The most affected areas are located along the river Congo Basin and in the

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
					former Katanga Province in the south.
Egypt	Avian Influenza (AI)	Moderate	 Occurrence of further H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry and possible occurrence of sporadic human infection.	H5N1 HPAI is endemic in Egypt. Outbreaks in poultry are reported every month with a marked seasonal pattern. Other influenza viruses circulating in poultry in the country are H5 (Low pathogenic avian influenza) LPAI and H9N2 LPAI. H5N1 and H9N2 human cases are sporadically reported.	
Eritrea	Desert Locust	Low	 Low numbers of adults may appear in the Western Lowlands.		
Ethiopia	Desert Locust	Low	 Low numbers of adults may appear in the Eastern Region.		<ul style="list-style-type: none"> • About 10.2 million people are severely food insecure, due to the impact of severe drought on livestock and crop production.
Gabon	Banana bunchy top disease (BBTD)	Moderate	 Spread of Banana bunchy top disease.	BBTD has already impacted banana production in the country.	
Ghana	Avian Influenza (AI)	Moderate	 Occurrence of further H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry due to further spread of the virus within the country or due to new incursion from neighboring countries where the virus is still actively circulating.	After its incursion in Nigeria in December 2014, H5N1 HPAI has been detected in Ghana in March 2015. Since then, the virus has caused over 30 outbreaks in five different regions with the last reported	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
				outbreaks observed in April 2016. Since the beginning of 2016, the virus has been actively circulating in three additional West African countries. Inadequate control measures in these countries and illegal movement of animals could further facilitate regional spread.	
Kenya	Wheat rust	Moderate	 Occurrence of outbreaks of stem rust disease in wheat.	Stem rust is a recurrent problem in the country as well as in the region. In addition to presence of inoculum of the Ug99 race of the fungus, a new race (Digalu race) was recently detected. The latter severely affected wheat in Ethiopia last year. Stem rust might amplify and cause outbreaks.	<ul style="list-style-type: none"> Unfavorable dry weather conditions have created severe food insecurity in people who are mainly located in pastoral areas by reducing herd size.
	Banana <i>xanthomonas</i> wilt disease	Low	 Spread of Banana <i>xanthomonas</i> wilt disease.	The disease is already present in the country and can spread further especially in the western parts of the country.	
Libya	Desert Locust	Low	 Small-scale breeding may occur in June 2016 in the southwest.		

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Madagascar	Migratory Locust	Moderate	 Mobile groups of adults mainly in the southwest.	No crop damage caused by locusts is expected.	<ul style="list-style-type: none"> • Drought conditions have created poor agricultural seasons in southern regions and consequently food insecurity in these areas. An estimated 1.89 million people are food insecure and conditions are expected to worsen further this year.
Malawi	Banana bunchy top disease (BBTD)	High	 Spread of Banana bunchy top disease.	BBTD has already impacted banana production in the country.	
	Red gum lerp psyllid	High	 Occurrence of outbreaks of the insect Red gum lerp psyllid in Eucalyptus plantations.	The combination of climate change with the general decline of forest conditions and the occurrence of Red gum lerp psyllid continue to damage plantations and small wood lots.	
	Blue gum chalcid	High	 Occurrence of outbreaks of the insect Blue gum chalcid in Eucalyptus plantations.	Blue gum chalcid continues to cause severe damages in nurseries and young Eucalyptus plantations.	
Mali	Desert Locust	Low	 Small-scale breeding will commence in the north with the onset of the summer rains.		<ul style="list-style-type: none"> • About 240 700 people, located mostly in the northern area, are estimated to be in Phase 3: “Crisis” and above, according to the last “Cadre Harmonisé” analysis.

