



HIGHLIGHTS

- While the country experienced below-normal rainfall, flash floods were reported, thus suggesting poor drainage facilities across much of Yemen
- To avoid future flood-related mortalities and agricultural losses, investments in sustainable drainage systems should be considered
- Government policies that regulate the construction of homes and shelters for internally displaced people in flood-prone areas are encouraged
- The spread of *Tuta absoluta*, the tomato killer caterpillar is expected to affect tomato plantations, especially across the Northern and Central Highlands

I. METEOROLOGICAL REVIEW

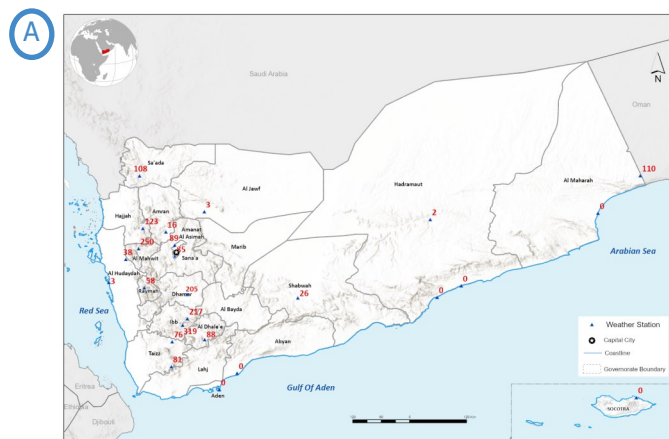
From 1 to 31 August, much of western Yemen experienced rainfall amounts of over 60 mm, especially in Ibb, Al Mahwit, Dhamar, Lahj, and Taizz (Fig. 1A and B), and this induced flash floods that affected dozens of people¹. When compared to the long-term average however, much of the country was characterized by up to 25 mm below-normal rainfall (Fig. 2A), and this suggests that much of the flash floods experienced were in areas that do not have the ability to quickly absorb rainwater.

Furthermore, since much of the highlands were characterized by rainfall activities, vegetation growth was boosted by up to 65 percent (Fig. 1C and 2B). Comparatively, the relatively dry coastal areas were characterized by vegetation stress of up to 25 percent (Fig. 1C and 2B). Taken together, moisture levels as reflected in the Agricultural Stress Index (ASI), a key metric for crop water requirements, show good crop performance with no indications of drought across the country (Fig. 6).

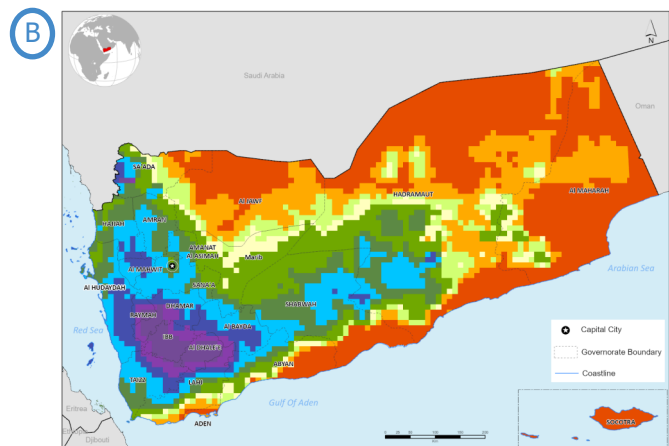
Regarding temperature, scorching hotness continued to affect Hadramaut (Seiyoun 44.7°C - 24 percent hotter than average maximum temperature), Al Hudaydah (Al Kaden, 43.4°C - 21 percent hotter than average maximum temperature), Shabwah (Ataq 41.7°C - 18 percent hotter than average maximum temperature), Al Hudaydah (40.5°C - 16 percent hotter than average maximum temperature), and Al Jawf (Al Jouf, 40.2°C - 15 percent hotter than average maximum temperature) governorates (Fig. 5A and Table 1).

The weather outlook until the end of September indicates that while overall rainfall performance will continue to be normal relative to the long-term average, cumulative rainfall amounts of over 100 mm may be experienced, especially over Ibb, parts of eastern Taizz, Al Dhale'e, western Dhamar, western Sana'a, and Al Mahwit governorates (Fig. 7). Vigilance to guard against flash floods in these areas is recommended.

