



# GIEWS Update

## Hurricane Matthew

### Floods and loss of crops raise food security concerns for over a million people in Haiti

#### Highlights:

- On 4 October 2016, Hurricane Matthew, a Category 4 event with sustained winds of 230 km/h, made landfall in southwestern Haiti, with impact also on parts of Cuba, the Dominican Republic and the Bahamas.
- Haiti was by far the most affected country. Early reports point to 473 confirmed deaths, with some unconfirmed reports putting this number at more than 1 000, and severe damage to at least 1 855 homes. About one-quarter of the expected total 2016 cereal crop is estimated to have been lost because of the Hurricane.
- Haiti's cereal import requirements are expected to reach their highest level since the 2010 earthquake as a result of the anticipated production losses.
- It is estimated that 1.4 million people, or 13 percent of Haiti's population, are in need of food assistance, of which 58 percent are in the most urgent need. FAO is seeking USD 9 million to provide urgently-needed support to 350 000 affected people.

#### Overview

On 4 October 2016, Hurricane Matthew, a Category 4 event with sustained winds of 230 km/h, made landfall in southwestern Haiti. The hurricane also impacted the southeast of Cuba, western provinces of the Dominican Republic and the Bahamas.

#### Haiti

Of the four countries impacted by the Hurricane, Haiti was the most affected, and in particular the southwestern departments of Grand'Anse, Sud and Nippes that were directly in its path, exposing 960 000 people, or 9 percent of Haiti's population, to winds with the speed of between 90 km/h to 120 km/h and storm surges. The rest of the country was exposed to winds of at least 60 km/h and excessive precipitation, particularly Sud-Est, Ouest, Artibonite

and Nord-Ouest departments. Early reports point to 473 confirmed deaths, with some unconfirmed reports putting this number at more than 1 000, and severe damage to infrastructure including bridges. An initial assessment by the Government of Haiti, FAO and other UN agencies points to severe losses to agriculture, particularly fruit trees and horticultural products in the most affected areas of Grand'Anse, Sud and Nippes and in Sud-Est Department. Severe crop losses in parts of Ouest Department have also been reported. The total value of crop losses has been estimated by the Government and FAO at USD 360 million and damages to productive infrastructure, which includes, but not limited to, irrigation and fishing equipment, and stocks, at USD 178 million. In total, 1.4 million people are estimated to be in need of immediate humanitarian assistance.

## Cuba

In Cuba, the second most impacted country, the provinces of Guantanamo, Holguin and Las Tunas, accounting for some 1.6 million people or 13 percent of the national population, were the most affected. In the municipalities of Baracoa and Maisi in Guantanamo Province roads and bridges were destroyed by the Hurricane. In Baracoa, early reports point to 90 percent of the homes having suffered damage, ranging from partial to total destruction. Early reports also point to severe damage to agriculture in five provinces of Guantamo. No deaths have been reported due to the Hurricane and the more than 1 million people that were evacuated have already returned or are returning to their homes.

## The Dominican Republic

The Dominican Republic was impacted by excess precipitation, which resulted in flooding and landslides, with four people reported to have died. In total, 37 809 people were evacuated in nine provinces of the country's 32. Fifty aqueducts/water systems in eight of the nine most affected provinces have been severely damaged. Water levels in creeks and rivers remain high.

## The Bahamas

In the Bahamas, the Government has rescinded all Hurricane-related restrictions. Two Hurricane-related deaths were reported but not yet confirmed. The primary impact includes standing flood water, fallen trees, damaged roofs and downed electrical and communication lines. Agricultural livelihoods are also reported to have been affected.

## Potential Impact on Agriculture

Prior to Hurricane Matthew, the 2016/17 agricultural season in Haiti, Cuba and the Dominican Republic had been progressing favourably, pointing to a welcome recovery in production after two years of drought-reduced outputs due to El Niño. When the Hurricane impacted the three countries, the main cereal season harvest had been virtually concluded and planting of the second season crop, to be harvested from late November up until mid-December, was ongoing or concluded. The main effects of the Hurricane on cereal crops have been post-harvest losses of the recently-gathered main crop, loss of main

crops that had not yet been harvested and flooding of recently-planted second season crops. FAO's forecasts for cereal output in 2016 in the affected countries have been revised, taking into account preliminary assessments by FAO, OCHA and WFP, as well as remote sensing data.

