



# Tales from the pondscape

Living among the ruins of large-scale  
aquaculture in Tarakan, Indonesia

Ph.D. Dissertation  
Thomas Mikkelsen



# Tales from the pondscape

Living among the ruins of large-scale aquaculture in Tarakan,  
Indonesia

Ph.D. Dissertation  
Thomas Mikkelsen

Department of Anthropology  
Graduate School of Arts  
Aarhus University  
Submitted May 2021



Supervisors:  
Michael Eilenberg (Principal Supervisor)  
Jason Cons (Co-Supervisor)

ISBN: 978-87-7507-517-1  
DOI: 10.7146/aul.441

Cover: detail of Pulau Tibi, an islet north of the island of Tarakan, covered  
in ponds. Courtesy of Google Earth



# CONTENTS

CONTENTS .....	1
Thanks .....	5
Maps .....	7
Abbreviations .....	9
PROLOGUE .....	12
The initial project .....	12
Rethinking the project .....	15
Harvest day .....	20
CHAPTER I - INTRODUCTION .....	23
Living with ruins .....	24
The pondscape .....	25
The cases .....	27
Aims and contributions .....	28
Research questions .....	33
Tarakan, North Kalimantan - the site of fieldwork .....	34
Dissertation outline .....	39
THE PONDSCAPE .....	41
... as a place .....	45
... as an analogy .....	49
... as an analytical framework .....	51
Extraction.....	51
Ruin.....	55

Connection.....	59
NOTES ON METHODS AND FIELDWORK .....	65
An arrival story .....	65
Data collection .....	69
On research assistants.....	69
On accommodation.....	71
On waiting.....	74
On anonymization.....	74
On places and people.....	75
CHAPTER II - A GENEALOGY OF EXTRACTIONS .....	77
PRECOLONIAL PATTERNS OF EXTRACTION .....	80
A frontier or not? .....	83
THE OIL FRONTIER .....	86
THE TIMBER FRONTIERS .....	90
THE MARITIME SHRIMP FRONTIERS .....	93
THE POND FRONTIER .....	100
Making way for the pondscape .....	103
Financing the pondscape .....	112
Building the pondscape .....	116
Farming the pondscape .....	119
SUMMARIZING THE CHAPTER.....	124
Past and present flows .....	125
The public private .....	127
Layered ruination .....	130
CHAPTER III - A CRABBY TALE .....	133

RUINATION .....	137
Ruined ponds .....	141
Patronage in flux .....	145
SCAVENGING FOR POSSIBILITIES .....	151
Introducing the mangrove crab .....	155
Productive ruins .....	159
THE COMMODITY CHAIN OF MANGROVE CRAB .....	167
Flows .....	171
Dams .....	175
Leakages .....	180
FUTURE TERRITORIALIZATIONS? .....	186
SUMMARIZING THE CHAPTER .....	190
The rot remains .....	191
Crops and weeds .....	194
CHAPTER IV - FISHING IN MUDDY WATERS .....	198
THE FIRST TRAWL BAN .....	202
The introduction of the trawl net .....	205
New and old tools .....	211
Effectivités and the first exceptions .....	216
TO TRAWL OR NOT TO TRAWL .....	222
Making a living from the ikan nomei .....	228
Ruined fishing grounds .....	234
“IN THE SEA WE WILL TRIUMPH” .....	239
Dynamite Politics .....	240
The second trawl ban and the first exceptions .....	245

Extensions of extensions .....	249
SUMMARZING THE CHAPTER .....	256
Shared ruins .....	258
Managing ruination .....	262
CONCLUDING REMARKS .....	265
Chapter I - Introduction .....	266
Chapter II - A genealogy of extractions .....	267
Chapter III - A crabby tale .....	268
Chapter IV - Fishing in muddy waters .....	270
Ruined and repurposed infrastructures .....	272
Tropes of core and periphery .....	273
Leaks and erosion .....	275
EPILOGUE .....	278
SUMMARY (ENGLISH) .....	280
RESUMÉ (DANSK) .....	283
REFERENCES .....	287



## Thanks

To Lisa, my wonderful partner, who without asking any questions moved to Indonesia with me for a year, and who has put up with me ever since. Thanks to Sonja who was so young when we started, this is the book I promised you. Thanks to Birk who has not seen Indonesia yet, but who arrived in time to be part of writing it all up. I love you all.

Thanks to Michael Eilenberg, my supervisor and friend. First of all, thanks for being ever-so patient and for showing me a direction throughout my studies. Thanks for involving me in your projects and helping me at every stage. Thanks to Christian Lund for his criticism and kindness. Thanks to AM for assisting me along the way. Thanks to Pujo Semedi for inviting me to Indonesia, and assisting us in times of distress. Thanks to Swety, for helping us navigating the oceans of paperwork necessary to do research in Indonesia. Thanks to Suyadi for assistance and introductions. Thanks to the PhD crew at Moesgaard: Abir, Andrea, Annika, Emilie, Fie, Jonas, Katrine, Laust, Malthe, Maria, Mikel, Mille, Theresa and Ulrik.

Thanks to my wonderful, dedicated team of research assistants. Yudi, Dilah and Kiky, without you this project would have been impossible. Vivi, Angga and Janu, thanks for your tireless work transcribing and translating endless pages of interviews. Thanks to Cipu and Dingding, true friends both in times of joy and times of hardship. Thanks to Joy and Pete, we will uphold our promise when the world opens again. Thanks to ibu Sugeng for the hospitality. Thanks to Intan for talks and coffee. Thanks to Ira for looking after us. Thanks to all of MAF Tarakan staff for shelter and kindness. Thanks to Chris Fawcett for proofreading.

But most of all, thanks to the people far too numerous to mention here, who took so much time to help a confused researcher from

Denmark, guiding and teaching him, patiently answering his many, many, many questions. Bringing him to their ponds, bringing him fishing, opening their homes, shops, offices and archives to assist in a project he himself at times did not understand. I hope I have done your time justice.

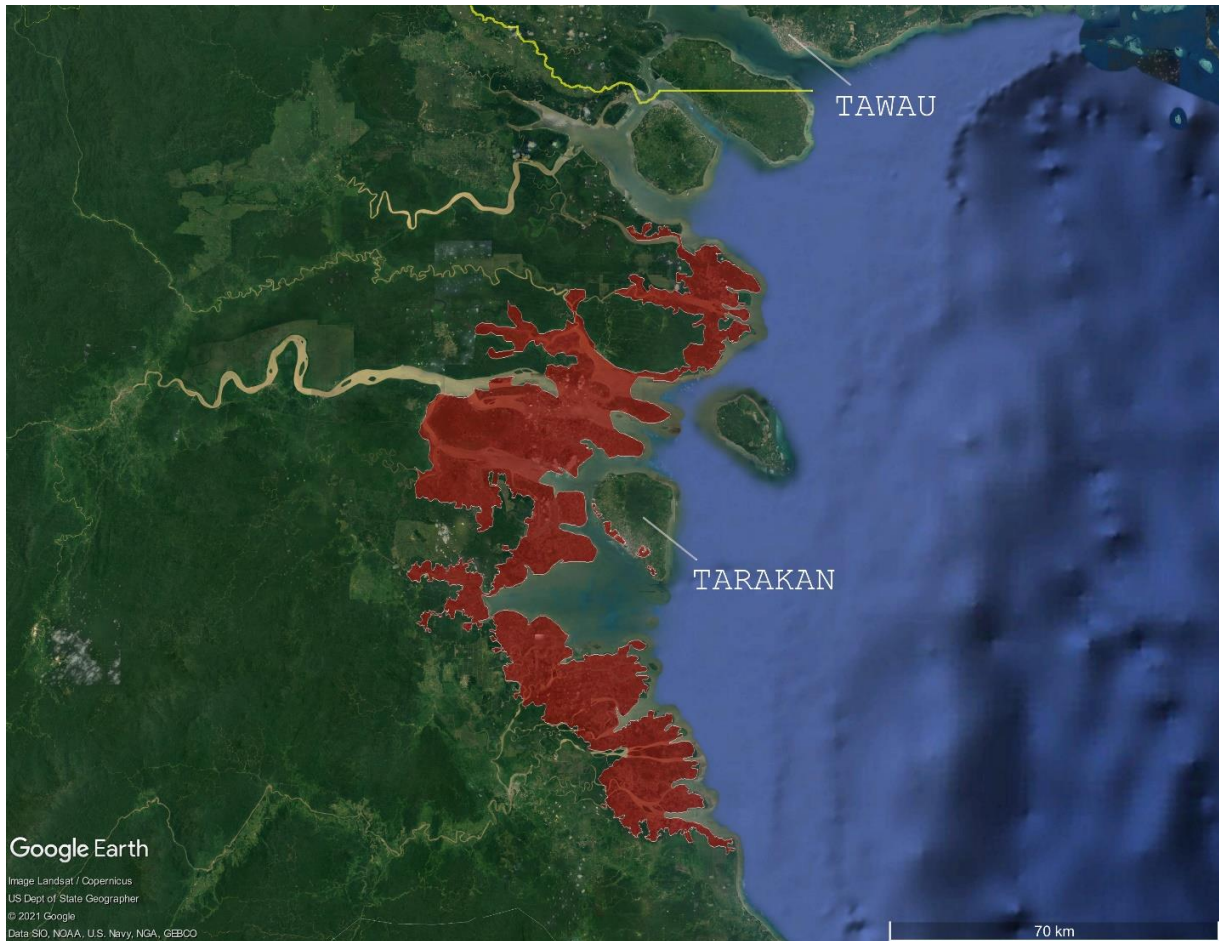
Although so many people have been involved in the production of this dissertation, any fault, omission or inaccuracy rests entirely with the author.

Thomas Mikkelsen  
Malling, May 2021

## Maps



*Map of Indonesia, with the province of North Kalimantan highlighted in green, and the pondscape highlighted in red (Courtesy of Google Earth)*



*Approximate map of the core pondscape, highlighted in red, centered around the city of Tarakan, situated on the west coast of the eponymous island. The national border between Indonesia and Malaysia is shown in yellow. The Malaysian city of Tawau is located just north of the national border*

*(Courtesy of Google Earth)*

## Abbreviations

BAPPEDA	Badan Perencana Pembangunan Daerah <i>Regional body for planning and development</i>
BKIPM	Badan Karantina Ikan Pengendalian Mutu Dan Keamanan Hasil Perikanan <i>Fish Quarantine and Inspection Agency</i>
BPM	Bataafsche Petroleum-Maatschappij <i>Batavian Oil Company</i>
DPPP	Dinas Pangan, Peternakan dan Perikanan <i>(regional) Food, Animal husbandry and Fisheries Office</i>
DPRD	Dewan Perwakilan Rakyat Daerah <i>Regional People's Representative Assembly</i>
GT	<i>Gross tonnage (the internal volume of a ship)</i>
ICJ	<i>International Court of Justice</i>
KKP	Kementerian Kelautan dan Perikanan <i>The Ministry of Marine Affairs and Fisheries</i>
KNTI	Kesatuan Nelayan Traditional <i>Union of Traditional Fishermen</i>
KPK	Komisi Pemberantasan Korupsi <i>Corruption Eradication Commission</i>
LANTAMAL	Pangkalan Utama TNI-Angkatan Laut <i>Naval Main Base</i>
MAF	<i>Missionary Aviation Fellowship</i>
MMAF	See KKP

NES	Nucleus Estate Scheme
ORMAS	Organisasi Kemasyarakatan <i>Societal (mass) organization</i>
PATKAMLA	Patroli Keamanan Laut <i>Small, lightly armed navy vessels outside ordinary classification</i>
POLAIR	Polisi Perairan <i>Marine Police</i>
POLRES	Kepolisian Resor <i>District Police</i>
POLDA	Kepolisian Daerah <i>Provincial Police</i>
PT.	Perseroan Terbatas <i>A limited liability company</i>
PSDKP	Pengawasan Sumber Daya Kelautan dan Perikanan <i>Marine and Fisheries Resources Surveillance</i>
PNK	Persatuan Nelayan Kecil <i>United Small Fishermen</i>
RISEZAsia	<i>The Rise of Special Economic Zones in Asian Borderlands</i>
RISTEK	Kementerian Riset dan Teknologi Republik Indonesia <i>Ministry of Research and Technology of the Republic of Indonesia</i>
SEZ	<i>Special Economic Zone</i>
Spp.	<i>Species pluralis</i>

TNI-AL      Tentara Nasional Indonesia - Angkatan Laut  
*The Navy of the Indonesian Armed Forces*

UBT          Universitas Borneo Tarakan  
*University of Borneo Tarakan*

UGM          Universitas Gadjah Mada  
*University of Gadjah Mada*

VOC          Verenigde Oost-Indische Compagnie  
*The United East India Company*

## PROLOGUE



### The initial project

This dissertation arose out of RISEZAsia, a project formulated and initiated by associate professor Michael Eilenberg of Aarhus University, who has also been my main supervisor throughout both my MA and my PhD. The RISEZAsia project was funded by a 2016 Starting Grant from Aarhus University Research Foundation.

The original project was planned to investigate the proliferation of Special Economic Zones (SEZs) in much of South East Asia, with a focus on a proposed zone in Tarakan. A SEZ is a specific area within the national borders of a country, where different policies are introduced in an attempt to attract foreign companies. This could be in the form of tax holidays, combined with more liberal



regulation regarding trading, customs, labor or the environment etc. Proponents of the SEZ idea see it as a way to increase revenue, employment and investment in less developed areas, while opponents criticize SEZs for being a way to circumvent labor rights, environment legislation and taxation in general.

In the planning of this project, we were especially interested in how concepts of sovereignty, development and notions of territory were used by the different stakeholders in establishing SEZs, and how they affected and were affected by the daily lives of people living in and around them. We hoped my fieldwork would provide a vantage point for understanding some of the interplay taking place between state, military and private interests, all partaking in a development discourse around the SEZ paradigm which was so pronounced in and near the border regions of Indonesia.

Having previously worked with carbon credit development schemes in a border region of West Kalimantan, I was intrigued by this new development scheme. To leverage my experience and knowledge of Kalimantan, we chose a proposed zone in Tarakan; a city located on the east coast of the island of Borneo. The fact that Tarakan is also the only city in North Kalimantan, Indonesia's newest province, which split from East Kalimantan in 2012, only made matters more interesting. As far as we knew at the time, the local government in Tarakan had applied to the Indonesian national government for permission to establish a SEZ catering to the palm-oil and aquaculture industries, and according to the scarce material we could find, were well underway in establishing a zone in an area along the coast south of the city.