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Mauritania	Desert Locust	Moderate	 Adult groups and perhaps a few small swarms will arrive in the south and breed with the onset of the summer rains.		<ul style="list-style-type: none"> • About 50 000 Malian refugees remain in southeastern Mauritania. • Over 93 100 people are estimated to be in Phase 3: “Crisis” and above, according to the last “Cadre Harmonisé” analysis.
Morocco	Desert Locust	Nil	 Small but dense groups will form in early June in Western Sahara and move to Mauritania.		
Mozambique	Banana fusarium wilt disease	Moderate	 Spread of Banana fusarium wilt disease race TR4, which is already present in Nampula province in the country.	Banana fusarium wilt disease has been already reported in two farms in Nampula province. It is a soil-borne disease that cannot be eradicated once established in a plantation. Thus, its containment and prevention are essential.	<ul style="list-style-type: none"> • Dry conditions have adversely impacted 2016 production in most central and southern provinces, while overall tighter supplies and the depreciation of the currency have contributed to high maize prices. • Currently, 1.8 million people are estimated to be food insecure.
	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.	Mozambique has shrimp species susceptible to AHPND. Strong awareness on shrimp diseases is present in the country.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
	Red gum lerp psyllid	High	 Spread of the insect pest Red gum lerp psyllid in Eucalyptus plantations.		
Namibia	Foot-and-mouth disease (FMD)	Low	 Incursion of Foot-and-mouth disease from Angola possibly mitigated by vaccination campaigns.	At the end of April 2016, a new FMD outbreak was observed in Cuando Cubanango region in Angola at the border with Namibia. Between January and August 2015, several FMD outbreaks were reported to occur along the Namibia-Angola border, due to the movement of animals between the two countries in search of grazing areas and watering points.	
Niger	Desert Locust	Low	 A few small groups from Algeria may arrive in the north where small-scale breeding will commence with the onset of the summer rains.		<ul style="list-style-type: none"> • About 677 600 people are estimated to be in Phase 3: “Crisis” and above according to the last “Cadre Harmonisé” analysis.
Niger	Avian Influenza (AI)	Moderate	 Occurrence of further H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry and possible incursion from neighboring countries where the virus is still actively circulating.	After its incursion in Nigeria in December 2014, H5N1 HPAI has been detected in Niger in two isolated outbreaks, lastly in February 2016 in Tillaberi region. The virus is still actively circulating in four Western Africa countries and in Cameroon. Inadequate	<ul style="list-style-type: none"> • Approximately 60 000 Malian refugees are estimated to be living in the country. • Almost 59 000 people in the southeast Diffa Region have been displaced due to fear of attacks.

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
				control measures in these countries can further facilitate regional spread.	
Nigeria	Avian Influenza (AI)	High	 Further spread of H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry.	H5N1 HPAI virus has been circulating in West Africa since December 2014 with Nigeria being the most affected country with over 500 outbreaks reported in poultry in 26 States. Given the current epidemiological situation and the lack of effective control measures, H5N1 HPAI can be considered endemic in Nigeria.	<ul style="list-style-type: none"> • About 3.4 million people, located mostly in Borno and Yobe, are estimated to be in need of food assistance according to the last “Cadre Harmonisé” analysis.
Rwanda	Blue gum chalcid	High	 Further spread of the insect Blue gum chalcid in Eucalyptus plantations.	The insect pest Blue gum chalcid is currently damaging Eucalyptus plantations.	
Somalia	Desert Locust	Low	 Scattered adults may appear on the northern plateau.		
South Africa	Red gum lerp psyllid	Moderate	 Spread of the insect Red gum lerp psyllid in Eucalyptus plantations within the country.	The introduction of biological control agents to reduce the pest population is in progress.	
	Blue gum chalcid	Moderate	 Occurrence of outbreaks of the insect Blue gum chalcid in Eucalyptus plantations.	The introduction of biological control agents to reduce the pest population is in progress.	
Sudan	Desert Locust	Low	 Low numbers of adults may appear in Kordofan and Darfur and		<ul style="list-style-type: none"> • An estimated 4 million people are in need of

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
			breed on a small scale with the onset of the summer rains.		humanitarian assistance, mainly IDPs in conflict-affected areas and pastoral communities.
Togo	Avian Influenza (AI)	Moderate	 Incursion of H5N1 Highly pathogenic avian influenza (HPAI) from neighboring countries amplified by inadequate capacity to detect and control the infection in poultry.	H5N1 HPAI virus has been circulating in six countries in West Africa since December 2014. The virus has not been reported in Togo so far, however the virus is still actively circulating in Western Africa countries. Inadequate control measures in these countries can further facilitate regional spread.	
Uganda	Rift Valley fever (RVF)	Moderate	 Occurrence of Rift Valley fever outbreaks in animals and occurrence of additional Rift Valley fever human cases.	In March 2016, Uganda reported Rift Valley fever human cases for the first time in the Southern-West Municipality of Kabale at the border with Rwanda. Since then and as of April 2016, five RVF human cases (three confirmed and two suspected) and the detection of RVF in a goat were reported in this municipality. The virus might still be circulating in the area.	<ul style="list-style-type: none"> • About 393 000 people in Karamoja region are estimated to be severely food insecure following consecutive unfavorable rainy seasons.