The impact on horticulture crops, grown almost all year round, and fruit trees and plantains, may be greater as they are particularly susceptible to wind damage and flooding. While the impact at a national level of horticultural crops losses may be moderate, they are an important source of income, particularly for the most vulnerable households.

## Haiti

The three departments of Haiti that were most impacted by the Hurricane (Grand'Anse, Nippes and Sud), represent close to 19 percent of the country's 736 200 hectares of Usable Agricultural Land (UAL), (FAO, 2015). However, taking into account also the Sud-Est and southern parts of Ouest departments that were less affected but nevertheless received excessive rainfall, close to 30 percent of the UAL was impacted. The departments in the southern part of Haiti saw rainfall levels reach at least 200 mm in the first ten days of October, more than 80 percent above the Long Term Average (LTA) for this period (Figure 1). The Department of Artibonite, which accounts for at least one-quarter of the maize output and almost all rice production, was also impacted by rainfall levels that were 60 to 80 percent above the LTA, or between 75 mm and 150 mm, during the first days of October (Figure 1). Early reports indicate some flooding and damage to irrigation canals in Artibonite.

Taking into account these reports, FAO has reduced, on a preliminary basis, its initial cereal output forecast for 2016 by 132 000 tonnes to 421 000 tonnes. This forecast assumes that yields would improve in the areas that received above normal rainfall but were

**Table 1: Cereal production in countries most affected by Hurricane Matthew**  
(thousand tonnes)

	2011-2015 average	2015 estimate	2016 forecast	Change 2016/2015
Cuba	963	781	880	13%
Dominican Republic	934	942	962	2%
Haiti	418	233	421	81%

Source: FAO/GIEWS

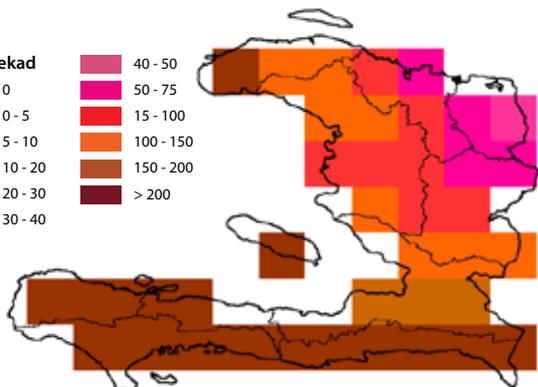
Figure 1: Haiti, the Dominican Republic and Cuba - Precipitation levels and difference from long-term mean after the passage of Hurricane Matthew (dekad 1 October 2016)

**Haiti**

Precipitation Dekad 1 October

mm/dekad

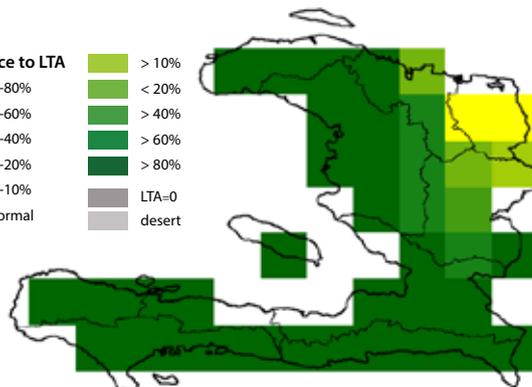
0	40 - 50
0 - 5	50 - 75
5 - 10	15 - 100
10 - 20	100 - 150
20 - 30	150 - 200
30 - 40	> 200



Precipitation anomaly Dekad 1 October  
(Relative difference to Long Term Average)

Difference to LTA

< -80%	> 10%
< -60%	< 20%
< -40%	> 40%
< -20%	> 60%
< -10%	> 80%
Normal	LTA=0
	desert

