

# Taking WFP's Flood Impact and Mapping to the Next Level

GFP Virtual Conference 2020





## GLOBAL PRESENCE

**WFP is headquartered in Rome. We have a global presence that includes:**

- 83 Country Offices worldwide
- 6 Regional Bureaux
- A vast supply chain logistics network that enables us to quickly deliver life-saving food assistance anywhere in the world

**Assists 80 million people in around 80 countries each year.**

# Emergency Geospatial Support Unit – Overview

- Global network of clients in HQ, RBs, COs through geospatial information tools and critical mapping outputs
- Diverse datasets brought together to enable WFP staff to develop insights into complex dynamics and provide actionable information for emergency response.





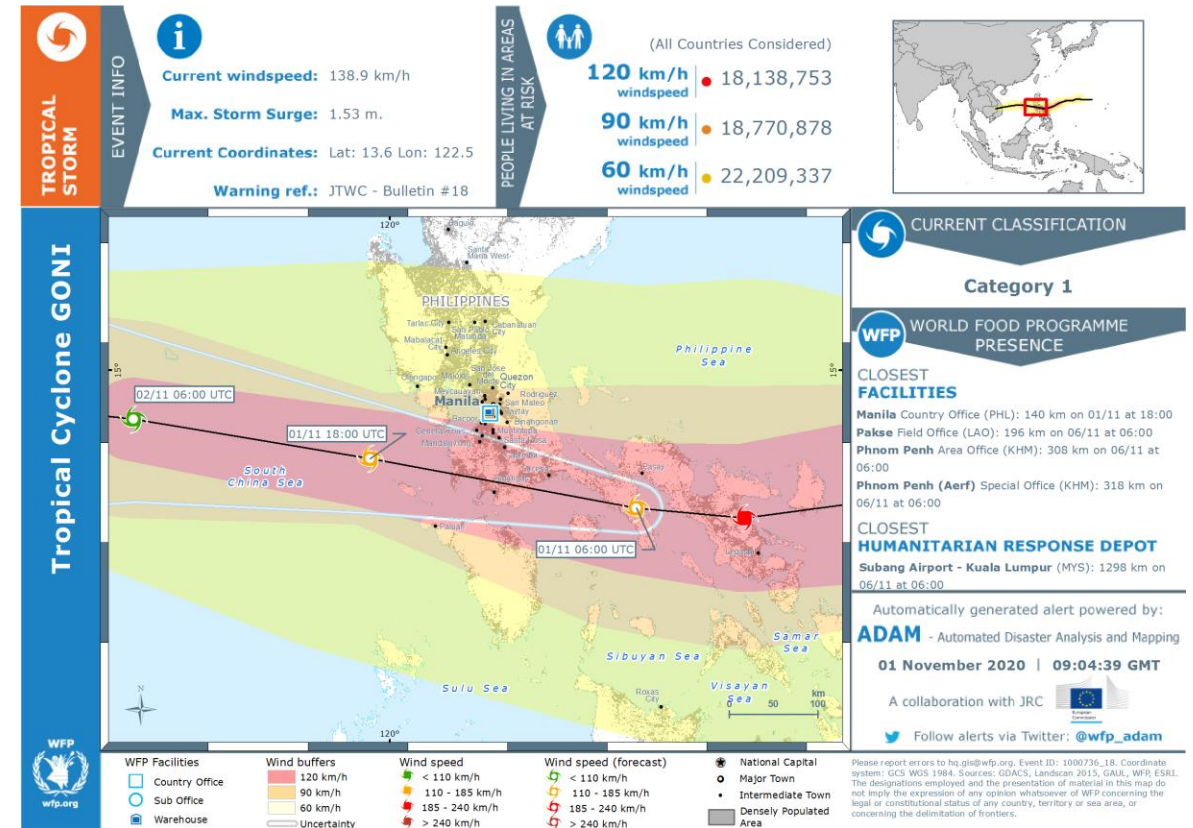
# WFP in Emergencies

As soon as an emergency strikes, WFP and partners must be able to answer to critical questions such as:

- Where are the flood affected areas?
- What is the extent of the flooding?
- How many people are affected?
- What is the impact on infrastructure, assets and livelihoods?
- How reachable are the affected areas?



Necessary to increase data accessibility fostering partnerships and automating data gathering



