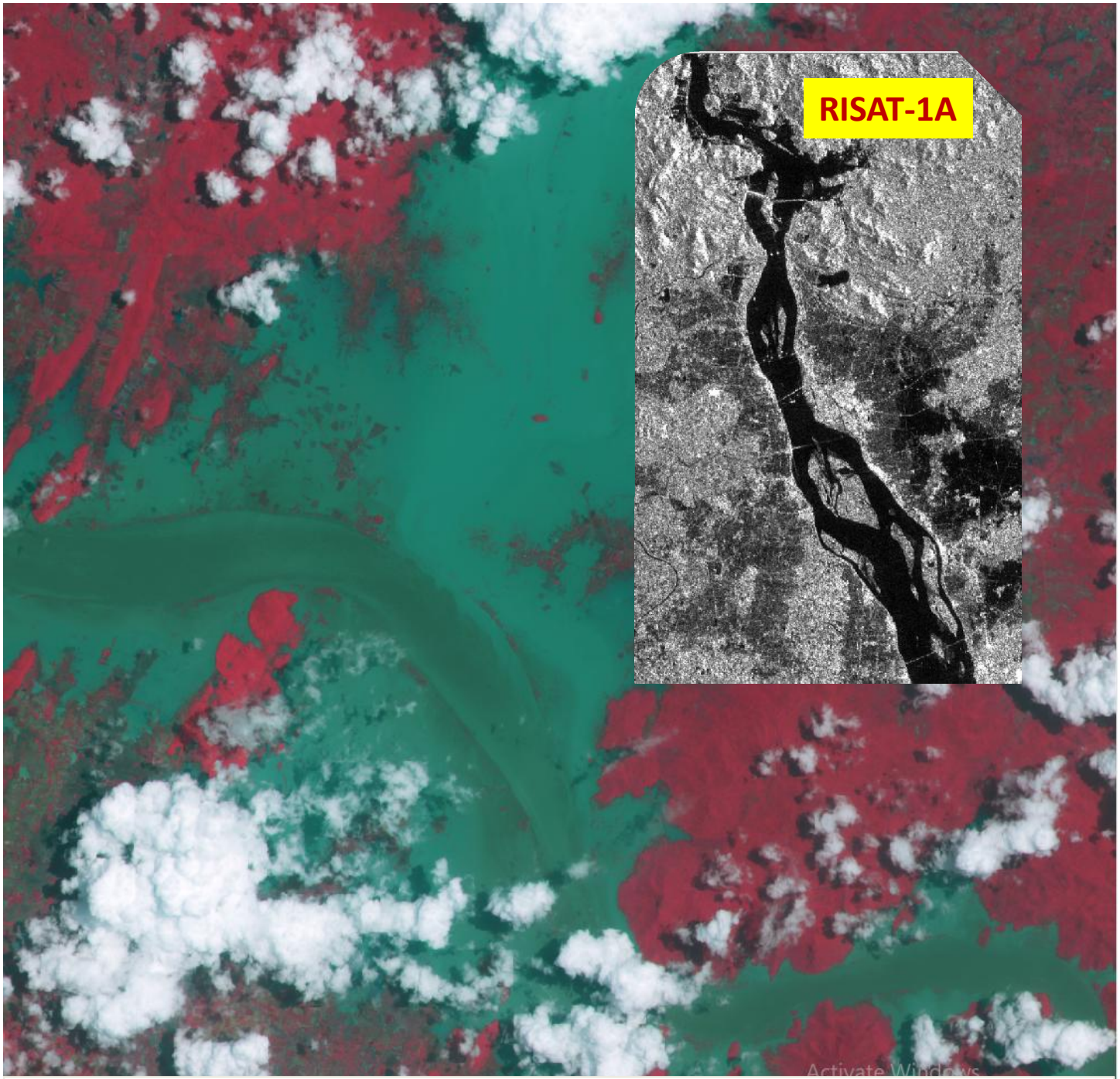
Satellite based Analysis on Godavari Floods - Flood Mapping & Monitoring in Andhra Pradesh State



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August 2022

Disaster Management Support Group
National remote Sensing Centre (NRSC)
Indian Space Research Organization (ISRO)
Dept. of Space, Govt. of India
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Telangana State, India.

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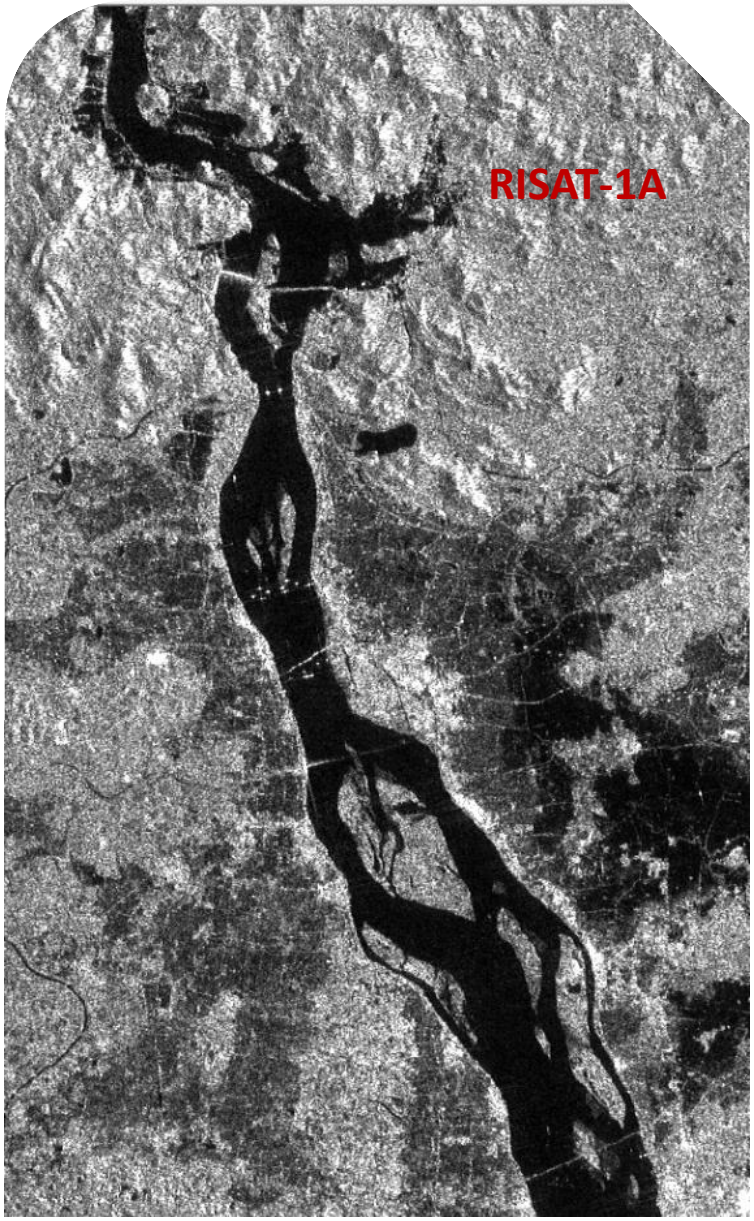

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Document Control Sheet

1.	**Security Classification**	**Official**		
2.	Distribution	NRSC/ISRO, Andhra Pradesh State Govt, MHA,GOI, NRSC website		
3.	Report /Document	Version – 1.0 Dated.05, August, 2022		
4.	Report Type	Study Report		
5.	Document Control No.	NRSA- RSA-DMSG-FMRAD-AUG-2022-tr-2073-v1.0		
6.	Title	Satellite based Analysis on Godavari Floods - Flood Mapping & Monitoring in Andhra Pradesh State		
7.	Particulars of collation	Pages: 65; Figures: 15; Tables : 2, Annexures-2		
8.	Author(s)	Data Analysis and Interpretation : Aakash Mohan , S/E-SD, FMRAD Asiya Begum , S/E-SE, FMRAD Technical Support : Subrata Mondal, Draughtsman C-II Shaikh Rafik Ramjan , Draughtsman C-II		
9.	Affiliation of authors	National Remote Sensing Centre		
10.	Scrutiny mechanism	Report Prepared by Dr A V Suresh Babu, Head-FMRAD	Reviewed by Dr KHV Durga Rao GH-DMSG	Approved by Dr.V.V.Rao DD-RSAA
11.	Originating unit	National Remote Sensing Centre		
12.	Sponsor(s)	National Remote Sensing Centre (DMSP)		
13.	Date of Project Initiation	14th July 2022		
14.	Date of Publication	5th August 2022		
15.	Abstract:			

Heavy rainfall and runoff in upstream catchment of Godavari river basin covered in Andhra Pradesh & Telangana during 2nd week of July 2022 and is resulted into floods in Godavari river. Godavari river that passes through Telangana State and the villages adjacent to the Godavari river are prone to flood inundation during heavy rainfall and runoff into river. NRSC has initiated to acquire the satellite data and map the flood inundation since 14th July 2022 to 3rd August 2022 for providing the near real flood inundation maps to the State and Central Disaster Management Support organizations. Summary of study is provided in this report.

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1. Introduction

Heavy rainfall and runoff was reported in catchment of Godavari river basin during 2nd & 3rd week of July 2022 leading to floods in Karnataka and Telangana States. Godavari and Sabari rivers passes through Andhra Pradesh State and the villages adjacent to these rivers are prone to flood inundation during heavy rainfall and runoff into rivers. In view of the above scenario, NRSC has initiated to acquire the satellite data and map the flood inundation areas since 14th July 2022 to 3rd, August 2022 for providing the near real flood inundation maps to the State and Central Disaster Management Support organizations.

NRSC has followed up with the rainfall pattern, predicted daily and one day forecast runoff scenarios on a daily basis and planned for acquisition of satellite data during the flood duration to support the Disaster Management Supports organizations as part of Indian Research Space Research Organisation (ISRO)'s Disaster Management Support Programme (DMSP). The report describes the summary of the study carried out on flood mapping and monitoring using multi-sensor satellite data across the flood duration period. As the floods have occurred over larger areas, several villages were likely to be submerged / partially submerged, the Support of International Disaster Charter is also called for acquisition of satellite data from international satellites apart from using Indian Remote Sensing (IRS) satellites.

2. Areas prone to be affected due to flood Inundation

Godavari river is completely passing through East Godavari and west Godavari districts and there are several habitations in the near reach of river stretches which are definitely prone to flood inundation and there by loss of property and is necessary to leave the locations during the flooding period when ever rivers are flowing beyond danger and high flood level

NRSC monitors the spatial rainfall pattern and the resultant predicted runoff on a daily basis, CWC measured water levels in rivers at established river gauge stations and plans for acquisitions of satellite datasets to monitor the river courses and predicted flood occurrences at qualitative / quantitative levels.

3. Rainfall Pattern & Analysis

India Meteorological Department (IMD) Provides Point Data on Rainfall. The IMD stations across the Godavari river catchment is depicts through few stations as shown Figure. 1.

Flood occurrence due to Godavari river is observed mostly in East & West Godavari districts. Figure.1. shows the Cumulative normal rainfall and cumulative actual rainfall during June - July 2022 . It is observed that these districts have experienced very high rainfall of 400-800mm against the normal rainfall of 200-400m whereas in Krishna district, the rainfall is 200-400mm in majority of the places. Rainfall observation points are shown in Figure. 3

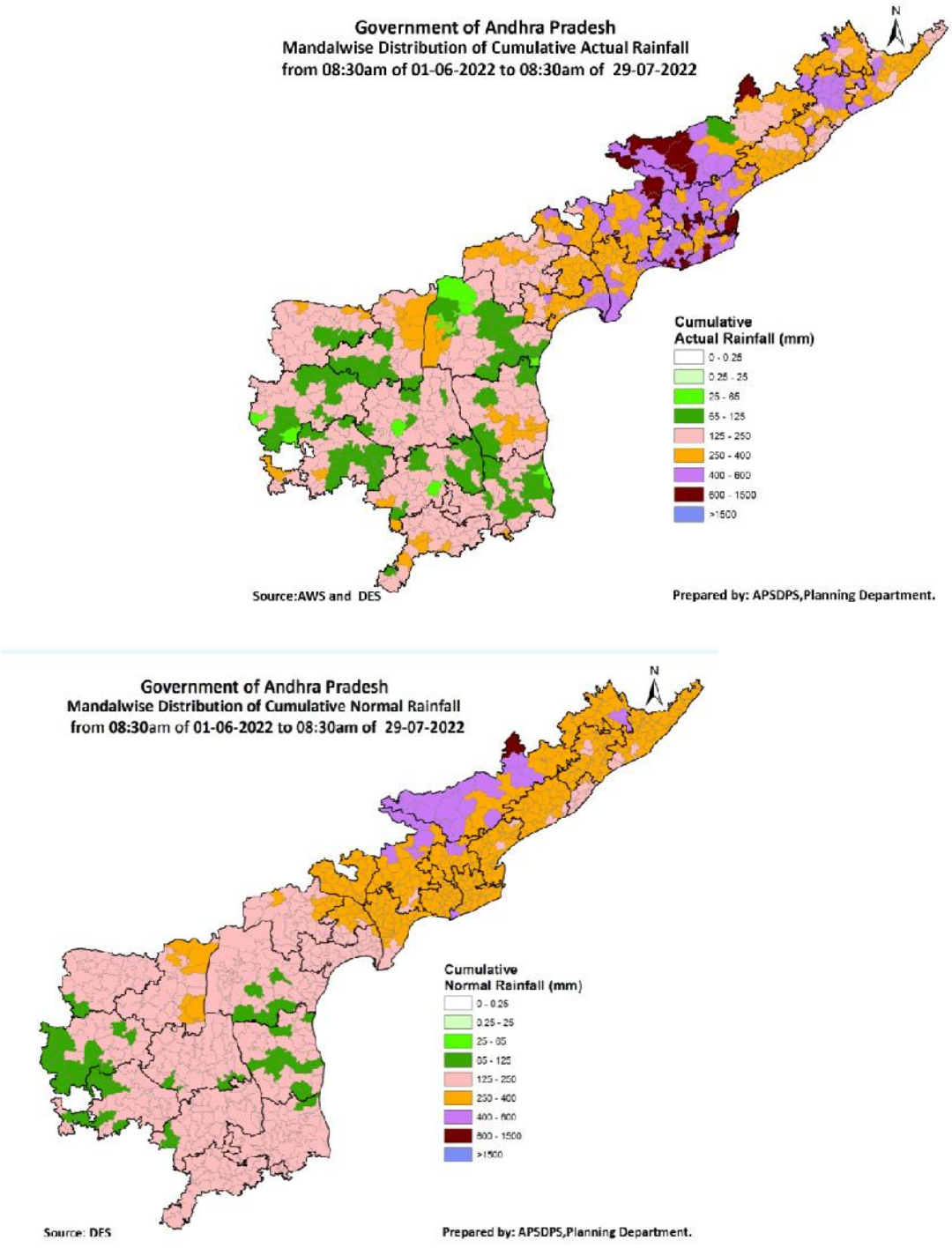


Figure.1. Cumulative and normal & actual Rainfall over Andhra Pradesh during June –July 2022 (Source : IMD)

Figure2. shows that the deviation in rainfall is excess beyond 20-60% excess in East & West Godavari districts. Flood Occurrence due to Godavari river is observed mostly in East & West Godavari districts. It appears to be the one of main cause for Godavari floods in Andhra Pradesh State

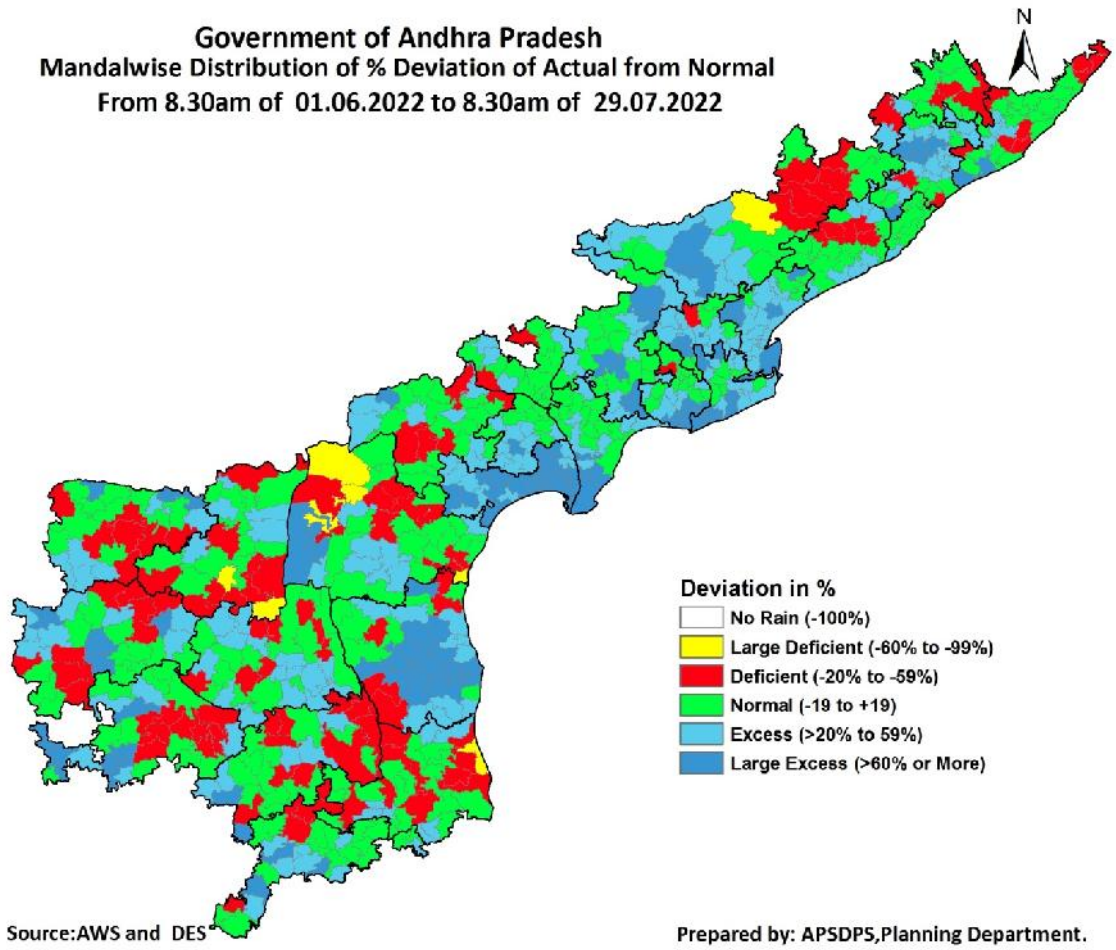


Figure.2. Deviation in actual rainfall over Andhra Pradesh State
(Source : IMD)

IMD Rainfall observation points are shown in Figure. 3. Rainfall status at Perur, Kaleswaram, Kunavaram, Konta, Bhadrachalam are provided in Figures 3(a), 3(b), 3c, 3(d) and 3(e)

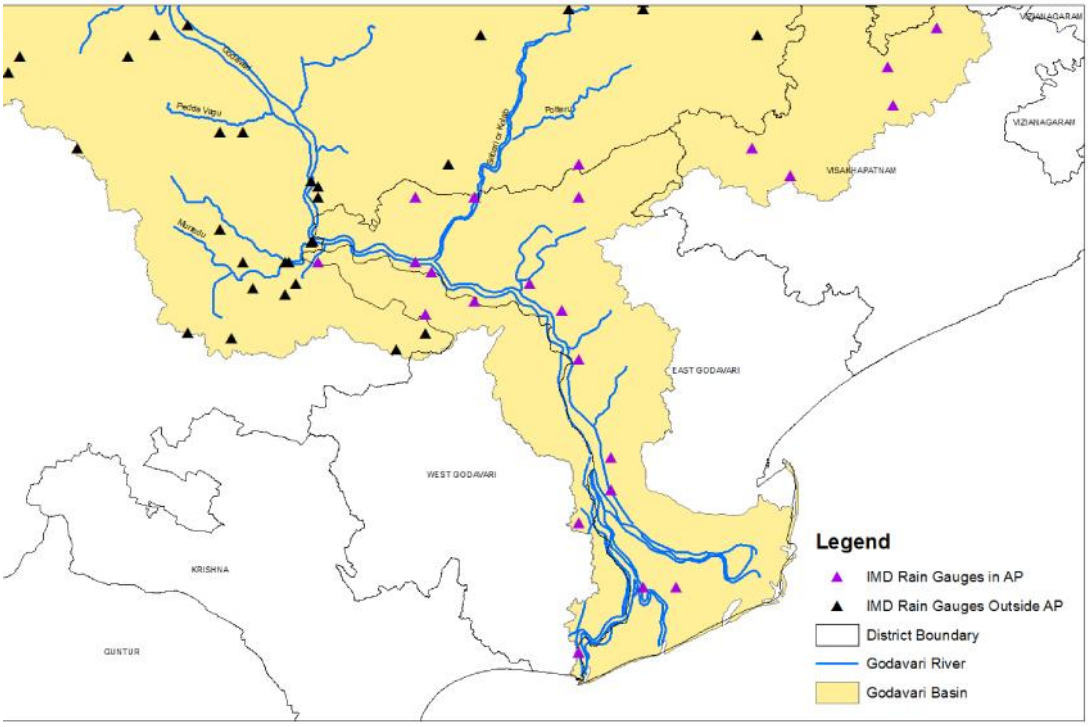


Figure.3. IMD Rainfall observation points
(Source : IMD)

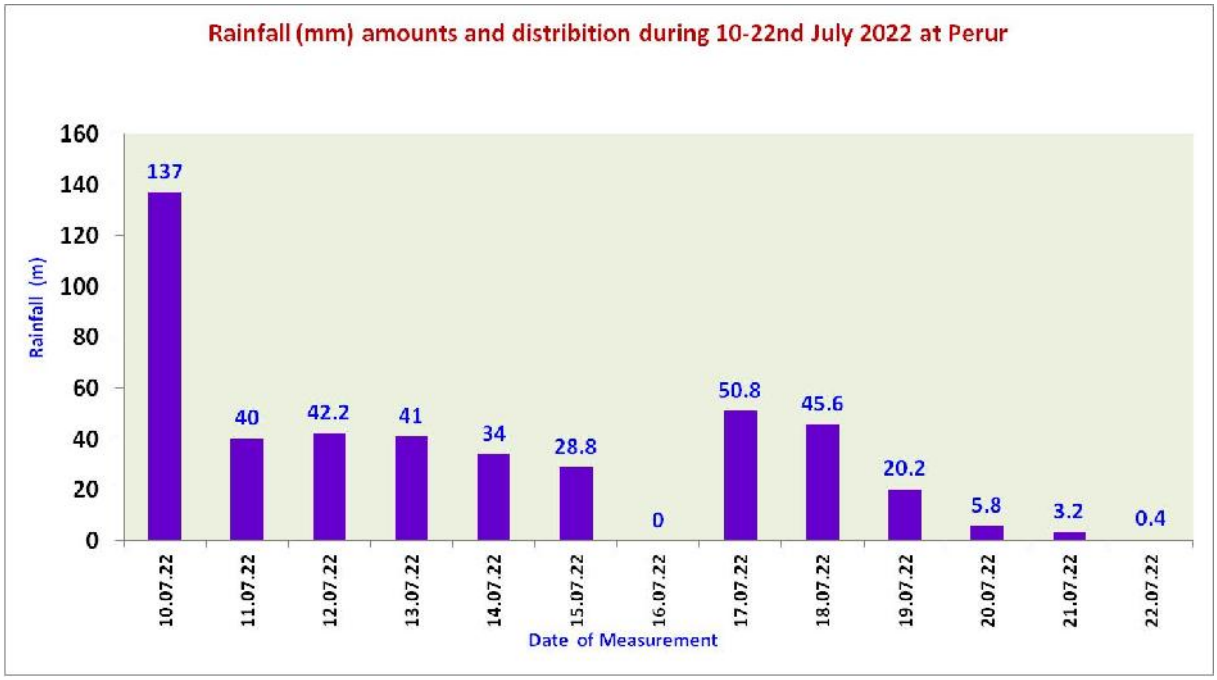


Figure.3a. Rainfall Observations during 10-22nd July 2022 at Perur (Source : IMD)

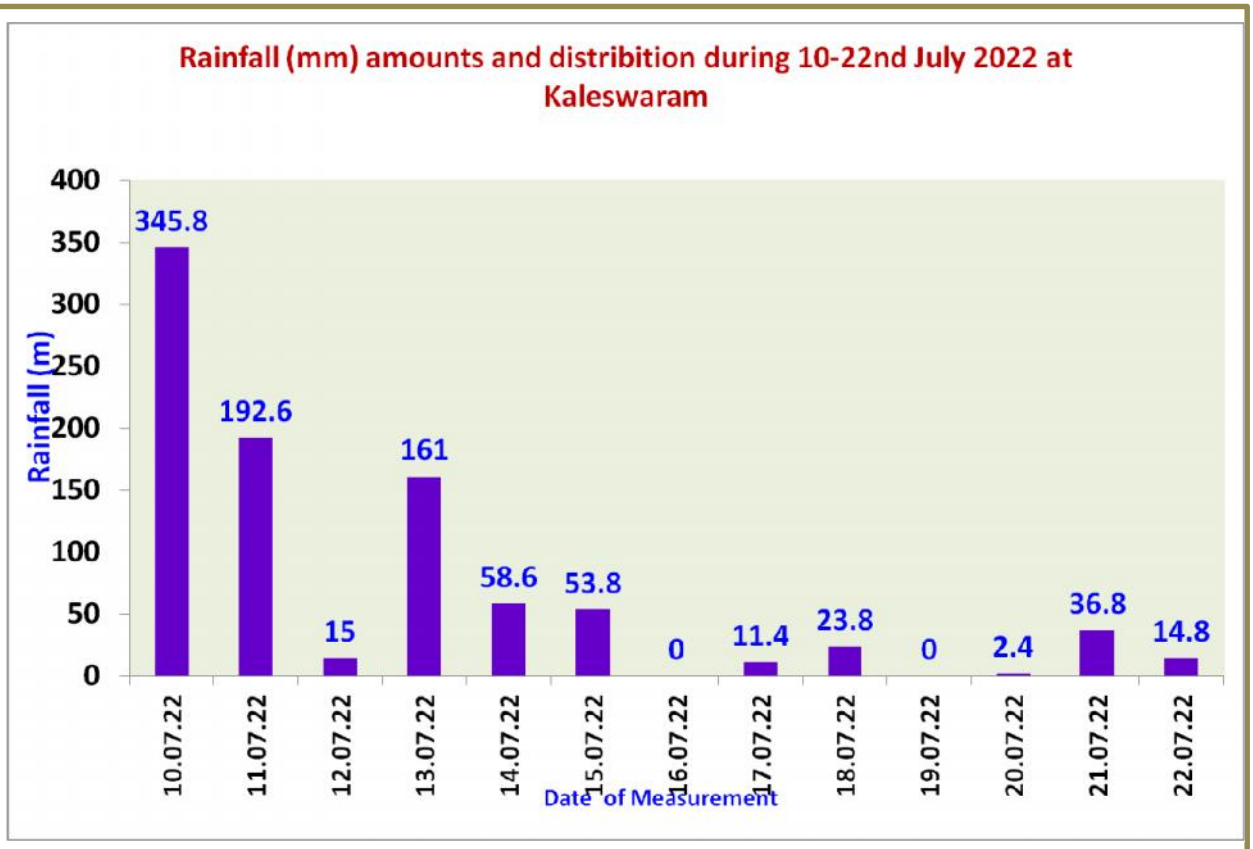


Figure.3b. Rainfall Observations during 10-22nd July 2022 at Kaleswaram (Source : IMD)

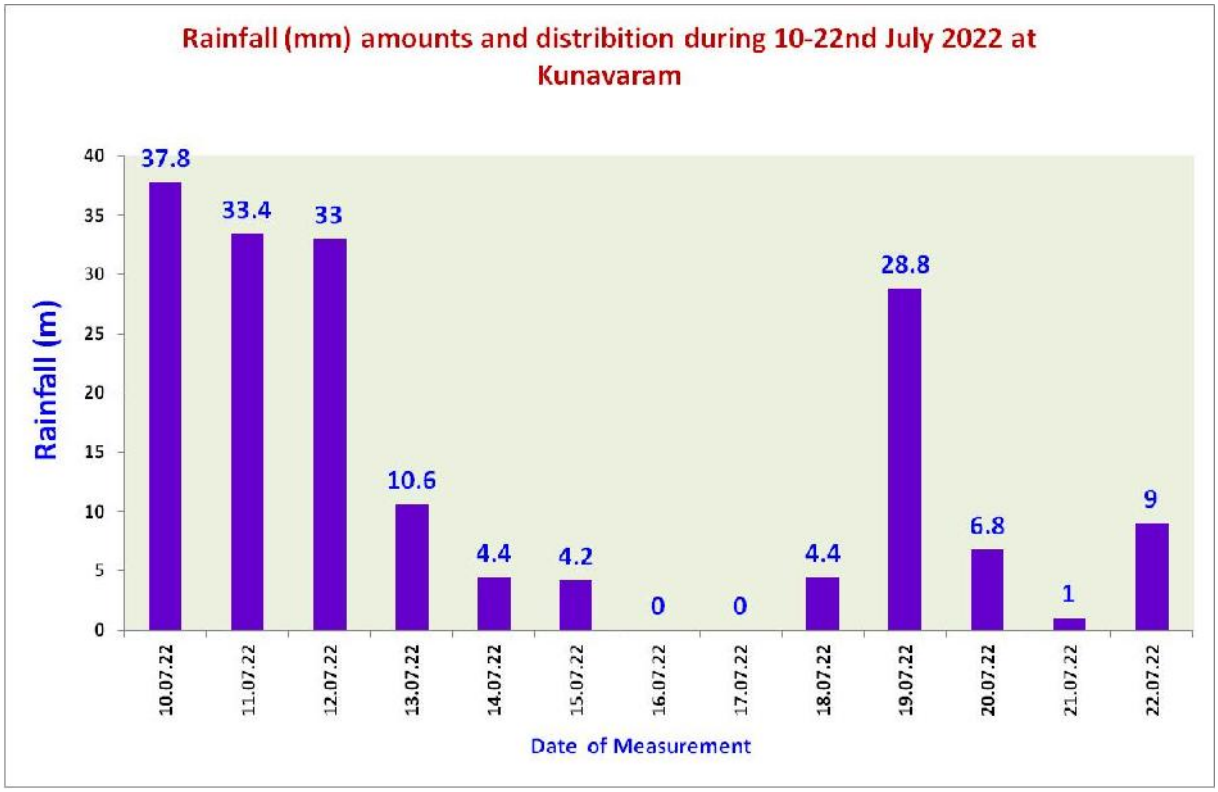


Figure.3c. Rainfall Observations during 10-22nd July 2022 at Kunavaram (Source : IMD)

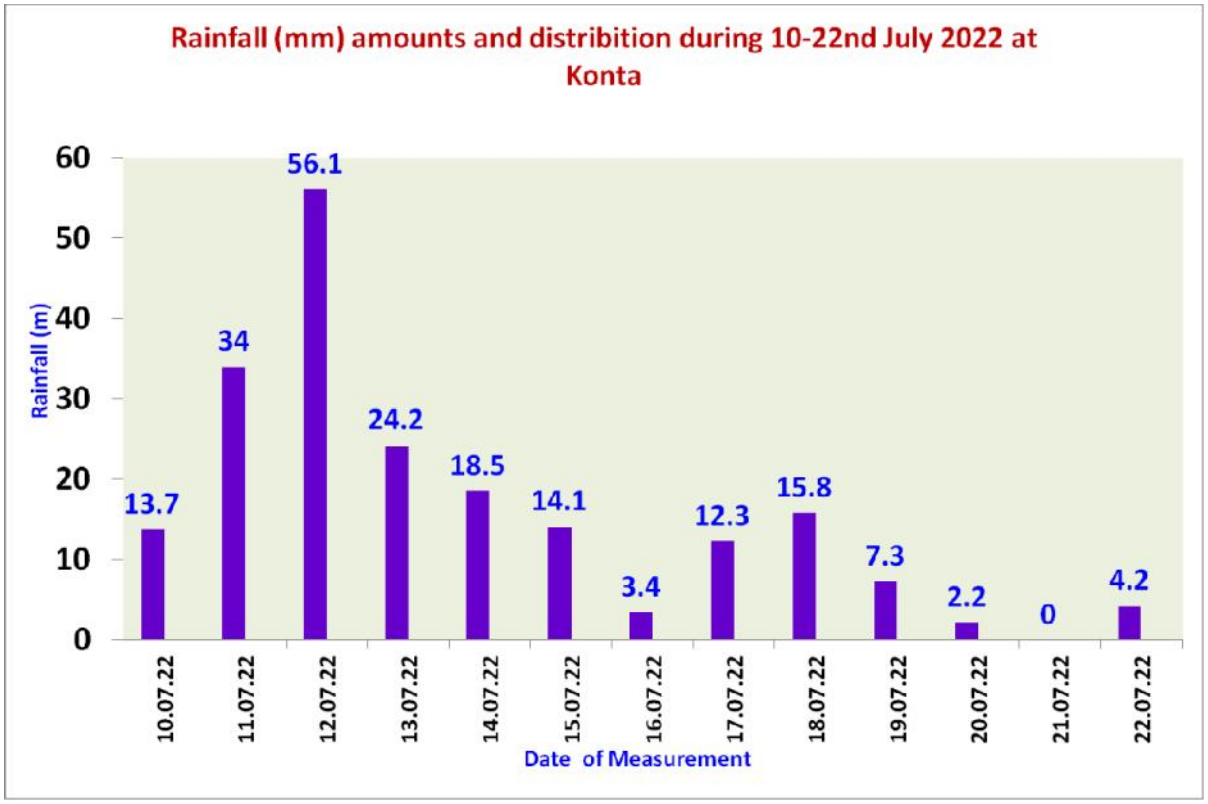


Figure.3d. Rainfall Observations during 10-22nd July 2022 at Konta (Source : IMD)

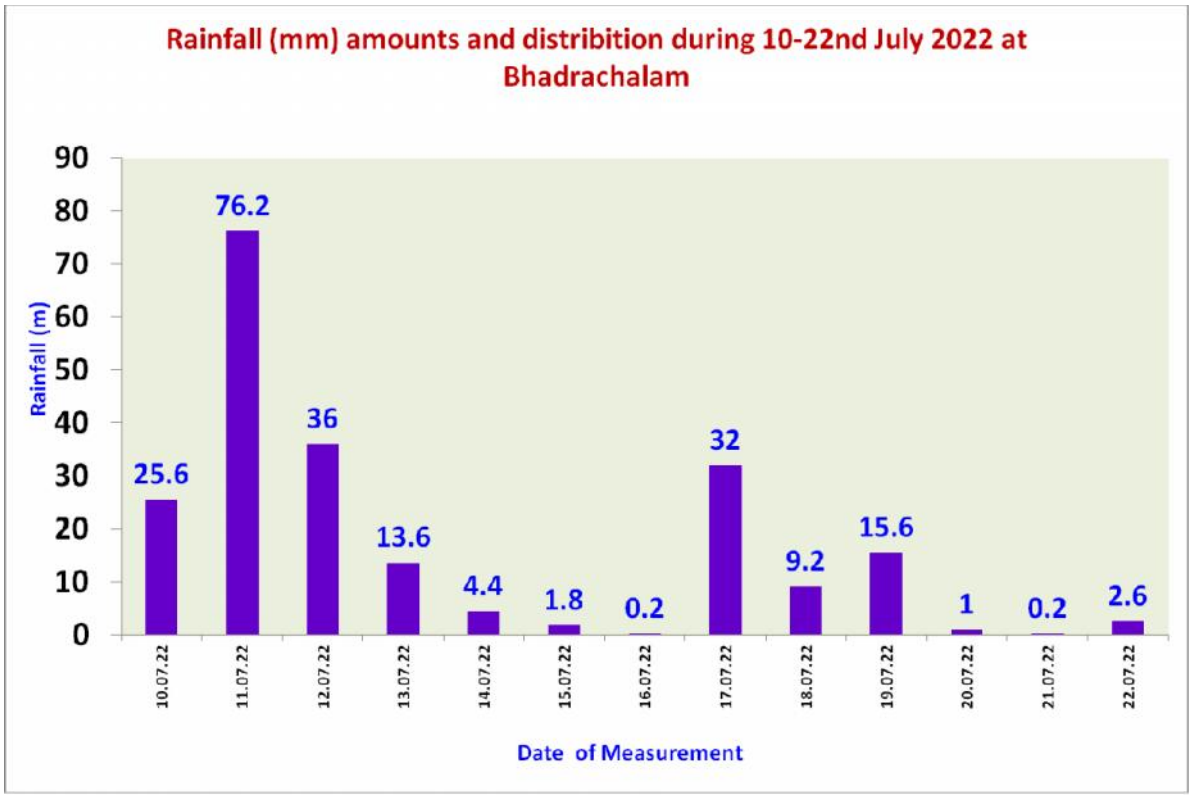


Figure.3e. Rainfall Observations during 10-22nd July 2022 at Bhadrachalam (Source : IMD)

4. Runoff Estimations in River Catchments and Flood Early Warning

4.1. Runoff Estimations

Runoff Maps (current and one day forecast) of the country is computed using slope corrected curve number grids of different Antecedent Moisture (AMC) conditions. All India Curve Number (CN) grid is prepared using 1:250000 scale Landuse / Landcover (LULC), Soil Map from NBSS&LUP, and 30m CARTO Digital Elevation Model (DEM). Model computes 5 day Antecedent Moisture condition (AMC) condition based on GPM/IMD-GPM Merged/ GEFS (used in order, which is decided based on availability) rainfall source data. GPM/IMD-GPM Merged/GEFS rainfall data is used for current day runoff calculation and GEFS data is used for calculating one day forecast runoff in the country (previous day 8:30AM to current day 8:30 AM rainfall is considered as current day rainfall for example current date is 02-Jul-2022 then rainfall is used from 01-Jul-2022 08:30 AM to 02-Jul-2022 08:30 AM and runoff is calculated accordingly). The runoff grids are computed and disseminated to know overall runoff pattern across the country to estimate the probability of forthcoming flood situation. These are calculated based on satellite based rainfall. National Database for Emergency Management (NDEM) Portal of NRSC/ISRO provides daily runoff at 3'x3' Grid on daily basis and also one day forest is also provided. The source for the data captured in this report is www. ndem.nrsc.gov.in.