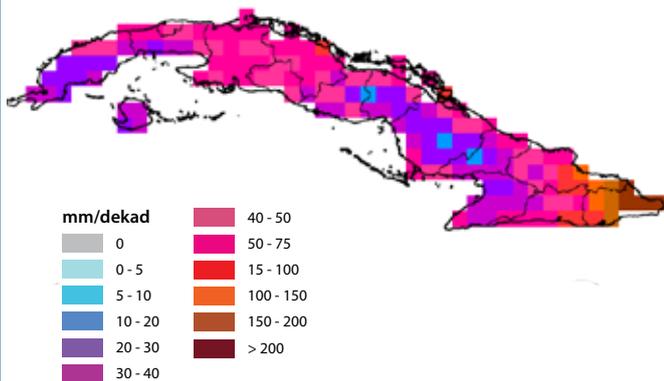


**Cuba**

Precipitation Dekad 1 October

mm/dekad

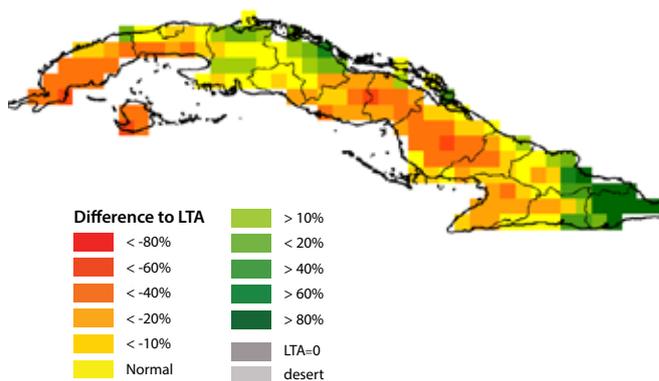
0	40 - 50
0 - 5	50 - 75
5 - 10	15 - 100
10 - 20	100 - 150
20 - 30	150 - 200
30 - 40	> 200



Precipitation anomaly Dekad 1 October  
(Relative difference to Long Term Average)

Difference to LTA

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Normal	LTA=0
	desert

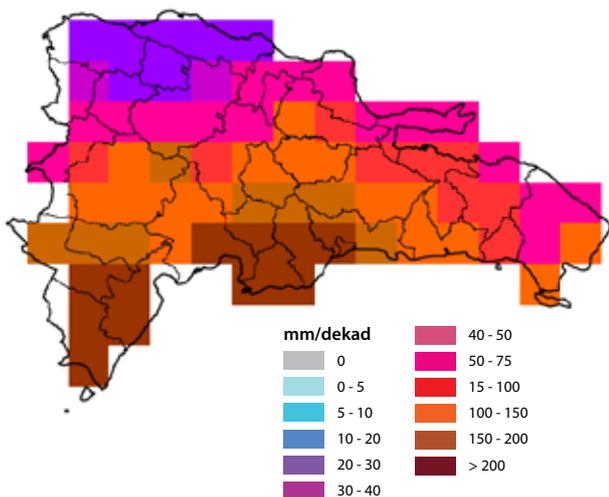


**Dominican Republic**

Precipitation Dekad 1 October

mm/dekad

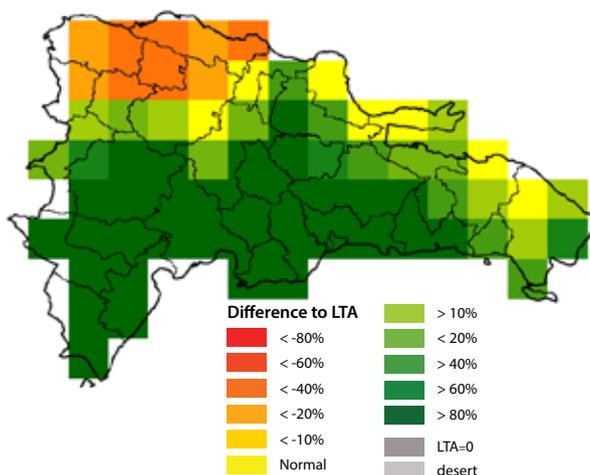
0	40 - 50
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20 - 30	150 - 200
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Precipitation anomaly Dekad 1 October  
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< -20%	> 60%
< -10%	> 80%
Normal	LTA=0
	desert