# Partners & Collaborators



Google Earth Engine



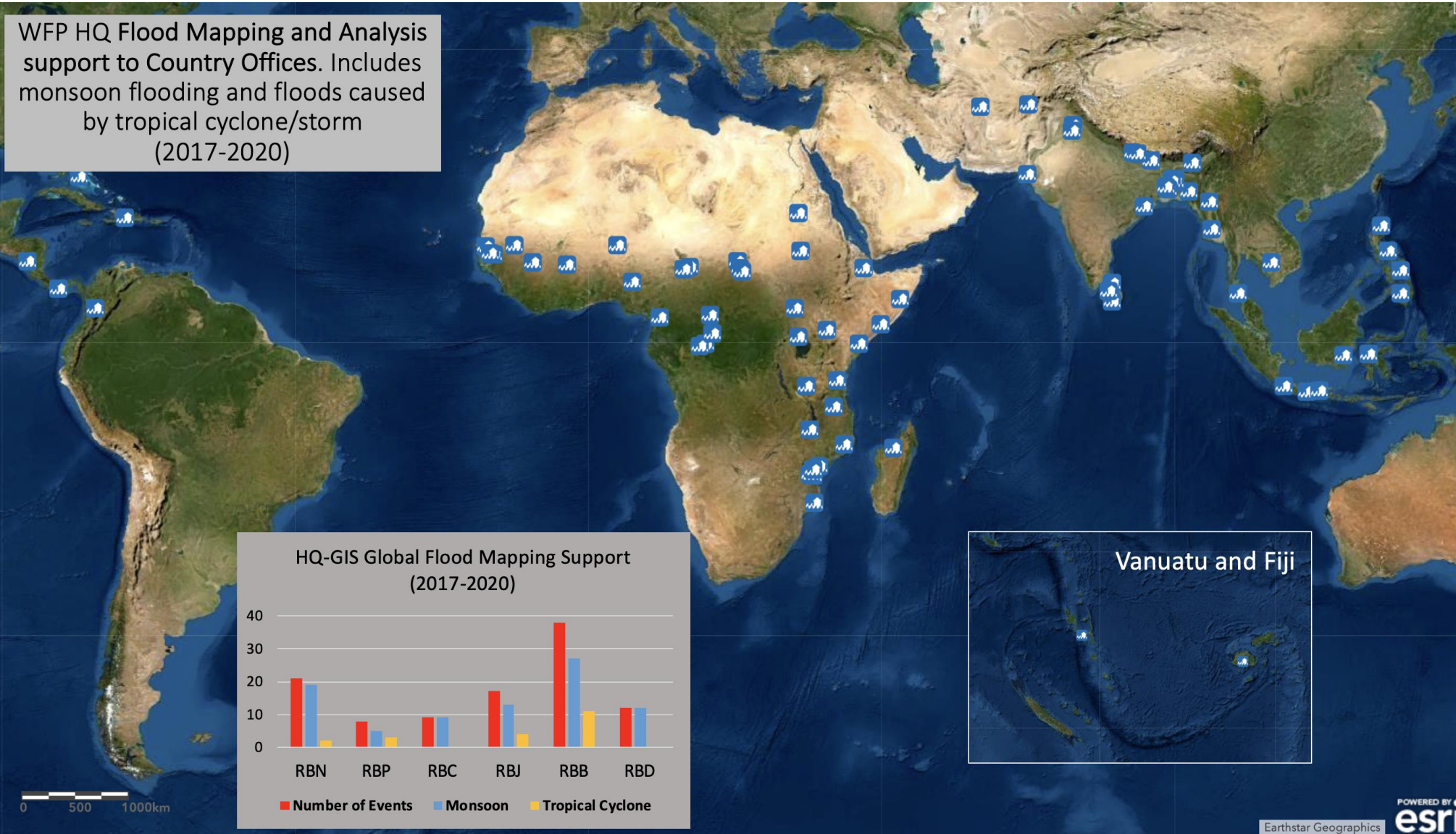
A MAXAR COMPANY



**AIRBUS** FOUNDATION

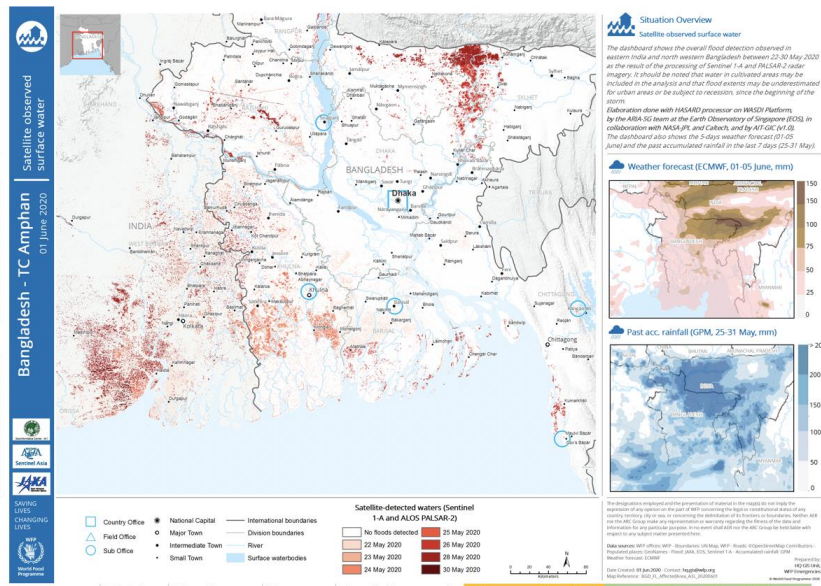
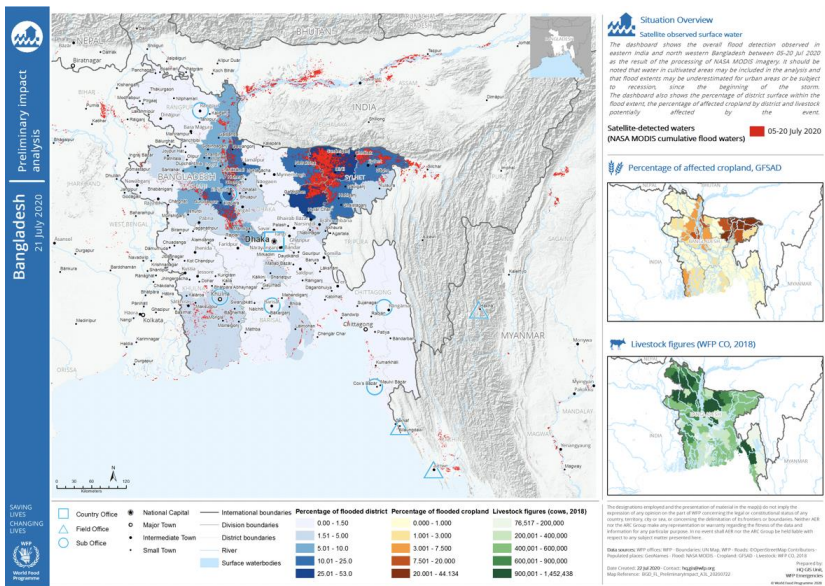


# Global Flood Mapping Support – Automatic Disaster Analysis and Mapping ADAM floods





# Global Flood Mapping Support – ADAM Floods



## Flood event summary

24, Jul 2020

ISO3	BGD
Country	Bangladesh
Event Name	Bangladesh, Mid July 2020
Date Published	2020-07-10T00:00:00+0200
Site Rep	A second wave of monsoon flooding hit Bangladesh from mid-July 2020. Many areas were still suffering from the first wave of flooding (reported separately), although some rivers had fallen slightly in northern districts. By 13 July, flooding had affected almost 1.4 million across 15 districts, with rivers expected to rise further. As of 15 July, Flood Forecasting and Warning Centre (FFWC) reported rivers were at danger levels in 17 locations and at severe flood levels (more than 1 metre above the danger mark) in 4 locations: the Brahmaputra river at Chilmari, Kurigram district; the Jamuna river at Bahadurabad; the Jamuna at Sariakandi; and the Jamuna at Kazipur.
Initial Impact Summary	47,980 [people] Affected in Faridpur, Bangladesh 77,620 [people] Affected in Bogra, Bangladesh

