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

SUMMARY

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 always accessible to artisanal fishers from the South-West 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.

An interdisciplinary research team at 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 from the Thiruvananthapuram district in Kerala. Findings suggest better ways to produce, disseminate and act on forecasts to increase the resilience and sustainability of artisanal fishing communities.

CONTEXT

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 incidents on the South-West coast continue, including accidents and casualties at sea and on shore, mainly due to adverse weather and sea conditions. Artisanal fishers increasingly go farther from shore to meet the demands of an extremely competitive market dominated by large mechanised boats amidst overfishing and decline of stock[4]. Additionally adverse transformations of the coastal geography— erosion in particular—make it increasingly difficult for shoreline fishing and the safe launching and landing of small craft, artisanal fishers to rely on more distant and often unsuitable harbours. Along with growing financial pressures and debt experienced by fishing households as well as an increased chance of extreme weather events over the Arabian Sea[5], the livelihoods of fishers have become more precarious and dangerous. Lack of accurate, locally relevant and timely marine weather forecasts increases the chances of serious or lethal accidents that affect the lives and livelihoods of artisanal fishers and their families.

Key findings

1. The growing risk of artisanal fishing

Growing financial pressures and the increasing frequency of extreme weather events over the Arabian Sea have made the livelihoods of Kerala artisanal fishers more precarious and dangerous than ever. But an on-site hazards analysis done in cooperation with local fishers showed that this risk can be reduced by accurate, locally relevant and timely marine weather forecasts.

2. Forecast accuracy and effectiveness

Fishers found weather forecasts too generic and expressed in a way which didn't give them the information they needed. To be useful for fishers, weather forecasts need to be area-specific, timely, precise, reliable and accurate, and geared to seasonal fishing practices and their daily routines.

3. 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. Local government should support the communication of forecasts through multiple avenues — including print media, community and wireless radio, narrowcasting and social networks. A fishers' wireless radio network would be a valuable asset for reducing risk.

4. Local action

Establishing local fishers' **disaster risk reduction committees** would be a big step in helping fishers to deal with hazardous weather; the committees would promote safer fishing and better forecasts, and foster mutual trust between fishing communities and government agencies.

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Highlights

RISK AND RISK APPRECIATION

Fishers have extensive 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 to get back. Many fishers look for forecasts, including by international and private agencies online and over social media.

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.

Location of Thiruvananthapuram district in Kerala, South India

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. However forecasters still need to better coordinate and 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. Fishers also resent blanket fishing bans on account of distant and/ or locally insignificant events.

FORECAST ACCURACY AND EFFECTIVENESS

Fishers in our study villages found existing weather forecasts accurate most of the time, but too generic, and often delivered in jargon (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 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.

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 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.

ACTING ON FORECASTS

Fishers consider skills and experience crucial for their success and safety. 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 fishing. The economy of fishing households is such that without regular and successful fishing, income is largely reduced. Given that government compensation for fishing days lost to adverse weather is too low, fishers constantly feel the pressure to fish.

Research approach

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)

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 Thiruvananthapuram 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.

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

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

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 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.

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.

REFERENCES

1. Anandan, S. (2013) "Accidents at sea on the rise", The Hindu, July 6 2016. https://www.thehindu.com/news/national/kerala/accidents-at-sea-on-the-rise/article4320363.ece accessed October 2018
2. South Indian Federation of Fishermen Societies (2017) Sea safety incidents on the lower South West Coast of India, Thiruvananthapuram: SIFFS
3. MINISTRY OF HOME AFFAIRS (|2018) Lok Sabha unstarred question no, 4055 to be answered on 20 MARCH, 2018, New Delhi: Government of India *(*The figures include missing persons assumed dead)*
4. Food and Agriculture Organization (2018) *State of the World Fisheries and Aquaculture*, Rome: FAO
5. Murakami, H, Vecchi, G A, and Underwood, S (2017). Increasing frequency of extremely severe cyclonic storms over the Arabian Sea. *Nature Climate Change* 7: 885 DOI: 10.1038/s41558-017-0008-6

SUPPORTING DATA

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[1]. 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[2]. 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[3].

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