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
	Blue gum chalcid	High	 Outbreaks of the insect Blue gum chalcid will continue to occur in Eucalyptus plantations.	The insect Blue gum chalcid is currently causing severe damages in Eucalyptus plantations.	
United Republic of Tanzania	Blue gum chalcid	Moderate	 Occurrence of outbreaks of insect Blue gum chalcid in Eucalyptus plantations.	Damage continues in Eucalyptus plantations due to Blue gum chalcid.	
Zambia	Epizootic ulcerative syndrome (EUS)	Moderate	 Further spread of Epizootic ulcerative syndrome to other parts of the country and potentially to other parts of Africa through <i>inter alia</i> heavy rainfall, flooding, poor biosecurity, movement of infected fish and possibly birds.	Zambia is the most severely affected country by EUS in Southern Africa.	
	Blue gum chalcid	High	 Occurrence of outbreaks of the insect Blue gum chalcid in Eucalyptus plantations.	Zambia has initiated pest management activities based on silvicultural practices, breeding programmes and quarantine measures to reduce the insect populations. Introduction of biological control agents to reduce the Blue gum chalcid population is in progress.	
	Red gum lerp psyllid	High	 Occurrence of outbreaks of the insect Red gum lerp psyllid in Eucalyptus plantations.	Zambia has initiated pest management activities based on silvicultural practices, breeding programmes and quarantine measures to reduce the insect populations.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Zimbabwe	Foot-and-mouth disease (FMD)	Low	 Occurrence of further Foot-and-mouth disease outbreaks, mitigated by the vaccination campaigns.	Since January 2015, several FMD outbreaks have been reported in the country and several provinces have been affected. Control measures including vaccination campaigns, animal movement control and awareness campaigns are ongoing.	<ul style="list-style-type: none"> •The El Niño-induced drought resulted in a sharp decrease in cereal production in 2016, which follows an already below-average 2015 output. The livestock sector has also been severely affected. •The number of people who require assistance is estimated at 2.8 million.
	Red gum lerp psyllid	High	 Outbreaks of the insect Red gum lerp psyllid will continue to be reported in Eucalyptus plantations.	Pest management efforts using biological control are in progress.	
	Blue gum chalcid	High	 Outbreaks of the insect Blue gum chalcid will continue to be reported in Eucalyptus plantations.	Pest management activities based on application of biological control agent are in progress to reduce Blue gum chalcid populations.	
	Bronze bug	High	 Outbreaks of the insect Bronze bug in Eucalyptus plantations.	Pest management activities are in progress.	

AMERICAS

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Belize	Bark beetle	Low	 Occurrence of outbreaks of Bark beetle in pine plantations.		

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Colombia	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.	Strong awareness on shrimp disease is present in the country.	
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction of <i>Enterocytozoon hepatopenaei</i> from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.	Strong awareness on EHP is present in the country.	
Guatemala	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.	Strong awareness on AHPND is present in the country. National action plan on AHPND is in preparation.	
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction of <i>Enterocytozoon hepatopenaei</i> from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feeds for broodstock.	Strong awareness on EHP is present in the country.	
	Bark beetle	High	 Occurrence of outbreaks of Bark beetle in pine plantations.	The abundance of stressed pine trees due to prolonged drought in the country is	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
				creating a suitable environment for the occurrence of outbreaks of bark beetles.	
Honduras	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.	Strong awareness on AHPND is present in the country. National action plan on AHPND is in preparation.	
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction of <i>Enterocytozoon hepatopenaei</i> from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.	Strong awareness on EHP present in the country.	
	Bark beetle	High	 Outbreaks of Bark beetle are continuing to be reported causing heavy losses in pine plantations.	A severe outbreak of bark beetle has affected about 10 000 ha of conifer forests.	
Nicaragua	Acute hepatopancreatic necrosis diseases (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.	Strong awareness on AHPND is present in the country. National action plan on AHPND is in preparation.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction of <i>Enterocytozoon hepatopenaei</i> from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.	Strong awareness on EHP is present in the country.	
	Bark beetle	High	 Occurrence of outbreaks of Bark beetle in pine plantations.	Pest management activities based on silvicultural practices are in progress.	
Panama	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.	Strong awareness on AHPND is present in the country. National action plan on AHPND is in preparation.	
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction of <i>Enterocytozoon hepatopenaei</i> from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.	Strong awareness on EHP is present in the country.	
Peru	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.	Strong awareness on AHPND is present in the country. National action plan on AHPND is in preparation.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction of <i>Enterocytozoon hepatopenaei</i> from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.	Strong awareness on EHP is present in the country.	

ASIA

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Afghanistan	Italian Locust	Low	 Natural disappearance of adults.		<ul style="list-style-type: none"> • 2.1 million people are classified as very severely food insecure. • Over 700 000 people are internally displaced, mostly in Helmand Province. • About 1.7 million people are targeted with food assistance.
	Moroccan Locust	Low	 Natural disappearance of adults.		
Armenia	Lumpy Skin Disease (LSD)	Moderate	 Re-emergence of Lumpy skin disease in the already affected area and possible spread within the country, due to the presence of favorable weather conditions for the vectors.	At the beginning of December 2015, Armenia observed its first Lumpy skin disease outbreak in the southernmost province of the country. Since then, no additional outbreaks were officially reported. In May 2016, a new outbreak was	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
	Italian Locust	Low	 Hopper development followed by fledging, mating, egg-laying and natural disappearance.	reported in Russia in Krasnodarskiy Kray Oblast.	
Azerbaijan	Lumpy Skin Disease (LSD)	Moderate	 Incursion of Lumpy skin disease from neighboring countries, reinforced by the presence of favorable weather conditions for the vectors.	Two outbreaks of LSD have been detected in Azerbaijan for the first time in July 2014, adjacent to the border with Iran Islamic Republic. LSD has spread throughout the Middle East in recent years, including Iran Islamic Republic and Turkey, where the disease is considered endemic since 2014. LSD has also been detected in the Russian Federation for the first time in July 2015 and in December 2015 in Armenia, in both cases in areas bordering Azerbaijan.	
	Italian Locust	Low	 No development expected.		
	Moroccan Locust	Low	 Mating, egg-laying and natural disappearance of adults having escaped anti-locust control operations.		

