Forecasting with fishers: Co-producing weather knowledge with artisanal fishers of the southwest Indian coast

Filippo Osella, University of Sussex, School of Global Studies, **Max Martin**, University of Sussex, School of Global Studies, **Pedram Rowhani,** University of Sussex, School of Global Studies, **Kate Howland**, University of Sussex, School of Engineering and Informatics, **Sukumarapillai Abhilash**, Cochin University of Science & Technology, **P. Vijayakumar,** Cochin University of Science & Technology **Rajasekaran Harikumar,** Indian National Centre for Ocean Information Services (INCOIS), Hyderabad, India

BACKGROUND

Accurate, accessible, and actionable forecasts can reduce weather-related accidents in fishing, the world's riskiest job. Along the southwestern coast of India inhabited by poor artisanal fishers, such accidents are frequent during the monsoon season (June – September) when high wind and large waves make fishing in the Arabian Sea risky. A Sussex team* explored ways to improve forecasts by studying: i) Local hazard risks, ii) the decision-making process involved in fishing; and iii) ways to co-produce risk communication with fishers and forecasters. We worked closely with the India Meteorological Department (IMD), Indian National Centre for Ocean Information Services (INCOIS), Kerala State Disaster Management Authority (SDMA), and Cochin University of Science and Technology (CUSAT).

METHODS

On the coast of Thiruvananthapuram district in Kerala state, we selected two fishing villages – Anjengo and Poonthura. We tracked five small (30 – 34 feet) boats in each village and logged their fishing trips for 120 consecutive days, covering the monsoon season of 2018. We compared this data with forecasts, instrument observation of wind and waves, and 20 interviews and eight focus group discussions with local fishers.

Fig 1: The fishing harbor at Vizhinjam village in Thiruvananthapuram, where fishers from the southern parts of the district launch and land their boats during the monsoon season, when the sea is often rough

FINDINGS

- Fishers seek and use multiple forecast sources even when they are not always easily accessible. Forecasts, however, are often generic and inadequate. The fishers compare forecasts with their traditional knowledge and direct observation of the sea and the sky to decide when to go fishing.

- Upto 72 per cent of the forecasts issued are accurate. While forecasters do not miss major weather events, they often issue false alarms, restricting fishing.

- Fishing decisions seem to be driven by the availability (and scarcity) of fish more than anything else; and fish are abundant on some days during the monsoon season.

Forecast and observations of high wave and wind event in June 2018					
DAYS	June 8	June 9	June 10	June 11	June 12
IMD alert/ forecast	Cautious (35-45 Kmph)	NVIS (40-50 Kmph)	NVIS (40-50 Kmph)	NVIS (40-50 Kmph)	NVIS (45-55 Kmph)
INCOIS forecast	High wave	High wave	High wave	High wave	High wave
Satellite observation Wind					
Wave					
Fishing statues	Fishing day	Non-fishing day	Non-fishing day	Non-fishing day	Non-fishing day
Fishers' Feedback	Needs more clarity	Heavy Wind	Heavy Wind	Heavy Wind	Heavy Wind
Forecast reliability	Good	Very Good	Very Good	Very Good	Very Good

