Policy Brief

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Susa Melkias, a fisherman, playing Radio Monsoon's marine weather forecast bulletin over a megaphone at the Anchuthengu lagoon, where the local fishers dock their boats

Forecasting with fishers to save lives at sea

CONTEXT

Accurate and timely marine weather forecasts are of crucial importance in planning and conducting fishing safely around the world yet this essential information is not easily accessible to artisanal fishers from the Malabar Coast of India. The persistence of weather-related accidents calls for urgent action to provide artisanal fishers with accurate, accessible, and actionable forecasts as a means to promote safety at sea.

A pilot study in the Thiruvananthapuram district by an interdisciplinary research team from the University of Sussex explored ways of improving risk communication, with accurate, accessible and actionable forecasts by co-producing test bulletins with fishers and forecasters.

Over the last 50 years, there have been many technical and socio-economic interventions on artisanal fishing in Kerala aimed at improving fishing practices, livelihoods, labour standards as well as the political and social status of fishing communities. However, many incidents, including accidents and casualties at sea and on shore, continue to mark fishing on the Malabar Coast. These incidents mostly related to adverse weather and sea conditions.

In Kerala in 2012 maritime agencies rescued 3,046 fishermen in 454 offshore operations, but 44 fishers lost their lives and 11 went missing. In 2011 there were 433 rescue operations saving 6,033 lives. During 2011–2016, an independent study documented 643 such incidents in Kollam and Thiruvananthapuram districts of Kerala and Kanyakumari district of Tamil Nadu, further south. Of these 75 per cent of the incidents involved small-scale motorised boats. In 2017, when Cyclone Ockhi hit the Arabian Sea, 162 fishers from Kerala and 203 fishers in Tamil Nadu (mostly Kanyakumari district) died*. In Kerala 384 and Tamil Nadu 4207 fishing boats were lost, disrupting coastal livelihoods.

Key findings

- **Risk and risk appreciation -** Fishers have extensive traditional knowledge of risks and risky behaviours, and safety at sea, complemented by years of interventions by the government and NGOs
- **Seasonal and daily risks -** Most incidents and accidents at sea are part of daily operations, with a strong connection to the sudden variation, and uncertainties of weather and sea conditions
- **Response to extreme weather -** The perceived inaccuracy of historical forecasts and the lack of ways to give feedback to forecasters have led to a serious mistrust of forecasts and forecasters reflected by bad press and hostile comments in public fora
- **Forecast accuracy and effectiveness -** Fishers found weather forecasts broadly accurate but too generic and expressed in a way which didn't give them all the information they need
- **Access to forecasts and alerts -** Fishers consult a variety of sources for forecasts and alerts, but there is no proper offshore communication system beyond the range of mobile phones to receive weather warnings, or to communicate distress messages

AUTHORS

Professor Filippo Osella
Dr Max Martin
Dr Kate Howland
Dr Pedram Rowhani
Professor Roderick Stirrat

UNIVERSITY OF SUSSEX

KEY FINDINGS

1.RISK AND RISK APPRECIATION

Fishers have extensive traditional knowledge of risks and risky behaviours, and safety at sea, complemented by years of interventions by the government and NGOs. They closely observe and understand weather conditions and make decisions on the basis of wind, waves, currents, rain, fog and lightning. They use GPS and compass to navigate and to mark fishing grounds; and use land features (hills, church spires, temples) and at night lights to get back. Many fishers look for forecasts, including by international and private agencies online and over social media.

2.SEASONAL AND DAILY RISKS

Most incidents and accidents in the sea are part of daily operations, with a strong nexus with weather and sea conditions, and their sudden variation, and uncertainties. Rising wind and currents, high waves, and low visibility make fishing during the monsoon season extremely hazardous, especially at night. The most common risks include getting lost at sea, and being taken far away by strong currents, capsizing and/or losing gear in rough sea. Getting hit by high waves while launching and landing is a major risk; especially when groynes and sea walls lead to changes in waves, currents, and contours of the coasts. Other risks include collision with ships, nets being run over by them, and aborted trips in extreme weather after burning a lot of fuel.

3. RESPONSE TO EXTREME WEATHER

Cyclone Ockhi of November 2017 shook the confidence of many fishers, and many of them still nurse a deep resentment of forecast agencies and the government for not giving them timely warnings. They were caught unawares, many lives were lost, and those who escaped lost boats and gear. Fishers get better forecasts about extreme events and offshore storms now, still forecasters need to better coordinate, streamline their messages and make them clearer, and locally relevant. The perceived inaccuracy of forecasts and the lack of ways to give feedback to forecasters have led to a serious mistrust of forecasts and forecasters reflected in bad press and hostile comments in public fora. Fishers also resent blanket fishing bans on account of distant and/ or locally insignificant events.

> ***"We need to talk to fishers while they are at sea to see they are safe."***
> *Charlotte, Fisherwoman, Poonthura*

4.FORECAST ACCURACY AND EFFECTIVENESS

Fishers in our study villages found existing weather forecasts accurate most of the time, still too generic, and often delivered in jargons (e.g. deep depression). Fishers clearly know how to tailor forecasts to their needs. They seek information on specific sea areas relevant to their work, precise timeframe for beginning and end of high wind/wave spells, details of offshore wind patterns at various distances from the shore, and their impact for small boats. The fishers also request for forecasts of direction and speed of currents, including deep water currents; tide timings and heights; and details of wave heights and wave frequency, both offshore and close to the coast.