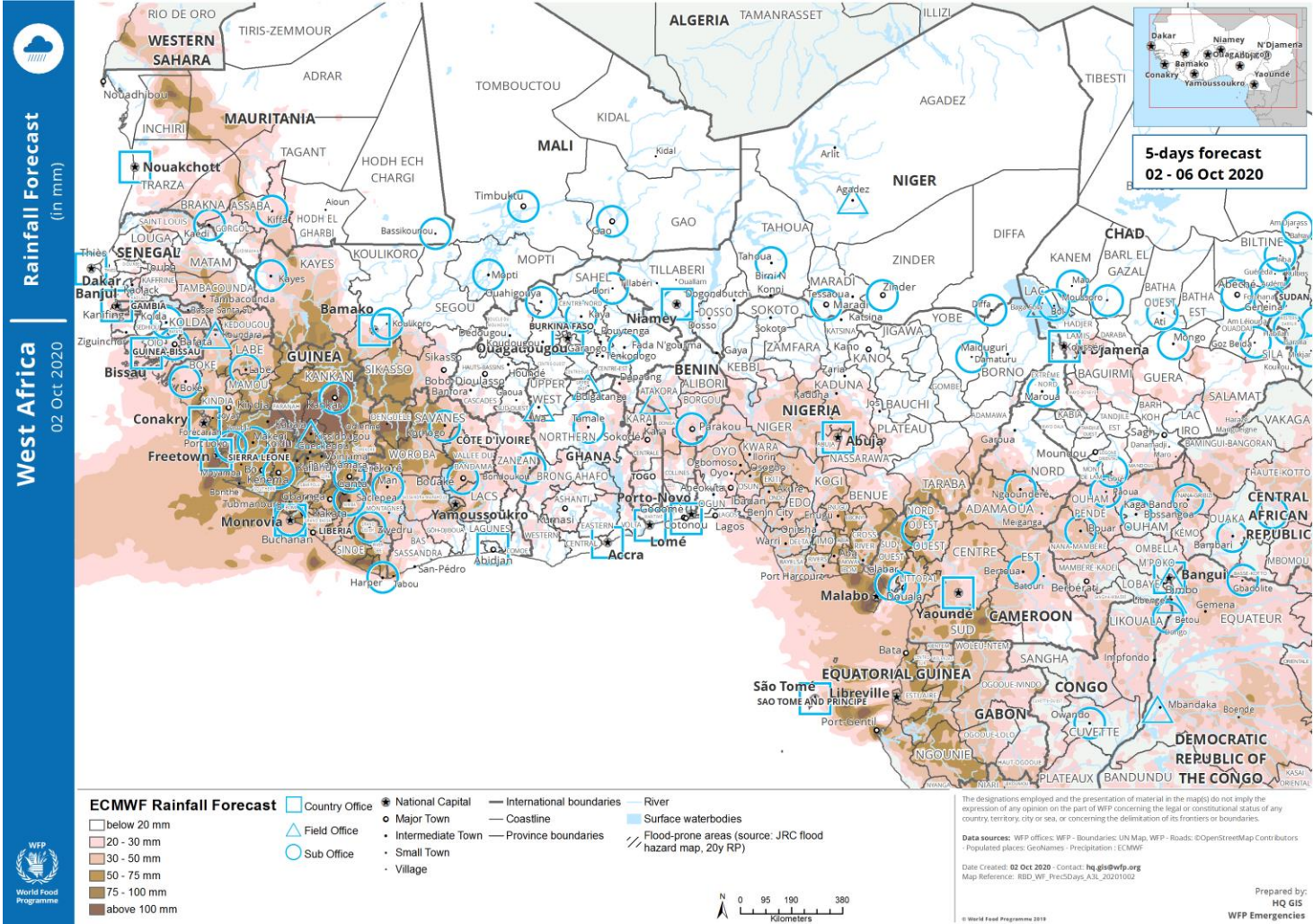
Country	Division	District	Name	Total_Livestock	Percent Flooded	% Crops Flooded
Bangladesh	Sylhet	Sunamganj	Sunamganj	2997262	52.983	44.134
Bangladesh	Sylhet	Sylhet	Sylhet	5133827	22.758	21.548
Bangladesh	Dhaka	Kishoreganj	Kishoreganj	6791811	25.103	20.66
Bangladesh	Dhaka	Netrakona	Netrakona	6327113	23.58	18.415
Bangladesh	Rajshahi	Sirajganj	Sirajganj	5650948	21.982	17.762
Bangladesh	Dhaka	Jamalpur	Jamalpur	2853796	18.577	15.746
Bangladesh	Sylhet	Habiganj	Habiganj	2253693	15.443	13.905
Bangladesh	Dhaka	Manikganj	Manikganj	1606339	9.28	7.337
Bangladesh	Rangpur	Gaibandha	Gaibandha	4233584	8.571	6.525
Bangladesh	Rajshahi	Natore	Natore	4052108	6.449	4.954
Bangladesh	Rangpur	Kurigram	Kurigram	2946833	6.102	4.836
Bangladesh	Dhaka	Tangail	Tangail	8350969	4.777	3.763
Bangladesh	Rajshahi	Bogra	Bogra	6488478	5.261	3.649
Bangladesh	Khulna	Satkhira	Satkhira	3982547	3.607	3.145
Bangladesh	Khulna	Khulna	Khulna	4857051	3.48	2.442
Bangladesh	Sylhet	Maulvibazar	Maulvibazar	2812664	2.641	2.283
Bangladesh	Rajshahi	Pabna	Pabna	5284458	3.055	2.074
Bangladesh	Rajshahi	Naogaon	Naogaon	7789806	2.527	1.832
Bangladesh	Barisal	Bhola	Bhola	5948437	2.635	1.729
Bangladesh	Chittagong	Brahmanbaria	Brahmanbaria	3632972	1.759	1.59
Bangladesh	Dhaka	Sherpur	Sherpur	2226161	1.269	1.186
Bangladesh	Khulna	Bagerhat	Bagerhat	3742510	1.741	1.159
Bangladesh	Dhaka	Shariatpur	Shariatpur	2529203	2.483	1.055
Bangladesh	Chittagong	Chittagong	Chittagong	7510667	1.207	0.62
Bangladesh	Dhaka	Rajbari	Rajbari	1784763	0.878	0.606
Bangladesh	Dhaka	Munshiganj	Munshiganj	3304229	1.039	0.597
Bangladesh	Chittagong	Cox's Bazar	Cox's Bazar	4690096	1.375	0.582
Bangladesh	Rangpur	Rangpur	Rangpur	6405084	0.675	0.527
Bangladesh	Khulna	Jessore	Jessore	7206112	1.019	0.501
Bangladesh	Rajshahi	Joypurhat	Joypurhat	3080201	0.534	0.475
Bangladesh	Rajshahi	Rajshahi	Rajshahi	5673947	0.674	0.435