Source: FAO/GIEWS Earth Observation - [www.fao.org/giews/earthobservation](http://www.fao.org/giews/earthobservation)

**Table 2: Cereal imports in countries most affected by Hurricane Matthew**  
(thousand tonnes)

	2011-2015 average	2015 estimate	2016 forecast	Change 2016/2015
Cuba	2 110	2 078	2 080	0.1%
Dominican Republic	1 697	1 664	1 860	11.8%
Haiti	543	669	680	1.7%

Source: FAO/GIEWS

not severely affected and that farmers in non-affected departments will have access to inputs for the second and third agricultural seasons. At this level, the 2016 cereal production is still anticipated to recover from last year's drought-reduced level (Table 1). However, output of maize, the most affected cereal crop, is now anticipated to increase only 26 000 tonnes or 1 percent from last year's record low production, reflecting crop losses averaging and estimated 55 percent in Grand'Anse, Sud, Nippes and Sud Est departments. This is a downward revision of 81 000 tonnes from FAO's initial 2016 forecast (Table 3). Rice production is now forecast to decline 5 percent from last year's poor harvest, to 87 000 tonnes, as the intense rains brought by the Hurricane are reported to have triggered floods and damaged infrastructure in the main producing area of Artibonite, when harvests of summer/autumn crops would have been already underway. Losses of pulse, roots and tubers, and banana output have also been estimated to be high in the affected areas, between 70 to 90 percent, and totalling almost 70 000 tonnes.

Cereal import requirements, which include both commercial imports and food aid, are now anticipated to increase to a record level of 680 000 tonnes, slightly above the previous record in 2010 when the country was severely impacted by an earthquake (Table 2). This estimated cereal import requirement reflects the level of total supplies needed to maintain the national historical consumption levels of cereals at 92 kg per person per year,

which takes into account population growth (Table 3). It is estimated that 1.4 million people, or 13 percent of Haiti's population, are in need of food assistance, of which 58 percent are in the most urgent need. Initial reports from local markets also point to significant food price increases, reversing the downward trend of the previous months.

### The Dominican Republic

The nine most affected provinces in the Dominican Republic (Santo Domingo, Pedernales, Azua, Monte Cristi, San Juan de la Maguana, San Jose de Ocoa, San Cristobal, Elias Piñas and Peravia), represent some 27 percent of the 1.9 million hectares under cultivation in the country. However, only five of these provinces saw precipitation levels of at least 200 mm, mainly the southern provinces bordering Haiti and those around the capital, Santo Domingo (Figure 1). However, remote sensing data for the first ten days of October also shows that the southern half of the country received 60 percent to 80 percent more rainfall than the LTA for the period (Figure 1).

**Table 3. Haiti - Commodity balance sheet, marketing year 2016/17 (July/June)**  
(thousand tonnes)

	Wheat	Sorghum	Rice (milled)	Maize	Total cereals 2016	Total cereals 2015	Total cereals 5-year avg
<b>DOMESTIC AVAILABILITY</b>		<b>75</b>	<b>87</b>	<b>259</b>	<b>421</b>	<b>350</b>	<b>600</b>
Percent change from 2015		159	10	145	20		
Stock drawdown	0	0	0	0	0	117	104
Production	0	75	87	259	421	233	418
Percent change from 2015	0	159	-4	11	81		
<b>TOTAL UTILIZATION</b>	<b>220</b>	<b>75</b>	<b>512</b>	<b>294</b>	<b>1 101</b>	<b>1 019</b>	<b>1 143</b>
Food use	205	40	472	259	976	948	950
Feed use		11		20	31	25	46
Other uses (seed, losses, other)	5	5	31	15	56	46	59
Exports							
Stock build-up	10	19	9	0	38		88
<b>IMPORT REQUIREMENTS (marketing year)</b>	<b>220</b>		<b>425</b>	<b>35</b>	<b>680</b>	<b>669</b>	<b>543</b>
Percent change from 2015	-4		6	25	2		