Fig 2: A table showing a set of windy days with large waves in June 2018. The maps show wind speed and wave height at different distances from the shore. While the forecasts for the period were generally very good, the fishers decided to fish even when there was an advice for caution. The fishers usually operated within five km from the shore during the monsoon season, as closer to the shore wind and waves are lower than that in the high sea
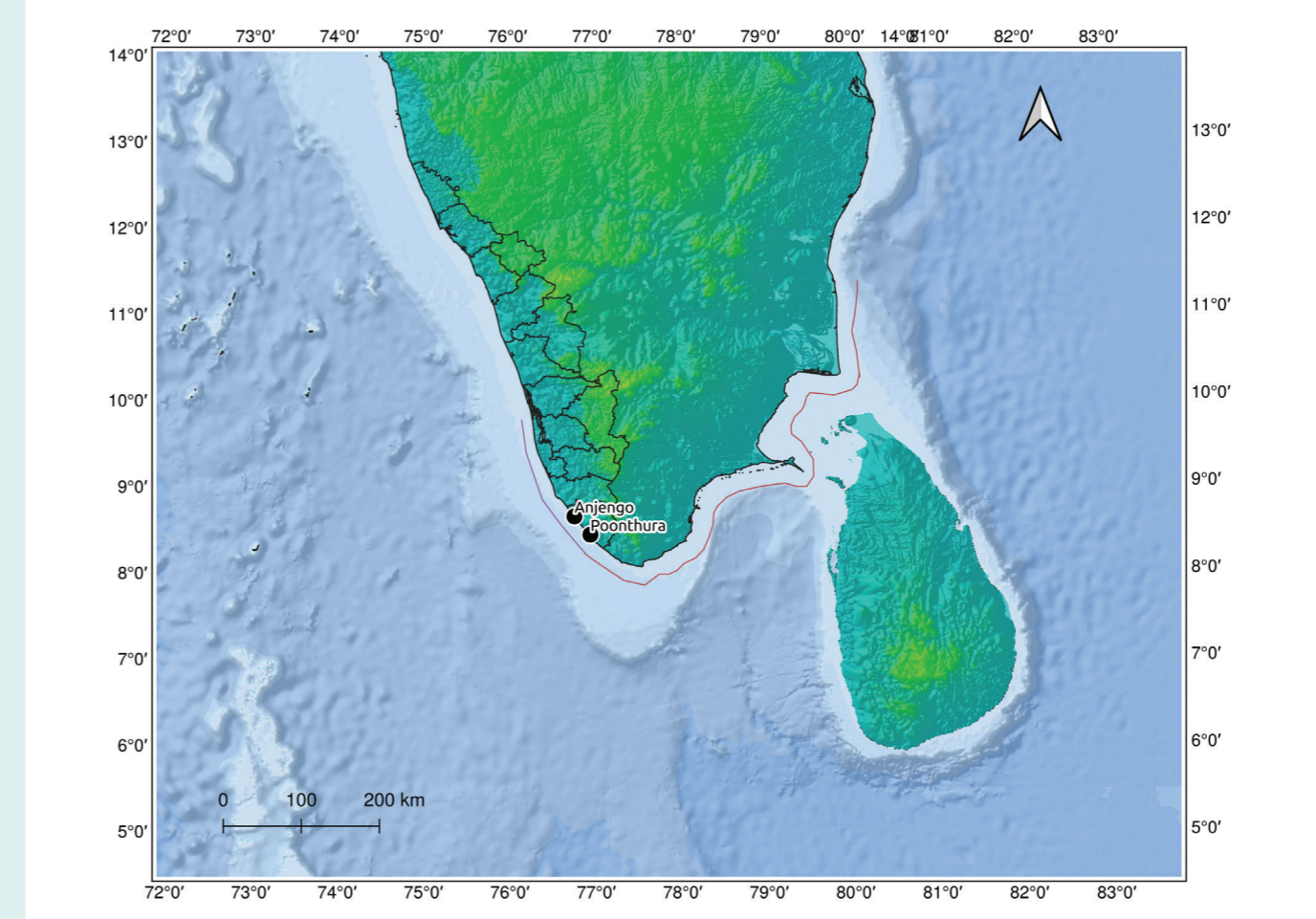

Fig 3: Map of south India showing Anjengo and Poonthura villages of Thiruvananthapuram district, where the field work was conducted