# Alert Detection and Mapping of Floods – ADAM Floods





# Regional Flood Alerting & Analysis (Early Warning)

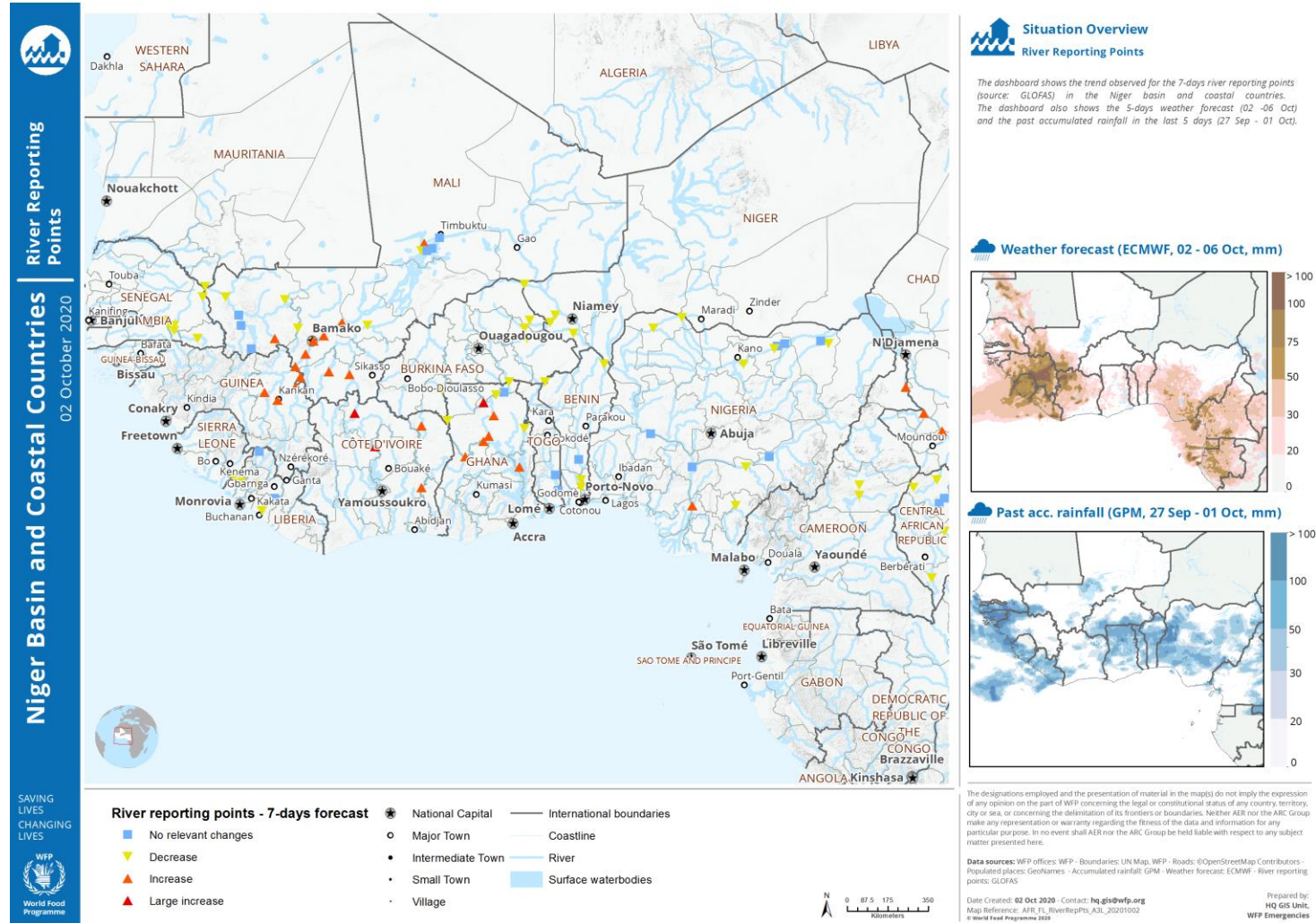


WFP provides a regional support to alert country offices in the region of extreme rainfall event for preparedness and planning purposes





# Regional Flood Alerting & Analysis (Early Warning)



WFP utilizes data from the European Commission to alert potential flooding to large river basins where WFP has operations/programmes on the ground

# Regional Flood Alerting & Analysis (Early Warning)

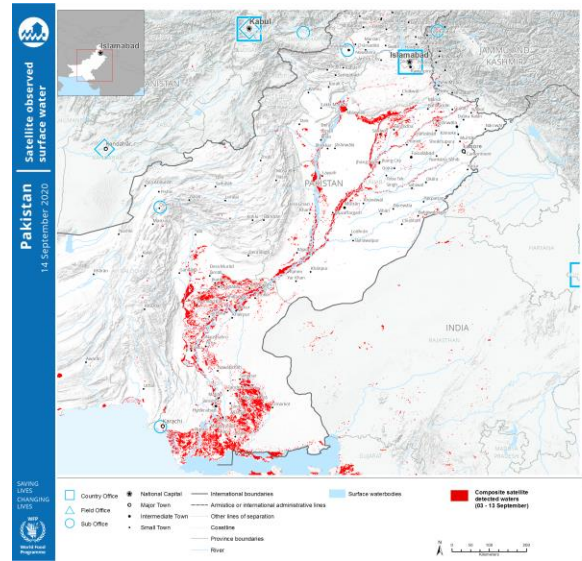


<i>Admin 1</i>	<i>Admin 2</i>	<i>Potentially exposed population by Admin 2</i>	<i>Percent of the total pop. by Admin 2</i>	<i>Cropland in areas at risk of flooding (ha)</i>	<i>Percent of total cropland areas</i>
Kankan	Kankan	32,553	5.81%	3,977	8.09%
	Siguiri	21,797	2.33%	5,244	5.39%
	Kouroussa	7,007	2.21%	1,974	3.67%
	Mandiana	6,952	1.73%	2,126	3.53%
	Kerouane	135	0.06%	64	1.13%
Faranah	Dinguiraye	1,911	0.89%	522	1.71%
	Faranah	584	0.18%	0	0.00%
	Dabola	41	0.02%	46	0.08%
<b>Total GUINEA</b>		<b>70,980</b>	<b>2.22%</b>	<b>13,953</b>	<b>3.66%</b>
Koulikoro	Koulikoro	24,039	8.39%	14,460	6.43%
Kayes	Bafoulabe	7,516	2.35%	3,104	2.54%
	Kita	1,886	0.30%	1,674	0.46%
	Kenieba	2,040	0.75%	58	0.30%
Sikasso	Bougouni	3,881	0.59%	3,970	0.71%
	Yanfolilla	2,963	1.05%	776	0.66%
	Kolondieba	2,850	1.01%	1,574	0.72%
Bamako	Bamako	175,538	5.40%	75	1.92%
<b>Total MALI</b>		<b>220,713</b>	<b>3.69%</b>	<b>25,691</b>	<b>1.58%</b>
Savanes	Tchologo	1,305	0.23%	567	0.19%
	Bagoue	2,624	0.61%	401	0.13%
	Poro	1,566	0.17%	242	0.06%
Woroba	Bafing	891	0.46%	106	0.35%
	Worodougou	485	0.16%	1	0.00%
	Bere	360	0.07%	73	0.02%
Denguele	Folon	81	0.08%	0	0.00%
	Kabadougou	45	0.02%	0	0.00%
<b>Total COTE D'IVOIRE</b>		<b>7,357</b>	<b>0.23%</b>	<b>1,390</b>	<b>0.09%</b>

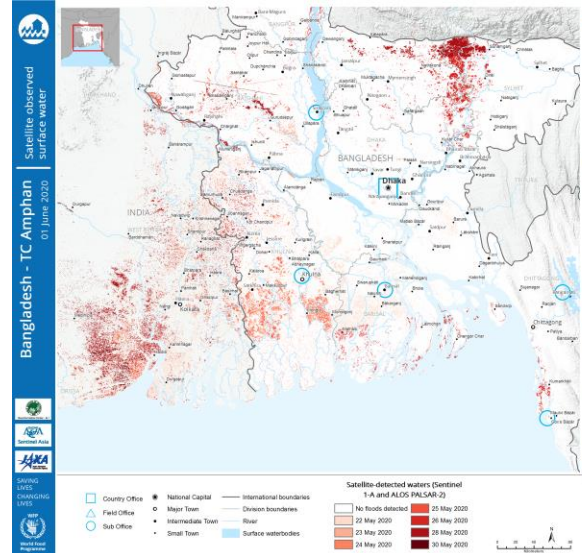
WFP provides a regional summary of potential flood impacts on people and livelihood using global/regional models for anticipatory actions and as additional precautionary information where local meteorological offices are not available/reliable.