Source: FAO/GIEWS

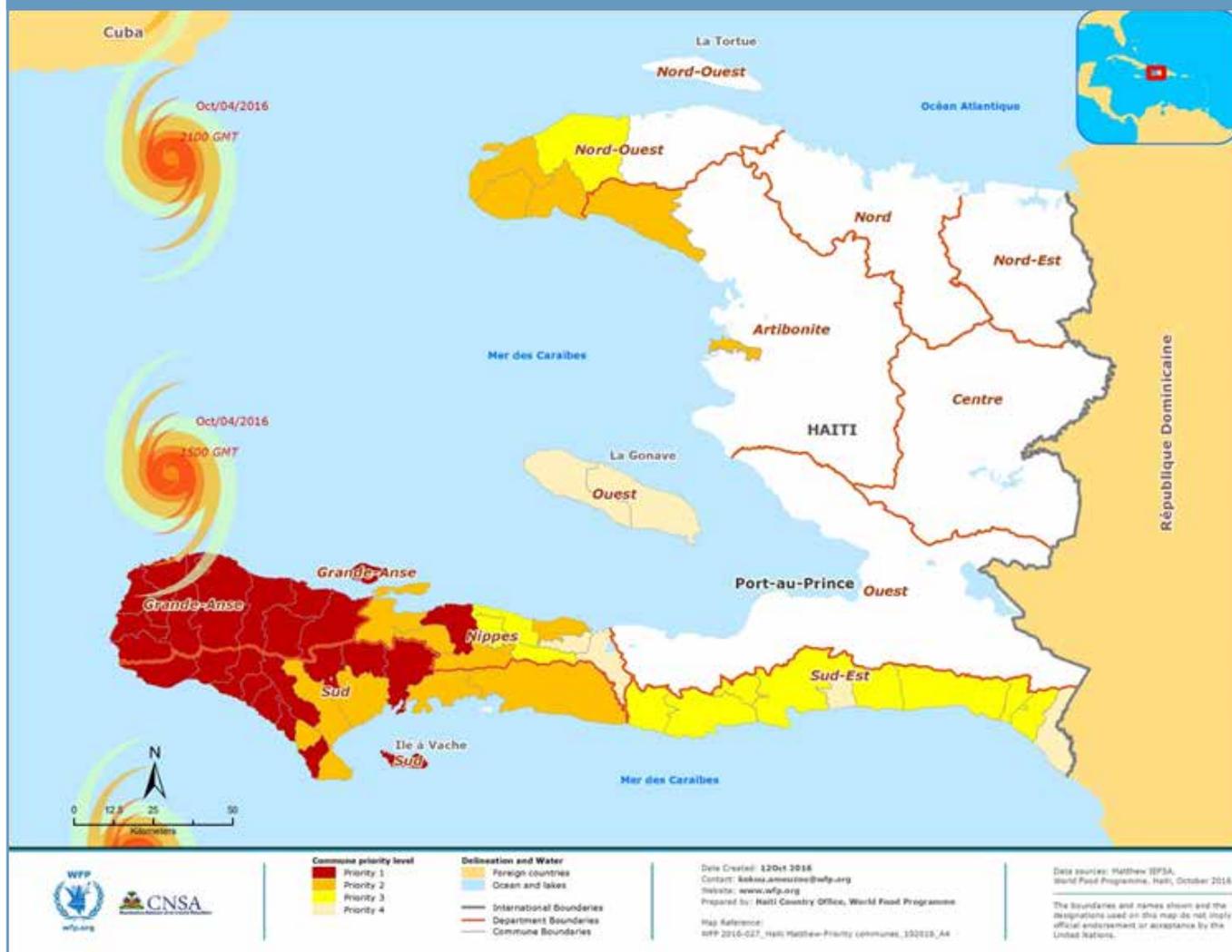
According to the Ministry of Agriculture, despite the excessive rainfall, no significant damage to agricultural crops had been reported apart from in Peravia where the high winds destroyed some banana trees. The Ministry of Agriculture also stated that water availabilities for irrigation improved significantly as water reservoirs, that were depleted after two years of El Niño, were replenished. FAO’s forecast for 2016 cereal output, the bulk of which is rice accounting for 96 percent of the total, points to a 2 percent increase from last year’s level to 962 000 tonnes (paddy equivalent) (Table 1). At this level, the cereal import requirement for the 2016/17 marketing year (September/August) is anticipated to decline some 9 percent to about 1.7 million, mainly reflecting the sustained levels of maize and wheat imports (Table 2). No assessments are yet available with regards to potential losses to horticultural and plantain production.