However, not long after my family and I finally arrived in Tarakan, having spent close to two grueling months in Java preparing our visas, I realized than no one, except a handful of people at the district development office (BAPPEDA) had even heard of the

proposal to create a large SEZ in Tarakan. It turned out that the preparations, investigations and official proposal to Jakarta, which we had learned of through contacts and publicly available material on government websites, had not actually materialized in any way. It had been abandoned after an internal struggle inside the district development office during the last electoral campaign for mayor. As the proponents of the SEZ had supported the pair of candidates who lost the ensuing election, they had, as is often the case in Indonesian province and district level politics, all been transferred to other less important and prestigious offices or left the administration completely<sup>1</sup>. In other words, the plans for the Tarakan SEZ had been shelved indefinitely, and no one really wanted to talk about it.

The only other SEZ in Kalimantan left on the drawing-board, was the so-called Maloy-Batuta SEZ in East Kalimantan, scheduled alongside a planned, but yet to be built, deep-sea port. With our residence permits being valid only within North Kalimantan, and the past two months of Kafkaesque bureaucracy fresh in our minds, our blood froze at the prospect of doing all the paperwork again. Instead, I went for coffee.

---

<sup>1</sup> For more on the SEZ in Tarakan that never materialized, see Mikkelsen & Eilenberg (2021).

## Rethinking the project



Being a harbor city, the most bustling part of Tarakan is the waterfront. Here one finds the wet markets, the food stalls, the best coffee shops, in short - more or less anything. From grimy workshops where all things mechanical and oily are brought back to life by squat men with only the simplest of tools, to hermetically clean glass-fronted stores, full of stylish teenagers, the newest smartphones and enough LEDs to illuminate entire alleys. And beyond, extending into the brown waters of the Batagau Strait like teeth on a comb, lie ramshackle jetties, each lined with colorful houses on stilts in various states of disrepair, with boats moored or sunken bellow and between them.

As I was walking along one of these jetties, I encountered a group of women cleaning and arranging fish to dry on a net, stretched

across a wooden frame. I admired their skill and colorful dresses, and they found both my presence and my interest hilarious. When they finished one frame, they set it out in the sun to dry, next to ten or twenty others. I was not allowed to leave before I had tried my best at filleting, and had been photographed with each of the women by a legion of kids brandishing an assortment of new and old smartphones. The women were fishermen's wives and daughters, all immigrant Bugis, and they were preparing *ikan nomei*, sundried fillets of a fish they insisted was endemic to Tarakan and sold to buyers all over the world. This was a neighborhood of fishermen.

With a gifted bag of dried fish in one hand I walked on, until I came to an area where the houses looked more robust, and the piers were made of concrete slabs instead of rickety planks. I found a coffee stall and sat down, hoping to find a moment of peace to write about the fishermen's wives, their colorful dresses and their dried fish, but alas, my presence caused too much amusement among regulars, a sentiment which only increased when I asked for coffee without sugar - a most ridiculous thing in the minds of most Indonesians. Their cheery inquisitiveness afforded me no other option than to put down my notebook again.

I asked them about the many signs that seemed to advertise different kinds of seafood on the buildings surrounding me, ranging from crudely painted pieces of wood to professionally rendered and printed banners, all advertising the shops underneath as somehow involved in buying or selling shrimp, fish and crab. I was told that most people in this neighborhood bought and sold these creatures, which was confirmed by the substantial traffic up and down the pier: men pushing carts filled to the brim with ice blocks, canvas bags and what looked like water balloons. Curious, I asked the proprietor about it, and it turned out that he also was a seller of these balloons. They contained *benur*, shrimp

larvae, suspended in maybe half a litre of water, he told me, and before I even finished my coffee, he had pulled me into his house where a number of huge tanks stood next to each other. He got the *benur* from Java he said, by air, and kept them for a while before he sold them on to pond owners. The man was very talkative, and I tried my best to follow his explanations. His son owned a couple of shrimp ponds, and he at once invited me to take part in harvesting one of them the following week. I agreed, and when I left after a couple of hours, filled to the brim with information, I was equally intrigued and puzzled.

I spent the following days alternating between getting our newly rented houses in order, walking along the docks and reading local newspapers in front of my computer. The more ground I covered on foot, the more curious I became about the sheer quantity of small proprietors involved in the trade of fish and shrimp.

Although I also encountered what seemed like warehouses and a few factories (their smell betrayed them) also engaged in the trade, the ratio between them and the simple shops was minuscule. The seafood business seemed on the one hand, to be all-pervading in extent yet so small-scale in size. In the countless shops they told me that they bought from pond owners and/or fishermen, and sold to bigger buyers. Those buyers told me that they bought from shop owners and sold to bigger buyers. These bigger buyers told me they either sold it to even bigger buyers, or to the factories wherefrom the products entered was loaded in containers and exported. I found this dendritic arrangement very interesting, as it seemed at odds with my (admittedly sparse) knowledge of economics. Why not skip the multiple layers (and margins) of the middlemen?

At home, reading the newspapers, I focused on everything maritime. I learned that Tarakan was a center for both the processing and

exporting of farmed shrimp from the entire province of North Kalimantan, funneling the produce of more than two hundred thousand hectares of ponds into the world market. The pond landscape also encouraged a trade in mangrove crabs, fierce and bulky creatures endemic to the mangrove forests that had once grown along the rivers and estuaries now covered with ponds. The crabs had found the ponds stocked to the brink with delicious shrimp to be excellent habitats, now that the mangroves were gone. According to the newspapers, these creatures were being smuggled to Malaysia alive and in large numbers, and the prices mentioned per kilo sounded almost ridiculously high.

I also learned that there were several thousand small-scale fishermen in Tarakan, many of whom specialized catching in the *ikan nomei* that I had become acquainted with on my first walk. Although the fish was not endemic to these waters, as the fishing women claimed, Tarakan was indeed one of the last places in Indonesia where they were being fished on a large-scale. In India there was a large fishery of them as well, so large that it had given the fish its curious English name, Bombay Duck. And indeed they were sold all over the world, Canada and Britain being the biggest markets outside Asia, due to their large number of Asian immigrants.

But both shrimp farmers and fishermen were beset by problems it seemed. The Tarakan shrimp industry was suffering from declining yields, deteriorating ponds and fluctuating market prices. There were remarks about the golden days being long past, and questions about what the new gold rush for Tarakan should be. The fishermen seemed to share a similar fate. Their catches declined as well, while their numbers grew. New legislation from Jakarta threatened to outlaw trawl nets, the chosen type of gear for the *nomei*

fishermen. While demonstrations had been held, both in Tarakan and Jakarta, the ban was still in place; trawl was illegal.

It was the same kind of problem these two industries faced: decreasing yields. What, I wondered does that mean for a society so dependent on extraction? What happens to the people doing the harvesting, to the multiple layers of middlemen, to the relationship between them? I decided that this could be a very interesting issue into which to delve deeper.

## Harvest day



*The day arrived, and the proprietor of the first coffee shop I entered kept his promise. We sailed early, on a foggy morning in a rented fiberglass speedboat with the seats pulled out, carrying supplies and 150 kilos of ice in a dirty Styrofoam box. We crossed the Batagau Strait unable to see much through a thick fog. The skipper navigating using only his keychain compass, took his time as the waters were littered with driftwood of all sorts, ranging from logs to what looked like whole floating islands of vegetation, carried to sea from the rivers into which we were now heading.*

*The fog lifted as we sailed into the mouth of the Sesayap. We quickly branched off the main river, and entered into a labyrinth of tributaries, with the riverbanks closing in on us for each turn we took. We arrived at the pond after a couple of hours, and were heartily greeted by the caretaker of the pond and his family. Only later did I realize that the entire landscape we had been*



*traversing consisted of ponds. The nipa-palms along the riverbanks hid any view into the flat world behind.*

*We emptied the pond that night, through a net tied to the concrete sluiceway that kept the water inside. Having timed the harvest with the spring tide, where the difference between the water inside the pond and the river outside was the greatest. The pond was emptied in some eight hours. We tied the net off and pulled one end onto land once every 30 minutes or so, emptying its contents unto a wooden platform built for the purpose. Working all night we landed some 22 kilos of tiger shrimp, less than a tenth of what the owner had hoped for. "The pond is sick [...] I will try to sell it before next harvest" he said.*

*On our way back home to Tarakan, the owner insisted that I did not sail in the boat carrying the shrimp. Despite the failed harvest, there was a risk that the boat could be attacked and seized by bandits on the return trip, and he had not bought protection from the police to ensure his safety. Even though I doubted the existence of such shrimp-pirates<sup>2</sup>, I got a ride back with a travelling salesman who had joined us the previous night. His inventory consisted of cigarettes, cooking oil and instant noodles, but his main business was the mangrove crabs he bought from caretakers of the ponds he visited. He showed me some he kept in a box by his feet, huge creatures, immobilized by a piece of string tied cleverly around their claws and legs. His boat was fast, and we raced towards home in clear weather on a flat sea.*

*As we neared the island of Tarakan, we started passing scores of long slender boats, all pulling what looked like really heavy nets. The trader pointed and laughed, "trawl nets!" he yelled in my ear,*

---

<sup>2</sup> As I will detail in the following chapters, it turned out that shrimp pirates are very much a thing, and that people are killed every year in robberies at the ponds or on their way back to Tarakan.

*I had told him of my interest the last night. I was surprised, as we were in plain view of the city. I had thought that the ban on trawling was in effect, but decided that there must be more to that ban that I had read about in the newspapers, as these fishermen were openly trawling.*

*I arrived home, carrying the plastic bags of shrimp and mangrove crabs I had been given as well as a conviction that I had most certainly found the topic of research that I were going to delve into during the rest of my fieldwork.*

## CHAPTER I - INTRODUCTION

This dissertation is about the lives lived in and around the headwaters of receding and emerging seafood commodity chains in Tarakan, a border city in North Kalimantan, Indonesia. It is a story about loss of livelihood and increasing resource scarcity - about the struggle to subsist among widespread environmental ruin in the remains of a declining resource frontier.

Every day, pond caretakers toil at maintaining the thousands upon thousands of shrimp ponds that expand along the rivers and streams, most of them immigrants from neighboring Sulawesi. But something is wrong. The ponds did not yield as they used to, and often harvests fail completely. Entire areas of ponds are being abandoned. What to do?

Every day, fishermen prepare their boats and provisions and go to sea, fishing among the islands and estuaries. Most of them return in the afternoon, where wives, daughters and old men wait in order to clean and prepare their catch. But the fishermen bring back less and less. There are fewer and fewer fish. Sometimes, the catches don't even cover the cost of fuel. What to do?

Every day, the catches and harvests are collected by travelling middlemen, or brought to small posts, sold or used as payment for accumulated credit. They are then bought and resold, ever accumulating, until they leave Tarakan for distant markets. But the flows are starting to run dry. Pond owners and fishermen default on or even flee from their debts, while middlemen face their own debtors with empty pockets. Factories are shutting down, old networks of trade disrupted. What to do?

Some of the answers to these questions are stories of repurposing and remaking. About the creative ways to find new livelihoods

through utilizing what remains. About struggling along despite hardship, hoping for new opportunities to arise. For others it is a story of despair and financial ruin. About accumulating debts and being robbed of any control over your own life.

For some it means a return to subsistence gathering, or collecting. Pond caretakers in ailing ponds have found that mangrove crabs, voracious creatures hitherto considered pests, thrive in the ruins of pond aquaculture, under conditions that farmed shrimps do not. Yesterday's nuisances become tomorrow's valuable commodities, and abandoned ponds become productive again in new and unexpected ways - at least for a while.

For others, answers to ruination are to increase and expand. Small-scale fishermen continue fishing with ever increasing efficiency. More and bigger boats, larger nets, finer mesh sizes, heavier and more destructive gear. All financed by ever larger loans, further solidifying existing patron-client relations, as well as accelerating the ruination of what is left. They fight legislation that seek to reduce the impact of trawling, and they fight outside fishermen from encroaching on the dwindling fish stocks they claim as their own.

The misery has led to possibilities for others though. Politicians, and businessmen have found a substantial audience through speaking on behalf the struggling pond owners and fishermen, and rent-seeking police and navy officers profit from both the illicit trade in mangrove crab, and from the bribes collected from desperate fishermen.

### Living with ruins

The resource frontiers and the subsequent extractions that have moved across both land and sea have left ruins, layered on top of each other, or deposited elsewhere. In Northern Kalimantan, rivers

bring the poisonous runoff from upstream plantations and gold mines into the downstream shrimp ponds, where piscicides and herbicides, antibiotics and the waste of billions of shrimps are added to the mix. The rivers flows on, until they empty into the straits and deltas of the Sulawesi Sea, along the coastal fishing grounds, dispersing and accelerating ruin all along the waterways.

These ruins are not stable, fixed or predictable. They wax and wane according to harvest cycles, currents, spills and overflows. As upstream histories become downstream legacies, the flows of water tie people living along the rivers together, while simultaneously enforcing existing social hierarchies. Upstream is wilder but cleaner and more controllable while downstream is more civilized, but more polluted and unpredictable. Ruins dictate possible ways of life in the future, leftovers of former and current regimes of extraction.

Thus bound together, thousands upon thousands of people struggle every day to make ends meet. Days, months, years and lives form around the logics of extraction and the patronage relations that empower them, into which people put their labor and around which communities grow. It is the people at the headwaters of the commodity chains that have to adapt to dwindling harvests and failing catches, to uneven implementation of laws and to possibilities outside of it. To ever-changing policies, volatile global markets and degraded ecologies.

### The pondscape

There is an oscillating or generational element to the frontier dynamics and territorializations that pave the way for the supply side of these commodity chains, leaving behind accumulating layers of environmental and social ruin. Each of these chains consists of

a number of entangled practices that are historically contingent, contested at multiple levels and actively creating future ruins.

In an attempt to situate commodity chains, the extractive practices that fuel them and the resulting ruins both spatially and temporally, I use the term pondscape. As a concept, the pondscape contains three strands of abstraction which intersect which each other in many ways.

The pondscape is a concrete place within which a concrete set of practices are nested, the result of the frontier of large-scale shrimp farming that spread through Kalimantan in the late 90s and 00s. Clogging the estuaries facing the island of Tarakan, lies the largest area in all of Indonesia converted to aquaculture. Divided into thousands upon thousands of individual ponds, the pondscape is comprised of both the physical dam infrastructure where the production and extraction take place, and the relational infrastructure of the patronage networks and global supply chains that sustain it. It also consists of the ruin and devastation that is continually created and subsequently left behind, both in the core of the pondscape, and in the periphery of surrounding rivers, reefs and coastlines so heavily affected by its presence.