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
	Boxwood blight	Moderate	 Boxwood blight disease (pathogen <i>Calonectria pseudonaviculata</i>) continues to cause dieback of boxwood trees (<i>Buxus hyrcana</i>), IUCN threatened species.		
Cambodia	Avian influenza (AI)	Low	 Occurrence of Highly pathogenic avian influenza (HPAI) outbreaks in poultry and possible virus incursion from neighboring countries.	Over 100 H5N1 HPAI outbreaks have been reported in Cambodia since 2004. Last outbreak was reported in May 2015, indicating that H5N1 is circulating in poultry production systems in Cambodia.	
China	Avian Influenza (AI)	Moderate	 Further occurrence of Avian influenza outbreaks in poultry due to several H5 Highly pathogenic avian influenza (HPAI) and Low pathogenic avian influenza (LPAI) viruses circulating in the country. Further occurrence of sporadic avian influenza human cases due to H5 HPAI and to H7N9 LPAI virus.	Several serotypes of HPAI and LPAI AI viruses are circulating and being detected in China and outbreaks in poultry and human cases have been occurring since the beginning of 2016, but with a lower intensity comparing to previous years. The occurrence of AI outbreaks in poultry and of human cases usually follows a seasonal pattern, with an increase in the number of outbreaks observed during the winter months. Data reported so far suggest	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
				this influenza season be milder, however additional outbreaks and human cases are still expected.	
Georgia	Boxwood moth	High	 Outbreaks of Boxwood moth continue to cause dieback of native boxwood species.	Pest management activities are initiated to protect the native species of boxwood.	
	Boxwood blight	High	 Occurrence of Boxwood blight disease (caused by pathogen <i>Calonectria pseudonaviculata</i>) continue to cause dieback of native box wood species.	Pest management activities are initiated to protect the native species of boxwood.	
	Lumpy Skin Disease (LSD)	Moderate	 Incursion and spread of Lumpy skin disease from neighboring countries, reinforced by the presence of favorable weather conditions for the vectors.	LSD, which has never been reported in Georgia, is spreading throughout the Middle East in recent years, including Iran Islamic Republic and Turkey, where the disease is considered endemic since 2014. LSD has also been detected in the Russian Federation for the first time in July 2015 and in Armenia in December 2015.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
	Peste des petits ruminants (PPR)	Low	 Occurrence of additional peste des petits ruminants outbreaks in the affected area and possible spread within the country. The risk is mitigated by the vaccination campaign performed.	In January 2016, Georgia reported an outbreak of PPR for the first time in a sheep flock in the Tbilisi area. The country has immediately embarked in a mass vaccination campaign targeting sheep and goat across the country. While the exact source of infection remains unknown in the area, PPR is known to be present in Turkey, Iran Islamic Republic and Iraq. The last PPR outbreak occurred in March 2016.	
	Italian Locust	Moderate	 Maturation of adults followed by mating and egg-laying.		
	Moroccan Locust	Moderate	 Adult mating, egg-laying and natural disappearance.		
India	Desert Locust	Moderate	 A few swarms from Yemen may arrive in Rajasthan and breed with the monsoon rains.		
	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as	Good surveillance and biosecurity measures are in place in the country, as well as strong awareness on shrimp diseases.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
			polychaetes, clams, oysters, etc. used as feed for broodstock.		
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction of <i>Enterocytozoon hepatopenaei</i> from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feed for broodstock.	Good surveillance and biosecurity measures are in place in the country, as well as strong awareness on shrimp diseases.	
Indonesia	Avian Influenza (AI)	Moderate	 Occurrence of H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry and of human cases in the early months of the year.	H5N1 HPAI is endemic in Indonesia where it has been regularly detected since 2003. Outbreaks in animals show a seasonal pattern with the seasonal pick usually observed during the winter.	
	Acute hepatopancreatic necrosis disease (AHPND)	Moderate	 Introduction of Acute hepatopancreatic necrosis disease from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.	Surveillance for AHPND as well as strong awareness on shrimp diseases is in place. Many small-scale producers exist in the country.	
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Moderate	 Introduction of <i>Enterocytozoon hepatopenaei</i> from other countries through live animals (e.g. live polychaetes, clams, oysters, etc.) used as feeds for broodstock.		