Continuous observations and analysis has been made on daily and cumulative runoff which could result into inflows into Godavari and its tributaries.

Figure. 4(a) indicates the Cumulative runoff during 10-14th, July 2022 in parts of Godavari river basin. This is varying between in 50-150mm during the period in many parts and is a very much critical period for saturation of soils and resulting into runoff and flood. The upstream of reach of Godavari beyond East and West Godavari has resulted into huge flows and lead to the floods. Further, it is reduced to the cumulative runoff of 10-50mm during 15-20th July 2022 (Figure 4b), 21-28th July 2022 (Figure 4c) and 15-28th July 2022. Figure 4(d) shows the cumulative runoff during 14-28th July (Figure 6) which very high which is in the order 150mm in upstream of East and West Godavari districts.

This is also evident through the simulated hydrograph where the discharges into the river at flood forecasting stations at Bhadrachalam and is described further here. (Figure.5)

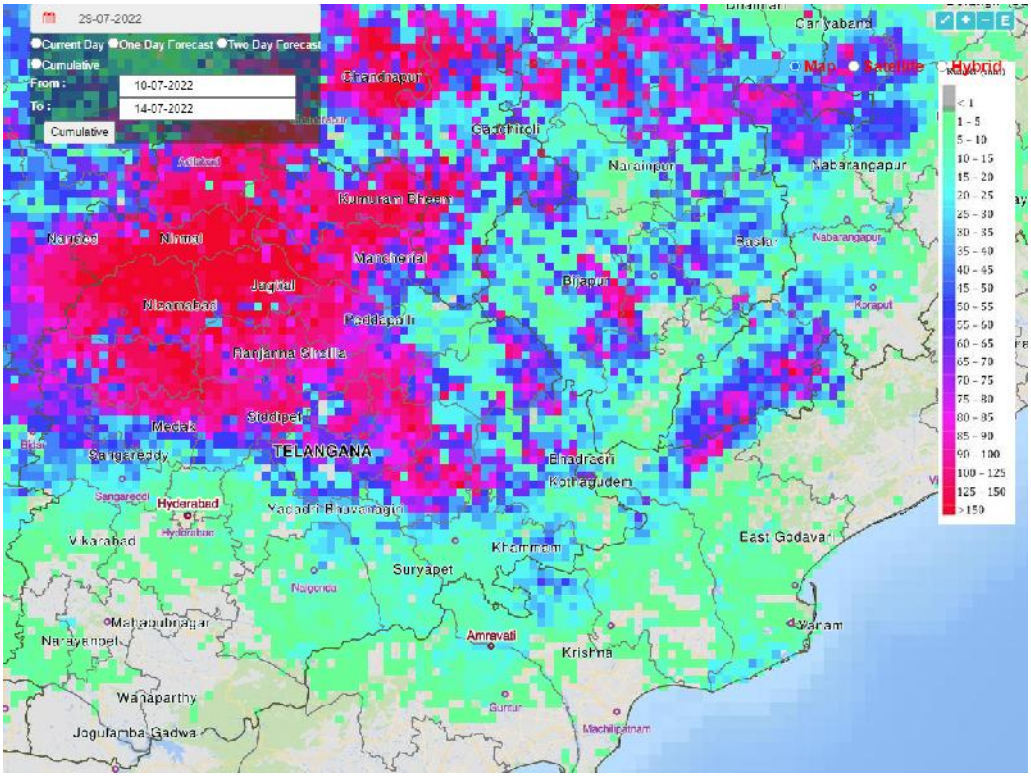


Figure.4(a). Cumulative runoff during 10-14th, July 2022 in parts of Godavari river basin (Source : www. ndem.nrsc.gov.in.)

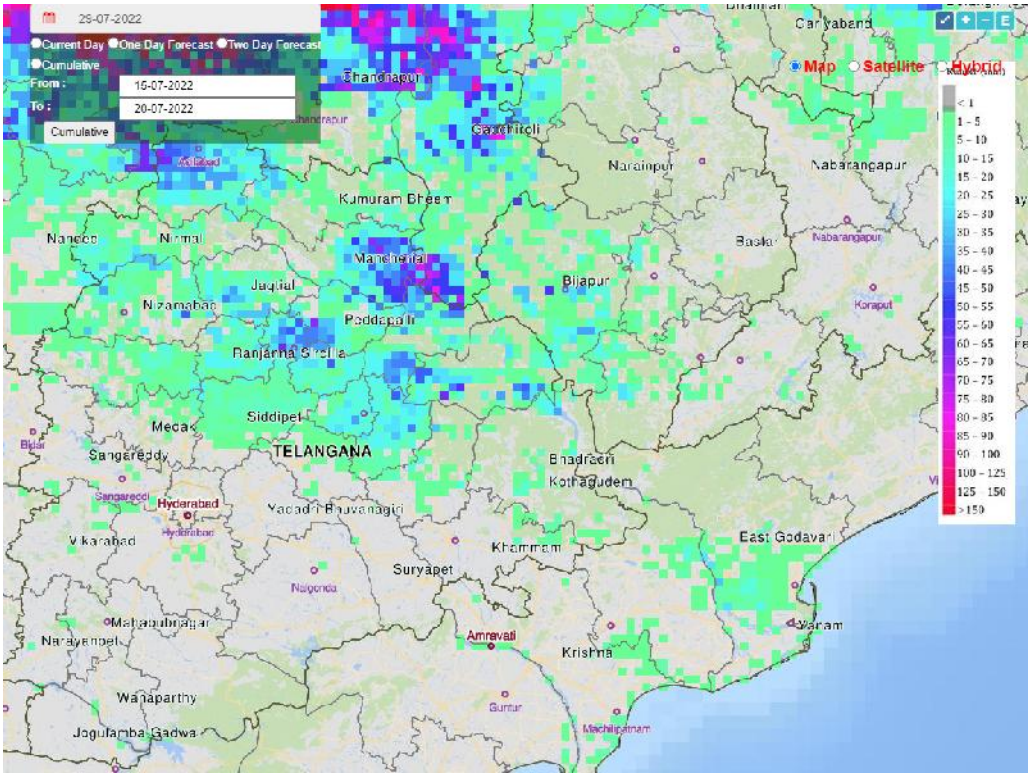


Figure.4(b). Cumulative runoff during 15-20th, July 2022 in parts of Godavari river basin (Source : www. ndem.nrsc.gov.in.)

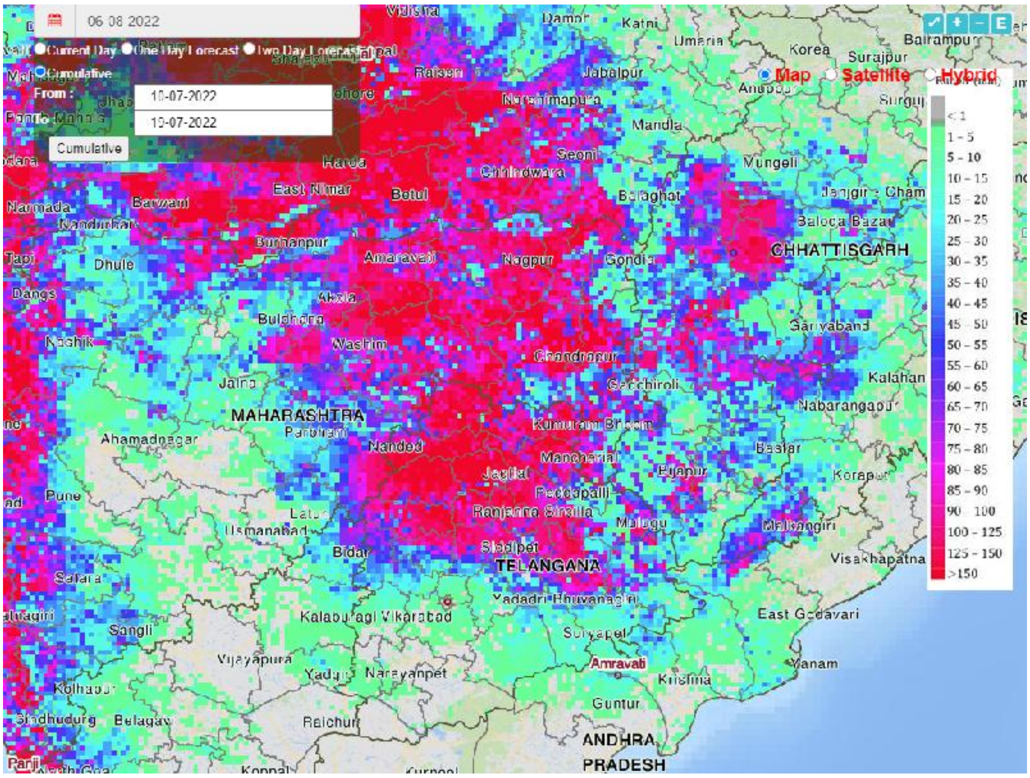


Figure.4(c). Cumulative runoff during 10-19th, July 2022 in parts of Godavari river basin (Source : www. ndem.nrsc.gov.in.)

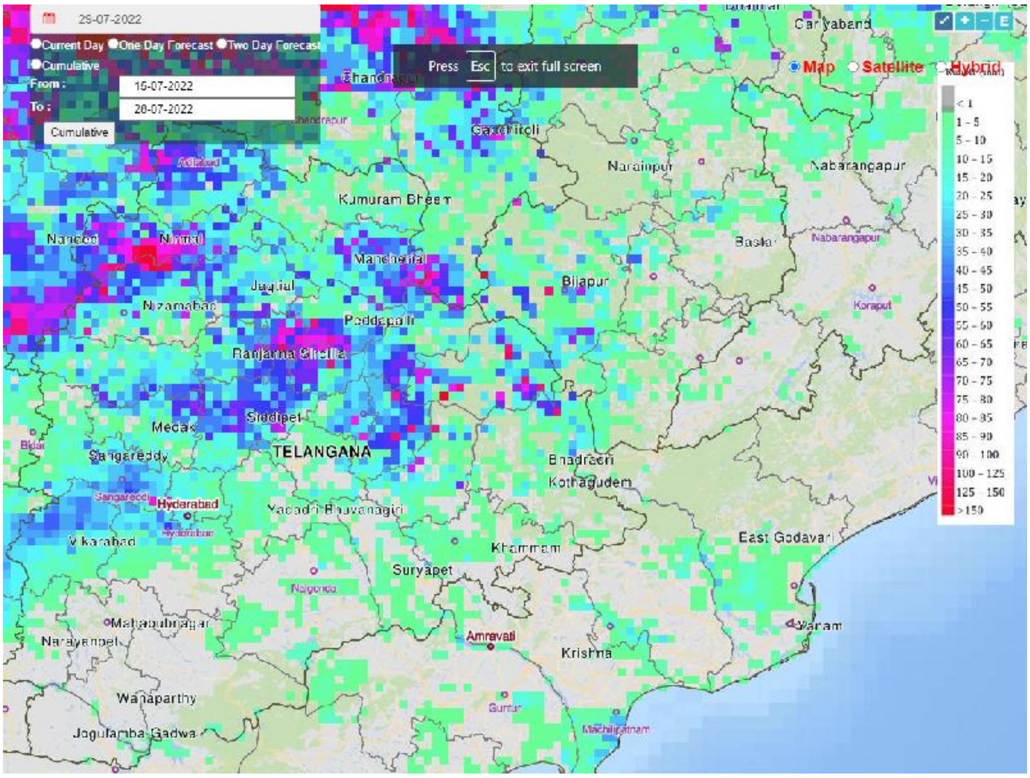


Figure.4(d). Cumulative runoff during 15-28th, July 2022 in parts of Godavari river basin (Source : www. ndem.nrsc.gov.in.)

4.2. Flood Early Warning

Spatial flood forecast model for Godavari river is developed under National Hydrology Project (NHP) is being run in real time with point rainfall data and WRF forecast rainfall data from India Meteorological Department (IMD). Flood Forecast results were provided with 48 Hrs lead time.

The satellite acquisitions are planned based early warning provide the lead time of 48 Hrs for enabling the flood inundation mapping and monitoring.

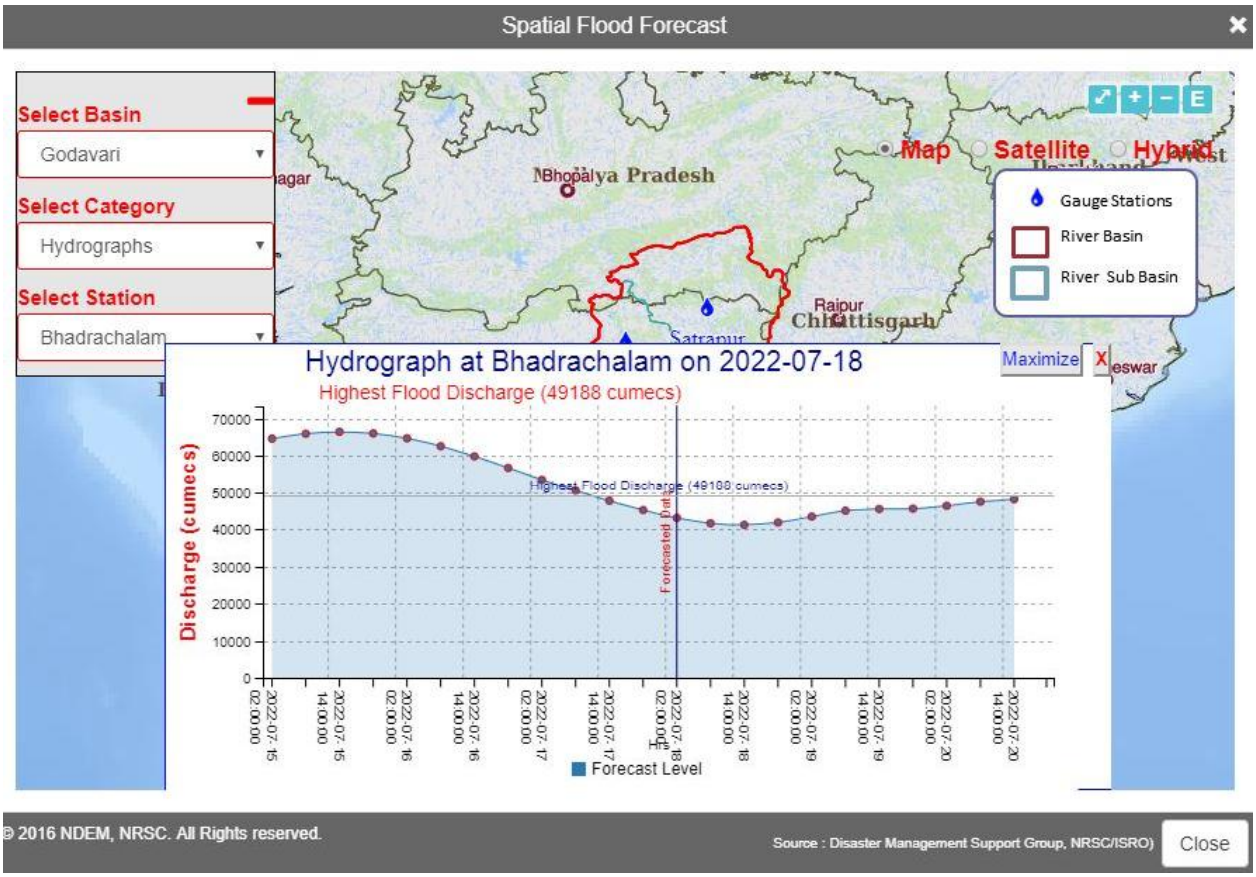


Figure.5 Hydrograph observed during 15th -20th July 2022 at Bhadrachalam

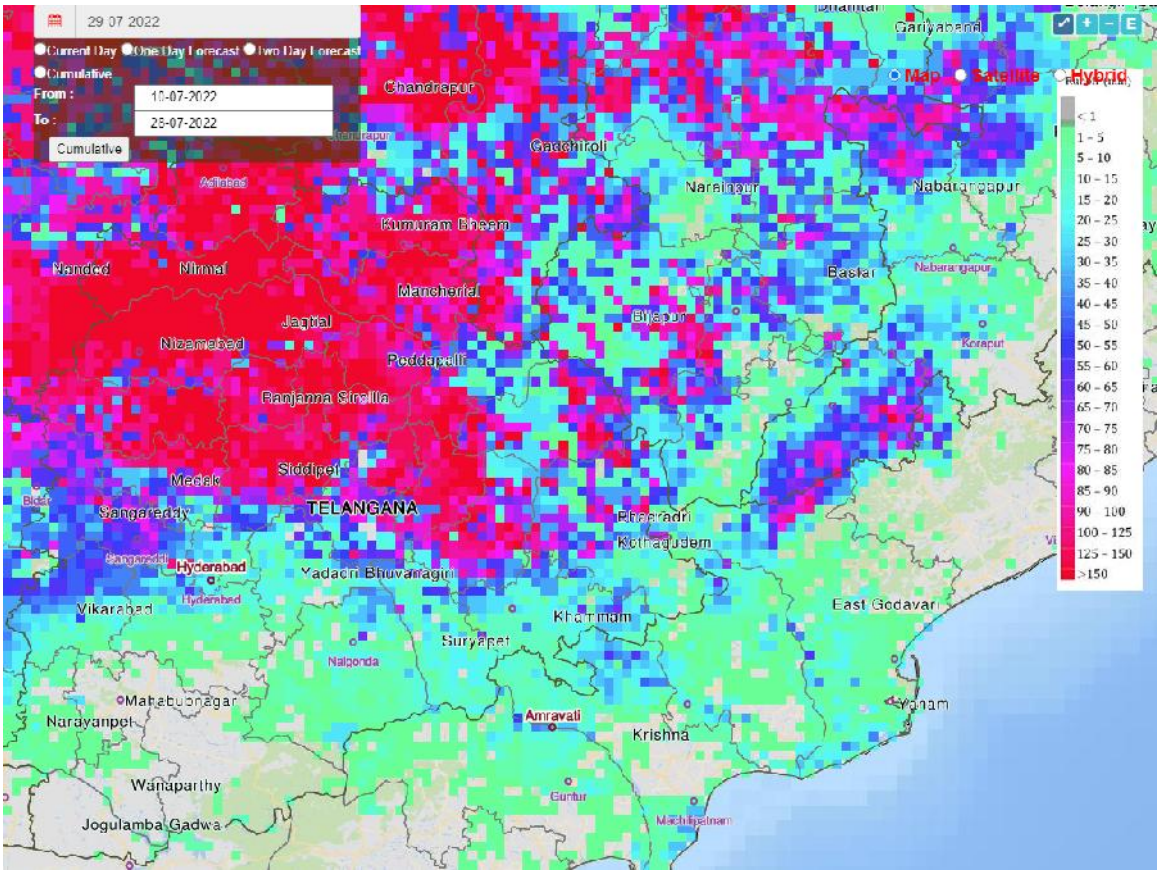


Figure.6. Cumulative runoff during 10-28th, July 2022 in parts of Godavari river basin (Source : www. ndem.nrsc.gov.in.)

4.3 . Monitoring of Water Level Gauge stations along Godavari River

CWC measures water levels at various gauge stations and provide the information and to understand the warning and danger levels across the river. Figure 6 indicates location of gauge points where in alerts are provided .

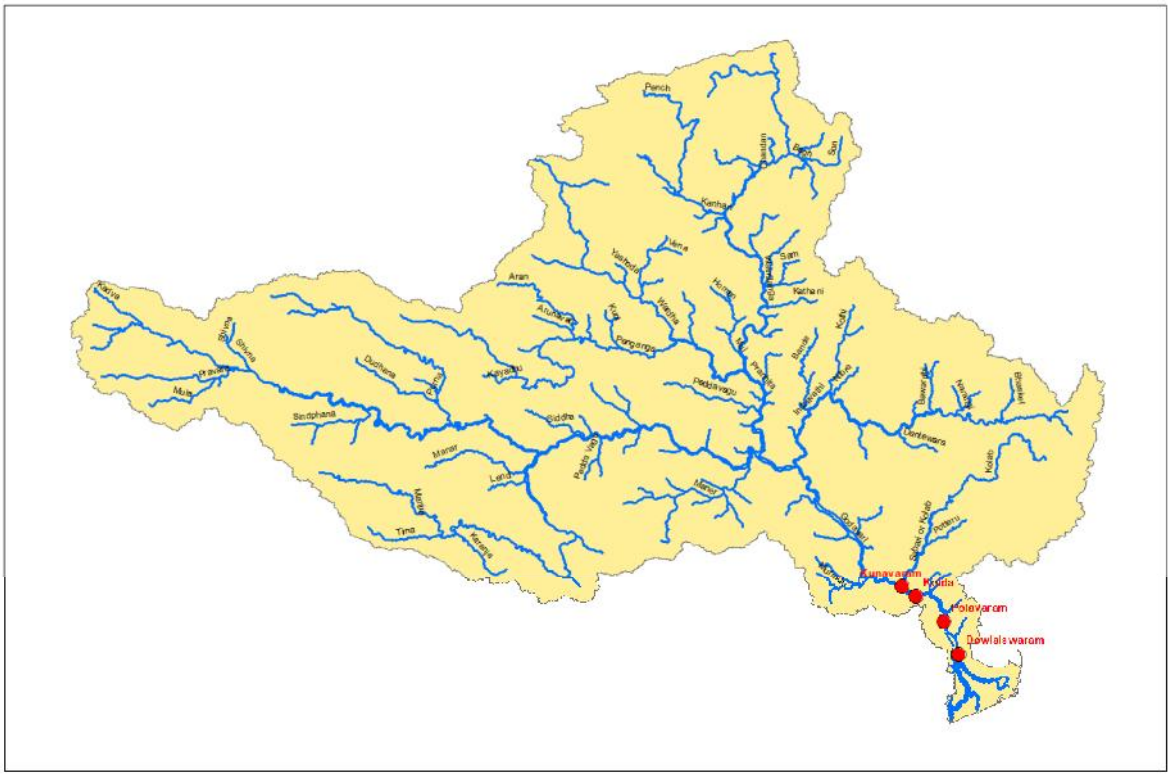


Figure. 7. Location of CWC Gauge Stations along Godavari river
(Source: CWC)

Figure 7(a) below indicate that the Water level has reached above Danger Level (39.24m) on 12th July 22 and is raised to 48.77m till 16th July 2022 and is continued beyond danger level at Kunavaram till 19th July 2022. (Source: CWC)

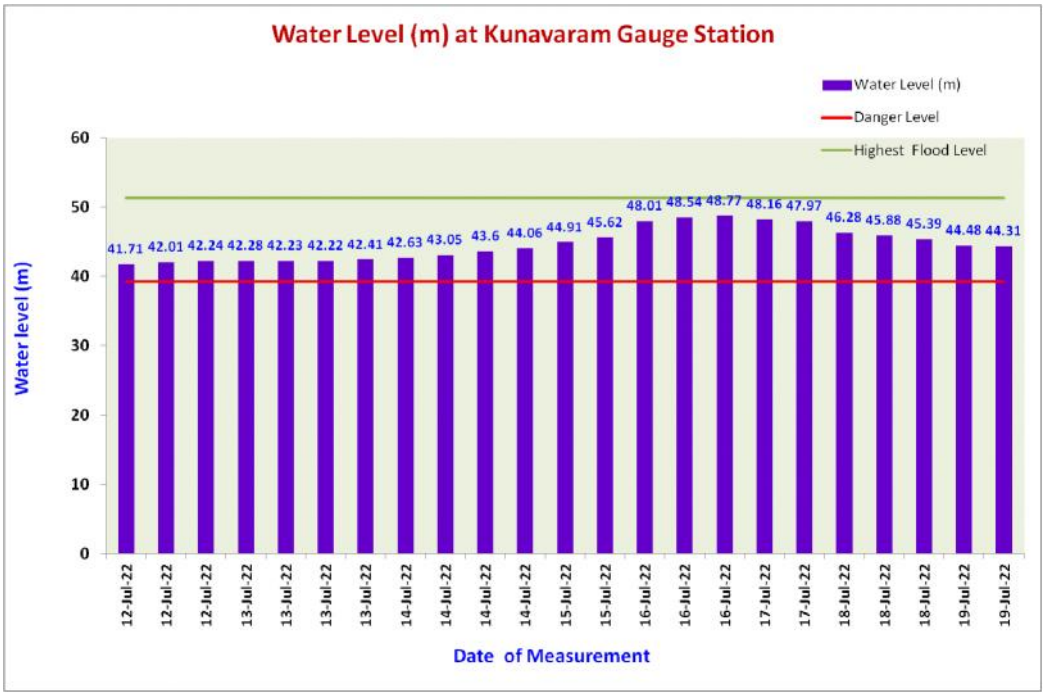


Figure 7(b) below indicate that the Water level has reached above Danger Level (16.08m) on 16th July 22 and is raised to 17.29m till 16th July 2022 and is continued beyond danger level at Dowlaiswaram till 19th July 2022. (Source: CWC)

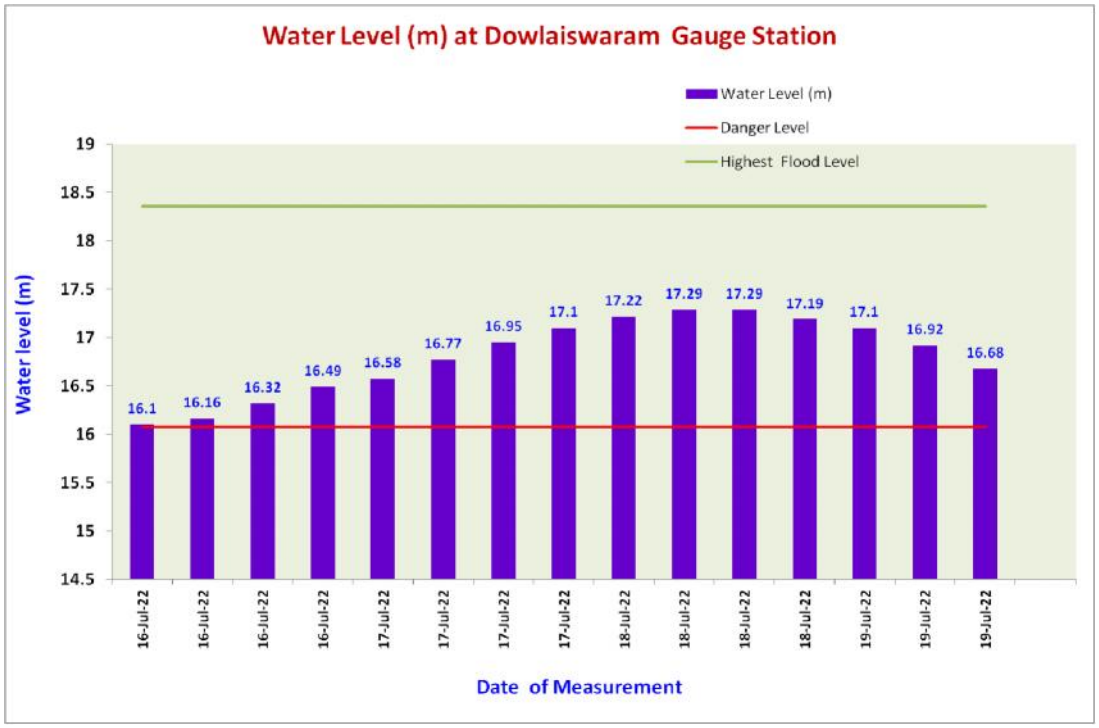


Figure 7(c) below indicate that the Water level has reached above Danger Level (48.77m) on 12th July 22 and is raised to 54.34m till 16th July 2022 and is continued beyond danger level at Bhadrachalam till 19th July 2022. (Source: CWC)

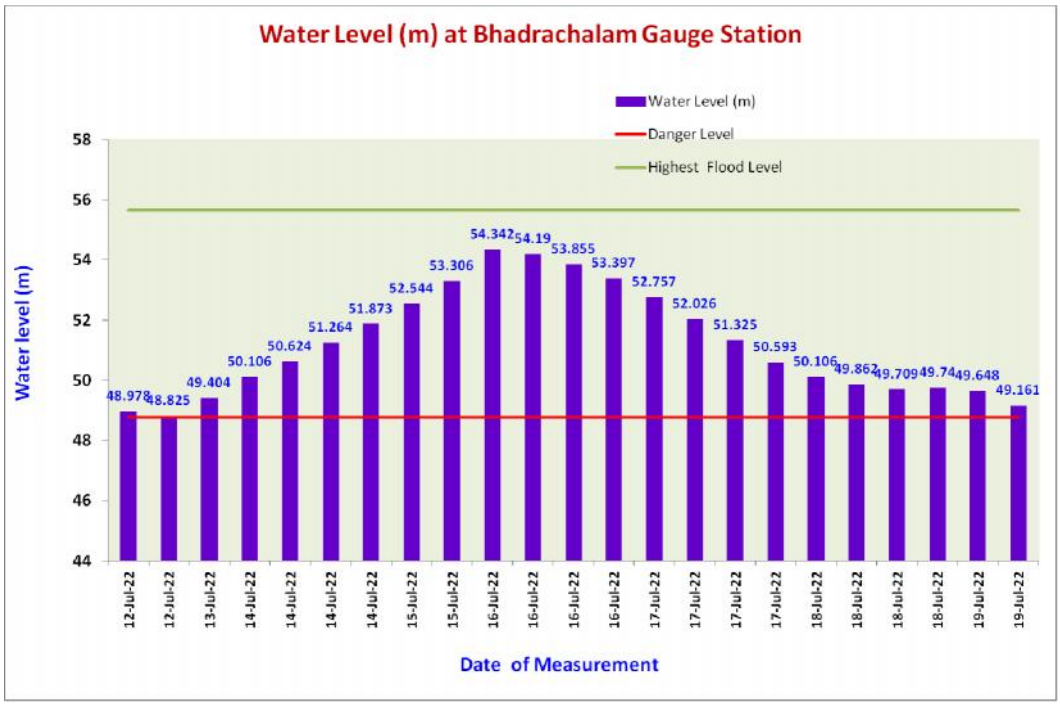
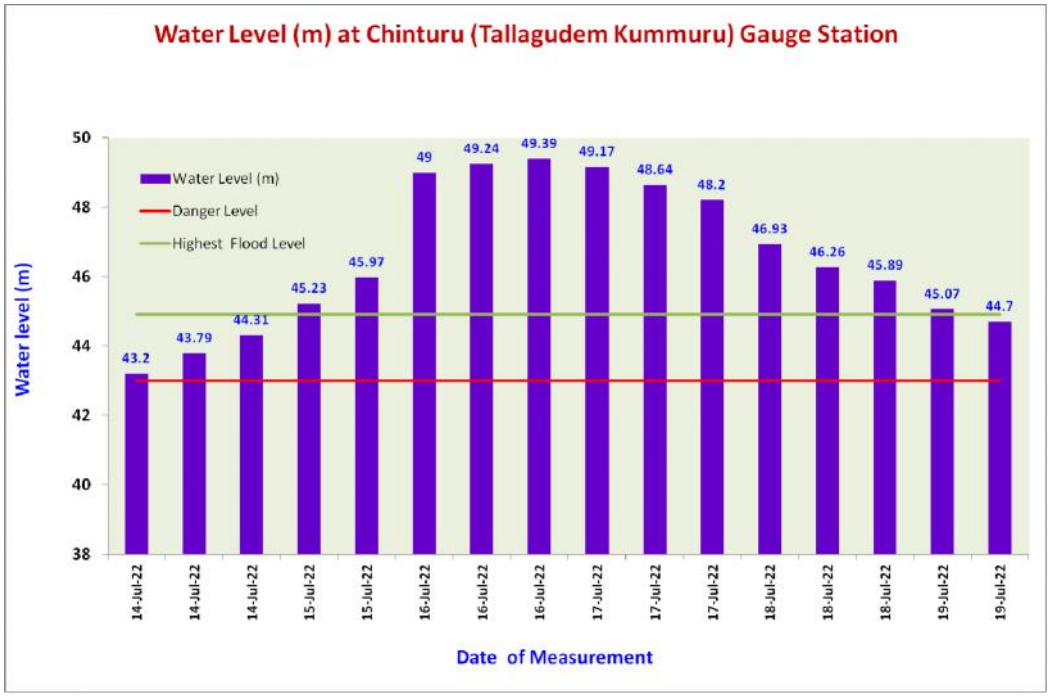


Figure 7(d) below indicate that the Water level has reached above Danger Level (43.00m) on 14th July 22. It crossed its previous Highest Flood Level (44.91m) on 15th July, 2022 and is raised to 49.39m till 16th July 2022 and is continued beyond danger level at Chinturu till 19th July 2022. (Source: CWC)



5. Satellite data planning and acquisition

Satellite data acquisition plan has been made based on the indications of flood inundation understood through the rainfall and runoff information at grid levels and also water levels gauge stations. The available satellite data of optical and Microwave SAR sensors have been utilized to the best possible acquisitions from multiple satellites.