Employed *pars pro toto* as an analogy for extractive supply-chain capitalism, the pondscape is also the headwaters of global rivers of commodities. It is the place where shallow and slow-flowing streams and rivulets that have been meandering through well-known landscapes fuse with the rapid currents spanning continents, before branching out into estuaries of wholesalers and consumers. The flows erode and redeposit the surrounding stratum, carrying rubble and driftwood along. In the confluence zone, the whirls and doldrums formed by friction between river and tributary, characterize the place where different scales meet. They are the

“awkward, unequal, unstable and creative” (Tsing, 2005, p. 4) processes that happen in encounters across difference.

Lastly, the pondscape is a multifaceted analytical vehicle for thinking and writing about the large-scale spatial and social aftermaths of the extractive supply-chain economy. It, on the one hand, collects the processes of unravelling and disassembling taking place as past frontiers crumble, while also containing the web of patronage systems that resists such erosion. It contains both the creativity and opportunity-seeking that might coalesce to form new frontiers in the ruins of the old, and the despair and ruination that stifles change.

### The cases

Two cases will make up the analytical part of this dissertation. The first case is about the dynamics in the heart of the ruined pondscape. Years after the frontier of pond aquaculture moved through and transformed the landscape, the old ponds are yielding less and less shrimp, sometimes failing completely. In these ruined ponds, the hired caretakers have found a new form of income, however meagre, the collecting and selling of mangrove crabs - an endemic creature considered a pest by the owners of ponds. This practice have created a new resource frontier and a new commodity chain has formed around it. Along with this, comes new attempts from state and non-state actors in appropriating and territorializing the flow of this emergent commodity.

The second is the case of the artisanal fishermen fishing in the ruined coastal areas. Taken as a group, they are somewhat diverse, but they all predominantly fish for the market and they are nearly all indebted to a number of middlemen. The clearing of the mangroves, increased fishing pressure and the runoff from upstream ponds, mines and plantations leads to dramatically declining

catches. Their struggle is being met with a tightening of regulations and conditional assistance from the national government and local government. An ongoing maritime border dispute with Malaysia means that the waters are heavily patrolled by the navy and coast guard, making fishing even more fraught with uncertainty and risk, as vessels of both nationalities routinely cross the border to fish and trade. The fishermen organize according to both gear and ethnicity, aided by aspiring businessmen and politicians eager to speak on the behalf of different constellations of fishermen.

The two cases are not by any means demarcated and separate summaries of different social, political and historical phenomena. Both are snapshots of life in the pondscape, put into historical context. Both are connected through ruination, as the latter is about people eking out a living in the ruins of the former. Both are fixated by intertwined debt-based patronage relations, granting both resiliency but also stifling change. Both are about people struggling along, making to do with what they have, hoping for new opportunities to present themselves. Both are about environmental degradation, massive destruction of landscapes that once were bountiful. Both are about possible futures, both are about where we go from here.

### Aims and contributions

In a highly influential, although in some circles controversial<sup>3</sup>, article in *Science*, the authors predicted that all fishing stocks currently fished economically, were headed for collapse in the mid-21<sup>st</sup> century, if the current fishing pressure were to continue unabated (Worm et al., 2006, p. 790). Although later nuancing their projections after accommodating some of the critique (Worm et al.,

---

<sup>3</sup> See part of the debate in Murawski et al. (2007).



2009), the debate underscored the severe situation for the sustainability of global capture fisheries, and it has been continuing since then, as the landings from global capture fisheries continues to decline at an alarming rate (Pauly & Zeller, 2016).

Concurrently with this decline, the harvests from aquaculture on a global scale, have increased dramatically. In recent years, world aquaculture production of major aquatic species groups has gradually surpassed that of capture fisheries. In 1986, more freshwater fish was farmed than caught. In 1994, more mollusks were grown than caught, in 1997, more diadromous fish<sup>4</sup> were farmed than caught and in 2014, more crustaceans were farmed than caught (FAO, 2020b, p. 23). The contribution of aquaculture to world production reached 46 percent in 2016–2018 (ibid), up from 12 percent in 1984 (Stonich & Bailey, 2000, p. 23). Considering that humans have probably been engaged in capture fisheries since before the dawn of homo sapiens (Hardy & Moncel, 2011, p. 8; Stringer et al., 2008, p. 14139), this shift is tectonic, and the rapidity of it is in all ways remarkable.

This have led to prominent voices advocating for a continuing “blue revolution”, arguing that aquaculture: “can support growing human consumption of fish and other aquatic species while relieving intense pressures on ocean ecosystems” (Sachs, 2007, p. 37). Others have warned against treating aquaculture as an easy technological fix, cautioning that the expansion of large-scale aquaculture have a direct, and overall detrimental effect on nearby wild fisheries stocks (Naylor et al., 2000, p. 1017).

But another tendency is also becoming apparent. The tremendous increase in aquaculture production has also started to slow down

---

<sup>4</sup> Fish that migrate between fresh and salt water such as salmon and eels.

considerably. Simultaneously, and on a global scale across all farmed species, the number of catastrophic busts, where a significant proportion of production is lost, or completely collapses, is increasing, a tendency that correlates strongly with the decreasing rates of growth in global aquaculture (You & Hedgecock, 2019, pp. 1053-1055). Additionally, species that had earlier experienced a rapid boom phase in farming, show an even larger risk of also experiencing a bust (ibid., 1056). In other words, hid behind the continuous expansion of global aquaculture, is a growing tendency of catastrophic failures leaving ruin and abandonment, as busts are overtaking booms.

The rapidity with which we as a species have been moving away from capturing our sources of aquatic protein towards farming them, are unprecedented and aquaculture have become an exciting multidisciplinary field of research. Add the vulnerability of large-scale aquaculture to catastrophic busts, and the potent call to researchers of all denominations, to engage in attempting to understand why, how and what is happening becomes, I believe, evident. We need to talk about this desolation.

The susceptibility of large-scale shrimp aquaculture to cycles of boom and bust, and the resulting stories of new wealth and unimaginable debt, have been well described in literature critical of the aquaculture<sup>5</sup>, since the industry took off in earnest in the 1980s (Arquitt, Honggang, & Johnstone, 2005; Deb, 1998; Flaherty & Karnjanakesorn, 1995; Flaherty & Vandergeest, 1998; Gujja & Finger-Stich, 1996; Páez-Osuna, 2001; Primavera, 1997; Vandergeest, 2008; You & Hedgecock, 2019). But while the practice of large-scale abandonment of ponds is often mentioned in the

---

<sup>5</sup> Béné (2005) has an excellent review of what he terms two discourses of literature on shrimp farming, the critical political ecology discourse and the technical best management practice discourse.

literature, it is mostly in passing, part of a long list of the many well-documented ills that plague large-scale shrimp farming. An abandoned shrimp farm has got to be one of the most desolate places on earth. Oppressively open yet completely empty, the sky mirrored in the stale water, broken only by the decaying branches of a lone mangrove tree. Nothing to fix your eyes upon but the lifeless, sunbaked embankment, snaking between pond after pond after pond. Not a sound to be heard. Contrasted with the mangrove it supplanted, knee-deep mud full of life, with a canopy not just above but all around you, a dense, tangled greenery, constantly clawing at your skin and your clothes.

Even beyond paraphrase<sup>6</sup>, the difference between the bustling mangrove and the ruined pondscape is complete. In the quest for the stand-alone asset: plentiful harvests of high-quality, high-value tiger shrimp, once vast mangroves were developed into fields of singular asset-production, everything else deemed weeds or waste (Tsing, 2015a, p. 6). A myriad of open-ended entanglements reduced and discarded by chainsaws, excavators and chemicals, a production landscape now gradually being left to ruin, now that shrimp cannot be farmed in marketable quantities in increasingly large parts of the pondscape anymore.

There is a mainly policy and technical-centered literature concerning various rehabilitating interventions in abandoned pondsapes, such as farm restoration or mangrove reforestation (Hossain & Kwei Lin, 2001; Matsui, Morimune, Meepol, & Chukwamdee, 2012; Primavera & Esteban, 2008; Stevenson, 1997; Stevenson, Lewis, & Burbridge, 1999). A common denominator for this literature is that it discusses and evaluates, sometimes critically, interventions that are done as "projects" by NGOs, often with

---

<sup>6</sup> Tsing (2003, p. 5100) on desolate landscapes and Ghosh (2016, p. 28) on mangroves.

international funding. These interventions in general target relatively small areas of abandoned shrimp ponds, and are expensive, inefficient and few and far-between<sup>7</sup>. They are far too small to substantially remedy the reality of life for the vast majority of people living in and around the ruination of abandoned ponds. As shall be discussed in this dissertation, I argue that the causes for ruination are political (Ferguson, 1990), or dare one say even structural (Tsing, 2015b, 2016), they are manifested both in longstanding ruined, landscapes (Tsing, Mathews, & Bubandt, 2019), as well as relationships (Stoler, 2008). And it is not only the core of the pondscape that fall into ruin. The large-scale destruction of mangrove habitat so often seen in connection with extensive shrimp farming, has severe effects on coastal fisheries in affected areas (Naylor et al., 2000, p. 1020), as is evident when the nets are emptied upon the deck: "sometimes, my catches doesn't even cover the price of the fuel" a fisherman told me as he emptied his trawl net unto the deck of his boat. "The catches are never good anymore<sup>8</sup>".

The disturbance, or destruction, wrought by human activity which now ranks alongside geological forces in shaping the world in which we live, have led to ongoing discussions about whether we should adopt the term Anthropocene to describe the geological era in which we currently live (Subramanian, 2019). While geologists debate, the term Anthropocene has, alongside a number of other terms (Haraway, 2016), found its use in anthropology as way to think about the radical making and unmaking of ecologies and living arrangements of both humans and nonhumans, we as a species have

---

<sup>7</sup> In a review article, Primavera & Esteban (2008) estimates that the reforestation of abandoned shrimp ponds in the Philippines costs 500 USD/ha, and that such projects only have a long-term survival rate of 10-20% (p. 356). In comparison, the price of a brand new 20 ha shrimp pond in Bulungan, considered the best part of the Tarakan pondscape, in 2018 was around 800 USD/ha.

<sup>8</sup> Interview 21.03.2018.

facilitated in what is, really, a blink of an eye (Latour, Stengers, Tsing, & Bubandt, 2018, p. 587). The attention to the non-human and the multi-species, is very much a part of this literature, both in terms of methodology and analysis (Gan, Tsing, Swanson, & Bubandt, 2017; Swanson, 2017), as is a the focus of the landscapes and ruins formed in the process of large-scale extraction and destruction (Bubandt & Tsing, 2018; Tsing et al., 2019).

In this dissertation I aim to dwell more on the ruins and the people who are living amongst them, than on the many multi-species arrangements assembling and disassembling in pace with the creeping ruination. As such, this dissertation engages with some parts of the Anthropocene literature, but keeps a primary focus on the people living in the aftermath of large-scale shrimp aquaculture. While some of the non-human inhabitants of these ruins do enter this tale, they do so as important, but minor characters. This dissertation will be about human life lived among these immense and spreading ruins. How did we get here? In a debate easily clouded by projections, statistics and the sheer scale and severity of the subject, returning to the concrete, to the particular, might be a way to begin.

### Research questions

Dealing ultimately with the question of how to live with resource scarcity and environmental ruin, this dissertation will examine both possibility and despair in the pondscape. How did it come to this, and how can people live in an environment where large-scale ruination persists? What comes after the boom, when the dust have settled and the ruins remain? Much have been written on resource frontiers and their tendency to cyclical processes of frontiers and territorializations, of new opportunities, new land rushes and

subsequent enclosures. But what if, one day, there is no new frontier in sight? What if there is an end, a limit to large-scale extraction? Such were the questions that brought me to the pondscape.

More specifically, this dissertation will deal with life in the pondscape - through ethnographic description, analogy and anthropological analysis. In order to narrow down and ground these questions, this dissertation will revolve around the following two questions:

- How did the pondscape develop?
- How are the conditions for life in the ruined pondscape?

Although questions clearly demarcate scope and intent, I intend to meander a bit, as the streams and rivers once did when impenetrable mangrove forests grew where ponds today crumble. In order to achieve this, I will attempt to weave description, analogy and analysis into a wider tapestry of decline and perseverance, combine the stories of individual people with broader strokes of historical and politic change and anthropological analysis.

### Tarakan, North Kalimantan - the site of fieldwork

The province of North Kalimantan, where my fieldwork took place, is in many ways a special place, and its recent history is closely tied together with the development of the pondscape and its proximity to Malaysia.

Indonesian politics had under the authoritarian New Order regime been heavily centralized around the president, army and the Golkar party. Following the Asian monetary crisis in 1998<sup>9</sup> and the subsequent collapse of the regime, Jakarta elites feared

---

<sup>9</sup> More on the Asian financial crisis and its effect on the pondscape in the next chapter.

defragmentation, a plausible scenario where Indonesia would be torn apart by secessionism, as different regions of the archipelago would demand independence from years of what many saw as Javanese dominance<sup>10</sup>. The response was a process of unprecedented decentralization that over a few years changed one of the most centralist nations in the world into an almost federal state (Mietzner, 2014, pp. 45-46). The political and administrative system of Indonesia was changed through the passing of legislation that among other things abolished the right of the central government to appoint the heads of local government, increased regional spending from the central government dramatically and greatly diminished the role of the army in politics. Provinces and especially districts<sup>11</sup> became much more independent than they had ever been before, and local elites scrambled to participate in (and benefit from) the new political reality.

While this most certainly put a lid on the secessionism that threatened the unity of Indonesia (Aspinall, 2013a, p. 132), it also led to a process known as blossoming or *pemekaran*. As local elites scrambled to take advantage of the possibilities to be earned in local rule, many successfully lobbied for the creation of new administrative units. From 1998 to 2004, the number of provinces rose from 27 to 33, and the number of districts rose from 249 to 349 (Hill, 2014, p. 3). As the dust settled, the central government tried to stop this process, among other ways by establishing a moratorium on the creation of new provinces between 2006-2006 and again between 2009-2012 (Lewis, 2017, p. 1051).

---

<sup>10</sup> The New Order state was Java-based and Javanese dominated. It had promoted (a particular type of) Javanese values as the central tenet of Indonesian statehood (Hatley, 1993, p. 50). In the same vein, Javanese comprised a significant majority of governors, bureaucrats and military officers in the Outer Islands (Mietzner, 2014, pp. 51-52).

<sup>11</sup> Except when indicated otherwise, the second tier of subnational administration (*kabupaten/kota*) will be referred to as "district".

The case of North Kalimantan is special, as it seceded from East Kalimantan in 2012, very late compared with other provinces (Mietzner, 2014, p. 58), becoming the 34rd and newest province in Indonesia. It also the least populous, and after the two Papuan provinces, the one with the lowest population density. The main reasons for allowing the formation of North Kalimantan, as explained the head of the House's Commission II on home affairs and regional autonomy, was to better develop the extraction of natural resources in the area, and because of what he termed "geostrategic needs" (Borneo Post, 2012).

