

Annex Content

Reviewers' comments:

1. How many interviews were conducted (overview)?

See overview table excel sheet! (Please treat confidentially)

2. What exactly was analyzed for coding?

See PDF with screenshots of Coding software Atlas.ti!

3. Ethical approval / debriefing forms

See PDF on Ethical Clearance & Oral consent!

Please understand that my interviewees (only) gave oral consent and did not sign any documents. This is mainly because in India most people would not sign any documents for reasons of privacy and sensibility that comes with the critical topic of coastal protection responsibilities, the loss of livelihoods and political influence.

Interview guide (open questions): Coastal actors

Background

- Politics of coastal protection in climate change adaptation
- The role of sand resources as a blind spot in coastal governance
- Impacts of shrinking beaches on fishing communities

Property:

- Who owns the beach?
- What beach sand related governance schemes are in place? (Governance of sand (does not stop at artificially drawn boundaries))
- Hard coastal protection
 - o Who enforces the CRZ guidelines & clearance? Who are the actors involved?
 - o What role plays the local panchayat in the implementation of groins?
 - o What is the role of political influence in coastal protection? Which actors are involved? Why do some coastal stretches and villages become “protected” while others do not?
 - o How is the length of the groyne being decided upon and by whom?
- Finance & funding
 - o How is coastal protection revenue-based and triggered?
 - o What are the vested interests in dumping rocks?
 - o Why is it more profitable than putting sand?
- Fishing communities
 - o How has erosion changed and affected their life and livelihood?
 - o How do fishers cope with less access to the beach?
 - o Why do they want groins? How do they get groins? What is the role of political influence here?
- Stay order & sanctioning of groins from TN to PY
 - o Coastal erosion has been shifted from PY to TN and now back to PY
 - o Can you describe the conflict?
 - o Why should TN stop building groynes when the issues has been shifted from PY?
 - o What are the governance issues that emerge between both states?
 - o What is the role of Auroville (NGO)?
 - o How could a proper shoreline management plan help?
- Coastal protection project/alternatives
 - o Do you consider the project a success? Why or why not? And for whom?
 - o What was the role of tourism in its implementation?
 - o What is the role of climate change for the project implementation?
 - o Groins in a way reclaim sand, what would be more cost-effective?
 - o Why is it not prioritized?
 - o Sand by-pass system? Why has it not been reinforced? Has it been revived now?
 - o How has the pandemic affected the restoration process?
 - o How did it affect fishing communities? Did they give feedback? Do they have more sand now?

- The reef does not deprive other beaches of their fair share of sand. → What is the fair share of sand? Has this calculation of sediment been correct? What justice considerations were made regarding potential sediment deficits upstream?
- For whom is beach the beneficial? Did the sand also move northwards? What are the impacts of the projects for the fishing communities in the context of erosion?
- Structures are lucrative business models and favorable for the contractor
 - What is the ongoing process behind? How does this work in detail?
(Adaptation funding)
- What about the remaining two components, south reef and beach nourishment? Are they being implemented? What are the problems with funding?

Further questions:

- Contacts (Port Department, Public Works Department, Fisheries department, NCCR, NIOT)?, Any interview partner who is a related actor would be welcome
- Shoreline management plans? Other planning maps?

Questions focused on sand

Interviewees: Public Works Departments, Coastal Zone Management Authorities, Government actors

Why is beach sand of importance?

How important are beach sand resources for the livelihood of coastal communities?

At Tamil Nadu's Coast, the Coromandel, how is climate risk linked to limited beach sand resources?

Have you heard of beach sand availability related struggles & conflicts by fishing as well as coastal communities?

What is the problem with governing coastal sand? Why is it complex from your experience?

How is access to sand resources negotiated? Can anyone claim it when the technological means are there? How easy is it to derive benefits from sand resources? (beaches are highly contested everywhere)

How do political practices shape access to beach sand resources?

- Who owns beach sand? 'poromboke'?
- What property rights are in place at the coast?
- How does decision-making over environmental clearances take place?
- How does the CRZ apply in this context?