NRSC / ISRO have activated a call on The International Charter Space and Major Disasters for support to acquire near real time satellite datasets and for possible interpretation of flood inundation.

The International Charter is composed of space agencies and space system operators from around the world who work together to provide satellite imagery for disaster monitoring purposes. The teams will find out more about the satellites the Charter members provide, and learn more about each member agency or organization on their websites for support to acquire satellite data and disseminate through the Charter Website. NRSC has activated the International Charter and received multi-mission satellite data. Satellite data is used for preparation of flood inundation maps for larger areas and also value addition using optical datasets

5.1. List of Satellite Data Utilized

List of satellite data utilized for the study is listed in Table.1. Microwave SAR datasets from IRS SAR, Sentinel 1A, Radarsat 2, RCM Missions, Kompsat5 have been utilized for large area analytics at district/sub district level for generation of flood inundation maps and reporting to the Disaster Management support organizations in near real time. Apart from the above, several optical datasets have been received from Pleiades, Kompsat3A, etc. and were utilized for reporting the observations in cloud free areas.

Table. 1. List of Satellite Data Used

S.No	Date of satellite Data Acquisition	Satellite /Sensor
1	14-07-2022	Sentinel-1A SAR (0600Hrs)
2	15-07-2022	Radarsat-2 SAR (1800Hrs)
3	16-07-2022	Sentinel-1A SAR(1800 Hrs)
4	19-07-2022	Risat1A -SAR(1800 Hrs) Sentinel 2B, Geoeye -2 ,NEWSAT, KOMPSAT V6 Pleiades
5	20-07-2022	Risat1A -SAR(1800 Hrs)
6	25-07-2022	Risat1A -SAR(1800 Hrs)
7	26-07-2022	Sentinel-1A SAR(1800 Hrs)
8	28-07-2022	Risat1A- SAR(1800 Hrs)
9	03-08-2022	Risat1A- SAR(1800 Hrs)

6. Methodology Satellite based Flood Inundation Mapping and Monitoring

Role of space applications in supporting flood disaster management is important, if the information can be provided to disaster management support organizations in near real time. Satellite remote sensing data provides information on spatial flood extent on a continuous basis. Satellite data can be used at regular intervals for updation of the flood condition on the ground in terms of flood progression, recedence and persistence.

The advantage of using radar data over the optical data is its ability to penetrate cloud cover and also data acquisition during day and night. Water surfaces are generally smooth at radar wavelengths and can be regarded as specular reflectors which yield small backscatter. The surrounding terrain is assumed to be rough at radar wavelengths which exhibits diffuse scattering with moderate backscatter. Hence, water is regarded as low intensity areas whereas the surrounding terrain corresponds to brighter intensities. Thresholding is the traditional method of detecting flooding in open areas. Intensities below the threshold are regarded as flood or open water, whereas pixels with intensities above the threshold are regarded as dry land. The threshold will depend on the contrast between the land and water classes, and generally needs to be set for each SAR scene. The backscatter depends on the frequency, incidence angle, polarization and is sensitive to the ripples on the water surface induced by wind waves.

Before the onset of flood season, pre-flood satellite data over flood prone states are acquired and analysed. River banklines, permanent water bodies and active river channel are extracted using digitization tools. These datasets and layers will be used as master data sets for further analysis. Detailed steps are as follows. The raw satellite data during floods will be geometrically co-registered with the respective state masters for positional accuracy. These rectified data sets are considered as master data sets for that particular year. Classification is performed to extract water bodies from the image.

In case of optical data, unsupervised classification will be performed giving maximum number of classes and main active river channel, its tributaries and permanent water bodies are classified and converted into vector format. Enhancement techniques are used for increase contrast between the features in the image. On-screen digitization techniques are used for delineation of river banklines from the image in GIS environment and after post editing, the final layer is stored in vector format. In case of microwave data, back scattering image (Sigma nought) is generated and water bodies are extracted using variable threshold technique model. State mask, hill mask, hill shadow mask are applied on the extracted water layer. Further, stray water pixels are separated by grouping and removing them. Flow chart of methodology for pre-flood data preparation is shown in Figure.8 . Flow chart of methodology for flood delineation from satellite data is shown in Figure.9

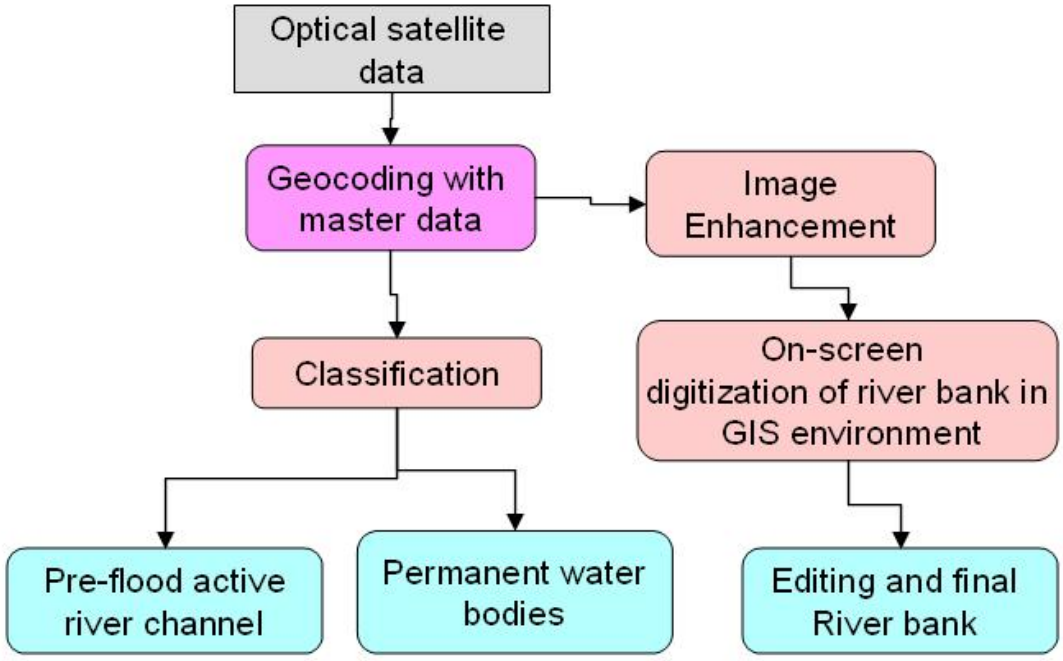
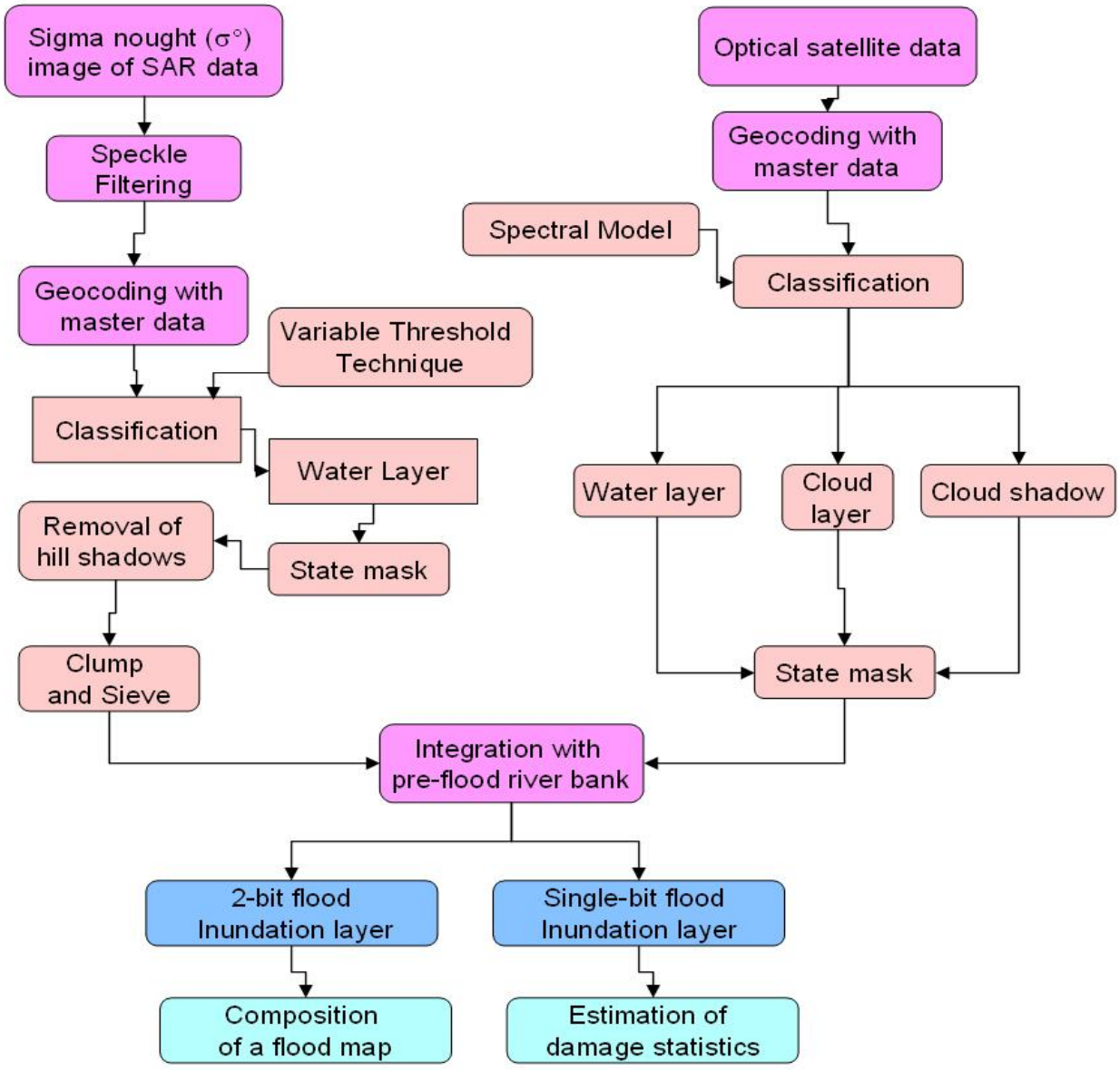


Figure. 8. Methodology for Pre-flood data preparation



Figre.9. Methodology for flood mapping and Monitoring

7. Flood Inundation Mapping and Monitoring

Analysis of multi-temporal satellite data of flood affected districts indicated that there are two categories flood inundation viz. (1) Riverine Flooding – Flood inundation due to overflow of water due to water levels beyond danger and high flood levels and ; (2) Rain induced flooding – This may represent the fields with standing water / fields interpreted as moist in microwave satellite data. The distinction could not be made due to the lack of acquisition of cloud free optical data. In general, Microwave satellite data acquisition is only one feasibility during high rainfall events and flooding scenarios.

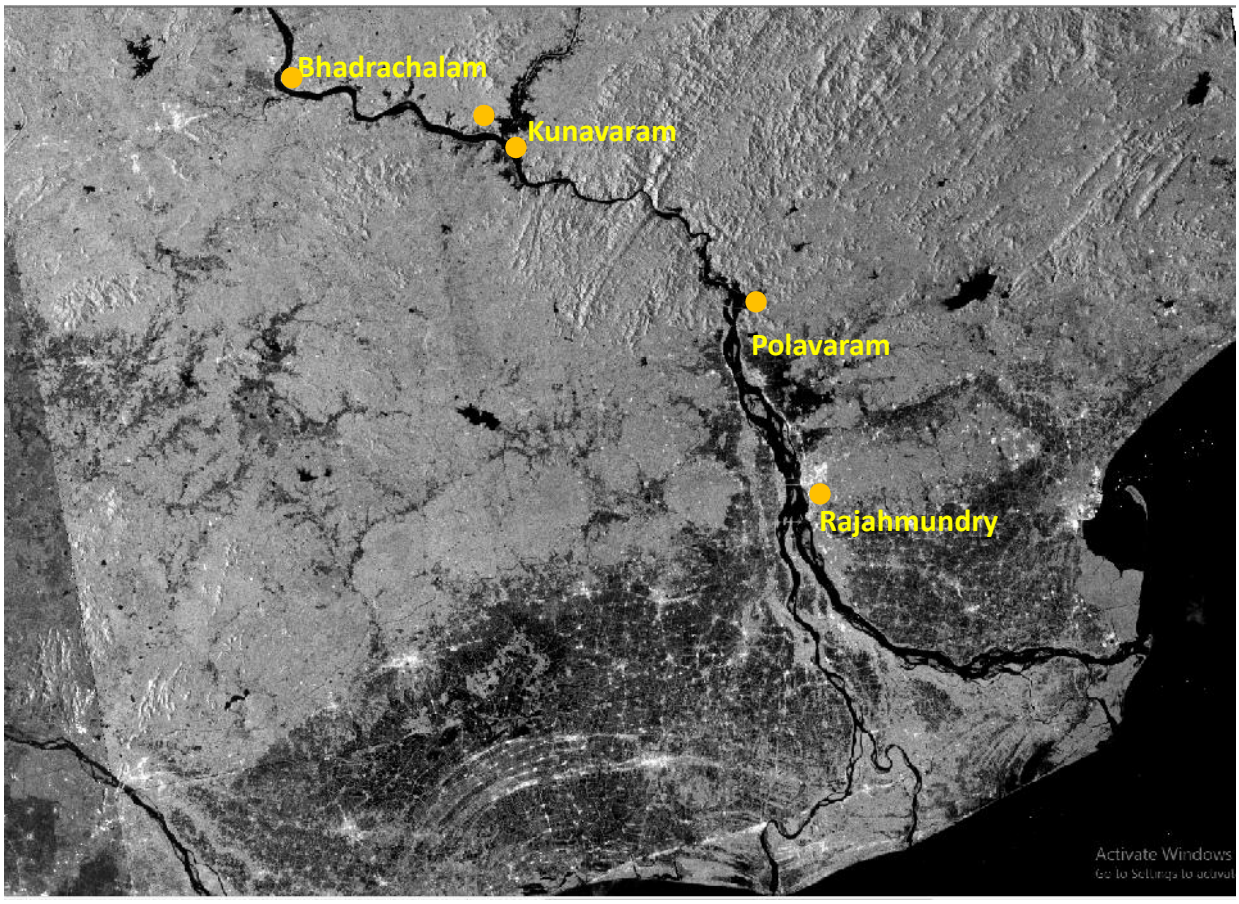


Figure. 10. View of Microwave SAR data showing the flooding conditions at Kunavaram, Polavaram surroundings as 14-16th July 2022.

7.1. Analysis of Flood Inundation areas

The list of flood affected districts and the corresponding areas under flood inundation due to Godavari river is shown in Table.2 in East & West Godavari , Krishna districts. . A Total of ~ 87843Ha is under flood inundation in 3 districts and majority area is in East Godavari (41485ha) and West Godavari districts (38052Ha) . Figure.12. shows the spatial depiction of riverine flood inundation areas and areas which represent the wet areas during maximum flood situation

Table.2. List of districts affected due to riverine flooding of Godavari River and also rain induced floods in Andhra Pradesh State

S. No.	DISTRICT	Inundated Area (ha)	Area Under Rain Inundation / Standing Water etc. (ha)	Total Area Inundated (ha)
1	EAST GODAVARI	41485	133439	174923
6	WEST GODAVARI	38052	199495	237547
3	KRISHNA	8307	221536	229843
	TOTAL	**87843**	**554470**	**642313**

Figure.11 shows the depiction of villages that are under flood inundation (where flood inundation area is 10% above out of Total Geographic Area(TGA) of village))

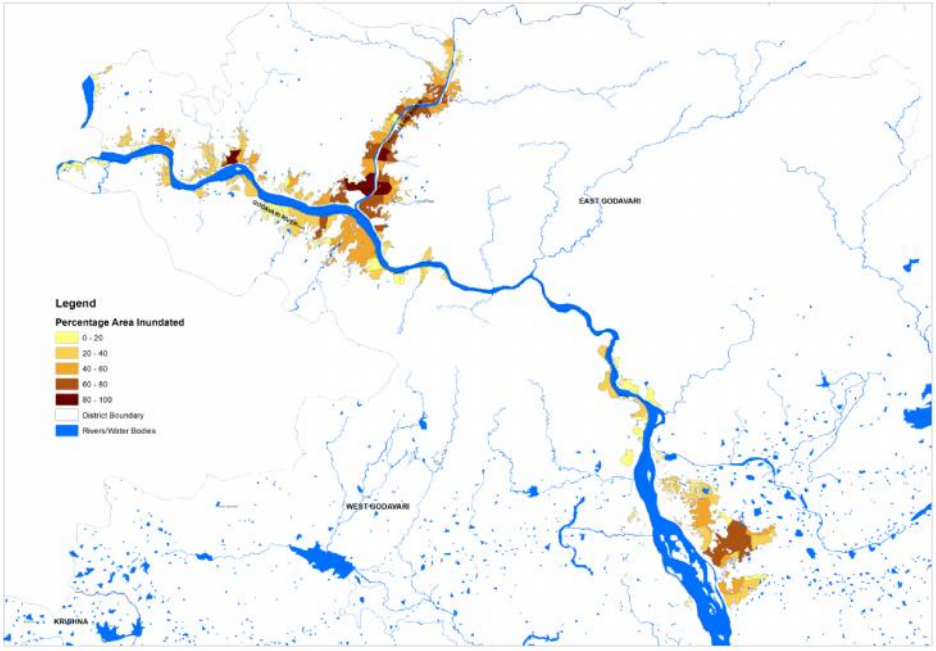


Figure.11. Villages under flood inundation in
(where flood inundation area is 10% above out of Total Geographic Area(TGA) of village)

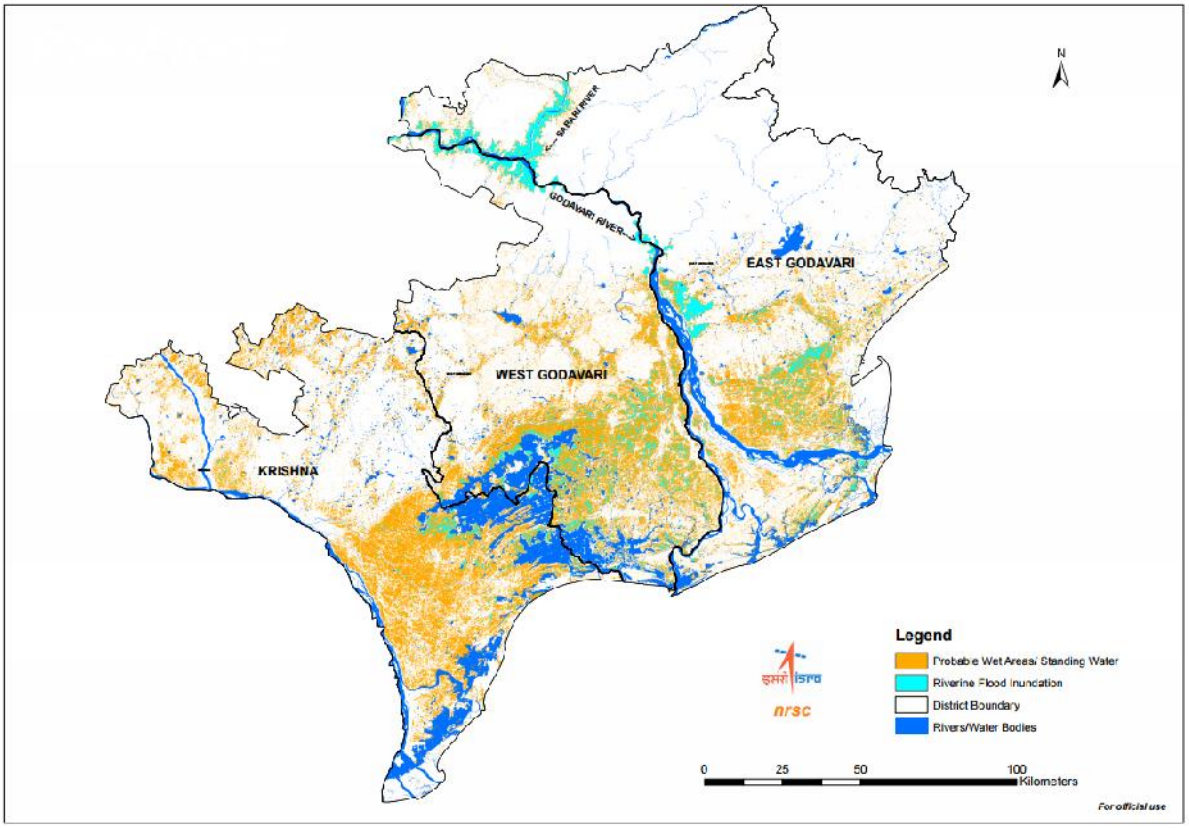


Figure.12a Maximum Flood inundation area and probable wet areas during maximum flood situation in East & West Godavari districts