A surge in global coal-prices, culminating in 2008 (Garnaut, 2015, p. 193), had started a boom in coal business which for a time made East Kalimantan the largest exporter of coal in the world, and the most economically productive in Indonesia by a significant margin, measured by per capita (OECD, 2008, p. 55). The secession of North Kalimantan was an attempt to even out this growth, but it was also a way for local elites in Tarakan to further develop the pondscape as well as accelerate the exploitation of other natural resources such as timber and palm-oil in the still somewhat-intact forests along the border with Malaysia.

The other main factor was the "geostrategic" one, as the head of the commission II diplomatically put it. The relationship between Indonesia and Malaysia, the smaller but richer and more developed neighbor to the north, had always been uneasy. After Indonesian independence, the area along the border became embroiled in several conflicts. When the British parts of Borneo was incorporated in the newly created Federation of Malaysia, then-president Sukarno reacted by supporting a communist pro-Indonesian insurgency in Malaysia, which led to a period of low-intensity warfare along and across the border (Peluso, 2008). Although the insurgency was quelled in the 1970s, the border area remained militarized



(Eilenberg, 2012) and disputes over alleged movement of border demarcation stones, surface on a regular basis in both countries (Borneo Post, 2014). But most importantly, a large part of the Sulawesi sea (the Ambalat block) located between the two countries have been disputed since offshore oil probing began in the late 1960s (Colson, 2003, p. 399). In 2002, Indonesia suffered a diplomatic failure when the International Court of Justice in The Hague ruled in favor of awarding sovereignty to Malaysia over two disputed islands (Sipadan and Ligitan) located on the periphery of the disputed Ambalat block. Since then, there has been several minor incidents between navy vessels of the two countries, and there is a heavy military presence on the island of Tarakan. The team lobbying for the creation of North Kalimantan argued that a new border province would strengthen Indonesia's claim to the rest of the Ambalat block, and that the creation of a provincial army base in Tarakan would make it easier for the Indonesian navy and air force to patrol the disputed area (SK, Pilipus, Muzakir, & Azram, 2013, pp. xxvi-xxviii; Tirtosudarmo, 2018, p. 75).

The city of Tarakan (population 240.000<sup>12</sup>) is located on an eponymous island, is separated from mainland North Kalimantan by the Batagau strait, of a few kilometres of width. Tarakan is close, less than 90 kilometres, to the border, and closer to the Malaysian city of Tawau, than it is to any other Indonesian city. There are no roads even remotely close, connecting it to the larger cities in East Kalimantan (Balikpapan, Bontang and Samarinda), all heavy transportation is done by sea, and despite its deep-water harbour, goods arrive much faster from Tawau than they do from anywhere else in Indonesia. Many people have relations living across the border, and combined with a long history of trade between the two

---

<sup>12</sup> <http://bkd.kaltaraprov.go.id/index.php/tentang-kaltara/>

cities, as shall be discussed in this dissertation, many feel closer connected to Tawau than to Jakarta.

In the many markets of Tarakan, it is not unusual to pay in Malaysian ringgit, which are in some places even preferred. Many people take advantage of buying cheaper goods from Tawau over more expensive, shipped in from Java. In 2016, the situation was so grave, according to the head of customs in East Kalimantan,<sup>13</sup> that he felt the need to write an opinion piece in the largest English-language newspaper in Indonesia, complaining that people in North Kalimantan not only buy many of their luxury items from Malaysia, but even "staple foods [ ... ], such as rice, sugar, fruit, vegetables, meat, chicken, milk and eggs, as well as liquefied petroleum gas (LPG) (Jakarta-Post, 2016)".

For life in the and around the pondscape, this meant a lot. The army and the military were very much involved in the shrimp and crab business, and their patrol vessels regularly seized both local and foreign fishermen. They also disrupted the cross-border trade between Indonesia and Malaysia, much of which was illegal but had tacitly been accepted by the local authorities for a long time. Being the newest province in Indonesia, many government institutions had at the time of my fieldwork, not yet moved from East Kalimantan to North Kalimantan, and there was a certain rivalry between the two provinces. On top of that, despite being the only city in the new province, Tarakan had not been chosen as the capital. Instead, the capital became the much smaller town of Tanjung Selor, which further complicated the life in the centre and periphery of the pondscape, as the three administrative layers often worked contrary to each other.

---

<sup>13</sup> In 2016, the head of customs in Tarakan was still based in Balikpapan, East Kalimantan, along with a number of other institutions, as North Kalimantan was not yet deemed to have sufficient administrative capacity (and because East Kalimantan was reluctant to let go of these privileges).

## Dissertation outline

This dissertation is divided into two main parts, the first introductory and the second descriptive and analyzing.

Above, I gave a preliminary introduction to what is at stake in this dissertation, the setting, the questions and the cases. Next follows an elaboration of the central reoccurring trope of the dissertation, what I term the pondscape, as both a concrete place, allegorical device and analytic container. Taken as a whole, the pondscape forms the nexus linking the separate parts of this dissertation together. Next, I will elaborate on the theoretical terms and concepts that I will be using the most, the ones that constitute the pondscape as an analytical framework. More specifically, I will be summarizing and positioning myself in the debates on frontiers, ruins and patronage relations. Having introduced the cases and established the theoretical basis for my argument, I turn to discuss the aims of this work, and the contributions I hope to add to the wider debates on resource extraction and inequality on both a local and global scale, both academically and to a wider audience. Closing the introductory section, I turn to the methodological and ethical premises that lays the foundation for this project, as well as the considerations I have done during the writing of this dissertation.

Having set the stage in the first, introductory section, the main part of this dissertation will be an account of the pondscape in three chapters. The first chapter is different in tone due to its historical scope, relying more primary and secondary literature in combination with ethnographic material than the following two chapters, which are set and written in the present.

The first chapter, "A genealogy of extractions", sets out to review the historical, political and economic foundations for the pondscape as a resource frontier and a concrete place. Through

establishing a genealogy tracing past generations of extractions, I will show how the pondscape came to be a successor of past landscapes, and how practices surrounding past regimes of extraction have to some extent constituted the present pondscape. The last generation in this genealogy will be that of the large-scale pond aquaculture that formed the pondscape as a place, and the chapter will conclude with a description of how large-scale shrimp farming was practiced, prior to the creeping ruination that gained momentum in the late 2000s and is currently transforming the pondscape.

Moving from the past into the present, the second chapter, "A crabby tale", picks up from where the first ended, detailing present-life in the midst of the now ruined pondscape among pond caretakers, owners, middlemen and cold storages - factories that process, package, freeze and facilitate export of the shrimp. One of the consequences of the increasingly failing ponds, and the resulting reorganizations of patronage networks and supply chains have been the emergence, or rather increased attention to the endemic mangrove crab as a valuable commodity, rather than a destructive pest. As many caretakers begin to prioritize scavenging for crab over toiling in ruined ponds, middlemen and cold storages tries to adjust to the realities of ruination. Savvy entrepreneurs profit from the smuggling of protected female crabs across the border to the Malaysian town of Tawau in a risky racket involving police, navy and local and national fisheries officials.

The third and last chapter, "Fishing in muddy waters", focus on the periphery of the ruined pondscape. Since long before the construction of the pondscape began, people have been fishing the bountiful coastal waters in the vicinity of Tarakan. Before the pondscape, the cold storages had first sourced their shrimp from their own fleets of trawlers, but later from a large number of

indebted artisanal fishermen using trawls gears, despite them technically being illegal. As the pondscape switched towards farmed shrimp, fishermen started trawling for fish instead. Acting as a sink for the large growth in population due to the booming pondscape, the number of artisanal fishermen kept growing, and landings started falling. In pace with the decreasing catches, conflict between users of trawl nets and especially gillnets started to grow, with the former accusing the latter for the diminishing numbers of fish. With the introduction in 2015 of a suite of legislations meant to curb the loss of fish stocks across Indonesia and its haphazardly implementation, the trawling fishermen were caught between ruin and legislation. With no other alternative, they chose to fight the legislation ferociously, ruined fish stocks notwithstanding.

Having presented and analyzed the two cases of life in the pondscape, the conclusion collects the threads and opens a discussion about the heritage of the pondscape, the ruination it brings, and its place in the world.

## THE PONDSCAPE

Human activity alters the environment in varying ways and on different scales, creating landscapes. Landscapes, understood here as "overlaid arrangements of human and nonhuman living spaces" (Gan et al., 2017), or in other words, "places of human habitation and environmental interaction (Olwig, 1996, p. 630)", are composites. As such, landscapes happens when the physical environment created through geological, atmospheric, plant and animal activity fuses with a cultural overlay, both of which are constantly in the making, reflecting ever-changing co-constitutive relations between humans and their surroundings.

Some authors use waterscape as an aquatic equivalent of the landscape. Originally used as a term in art history to describe paintings predominantly featuring bodies of water (Orlove & Caton, 2010, p. 408), the term has since found some use in anthropology and political geography. Swyngedouw (1999, 2015) for example, employs the waterscape as a hybrid of socio-natural relations and processes at a national scale to examine the interplay between the building of water infrastructure and the historical advent of modernism (and fascism) in Spain. Swyngedouw's analysis of the evolution of a largescale, centrally controlled water management system over time highlights the rewards of taking into account the "multiplicity of historical-geographical relations and processes (Swyngedouw, 1999, p. 445)" into account when analyzing waterscapes (or pondsapes for that matter).

Where Swyngedouws analyzes the development of water infrastructure on a national scale, Hastrup & Hastrup (2015) are interested in the social life of water on a much more local scale. Focusing on what they term waterworlds, they seek to open up for investigating life in a time of global climate change and environmental instability. Waterworlds are meant to explore "the role of water in worlding exercises across the globe" (Hastrup & Hastrup, 2015, p. 3)". Central in waterworlds are an ubiquitous uncertainty and instability of things that used to be fixed, or at least somewhat predictable. They highlight the prevalence of liquid fear (Bauman, 2013) in waterworlds, by which they mean the uncertainty resulting from the falling apart of customary socionatural cause-and-effect sequences rendering what used to be stable unknowable and unforeseeable.

The term pondscape have been employed in freshwater ecology, to refer to larger pond ecosystems consisting of singular ponds "and [their] immediate catchment, but also the terrestrial matrix of

land between ponds" (P. Wood, Greenwood, & Agnew, 2003, p. 206). Additionally, writing on urban hydrologies in India, Cornea, Zimmer and Véron (2016) used pondscales to describe the composite nature of the many artificial ponds across Indian cities, with the individual pond being "both a site of social relations and a biophysical resource" (p. 396).

I seek to combine such perspectives, to examine the composite socio-nature of the larger pond area, including both the immediate terrestrial and marine waterscapes influenced by intensive pond aquaculture along the estuaries of North Kalimantan where a certain kind of amphibious landscape dominates. From the air, mosaics of greens, browns and blues, have an eerie likeness to those vivid cross sections of cells you find in biology textbooks. An aquatic landscape formed by large-scale shrimp aquaculture - a pondscape. Based on ponds of 10 to 15 ha, proliferating alongside the large rivers and smaller streams, thousands upon thousands of such ponds cover the estuaries, islets and downriver areas of the rivers that empty into the Batagau Strait. The pondscape forms the production side of the farmed shrimp export-economy, a now waning boom crop still of high importance in Tarakan. In order to maximize the productive surface, the ponds have been shaped to fit each other, following the twisting and winding streams they depend on for fresh water and for disposal of waste. Streams that run into rivulets, that run into rivers, that run into the sea during low tide, and reverse during high tide creating long stretches of labyrinthine brackish waterways.

Once meandering freely through mangrove forests, the streams are now held in place by pond infrastructure: sluiceways, dykes and embankments, all built to manage water flow in and out of the ponds during ebb and flood. This lunar heartbeat drives the farming of shrimp, it lets caretakers empty and fill ponds and it makes it

possible to harvest an entire filled pond through a sluiceway with a single net.

The pondscape is both a fragmented and completely decentralized waterscape, and an amalgamation of waterworlds. Gemming throughout the mangroves and intertidal forests without any central plan, and obeying no centrally set of regulations, the pondscape results from the hopes, ambitions and sweat of thousands of small-scale entrepreneurs, their hired caretakers and the hydrology, biology and geography of the forests and the rivers. And yet the pondscape looks and functions as a whole. It sucks labor in and funnels shrimp and crab in the form of commodities out into global supply chains snaking across the globe, while excreting pollution and ruination. It is at the same time extremely local and completely global, "a landscape in which the logic of capital had remade the first nature and bound together far-flung places to produce a profound new integration of biological space and market time" (Cronon, 2009, p. 224).

The pondscape will be the focal point of this thesis. I will use the term pondscape more broadly than either waterscape or waterworld, both as a description and as a framework for analysis. As such, the pondscape is both an ethnographic portrait of a certain set of practices and relations nested within a certain kind of place, an analogy for extractive supply-chain capitalism and as multifaceted analytical trope for thinking about the large-scale spatial and social effects of the supply-chain economy.

These different ways of thinking and writing with and about the pondscape each have their own strengths and weaknesses. In the analytic part of this thesis, I aim to weave these three strands of writing into a broader tale of life amidst and on the periphery of ruination, of life in the confluence of commodity flows, of life in the headwaters of extractive supply-chain capitalism. In



other words, of life in the pondscape. In the following I will introduce the three strands, or perspectives on the pondscape.

### ... as a place

As an ethnographic description of a certain place at a specific point in history, the pondscape depicts the field in which I conducted my fieldwork.

There are no clear-cut boundaries of the physical infrastructure of the pondscape, and as such, it has no exact size. Spatially, it covers much of the coastal, and lower riverine area of North Kalimantan, centered on the city of Tarakan, from where it's produce is collected, processed and exported. The core of the pondscape, formed by thousands upon thousands of ponds, extend from the tidal limit of the winding rivers, it continues along the numerous tributary streams and rivulets, all the way to the estuaries that empties into the Batagau Strait, covering the numerous islets situated in the river mouths. Official data puts this core area to nearly 150.000 ha (1500 km<sup>2</sup>) (Tribun-Kaltim, 2018), consisting of 13.132 productive ponds (BPS-Tarakan, 2019, p. 305)<sup>14</sup>. These numbers though, should not be taken too literally, as discussed in the following chapter. In addition to the productive ponds, the core of the pondscape also consists of a very large number of abandoned ponds<sup>15</sup>. Away from the core, the

---

<sup>14</sup> My approximation using the polygon tool in Google Earth to roughly measure the size of the area visibly covered in ponds (thus consisting of both productive and abandoned ponds), puts it at somewhere between 200.000 and 250.000 ha (2000-2500 km<sup>2</sup>). In comparison the size of the country of Luxembourg is 2586 km<sup>2</sup>.