How could sand actually support coastal protection against erosion?

Introduction → Governance aspects, sand, protection, dredging

Dredging:

- Why has dredging sand become important? (untrap the sediments)
- What are the challenges regarding dredging?
- Dredging for protection?
- Sand bypass system? Maintenance? Problems?
- How are decisions being made in regard to dredging sand?

Erosion & groins:

- How are decisions being made in regard to the construction of groins?
- What actors are involved in this process?
- What role play fishing communities?
- What is the role of political influence in groyne implementation?

Challenges:

- What political barriers are there for successful measures against erosion?
- What role plays the local government in coastal protection implementation?
- Why some fishing communities get very big groins and some only less but then are more affected? Role of power here?
- These structures are lucrative business models, running into crores, and favorable for the contractor-builder fraternity as it is an ongoing process → How does this work in detail? Is this already a strategy to get adaptation funding?

Interview guideline (open questions & discussion)

Guiding questions/themes

Naan Dennis. Naan german.French aaraichi niruvanathula kadal arippu pathi padikka vanthu iruken. Athunala meenavar makkalku erpadura prachanai pathiyum padika porom.

- Challenges & climate variability:
 - o What are the current challenges and difficulties that you are facing?
 - o **nenga ena mari prachanailam santhikurenga?**
 - o Have some of these challenges intensified over the past 10 years? If yes, why?
 - o To what risks did these challenges lead?
 - o What role plays climate variability in this?
- Beach & Sand: Questions regarding your relationship/connection with beach & sand
 - o What does the sand & the beach mean to you? How important is it for your life?
 - o **Beach unga vazhkaila evlo mukkiyam?**
 - o Why are they important to you?
 - o Is the beach easily accessible for you? What difficulties do you face?
 - o According to your opinion, what should be done or what has to change to solve this?
- Erosion (beach sand/land loss):
 - o Can you talk about your experiences and observations over the last 10 years with regard to erosion (beach loss)? (childhood age)
 - o **manal arippu nala ena prachanai santhikurenga?**
 - o How has it changed in comparison to today? What do you think is the reason behind the erosion?
 - o How has it affected your life and daily work? What risks or dangers have you faced as a result of less space?
 - o How did you adapt or change your life and your daily work concerning less coastal space?
- Seawall, rocks & groin: (risk) perception on hard infrastructures & measures
 - o What do you think about the rocks/groins/xyz?
 - o **Kaalu podurathu paththi ena ninaikurenga?**
 - o Are they beneficial for you? Why (not)?
 - o How have they changed your business? Can they be dangerous?
 - o Did they block access to the beach? Did some migrate or engage in other labor? (alternative livelihood options, Chennai)
 - o What feelings do you associated with them? (being safe, protection)
 - o If you wish to have a groins one, what do you do to get one? Who brought them?
 - o Can you decide where you want to have them?
- Contested coastal space & conflicts:
 - o Has the loss of beach and space led to problems? Please explain in detail!
 - o **Beach idam illama porathu nala ena prachanai santhikurenga?**
 - o What rules are in place to regulate beach space usage?
 - o Can you fish anywhere? Can you park your boat anywhere? But what if there is not enough space anymore here?

Kommentiert [1]: The loss of beach space due to erosion and/or protection with the building of coastal structures has a very significant and direct impact on the livelihoods of those coastal fishing communities that depend on and use beach-space. Seawalls and revetments have the most significant impact on livelihoods because they block and restrict access to the sea and fully occupy the beach-space. All shore-based livelihood activities are severely affected and hampered by such structures.

Kommentiert [2]: Daily activities that require sand/space:

- Boat landing and storage, park/berth boats
- Boat repair and maintenance
- Catch drying (includes fish, seaweeds and conches)
- Pulling nets, laying and operating shore seine, storage of nets
- Making, mending and maintenance of nets (also cleaning and drying)
- Space for cultural needs including religious spaces such as temples, churches and mosques, wedding halls, community halls, play grounds and burial/cremation grounds

- Have there been any issues with other fishing communities?
- What do you think about the increasing beach tourism here? How has it impacted your daily fishing activities? Is it given priority over fishing?
- What are the problems you are facing when the land is shrinking? (housing problems) Does coastal erosion affect property rights?
- Who owns the beach? What is the political power of the coastal communities to fulfill their needs? Who decides over access to beach sand?