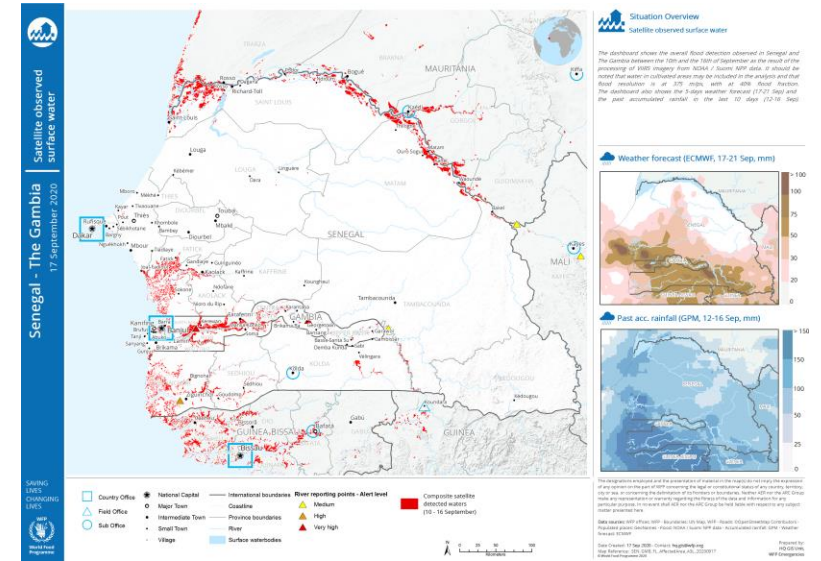
# WFP Country Offices Support Flood Response Maps



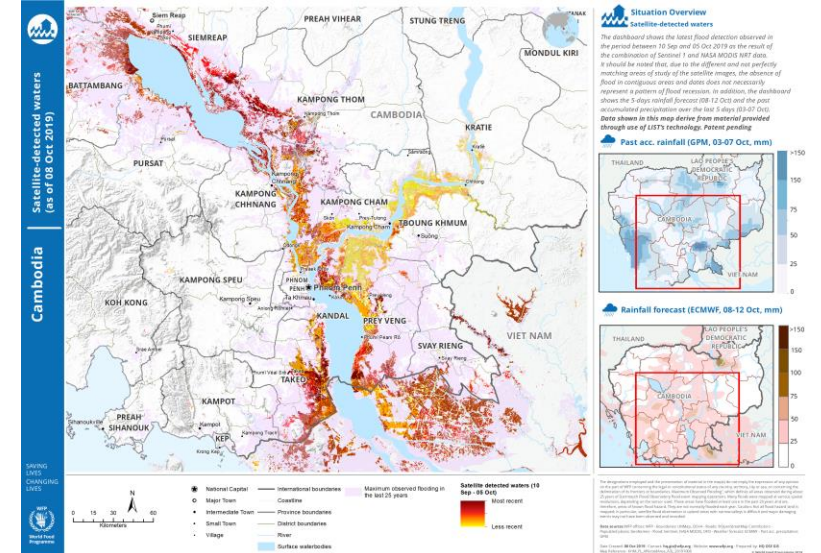
## Pakistan Monsoon Flooding



## Bangladesh TC Amphan



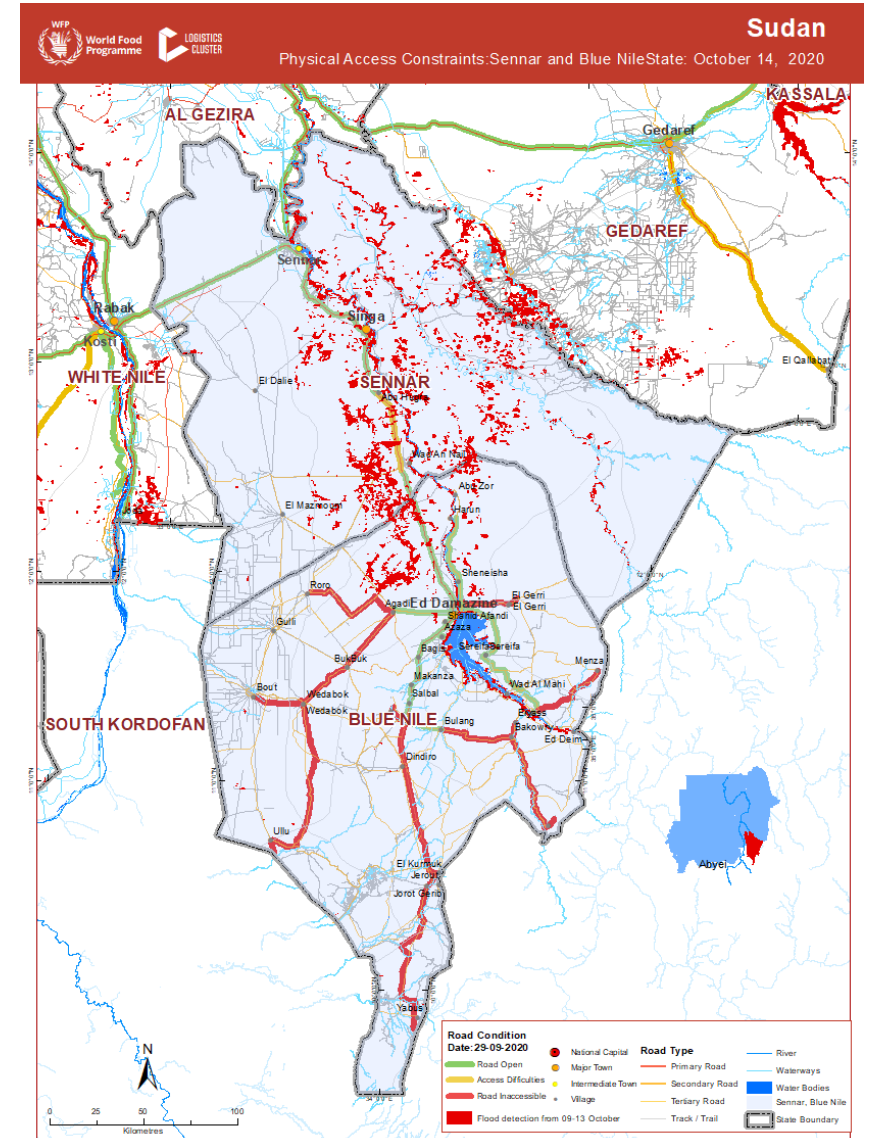
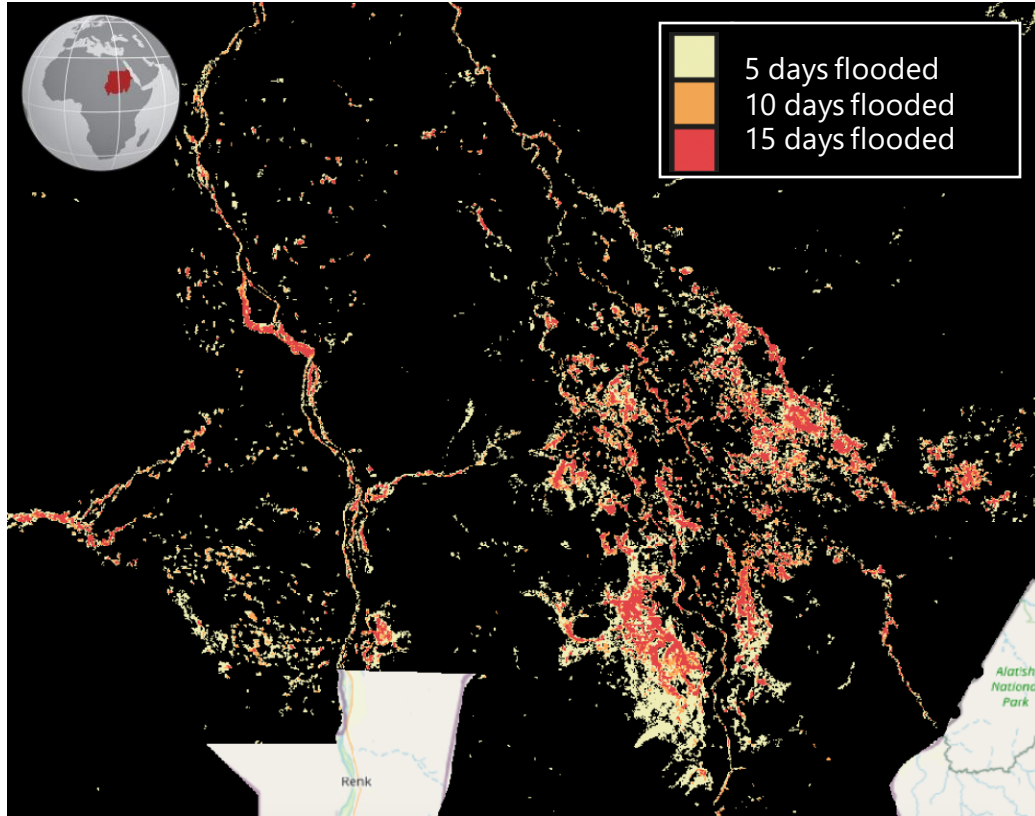
## West Africa Monsoon Flooding