<sup>15</sup> It is difficult to say exactly how many ponds are abandoned, as there exists no official data (that I have been able to acquire), and because ponds are sometimes left for years, in the hope they become productive (or rentable) again, while others are left for good. Working in the Mahakam delta south of

periphery of the pondscape extends past the core pond area, and covers the nearby coastlines, rivers and fishing grounds, where the marine ecosystems and the people who depend on them are heavily affected by the loss of mangroves, acidification and the runoff of silt and toxins.

As a certain set of practices and relations, the pondscape connects many thousand ponds with the city of Tarakan. Through hierarchical networks of middlemen, it terminates at the cold storages. It also covers the web of relations and practices surrounding this flow, ranging from pond caretakers to pond owners, from dock workers to bureaucrats, from suppliers to agents, from police officers to the bandits that prey on the high-value cargo of the returning boats.

In Northern Kalimantan, pondsapes are painstakingly built in transformed mangrove swamps, held in by piling, pushing and digging the muddy mangrove soil into embankments no more than a couple of meters across - the cell walls of each individual pond. These embankments provide the only solid ground in the pondscape, but comprise only a fraction of the it, the rest is, most of the time, submerged. As such, the physical pondscape predominantly consists of water, either stagnant or slowly flowing according to the tide. Houses, gangways, sorting platforms and jetties are all built on wooden stilts, flimsy structures clinging desperately to the narrow embankments or riverbanks. As the ponds lay side by side, you can travel along pond after pond, walking on the embankments, zig-zagging slowly across the flat landscape.

A flatness which is remarkable. As the containing embankments are at most a meter or two above the surface of the river at ebb, you

---

Tarakan, Bosma et al. (2012, pp. 91-92) estimates that 21% of all ponds had been abandoned over a period of 4 years, from 2001 to 2005.

are never offered an overview of the wider pondscape, save for the neighboring ponds and a distant horizon, broken somewhere by a line of nipa-palms. The sky overhead, unshaded by any elevation or tall vegetation, is reflected in the stagnant surface of the pond. This inability to appreciate the vastness of the pondscape despite its naked openness, coupled with the dominance of the sky both overhead and underneath, leads to a feeling of remoteness, somewhat similar to sitting in a boat on a calm sea. Such a feeling of isolation is paradoxical though. The pondscape is much more densely inhabited than the mangrove swamp it replaced, and all ponds are connected through the waterways that feed them, the embankments that contain them, and ultimately through the shrimp commodity chain, to consumers all over the world.

The pondscape is a labor-intensive landscape, in constant need of vigorous maintaining, constantly in a process of falling apart - in a process of constant ruination. Embankments leak and collapse, sluiceways sink and ponds overgrow. Houses rot, boats leak, gangways collapse. Over time, the ponds themselves slowly become unproductive, disease-ridden and clogged with the waste of millions upon millions of shrimp. Occasionally, sweeping epidemics wipe out shrimp in entire areas of predominantly older, downriver ponds. The frequency of failed harvests is ever increasing, and the most unproductive parts of the pondscape are being abandoned and left to fall into ruin.

The water that fills the ponds, eventually flows on, from rivulet to river, until flows to the sea, where fishermen in small boats trawl or place their traps and nets. The people along the fringes of the pondscape are predominantly coastal fishermen, but occasionally also caretakers or pond owners. Even here, in the sheltered waters of the estuary, the ponds themselves, the ruination and decline of the pondscape is an inescapable part of

life, the proximity to the central pondscape is acutely felt in a number of ways.

It is widely recognized (Ellison, 2008; Manson, Loneragan, Skilleter, & Phinn, 2005; Mumby et al., 2004; Primavera, 1997), that mangroves play a critical role as hatcheries and shelters for many species of fish and crustaceans, many of which form the basis for the coastal fisheries in the periphery of the pondscape. As the pondscape spread, thousands of square kilometers of mangrove were eventually converted to ponds. Consequently, fish stocks declined. Looking at the conversion of mangroves alone, close to half a kilo of fish and crustaceans are lost from capture fisheries for each kilo of shrimp harvested (Naylor et al., 2000, p. 1020). Fewer fish means smaller landings, and in order to sustain their livelihood (and to service their loans), most fishermen started to undertake more numerous and longer trips and bought bigger boats with more powerful engines (on credit) in order to use heavier equipment. But despite the intensification, landings stagnate at best. Only the rising prices of fish keep the boats in the water - the fishing grounds, as the rest of the pondscape, are in a process of ruination.

Large parts of the pondscape in which I worked, and which form the basis for this dissertation, were in a process of such a decline, or ruination. The boom days were gone, the windfall harvests and landings were set aside as subjects for tall tales and memories.

The big question for the people in the pondscape I worked with, were not how to maximize harvests and landings, but how to minimize risk of complete failure, and what to do when that day arrived where there would be no more.

### ... as an analogy

The pondscape is also an analogy. Using it as such, allows for a figurative discussion of the confluence of global extractive supply-chain capitalism with local long running systems of debt-based patronage, and the ruination it brings.

People and things are sucked into the streams, becoming commodities in the process, flowing ever faster as rivulets run into streams that run into rivers. These differently scaled flows fuse sometimes smoothly, sometimes roughly. The paths along which the commodities flow, follow for the most part river beds carved by centuries of earlier trade, when commodities were different and borders even easier crossed. The commodities are carried far away, along flows that connects countries and continents and when they reach their destinations, the flows branch out again in an estuary of wholesalers, retailers and finally consumers, far removed from the histories and social lives of the products they consume.

Describing commodity chains through river analogies is nothing new. Thomas Friedman for example, employed a similar analogy in his book *The World is Flat*, describing the flows of commodities "like streams feeding into powerful rivers" (Friedman, 2006, p. 151). To Friedman, a liberal proponent of unfettered market capitalism, the commodity chain is one of the "great flatteners" in the world, one of the forces that will tear down hierarchies and transform them "into more horizontal and collaborative structures" of capitalist utopia (Friedman, 2006, p. 48).

The pondscape in itself is indeed a flat world in which there are no vantage points from where a complete overview can be found. It is as flat and as interconnected as the brave new world envisioned by Friedman, but in a perverse way. Here, the connected flatness fosters isolation and constant (liquid) fear (Bauman, 2013). Will the river bring pirates? Will it bring poison from the mines or

the plantations upstream? Will there be any fish in my net when it is pulled up? Despite the connectedness, information does not flow alongside the commodities. People in the pondscape are constantly looking for the "true" price of their catch or harvest, the salary of the neighboring caretaker, or something as banal as a ride to town on a passing boat. It is only the flow of commodities that are connected through the powerful rivers.

The levelling of hierarchies and opening of possibilities for all, as predicted by the likes of Friedman, have not materialized in the pondscape. Here, only mangrove forests and living standards for the legion of caretakers, fishermen and indebted pond owners were levelled, while a tiny local minority accumulate capital at an unbelievable rate, as a handful of international lead companies profit. In the pondscape, the flows foster and strengthen heterogeneity, and preserves and accentuates difference, rather than dissolving it (Tsing, 2016, p. 330).

The flows change the landscape through which they travel. Erosion created by the friction of the flow wash away the soil that gives life to the very commodities which it carries. It undermines its banks, leading to collapses, and it deposits the resulting rubble and debris elsewhere along its banks. Sudden surges devastate the surrounding landscape, as masses of water tear away everything in its path, readjusting channels, leaving desolated landscapes in its wake.

Sediments slowly accumulate, leading to stratified deposits of past flows, histories of former extractions. Along the way, embankments and blockades are raised across old river beds, in attempts to stem and direct the flows along certain ways and to certain destinations, efforts that are frustrated by leakages and unexpected circumventions as the flows rustle on.

As such, the concrete shape of the ponscape itself is analogous to the supply chain of which it is a part, thus exhibits what Sara Green (2005), terms fractal self-similarity. Any part of a fractal contains the whole, and the whole is but another version of any one of the parts (p. 134), traversing a diversity of scales. This synecdochal quality of the ponscape lends itself to a extrapolation of the analysis into a wider discussion about a mode of production and organization that has become prevalent all over the world.

### ... as an analytical framework

Taken as a point of analytical departure, the ponscape ties together a number of separate and entangled debates in anthropology and beyond. I employ the ponscape as an assemblage of scholarly debates of extraction, ruin and connection.

#### *Extraction*

A frontier is a term or metaphor used extensively in literature and the number of uses and definitions of it are many. In collegial speak, a frontier is the area close to a border or boundary, with connotations of economic potential and general lawlessness. Here though, I will adopt an open-ended understanding of frontiers from Cons and Eilenberg (2019), for whom the frontier first and foremost is imaginative, a discourse. In the words of Rasmussen & Lund, "[a] frontier is not space itself. It is something that happens *in* and *to* space" (Rasmussen & Lund, 2018, p. 388). As such, frontiers are areas where "the material reality are bound to certain visions of and cultural vocabularies for what a frontier is and might be" (Cons & Eilenberg, 2019, p. 7). Three such interconnected framings are central.

First, the frontier imagined as integral or essential to economic activity, and capitalism especially. As such, frontiers are seen

as concrete places where new surplus value are created (extracted), commodified and subsequently enter into a capitalist system in a way described as primitive accumulation (Marx, 2007), accumulation by dispossession (Harvey, 2009, pp. 73-76) or salvage accumulation (Tsing, 2015a, p. 63). Tsing (2003) argues that the resource frontiers she witnessed at the time in Kalimantan and elsewhere (timber and oil palm), were not logical intensifications of earlier regimes of extraction and commodification which have been conducted in the area in centuries, but something new. They resulted from "series of historically nonlinear leaps and skirmishes", connecting them to other, older frontiers (Tsing, 2003, p. 5102), "globally traveling project[s] [requiring] localization to come to life" (Tsing, 2003, p. 5105).

Resource frontiers then, are brought about by the extraction of newly "discovered" resources, challenging and often substituting existing claims to land control and ownership (Peluso & Lund, 2011, p. 668). Thus, local resource frontiers wax and wane according to market imperatives, receding or advancing as the commodities they can supply fall in or out of taste and demand in regional and world markets (Eilenberg, 2014, p. 162; Geiger, 2008, p. 93), over the *longue durée* creating the sedimentations of past frontiers that so characterize the pandscape.

Second, the frontier is seen as a place of danger and general lawlessness at the margins of state or central control. Where the concept of the frontier initially (and collegially) holds the notion of being closely related to the boundary, a place far from the center of the state, as in the classical image of the Wild West (Turner, 2008). In recent research a more precise terminology is used, as frontiers not necessarily take place in the border area of states, so two concepts are considered to be separate, but



often connected (Eilenberg, 2014; Geiger, 2008; John F. McCarthy & Cramb, 2009).

The violence and lawlessness of the frontier; a place of uncertainty, thieves and armed men (Eilenberg, 2012; Tsing, 2003) are thus not a result of the distance from the central state, but rather of the unmaking of previous orders of property and authority, as land is "made free" through the extinction of rights, regulations and restrictions, very often leading to conflict and confrontation between and among former users and newcomers (Hall, 2011, p. 844ff; Rasmussen & Lund, 2018, p. 391). Violence, both in the past and present history of the pondscape have been both physical and structural. During the boom days when the pondscape expanded drastically, the rush for land dispossessed the past users and dwellers of the land, often without compensation of any kind. As the pondscape slowly fall into ruin and resources becomes ever scarcer, new conflicts arise over how to divide the dwindling profits and avoid the increasing costs.

Third, the frontier is a space of wilderness and promise - a space awaiting the subjugation of industrious men. It invokes fantasies of the untouched, unpeopled and unused. This aspect of the frontier have persisted since Turner's classical analysis of how the West was "won", pacified and transformed into a space of civilization and order (Turner, 2008). The trope of the bountiful frontier can range from pure conjuring (Tsing, 2000) to enormously profitable (John F. McCarthy & Cramb, 2009).

Where most frontiers produce value for at least some, they are seldom as wild and unused as the discourse cast them to be. "frontiers create wilderness so that some - and not others - may reap their rewards" (Tsing, 2005, p. 27). The accounts of conflict and dispossession are part of the frontier trope, as mentioned above. In the pondscape, it was the rights and claims of the

indigenous Tidung that were ignored by the local authorities while it was erased by the predominantly Bugis entrepreneurs.

Asking why and how frontiers form in some places and not in others, Cons and Eilenberg (2019) coins the term "frontier assemblage". The frontier assemblage is the collection, or coming-together of a number of heterogeneous practices and things on different scales, all factors that form the prerequisite for the emergence of the discourse of the frontier and its concrete manifestations. These elements are many and can be otherwise incomparable: "[...] materialities, actors, cultural logics, spatial dynamics, ecologies, and politic economic processes", (Cons & Eilenberg, 2019, p. 2), that under certain conditions results in resource frontiers.

Using assemblage as a concept in this way ultimately stems from the work of Deleuze and Guattari (1988), but have since been widely employed and developed. Eilenberg and Cons draws mainly on a secondary literature from anthropology and geography that employ assemblages to map the way "historically contingent convergences [...] often coalesce in spaces and landscapes" (Cons & Eilenberg, 2019, p. 5), and makes frontiers happen. In other words, the frontier is an emergent property (DeLanda, 2016, pp. 9-10) of the frontier assemblage.

The pondscape in comparison, is for the most part not a place of becoming any more. As a waning resource frontier, it is rather in a state of *unbecoming*. Unravelling and falling apart, the relationship between the heterogeneous parts that constituted it as a frontier assemblage lose their significance. The synergy, or emergent properties that assembled the frontier in the late 90s and early 00s, vanish as they come apart, or deterritorialize analytically. This is not to say that the elements disappear, rather they reassemble in new ways and create new, but different

meanings, possibly forming new frontiers. This can be in the form of what Middleton terms *recursive* [frontier] assemblages (Middleton, 2019, p. 196), that is frontier assemblages that are "prone to periodic (often highly contingent) cycles of birth, demise and reformation" (ibid), where new resource frontiers assemble amidst the ruins of former frontiers. Will this happen in the pondscape? Only time will tell, although there are signs that among the ruins are new commodities to be extracted. Until now, however, the frontier assemblage is coming apart - a frontier *disassemblage*.

Inherent in the concept of assemblage is its ability to contain, amongst other things, both the emerging and the ephemeral (G. E. Marcus & Saka, 2006, pp. 102-103). Such talk of disassembling is, on the one hand of course, playing with words. But on the other, seen in connection with the specific case of the pondscape, I think it serves to emphasize unravelling over becoming and the narrowing down over the emerging of possible futures. When the frontier assemblage decompose, the ruins remains.