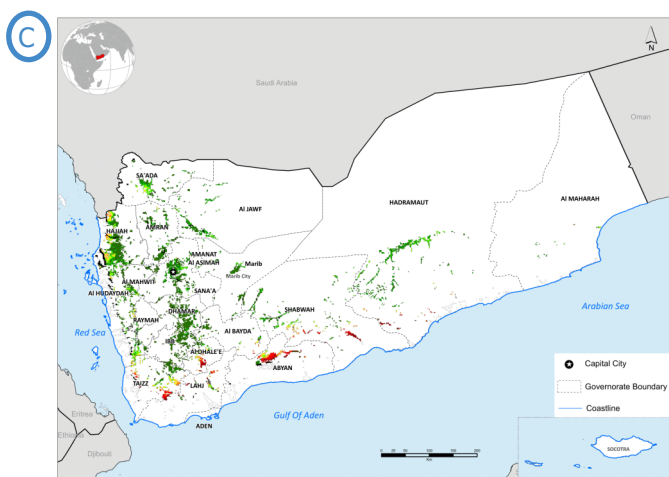
Fig. 1: Performance of monthly rainfall and vegetation conditions A) Observed rainfall (mm) B) Satellite-based rainfall estimates (mm) C) Vegetation Condition Index



Source: CAMA



Rainfall (mm)
 < 5 5 - 10 10 - 15 15 - 20 20 - 40 40 - 60 60 - 100 100 - 150 150 - 200 200 - 300 Above 300
 SOURCE : CPC



VCI
 <0.15 0.15-0.25 0.25-0.35 0.35-0.45 0.45-0.55 0.55-0.65 0.65-0.75 0.75-0.85 >0.85 missing cloud snow
 SOURCE : VCI - GIEWS, Crop mask - JRC

AGROMETEOROLOGICAL UPDATE

Fig. 2: Monthly anomalies (difference from long-term average, LTA) for A) rainfall (LTA: 1981 – present) B) Normalized Difference Vegetation Index (LTA: 1984 - 2015)

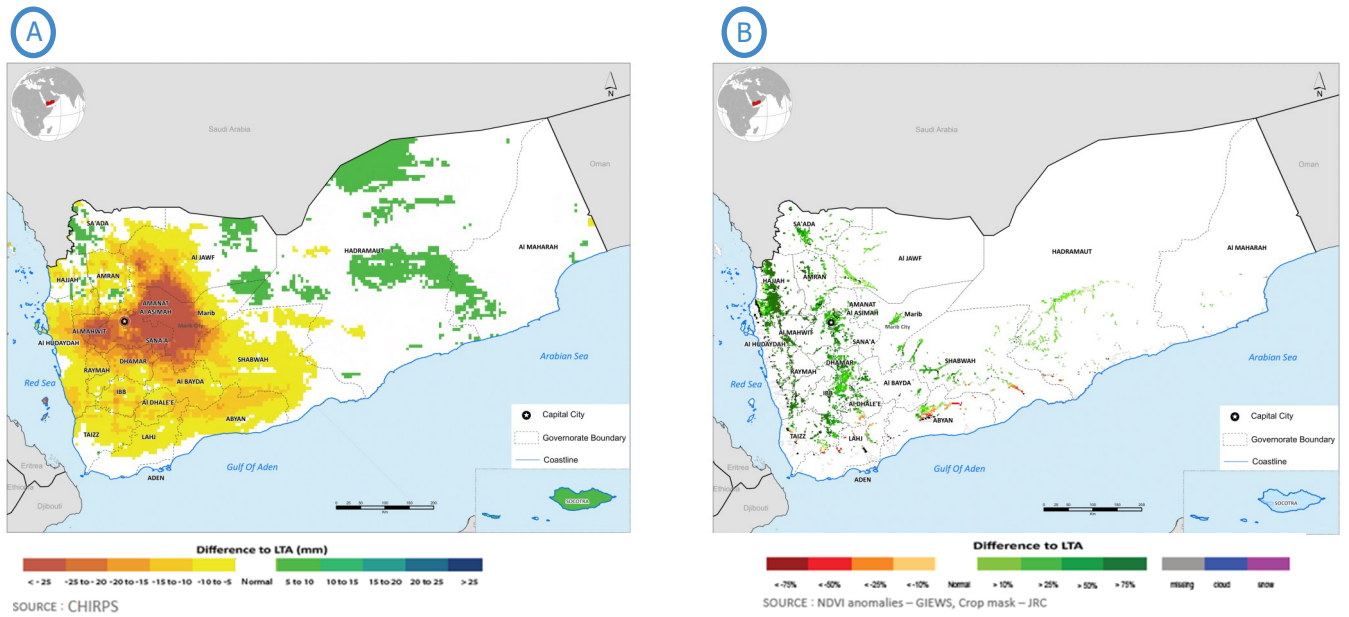


Fig. 3: Progress of rainfall estimates A) 1 to 10 Aug B) 11 to 20 Aug C) 21 to 31 Aug