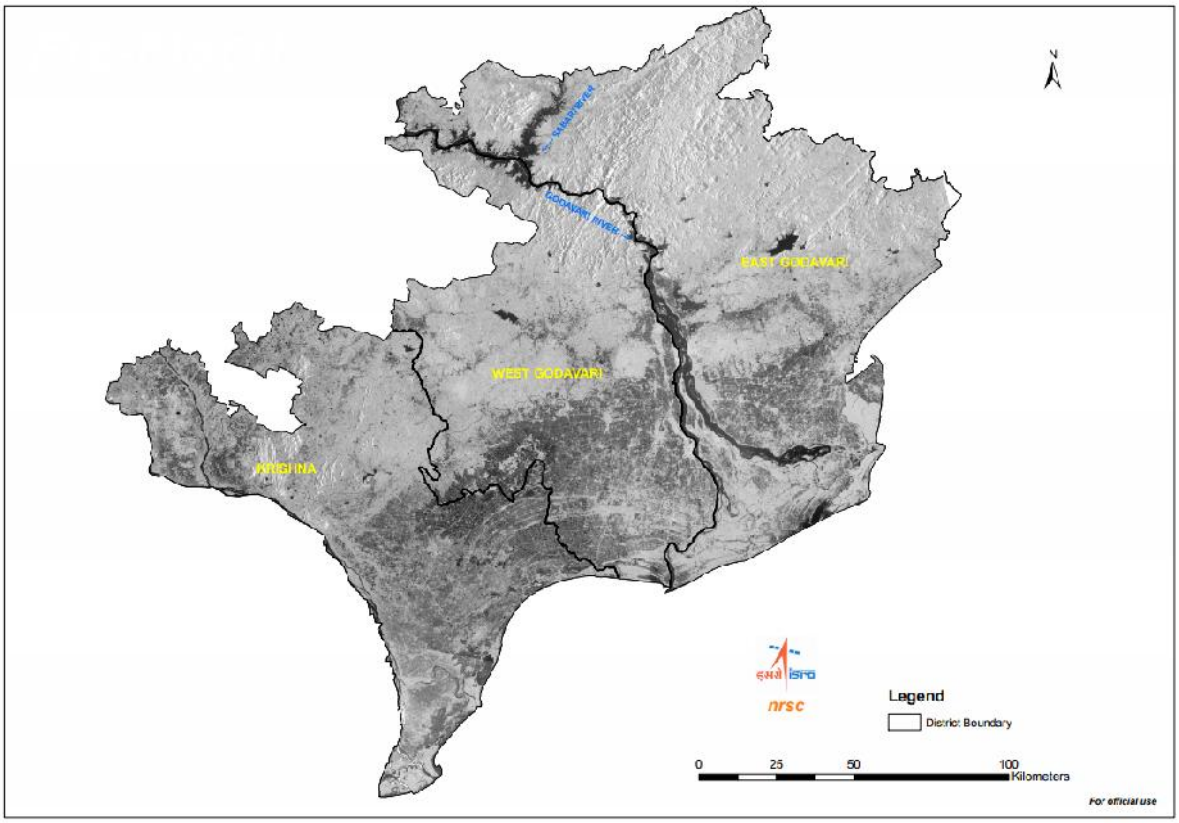


Figure.12b Microwave SAR data during the maximum flood situation

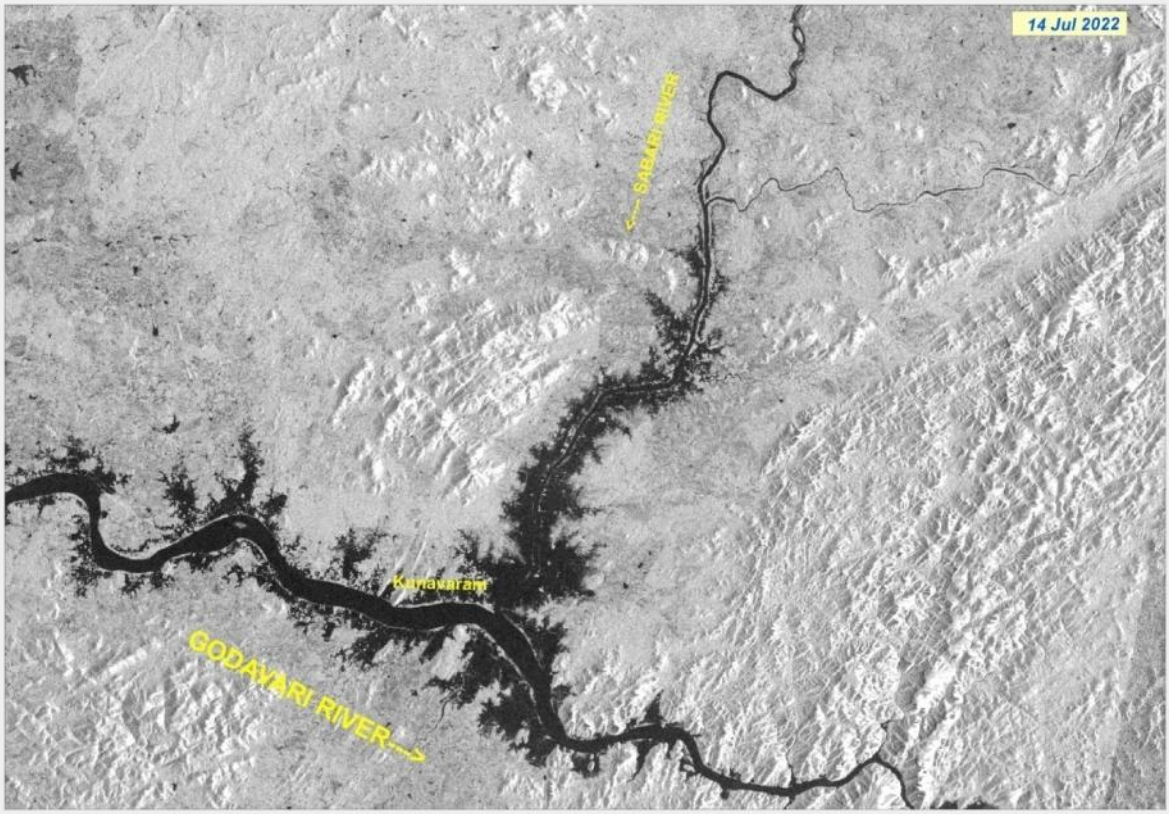


Figure.13a Sentinel1A SAR data over Kunavarm surrounding as on 14th July 2022

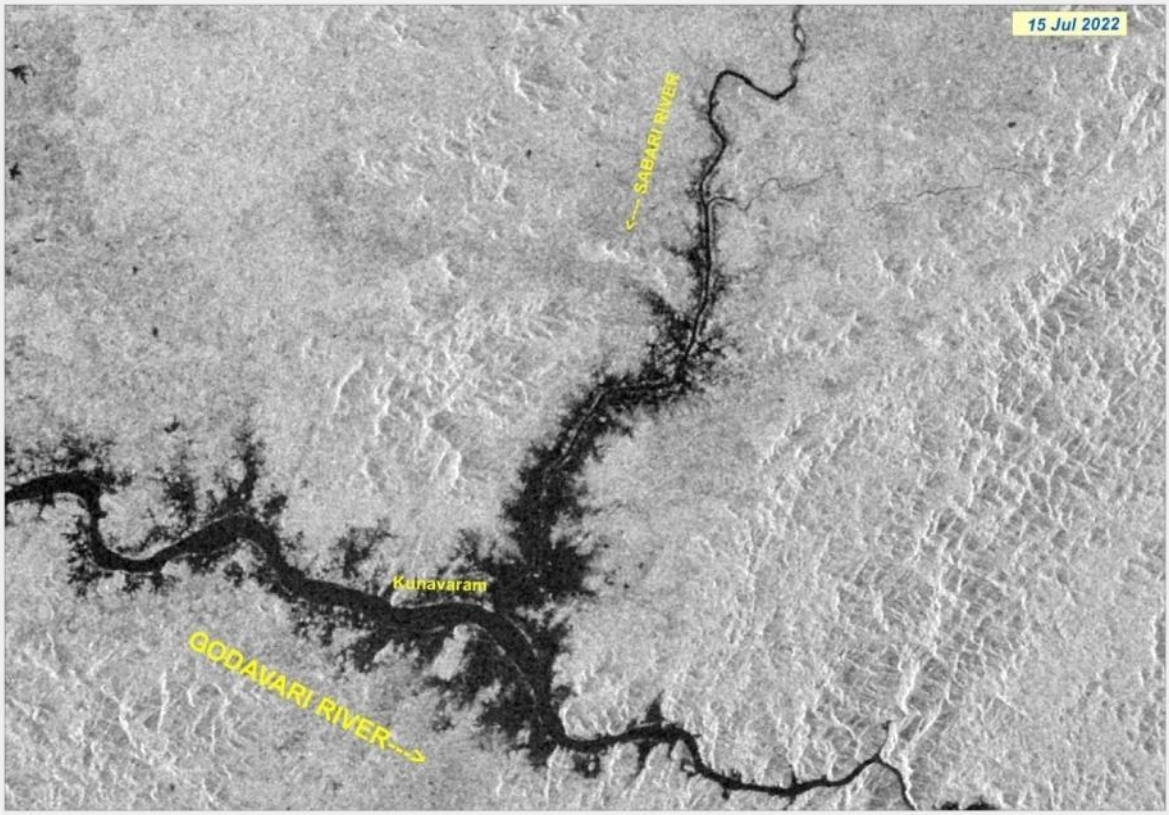


Figure.13b RADARSAT2 SAR data over Kunavarm surrounding as on 14th July 2022

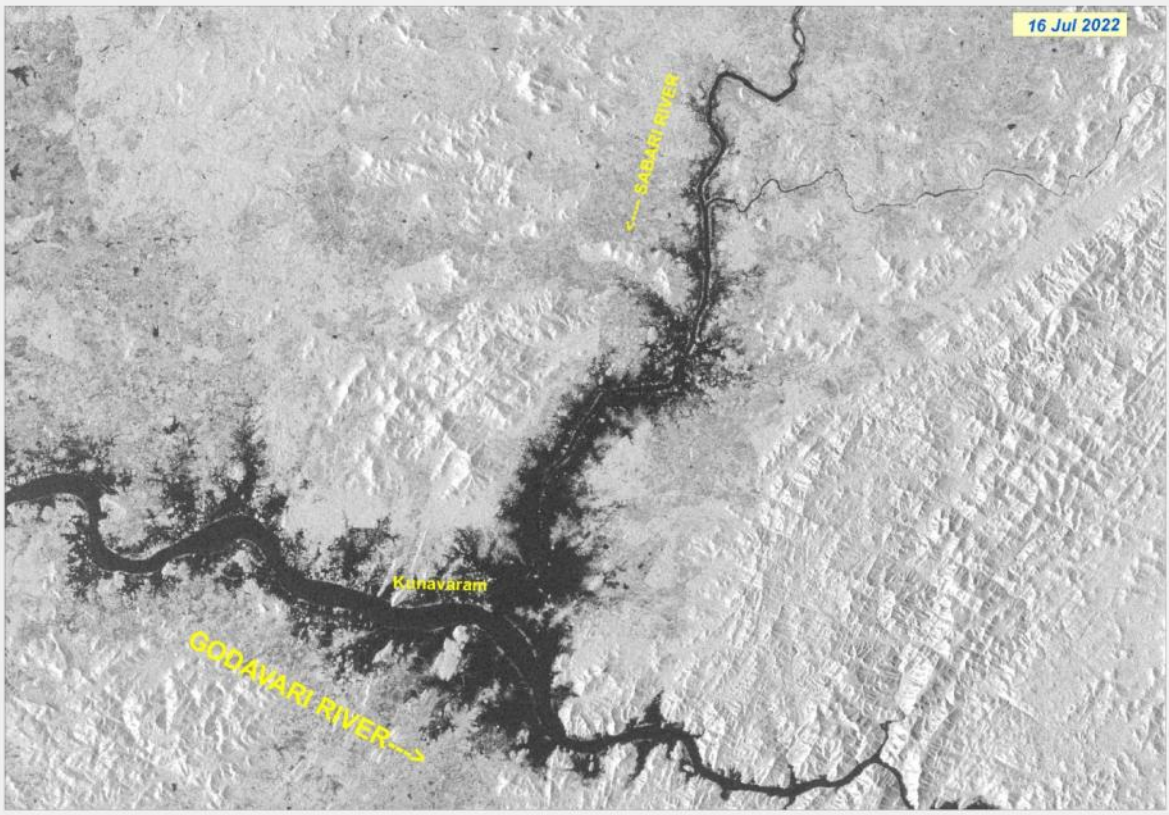


Figure.13c Sentinel1A SAR data over Kunavarm surrounding as on 16th July 2022

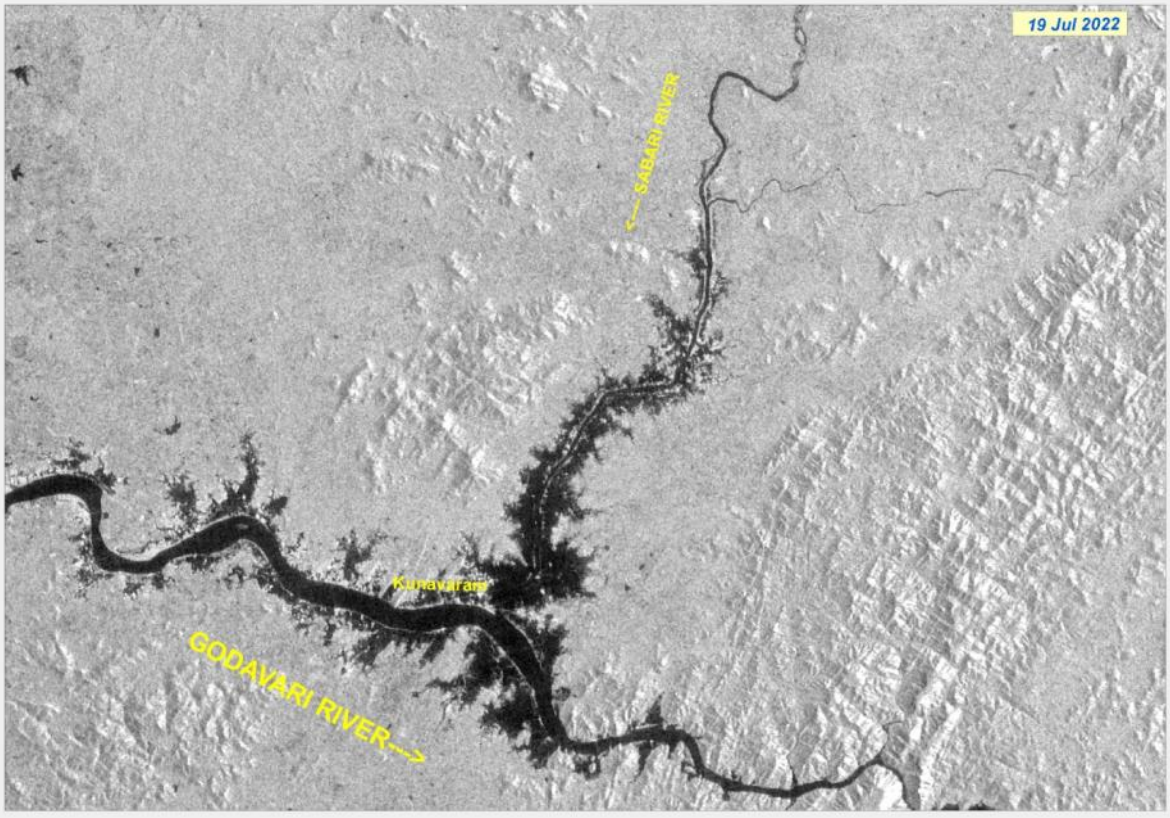


Figure.13d RISAT1A SAR data over Kunavarm surrounding as on 19th July 2022

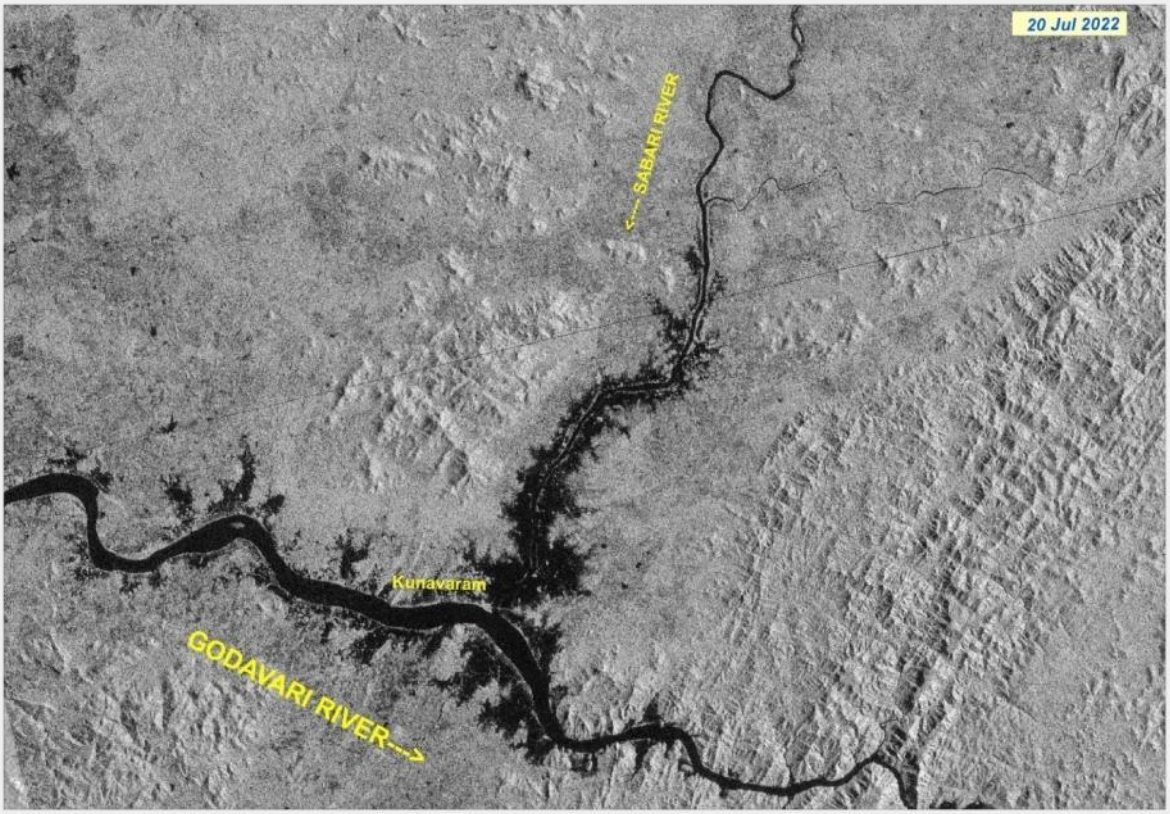


Figure.13e RISAT1A SAR data over Kunavarm surrounding as on 2Oth July 2022

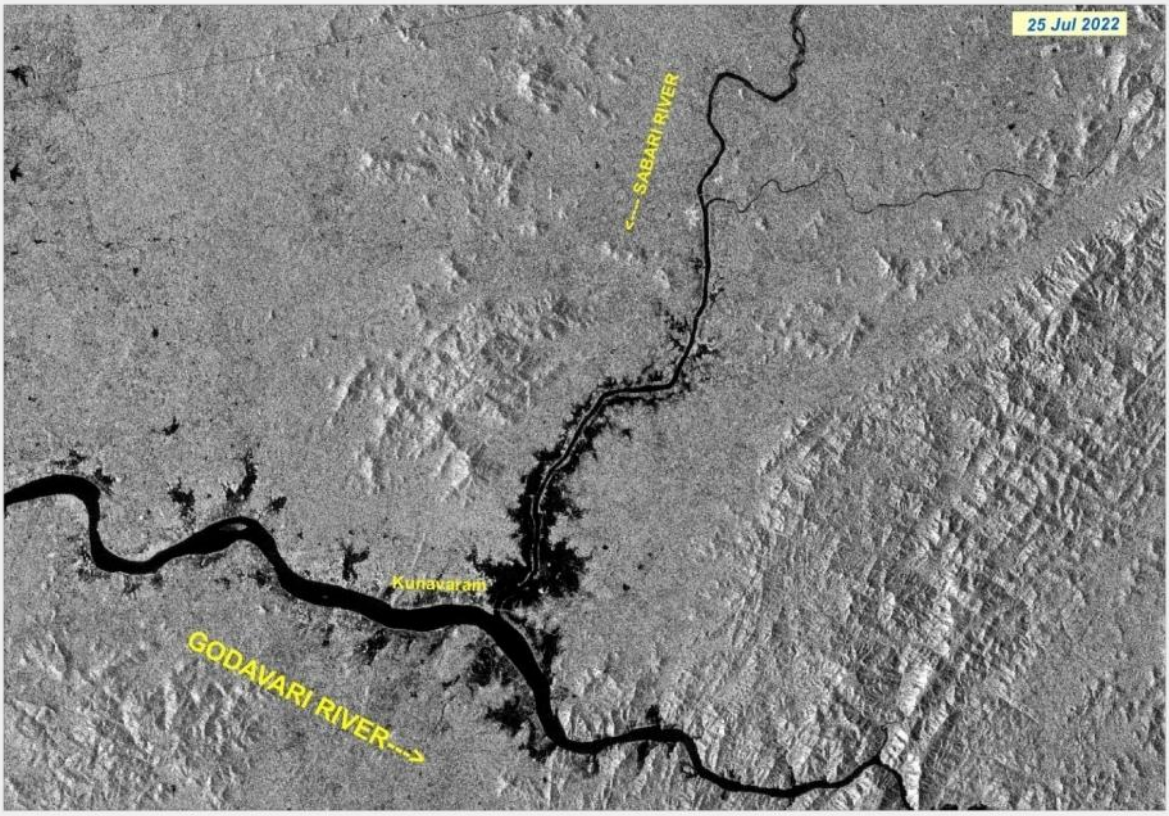


Figure.13f RISAT1A SAR data over Kunavarm surrounding as on 25th July 2022

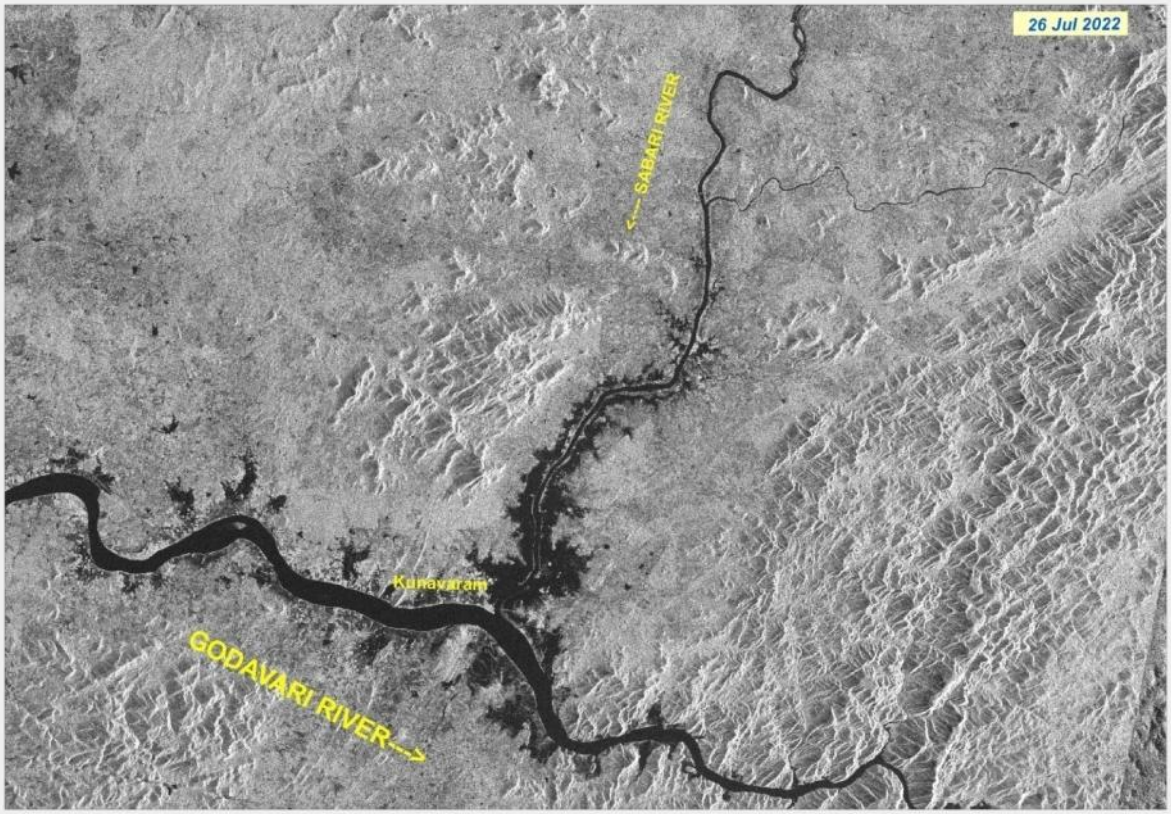


Figure.13g Sentinel 1A SAR data over Kunavarm surrounding as on 26th July 2022

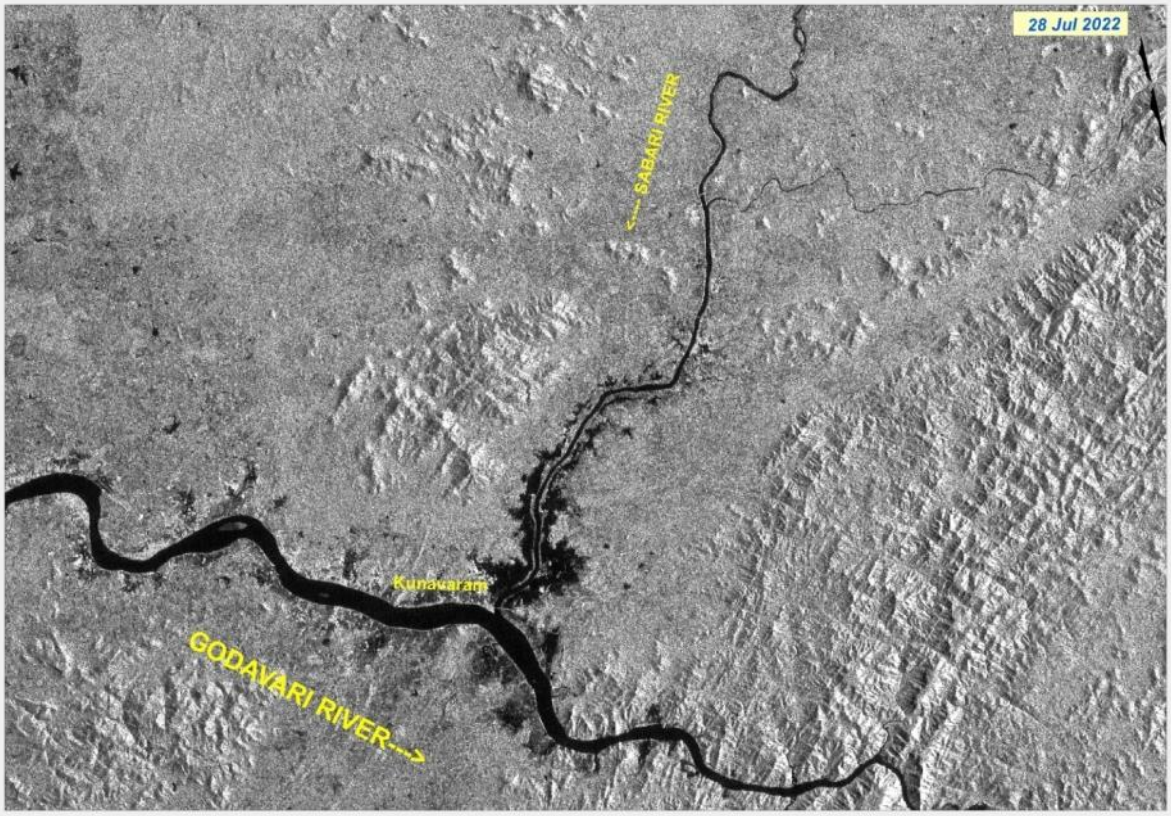


Figure.13h RISAT1A SAR data over Kunavarm surrounding as on 28th July 2022

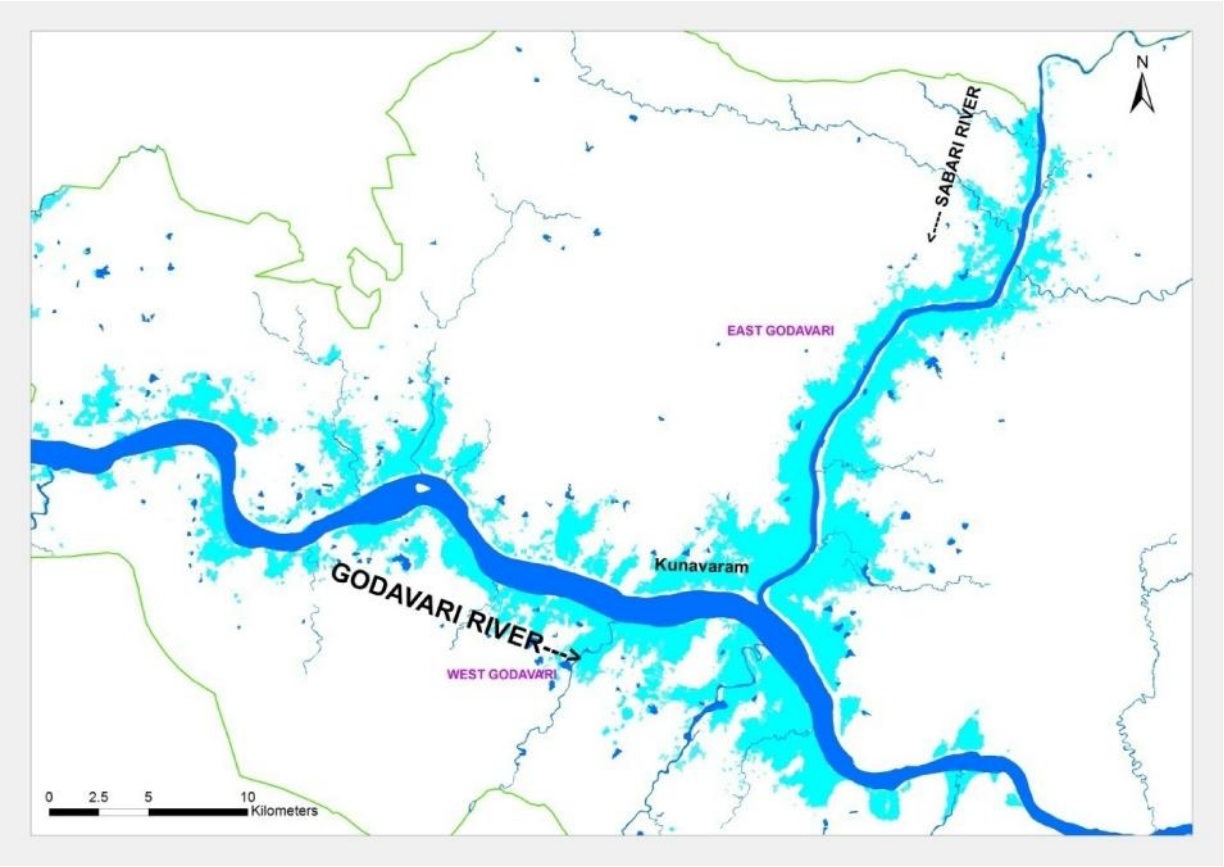


Figure.14a Cumulative flood inundation during 14th July to 20th July 2022 over Kunavarm surroundings

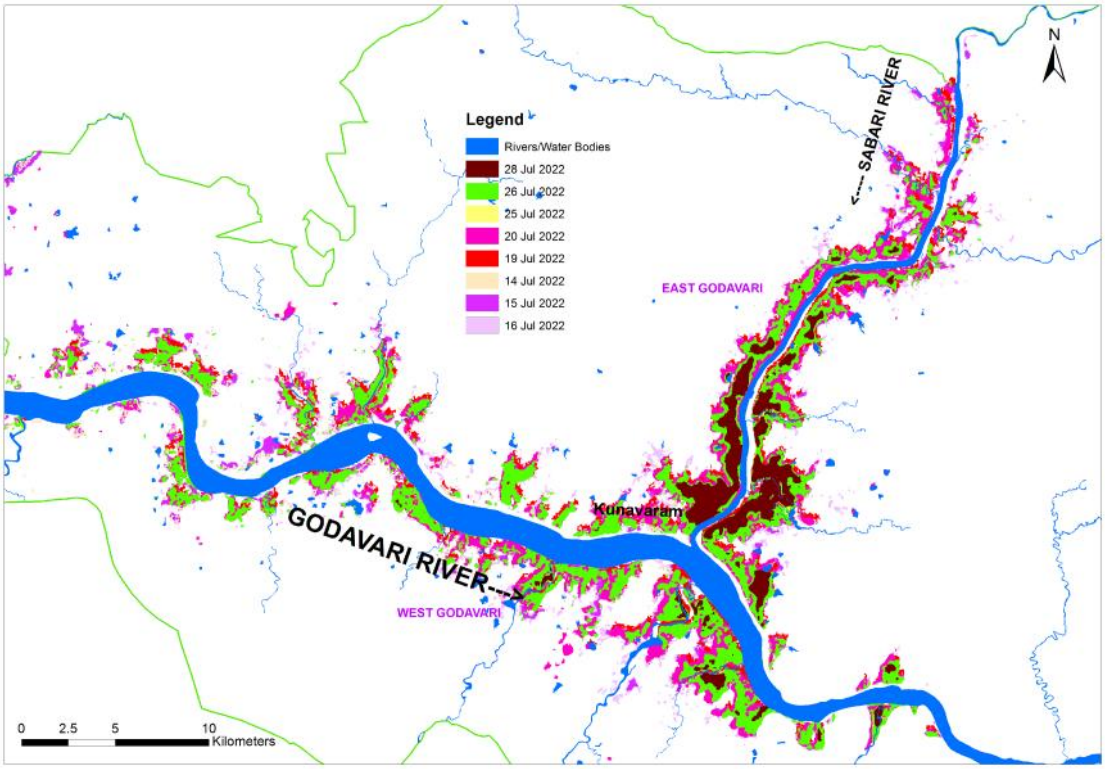


Figure.14b Recession pattern of flood inundation during 14th July to 20th July 2022 over Kunavarm surroundings

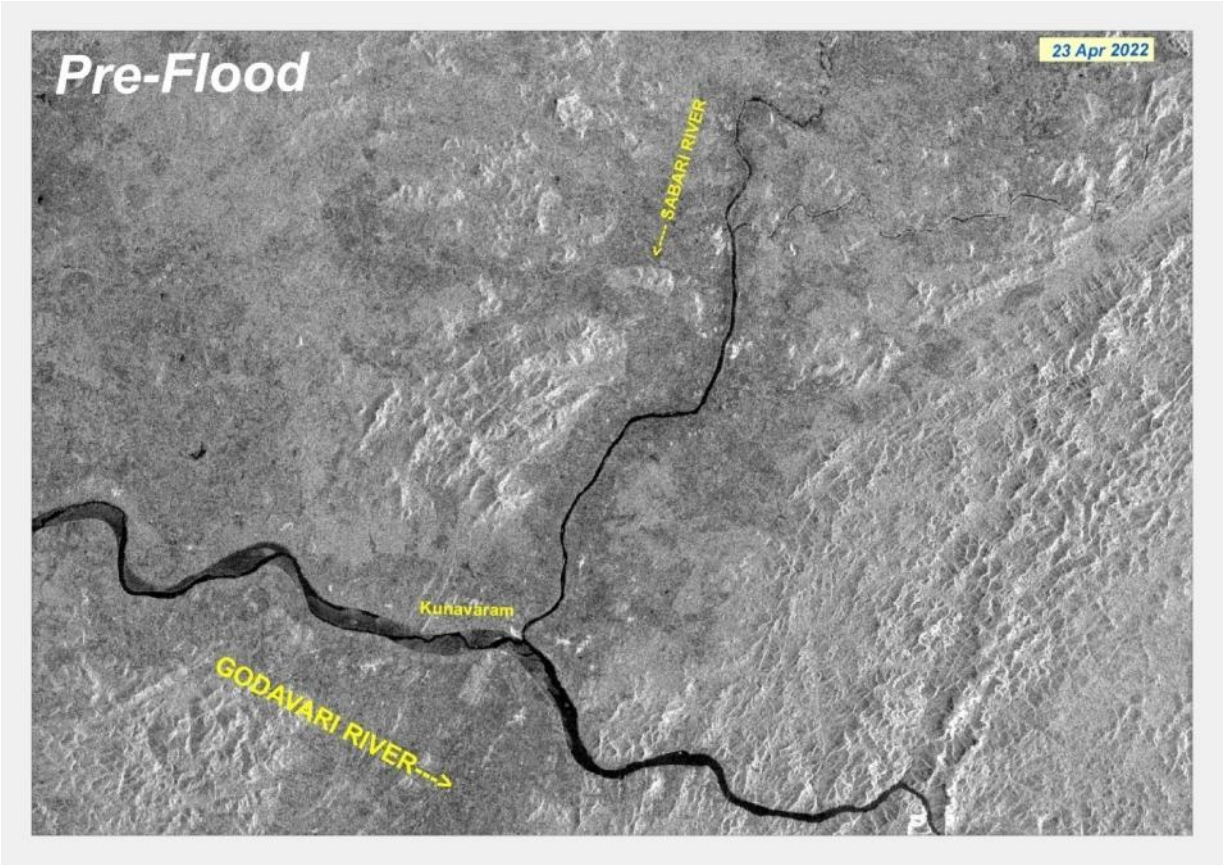


Figure.14c RISAT1A SAR data over Kunavarm surrounding as on 25th July 2022

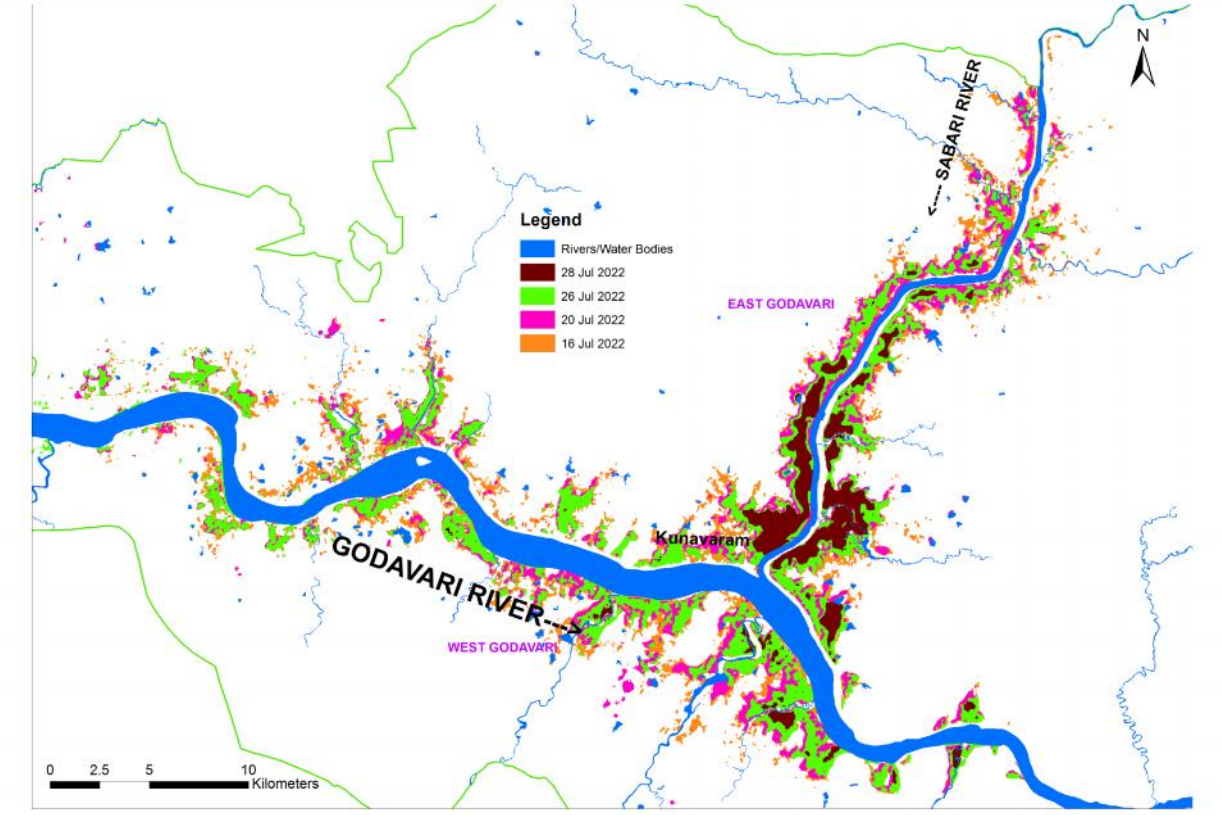


Figure.14d Recession pattern of flood inundation during 14th July to 20th July 2022 over Kunavarm surroundings

7.2. Monitoring of Flood scenario on 3rd August 2022

RISAT1 SAR data has been acquired on 3nd August 2022 for identification of Flood inundation along the Sabari / Godavari river confluence. It is observed that, flood is receded as shown in Figure .15

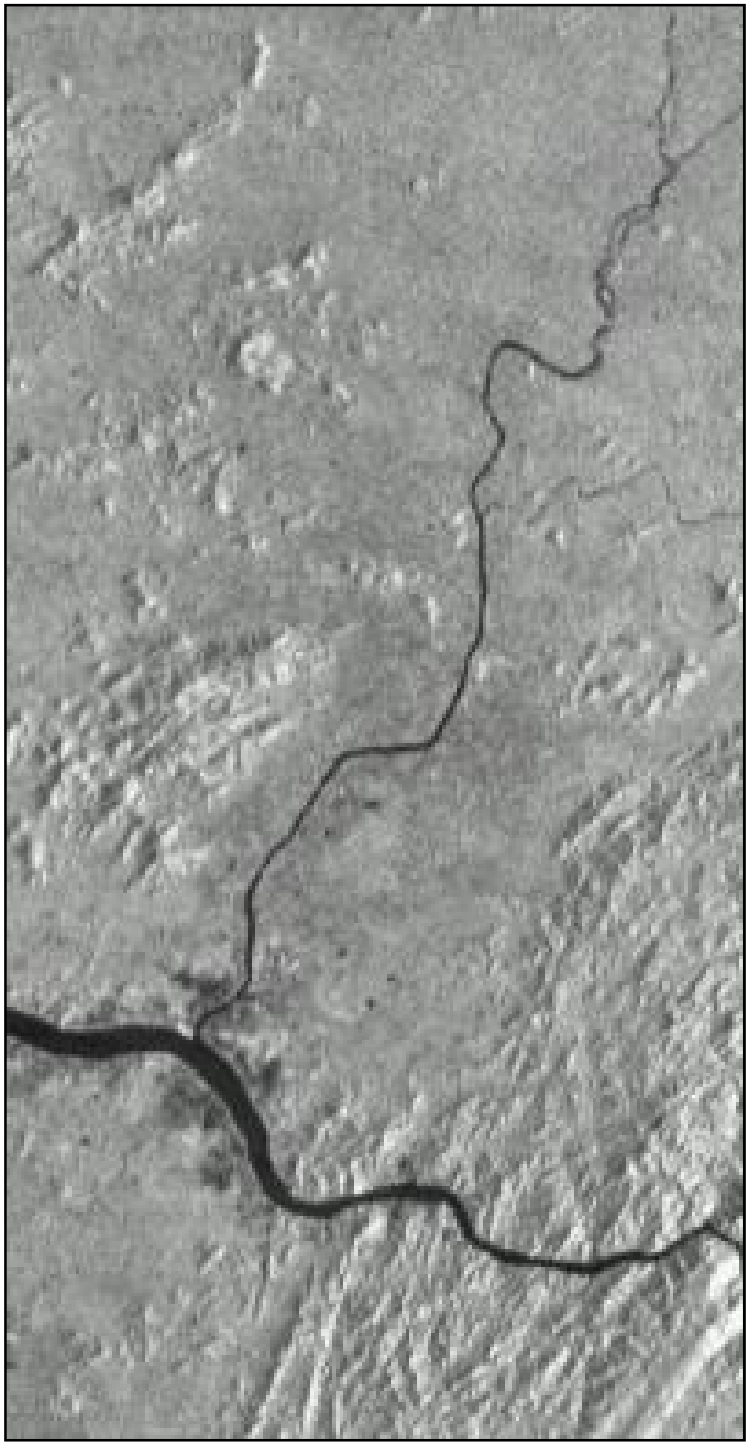


Figure.15 Satellite (RISAT1A) image showing Sabari and Godavari river confluence at Kunavarm - free from flood inundation as on 3rd August, 2022