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Iran (Islamic Republic of)	Avian influenza (AI)	Moderate	 Incursion of H5N1 Highly pathogenic avian influenza (HPAI) from Iraq and possible further spread.	Between December 2015 and February 2016, H5N1 HPAI outbreaks have been observed in the neighboring Iraq.	
	Acute hepatopancreatic necrosis disease (AHPND)	Low	 Introduction of Acute hepatopancreatic necrosis disease from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.	Good surveillance and biosecurity measures are in place in the country, as well as strong awareness on shrimp diseases.	
	Oak charcoal disease	High	 Oak charcoal disease (pathogen <i>Biscogniauxia mediterranea</i>) continues to cause decline of oak forest in Zagros due to the abiotic stresses.	The decline of oak charcoal disease has a negative impact on the livelihood of nomad people and watershed management. Operations to minimize the impact of the charcoal disease and abiotic stresses are in progress.	
	Boxwood blight	High	 Boxwood blight disease (pathogen <i>Calonectria pseudonaviculata</i>) continues to cause dieback of boxwood trees (<i>Buxus hyrcana</i>), IUCN threatened species.	Quarantine and disease management activities are in progress.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Iraq	Avian influenza (AI)	Moderate	 Further spread of H5N1 Highly pathogenic avian influenza (HPAI) in the country.	Between December 2015 and February 2016, Iraq has officially reported six H5N1 HPAI outbreaks in commercial and backyard flocks in five governorates across the country.	<ul style="list-style-type: none"> • In Iraq, as of December 2015, there were at least 4 million people internally displaced due to conflicts, nearly 2 million of whom have been displaced since January 2014.
	Acute hepatopancreatic necrosis disease (AHPND)	Moderate	 Introduction of Acute hepatopancreatic necrosis disease from affected countries through trade and movement of: (i) infected broodstock and post-larvae and (ii) other live aquatic animals such as polychaetes, clams, oysters, etc. used as feed for broodstock.		
Jordan	Banana fusarium wilt disease	Low	 Spread of Banana fusarium wilt disease race TR4 which has been recently reported for the first time in one farm.	Banana fusarium wilt disease is a soil-borne disease that cannot be eradicated once established in a plantation. Prevention of spread is crucial.	<ul style="list-style-type: none"> • As of mid-May 2016, over 4.7 million Syrian refugees were registered overall in Egypt, Iraq, Jordan, Lebanon and Turkey.
Kazakhstan	Italian Locust	High	 Emergence of adults, mating and egg-laying followed by natural disappearance.		
	Migratory Locust	Low	 Emergence of adults, mating and egg-laying followed by natural disappearance.		
	Moroccan Locust	Moderate	 Adult mating and egg-laying followed by natural disappearance.		

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Kyrgyzstan	Italian Locust	Moderate	 Emergence of adults, mating and egg-laying followed by natural disappearance.		
	Moroccan Locust	Moderate	 Mating and egg-laying followed by natural disappearance.		
Lebanon	Banana fusarium wilt disease	Low	 Spread of Banana fusarium wilt disease race TR4 which has been recently reported for the first time in one farm.	Banana fusarium wilt disease is a soil-borne disease that cannot be eradicated once established in a plantation. Prevention of spread is crucial.	<ul style="list-style-type: none"> As of mid-May 2016, over 4.7 million Syrian refugees were registered overall in Egypt, Iraq, Jordan, Lebanon and Turkey.
	Avian influenza (AI)	Moderate	 Further spread of H5N1 highly pathogenic avian influenza in the country.	Lebanon confirmed the first H5N1 HPAI incursion in April 2016 in several chicken farms in a village of the Bekaa region at the border with Syrian Arab Republic.	
	Western conifer seed bug	High	 Western conifer seed bug is continuing to cause damage to pine plantations (<i>Pinus pinea</i>).	Heavy yield losses continue to impact rural livelihoods. The yield reduction of pine nuts is reported throughout the country.	
	Dry cone syndrome	High	 Dry cone syndrome is continuing to cause damages to pine plantations (<i>Pinus pinea</i>).	Heavy yield losses continue to impact rural livelihoods. The yield reduction of pine nuts is reported throughout the country.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Maldives	Peste des petits ruminants (PPR)	Low	 Occurrence of peste des petits ruminants outbreaks in the affected area.	In March 2016, a PPR outbreak was reported in a goat farm in the Kolaa area of Ga Kolamaafushi. Previously, PPR incursion was reported in June 2011. Goat production in Maldives is of small scale due to limited land availability. Goats are in demand for particular cultural events and live animals are usually imported from India. The importation could represent a possible source of disease introduction, due to the fact that India is endemic for PPR.	
Mongolia	Sheep and goat pox (SGP)	Low	 Further occurrence of Sheep and goat pox outbreaks in the Eastern part of the country possibly mitigated by the vaccination campaign implemented.	In January 2015, SGP outbreak was reported in sheep in Mongolia for the first time since February 2013. Since January 2016, the number of reported SGP outbreaks has dramatically increased and the virus had spread into new areas. Vaccination campaigns have been implemented in affected area reducing dramatically the spread of the disease.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
	Peste des petits ruminants (PPR)	Low	 Incursion of peste des petits ruminants from neighboring countries.	PPR has never been reported in Mongolia, however the virus is circulating in the neighboring countries.	
Myanmar	Avian influenza (AI)	Moderate	 Further occurrence of H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry.	In May 2016, an H5N1 HPAI incursion was observed in Sagaing region in the largest (chicken) egg production zone in Myanmar. Co-infection with H9N2 low pathogenic strain was also observed. Control measures have been implemented.	<ul style="list-style-type: none"> • Floods (of July-August 2015) have caused severe damage to the agricultural production by reducing the 2015 main season paddy production. • Poor rains, coupled with higher than normal temperatures (since November 2015) are expected to negatively impact the secondary season rice crop.
Oman	Desert Locust	Low	 A few swarms from Yemen may transit along the eastern coast on their way to Indo-Pakistan.		
Pakistan	Banana fusarium wilt disease	Moderate	 Spread of Banana fusarium wilt disease race TR4 which has been reported recently for the first time in one farm.	Banana fusarium wilt disease is a soil-borne disease that cannot be eradicated once established in a plantation. Prevention of the spread is crucial.	
Pakistan	Desert Locust	Moderate	 A few swarms from Yemen may arrive in Tharparkar and Cholistan and breed with the monsoon rains.		