### *Ruin*

Orchards have been left, fishing traps abandoned. Reefs have been dynamited, oil wells have been dug, mangroves have been cut, seafloors torn up, waterways diverted. Rivers have turned brown, seas been emptied, ponds have been abandoned, beaches have become littered with trash. "[Ruins] are generated through specific social relations between people, materialities, and the built and natural environment" (Navaro, 2012, p. 152).

Ruins accumulate. Over time, different generations of extractions succeed each other, creating commodity flows that connect far off places. Extractions create certain landscapes, landscapes that linger even after the extractive regimes have ceased or moved past (Tsing, 2015a, p. 6). In places where largescale successive

resource extractions have taken place, a corresponding succession of largescale altered landscapes become layered unto each other, each deposit a testament to the actions of the past. These testaments, or ruins, are not inactive legacies, and large-scale extraction of resources create large-scale ruins, as in the ruined pondscape.

Ruins persist. Understanding what that means for the lives of people living "with or in ruins" is the question Ann Stoler pose in the introduction to the edited volume, *Imperial Debris* (Stoler, 2013). Stoler calls to attention "[...] the politics animated, [...] the critiques condensed or disallowed, and [...] the social relations avidly coalesced or shattered around them" (Stoler, 2013, pp. 12-13). In an earlier article, Stoler put the question more elaborately: "what people are "left with": to what remains, to the aftershock of empire, to the material and social afterlife of structures, sensibilities and things [...]. The focus then is not on inert remains but on their vital reconfiguration [...]. How do imperial formations persist in their material debris, in ruined landscapes and through the social ruination of people's lives?" (Stoler, 2008, p. 194). The decaying ruins of colonial empire most certainly persists in Tarakan, as they do in all of Indonesia. Most evident in Tarakan are the ruins of abandoned colonial oil and military infrastructure, rusting gun barrels pointing to the sea, decrepit pump jacks now popular excursion spots for selfie-hungry teenagers.

Whereas Stoler is concerned with the lingering effects of imperial ruins, her insights are applicable to ruins originating from other histories and extractive regimes as well. Exchange empire with capitalist extraction and imperial with extractive in Stoler's quote above, and we have a potent call to pay attention to the remains, the afterlives and the persistence of ruins of large-

scale capitalist extraction in the ponscape. To the human lives and relations that here are warped around these ruins and to the politics and economies that have formed and are being formed by them.

In her ethnography of affect and space in the ruins of post-war Northern Cyprus, Navaro (2012) describes the practice of both individual and institutionalized looting of abandoned Greek Cypriot houses and shops, following the flight of their former inhabitants. In the beginning, the looting and repurposing of items and property were done by individuals out of necessity, but as the conflict calmed, a veritable economy evolved out of looting and selling the plunder afterwards (Navaro, 2012, pp. 152-160). Navaro also shows how both the act of looting, and the looted items themselves became perceived negatively in the years after the civil war. "To loot" was used as a way to critique both the Turkish-Cypriot government that had authorized it, and as a self-critical moral discourse used by the people that had participated to reflect upon the still unhealed wounds of the civil war.

The practice of looting described by Navaro is one way of scraping a living amongst ruins. Claiming what is left among the deteriorating landscapes, making to do with the spoils of war, reusing and repurposing what is effectively a limited resource. Looting was initially done out of peoples own accord, spontaneously as needs arose, but it became organized and authorized through a legal veneer that effectively institutionalized plunder, and employed it not only as a means of survival, but also as a form of identity politics with things. Thus the organization that was part of perpetrating the violence that had created the ruins in the first place, came to utilize them afterwards. Ruined ecologies are to the profit of some and the ruination of others (Stoler, 2013, pp. 10-14).

In a somewhat similar vein, Tsing explores the practice of picking, as a way of finding possibility in, and coping with precarity in a ruined environment (Tsing, 2015a). Based on work among pickers and buyers of the matsutake mushroom, a mycorrhizal fungus that only thrive in great numbers in forests that are out of ecological equilibrium, such as former peasant woodlands in Japan, or abandoned ruins of industrial plantation forests in USA. Precarity is argues Tsing, a condition of our time, a result of an unfettered large-scale capitalist extraction, that in its lust for the singular - the monocrop, the specific target species or the isolated mineral, has devastated large parts of the globe. This destruction has relegated people to seek alternative ways of subsistence in ruins, where unexpected entanglements sometimes can afford people livelihoods: "In a global state of precarity, we don't have choices other than looking for life in this ruin" (Tsing, 2015a, p. 6). Tsing then goes on to show how capitalist extraction thrives and even prospers in such devastations, without the factory work one usually associates with capitalism.

Tsing shows another way of living in ruined landscapes. For the pickers, foraging for mushrooms is a practice that offers an escape from the precarity of the low-wage, zero-benefit reality of the bottom of the American job-market. It is also a way to live and express personal ideals of freedom for a varied group of people ranging from white supremacists to Hmong war veterans (Tsing, 2015a, p. 86. ff.). All these world-making projects are nested within a supply chain capitalism that simultaneously create and subsist in its own ruined environments (Tsing, 2016, p. 330), in a constitutive destructive process that "[...] translates violence and pollution into profit" (Tsing, 2015a, p. 64).

There is a similarity between the ways of subsisting in the aftermath of large-scale ecological destruction and life in the

societal and infrastructural collapse of civil war. Looting or foraging becomes not only viable, but often the only way of making a living. In the ruined pondscape, people have to adapt too. Resources earlier relied upon dwindle, investments turn sour, loans become unserviceable. Pond caretakers increasingly turn to the scavenging of mangrove crabs in order to complement their income, while the artisanal fishermen attempt to increase their efficiency and fight any regulation that restrict them.

It is not only the physical environment that deteriorates as the pondscape fall into ruin (Stoler, 2013, pp. 12-13). In the pondscape, so does the networks of patronage and debt relations that connects fishermen and pond owners with the layers of middlemen and cold storages, and makes mass export through global supply chains possible.

### *Connection*

Patronage in broad terms have been used to describe Indonesian politics from a broad national level, (Aspinall, 2013b; D. Y. King, 1982; Van Klinken, 2009) to more specific analysis of regional politics, conflict and resource extraction in the borderlands (Eilenberg, 2012; Obidzinski, 2003; C. Wilson, 2013).

In its classic sense, “[a] patron-client link is an exchange relationship or instrumental friendship between two individuals of different status in which the patron uses his own influence and resources to provide for the protection and material welfare of his lower status client and his family who, for his part, reciprocates by offering general support and assistance, including personal services, to the patron” (James C. Scott & Kerkvliet, 1975, p. 502). Here, the asymmetry in terms of wealth and power between the two parts and the informal and diffuse character of the relation are key (James C. Scott & Kerkvliet, 1975, pp. 508-509). Another key insight of the patron-client relation in its

classic sense, is that there often is no attempt at striking a balance in the relationship between patron and client. Instead, if both parts are interested in keeping the relationship, a continuous imbalance is sought (Foster, 1963, pp. 1282-1283; Merlijn, 1989, p. 691). From the perspective of the client, the relationship is ideally a "safety first" principle. The potential profit from a good year is forfeited for the promise of protection during a bad year (James C. Scott, 1977, pp. 17-18).

In the literature of artisanal fishing in South East Asia, patronage relations between fishermen and middlemen feature regularly. Firth's (2006 (1966), pp. 182-189) classic ethnography of life in a Malay fishing community describe in great detail the fishermen's relationship with fish buyers as well as town-based financiers. Firth describes how fish buyers extends credit to fishermen in the form of cash or equipment, which the fishermen then repays by selling their catch to the patron below market price, creating long-standing relationships between middleman and fisher. Where Firth did not find that the middlemen profited greatly on this (Firth, 2006 (1966), pp. 232-233). Szanton (1971) in his somewhat contemporary study of a Pilipino fishing community finds that middlemen operating similarly to the ones described by Firth, did have very high return on their investments (pp. 54-56), but otherwise described a very similar system.

Newer literature has especially focused on this asymmetry in power and possibility between fishermen and middlemen, but also on the benefits that each are getting from the relationship. For the fishermen, who often lack access to loans from elsewhere, the availability of flexible credit during periods of bad catches and capital for investment in (and access to) gear and other necessities, as well as getting access to wider markets, are of greater importance than not being beholden to a patron (Acciaoli,



2000; Ferse, Glaser, Neil, & Mánez, 2014; Pelras, 2000; Ruddle, 2011; Sudarmono, Sulehan, & Rahamah Hj Abu Bakar, 2011). In addition, it has been shown how political influential patrons have shielded client fishermen (and thus themselves) from environmental regulation (such as enforced prohibition against cyanide and dynamite fishing) that would have limited their income (Fabinyi, 2012; Ferse et al., 2014; Kusumawati, Bush, & Visser, 2013), something authors writing from a development and environmental perspective have criticized (Lowe, 2002; Nurdin & Grydehøj, 2014). From the same perspective, the patronage system have been criticized for being oppressive and potentially trapping fishermen in perpetual debt (G. Wood, 2003). For the patron, having a number of client fishermen secures a steady and secure access to fish at low prices, (Ferse, Knittweis, Krause, Maddusila, & Glaser, 2012; Lowe, 2000), as well as it secures him (or her) a base of followers in case he should run for office or otherwise be in need (Acciaiolli, 2000; Pelras, 2000).

In the pondscape, such patron-client relations connect together not only fishermen, but also the majority of pond owners with a hierarchy of patron middlemen (Gunawan, 2012; Kusumawati et al., 2013). In addition, smaller patrons are often themselves clients to more influential patrons who themselves often are indebted to cold storages and exporting companies. Through the exporting companies and the cold storages, patronage networks fuse with global commodity chains shipping shrimp, crab and fish off to retailers and consumers all over the globe.

While the study of the exchange and circulation of goods and commodities, and the systems of attached meanings, values and beliefs they circulate in, have been a central part of anthropology since the earliest days of the discipline (Malinowski, 1922 [2002]; Mauss, 2002), the idea of commodity chains originates with the

world-system approach of Immanuel Wallerstein. The world-system approach was, simply put, a macroeconomic analytic theory that took, not the village or the state, but the entire world as its primary unit of analysis, using the concepts of core, semiperiphery and periphery to describe world division of labor instead (Hopkins & Wallerstein, 1977, p. 115). Arguing amongst other things, that instead of analyzing international trade between states, we should look at the world market which was, they argued, characterized by commodity chains. "What we mean by such [commodity] chains is the following: take an ultimate consumable item and trace back the set of inputs that culminated in this item - the prior transformations, the raw materials, the transportation mechanisms, the labor input into each of the material processes, the food inputs into the labor. This linked set of processes we call a commodity chain" (Hopkins & Wallerstein, 1977, p. 128). In the world-system approach, commodity chains connect the core with the periphery, with the core commanding the activities that generate the largest share of the surplus, while the periphery commanded little or no surplus. In other words, value is not generated in the early stages of a supply chain, but increases as it moves through the chain until it terminates, most often in a part of the core (Arrighi & Drangel, 1986, pp. 11-17).

Still employing the macroeconomic perspective but giving away with the dichotomy between core and peripheries in the world-system approach, Eric Wolf in his seminal "Europe and the People Without History" (1982), sought to highlight the (historical) interconnectedness and shared history-making of the whole world through networks of trade. Although not mentioning commodity chains directly, Wolf writes about trade networks, and describes how they connected European capitalist and non-capitalist orders of production, through "[capitalism's] ability to reproduce itself on

an ever-widening scale [...] by entering into working arrangements with other modes [of production]" as well as its "ability to enter into temporary and shifting relations of symbiosis and competition with other modes [of production]" (Wolf, 1982, p. 79).

Anna Tsing argues along similar lines. She sees capitalism as a system of accumulating wealth through "translating", that is, "the drawing of one world-making project into another" (Tsing, 2015a, p. 62). Capitalism is a system for taking advantage of value created outside capitalist control and through translation, incorporating it into a capitalist system. Where Wallerstein spoke of commodity chains, Tsing speaks of supply chains, particular kinds of commodity chains controlled by individual firms that control much of the flow of commodities through the chain, translating value from non-capitalist to capitalist value systems. A supply chain, according to Tsing (2009), is a form of commodity chain "[...] based on subcontracting, outsourcing, and allied arrangements in which the autonomy of component enterprises is legally established even as the enterprises are disciplined within the chain as a whole" (Tsing, 2009, p. 148). In a later article, she adds that a supply chain is a "commodity chain in which a lead firm helps shape the structure of the chain" (Tsing, 2016, p. 331). This translation leads to "salvage accumulation": "the process through which lead firms amass capital without controlling the conditions under which commodities are produced" (Tsing, 2015a, p. 63; 301). The sites being salvaged she calls "pericapitalist", which can be everything from ecologies and life processes to non-capitalist modes of production - What Wolf's mentions as capitalism's "shifting relations of symbiosis and competition with other modes [of production]" (Wolf, 1982, p. 79).

The pericapitalist sites where salvage accumulation takes place Tsing argues, are a necessity of modern supply chain capitalism

(Tsing, 2015a, p. 301 n2). The supply chain thrive on, sustain and reshape heterogeneity both socially and environmentally. "Difference becomes a resource; gaps widen. Precarious wealth and precarious poverty sit side by side [...] heterogeneity and ruin are structural features of capitalism" (Tsing, 2016, p. 336).

The pondscape is a pericapitalist site, where global supply chain capitalism fuse with debt-based patronage systems through a number of middlemen intermediaries or translators, allowing for the extraction and export of enormous amounts of value in the form commodified shrimp, crab and fish, accumulating wealth among few while it impoverishing the many. But as the pondscape slowly falls into ruin, once reciprocal relations turns increasingly one sided.

## NOTES ON METHODS AND FIELDWORK



### An arrival story

After a long and harrowing flight, we found ourselves, with all of our luggage piled up on a trolley in an unstable heap, navigating the arrival hall of the Soekarno-Hatta airport in Jakarta. Named after two central heroes of the Indonesian struggle for independence, Soekarno was to become the first president of Indonesia, and Mohammed Hatta his first vice-president. The airport have won awards for its design, which showcases art and architecture from the whole Indonesian archipelago, but to a tired visitor, the finer details of the overcrowded halls and pathways are not relished, merely endured.

The traffic in Jakarta is in a league of its own. Arriving in the evening, the 30 kilometers to our hotel took almost four hours, longer than flying from Copenhagen to Istanbul. Even though I had worked here for a while in the past, I had either suppressed the

memory or it had gotten even worse. In the massive traffic jams, drivers constantly change lanes, always trying to get ahead of everyone else. Each small hole in the jam attracts all neighboring cars like shit attracts hungry flies. Our driver was no exception. I pity the patient in the ambulance that was stuck beside us in the clogged emergency lane, but after some time, the wailing siren was just another nuisance, blending with the desperate honking of similar frustrated drivers. Having settled in Kuningan, the central business district of Jakarta, I embarked on procuring the necessary permissions, notifications, permits and whatever else these types of bureaucratic documents are called.