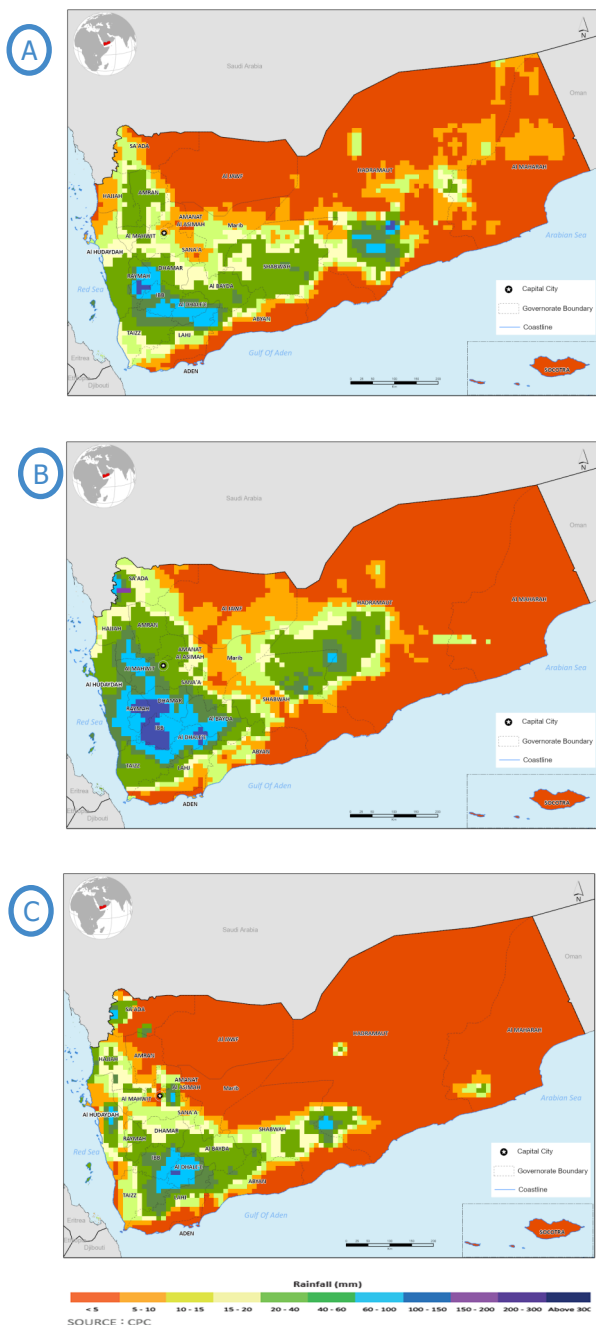
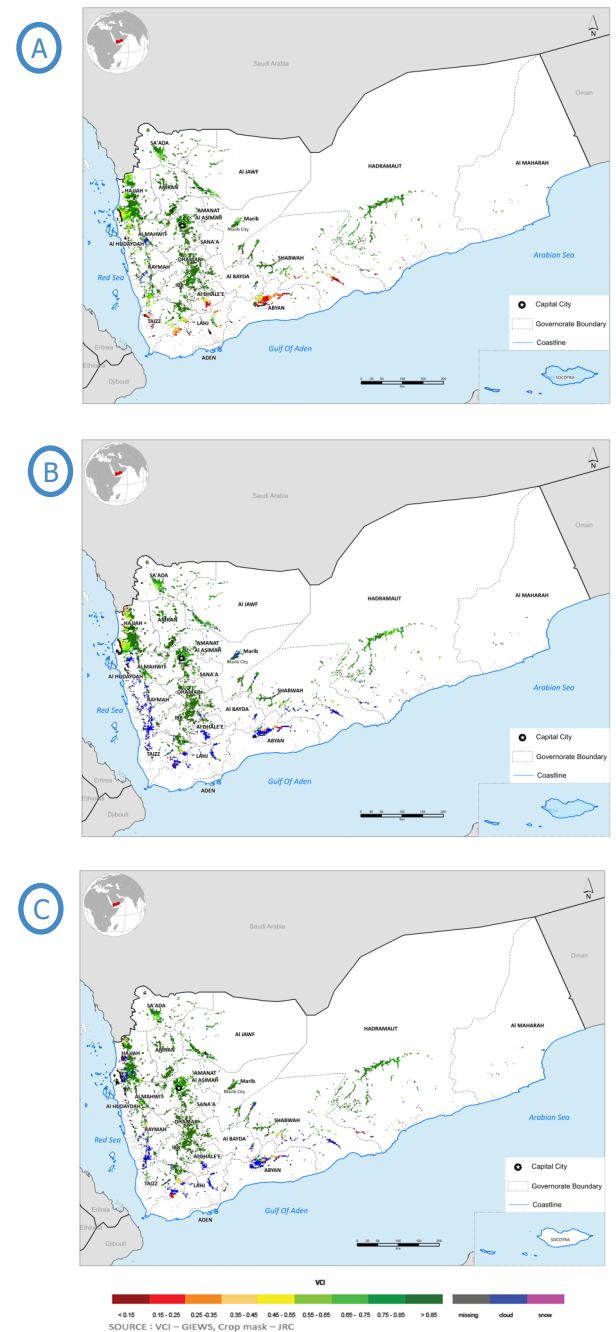


Fig. 4: Progress of vegetation conditions for A) 1 to 10 Aug B) 11 to 20 Aug C) 21 to 31 Aug