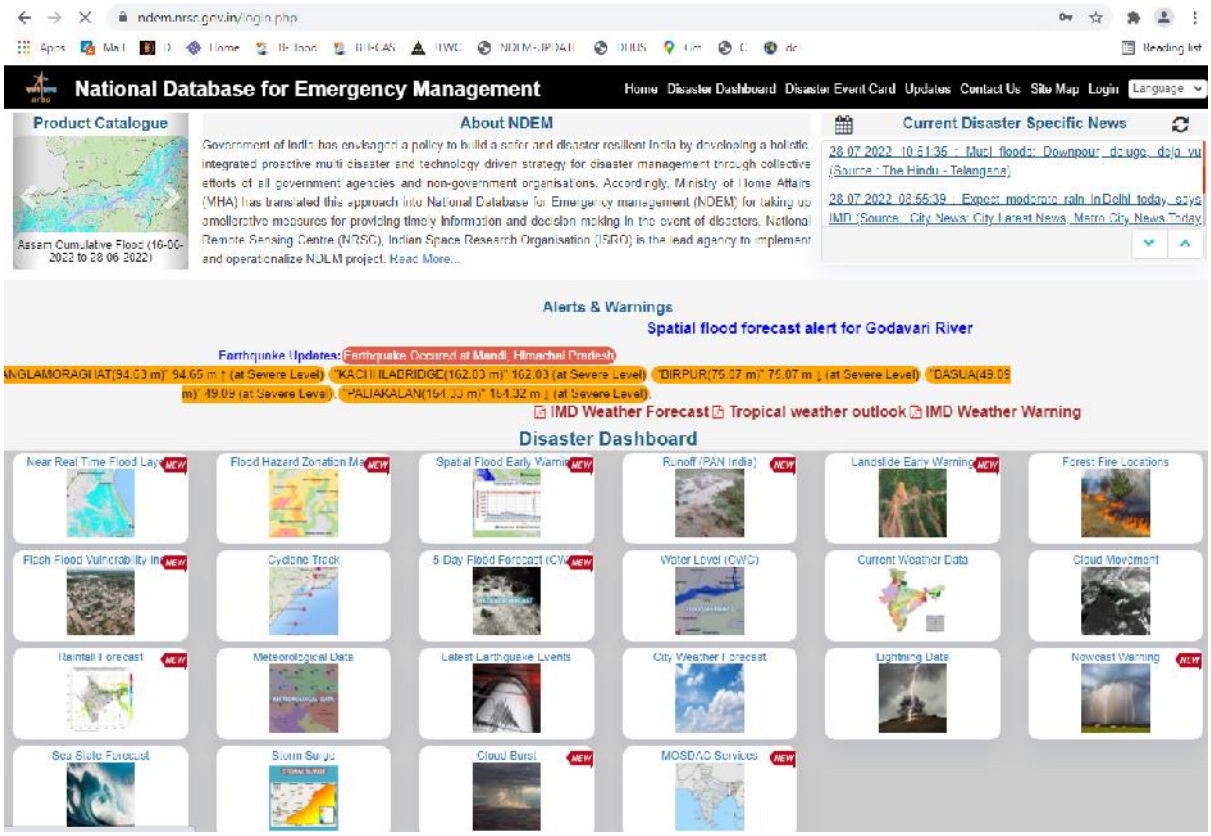
8. Dissemination to State / Central Disaster Management Organizations

1	MHA	1. Joint Secretary, NDM, Ministry of Home Affairs, North Block, New Delhi. 2. NDM control Room, Ministry of Home Affairs, North Block, New Delhi 3. Director, DM-III, NDM, Ministry of Home Affairs, North Block, New Delhi.
2	NDMA	1. Vice Chairman, National Disaster Management Authority (NDMA), New Delhi 2. Control Room, National Disaster Management Authority (NDMA), New Delhi
3	NODAL MINISTRIES	1. Chairman, Central Water Commission, Sewa Bhavan, R K PURAM, New Delhi 2. ADGM (H & A), India Meteorological Department, Mausam Bhavan, New Delhi
4	STATE	1. Relief Commissioner, Andhra Pradesh 2. Secretary, APSDMA 3. ED, APSDMA
5	ISRO/ DOS	1. Director, EDPO, ISRO Head Quarters, Antariksha Bhavan, New BEL Road, Bangalore-560094. (e-mail) 2. Programme Director, EDPO, ISRO Head Quarters, Antariksha Bhavan, New BEL Road, Bangalore-560094. (e-mail) 3. Associate Director, EDPO, ISRO Head Quarters, Antariksha Bhavan, New BEL Road, Bangalore-560094. (e-mail)
6	NRSC	1. Group Head, DMSG, NRSC 2. Deputy Director (RSA) & PD, RRES 3. Associate Director, NRSC 4. Director, NRSC

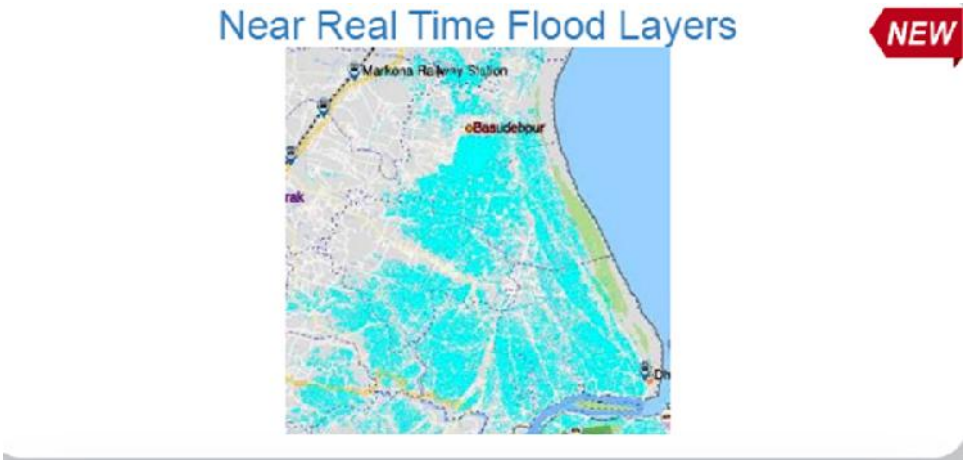
8.1. Dissemination of Information through Email and Web Portals

NRSC disseminated the maps and GIS and value added images to the following distribution List and also uploaded GIS layers in ISRO Bhuvan Portal, National Database for Emergency Management (NDEM) portal for further visualisation of the current and historic flood information along with legacy layers and analytics

https://ndem.nrsc.gov.in



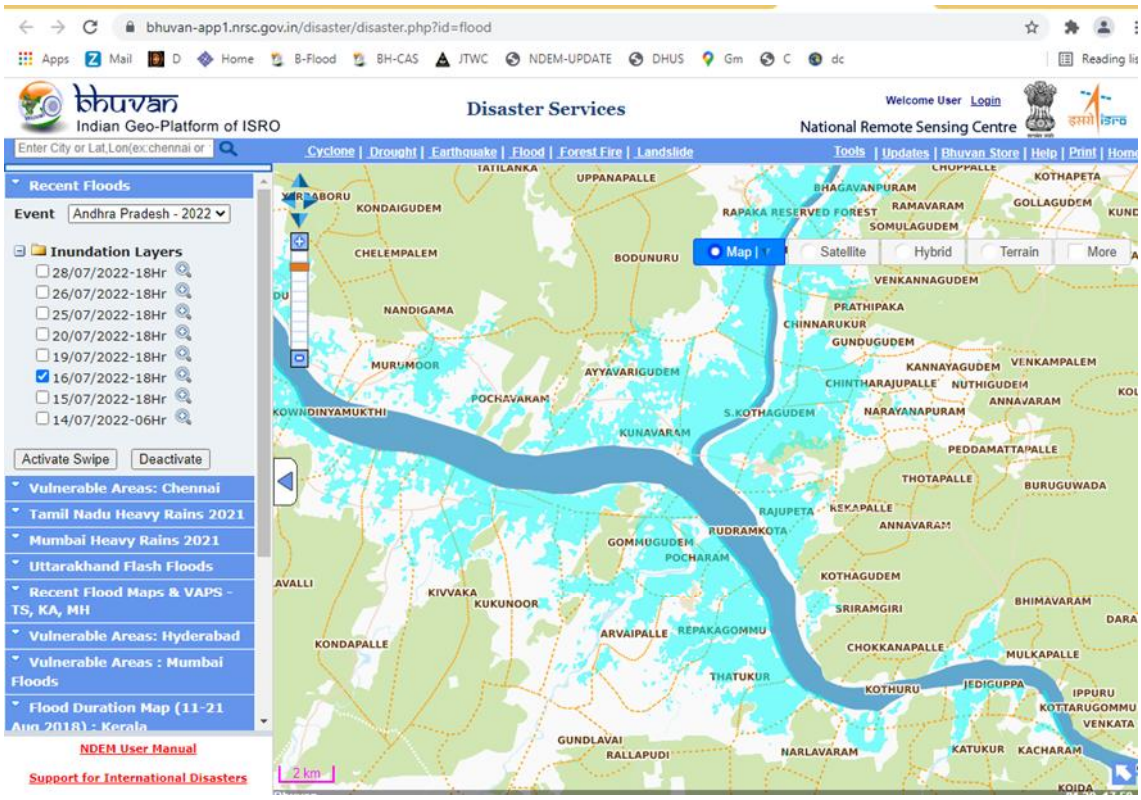
Click on **Near Real Time Flood Layers**



https://bhuvan.nrsc.gov.in

Bhuvan Geoportal can be used for visualisation of the flood layers

https://bhuvan-app1.nrsc.gov.in/disaster/disaster.php?id=flood



Annexure-2 -List of villages under flood inundation (where flood inundation area is 10% above out of Total Geographic Area(TGA) of village)

S. No.	Village	District	Flood Inundated Area (ha)	Village Area (ha)	Percentage of Area Inundated by Floods (ha)
1	Chintharajupalle	EAST GODAVARI	389	410	94.88
2	Srirampuram	EAST GODAVARI	147	160	91.44
3	Kondarajupeta	EAST GODAVARI	93	104	89.33
4	Walfordpeta	EAST GODAVARI	290	333	86.98
5	S.Kothagudem	EAST GODAVARI	243	290	83.65
6	Gowridevi Peta	EAST GODAVARI	282	339	83.29
7	Ravigudem	EAST GODAVARI	237	289	82.22
8	Rachagampalle	EAST GODAVARI	50	62	79.93
9	Chuchirevula Gudem	EAST GODAVARI	267	335	79.66
10	Mallethota	EAST GODAVARI	327	413	79.24
11	Waddegudem	EAST GODAVARI	759	993	76.47
12	Katavaram	EAST GODAVARI	838	1125	74.50
13	Venkannagudem	EAST GODAVARI	138	190	72.54
14	Munagala	EAST GODAVARI	842	1183	71.18
15	Gundugudem	EAST GODAVARI	205	297	68.92
16	Jaggavaram	EAST GODAVARI	165	240	68.84
17	Somulagudem	EAST GODAVARI	163	244	66.84
18	Tallagudem	EAST GODAVARI	59	91	65.70
19	Seethampeta	EAST GODAVARI	128	196	65.35
20	Bojjaraigudem	EAST GODAVARI	300	462	64.99
21	Ulumuru	EAST GODAVARI	193	297	64.90
22	Abicherla	EAST GODAVARI	153	237	64.74
23	Mukkunuru	EAST GODAVARI	111	172	64.66
24	Butchempeta	EAST GODAVARI	430	666	64.57
25	Chinarkur	EAST GODAVARI	260	404	64.30
26	Koppalle	EAST GODAVARI	176	277	63.46
27	Jalimudi	EAST GODAVARI	71	116	61.51
28	Peddarukur	EAST GODAVARI	111	181	61.26
29	Chutur	EAST GODAVARI	41	72	56.89
30	Nellipaka	EAST GODAVARI	216	382	56.46
31	Prathipaka	EAST GODAVARI	152	270	56.30
32	Kudalipadu	EAST GODAVARI	180	320	56.10
33	Agraharapu Koderu	EAST GODAVARI	140	252	55.56
34	Regulapadu	EAST GODAVARI	212	385	55.15
35	Kummuru	EAST GODAVARI	220	403	54.62
36	Markandeyula Peta	EAST GODAVARI	257	479	53.71
37	Yerragunta	EAST GODAVARI	136	255	53.31
38	Torredu	EAST GODAVARI	554	1051	52.73
39	Gunduvarigudem	EAST GODAVARI	41	79	52.34
40	Kannayagudem	EAST GODAVARI	133	256	52.08
41	Chidumurum	EAST GODAVARI	132	254	52.07
42	Raghudevapuram	EAST GODAVARI	1055	2045	51.56
43	Chuchirevula	EAST GODAVARI	190	377	50.38
44	Thummargudem	EAST GODAVARI	116	232	49.99
45	Lingapuram	EAST GODAVARI	114	233	48.88
46	Choppalle	EAST GODAVARI	184	382	48.16
47	Marrigudem	EAST GODAVARI	62	131	47.51
48	Vetlapalem	EAST GODAVARI	1179	2520	46.80
49	Gommu Ayyavarigudem	EAST GODAVARI	26	56	46.19
50	Mirthipadu	EAST GODAVARI	185	407	45.41
51	Rekapalle	EAST GODAVARI	254	571	44.53
52	Gurrampeta	EAST GODAVARI	127	287	44.19
53	Kuturu	EAST GODAVARI	58	131	44.05
54	Repaka	EAST GODAVARI	314	714	44.05
55	Ayyavaripeta	EAST GODAVARI	91	233	39.11
56	Tripura Penta Veedu	EAST GODAVARI	63	161	39.05

57	Muggaulla	EAST GODAVARI	299	770	38.83
58	Hundeswarapuram	EAST GODAVARI	122	314	38.76
59	Chowdavaram	EAST GODAVARI	95	247	38.46
60	Karakagudem	EAST GODAVARI	80	210	38.22
61	Chatti	EAST GODAVARI	562	1471	38.19
62	Mulluru	EAST GODAVARI	157	416	37.87
63	KATHERU	EAST GODAVARI	326	892	36.54
64	Mamilladoddi	EAST GODAVARI	213	586	36.30
65	Gadala	EAST GODAVARI	296	822	35.94
66	Kothagudem	EAST GODAVARI	171	480	35.57
67	Pedabrahmadevam	EAST GODAVARI	579	1633	35.46
68	Sriramgiri	EAST GODAVARI	78	221	35.40
69	Chinakondepudi	EAST GODAVARI	616	1753	35.15
70	Kusumanapalle	EAST GODAVARI	265	771	34.29
71	Gottugudem	EAST GODAVARI	54	159	34.28
72	Isunuru	EAST GODAVARI	133	396	33.65
73	Nallagonda	EAST GODAVARI	279	831	33.56
74	Mulakallanka	EAST GODAVARI	172	517	33.32
75	Chinnapolipaka	EAST GODAVARI	29	89	33.22
76	Yanamadala	EAST GODAVARI	73	224	32.74
77	Tekubaka	EAST GODAVARI	165	505	32.64
78	Chelempalem	EAST GODAVARI	79	244	32.22
79	Gandredu	EAST GODAVARI	144	461	31.16
80	G. Medapadu	EAST GODAVARI	554	1798	30.81
81	Murumoor	EAST GODAVARI	34	112	30.80
82	Burugupudi	EAST GODAVARI	502	1653	30.34
83	Nallakunta	EAST GODAVARI	195	655	29.70
84	Mulkapalle	EAST GODAVARI	24	86	28.11
85	Vangalapudi	EAST GODAVARI	134	480	27.89
86	Bhagavanpuram	EAST GODAVARI	97	350	27.77
87	Lolla	EAST GODAVARI	161	587	27.36
88	K. Narayanapuram	EAST GODAVARI	72	279	25.77
89	Nuthigudem	EAST GODAVARI	76	300	25.22
90	Narasingapeta	EAST GODAVARI	97	393	24.58
91	Manjeru	EAST GODAVARI	138	563	24.51
92	Raghavapuram	EAST GODAVARI	41	169	24.07
93	Voolapalle	EAST GODAVARI	212	906	23.41
94	Thotapalle	EAST GODAVARI	88	385	22.84
95	Gollagudem	EAST GODAVARI	34	149	22.70
96	Kandulapalem	EAST GODAVARI	61	268	22.61
97	Chintur	EAST GODAVARI	112	496	22.60
98	Arikarevula	EAST GODAVARI	62	276	22.53
99	Pedapudi	EAST GODAVARI	337	1512	22.29
100	SAMALKOTA	EAST GODAVARI	326	1469	22.18
101	Dandangi	EAST GODAVARI	5	23	21.89
102	Venturu	EAST GODAVARI	163	766	21.23
103	Chinna Nallakunta	EAST GODAVARI	38	179	21.21
104	Biccavolu	EAST GODAVARI	399	1901	20.99
105	Thoyyeru	EAST GODAVARI	2	11	20.81
106	Gundala	EAST GODAVARI	199	965	20.59
107	Boyanapudi	EAST GODAVARI	54	268	20.22
108	Ummadivaram	EAST GODAVARI	36	181	20.08
109	Melluru	EAST GODAVARI	56	280	19.92
110	Dugutta	EAST GODAVARI	106	536	19.78
111	Venkatrayapalem	EAST GODAVARI	23	118	19.61
112	Paidigudem	EAST GODAVARI	24	125	19.60
113	Nadurubada	EAST GODAVARI	67	353	18.98
114	Thallagudem	EAST GODAVARI	15	82	18.75
115	Sampara	EAST GODAVARI	185	994	18.58
116	Manturu	EAST GODAVARI	4	20	18.17
117	G. Mamidada	EAST GODAVARI	142	786	18.09
118	Pandirajupalle	EAST GODAVARI	26	145	17.98

119	Kumarapriyam	EAST GODAVARI	51	289	17.84
120	Chokkanapalle	EAST GODAVARI	46	261	17.77
121	Rayanapeta	EAST GODAVARI	82	468	17.44
122	Govindarajupalem	EAST GODAVARI	32	187	17.27
123	Koppavaram	EAST GODAVARI	36	207	17.20
124	Kaikavolu	EAST GODAVARI	62	364	17.15
125	Puttakonda	EAST GODAVARI	27	161	16.62
126	Devipatnam	EAST GODAVARI	3	17	16.26
127	Vadlamuru	EAST GODAVARI	35	224	15.76
128	Kuyuguru	EAST GODAVARI	86	559	15.40
129	Mahendrawada	EAST GODAVARI	90	582	15.38
130	Venkata Krishnarayapuram	EAST GODAVARI	54	356	15.14
131	Unduru	EAST GODAVARI	41	275	15.07
132	Tanumalla	EAST GODAVARI	33	220	15.05
133	Madimeru	EAST GODAVARI	82	547	14.93
134	Kotipalli Bhaga	EAST GODAVARI	16	111	14.77
135	Tadipalle	EAST GODAVARI	24	165	14.55
136	Pandalapaka	EAST GODAVARI	102	712	14.28
137	Koti	EAST GODAVARI	132	930	14.19
138	Gommu Koyagudem	EAST GODAVARI	48	339	14.17
139	Vendra	EAST GODAVARI	69	489	14.14
140	Yerraboru	EAST GODAVARI	25	178	13.99
141	Chelluru	EAST GODAVARI	191	1387	13.81
142	Vedurupaka	EAST GODAVARI	195	1424	13.70
143	Madhurapudi	EAST GODAVARI	174	1270	13.68
144	Balabhadrapuram	EAST GODAVARI	245	1819	13.45
145	Ganugulagondi	EAST GODAVARI	642	4777	13.44
146	Chinthalagudem	EAST GODAVARI	25	190	13.35
147	Komaripalem	EAST GODAVARI	85	659	12.82
148	Injaram	EAST GODAVARI	76	598	12.66
149	Narasapurapupeta	EAST GODAVARI	77	625	12.34
150	Tossipudi	EAST GODAVARI	20	163	12.32
151	Chodavaram	EAST GODAVARI	122	994	12.26
152	Purushothapatnam	EAST GODAVARI	120	996	12.02
153	Seela	EAST GODAVARI	110	924	11.87
154	Velampalem	EAST GODAVARI	149	1253	11.86
155	Rajupalem	EAST GODAVARI	28	238	11.75
156	Pulagurtha	EAST GODAVARI	107	932	11.44
157	Konkuduru	EAST GODAVARI	83	748	11.05
158	Pedaparthi	EAST GODAVARI	37	335	10.99
159	Nagampalle	EAST GODAVARI	135	1242	10.86
160	Turakalagudem	EAST GODAVARI	9	80	10.81
161	RAMACHANDRAPURAM(U)	EAST GODAVARI	87	814	10.74
162	Nimmakayala Kothapalle	EAST GODAVARI	204	1921	10.60
163	Kutukuluru	EAST GODAVARI	34	323	10.46
164	Gudigalla Rallagunta	EAST GODAVARI	8	79	10.43
165	Samalkot (M)	EAST GODAVARI	133	1286	10.32
166	Lellavai	EAST GODAVARI	24	229	10.29
167	Boddugudem	EAST GODAVARI	48	468	10.26
168	Utrumilli	EAST GODAVARI	16	159	10.13
169	Vella	EAST GODAVARI	68	668	10.13
170	Yerupalle	EAST GODAVARI	38	382	10.00
171	Narsimhapuram	EAST GODAVARI	70	703	10.00
172	Nandigama	KRISHNA	386	762	50.60
173	Dandiganapudi	KRISHNA	277	733	37.83
174	Putlacheruvu	KRISHNA	202	583	34.66
175	Vennanapudi	KRISHNA	210	633	33.19
176	Nandivada	KRISHNA	368	1144	32.20
177	Borrapothupalem	KRISHNA	89	317	28.12

178	Tamirisa	KRISHNA	578	2060	28.03
179	Sreenivasapuram	KRISHNA	30	135	22.55
180	Thummalapalle	KRISHNA	177	843	21.04
181	Koduru	KRISHNA	138	694	19.94
182	Lellapudi	KRISHNA	32	165	19.45
183	Aripirala	KRISHNA	145	749	19.39
184	Singanapudi	KRISHNA	124	647	19.17
185	Dakaram	KRISHNA	58	359	16.04
186	Nuthulapadu	KRISHNA	55	354	15.53
187	Chevuru	KRISHNA	110	751	14.71
188	Peruru	KRISHNA	61	423	14.46
189	Prodduvaka	KRISHNA	60	421	14.29
190	Ayyavari Rudravaram	KRISHNA	87	615	14.09
191	Gannavaram	KRISHNA	159	1142	13.90
192	Pedavirivada	KRISHNA	84	643	13.06
193	Hussainpalem	KRISHNA	20	170	11.88
194	Tamarakollu	KRISHNA	73	648	11.20
195	Endapalle	KRISHNA	51	459	11.15
196	Guntakoduru	KRISHNA	42	379	11.13
197	Devaram	KRISHNA	25	233	10.77
198	Kondangi	KRISHNA	170	1583	10.76
199	Laxmipuram	KRISHNA	168	1622	10.36
200	Guraja	KRISHNA	69	675	10.24
201	Ramachandrapuram	WEST GODAVARI	311	465	66.96
202	Koderu	WEST GODAVARI	138	217	63.47
203	Chintapalle	WEST GODAVARI	165	279	59.34
204	Pocharam	WEST GODAVARI	368	664	55.46
205	Rudramkota	WEST GODAVARI	294	555	53.07
206	Venkatayapalem	WEST GODAVARI	441	850	51.87
207	Kapavaram	WEST GODAVARI	540	1069	50.50
208	Repakagommu	WEST GODAVARI	736	1548	47.56
209	Repakakhandrika	WEST GODAVARI	49	109	45.24
210	Edulakunta	WEST GODAVARI	27	60	44.80
211	Enikepalle	WEST GODAVARI	48	108	44.56
212	Thatukur	WEST GODAVARI	1137	2586	43.98
213	Pedaramachandrapuram	WEST GODAVARI	22	52	42.92
214	Chegondapalle	WEST GODAVARI	67	170	39.40
215	Kondrukota	WEST GODAVARI	434	1110	39.15
216	Gommugudem	WEST GODAVARI	203	521	39.01
217	Krishnapuram	WEST GODAVARI	17	46	36.96
218	Pasalapudi	WEST GODAVARI	313	850	36.85
219	Cherukuganuma Agraharam	WEST GODAVARI	97	271	35.94
220	Naganamilli	WEST GODAVARI	50	141	35.06
221	Narlavaram	WEST GODAVARI	250	741	33.77
222	Polaram	WEST GODAVARI	143	425	33.60
223	Panduvvakhandrika	WEST GODAVARI	49	150	32.54
224	Panduvva	WEST GODAVARI	184	583	31.57
225	Pedanindrakolanu	WEST GODAVARI	517	1639	31.56
226	Thondipaka	WEST GODAVARI	293	933	31.39
227	Dacharam	WEST GODAVARI	512	1653	30.96
228	Jagannadhapuram	WEST GODAVARI	499	1632	30.56
229	Meena Valluru	WEST GODAVARI	192	628	30.52
230	Mandapaka (Rural)	WEST GODAVARI	331	1095	30.20
231	Adavikolanu	WEST GODAVARI	458	1577	29.05
232	Kowndinyamukthi	WEST GODAVARI	110	380	28.98
233	Gopikunta Khandrika	WEST GODAVARI	7	24	28.82
234	Arugolanu	WEST GODAVARI	544	1910	28.46
235	Doddanapudi	WEST GODAVARI	348	1232	28.28
236	Singanapalle	WEST GODAVARI	69	247	27.79
237	Katukur	WEST GODAVARI	136	506	26.95

238	Nawabpalem	WEST GODAVARI	76	284	26.91
239	Singavaram	WEST GODAVARI	268	1001	26.75
240	Madhavaram	WEST GODAVARI	445	1698	26.19
241	Oduru	WEST GODAVARI	127	488	26.09
242	Kakileru	WEST GODAVARI	100	383	26.00
243	Padala	WEST GODAVARI	74	294	25.17
244	Koyyetipadu	WEST GODAVARI	67	270	24.78
245	Krovvidi	WEST GODAVARI	235	969	24.22
246	Gogunta	WEST GODAVARI	125	534	23.36
247	Ballipadu	WEST GODAVARI	104	448	23.14
248	Pedapulleru	WEST GODAVARI	62	268	23.04
249	Ravimetla	WEST GODAVARI	173	759	22.83
250	Kodurupadu	WEST GODAVARI	91	401	22.80
251	Vinjaram	WEST GODAVARI	347	1557	22.28
252	Garuvuguntakhandrika	WEST GODAVARI	24	111	21.86
253	Konala	WEST GODAVARI	103	471	21.82
254	Racharla	WEST GODAVARI	124	574	21.65
255	Arulla	WEST GODAVARI	145	674	21.57
256	Bodapadu	WEST GODAVARI	75	349	21.56
257	Pydipaka	WEST GODAVARI	175	814	21.49
258	Kothapalle Agraharam	WEST GODAVARI	48	224	21.49
259	Ibrahimpeta	WEST GODAVARI	116	543	21.41
260	Yanalapalle	WEST GODAVARI	85	399	21.35
261	Kannayakumudavalli	WEST GODAVARI	54	254	21.13
262	Kukunoor	WEST GODAVARI	504	2397	21.02
263	Arthamuru	WEST GODAVARI	239	1151	20.81
264	Thutigunta	WEST GODAVARI	230	1105	20.77
265	Chanamilli	WEST GODAVARI	177	859	20.64
266	Jallikakinada	WEST GODAVARI	59	287	20.55
267	Krishnayapalem	WEST GODAVARI	58	289	20.06
268	Bhatlamagutur	WEST GODAVARI	125	624	20.05
269	Siddapuram	WEST GODAVARI	255	1273	20.04
270	Kolamuru	WEST GODAVARI	304	1520	20.00
271	Kivvaka	WEST GODAVARI	334	1673	19.95
272	Suryaraopalem	WEST GODAVARI	91	456	19.87
273	Jakkaram	WEST GODAVARI	48	243	19.86
274	Narasimha Apparaopuram	WEST GODAVARI	12	58	19.79
275	Seetharama Nagar	WEST GODAVARI	210	1066	19.68
276	Alampuram	WEST GODAVARI	121	615	19.61
277	Kothuru	WEST GODAVARI	91	469	19.51
278	Varighedu	WEST GODAVARI	137	705	19.41
279	Duddepudi	WEST GODAVARI	13	70	19.36
280	Thurupuvipparru	WEST GODAVARI	58	302	19.32
281	Ganapavaram	WEST GODAVARI	148	769	19.29
282	Garagaparru	WEST GODAVARI	220	1142	19.24
283	Thimmaraogudem	WEST GODAVARI	205	1080	18.99
284	Dharmapuram	WEST GODAVARI	92	491	18.74
285	Kollaparru	WEST GODAVARI	210	1150	18.29
286	Kakaramilli	WEST GODAVARI	16	87	18.06
287	Mudunuru	WEST GODAVARI	200	1119	17.85
288	Polavaram	WEST GODAVARI	606	3435	17.64
289	Bondada	WEST GODAVARI	358	2033	17.63
290	Arvaipalle	WEST GODAVARI	191	1091	17.50
291	Atlapadu	WEST GODAVARI	55	315	17.49
292	Cherukuwada	WEST GODAVARI	157	902	17.44
293	Pothunuru	WEST GODAVARI	463	2657	17.44
294	Saripalle	WEST GODAVARI	99	575	17.28
295	Unudurru	WEST GODAVARI	122	719	16.99
296	Penugonda	WEST GODAVARI	184	1082	16.96
297	Gummuluru	WEST GODAVARI	122	720	16.92
298	Penumantra	WEST GODAVARI	256	1523	16.80

299	Arikirevula	WEST GODAVARI	44	266	16.45
300	Kommara	WEST GODAVARI	121	744	16.30
301	Duvva	WEST GODAVARI	289	1810	15.95
302	Kasipadu	WEST GODAVARI	89	559	15.92
303	Usulumarru	WEST GODAVARI	62	393	15.86
304	Maredubaka	WEST GODAVARI	349	2233	15.64
305	Kakarlamudi	WEST GODAVARI	112	723	15.51
306	Kovvali	WEST GODAVARI	458	2993	15.29
307	Bommidi	WEST GODAVARI	117	770	15.21
308	Ravipadu	WEST GODAVARI	157	1036	15.19
309	Munamarru	WEST GODAVARI	42	277	15.18
310	Kavalipuram	WEST GODAVARI	74	490	15.04
311	Vellamilli	WEST GODAVARI	154	1036	14.89
312	Agraharagopavaram	WEST GODAVARI	36	241	14.88
313	Sridhara	WEST GODAVARI	145	975	14.88
314	Pittalavemavaram	WEST GODAVARI	71	498	14.35
315	Tirumalapuram	WEST GODAVARI	292	2045	14.29
316	Akuteegapadu	WEST GODAVARI	81	570	14.24
317	Tekuru	WEST GODAVARI	68	479	14.20
318	Gummampadu	WEST GODAVARI	28	199	14.07
319	Padamara Vipparru	WEST GODAVARI	203	1472	13.78
320	Kolleru Lake	WEST GODAVARI	616	4505	13.68
321	Itempudi	WEST GODAVARI	12	85	13.66
322	Kaldhari	WEST GODAVARI	142	1054	13.49
323	Bayyavaram	WEST GODAVARI	64	472	13.47
324	Rachuru	WEST GODAVARI	178	1337	13.33
325	Valluru	WEST GODAVARI	122	918	13.30
326	Mallipudi	WEST GODAVARI	45	339	13.28
327	Nandamuru	WEST GODAVARI	74	567	13.09
328	Korupalle	WEST GODAVARI	39	301	13.08
329	Koida	WEST GODAVARI	78	596	13.04
330	Bavayapalem	WEST GODAVARI	108	829	13.04
331	Annavaram	WEST GODAVARI	40	305	12.98
332	Kalla	WEST GODAVARI	234	1809	12.92
333	Kolanapalle	WEST GODAVARI	84	651	12.91
334	Tamarada	WEST GODAVARI	32	249	12.83
335	Kanuruagraharam	WEST GODAVARI	59	459	12.80
336	Chataparru	WEST GODAVARI	184	1446	12.75
337	Munipalle	WEST GODAVARI	50	397	12.68
338	Bhimadole	WEST GODAVARI	243	1921	12.66
339	Veereswarapuram	WEST GODAVARI	16	129	12.63
340	Alamuru	WEST GODAVARI	113	898	12.56
341	Kopalle	WEST GODAVARI	83	667	12.49
342	Kolleru	WEST GODAVARI	113	915	12.33
343	Darsiparru (R)	WEST GODAVARI	84	682	12.25
344	Yenuguvanilanka	WEST GODAVARI	124	1016	12.19
345	Ragolapalle	WEST GODAVARI	29	235	12.16
346	B.Kondepadu	WEST GODAVARI	47	393	12.06
347	Relangi	WEST GODAVARI	185	1531	12.06
348	Undi	WEST GODAVARI	224	1876	11.96
349	Ardhavaram	WEST GODAVARI	99	828	11.93
350	Peravali	WEST GODAVARI	72	605	11.89
351	Kagupadu	WEST GODAVARI	69	580	11.85
352	Neggipudi	WEST GODAVARI	29	247	11.73
353	Marteru	WEST GODAVARI	38	323	11.72
354	Ogidi	WEST GODAVARI	17	142	11.68
355	Vadapalle	WEST GODAVARI	97	830	11.63
356	Badampudi	WEST GODAVARI	122	1056	11.57
357	Chinapulluru	WEST GODAVARI	31	273	11.49
358	Pulla	WEST GODAVARI	405	3610	11.23
359	Taratava	WEST GODAVARI	26	235	11.13
360	Mallavaram	WEST GODAVARI	151	1357	11.13