Acquiring first visas, then the required work permits for all three of us, was a task that almost ended this project before it even began. Obtaining even the initial acceptance of the project from RISTEK, the Ministry of Research and Technology of the Republic of Indonesia, was an extended process that had required months of waiting, and several visits to the Indonesian embassy in Copenhagen. The constant delays had postponed our departure from Denmark twice, before we finally could, in the 11<sup>th</sup> hour, depart for Jakarta.

Here, we spent around a week, as I went the round of various government institutions in order to secure the necessary stamps, approvals and recommendation letters. This went relatively smooth, and we were in high spirits when we, an early morning, left for Yogyakarta, Java, to meet the academic sponsor of my fieldwork, Pujo Semedi, professor of anthropology at UGM, Universitas Gadjah Mada. We also had to apply for a work permit for me, at the Yogyakarta immigration office, as per the requirement of the research visa. I had been assured by the RISTEK office in Jakarta that this would be a mere formality as I had by now all necessary

permits, so we dutifully appeared at the overcrowded immigration office the morning after our arrival.

"You see. RISTEK doesn't know anything about immigration ok?", the immigration officer said, after having spent approximately 5 seconds looking through the sizeable stack of papers I had prepared for him, as I had been instructed to by the RISTEK office in Jakarta. Instead, he gave me a number to a "visa agent" who, he informed me, would help me organize my application. Back at the hotel I called the number and set up an appointment. In the afternoon I went to the UGM campus and met with the secretary for the international relations office, who was tasked with assisting visiting researchers.

"We don't want you to get an agent. He is working with them you see, they get maybe 40% ok? It is just hidden corruption. We have a zero tolerance here at UGM". She asked me to cancel my appointment with the agent, which I did, and she continued to tell me about an incident that had happened not long ago, where the immigration office had required a team of visiting Australian researchers to pay a substantial amount of money "in envelopes", in order for them to procure the necessary permits. "We called the KPK<sup>16</sup> on them. They flew in from Jakarta and ransacked the entire office. They went through everything and several people got fired [...] We will help you deal with them".

I returned to the immigration office the next morning, along with the secretary from UGM. After a few hours of waiting in line, I met with the same immigration officer from the day before. The man who had been fluent in English the day before, suddenly seemed to be unable to utter a single word in English today. He gave me a

---

<sup>16</sup> The Corruption Eradication Commission (KPK) is a national government agency tasked with combatting corruption in Indonesia. KPK is well-known for targeting even ministers, members of parliament and senior police officers.

list of 14 documents I needed to procure, along with a number of forms I had to fill in. He made it clear that both me and my wife, but also my 5 months old daughter would need a work permit. For the next 4 weeks, I went back and forth between the immigration office, and what seemed as every single government office in the city of Yogyakarta. The initial 14 documents were relatively quickly collected, but the officer at the immigration office always had some critique. "I need this signature to be on the left side", "These pictures are not in good enough quality", "We have changed our procedures, the title should be in caps" or "In this kind of document, the signature need to be on the right side". At one point we moved to a different hotel, and when the immigration officer learned about it, he gleefully told me to get a new set of "proof of residence papers from the hotel owner and from village and neighborhood leaders" in the part of town where the hotel was located. It was clear that I had become part of a feud between UGM and the immigration office, and that by cancelling my appointment with the visa agent who, I later learned, was one of the men fired after the KPK raid, unwillingly had chosen sides.

One day when I was just about to leave the immigration office after having a version of one document rejected, the officer called me back (in English). I went to the desk and he told me to return later the same day with my family. When I did, we were shown into the office of the head of immigration. After an exchange of pleasantries, he authorized our work permits and handed our passports back to us. We were free to go. Although we did spent a week or two on paperwork in Tarakan as well, but it felt less oppressive, as I was able to do some work between my visits at the local immigration office. For the second part of the fieldwork we skipped applying for formal research permits and opted for social visit visas instead.



## Data collection

The bulk of the ethnographic material that form the basis of this dissertation was collected during two extended fieldworks in and around Tarakan, a former oil- and now a declining shrimp hub in North Kalimantan, Indonesia. Situated in the middle of what I term the pondscape, the city served as a base for my work among the caretakers, pond owners, fishermen, middlemen and bureaucrats living and working in and around it. Accompanied by my family, I conducted the first fieldwork from October 2016 to March 2017, and the second from December 2017 to April 2018. Out of the roughly 11 months we spent in Indonesia, the first six weeks was spent in Java, getting the paperwork in order necessary for a foreign research permit.

Relatively shortly after commencing fieldwork in earnest, I realized that the original plan of studying the implementation of a SEZ in Tarakan was probably not going to be the main focus of my fieldwork, as explained in the preface, and within two weeks, I had given up on the idea altogether.

## *On research assistants*

I did not speak enough Indonesian to confidently manage fieldwork completely on my own which was a constant source of frustration and embarrassment. Both in my everyday work, but maybe most in relation to my own vanity: "native" language proficiency still being regarded as one of the pillars of a "proper" anthropological fieldwork according to the Malinowskian ideal (Kuper, 2014, p. 92).

To mitigate, I found and hired three research assistants. One assistant full-time during the first part of the fieldwork, two part-time assistants on the second part. Besides, I also employed a handful of assistants assisting me with transcribing and

translating the more formal interviews recorded during both fieldworks. This meant that most of the time, I had an assistant who assisted me in the field, with not only ad hoc translation, but also with the myriad of practical things that are also part of an ethnographic fieldwork: arranging formal interviews with high level officials, collecting archival data at the fishery department or locating a certain influential middleman, to everyday issues such as figuring out which valve fits which kind of gas cylinder, obtaining the papers needed for renewing some kind of permit or for renting a boat at a reasonable price.

Although my assistants did their best, having to communicate through a translator for much of the time is difficult, and takes its toll on all participants. My assistants were not trained translators, but students from the local university, who started out as very eager but also very unaccustomed to the mentally draining work translation is, and so was I. Throughout the fieldwork however, our cooperation continually improved, as we all became more experienced in working together, which often just meant slowing down. In the end, we were a formidable team, and I owe much to Yudi, Dilah and Kiky for their tireless assistance.

Nevertheless, while misunderstandings and confusions are commonplace in all kinds of research, doing fieldwork with translators is difficult. The presence of an interpreter lends to an array of positionings between not only anthropologist and the informant, but also between informant and interpreter, and manifests in the information that can be collected. In the sparse literature on the subject of the use of interpreters in anthropology, Berreman (2007 [1963], pp. 140-145), describes how his choice of interpreter greatly affected the willingness of different groups of informants to engage with him and to talk openly. During my fieldwork, I experienced similar situations.

When working with and among diverse ethnicities where ethnic (and sadly often violent) politics are the norm. As will be discussed in more detail in the following chapters, the history of Kalimantan as a whole, (Davidson & Kammen, 2002; Peluso, 2008; Tanasaldy, 2012, p. 209ff) and Tarakan in particular (C. Wilson, 2013), is fraught with tension between different ethnic groups. In the pondscape, ethnic stereotyping, gossip and at times outright violence made some places undesirable to be in for some, and practically closed for others. While my informants and assistants were experts in navigating this constantly shifting reality, I somewhat learned it along the way. But there were situations where I afterwards regretted having used one assistant in one particular setting.

But on the other hand, having local assistants also had its advantages. Being university students in Tarakan, meant being children of middleclass parents, which in the pondscape often meant that their families and friends owned ponds, were successful fishermen and knew or were middlemen or government officials. The networks of my assistants added greatly to the initial "snowball-effect" (Noy, 2008) in getting to know people. Suddenly I was activating what seemed as whole extended families and sometimes entire neighborhoods, all insisting on assisting and introducing me to whomever they thought I needed to talk to and I was happy to oblige. Often, this gave me contact to people I would never have otherwise met, or whom I would have had to actively search for. With the use of research assistants, I was instantly catapulted into the nooks and crannies of the pondscape.

### *On accommodation*

When we left for Indonesia in October 2016, our daughter was 5 months old. We had arranged for my partner to take the majority of the leave, which was the only way we could manage economically to

go together as a family. Bringing such a young child on fieldwork abroad, put some restrictions on the kind of fieldwork I could do. Notably, it quickly became apparent that we had to find accommodation separate from the seaside neighborhoods where many of my informants lived. While Tarakan as a whole is occasionally plagued by both malaria and dengue fever, it is especially the poor lower lying parts of the town - along the harbor - that suffer. However much I wanted to live among my informants from a professional perspective, we could not defend exposing our daughter to any avoidable risk.

Instead, we looked for a separate house with both water and electricity in the central hills, which proved difficult to find. After almost loosing hope, we coincidentally learned that there was a small community of American missionaries living in Tarakan, part of an NGO called Missionary Aviation Fellowship<sup>17</sup> (MAF). I located their office and learned that they worked with servicing many of the interior villages of the province with a fleet of small single-engine aircraft, both as missionaries but also as providers of logistics to villages that were otherwise very difficult to reach. I also learned that they had a house they would be willing to rent us at a reasonable price. Over the course of our stay in Tarakan, we received an abundance of aid and kindness from MAF.

Although I later learned that our neighbor was deeply involved in the export of illegal mangrove crab to Malaysia (initially I was puzzled about the hectic activity in his driveway in the middle of the night), living away from my everyday informants shaped the overall character of fieldwork. Ethnography being an art of the possible (Hannerz, 2003, p. 212), I chose not to attempt a classic long-term single location fieldwork which, the combination of

---

<sup>17</sup> <https://maf.org/where-we-go/kalimantan/>

working through assistants and living separated from my informants, would have been awkward and difficult. Instead, I opted for a, these days probably equally classic, multi-sited approach in the vein of George Marcus, fitting the study of markets, production, distribution and consumption (G. Marcus, 1986, p. 171). This was an approach I had prepared for at least partly in the original project, but instead of following the paths and threads of things (G. Marcus, 1995, p. 106ff) moving through a SEZ, I began studying things moving through what I at that point still hadn't conceptualized as the pondscape.

While these "things", the shrimp around which the pondscape was built, the crabs that had migrated into it, as well as the fish that its periphery, all interests me in terms of their biology, but it is mainly in terms of their use as analytical prisms I use them. As windows, though which political processes can be followed, where different actors, agents, concepts and technologies interact in different sites, creating or consolidating knowledge and power (Shore & Wright, 2011). Commodity chain studies is an established genre, both within and beyond anthropology, and I set forth to attempt understanding "how such chains are articulated within and through the larger social, cultural and political-economic environments in which they operate" (Bair, 2005, p. 168).

For such a study, I realized that Tarakan was perfectly situated. Being practically the only place in the entire province of North Kalimantan with processing facilities, it was the hub for aquaculture in the largest pond area in Indonesia, and one for a substantial artisanal fishery as well. Being an island roughly surrounded by ponds on one side and the sea on the other, it collected most of the upstream parts of several commodity chains in a relatively small space, as well as many of the institutions that governed them.

### *On waiting*

Fieldwork in the pondscape implied a lot of waiting. Waiting for the tide be optimal for going fishing, for the shrimp to grow, for the pond to empty during harvest, for the sun to set in order to go scavenging for crabs, for the electricity to return or for someone looking for a can of gasoline. Waiting through incredibly long political meetings characterized by a dreary succession of monotone one-hour speeches, or for someone important to show up for an interview. Despite knowing this from past experience, I could not help at times being overwhelmed by despair, convincing myself that that I was definitely missing out on something incredibly important going on elsewhere. While I probably was, it was also during these times, where much coffee and tea was consumed, what Sjørsløv terms hanging out (Sjørsløv, 2013), that an interesting off-hand remark would fall or an invitation would be extended that would eventually lead me on.

When speaking to government officials, my experience was that the higher up in the administrative hierarchy an informant was, the longer you would have to wait for the person in question to show up to the appointment. Speaking with someone relatively low ranked, he or she would be maybe half an hour late. A head of office will easily let you wait an hour or more, and at times only then send his or her assistant to reschedule the meeting that was supposed to have happened, as it had gotten late, or something had showed up that they needed to take care of.

### *On anonymization*

In this dissertation I have anonymized informants to the extent that I mention no names. In cases where the description of sensitive situations could potentially lead to the identification of certain people, I have taken the liberty of slightly changing minor details, to further anonymize the people in question. I have

taken to these somewhat drastic measures, as parts of this dissertation treat situations that are illegal according to Indonesian law, but also takes place in a context that were at times very violent<sup>18</sup>.

Since many of the people involved in the commodity and supply chains I describe in this dissertation cheated, bribed, blackmailed and threatened each other, I was as careful as I could be in not putting anyone at risk through my work. As I worked with people with competing interests: caretakers and pond owners, pond owners and middlemen, smugglers and the coast guard as well as competing politicians and organization leaders, I was extremely careful in not unwittingly revealing what the different parties had told me. This despite I am sure that most of my informants already sanitized much of what they told me, and rightly so, as livelihoods potentially and occasionally were on the line.

### *On places and people*

Throughout my two fieldworks I was able to move around the ponds, fishing communities and the networks of collectors and minor middlemen. I spent the most time among fishermen, pond caretakers and pond owners, but I also established access to a handful of large middlemen in the business of shrimp and mangrove crab. I had good relations with the leaders of two unions of fishermen, the small local WWF office, the Faculty of Fishery and Marine Sciences at Universitas Borneo Tarakan (UBT) and PT. Mustika, the largest cold storage in Tarakan. I visited a number of the regional and provincial government offices, most often the local fisheries office (DPPP) as well as both the fisheries inspection (PSDKP) and

---

<sup>18</sup> When I returned for the second stretch of fieldwork, I learned that one man I had sailed with for most of a day during my first visit to Tarakan, a pleasant but silent collector of mangrove crab, was presumed killed. He had disappeared on a collecting trip, and nothing but his upturned boat was found, floating with its valuable engine removed. No suspect (or body) ever surfaced. Such stories were all too common in pondscape.

the fisheries quarantine office (BKIPM), two agencies that sorted directly under the national Ministry of Marine Affairs and Fisheries (KKP). I had some five days in Tawau, Malaysia where I visited buyers and an export agent of shrimp and crab, and at the very end of my fieldwork I finally managed (and felt safe risking) interviews with several maritime police (POLAIR) and navy (TNI-AL) personnel.

I spent the majority of my time among the fishermen, pond caretakers and minor middlemen, either at their ponds or by the jetties and coffee shops where much time is spent. I went fishing and on nightly crab collecting trips and was present during six pond harvests. Meetings with governments officials often had to be arranged beforehand, and we met at their offices or in the ubiquitous coffee shops, and similarly so with some of the more important middlemen. These were less frequent and more difficult to set up than the much less formal (and fun) hanging around in a fishing neighborhood or by a shrimp pond.