AGROMETEOROLOGICAL UPDATE

Fig. 5: Performance of monthly temperature conditions for A) Maximum B) Minimum

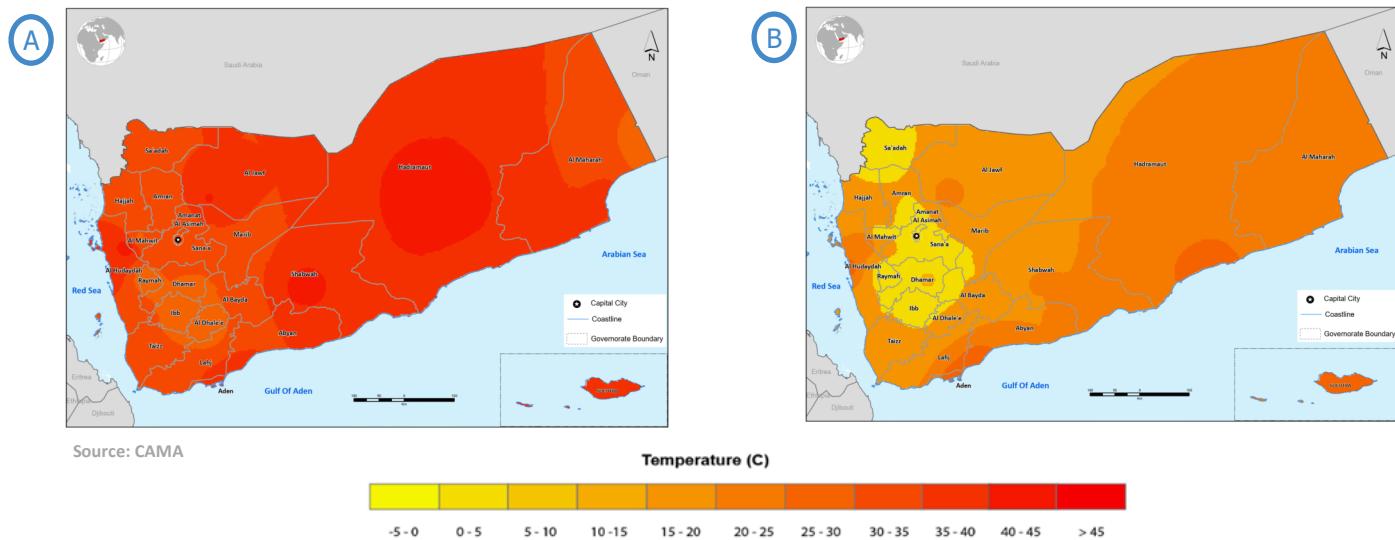
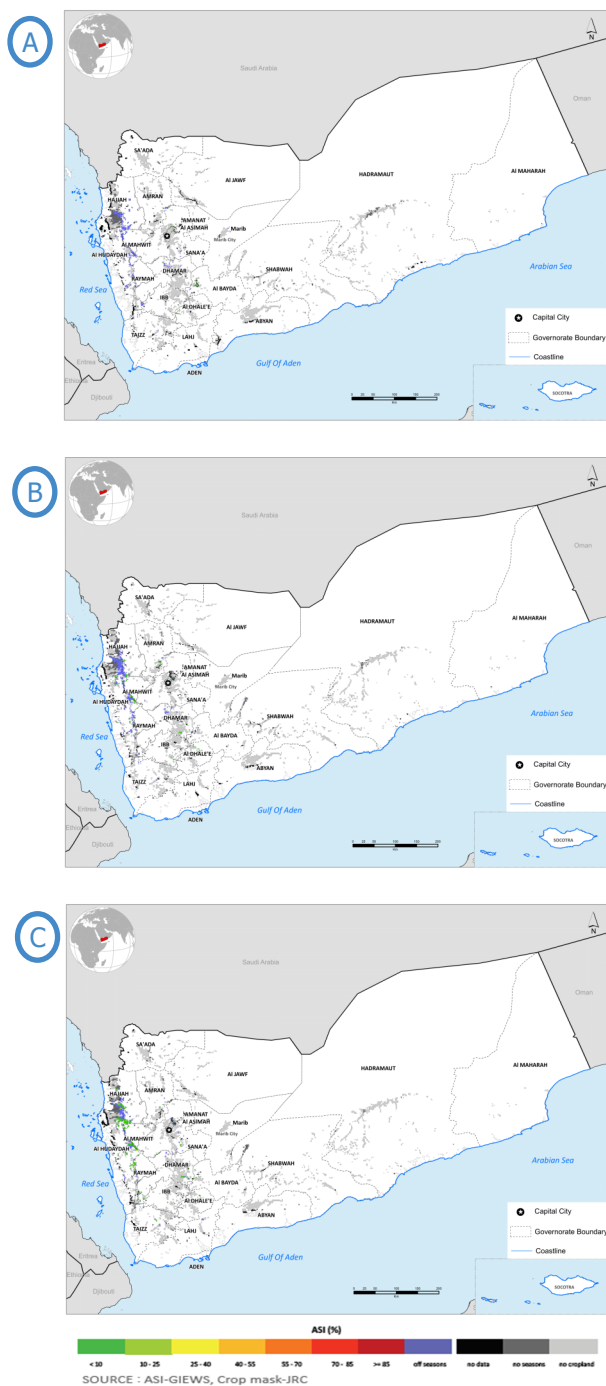