361	Kodamanchili	WEST GODAVARI	92	826	11.11
362	Pochavaram	WEST GODAVARI	57	515	10.99
363	Sattala	WEST GODAVARI	62	561	10.96
364	Kaikaram	WEST GODAVARI	260	2373	10.94
365	Achanta Vemavaram	WEST GODAVARI	120	1110	10.78
366	Navarasapuram	WEST GODAVARI	46	425	10.78
367	Muddapuram	WEST GODAVARI	38	350	10.77
368	Iragavaram	WEST GODAVARI	148	1381	10.72
369	Tadiparru	WEST GODAVARI	61	573	10.70
370	Kalavalapalle	WEST GODAVARI	133	1247	10.68
371	Chintalagudem	WEST GODAVARI	17	161	10.60
372	Pali	WEST GODAVARI	28	269	10.56
373	Agadallanka	WEST GODAVARI	275	2603	10.55
374	Venkatadriapparaopuram	WEST GODAVARI	19	178	10.51
375	Satyawada	WEST GODAVARI	47	465	10.18
376	Kesavaram	WEST GODAVARI	141	1398	10.10
377	Vasantawada-II	WEST GODAVARI	51	501	10.08
378	Chigurumamidi	WEST GODAVARI	233	2320	10.03

Flood Inundation in Godavari River, Andhra Pradesh State

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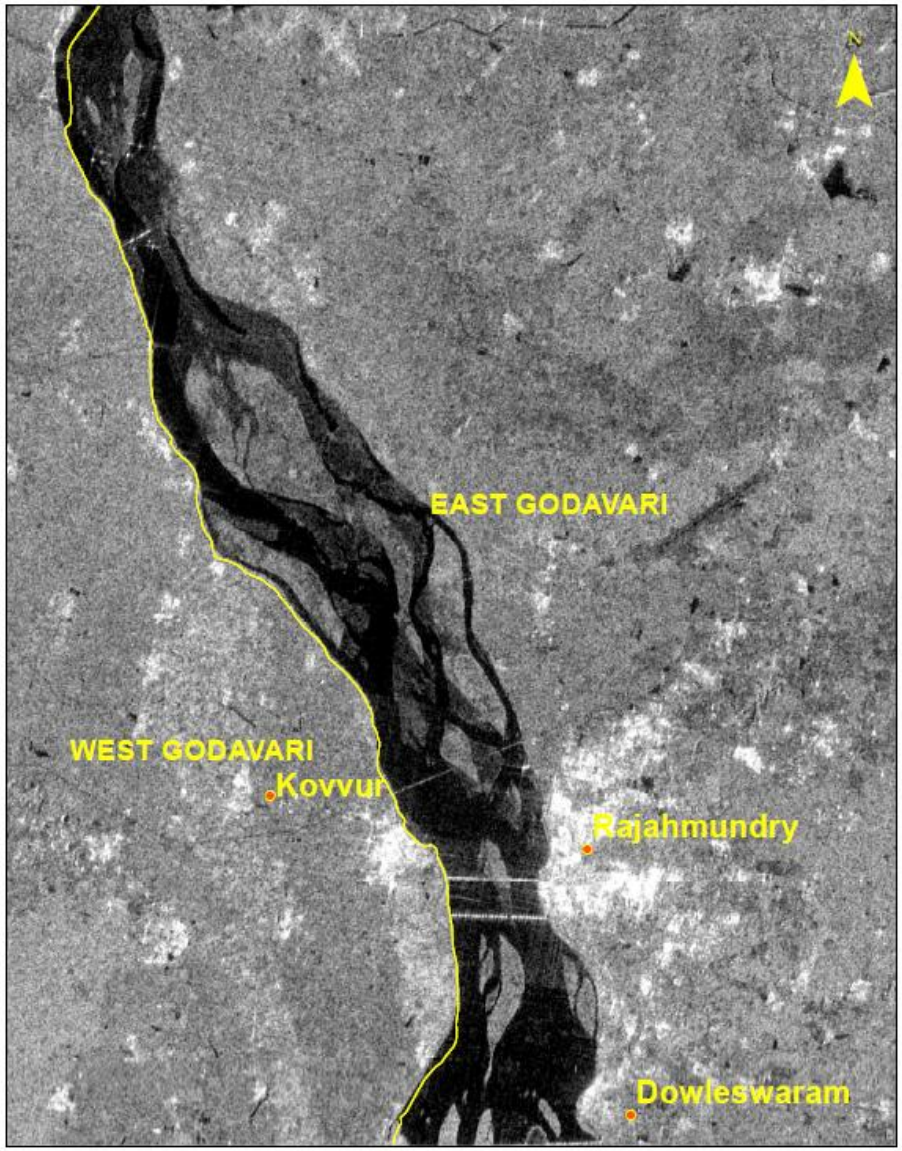
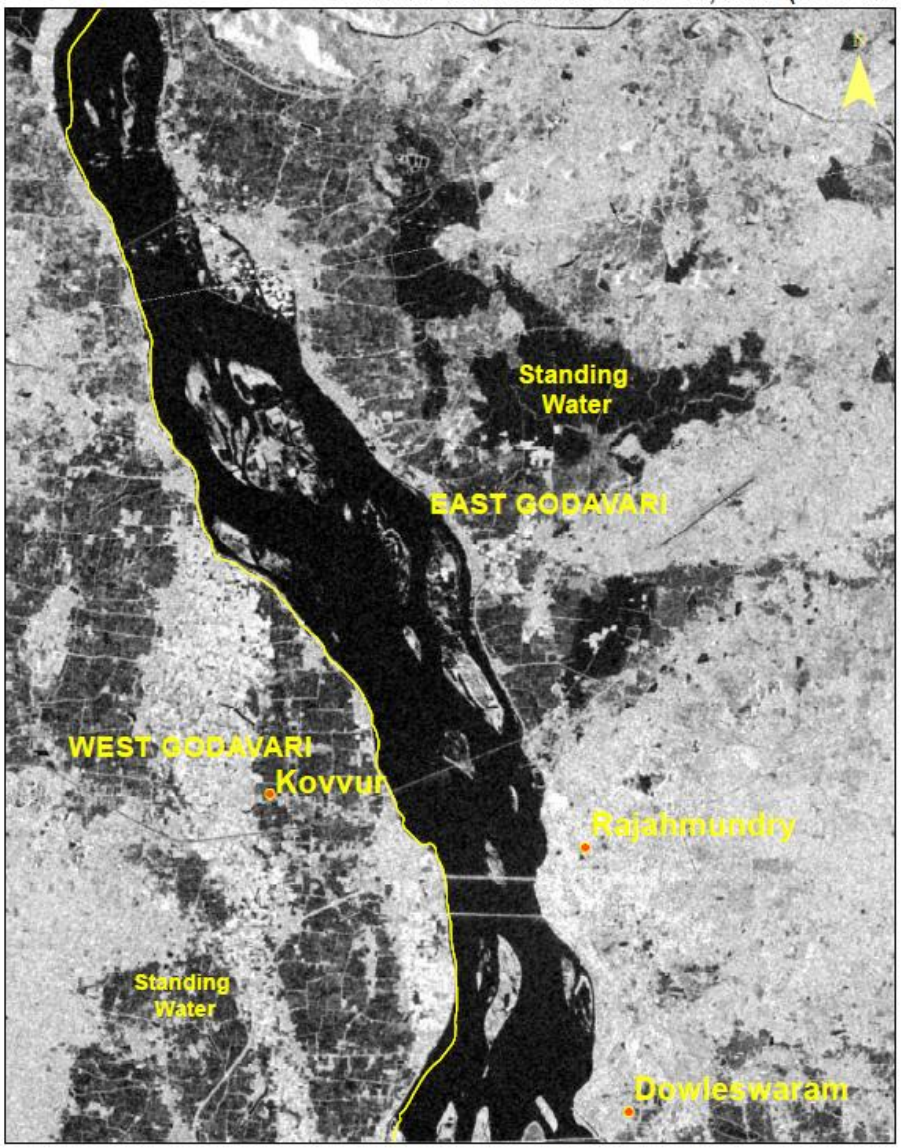
Pre-Flood

IRS SAR data of 15 Apr, 2022

During-Flood

Sentinel 1A SAR data of 16 Jul, 2022 (1800 Hrs)





Water

Land/Non-Water

0 2 4 8 12

Kilometers

Flood Inundation in Sabari and Godavari Rivers, Andhra Pradesh State

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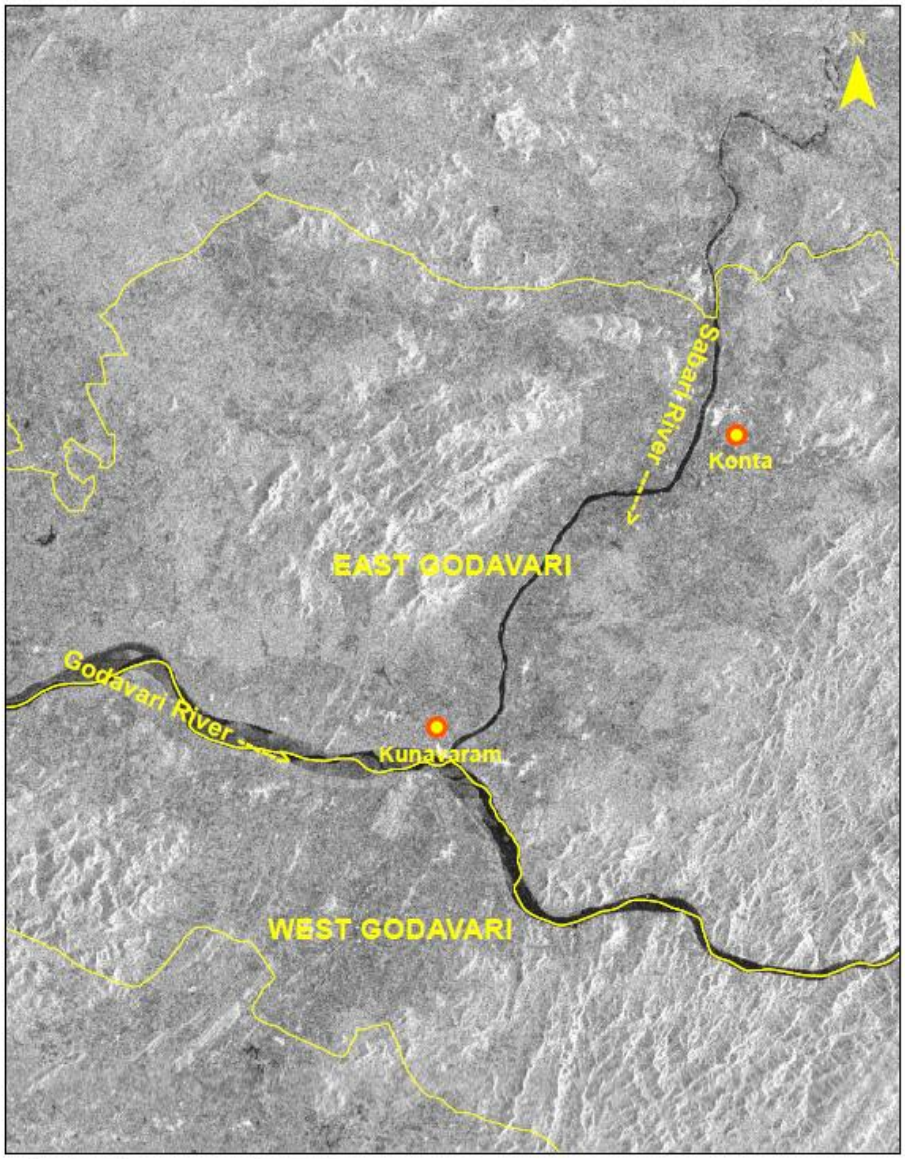
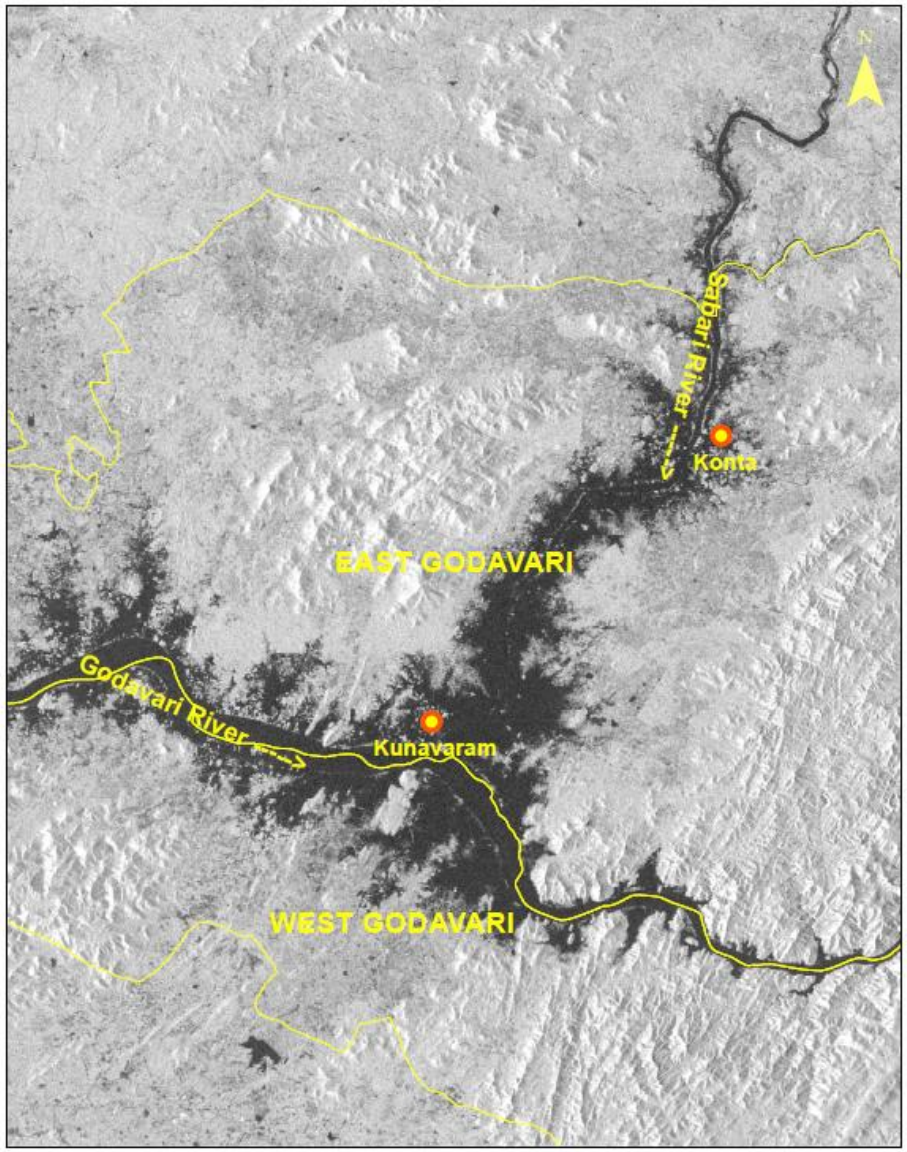
Pre-Flood — IRS SAR data of 23 Apr, 2022



During-Flood — Sentinel 1A SAR data of 16 Jul, 2022 (1800 Hrs)



Water

Land/Non-Water

0 4 8 16 24

Kilometers

Heavy rain and flood affected areas in Coastal Region, Andhra Pradesh State

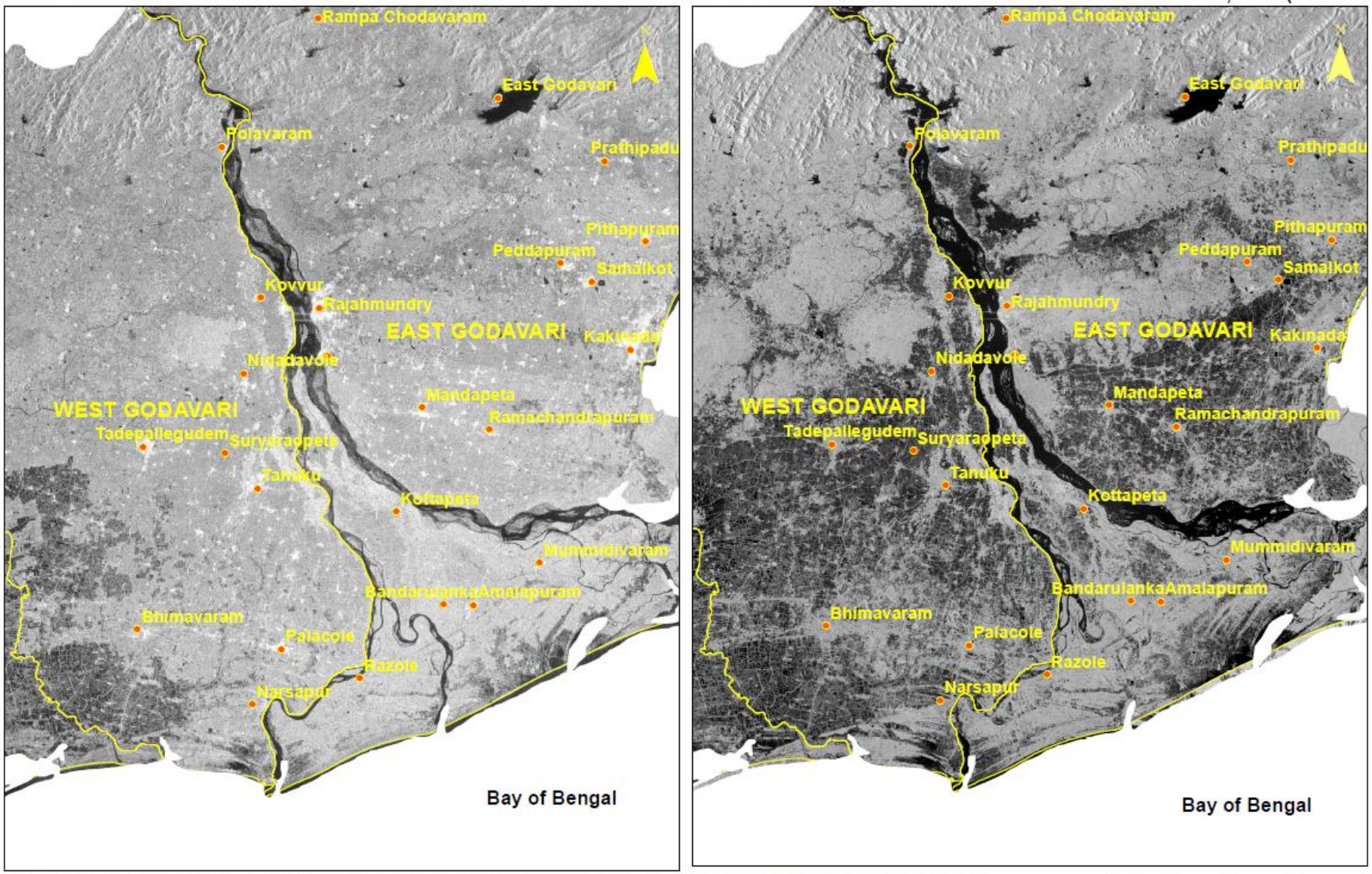
nrsc

Pre-Flood

IRS SAR data of 15 Apr, 2022

During-Flood

Sentinel 1A SAR data of 16 Jul, 2022 (1800 Hrs)



Note: The dark pixels/ patches seen in the satellite image of Sentinel 1A SAR of 16 July 2022 may represent areas under rain water accumulation / flood water in low lying areas / salt panes/ aquaculture. Flooding beneath the vegetation can be seen partially.

0 5 10 20 30

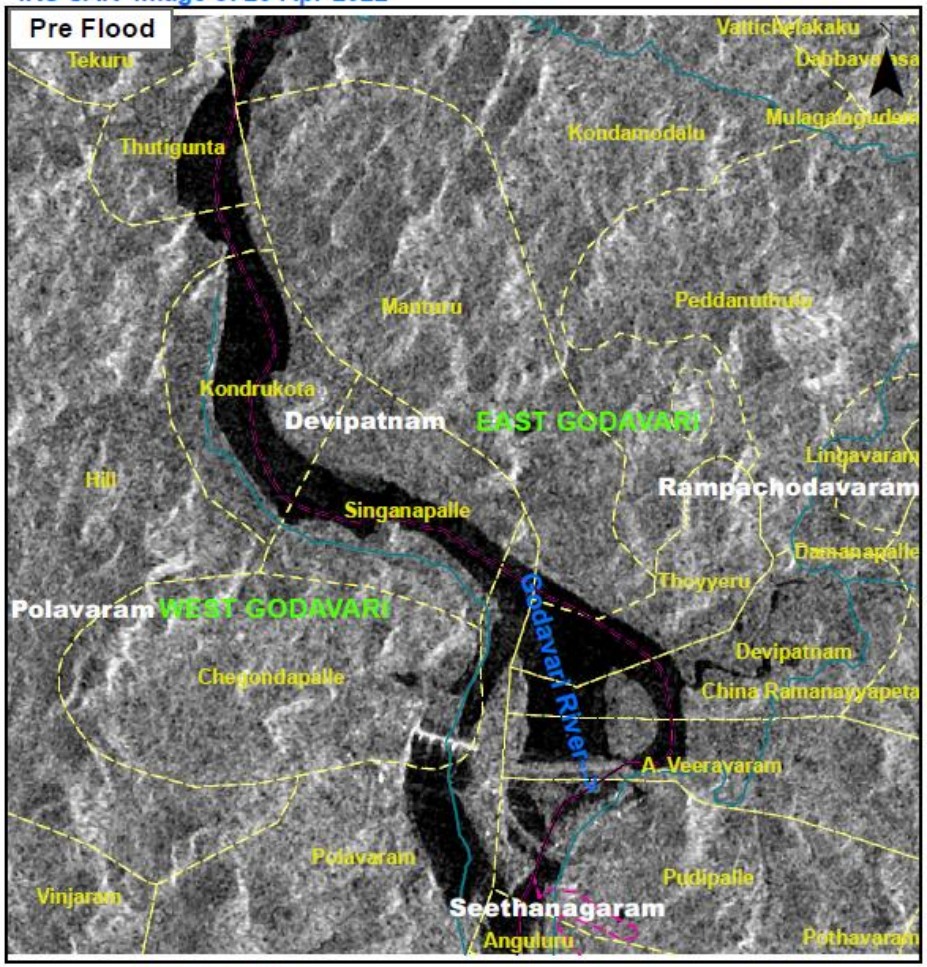
Kilometers

Flood Inundated areas in Part of Polavaram Mandal of West Godavari and Devipatnam Mandal of East Godavari District,Andhra Pradesh State

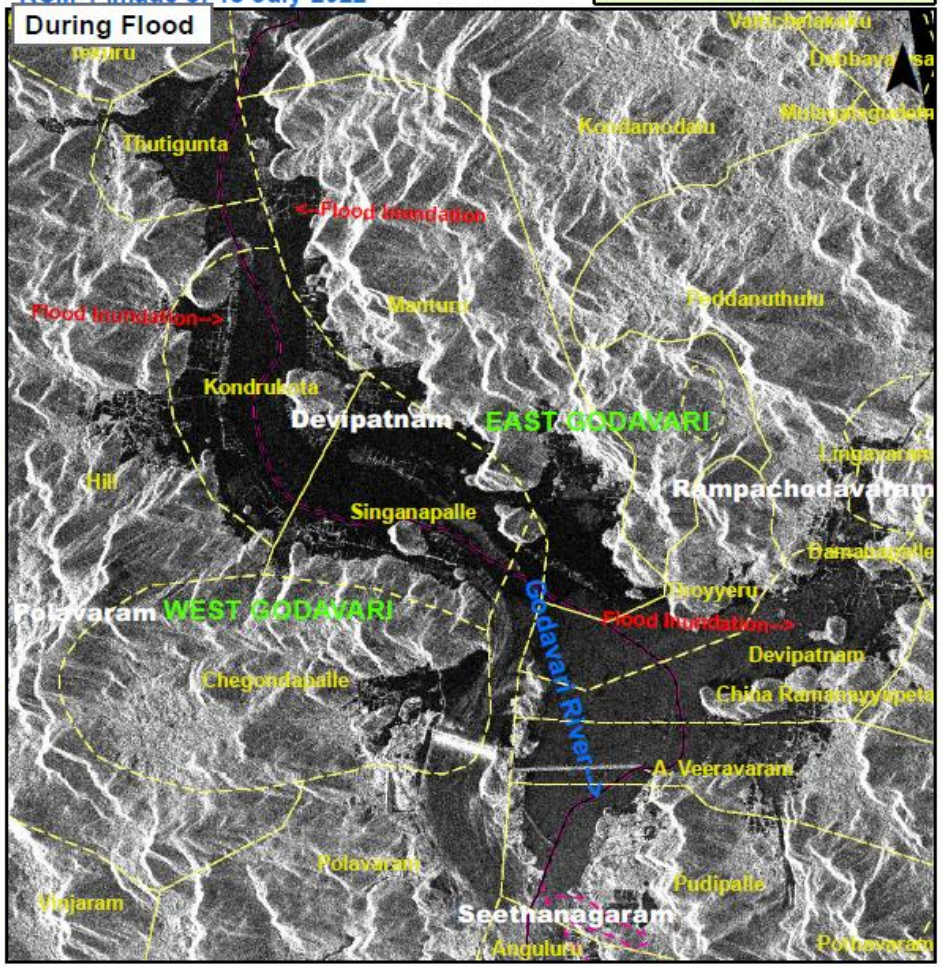
Date of Issue : 19.07.2022

DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/01

IRS SAR Image of 23-Apr-2022



RCM-1 Image of 18-July-2022



Location Map

Part of East and West Godavari districts

Legend

- Village Boundary
- Mandal Boundary

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Dept. of Space, Govt. of India
Hyderabad- 500 037
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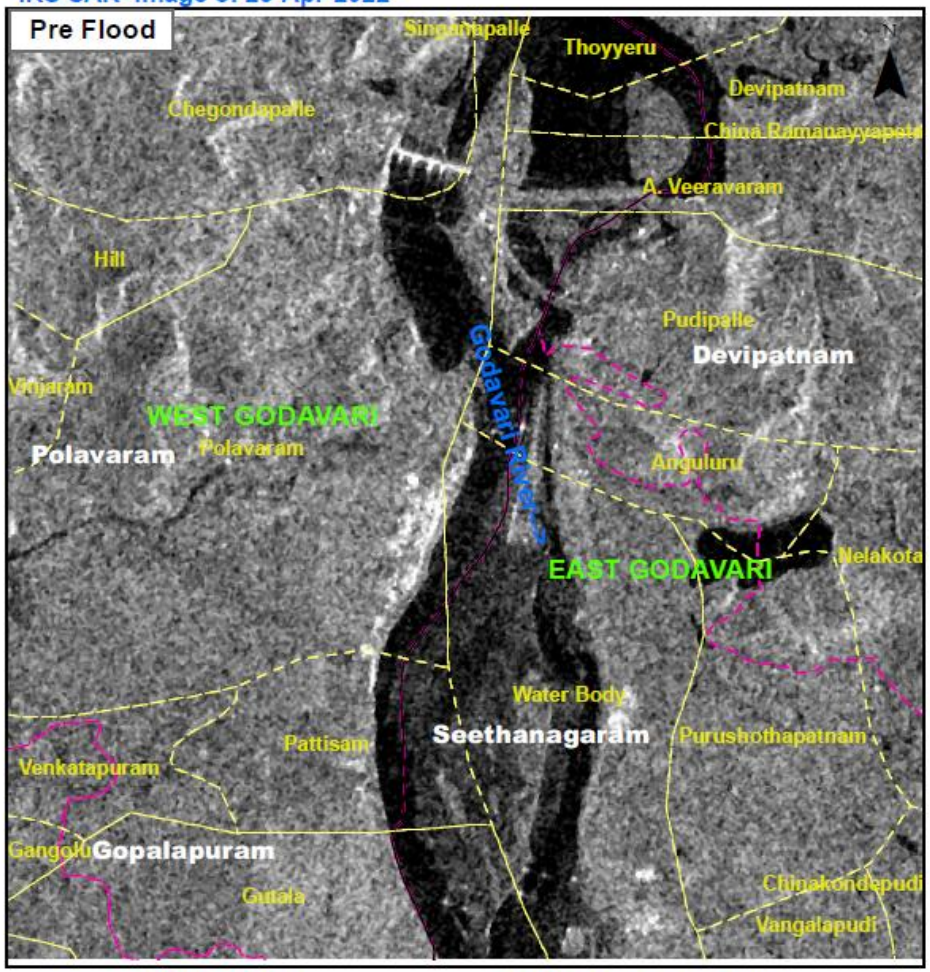
Date of Issue : 19.07.2022

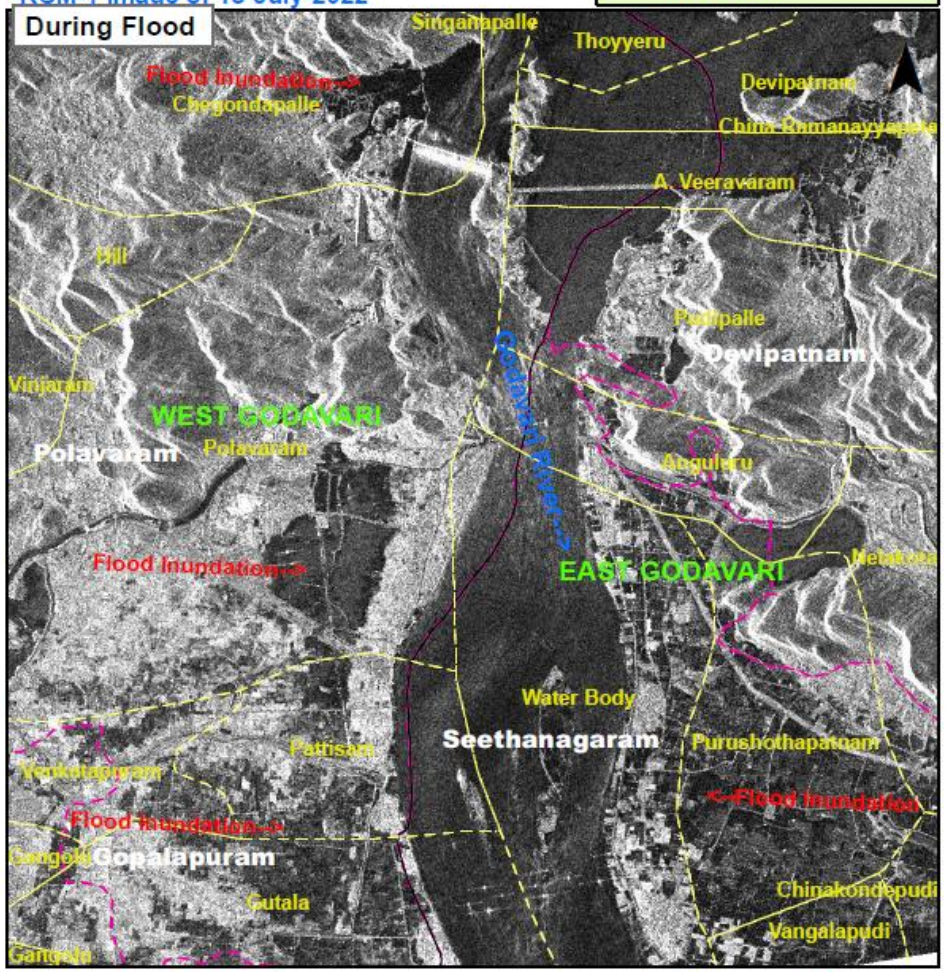
Flood Inundated areas in Part of of West and East Godavari Districts,Andhra Pradesh State

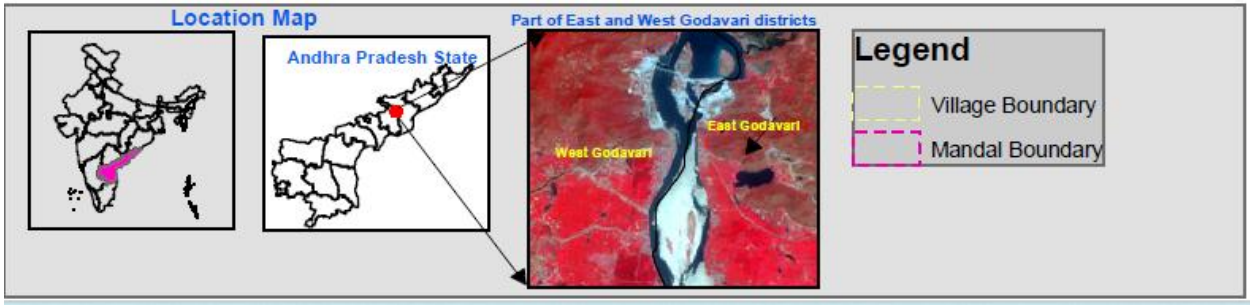
DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/02