Fishing Activity Vs IMD Weather Warning

Percentage of Fishing days — Anjengo, Poonthura

- No Warning Period
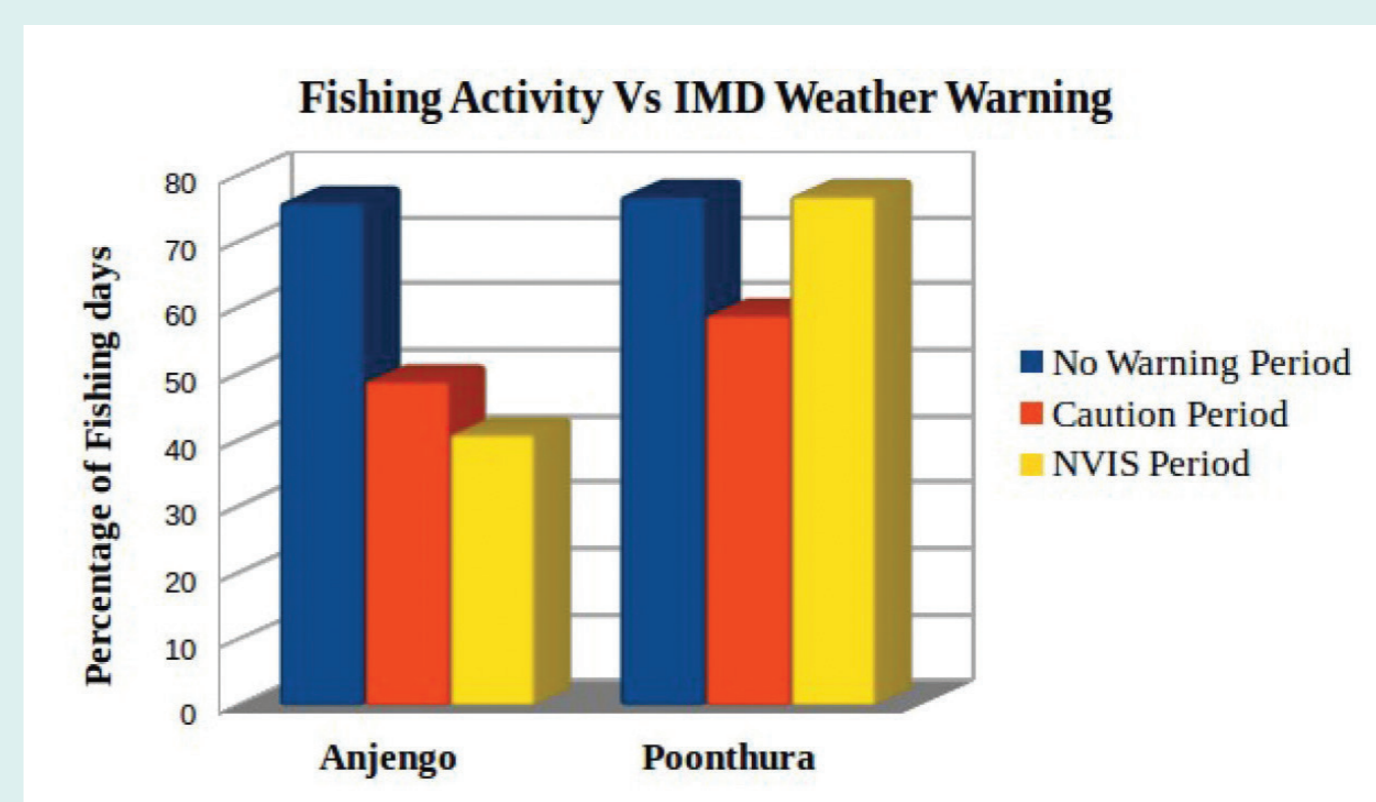- Caution Period
- NVIS Period

Fig 4: Fishers of Anjengo and Poonthura went to fish on more than 70 per cent of the days when there was no alert or advisory in place. Fishers of Poonthura went to fish on 70 per cent of the days when there was an NVIS (do not ventureinto the sea) advisory, and close to 60 per cent when there was an advisory (calling for caution). Fishers of Anjengo when to the sea only on 40 per cent of the days when there was an NVIS advisory, and close to 50 per cent when there was an alert

CONCLUSIONS

The findings are relevant to overlapping Sustainable Development Goals. In uncertain weather, fishing is risky or restricted, with impacts on local livelihoods (SDG 1 No Poverty) and food security (SDG 2: End Hunger). As fish stock is depleted in the coastal waters (SDG 14: Ocean Conservation), fishers take multiple risks anyway by going offshore in bad weather. We recommend accurate, local and timely forecasts over multiple channels (such as mobile phones, the Internet, and VHF/FM radio), backed by better weather observation networks and systems (SDG 13: Climate Action) to help fishers make informed decisions. Forecasters and fishers need to interact closely to share experiences, knowledge and challenges they face. Such co-production of weather knowledge can contribute to better forecasts for safe and sustainable fishing (SDG 8: Decent Work and Economic Growth).

UNIVERSITY OF SUSSEX | IDS Institute of Development Studies