Fig. 6: Progress of Agricultural Stress Index (ASI) for A) 1 to 10 Aug B) 11 to 20 Aug C) 21 to 31 Aug



II IMPACT ON LIVELIHOODS

While much of Yemen experienced below-normal rainfall throughout August 2023, flash floods were reported across much of the western parts of the country thus pointing to the inability of much of Yemen to absorb rainwater. In a nutshell, flash floods occur when excessive rainfall falls within a short period of time and the ground over which it falls has no capacity to safely channel the rainwater. Considering the amount of rainfall that usually falls over Yemen, lives and livelihoods can be saved by investments in sustainable drainage systems that slow down runoff and safely convey it to watercourses. Furthermore, government policies that regulate the construction of homes and shelters for internally displaced people in flood-prone areas have the potential to reduce flood-related mortality.

Apart from the flash floods that were reported in selected areas, climatic conditions in August supported agricultural activities without major negative implications. Specifically, across the Northern Highlands i.e., Sana'a, Amran, and Saadah Governorates, cereals crops such as sorghum, wheat, maize, and barley were in their growing stage and are expected to be harvested beginning this September and may last until November. Some farmers also started harvesting fruit trees such as apples, pomegranates, and grapes. In the Southern and Central Highlands which cover Dhamar, Albayda, Ibb, and Taiz Governorates, most farmers were engaged in the harvesting of vegetables, especially tomatoes, potatoes, and chilly. It should also be noted that with the experienced rains, the spread of Tuta absoluta, the tomato killer caterpillar is expected to affect tomato plantations, especially across the Northern and Central Highlands. Vigilance is encouraged.

The outlook until the end of September indicates that due to the wet conditions, crop pests and diseases are likely to resurge. Specifically, the forecasted rainfall is expected to encourage the resurgence of winter Desert Locusts (DL) earlier than usual across the Red Sea and Gulf of Aden coasts. Solitarious adults that usually group in the interior of the country around the Hadramaut Valley are also expected to migrate towards the Red Sea and Gulf of Aden coasts after vegetation dries out in the interior of Yemen². Vigilance and continued surveys remain a necessity.

Fig. 7: Rainfall forecast until end of September

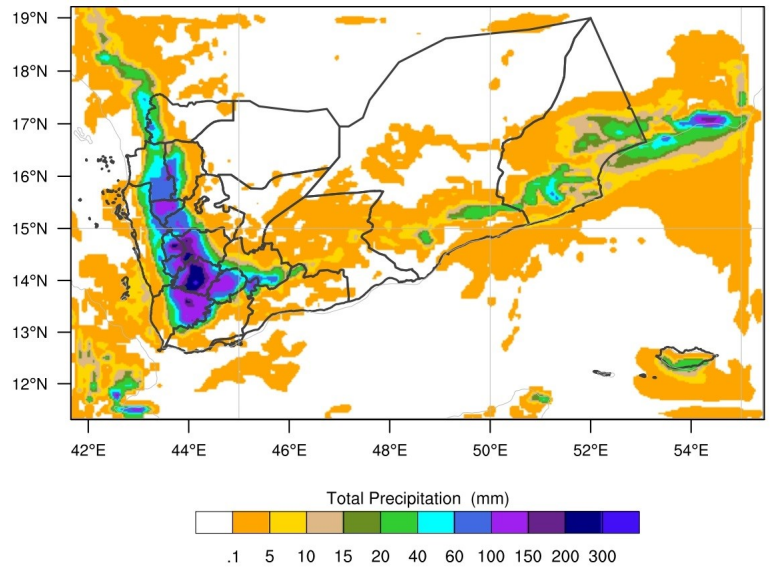
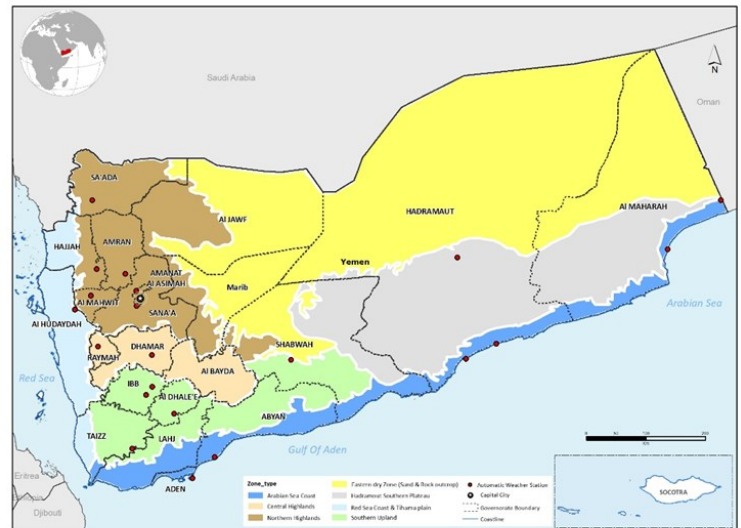