Location of Thiruvananthapuram district in Kerala, South India

5. ACCESS TO FORECASTS AND ALERTS

Fishers consult a variety of sources for forecasts and alerts – mainly television, and the internet, along with peer groups, social media and institutions such as local churches. Fishers use mobile phones. Some of them, especially young fishers of Poonthrua, use wireless radio for two-way communication amongst boats. However, there is no proper offshore communication system beyond the range of mobile phones to receive weather warnings, or to communicate distress messages.

6. ACTING ON FORECASTS

Fishers consider skills and experience crucial for their success and safety, but equally important are luck and God's blessings and protection. There is a general feeling that fishing at times can be extremely dangerous, but "this is our way of life", as they say. Decisions to go out fishing or to stay back, or indeed to return when the weather turns foul, are taken on the basis of forecasts, observations based on experience, and information shared over social networks. And yet, there is a substantial pressure to fish in bad weather because during the monsoon fish is more abundant, and competition less with trawlers being banned from

High swell waves hit the eroded shoreline of Anchuthengu, destroying houses, as a result of a storm in the Southern Ocean, 9000 km away from the Indian coast. (Photo: Kevin Julius)

fishing. The economy of fishing households is such that without regular and successful fishing, income is largely reduced. Given that government compensations for fishing days lost to adverse weather (and related restrictions) are too small, fishers constantly feel the pressure to fish. Seeing a boat return with large catch is enough to convince many fishers to defy warnings and take undue risks.

FUNDING

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http://www.sussex.ac.uk/ssrp/

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RESEARCH APPROACH

Our research had three objectives:

i) Study hazard risks, using local knowledge and instrument observations: forecasts, fishers' reports, ship logs, and data from wave rider buoys & automated weather stations

ii) Understand the decision-making process involved in fishing mediated by local risk cultures, using ethnographic methods

iii) Co-produce risk communication with fishers and forecasters, contributing to accurate, accessible, actionable forecasts and advisories through workshops, and focus groups.

The researchers chose two fishing villages in the district — Anchuthengu and Poonthura. They tested the perceived accuracy and accessibility of forecasts and alerts from both the India Meteorological Department (IMD) and the Indian National Centre for Ocean Information Services (INCOIS), and the State Disaster Management Authority (SDMA) – and fishers' actions based on them. From February to September 2018, the team conducted 20 in-depth interviews, eight focus groups and two co-production workshops; besides tracking five boats for 100 days in each village, recording their fishing patterns in line with forecasts, perceived risks, and local risk cultures. A test website (radiomonsoon.in) was set up with social media interfaces, and a free phone service accessed by 140 boats, especially when the sea is rough.

Policy recommendations

EVERYDAY RISKS

Lethal accidents at sea do not occur only during extreme weather events such as cyclones, but are common place throughout the year, especially during the monsoon season. Plans and measures for responding to disasters must go alongside the promotion of safe fishing on a daily basis. There should be urgent attention on beach and harbour structures that interfere with fishing and fishers' habitat safety

LOCAL ACTION - WORKING TOGETHER

Facilitating and fostering local fishers' disaster risk reduction committees – as tested in Anchuthengu – will help in dealing with fishing in hazardous weather; to promote safe fishing and better forecasts; and to foster mutual trust between fishing communities and government agencies.

PRECISE, CLEAR, TIMELY, LOCALLY-RELEVANT FORECASTS

To be useful for fishers, weather forecast needs to be area-specific, timely, precise, reliable and accurate. Bulletins should focus on coastal and offshore weather systems and sea conditions, clearly tracking the development and impact of weather systems over time and space. Bulletins need to be geared to seasonal fishing practices and their daily timing/ routines. At least two bulletins are needed daily.

Fishing is risky and fishers know it - forecasts are good, but too generic and with limited reach

RISK COMMUNICATION

Forecast bulletins need far wider and easier reach. They must be clearly communicated in a language and style accessible to fishers. Especially in the context of offshore extreme weather, there should be no conflicting information, and different user groups (e.g. coastal fishers, deep sea fleets, multi-day boats) need to be targeted. There is an urgent need for carefully planning and implementing a risk communication strategy based on fishers' feedback and user interface design. Kerala government must guide relevant agencies to effectively disseminate information based on forecasts from IMD and INCOIS. It must also promote multiple information, technology and communication avenues — including print and electronic media, community radio, wireless radio, narrowcasting and social networks. There is a clear need for a fishers' wireless radio network with adequate training, smoother licensing procedures, and transmission/ relay hubs and maintenance facilities. Regular feedback from fishers can improve forecasts.

Boats from Poonthura launch and land at the crowded fishing harbour of Vizhinjam, about 11 km away from the village.

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CONTACT INFORMATION

Dr Max Martin
Max.Martin@sussex.ac.uk
Sussex Sustainability Research Programme
http://www.sussex.ac.uk/ssrp/
Sussex Asia Centre
http://www.sussex.ac.uk/sussexasiacentre/
University of Sussex
Falmer
Brighton
BN1 9QQ
United Kingdom

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