## Cambodia Monsoon Flooding



# Country Offices Support Flood Monitoring for Physical Access Constraints (Logistics Cluster)



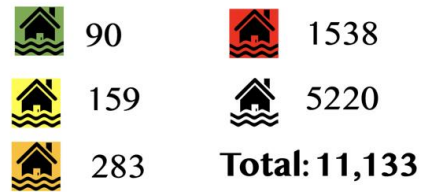
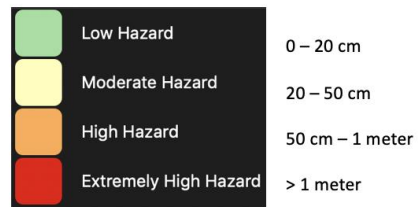


# Detailed Local Analysis

## Drone based Flood Modeling for local preparedness – Mozambique

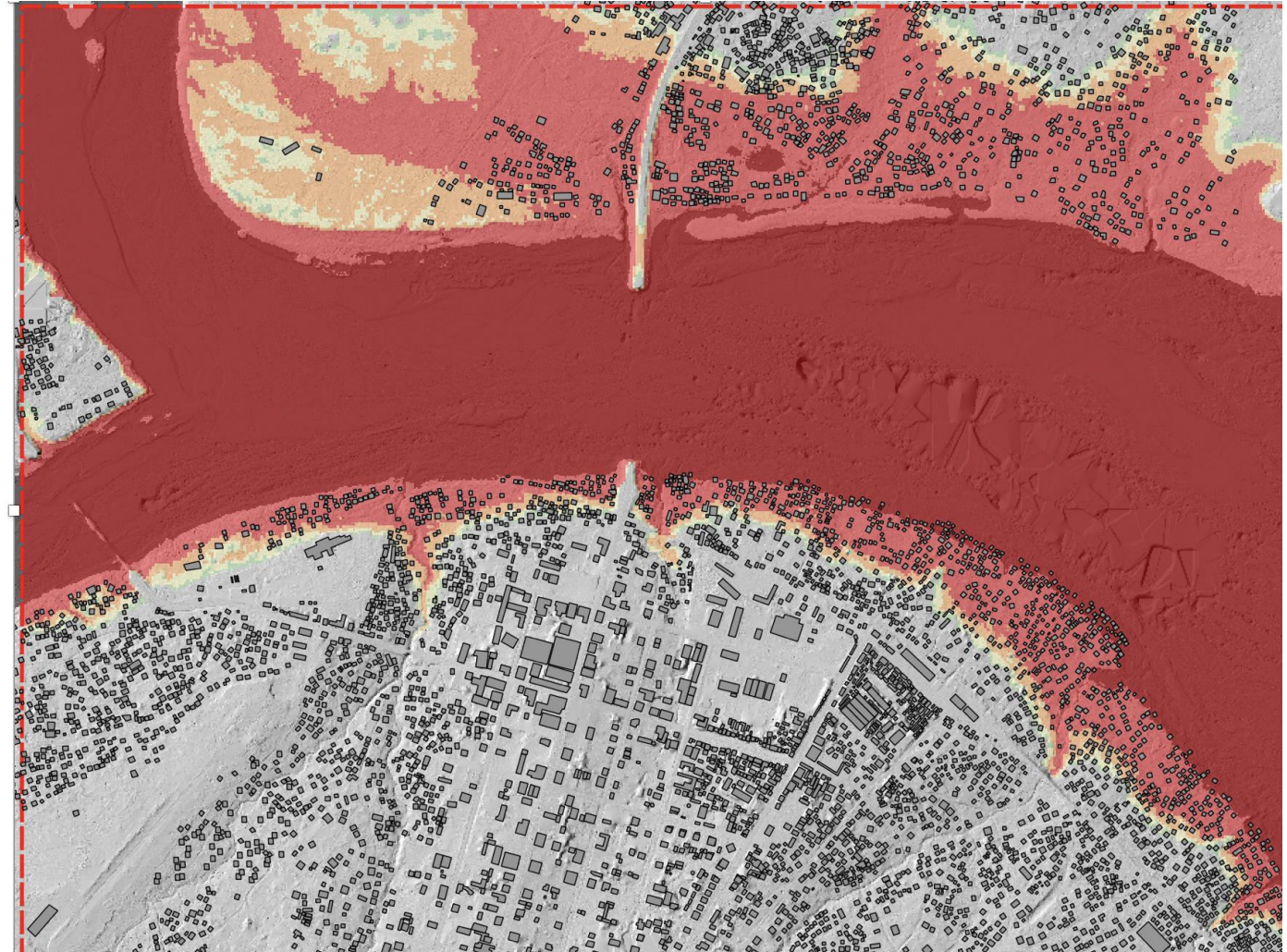