**Cuba**

In Cuba, the three most affected provinces of Guantanamo, Holguin and Las Tunas represent 20 percent of the country’s arable land and close to 6 percent of the national cereal output. The three provinces were affected by severe strong winds and excess precipitation. Of the three, Guantanamo Province, and in particular the municipality of Baracoa on the eastern tip of Cuba, was the most affected as more than 200 mm rainfall fell during the first ten days of October, more than 80 percent above the LTA for this period (Figure 1). Holguin and Las Tunas were also impacted by rainfall levels that were 60 percent in excess of the LTA for the first ten days of October.

Preliminary reports point to severe losses in the horticultural sector as well as the loss of plantain trees

Figure 2: Haiti - Path of Hurricane Matthew and most affected areas



Source: WFP and National Coordination for Food Security, Ministry of Agriculture of Haiti

in all three provinces. Although the losses have not yet been fully quantified, in 2014 the three provinces produced some 2.5 million tonnes of horticultural products, including 7 percent of the national tomato crop and 17 percent of national plantain production. The potential impact on national cereal output, and in particular maize, the crop most cultivated in these provinces, is anticipated to be minor, the increased rainfall levels across the country may result in better crop establishment in fields recently planted and in better yields of crops that were in vegetative

development. Taking into account the national contribution of the three provinces affected by the Hurricane, FAO's forecast for 2016 cereal output has been revised downward, by 10 000 tonnes to 880 000 tonnes (paddy equivalent), 13 percent above last year's reduced level, but well below the five-year average (Table 1). Cereal imports, which represent two-thirds of domestic utilization, and composed mostly of wheat and maize, are forecast to remain relatively unchanged at 2.1 million tonnes for the 2016/17 marketing year (July/June), (Table 2).

## FAO's Response

- FAO Emergency Response capacities have been deployed to Haiti.
- FAO has begun immediate Emergency Food Security Assessments (EFSA-72) together with the national authorities and Food Security Cluster partners, as well as agricultural needs evaluations in Haiti.
- A Post-Disaster Needs Assessment will be undertaken with the support of an FAO assessment expert and to be coordinated by the Ministry of Planning and External Cooperation of Haiti.
- A Rapid Assessment to be conducted by the Ministry of Agriculture and Natural Resources, FAO and WFP on agricultural damages is also ongoing in the most affected departments in Haiti. Through internal resources, FAO is mobilizing to provide urgently-needed support to save and restore the livelihoods of the affected communities.
- Under the Flash Appeal for Haiti, which was launched on 10 October 2016, the funding requirements for FAO is USD 9 million to assist 300 000 (60 000 households) of the most vulnerable and severely food-insecure people who depend on agricultural activities (agriculture, livestock and fishery) for their livelihoods. With the magnitude of devastation in the rural areas we fear that, in the context of the ongoing assessments, these figures may significantly increase.
- FAO is collaborating with the Economic Commission for Latin America and the Caribbean (ECLAC) and has deployed a fisheries expert from the FAO Regional Office (FAO-RLC) to support the evaluation of the impact on the fisheries sector in the Bahamas.
- In Cuba, a Flash Appeal in response to Hurricane Matthew will be released in the coming days in which FAO aims to reach the most vulnerable in rural, suburban and urban farming systems. Through its own resources, FAO is also supporting the agricultural and fishery livelihoods in all the affected municipalities in Guantanamo and Holguin.



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