4th International Climate Change Symposium – Washington DC

Social adaptation strategies of marine fishers to respond to climate change: The case of 'Tsunami' affected fishing hamlets in Tamil Nadu, India

Session 15: Fisheries and aquaculture in the face of climate change

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Key objective of this paper
How small-scale marine fishers socially adapt to climate change impacts

Presentation outline

- Climate change impacts on coastal India
- Climate change vulnerability of coastal Tamil Nadu - Locating the research site.
- The case
- How marine fishers across the study sites are vulnerable to climate change?
- Social adaptation strategies marine fishers to respond to climate change – A case from the field
- Discussions

Vulnerability - *the potential for loss* (Cutter 1996)

Vulnerability reduction is the central element in climate change adaptation and disaster management aspects (Ribot 2009)

Adapting to climate variability and change (Wheaton and Maciver 1999)

Who or what adapts ?

What and how resources used?

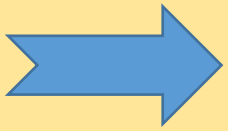
What they adapt to? (Climate, etc)

How they adapt?

Adaptation and adaptive society - Mounting literature and definitions

Climate change adaptation is an inherently social process, underpinned by socio-cultural characteristics of the societies that adapts (Wolf 2011)

Place-based communities Charles (2012)



'Adaptive capacity reflects the capability to with risks and to respond to impacts, including recovery from negative effects, learning and adapting over time, and taking advantage of opportunities for positive change'

‘Assets’/ ‘Capitals’ – Sustainable livelihoods (Scoones 1998)

Local institutions – (Agrawal and Perrin 2008)

Fisheries governance and climate change (Charles 2012)

‘Framing’ the framework

Climate change impacts and marine fisheries of India

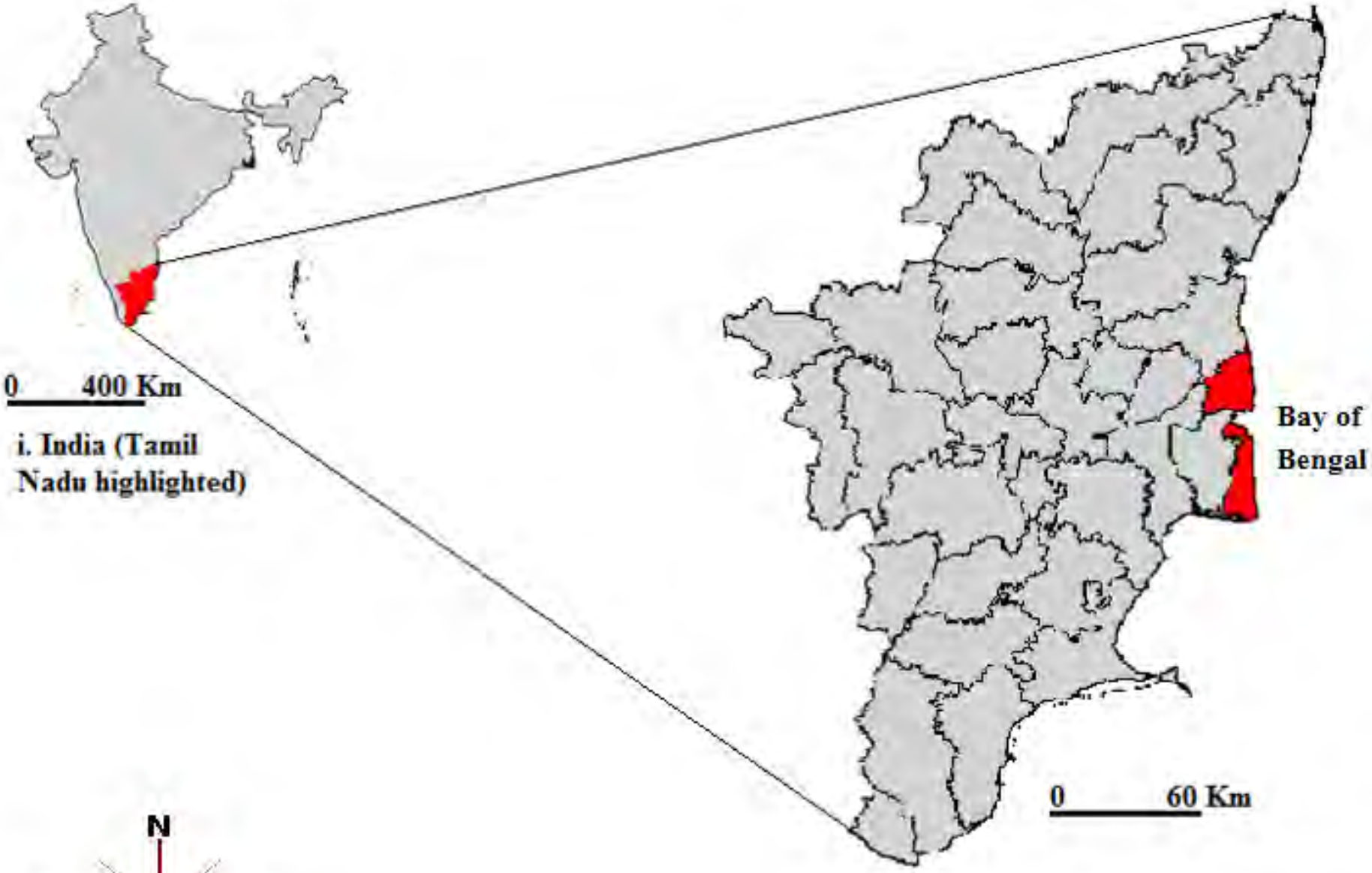
Indian fisheries are in unsustainable conditions