IRS SAR Image of 23-Apr-2022



RCM-1 Image of 18-July-2022





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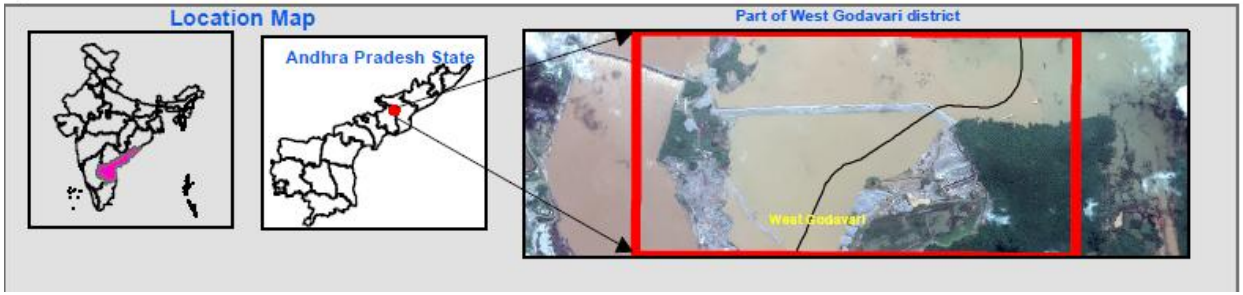
Date of Issue : 19.07.2022

Polavaram Coffer Dams,West Godavari District,Andhra Pradesh State

DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/04

Pleiades Image of 19-Jul-2022



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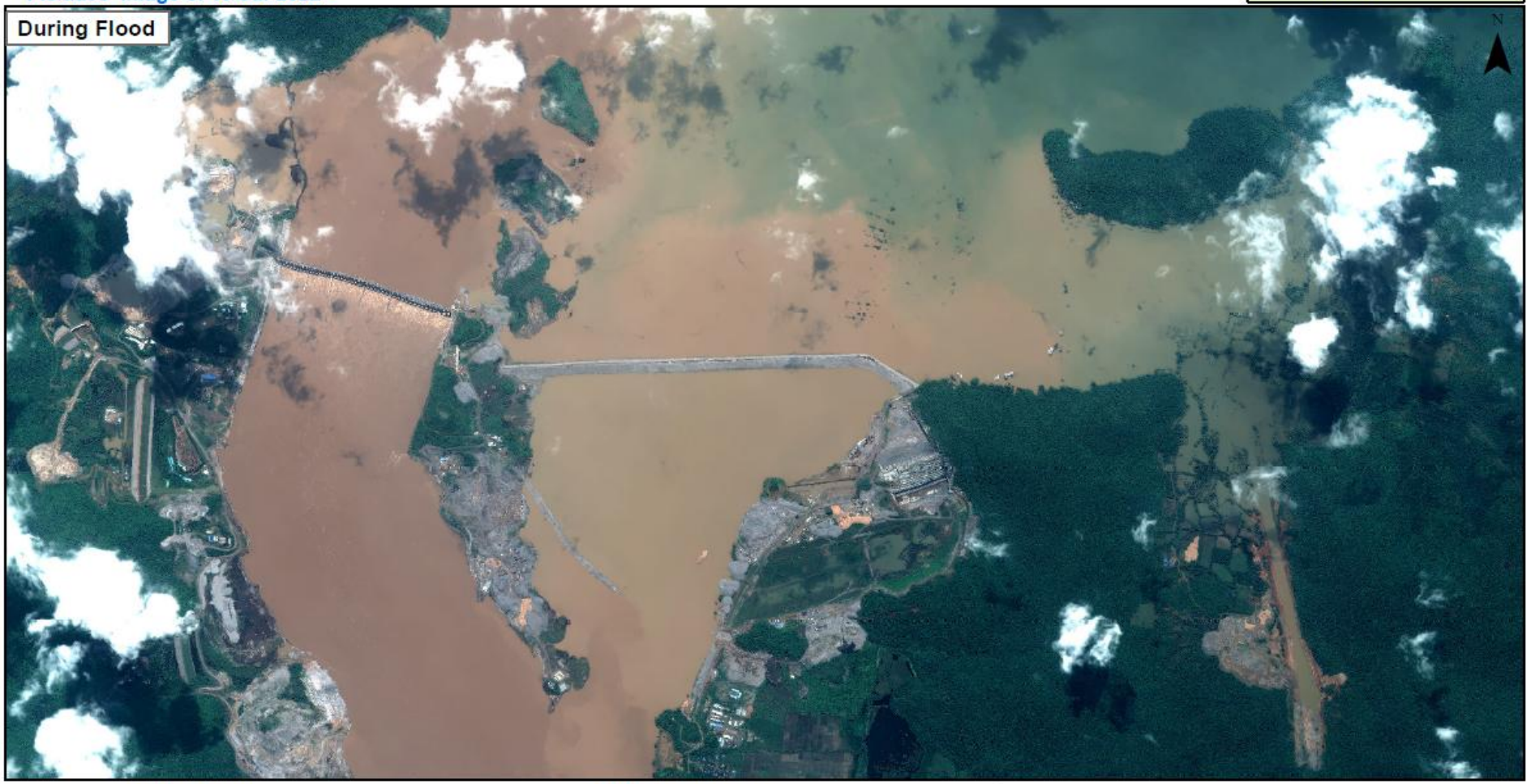
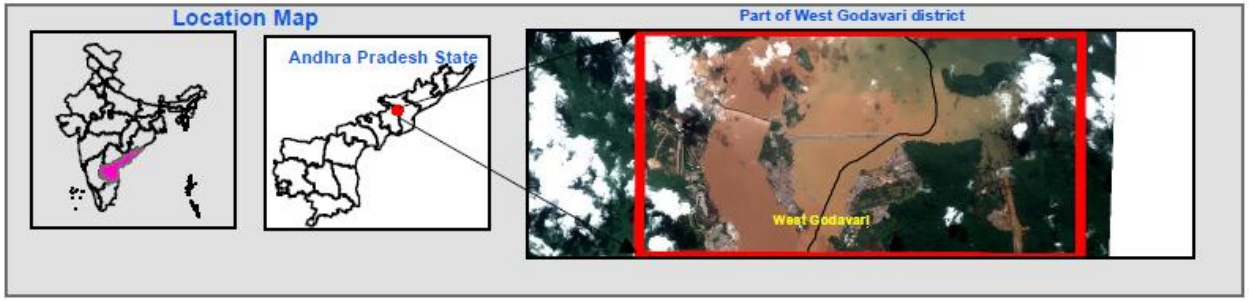
Date of Issue : 19.07.2022

Polavaram Project Overview,West Godavari District,Andhra Pradesh State

DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/05

Pleiades Image of 19-Jul-2022





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Date of Issue : 19.07.2022

DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/03

Polavaram Spillway,West Godavari District,Andhra Pradesh State

Pleiades Image of 19-Jul-2022

Location Map

Part of West Godavari district

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Flood Inundated areas in Bobbar Lanka village, adjacent to Dhavaleswaram Barrage,Andhra Pradesh State

DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/18

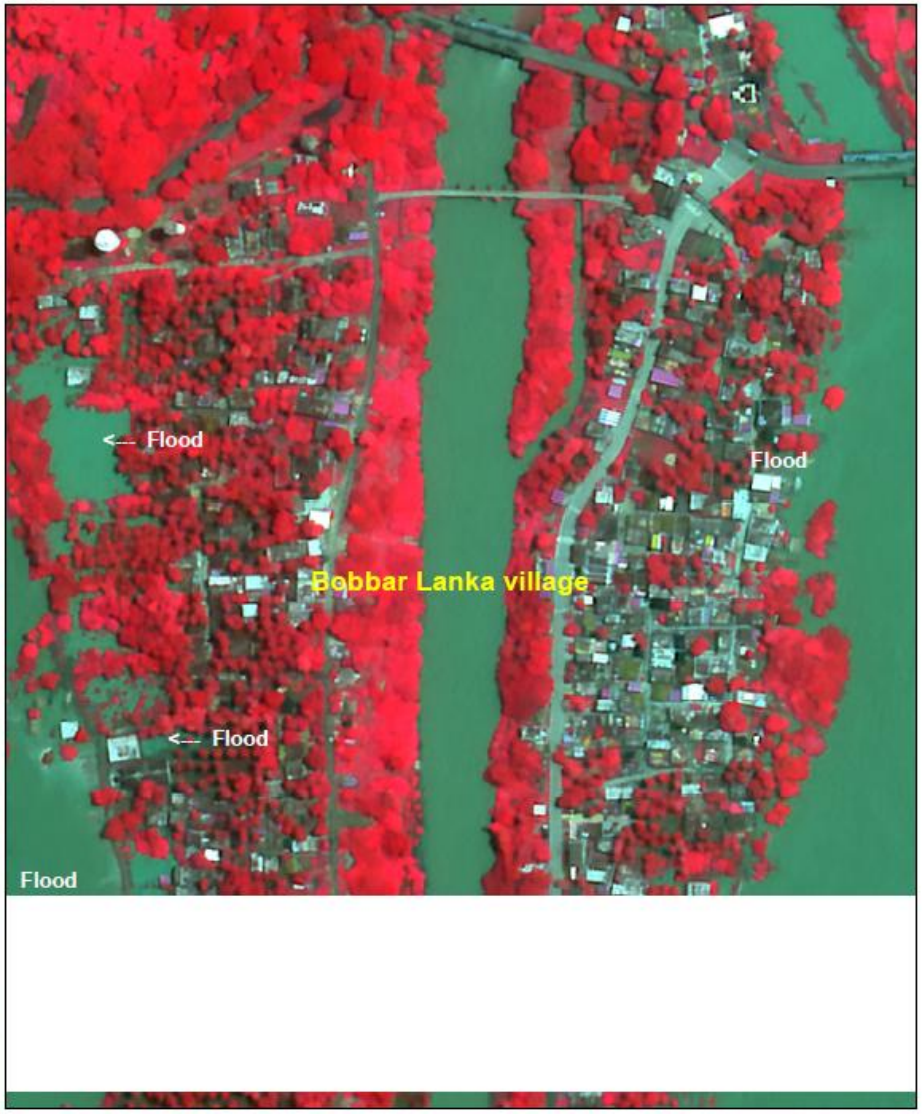
Date of Issue : 28.07.2022

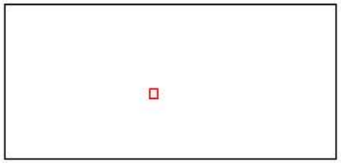
Pre Flood

CARTOSAT 3 MX Image of 29-Dec-2020

During Flood

NEWSAT Image of 19-July-2022





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N
W E
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0 0.0425 0.085
Kilometers

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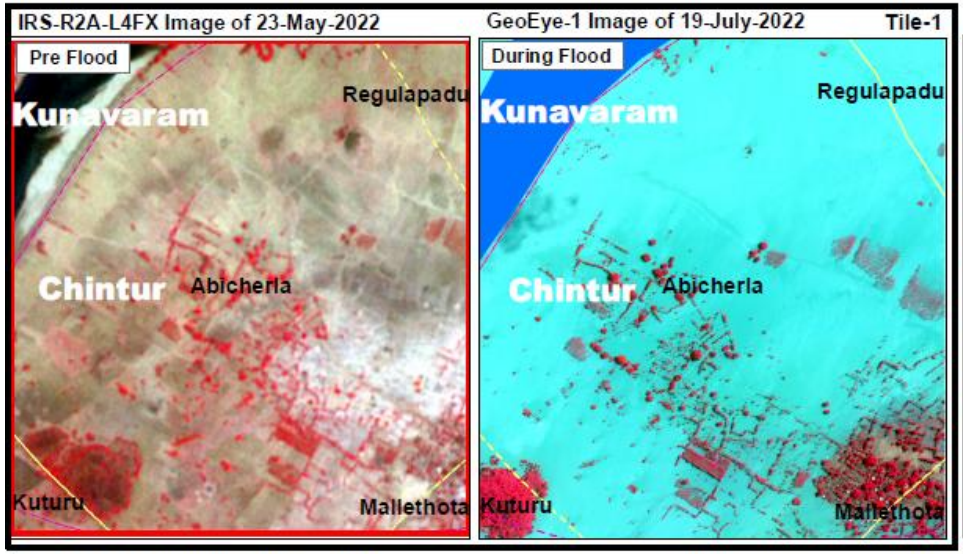
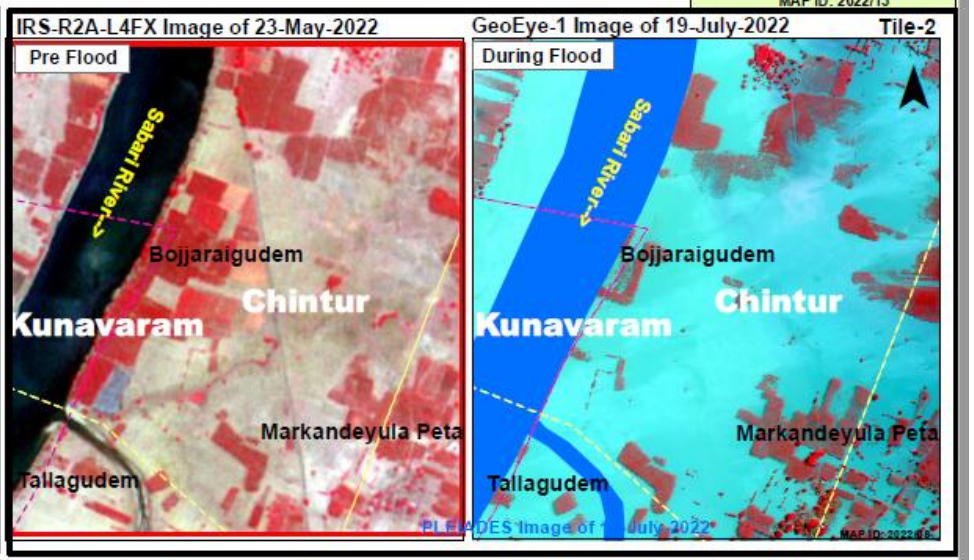
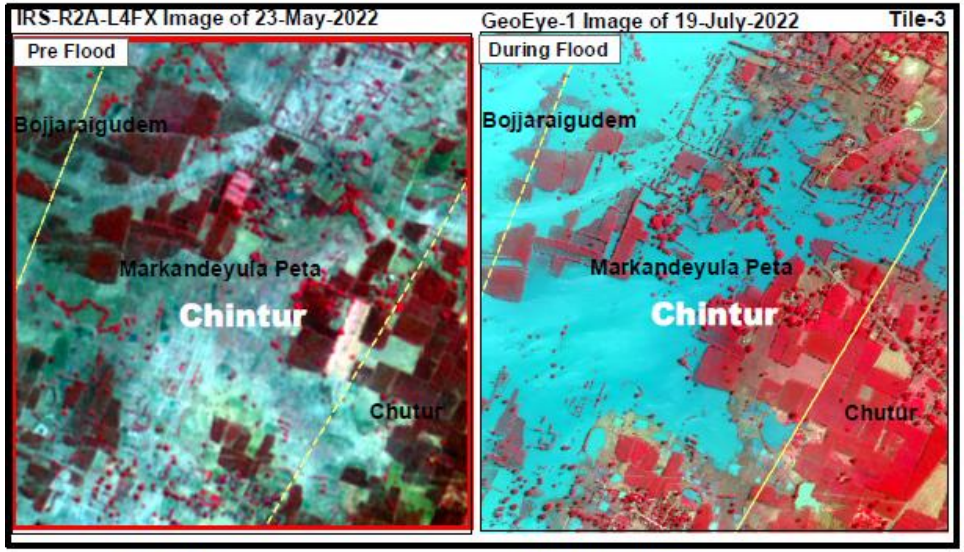
Flood Inundated areas in Chintur Mandal of East Godavari District,Andhra Pradesh State

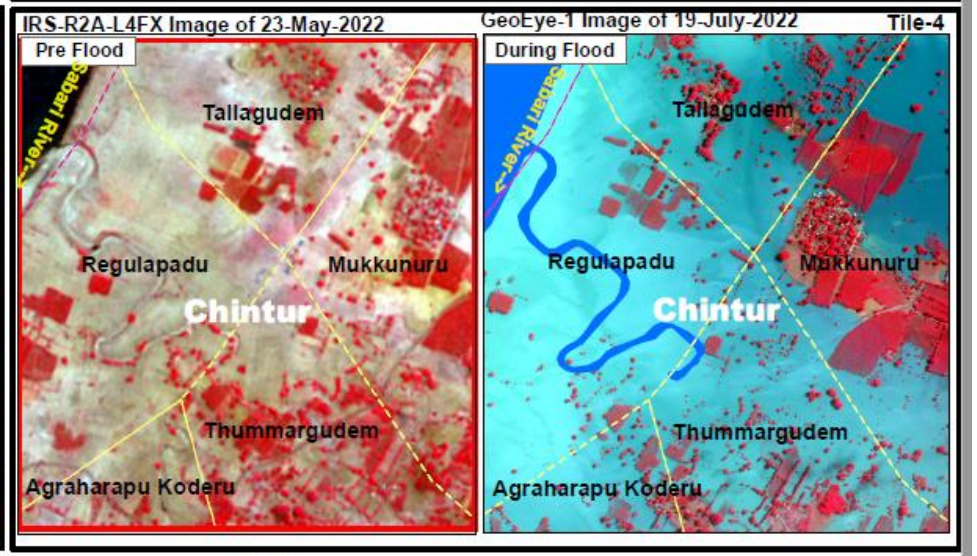
Date of Issue : 21.07.2022

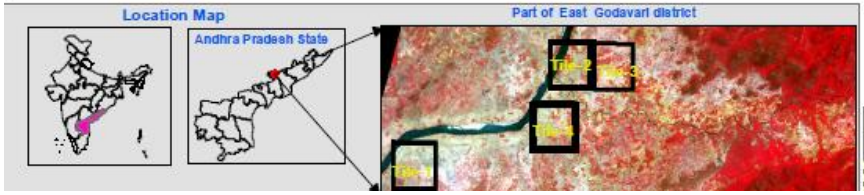
DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/15











Legend

Village Boundary

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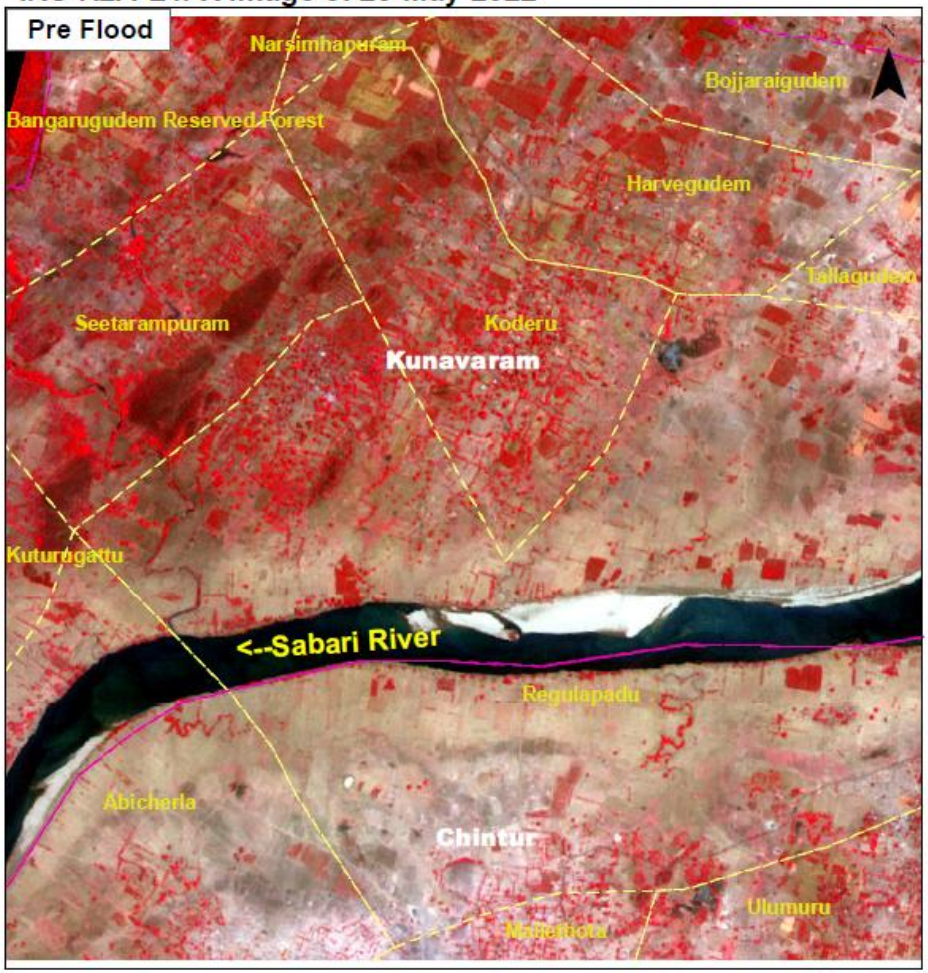
Flood Inundated areas in Part of Kunavaram and Chintur Mandals,East Godavari District,Andhra Pradesh State

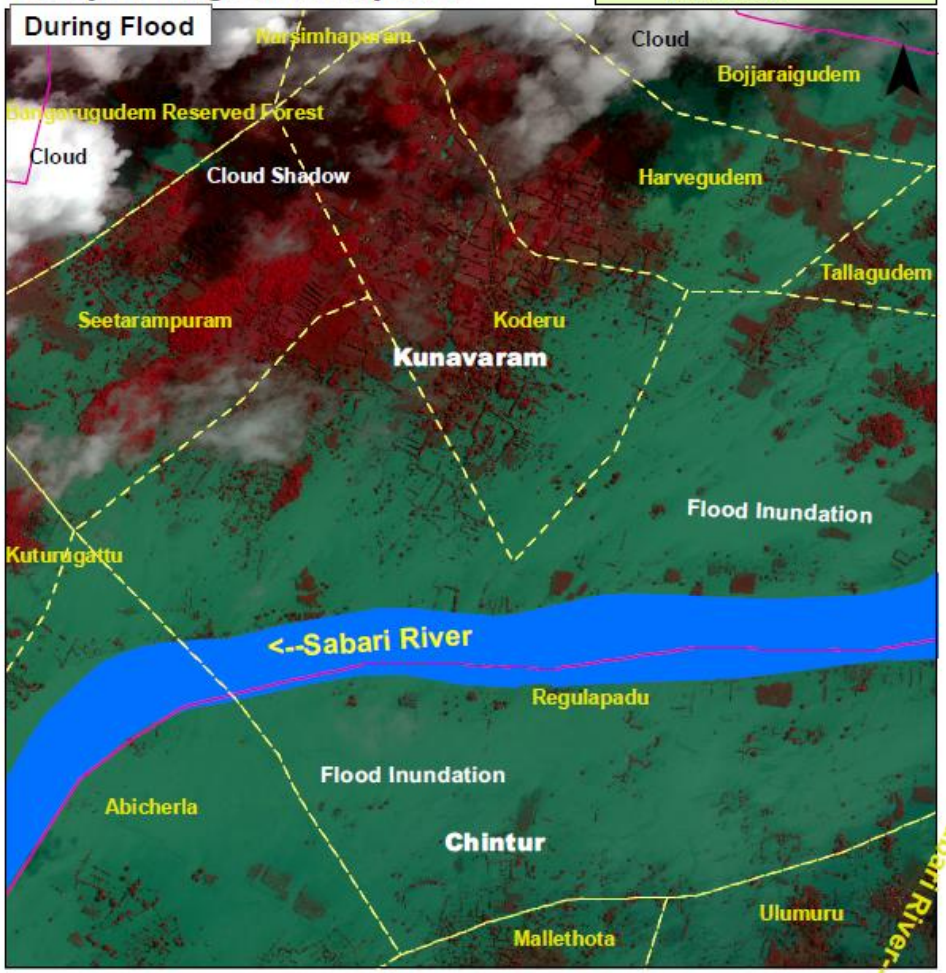
Date of Issue : 19.07.2022

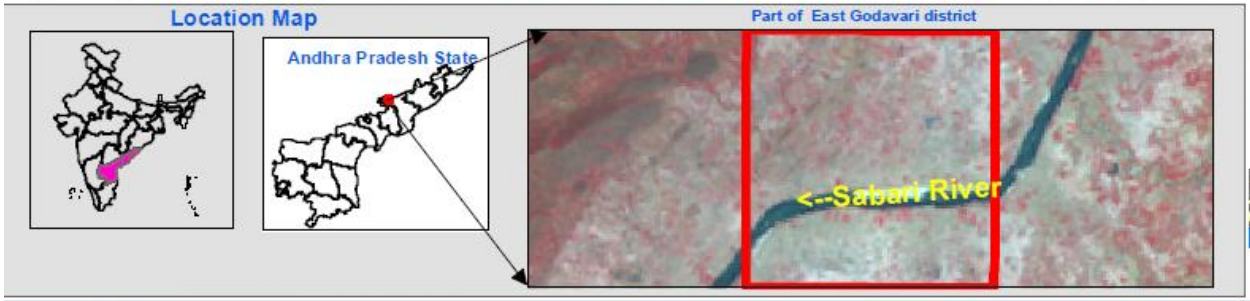
DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/17

IRS-R2A-L4FX Image of 23-May-2022



GeoEye-1 Image of 19-July-2022





Legend
Village Boundary
River

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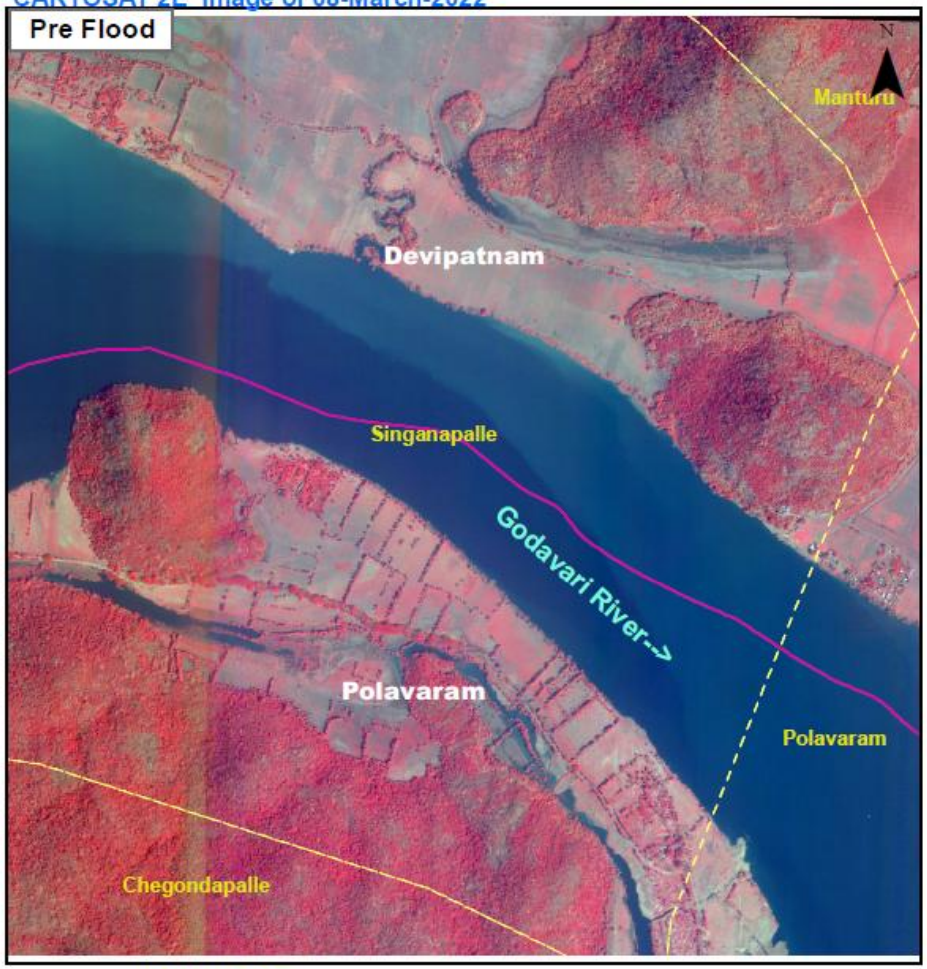
Date of Issue : 19.07.2022

Flood Inundated areas in Part of East and West Godavari Districts,Andhra Pradesh State

DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/07

CARTOSAT 2E Image of 08-March-2022



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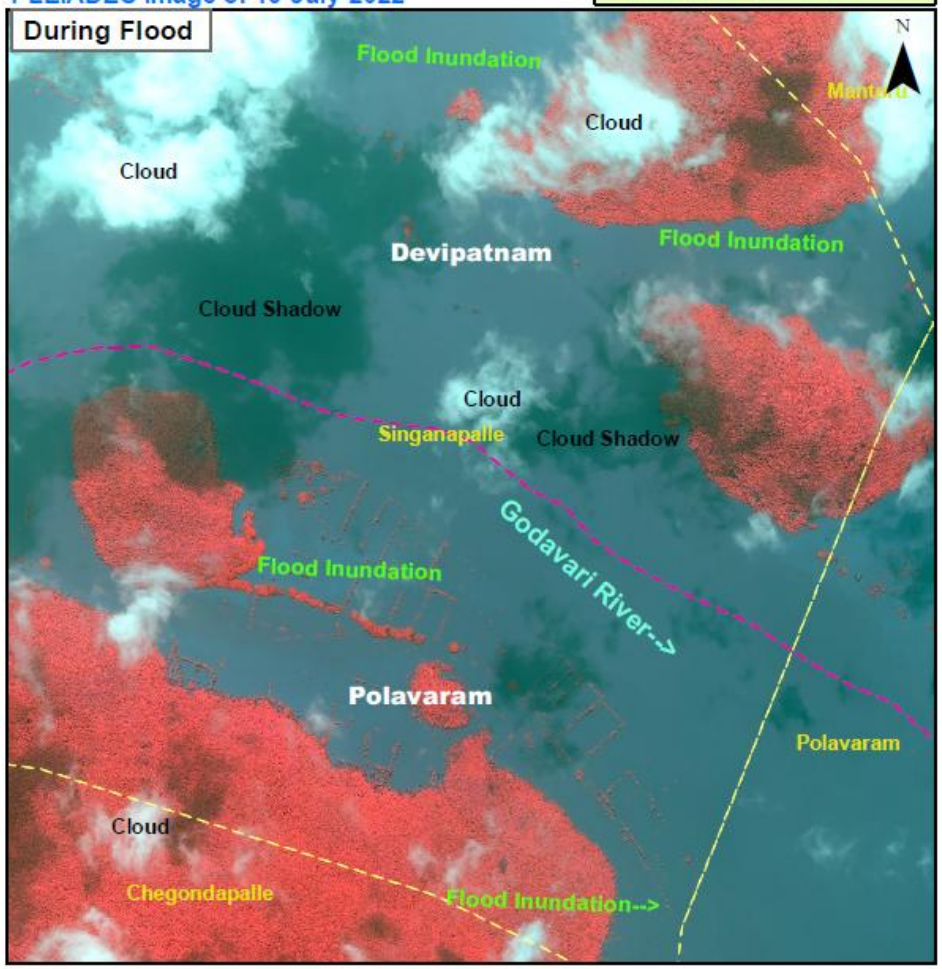

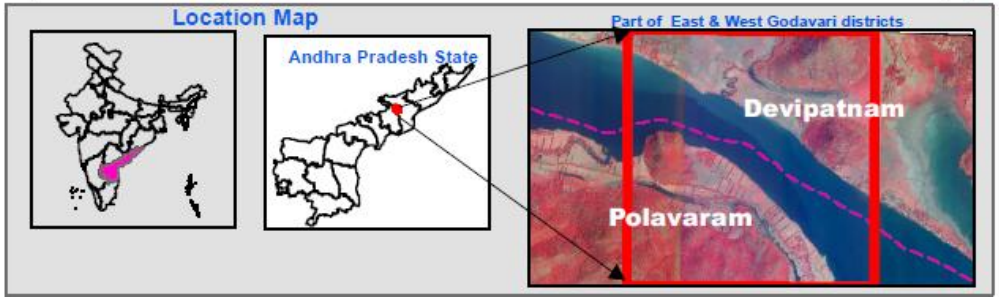

Legend

- Village Boundary
- Mandal Boundary

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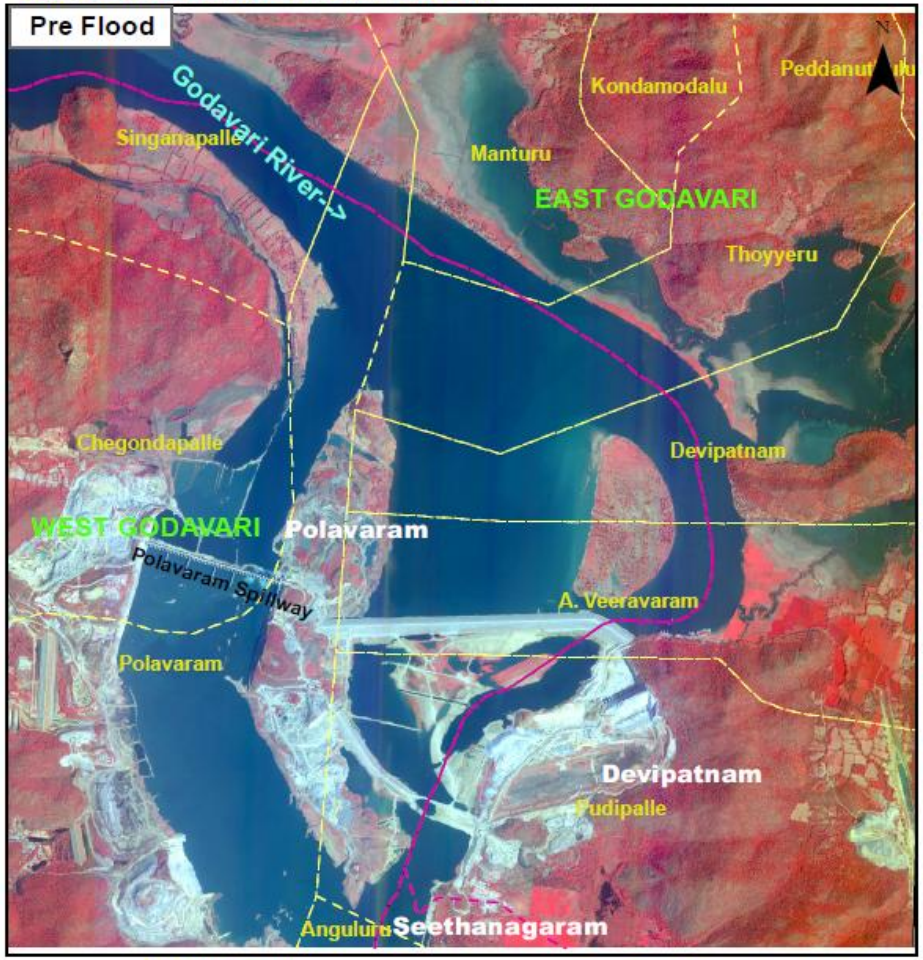
Flood Inundated areas in Part of East and West Godavari Districts,Andhra Pradesh State