### Flood Simulation Result

Maximum Flood Inundation hazard based on 2015 event



 1.7 kilometers

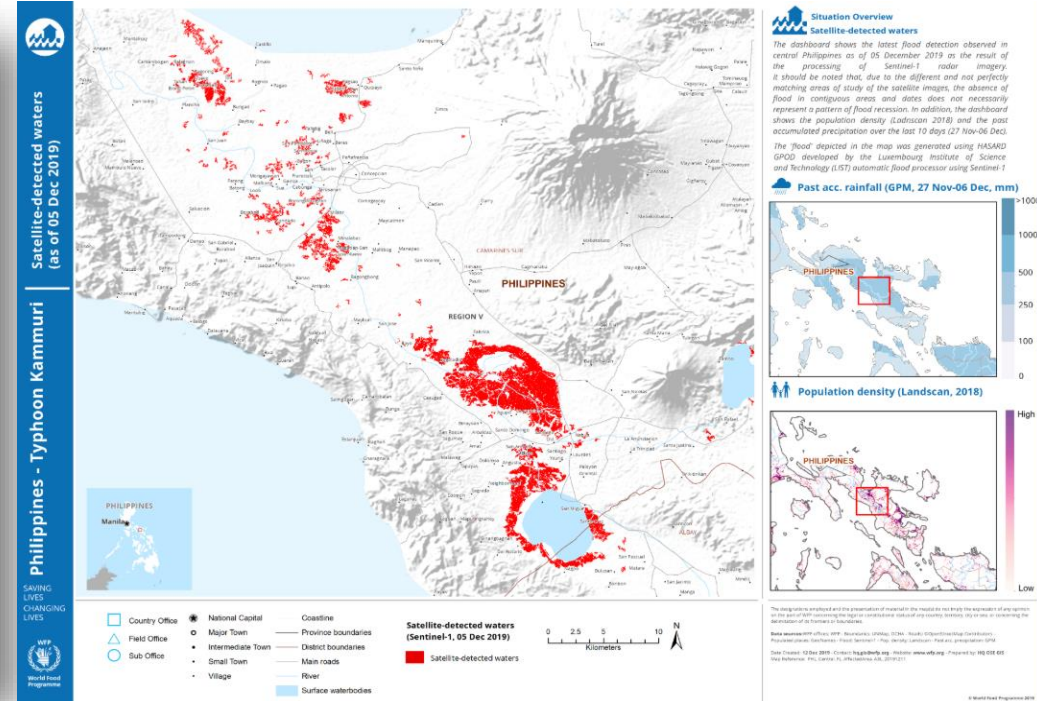
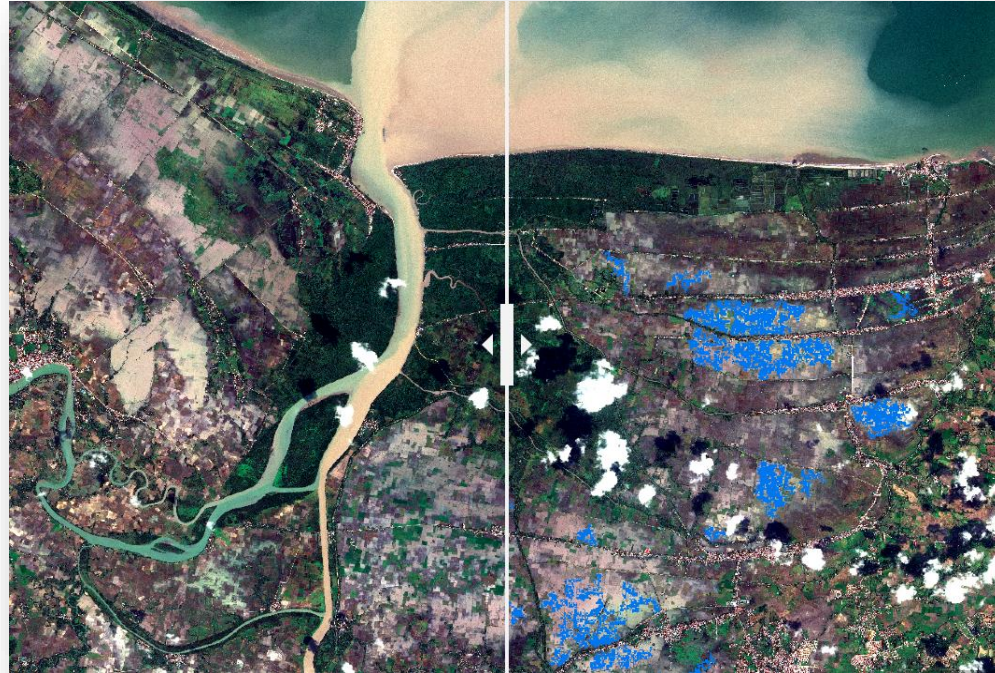
 7 bridges





# Detailed Local Analysis

## High Resolution Flood Mapping – Philippines TC Kammuri



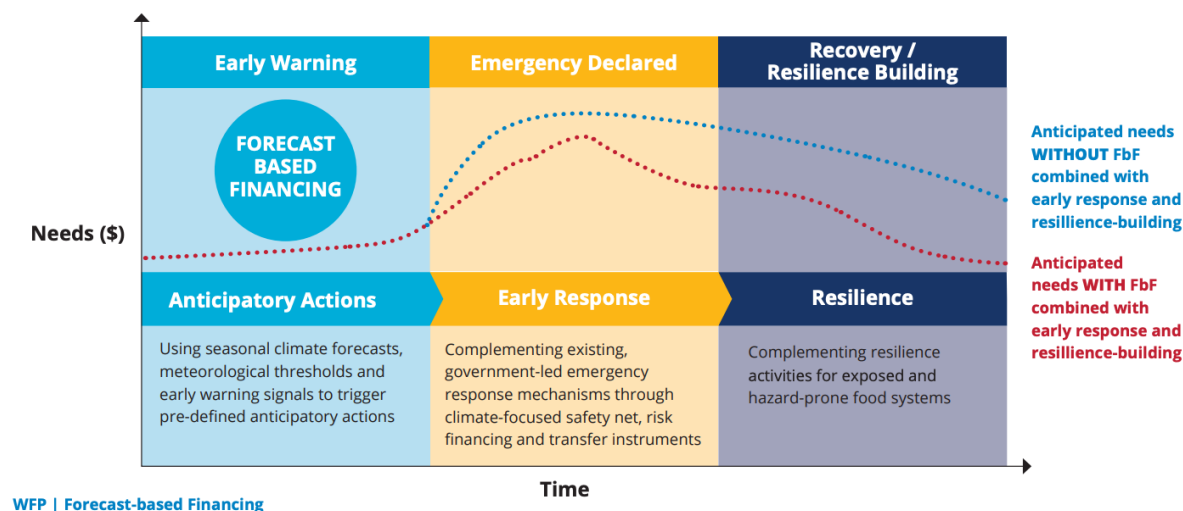
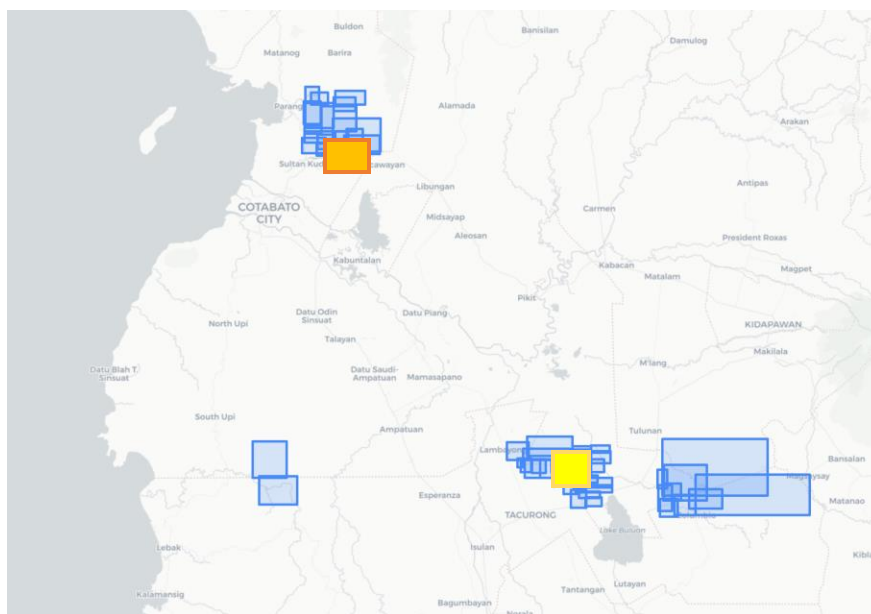