Potential future questions/themes

- Political sphere: Governmental Issues
 - What measures are in place by the government to support fish workers' livelihood?
 - What steps can the community undertake in order to protect the coast?
 - When you look into the future, what changes and measures to protect the coast would you desire?
 - How is the shrinking coastal space/beach commons ('poromboke') impacted by power & inequality?
 - Besides the access to the beaches, what other resources (financial, social, capital, ...) you wish to have more access to?
- Coastal protection project & acceptance of sand-based solutions:
 - What do you think about it? Beneficial?
 - Why do you think the government has done this?
 - What do you think about sand as protection? (social reluctance, coastal communities often feel safer with a hard solution)

Research question(s) (Theory-driven, broader picture)

Research gap: What is the significance of structural, social, and political processes that define the relationship between communities, ecosystems and technologies?

Generic RQs:

- How does coastal erosion change the nature of power and forms of access to resources?
- What altered patterns of **access to** natural resources by coastal communities can be identified in relation to sand/beach?

How do fish workers adapt to disrupted/alterd resource flows of sand along the coastline and threatened beaches?

- To fish workers (what are their lived experiences):
 - Social vulnerability dimensions:
 - Political, economic and institutional capabilities
 - Power structures & uneven access to resources
 - Adaptive Capacity (social capital, local knowledge)

Kommentiert [3]: Situate adaptation as part of socio-political processes (relations, contestations, negotiations, cooperation at multiple scales) -> analysing social dynamics of vulnerability to address the political nature of climate change

Kommentiert [4]: Social vulnerability on the other hand, helps with understanding the social dynamics of people's susceptibility to harm and their ability to cope with effects of events such as disasters

Interview key themes:

- Climate/coastal risks, erosion, coastal protection, sand movement
- Climate change/variability (perception), livelihood adoptions (farmer, fisher), local adaptation (boat movement)
- Land rights/Property/access to beach sand (Poromboke, CRZ, Sand rights)

Oral informed consent

Vanakkam,

My name is Dennis. I am from Germany. I am a researcher at Bonn University working on coastal issues and climate change. I am happy to meet you!

[your introduction]

We are currently undertaking a study. In our study, we want to understand the impact of coastal erosion/land loss on fishing communities. In particular, we want to look at the protection measures of the coast. Therefore, we wish to include your daily experiences and knowledge, as well as the challenges you are facing.

We are very happy to reach out to you and be able to speak to you. We would like to have a conversation with you where we will ask a range of questions about the importance of having a sandy beach and access to the ocean, as well as about the problem of increasing land loss due to erosion.

Your answers are stored safely and confidentially and your information will be treated anonymously. With your permission, we would like to record our conversation to make sure we get your words correctly. You can ask us any questions you want before or throughout; you can also withdraw at any stage.

Do you have any questions?

Can we have an interview with you?

-

List of interviewees (to be conducted):

Name (f/m)	Profession/Position/ Institution	Village/Location	Contact details	Notes
seeds	Local Panchayat	French Pillaichavady	kljshnd	met at construction site, knows about court case

Kommentiert [5]: I will say this in the beginning in Tamil to introduce myself.

Kommentiert [6]: Eṅ peyar ṭeṅṅis. Nāṅ jermaniyaic cērtavaṅ. Nāṅ pāṅ palkalaikkalākattil kaṭalōrap piraccinaikaḷ marrum kālanilai māṅṅam kuṟittu āṛaycci ceytu varukiṟēṅ. Uṅkaḷai cantittatil maḷiḷcci aṭaikiṟēṅ.