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Philippines	<i>Enterocytozoon hepatopenaei</i> (EHP)	Moderate	 Introduction of <i>Enterocytozoon hepatopenaei</i> from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feeds for broodstock.		
Saudi Arabia	Desert Locust	Low	 Low numbers of adults may appear on the Red Sea coast.		
	Rift Valley fever (RVF)	Moderate	 Occurrence of Rift Valley fever outbreaks in animals and humans.	Climate anomalies (NDVI and strong precipitations) have been observed in Southwestern Saudi Arabia during April and May 2016 with NDVI values that reached the highest values of the last 14 years. Last RVF outbreaks occurred in 2000 (including 886 human cases) and in 2010, always in Jizan Province.	
Sri Lanka	Acute hepatopancreatic necrosis disease (AHPND)	Moderate	 Introduction of Acute hepatopancreatic necrosis disease from affected countries through trade of aquatic animals (infected broodstock, post-larvae and other live aquatic animals such as polychaetes, clams, oysters, etc.) used as feed for broodstock.	Strong awareness on AHPND is in place in the country. National action plan on AHPND is in preparation.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
	<i>Enterocytozoon hepatopenaei</i> (EHP)	Low	 Introduction of <i>Enterocytozoon hepatopenaei</i> from other countries through trade of live animals (e.g. live polychaetes, clams, oysters, etc.) used as feeds for broodstock.		
Syrian Arab Republic	Avian influenza (AI)	High	 Occurrence of H5N1 Highly pathogenic avian influenza (HPAI) outbreaks in poultry.	Between December and April 2016, H5N1 HPAI incursions were reported in Iraq and in Lebanon. Considering the recent detection of H5N1 HPAI in eastern Lebanon, adjacent to the border with Syrian Arab Republic, and the current situation in Iraq, the circulation of the virus in Syrian Arab Republic is probable.	<ul style="list-style-type: none"> • Agricultural production is significantly affected by conflicts. • About 13.5 million people are in need of humanitarian assistance, with caseloads increasing.
Tajikistan	Italian Locust	Low	 Adult mating and egg-laying followed by natural disappearance.		
	Moroccan Locust	Nil	 Life cycle completed.		
Turkey	Avian influenza (AI)	Moderate	 Incursion of H5N1 Highly pathogenic avian influenza (HPAI) from Iraq and possible further spread.	Between December 2015 and February 2016, six H5N1 HPAI outbreaks were observed in five governorates in Iraq. The first outbreak was detected in the Kurdistan region at the border with Turkey. Virus incursion from	<ul style="list-style-type: none"> • As of mid-May 2016, over 4.7 million Syrian refugees were registered overall in Egypt, Iraq, Jordan, Lebanon and Turkey.

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
				Iraq could be facilitated by the presence of shared borders, connecting roadways and anecdotal evidence of smuggling between the Kurdish border and Turkey and the potential surplus poultry in the Kurdish region that has been potentially exported to Turkey.	
	Lumpy Skin Disease (LSD)	Moderate	 Spread of Lumpy skin disease within the country, reinforced by the favorable weather conditions for the vectors.	First detected in October 2013, LSD has spread rapidly in the country and is currently considered endemic.	
	Chestnut gall wasp	High	 Chestnut gall wasp continues to spread across the country in Chestnut trees.	Pest management activities based on application of biological control agent are in progress to reduce the populations of the insect.	
Turkmenistan	Italian Locust	Nil	 Life cycle completed.		
	Moroccan Locust	Nil	 Life cycle completed.		
Uzbekistan	Italian Locust	Low	 Emergence of adults, mating and egg-laying followed by natural disappearance.		
	Migratory Locust	High	 Emergence of adults, mating and egg-laying followed by natural disappearance.		
	Moroccan Locust	Nil	 Life cycle completed.		