(Bhathal and Pauly 2008)

Tremendous pressure on the fishing grounds across coastal India for over the past few decades due to the numerous increase of mechanised fishing

Climate change impacts intensify and complicate the livelihoods of small-scale fishing communities which are already under multiple stressors in diverse and multiple pathways (Vivekanandan 2010; Lakshmi 2011; Salagrama 2012).

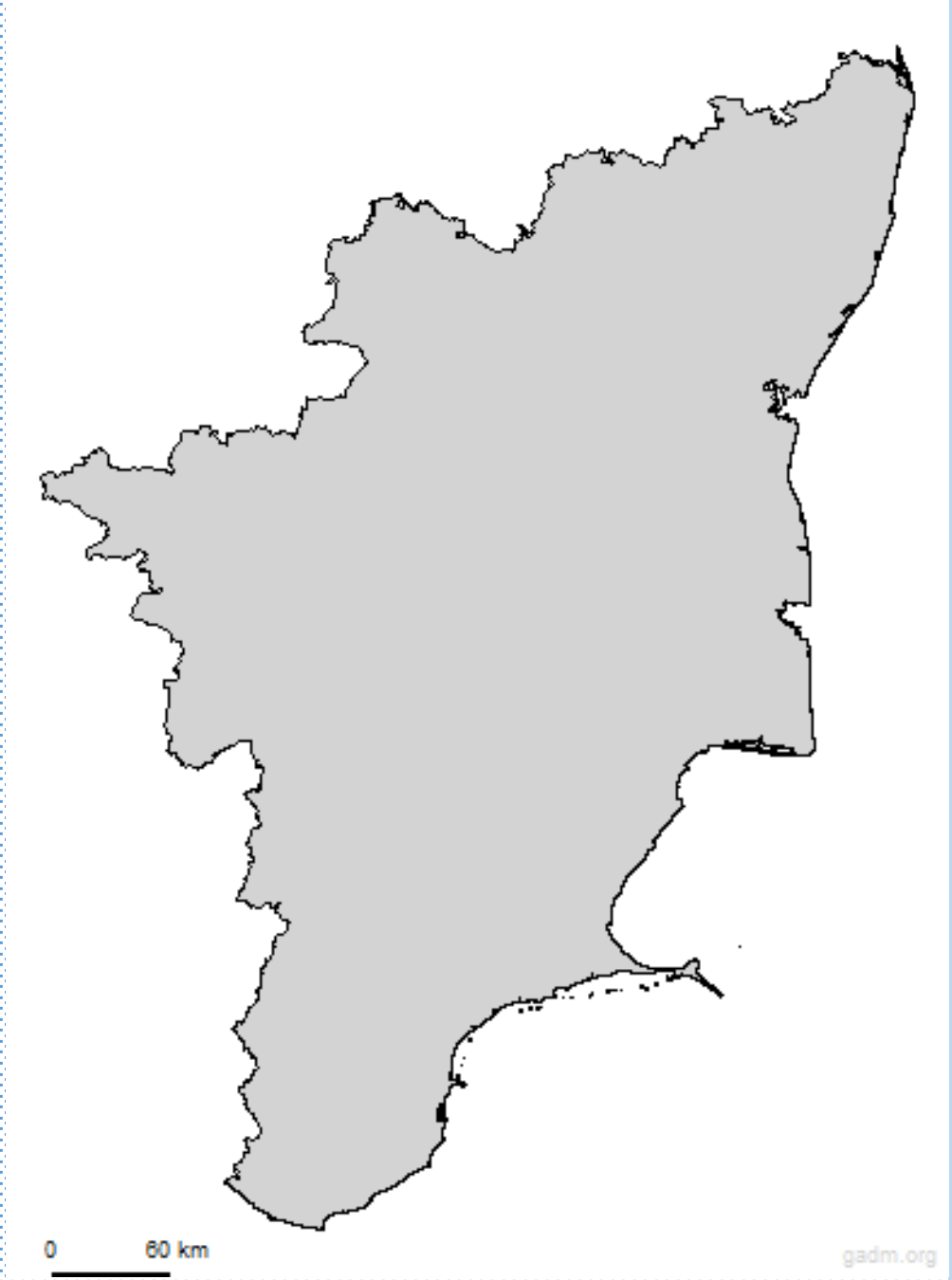
The case of coastal Tamil Nadu --- But why ‘Tamil Nadu’?