sdsad	Naam Thamizhar Katchi (?)	Periya Kalapet	sdfsdfs	Contact shared by sdfsdfs
fghhgh	Fisherman	French Pillaichavady	sadsds	Met at the village
hsdfghf	Uur Panchayat	Bommayapalayam	sbsstgr	Met at Bommaiypalayam tsunamai quarters
dfghghk	Uur panchayat	TN Pillaichavady	trgrtrr	Met at the village
	DST (Pondicherry)			
sadsas	Fisherman	Kalapet	srtrtrr	Contact shared by ewferfer

Contacted persons:

- sdsdsds (NIOT)
- sdsdsds
- Fisheries Department
- dsdsdfb (Engineer)

Discussion:

Displacement after Tsunami → Impact on land? (“we lived on the beach”)

- How relocation after Tsunami impacted your access to beach land?
- How has it changed your daily fishing activities?

Open interview question: NGO PondiCAN

Context: Pondicherry Beach areas has been nourished recently and an artificial reef has been constructed to reclaim sand resources.

Questions regarding the coastal protection & restoration:

- Why did the government now decided to act upon erosion? Why has it not done something before? What is the role of power in this?
- Has dredging of sand been done during Covid?
- What are the pros and cons of the measures? Is it sustainable? If, sustainable in terms of what (finance)?
- How did it affect fishing communities? Did they give feedback? Are there any shifts of behavior visible? Do they have more sand now?
- “The reef stops the sediment from moving north. But, during high tide, when it is submerged one meter below sea level, sand can move northward, which is desirable so that the north doesn’t become sand deficient” → How did it actually unfold? Could sand move northwards? Was this calculation of sediment movement correct?
- “The advantage of a reef compared to other structures designed to retain sand is that the reef retains only as much sand as is needed to restore the eroded beach. It does not deprive other beaches of their fair share of sand. It behaves like a speed breaker.” → What is the fair share of sand?
- Seawalls & Groynes:
 - o These hard structures are lucrative business models, running into crores, and favorable for the contractor-builder fraternity as it is an ongoing process. (Report)
 - → How does this work in detail? Is this already a strategy to get adaptation funding?
- For whom is the beach beneficial? Did the sand also move northwards? What are the impacts of the projects for the fishing communities in the context of erosion?
-

Current state of the restoration (article information):

- The remaining two components of the coastal protection project (the south reef and beach nourishment) are to be implemented by the state government. However, they have been delayed due to a lack of funds → is this really the current state of the art? Has there been any dredging? Has the sand-bypass system been revived successfully?



IDOS

German Institute
of Development
and Sustainability

Ethical Clearance Certificate

IDOS Research Ethics Committee

Certificate Number: 2023-C-004

Project title: 'Adapting to multiple drivers of risk: The role of sand resources and their extraction for coastal communities'

Names of researchers: Dennis Schüpf (IDOS)

This is to certify that the application for ethical clearance submitted by Alexia Faus Onbargi
for the research project
'Adapting to multiple drivers of risk:
The role of sand resources and their extraction for coastal communities'
has been approved.

The application for ethical clearance for the above mentioned research was reviewed by the IDOS Research Ethics Committee based on the IDOS Research Ethics Principles.

Ethical approval for this project has been given on the 07.12.2023.

Reviewers specifically checked the following aspects in line with the IDOS Research Ethics principles:

- Equitable research partnerships and researchers' safety and wellbeing
- Data collection activities
- Confidentiality, data protection and management of data
- Impact on participants, research staff and researched communities
- Dissemination of results and publication

Date: 11.12.2023

Tina Zintl, PhD
Chairperson,
Research Ethics Committee

Armin von Schiller, PhD
Vice Chairperson,
Research Ethics Committee

Ref: 231017-1-rel.DIR

RRO Pondicherry,
2nd street, 23/6 Navasakthi Nagar,
Valuthavur Road, Near Rani Hospital,
Aruthra nagar, Puducherry – 605 006

Sub: IFP endorsement letter for the research work of Dennis Schüpf - reg.

Sir / Madam,

Dennis Schüpf, holder of German passport N° **C5XM6T5WZ**, is a Doctoral Student at the Department of Social Sciences of the French Institute of Pondicherry (IFP) and also a Doctoral Student at IDOS, German Institute of Development & Sustainability (Bonn, Germany). His dissertation is on the topic “*Adapting to multiple drivers of risk : climate change, coastal erosion etc and their effects on coastal communities*” which is within the framework of the IFP Interdisciplinary Programme Coast.