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Viet Nam	Avian Influenza (AI)	Moderate	 Spread of further highly pathogenic avian influenza (HPAI) outbreaks.	Both H5N1 and H5N6 HPAI outbreaks were reported in the country in the first half of 2016. Historically outbreaks in poultry occur throughout the year.	
Yemen	Desert Locust	High	 Swarms will form in the interior and may remain to mature and lay eggs in July 2016 or, if conditions dry out, move to the Gulf of Aden and continue to Indo-Pakistan.	High risk to crops from increasing locust numbers. The full extent of infestations in the interior is not well known due to difficulties in mounting surveys in insecure and remote areas.	<ul style="list-style-type: none"> • Around 21.2 million people (82 percent of the population) require humanitarian assistance due to conflicts, poverty and high food and fuel prices. • According to the IPC indicative analysis of June 2015, out of the 12.9 million food insecure people, about 6.1 million were in Phase: 4 “Emergency”, while 6.8 million were in Phase: 3 “Crisis”.
	Rift Valley fever (RVF)	Moderate	 Occurrence of Rift Valley fever outbreaks in animals and humans.	Climate anomalies (NDVI and strong precipitations) have been observed in Yemen during April and May 2016. RVF outbreaks were previously observed in September 2000 in small ruminants in the two governorates of Al Hudaydah and Hajjah.	

EUROPE

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Albania	Pine Processionary moth	High	 Outbreak of Pine processionary moth will continue to be reported in black pine plantations.	About 80 000 ha of Albania's black pine forests is affected by Pine processionary moth. Various levels of infestation are found in the north and the south of the country.	
Belarus	African Swine Fever (ASF)	Moderate	 Incursion of African swine fever outbreaks from neighboring countries and spread in the country.	Since its incursion in Europe in early 2014, ASF has become endemic in some countries bordering Belarus.	
Bulgaria	Lumpy Skin Disease (LSD)	High	 Occurrence of Lumpy skin disease in the already affected area and possible spread within the country, facilitated by the favorable weather conditions for the vectors.	Following the re-emergence of the disease at the beginning of April in Greece, Bulgaria reported its first LSD incursion on April 12. Since then, the disease has caused over 155 outbreaks in over 10 regions, located in Southern and subsequently Northern Bulgaria. Vaccination campaign is ongoing.	
Estonia	African Swine Fever (ASF)	High	 Occurrence of African swine fever outbreaks.	Since the ASF incursion in the country in early 2014, the presence of the virus continues to be reported in domestic pigs and wild boars in the country. No vaccine is available to control the disease.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Greece	Lumpy Skin Disease (LSD)	Moderate	 Further spread of Lumpy skin disease in the already affected area and possible spread within the country, due to the favorable weather conditions for the vectors. The likelihood of occurrence could be reduced with mitigation measures (i.e. vaccination).	Since the last outbreak of LSD in December 2015, the disease has re-emerged in Serres Regional Unit (RU), and since then in four additional RUs.	
Latvia	African Swine Fever (ASF)	High	 Occurrence of African swine fever outbreaks.	Since the ASF incursion in the country in early 2014, the presence of the virus continues to be reported in domestic pigs and wild boars in the country. No vaccine is available so far to control the disease.	
Lithuania	African Swine Fever (ASF)	High	 Occurrence of African swine fever outbreaks.	Since the ASF incursion in the country in early 2014, the presence of the virus continues to be reported in domestic pigs and wild boars in the country. No vaccine is available to control the disease.	
Poland	African Swine Fever (ASF)	Low	 Occurrence of African swine fever outbreaks in the North-East of the country.	Since the ASF incursion in the country in early 2014, the presence of the virus continues to be reported in domestic pigs and wild boars in the country. No vaccine is available to control the disease.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Republic of Moldova	African swine fever (ASF)	Moderate	 Incursion of African swine fever outbreaks from neighboring countries and spread within the country.	Since the incursion of ASF in Europe in early 2014, the presence of the virus continues to be reported in the Balkan countries, Ukraine and at a lower extent in Poland. In Ukraine, outbreaks were recently reported in backyard pig farms at the western border with Moldova.	
Romania	Lumpy Skin Disease (LSD)	Moderate	 Incursion of Lumpy skin disease from neighboring countries where the virus is actively circulating and further spread within the country. The possibility is increased by the ongoing favorable weather conditions.	Since the re-emergence of LSD in northern Greece in early April 2016, the disease has been spreading northward, with incursion and further spread in Bulgaria, in Former Yugoslav Republic (FYR) of Macedonia and in Serbia. In Bulgaria, outbreaks have been detected close to the border with Romania.	
	African swine fever (ASF)	Moderate	 Incursion of African swine fever outbreaks from neighboring countries and spread within the country.	Since the incursion of ASF in Europe in early 2014, the virus continues to be reported in the Balkan countries, Ukraine and at a lower extent in Poland. In Ukraine, outbreaks of ASF were recently reported in backyard pig farms at the northern border with Romania.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
Russian Federation	Lumpy Skin Disease (LSD)	Moderate	 Re-emergence of Lumpy skin disease in the already affected area and possible spread within the country, due to the favorable weather conditions for the vectors.	LSD was first detected in the southern area of the country in July 2015, at the border with Azerbaijan. In May 2016, a new outbreak of LSD was reported in the Russian Federation in Krasnodarskiy Kray oblast.	
	African Swine Fever (ASF)	Moderate	 Occurrence of African swine fever outbreaks and spread into new area within the country.	Since the ASF incursion in the country in early 2014, the presence of the virus continues to be reported in domestic pigs and wild boars in the country. No vaccine is available to control the disease.	
	Italian Locust	Moderate	 Emergence of adults, mating and egg-laying followed by natural disappearance.		
	Migratory Locust	Low	 Emergence of adults, mating and egg-laying followed by natural disappearance.		
	Moroccan Locust	Moderate	 Adult mating and egg-laying followed by natural disappearance.		
Serbia	Lumpy Skin Disease (LSD)	High	 Incursion of Lumpy skin disease from neighboring countries where the virus is actively circulating and further spread within the country. The possibility is increased by the ongoing favorable weather conditions.	In June 2016, Serbia reported its first LSD incursion.	