# Detailed Local Analysis

## Locality prioritization of extreme rainfall events for Forecast Based Financing Philippines



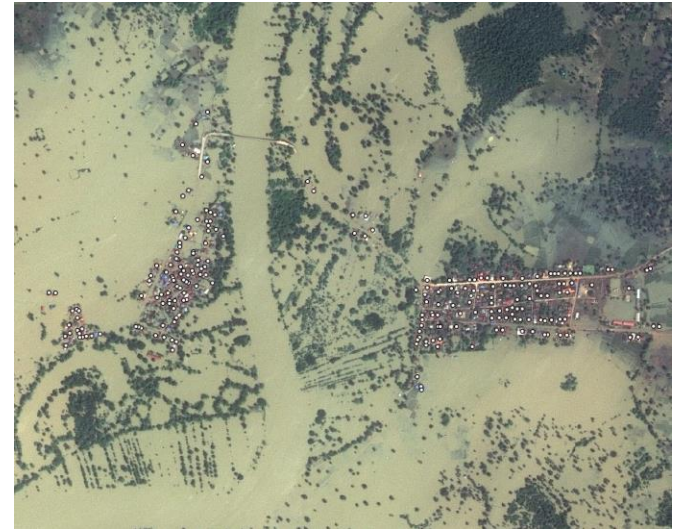
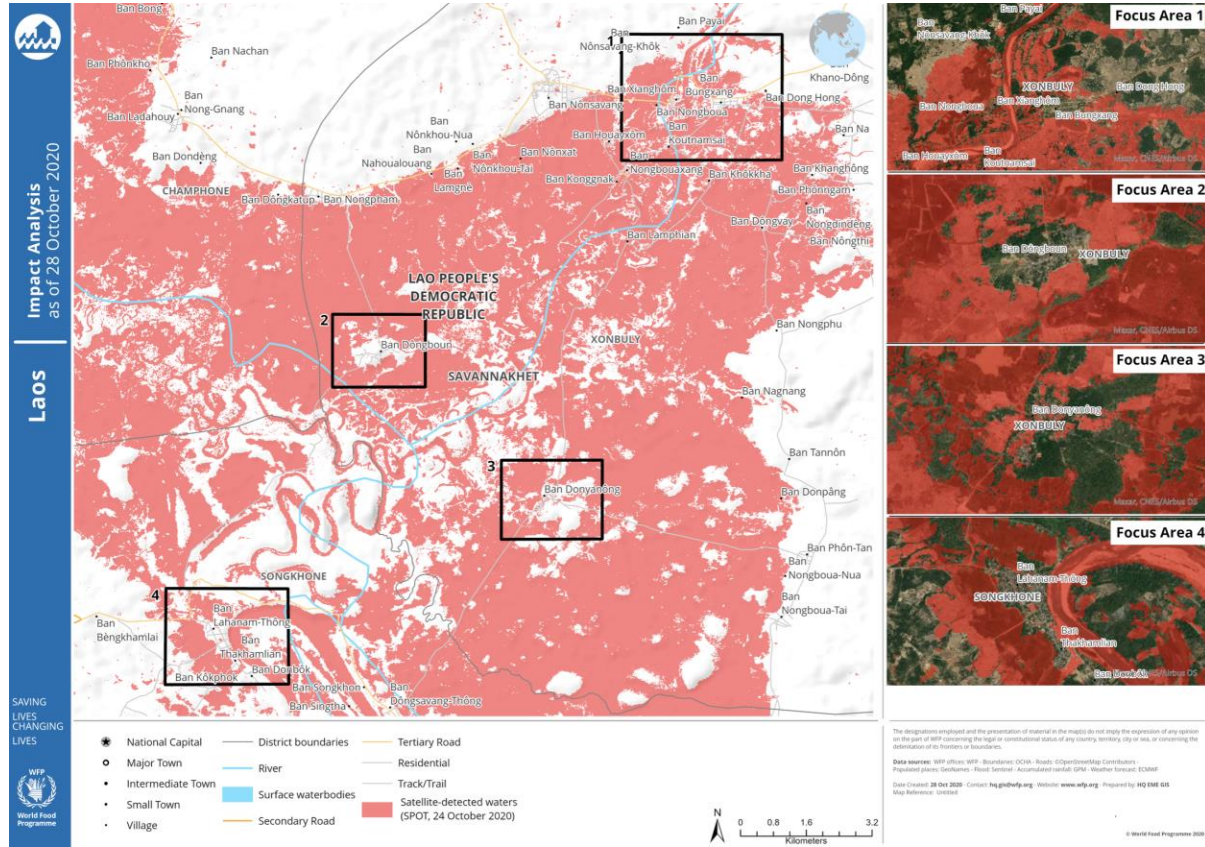
Municipality	Barangay	Days Accum Rainfa	Mean Precip (Oct)	Rainfall Forecast (7D)	Rainfall Forecast (10D)	Flood Hazard Area	II threshold	III threshold	IV threshold	V threshold	FbF ACTION	Population	Poor Household
Tulunán	Maybula	52.51	209	97.15	121.25	Yes	100	150	200	250	SET	3709.76	90
Datu Paglas	Kalumenga	52.51	186	40.53	63.54	No	100	150	200	250	READY	3409.3	192
Pandag	Kayupo	52.21	194	0	0	No	100	150	200	250	MONITOR	1705.03	324
President Quirino	Kalanawe I	52.21	199	0	0	Yes	100	150	200	250	MONITOR	4544.11	112
President Quirino	Kalanawe II	52.21	200	0	0	No	100	150	200	250	MONITOR	2031.39	201
President Quirino	Katico	52.21	198	0	0	Yes	100	150	200	250	MONITOR	2467.89	172
President Quirino	Pedtubo	52.21	190	0	0	No	100	150	200	250	MONITOR	4847.86	83



WFP | Forecast-based Financing

# Detailed Local Analysis

## High Resolution Flood Mapping and Impact Estimation – Laos





# Summary

- Responding to disasters & saving lives require innovation, latest scientific advances as well as newest technologies.
- WFP is developing the first global alerting, modeling, and mapping system of floods, all in one place, that is able to assess impact at the local scale it matters.
- This global system pushes scientific & technical state-of-the-art in model forecasting, Earth Observation data processing and interoperability standards
- It also brings about important partnerships with universities, NGOs, and private sector entities and foundations
- The team also engages with Country Offices and national partners in local scale pilot projects to identify the next challenges

# WFP and the Humanitarian Community for Flood Response



**GLOBAL  
FOOD SECURITY CLUSTER**  
*Strengthening Humanitarian Response*



**OCHA**  
United Nations  
Office for the Coordination  
of Humanitarian Affairs



**Food and Agriculture Organization  
of the United Nations**



**UNOSAT**

**Humanitarian  
RESPONSE**



**Sentinel Asia**



**Asian Disaster Preparedness Center**







Saving Lives, Changing Lives