For your kind perusal, please find below the Research Synopsis of Dennis Schüpf:

The main purpose of his research is to explore sustainable responses to coastal climate change. The study aims to analyse beach nourishment measures and practices along the Coromandel Coast to understand how they affect coastal livelihoods, such as small-scale fisheries.

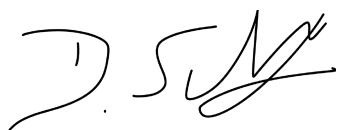
The research is based on qualitative social science methods (participant observations, semi-structured interviews, focus group discussions) drawing upon an empirical case study. The application of these methodological approaches fosters a better understanding of the complex phenomenon of coastal erosion and climate change. Thus, the research findings will help to engage in sustainable adaptation planning measures under the recognition of various coastal stakeholders.

Finally, the research focuses on the social vulnerability context of small-scale fisheries, which are unevenly affected by both rising sea levels and storm surges.

Thanking you in advance for promoting the Indo-French-German academic and scientific cooperation.

Yours faithfully,

Forwarded



Dennis Schüpf

Doctoral Student, Dept. of Social Sciences



Dr. Blandine Ripert

Directress



Participant Information Sheet

Project Title: Adapting to multiple drivers of risk – The role of sand resources and their extraction for coastal communities

Date: 09.10.2023 – 28.02.2023

Larger project: Klimalog

Project duration:

- End of 2025

Funder: BMZ

Lead Researcher: Mariya Aleksandrova

Research Team / Research Partner: IFP [French Institute of Pondicherry - French Institute Pondicherry \(ifpindia.org\)](http://ifpindia.org)

Aim: Understanding the role of sand resources in the context of social vulnerability to climate change

Outputs: (not mandatory)

Time-frame: (not mandatory)

Synopsis/ Abstract:

Projects aimed at adapting to climate change often cause maladaptive outcomes due to a lack of understanding the wider socio-political context as well as related impacts beyond the spatial scale of the intervention. Besides risks stemming from rising sea levels, coastal communities increasingly face compound risks rooted in non-climate stressors, such as extensive sand mining or port expansions, which exacerbate coastal hazards. Hard coastal infrastructure, such as seawalls, require the removal of sand and vegetation, which may lead to the degradation of natural buffers against storm surges and flooding with unintended outcomes and spatially shifting vulnerabilities for small-scale fisheries. The removal of coastal sand resources, mainly for construction purposes in nearby urban areas, not only implies the degradation of natural buffers but also affects the livelihoods of local communities. Hence, the complexity of coastal adaptation not only evolves from the uncertainties of climate change impacts, but also from an ever-expanding use of coastal resources creating a changing social-ecological environment.

Against this backdrop, my research investigates the social implications of sand resource extraction and their distribution in the context of local vulnerabilities. I intent to do so, by applying a political ecology lens with the objective to critically assess the conditions under which coastal communities adapt to not only a changing climate but also environment.

The following overarching research questions guide the analysis and structure the doctoral thesis: 1) How does access to sand resources shape power relations and vice versa regarding adaptation outcomes? 2) To which extent does sand mining impact the social vulnerability of coastal communities and their ability to adapt to climate change?

Data management and informed consent:

If you think you might be interested in participating, we will send you an Informed Consent Form. Signing this form is required before participation. **All interviewees will remain confidential and any information publicized will be anonymized.**

For further questions:

Please e-mail: dennis.schuepf@idos-research.de

Hello,

My name is Dennis Schüpf. I am from Germany. I am student researcher on coastal issues from Bonn University. I am happy to meet you!

We are currently undertaking a study. In our study, we want to understand the impact of the coastal erosion/land loss on fishing communities. In particular, we want to look at how the protection measures of the coast. Therefore, we wish to include your daily experiences and knowledge, as well as the challenges you are facing.

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Do you give your permission for me to interview you?