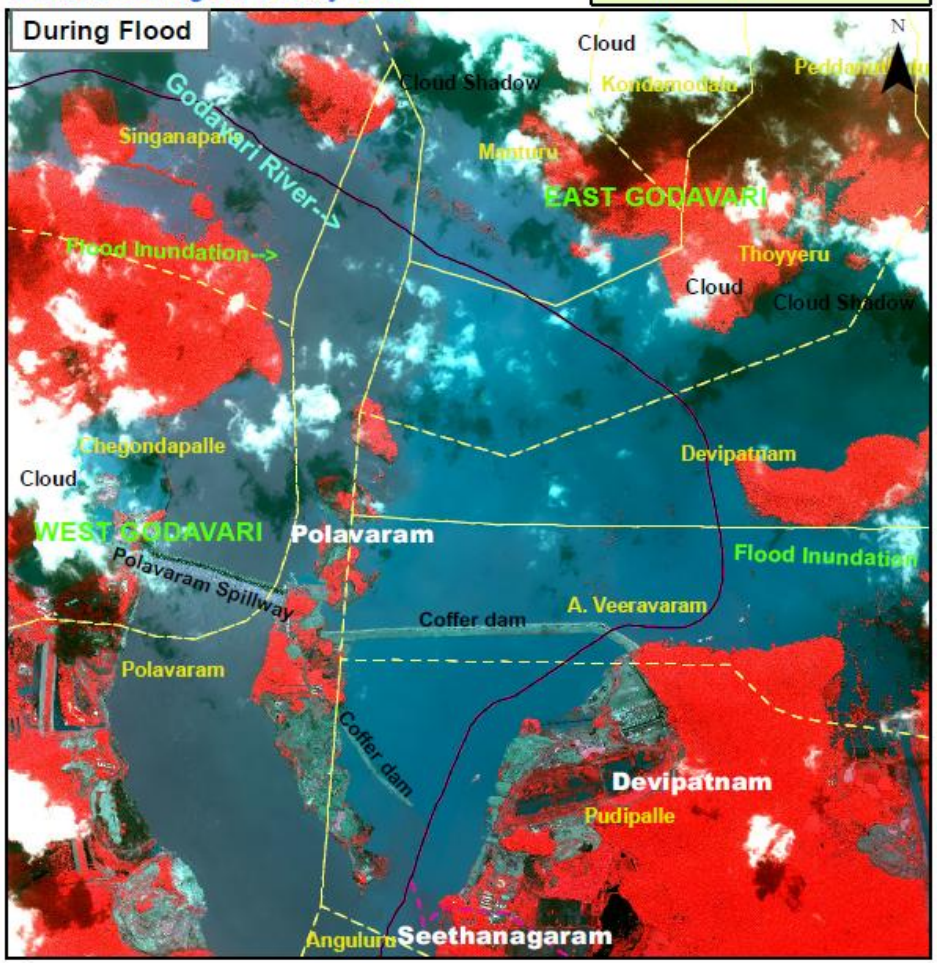
Date of Issue : 19.07.2022

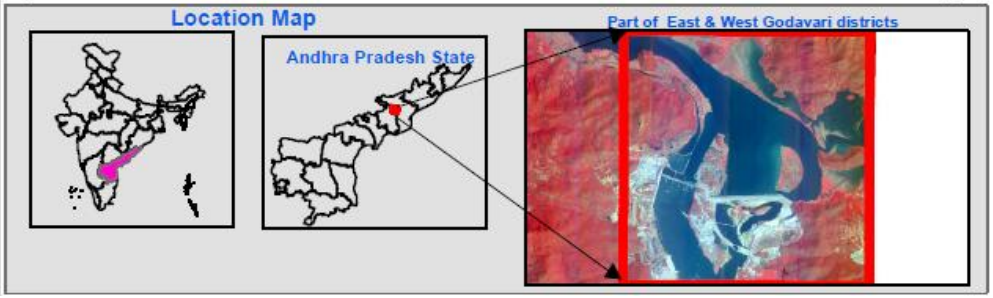
DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/08

CARTOSAT 2E Image of 08-March-2022



PLEIADES Image of 19-July-2022





Legend

- Village Boundary
- Mandal Boundary

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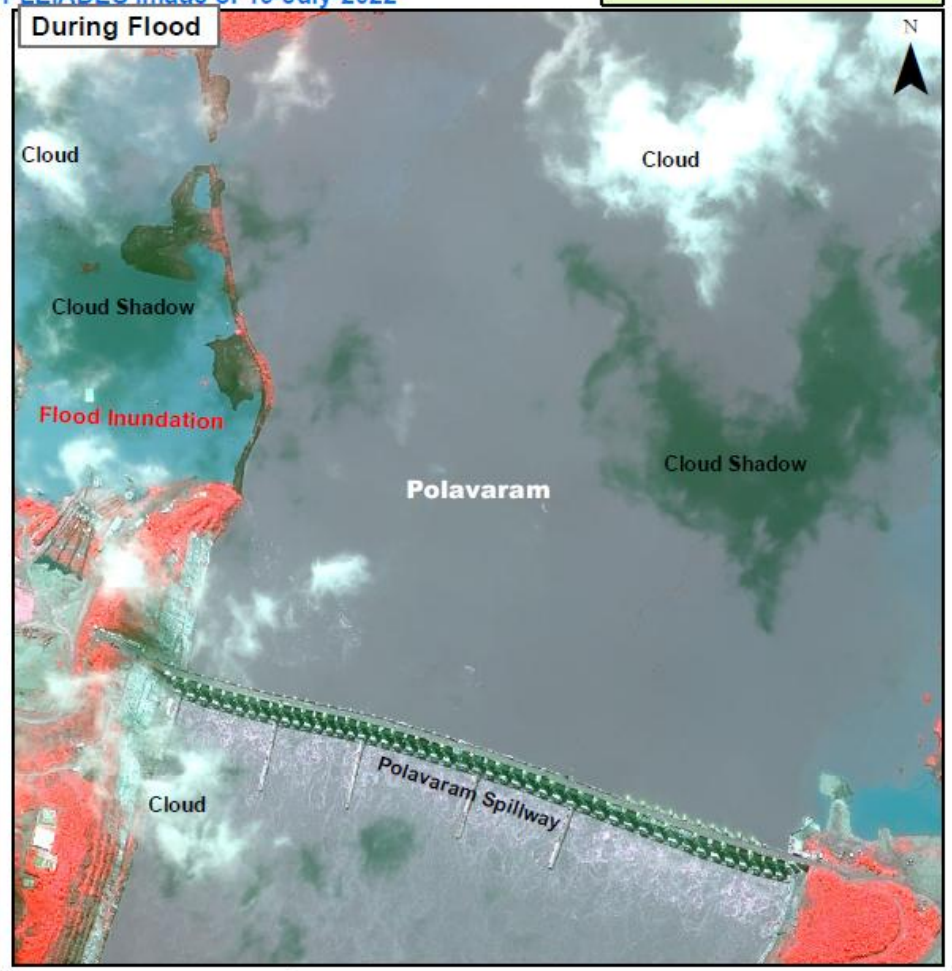
Date of Issue : 19.07.2022

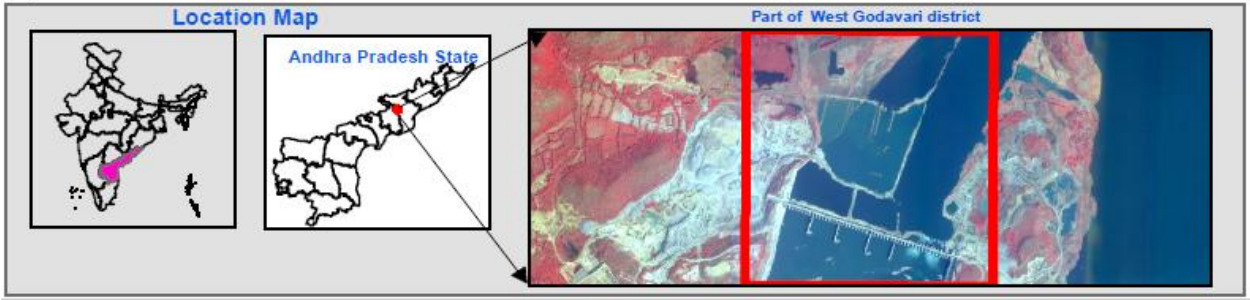
Flood Inundated areas in Part of Polavaram Mandal,West Godavari District,Andhra Pradesh State

DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/06

CARTOSAT 2E Image of 08-March-2022

PLEIADES Image of 19-July-2022





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Flood Inundated areas in Meduru Lanka village, adjacent to Dhavaleswaram Barrage,Andhra Pradesh State

DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/18

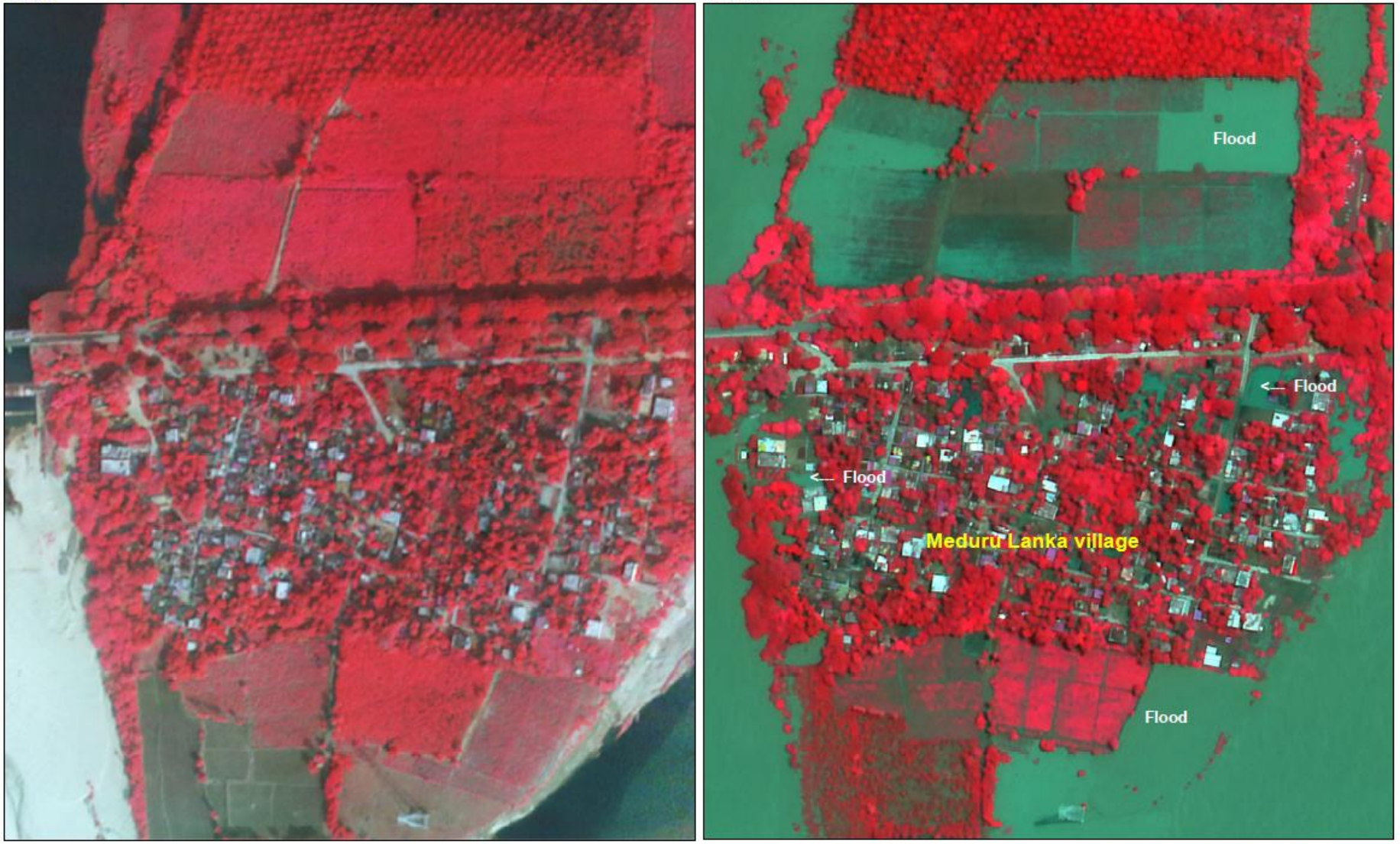
Date of Issue : 28.07.2022

Pre Flood

CARTOSAT 3 MX Image of 29-Dec-2020

During Flood

NEWSAT Image of 19-July-2022



SATELLOGIC

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0 0.0475 0.095 Kilometers

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Flood Inundated areas in Rajavaram and Peravaram village, adjacent to Dhavaleswaram Barrage,Andhra Pradesh State

DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/17

Date of Issue : 28.07.2022

Pre Flood

CARTOSAT 3 MX Image of 29-Dec-2020

During Flood

NEWSAT Image of 19-July-2022

SATELLOGIC

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This product is prepared using Satellogic satellite image received under International Charter, Call ID-877

N W E S

0 0.1 0.2 Kilometers

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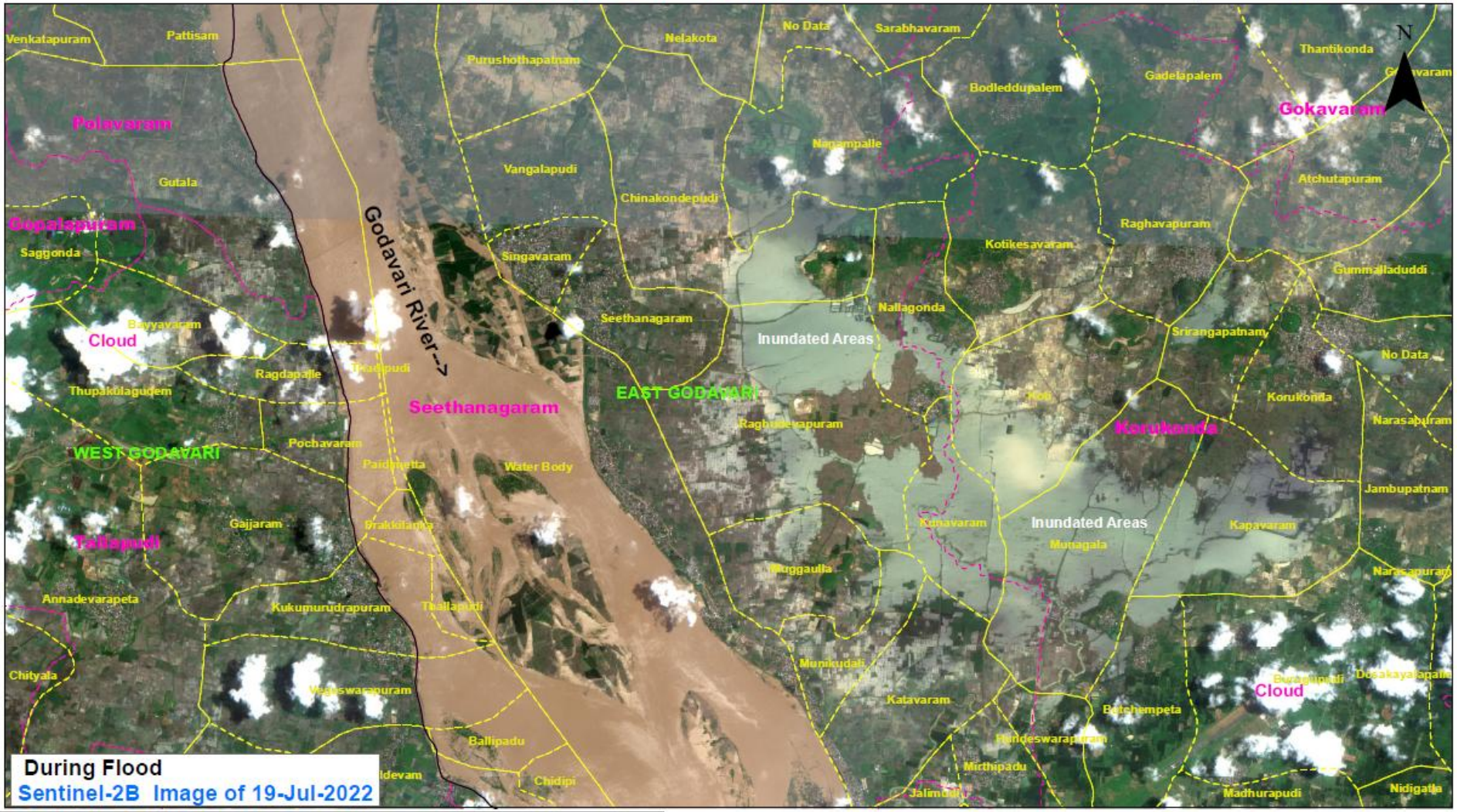
Flood Inundation in part of Seethanagaram and Korukonda Mandals,East Godavari District, Andhra Pradesh State as on 19th July,2022

Date of Issue : 21.07.2022

DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/12



Location Map

Seethanagaram and Korukonda mandals,part of East Godavari district

Note: Village Boundaries are overlaid

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0 5 10 20 30 Kilometers

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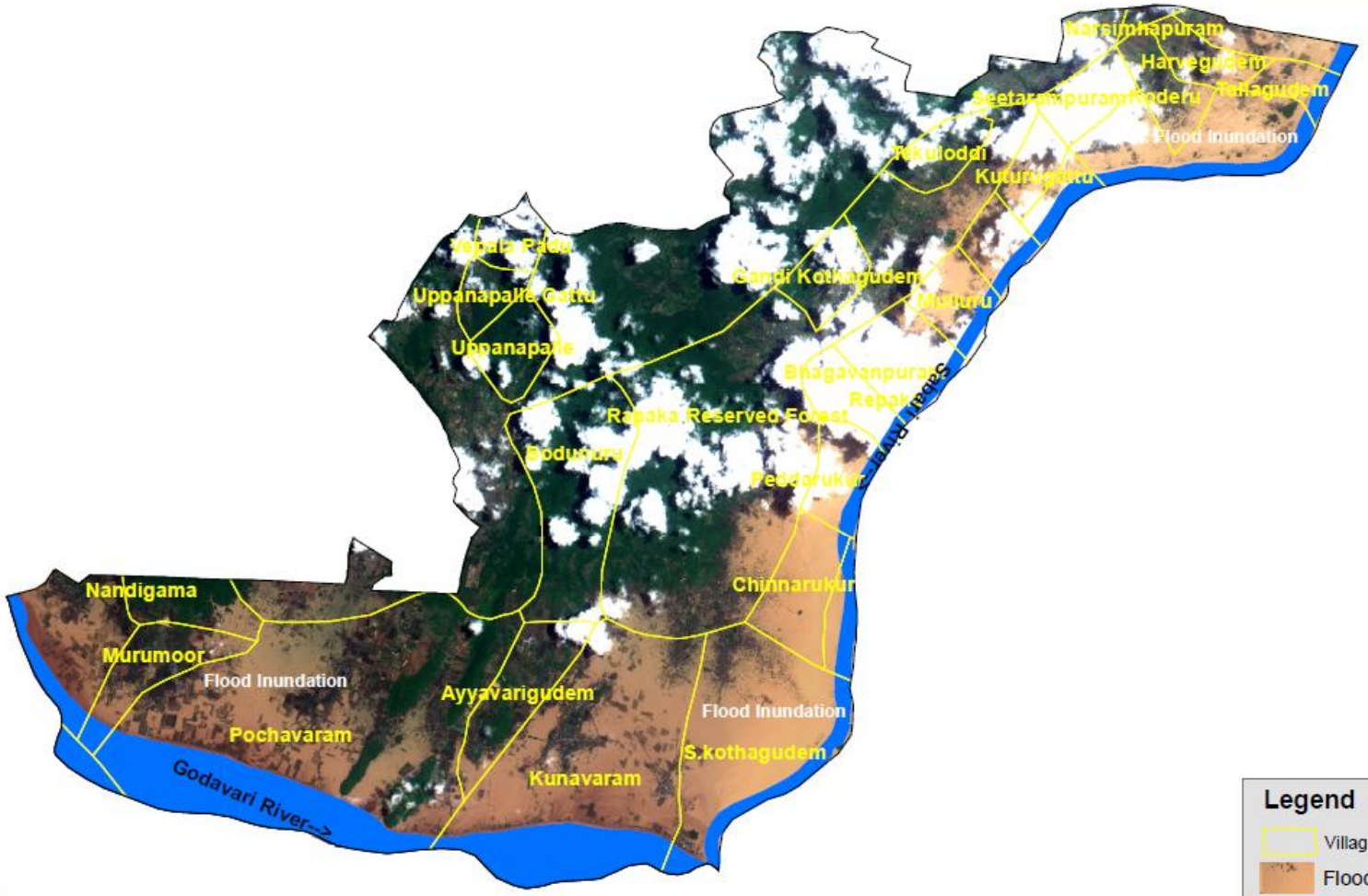
Flood Inundation in Kunavaram Mandal,West Godavari District,Andhra Pradesh State as on 19th July,2022

Date of Issue : 20.07.2022

DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/09

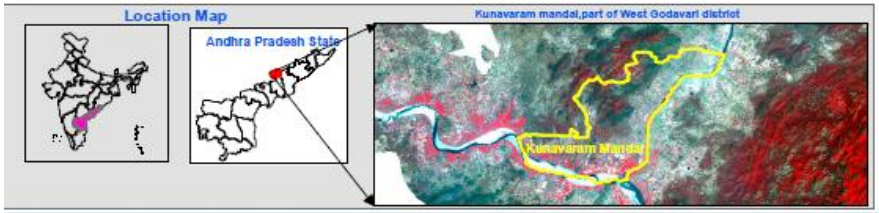


Legend

- Village Boundary
- Flood Inundation
- River

During Flood

Sentinel-2B Image of 19-Jul-2022



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0 5 10 20 30 Kilometers

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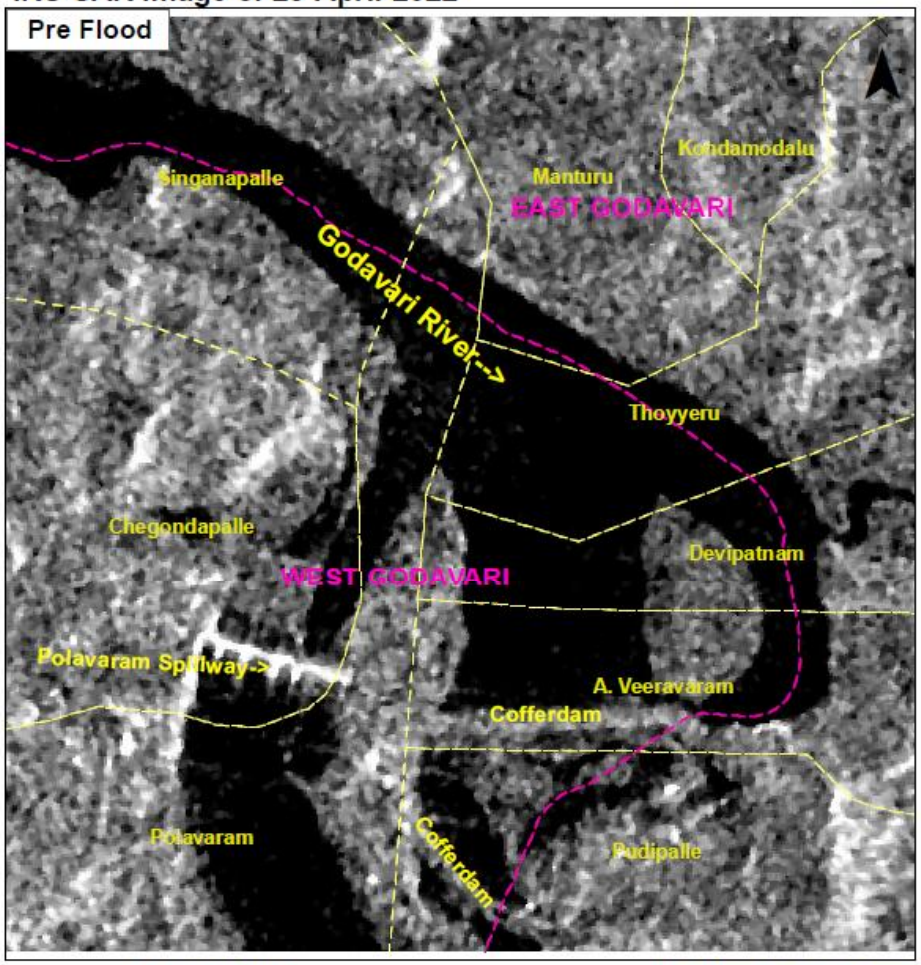
Flood Inundated areas in surroundings of Polavaram Mandal,East and West Godavari Districts,Andhra Pradesh State

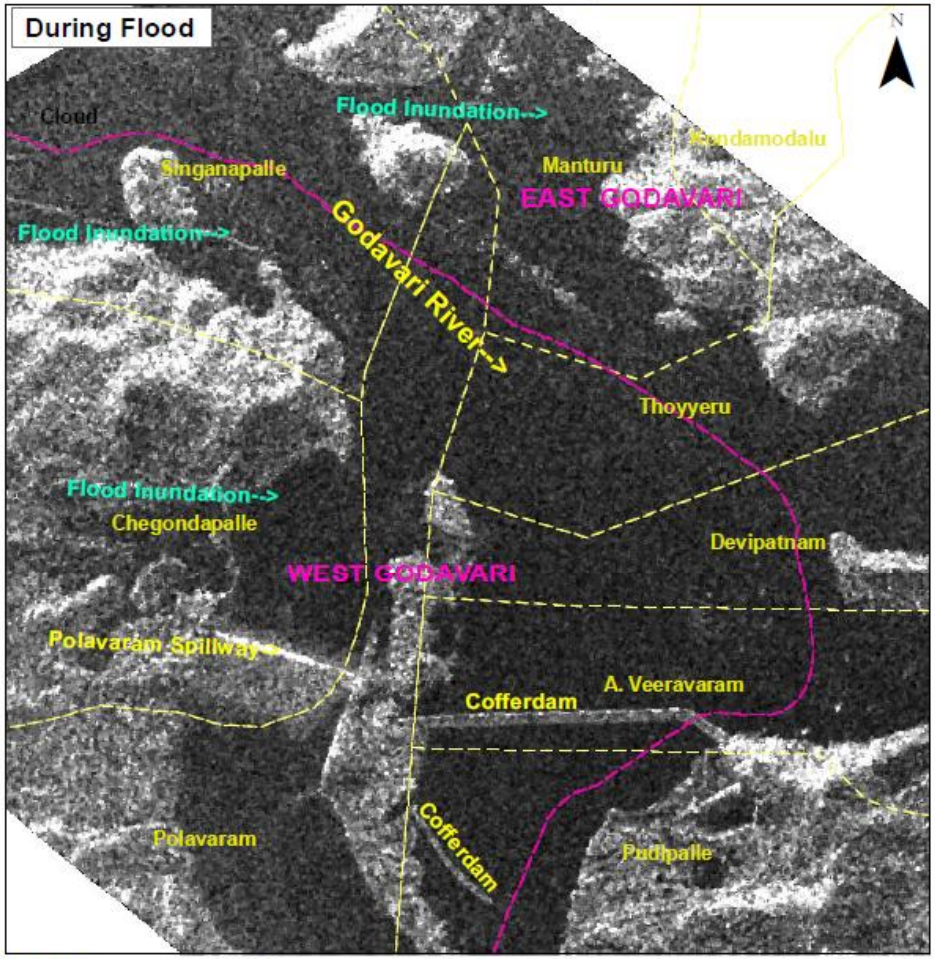
Date of Issue : 22.07.2022

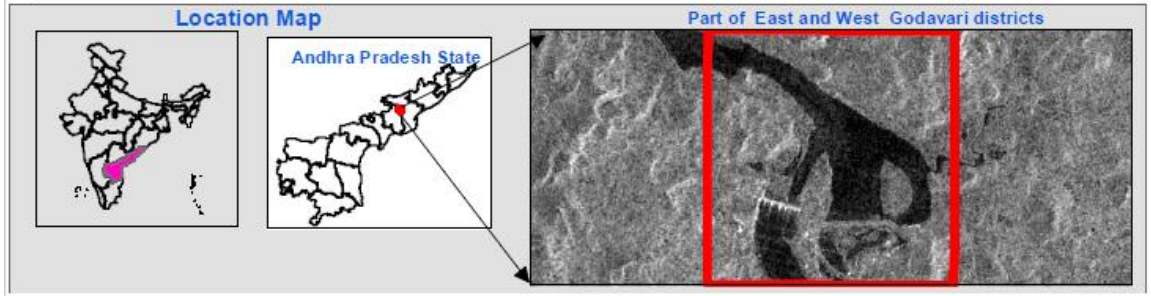
DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/18

IRS-SAR Image of 23-April-2022



IRS SAR Image of 21-July-2022





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Legend

- Village Boundary
- Mandal Boundary

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Flood Inundated Areas Sorroundings of Polavaram, Andhra Pradesh State

DISASTER EVENT ID: 07-FLD-2022-AP
MAP ID: 2022/24

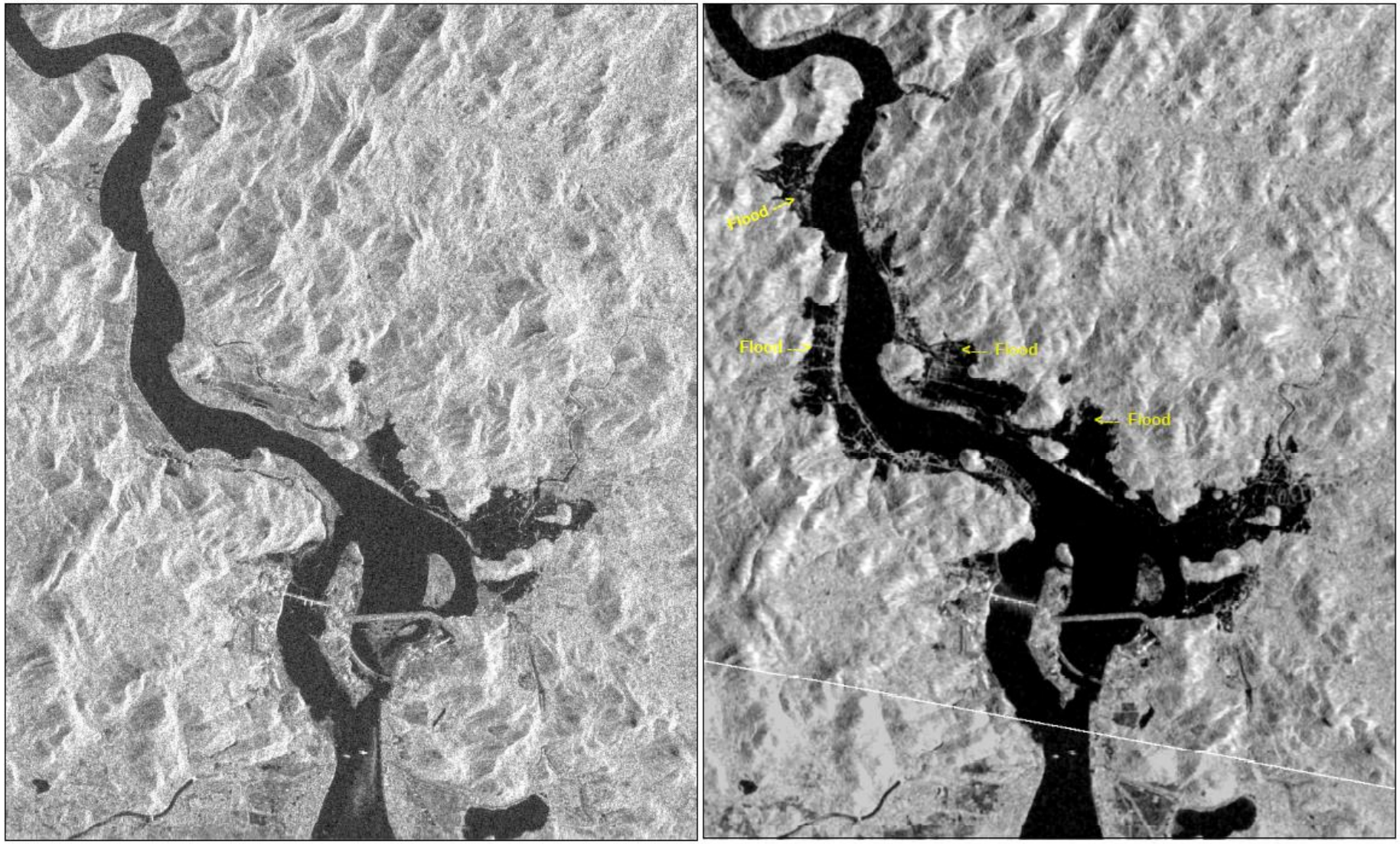
Date of Issue : 02.08.2022

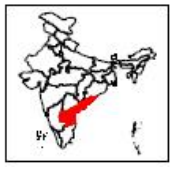
Pre Flood

Sentinel 1A image of 10 Jan 2022

During Flood

Sentinel 1A image of 02 Aug 2022





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0 0.5 1 2 3 4 5 Kilometers

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