Fig. 8: Agro-ecological zones and location of observatory stations



¹<https://reliefweb.int/report/yemen/flash-floods-yemen-compound-crisis-women-and-girls>

²<https://www.fao.org/ag/locusts/common/ecg/1914/en/DL539e.pdf>

Sources:

- Primary data are sourced from the Civil Aviation and Meteorology Authority (CAMA), Ministry of Agriculture and Irrigation (MAI), and FAO Global Information Early Warning System (GIEWS)
- Vegetation indicators are sourced from FAO GIEWS and are based on 10-day vegetation data from the METOP-AVHRR sensor at 1 km resolution (2007 and after). Data at 1 km resolution for the period 1984-2006 are derived from the NOAA-AVHRR dataset at 16 km resolution <http://www.fao.org/giews/earthobservation/country/index.jsp?lang=en&code=YEM#> and the European Union's anomaly hotspots of agricultural production (ASAP)
- Rainfall estimates (RFE2) are sourced from the Climate Prediction Centre (CPC) of The National Oceanic and Atmospheric Administration (NOAA)

Technical Partners

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Resource Partner



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III. VARIATIONS OF RAINFALL AND NDVI

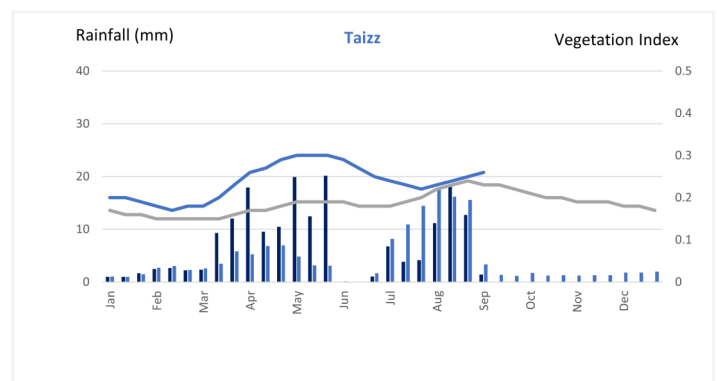
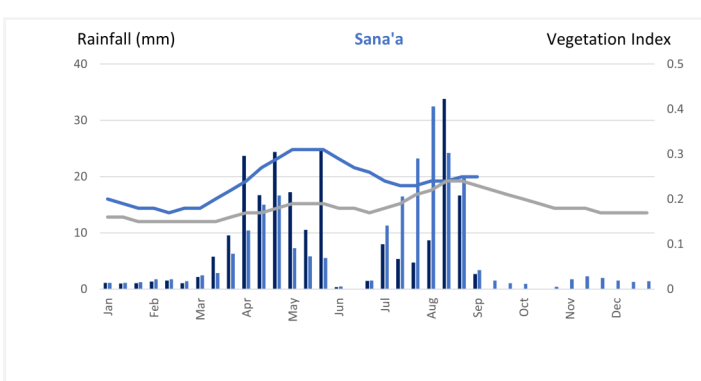
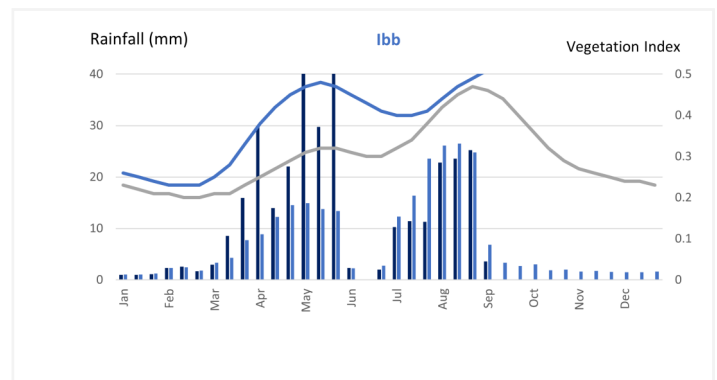
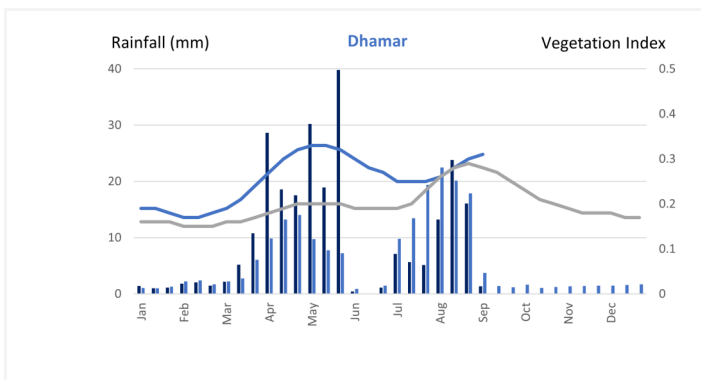
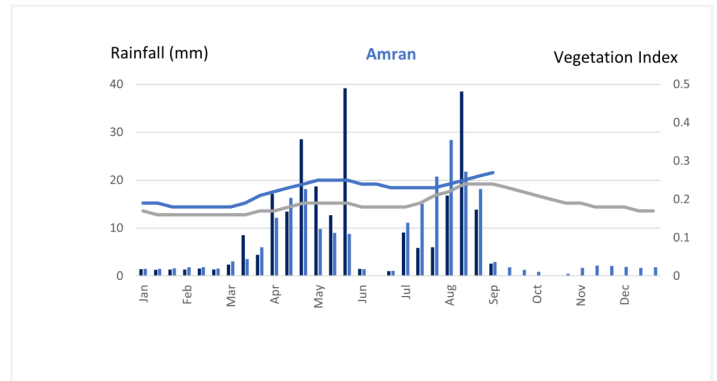
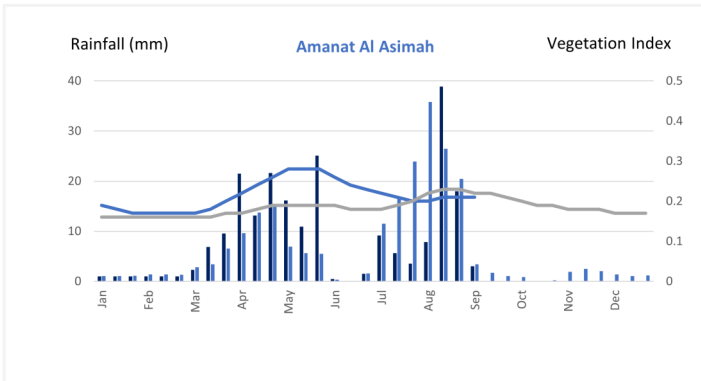
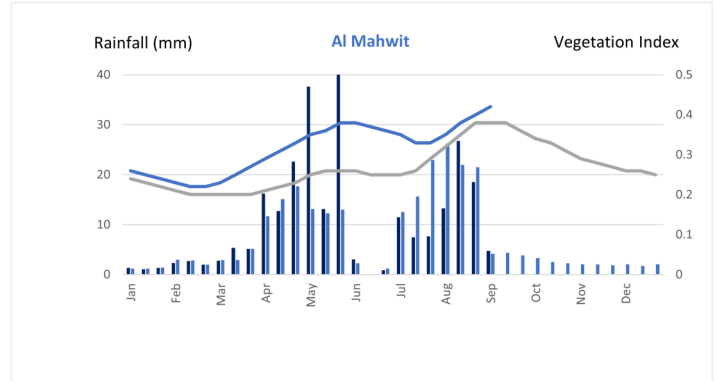
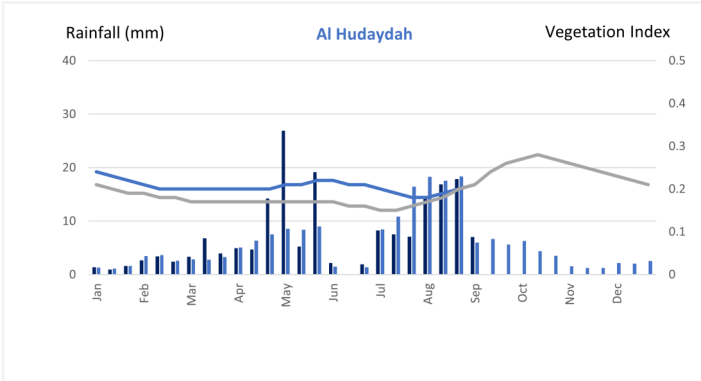
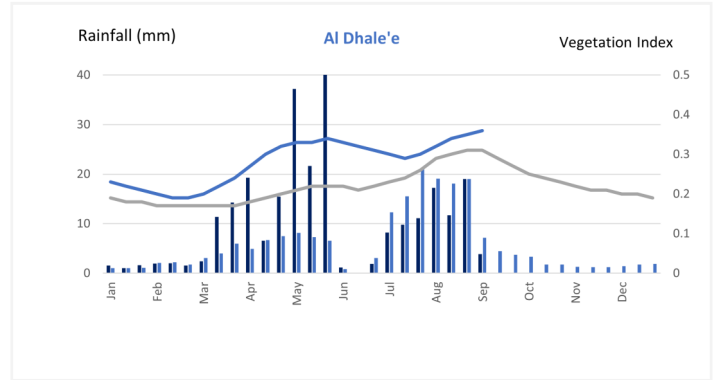
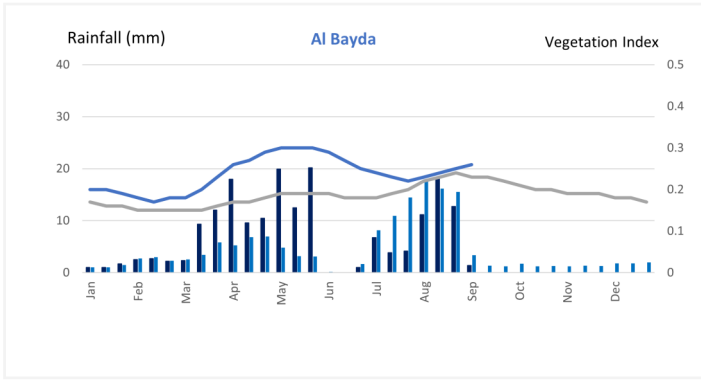
AGROMETEOROLOGICAL UPDATE