Country/Area	Threat disease	Likelihood of occurrence	Forecast for July-September 2016	Details	Country context
The former Yugoslav Republic of Macedonia	Lumpy Skin Disease (LSD)	High	 Occurrence of Lumpy skin disease in the already affected area and possible spread to other areas within the country, due to the favorable weather conditions for the vector. The possibility of spread could be reduced with the mitigation measures in place (i.e. vaccination).	Following the re-emergence of the disease at the beginning of April 2016 in Greece, the former Yugoslav Republic of Macedonia reported its first LSD incursion in April 2016. Since then, over 20 outbreaks occurred in nine regions, in the southern part of the country. Vaccination campaign is ongoing.	
Ukraine	African Swine Fever (ASF)	Moderate	 Occurrence of African swine fever outbreaks and further spread within the country.	Since the ASF incursion in the country in early 2014, the presence of the virus continues to be reported in domestic pigs and wild boars in the country, with new areas being recently affected at the border with Moldavia and Romania.	

FCC TERMINOLOGY

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 a FCC threat into a country, across border or to a specific area.
Likelihood of occurrence	Chances of a FCC threat to happen.
Likelihood of spread	Chances of geographical spread of a FCC threat within a country beyond its original introduction.
Likelihood of re-emergence/ amplification	Chances of re-emergence/amplification (e.g. increase, breeding, etc.) of a threat already existing within a country.

INFORMATION SOURCES

Transboundary Animal Diseases

- Early Mortality Syndrome/Acute hepatopancreatic necrosis disease (EMS/AHPND)FAO. 2013. Report of the FAO/MARD Technical Workshop on Early Mortality Syndrome (EMS) or Acute Hepatopancreatic Necrosis Syndrome (AHPNS) of Cultured Shrimp (available at <http://www.fao.org/docrep/018/i3422e/i3422e00.htm>)
- ECDC - Communicable disease threats report (CDTR) available at http://ecdc.europa.eu/en/publications/surveillance_reports/Communicable-Disease-Threats-Report/Pages/default.aspx
- 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) (<http://empres-i.fao.org/eipws3g/>)
- Global Early Warning System (GLEWS) at FAO
- OIE World Animal Health Information Database (WAHID) Interface http://www.oie.int/wahis_2/public/wahid.php/Wahidhome/Home
- Ebola virus disease <http://www.who.int/csr/disease/ebola/en/>

Desert Locust

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

Migratory Locust in Madagascar

- Bulletins of the Locust Watch Unit (available at <http://www.fao.org/emergencies/crisis/madagascar-locust/en/>)
- Locust Situation Updates available at <http://www.fao.org/ag/locusts/en/info/info/index.html>

Locusts (three species) in Caucasus and Central Asia

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

Wheat rust disease

- Global wheat rust monitoring system

Threats to Food Security

- FAO. 2016 Crop Prospects and Food Situation, No 2, June 2016 available at <http://www.fao.org/3/a-i5710e.pdf>
- El Niño. Climate Prediction Center. NCEP. http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf

Other regional/global threats

- Zika virus. FAO website: <http://www.fao.org/zika-virus/en/>; WHO website: <http://www.who.int/emergencies/zika-virus/situation-report/30-june-2016/en/>

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