i. India (Tamil Nadu highlighted)

ii. Tamil Nadu (Nagapattinam district highlighted)

Source: gadm.org



Tamil Nadu

Tamil Nadu - the southernmost state of the Indian peninsula

1076 km coastline - 13 Coastal districts

Four zones of coastal Tamil Nadu

96% traditional fishermen - 66% of the marine fishing villages lie below poverty line

Marine fisheries of Tamil Nadu (Government of Tamil Nadu 2018)

Coastal length	1076 Km
Coastal districts	13
Marine fishing villages	608
Marine fishers' population	9.85 Lakh
Mechanised fishing boats	5861
Traditional fishing vessels (Motorised and Non-motorised)	35,666 (30,269 + 5,427).
Estimated marine fish production (2016 – 2017)	4.72 Lakh tonnes
Estimated marine products export (2016 – 2017)	79,336 MT Around INR 3,194 Crore

Roles of ‘caste’ in marine fisheries management

Mukkuvars	• Southwest coast of Tamil Nadu – Religious councils
Paravas	• Gulf of Mannar of Tamil Nadu – Caste Councils
Pattinavars	• Coromandel Coast of Tamil Nadu – Network of caste councils/Uur panchayats/Fishermen Councils.

The case

95 different fish species belonging to 42 family and 59 genera distributed along the Nagapattinam coastal waters.

Rich abundance of Mackerel, Seerfishes, Oil Sardines, Flying fish and Anchovies

Why marine fishers across the Coromandel coast of Tamil Nadu are highly vulnerable to climate change?

Over and unsustainable fishing (Bhathal 2014)

Geographical vulnerability (Mascarenhas 2004; Byravan *et al*. 2010)

The 2004 Indian Ocean Tsunami effects – double burden

Tsunami disaster in Tamil Nadu
(Source: Down to earth)

Climate change and marine fishers of Nagapattinam district

High risks prone - tsunami and storm surges.

2004 Indian Ocean Tsunami, six major cyclones and various climate extremes for over the last four decades.

More exposed to sea level rise, shore erosion, seawater intrusion, weather and climate risks, including heavy rainfalls and floods

Materials and Methods

- Setting the study sites – Methodology of choosing the study sites
- Qualitative approach
- Sampling methods
- Field visits -- Collecting the data

Study village 1

Governance systems of the local institutions Tsunami effects

Climate change threats

Study village 2

Tsunami, 2004: 12 people lost their lives.

Single-caste (Pattinavar) fishing village.

Findings

How fishers and their community institutions perceive climate change?

'Cyclones and storms had never been a new disastrous phenomenon in the lives of us, but the tsunami was an unprecedented disaster. Tsunami heavily upset the 'normal' weather patterns and 'normal' fishing seasons. It changed the sea, so much. Significant commercial fish species had migrated to interior sea/some other coasts since the tsunami. For over the last two decades, fishing is increasingly becoming an uncertain occupation'.

Senior fishermen – April 2017

Voices of fishers

- Long term impacts of the 2004 Indian Ocean Tsunami
- Living with climate change?
- How climate change impacts have been experienced and perceived by the fishermen?
- Climate change and fishing – How it affects?

Fishing vessel of artisinal fisherman on the beach of Kodiyampalayam (April 2016) Image © Madhanagopal

Kodiyampalayam (April 2016) © Madhanagopal

Kodiyampalayam (April 2016) Image © Madhanagopal

Shore erosion - Loss of fishing spaces across the villages along the coast – Risk ridden lives

What matters in climate change adaptation of marine fishers?

Credits – a brief overview

Coping mechanisms through social networks

‘Capitals’ in climate change adaptation – Field insights

Fishers’ institutions

Insecure Lives Under Extreme Climate Conditions: Insights from a Fishing Hamlet in Tamil Nadu, India

by Devendraraj Madhanagopal, on 17 April 2018

Tags: fishing | climate change | social change | precarity | insecurity | poverty | vulnerability | safety | India | Tamil Nadu

Study village 2 (Focus group discussions)

Improving the future of disaster relief (Madhanagopal 2018)

Scope in localized climate change adaptation efforts - Local leadership, beliefs, cultural norms and collective action

Shared values and social bonding of fishers – Its relevance in climate change adaptation (Charles 2012; Nayak and Berkes 2014)

'All the big fishing villages across the Coromandel Coast of Tamil Nadu enjoy the better economic and road transportation facilities. In most cases, the government gives first preference to the villages which largely practice mechanized fishing as they possess large vote-counts and also taxes than us'

- A fishermen council leader (May 2016)

Discussions

Social capital and shared values

Information as ‘asset’ in climate change adaptation

Limitations

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Thank you..!!
Questions?