

Interactive comment on “Analytical Study of North Indian Oceanic Cyclonic Disturbances with Special Reference to Extremely Severe Cyclonic Storm Fani: Meteorological Variability, India’s Preparedness with Terrible Aftermath” by Soumen Chatterjee

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Respected Sir, I want to thank for your constructive comments on my manuscript. As I have focused on the analytical study of North Indian Oceanic cyclonic disturbances, I have included the long-term (of last 150 years) annual and seasonal distribution of tropical cyclones over the Arabian Sea (AS) and Bay of Bengal (BoB). It would also help us to understand the most affected regions by cyclones over the North Indian Ocean

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(NIO). On the other hand, to give a more specific example on the terrible aftermath over the eastern coast, I have selected one of the recent and rarest cyclonic storms Fani with its detailed meteorological variability with overall India’s preparedness. It would also help to understand how the local and national government have tackled this deadly cyclone and what could be done to minimize the casualty to face that kind of monstrous cyclone in near future. That is the main reason behind the selection of the only one extreme event (Fani) with detailed scenario in the present manuscript.

Firstly, you have stated that “This paper focused on the historical background of tropical cyclones over North Indian Ocean with particular reference to cyclonic storm Fani. The cyclonic disturbances from 1891 to 2018 was detailed described, and the developing trend was simply plotted. The flooded area of storm Fani was mapped by using Sentinel-1 SAR dataset. The discussion mainly focused on India’s preparedness, inundation detail and some damage statistics. After reading this paper, to be frank I can’t find significant academic contributions of this study. It looks more like a general report, the in-depth scientific analysis or discussion obviously is insufficient”. I have tried my best to justify my manuscript. This manuscript could be the first one which includes several parameters at the same time:

- [1] The historical background and trend analysis of tropical cyclones (TCs) over NIO.
- [2] State-level and national- level preparedness to fight against the deadly cyclonic storm like Fani.
- [3] Visualization of the flood-affected area by analyzing Sentinel-1 SAR dataset in GEE environment.
- [4] Zone wise quantification of inundated areas to understand the flood situation with other damage statistics.
- [5] Highlights the reasons behind recognition from WMO and UN.

Besides, I have tried to include one more paragraph at the end of the “5.2 Inundation

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detail” section after line number 216 to correlate the inundation with surface elevation, water system distribution, urban development, etc. That paragraph with a new figure has also been given in the track change version of the manuscript as well as the Reply to Anonymous Referee #1. The paragraph with little changes from the previous reply has been given below:

“On the other hand, the more detailed analysis helps to determine that the maximum flood extent of the study area can be found up to 40 meters altitude from the mean sea level (MSL) in the lower catchment areas (floodplain region) and also along the low lying areas of the river valleys. The calculated areal extension of flooding (up to 75 km inside from the coast) based on surface elevation also helps to establish the same fact (Figure 9). Nearly 69.96% of the total inundated area is extended up to 20 meters altitude from MSL. On the other hand, 21.26% of the flood has occurred between 20-30 meters and only 7.96% of the total flooded area has been found in between 30-40 meters altitudinal extension. As the ESCS Fani has made the landfall near Puri of Odisha, the interfluvial region of Bhargabi and Kaathajodi River has experienced severe flooding. The heavy rainfall has caused flooding in the deltaic portion of Mahanadi River for having lower altitude (< 10 meters from MSL) and the presence of distributaries and innumerable rivulets. Besides, the interfluvial regions of Haldi-Rupnarayan, Silabati-Dwarakeswar and Ganges deltaic portion of West Bengal has also experienced flooding. No urban area except Puri has been affected due to flooding during this cyclonic event, but the large infrastructural destruction has been made by cyclonic storm Fani due to high velocity of gusty wind in almost every large to small urban centres of the coastal districts. The other damage history excluding flooding has been discussed in the next section below.”

Hopefully, those changes will be very much helpful to achieve its final goal.

Please also note the supplement to this comment:

<https://nhess.copernicus.org/preprints/nhess-2020-287/nhess-2020-287-AC4->

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[supplement.pdf](#)

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2020-287>, 2020.

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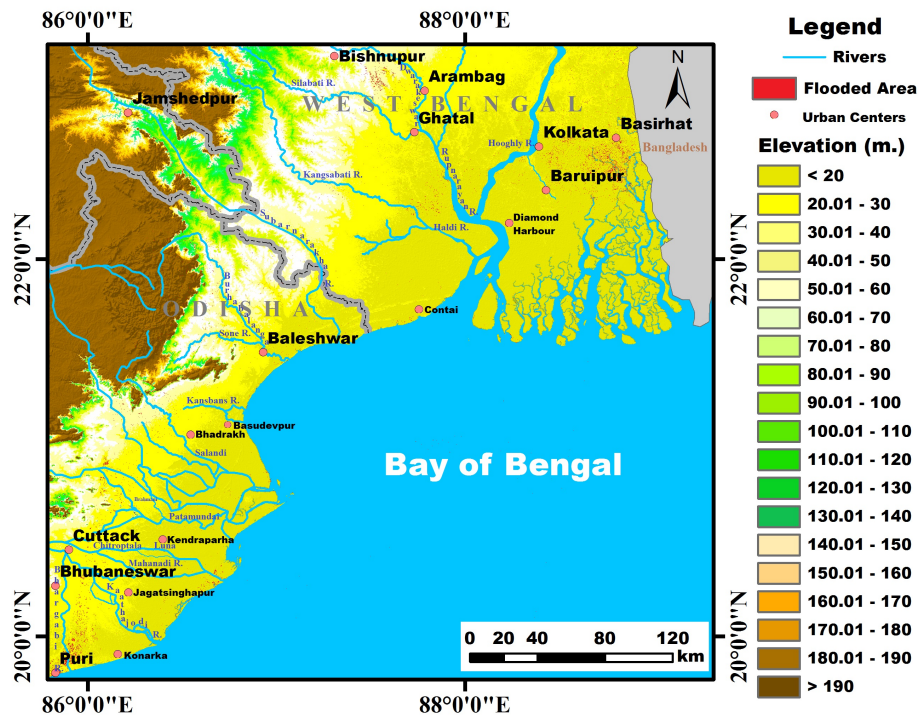


Fig. 1. Figure 9: Large to small urban centres which are affected by Fani with major drainage system of the study area on NASA's © SRTM DEM.