Rainfall STA (2009 - 2022)

Rainfall 2022

NDVI 2023

NDVI STA (2009 - 2022)



AGROMETEOROLOGICAL UPDATE

Table 1: Observed Station Data: Rainfall and Temperature

Governorate	Station	Rainfall (mm)	Temperature (°C)	
		Monthly	Max	Min
Abyan	Al Kood	-	-	-
Aden	Aden	-	39.9	29.7
Al Dhale'e	Al Dhala	-	-	-
Al Hudaydah	Al Kaden	38	43.4	24.6
Al Hudaydah	Al Hudaydah	38	40.5	27.2
Al Jawf	Al Jouf	3	40.2	22.4
Al Maharah	Algaidha	0	35.5	21.6
Al Maharah	Serfeet	110	26.7	20.2
Al Mahwit	Almahweet	250	29.2	13.0
Amanat Al Asimah	CAMA/YMS Office	85	-	-
Amanat Al Asimah	Al-Asbahi	64	-	-
Amanat Al Asimah	Aljamaah	-	34.0	13.0
Amanat Al Asimah	Alhasba	-	-	-
Amanat Al Asimah	Baghdad	103	-	-
Amanat Al Asimah	Shamlan	42	-	-
Amanat Al Asimah	Sawan	9	-	-
Amanat Al Asimah	Al Erah	-	-	-
Amran	Amran	15	32.6	12.6
Amran	Hamdah	-	-	-
Amran	Qa'a Alboon	9	32.0	13.0
Amran	Amran Gov.	-	-	-
Amran	Eial Sourih	-	-	-
Dhamar	Dhamar	205	29.5	9.8
Dhamar	AREA-HQ	-	-	-
Dhamar	Rosabh	115	-	-
Dhamar	Dhamar (MAI)	205	30.0	10.0
Dhamar	Maqar-Alhya'a	98	28.0	9.0
Dhamar	Qa'a Shrah	-	-	-
Hadramaut	Al Mukalla	-	-	-
Hadramaut	Al Shaher	-	38.3	26.3
Hadramaut	Seiyoun	2	44.7	23.2
Hadramaut	Assom	-	-	-
Hadramaut	Tarim	-	-	-
Hadramaut	Sah	-	-	-
Hadramaut	Aliotoof	-	-	-
Hadramaut	Seyun Pr	-	-	-
Hadramaut	Seyun Re	-	-	-
Hadramaut	Hawrah	-	-	-
Hadramaut	Doaan	-	-	-
Hadramaut	Shibam	-	-	-
Hadramaut	Ard Makharsh	-	-	-
Hadramaut	Brom	-	-	-
Hajjah	Hajjah	123	32.2	18.0
Ibb	Alsaddah	217	27.7	11.6
Ibb	Ibb	305	29.0	13.0
Ibb	Ibb (MAI)	500	29.0	14.0
Raymah	Al Jabeen-Rimah	58	26.6	11.2
Sa'ada	Sadah	107	34.5	11.7
Sana'a	Sana'a	89	34.0	12.7
Sana'a	Al Erah	-	-	-
Sana'a	Sanhan	33	-	-
Shabwah	Ataq	26	41.7	20.2
Socotra	Socatra	-	35.6	26.0
Taizz	Al Maafer	76	-	-
Taizz	Mashra and Hadnan	21	-	-
Taizz	Al Modafar	17	-	-
Taizz	Al Qahera	18	-	-
Taizz	Wadi Arafat	13	-	-
Taizz	Hawban Qadas	0	-	-
Taizz	Al Akahel	14	-	-
Taizz	Sabar almoadh	9	-	-
Taizz	Airport	70	33.5	20.9