Additionally, to extend the historic scope and continuity of this tale, I have also employed a number of newspaper articles, laws, government and NGO-reports as well as other primary historic sources. These will be cited alongside academic sources.

.o000o.

Despite the language limitations which was an undeniable disadvantage and although there are a lot more I would do if I had the time, I consider the fieldwork I conducted and the data I collected, to be adequate in order to at least partially answer the research questions I have raised above.



## CHAPTER II - A GENEALOGY OF EXTRACTIONS



For hundreds if not thousands of years, resources have been extracted, traded and shipped off from the forests, rivers, caves, reefs and from the inland villages of Northeast Kalimantan<sup>19</sup>. Slaves, bird's nests, rattans, eaglewood, beeswax, gold dust, plumes from the bird of paradise. Trepang<sup>20</sup>, pearls and prized shells, shark fins and other treasures from beneath the waves. Later it became oil and gas, fish and shrimp from the sea, and timber and palm oil from the forests, until it became shrimp. Each resource frontier produced its own ruined landscapes, as changing policies (re)organized people, trade routes and trading centers to extract and export commodities to profit from the demands of

---

<sup>19</sup> Parts of this chapter are also appearing in Mikkelsen and Eilenberg (2021) a contribution to the edited volume, "Development Zones in Asian Borderlands", edited by Mona Chettri and Michael Eilenberg.

<sup>20</sup> Trepang is the name for a range of edible holothurians also known as sea cucumbers or *bêche-de-mer*. Boiled, dried and sometimes smoked, they were and still are exported to China in large numbers. For one account of this extensive trade, see Sutherland (2000).

markets thousands of kilometers away. Although several of these old boom commodities of the past are still extracted and sold to some extent, it is only to a much smaller scale than when they were ascendant.

The current generation of resource frontiers sweeping through this part of Northeast Kalimantan, is that of largescale farming of tiger shrimp in extensive brackish water ponds, built in the former estuarine and mangrove forests along the rivers and estuaries of the Bornean mainland. This specific kind of largescale aquaculture arrived in the area in the early 80s, and boomed during and after the Asian financial crisis in 1998, which also led to the fall of the New Order regime. Prices skyrocketed, as exporters took advantage of the plummeting rupiah, and the almost complete lack of governmental oversight in the following years meant that ponds could be built with minimal government interference. Everyone constructed ponds, the market was in a frenzy, and there was seemingly no end to the profit that could be earned as the landscape around Tarakan was dramatically altered to fit the large-scale production of farmed tiger shrimp.

Today, the thousands upon thousands of ponds have aggregated into what I term a pondscape, the core of which is composed of around 1500 square kilometers of extensive shrimp ponds lying side by side, surrounded by a large periphery of ruined rivers, estuaries, coasts and reefs. Once rich ecosystems now heavily affected by the intense shrimp farming in the core of the pondscape.

The extraction and movement of commodities and the connecting of people towards large-scale export is nothing new, nor is the resulting ruination, which has been a constant in the genealogy of resource extraction, although taking place on different scales throughout history. Each past resource frontier can be understood as being part of a larger genealogy of extraction, each in some

respects paving the way for the next one. What ties these separate generations together is the longevity of concrete and relational infrastructure which allows the extraction, processing and movement of resources across space (Larkin, 2013, p. 327). Tangible infrastructure such as logging roads, harbor facilities, cold storages are easily repurposed into facilitating new extractions. So is the fabric of longstanding systems of patronage and interlacing commodity chains, a sort of economic infrastructure, that have outlived regime changes, wars and different resource booms to facilitate ever new generations of frontiers and territorializations. As such, each new frontier is partly fueled by the vestiges of former extractions.

Rasmussen & Lund (2018) argue that what they term frontier dynamics and the subsequent territorializations can be seen as cyclical and co-constitutive. In their conception, frontier dynamics dissolve the existing social orders - property systems, political jurisdictions, rights and social contracts, whereas territorializations establish new ones and re-order space again, often by reworking and reinterpreting the old institutions and arrangements. This cycle is spurred on by the discovery, utilizations and subsequent commodification of new resources (Rasmussen & Lund, 2018, pp. 388-389), highlighting that resource frontiers are "relational zones of economy, nature and society [...] where new forms of social property relations and systems of legality are rapidly established in response to market imperatives (Barney, 2009, p. 146).

.o000o.

In this chapter, I will present such a genealogy of extractions, centered on what is today the Indonesian province of North Kalimantan. The genealogy starts around the turn of the 18<sup>th</sup> century, when colonial powers both fought and traded with the Sulu,

a loosely formed thalassocracy that organized resource extraction and trade along the coasts of the Sulu and Sulawesi seas, fueled by labor from extensive slave raids in large areas of South East Asia. Through frontiers of oil, timber and fisheries, it concludes with a view of everyday life in the pondscape at its economical peak in the early years of the 21<sup>st</sup> century.

This chapter does not aim to be a complete account of all the many different resource frontiers that have swept through what is today North Kalimantan. Although such a compilation would be interesting, I have focused on the frontiers that paved the way for the pondscape. Thus somewhat unusually for an account on resource frontiers in Kalimantan, I have omitted discussing the expansion of oil palm plantations<sup>21</sup>.

Instead, I have focused on highlighting the continuity between generations of resource frontiers, in the form of repurposed infrastructure and the continuity of both long standing networks of patronage and the commodity chains into which they terminate, all among the accumulated layers of ruins they are producing.

## PRECOLONIAL PATTERNS OF EXTRACTION

Before 1900, the estuary of the river Sesayap of North East Kalimantan was characterized mainly by mangrove forests interspersed with the occasional patch of tropical lowland and peat swamp forest. The river, flowed into the Batagau Strait, dotted with islets separating the island of Tarakan from the coast of Borneo proper. The people living along the rivers, coasts and

---

<sup>21</sup> The palm oil sector in North Kalimantan is not very well developed yet, although everything looks as if this is only a matter of time. In 2018, oil palm covered 35.690 ha in North Kalimantan (BPS-Tarakan, 2019, p. 280) and as shown in the preceding chapter, the core pondscape covers 200.000 ha, conservatively put. In comparison, oil palm plantations covered 1.199.407 ha in East Kalimantan in the same year (Disbun, 2020), a province less than twice the size of North Kalimantan.

on the island of Tarakan was predominantly Tidung, a diverse murut<sup>22</sup>-speaking group (Lobel, 2013, p. 401), a majority of whom adopted Islam<sup>23</sup> somewhere between the late 18<sup>th</sup> and the early 19<sup>th</sup> century (Okushima, 2003, p. 235). There are early Spanish mentions of Tidung raiding parties attacking settlements along the coasts Philippines in the late 18<sup>th</sup> century (Forrest, 1779, p. 16, quoted in Warren, 2007, p. 86). In 1908, they were described as living in stilt houses along the upper estuaries of North Eastern Borneo, fishing, farming sago and collecting bird's nests and other forest products for trade (Beech & Fokker, 1908).

The profusion and richness of valuable natural resources from the forests of North East Borneo and the marine gardens of the Sulu and Celebes Sea have attracted extraction and trade, conflict and ruination for centuries, connecting hidden swallow caves and remote reefs with wider East Asia and China especially as early as 1349 (Bond, 2020, p. 55; Warren, 2007, p. 71).

Historical sources are sparse until the early 1800s when one of the many autonomous states in the area, the Sulu Sultanate, ascended its dominancy over much of the Sulu and Sulawesi seas. The center of the Sulu thalascocracy was situated on Jolo, the largest island in the Sulu archipelago northeast of Tarakan. From here, the Sulu found themselves to be in the middle of the extremely profitable trade going north to China, East to the Philippines and south to the rest of the archipelago, where both British and Dutch too participated in the trade.

---

<sup>22</sup> The murut language group comprises a number of languages spoken from Bulungan in North Kalimantan to Sabah in Malaysia. For a recent discussion of the long disputed grouping of languages in North Borneo, see Lobel (2013).

<sup>23</sup> The process of *Masuk Melayu* or becoming Malay, have long been a topic in the literature on ethnicity and identity in Borneo. For an overview of the academic discussions of these topics, see King (2017) or Sillander and Alexander (2016). For a discussion of the Tidung, and their present construction of and mediation between Melayu and Dayak identities, see Bond (2017, 2020).

The Sulu were infamous slave-raiders, and from the end of the eighteenth century to the middle of the nineteenth, they carried out large-scale, well-organized raids from the Bay of Bengal to New Guinea, from the coasts of Java to the Philippines. The raiding was so severe that it depopulated entire areas in the hardest hit areas (Warren, 2007, p. 169). A majority of the slaves taken were employed by the Sulu in the procurement of maritime goods such as shark fins, pearls and trepang. By the 1830s, Warren estimates that the Sulu maintained a pyramidal structure of around 68.000 slaves and clients along the coasts and rivers, all were collecting and paying tribute in goods that were later traded with the Chinese (Warren, 2007, p. 74). The coastline of Northeast Kalimantan was characterized by a number of petty sultanates and strongmen, situated along the coast, all owing their position to the protection they bought from the Sulu with the commodities they could collect from their own subordinates and allies upstream, and constantly competing to control territory and trade<sup>24</sup>.

Tarakan was one of such ports, a hub for the trade of upriver forest products, birds-nests, waxes and gold dust being the prime goods. The port was ruled by dynasties of strongmen alternating their allegiance through intermarriage and tribute with either the Sulu or the Bugis, a polity located on the southern arm of Sulawesi (Pelras, 1996, pp. 311-312), whoever was the strongest. South and north of Tarakan were similar sultanates and ports, embroiled in constant conflict over access to the upriver produce, which translated into protection and status. Often did the Sulu or Bugis intervene in local politics to change or maintain a favorite ruler (Sellato, 2001, p. 21; Warren, 2007, p. 86). Territorial control was not the goal for these down-river strongmen, and often their

---

<sup>24</sup> See Bond (2020) for a historical reconstruction of these 1800s struggles, seen from the perspective of Tidung polity (p. 53ff).

direct power of influence ceased at the very boundaries of their town, which was built in easily defensible areas, such as islands or on hills in estuaries. Communities in the near vicinity of these kingdoms were subordinate to them, but further upstream the kingdoms relied on networks of patron-client relations to funnel the valuable goods to their ports, and further on to Sulu or Bugis trading ships (Warren, 2007, pp. 84-90).

### A frontier or not?

Tsing (2005) argues that there is a difference between the early commodification and trade I describe above, and the subsequent resource frontiers that were to devastate enormous areas of Kalimantan in the 90s and 00's which I will describe below. "The commodification of forest products is centuries old in this area, and while the new frontier *draws* [my italics] on earlier trade, it is not a logical intensification of this earlier trade" (Tsing, 2005, p. 33). Although the highland Meratus, among whom Tsing did fieldwork had participated in such trade networks since precolonial times (Tsing, 1993, pp. 42-43), she describes the all-consuming timber frontier that swept through much of Kalimantan (and which she experienced firsthand) as "a series of historically nonlinear leaps and skirmishes that [came] together to create their own intensification and proliferation" (ibid). Tsing sees resource frontiers as imaginative projects resting on a colonialist logic formed by a conjunction of Cold War militarization and capitalist transnationalism (Tsing, 2005, pp. 27-28), and thus, nested in a particular historical and ideological context fundamentally different from the preceding regimes of extraction, both in scope and in terms of their logic and destructiveness.

The *collecting* of forest resources, which she argues has taken place for centuries, even if intended for sale on a large-scale,

she argues, is fundamentally different to the logic of the resource frontier. When collecting, the extraction of resources is integrated into the possibilities of living with the forest, it does not jeopardize subsistence and it is ever only supplementary to other strategies she argues. It is done in small quantities and not under coercion or threat of violence. This she argues, distinguish the resource frontier from previous regimes of resource extraction and subsequent trade (Tsing, 2005, pp. 183-186). This I will argue, might hold true for the relatively sheltered Meratus among whom Tsing did her fieldwork, but for the coastal communities who did not enjoy the protection of living in upland mountains, the threat of violence was very real indeed, and the pressure on the resources in question - trepang, swallows' nests or pearls for example, only limited by the technologies of extraction available at the time.

The extractive and redistributive heartbeat of the Sulu Sultanate was by and large driven by slavery. Slaves rowed and fought on the warships, they labored in the fields, served as concubines and collected and harvested vast quantities of marine and jungle resources for trade. Reflecting on the scale of slavery and the commodity chains it fueled, Warren estimates conservatively that between 200.000 and 300.000 people were enslaved and put to work for the Sulu Sultanate between the late eighteenth and late nineteenth century (Warren, 2007, p. xxxv). "Slavery in the Sulu, as in other areas of Southeast Asia, was primarily a property relation but not exclusively so, and in this context must be understood to imply several possible statuses of "acquired persons" who have been more or less forcefully transferred from one society to another" (Warren, 2007, p. 215). Many of these slaves entered into relationships more akin to patronage, than to what in the West was perceived as slavery. Slaves could live quite independent lives, marry, trade and own property as long as they fulfilled their obligations to their



patrons, and the power and wealth of a Sulu patron was commensurate with the number of slaves he owned (Warren, 2007, pp. 217-222).

The men and women, who, under orders from the Sulu, spent a great deal of their time collecting trepang or diving for pearls from small rickety boats in constant danger of drowning or shark attack, or the men risking their lives braving the steep and slimy walls of swallow caves to scrape off the gooey swallow nests, were far removed from the consumption of the commodities they were instrumental in creating. These commodities were items of luxury, destined solely for export and definitely not for everyday use, harvested and consumed by people who would never meet. Contemporary sources show that the Chinese investors behind the annual trading fleets could expect margins of up to 300 percent on top of what they paid the Sulu merchants (saying nothing of the thousands of people who had collected them without salaries under the threat of violence), when the wares ended up in a Wuhan medicinal store, or at a dining table of a mandarin in Beijing. Warren cites an English naval officer who surveyed the area in 1812, who claimed that if only one in three of the annual Chinese trading junks made a successful return laden with commodities, the group of investors behind the voyage would break even. Although Warren considers this to be a bit exaggerated (Warren, 2007, p. 9), it indicates the immense profits that were to be made in this trade - in stark contrast with the realities of the people forcibly collecting them.

I will argue that the large-scale extraction of commodities for export created resource frontiers and ruined environments already in the 18<sup>th</sup> century, and very possible earlier than that, although at a much smaller scale of destructiveness than the frontiers of today, due to the technologies of time. The fierce competition for the most productive swallow caves led to brutal wars over the control of productive caves (Kaskija, 2012; Okushima, 2002;

Warren, 2007, pp. 90-93), and eventually to their overexploitation. At sea, the large-scale systematic collection of trepang led to local extinctions on popular reefs (Máñez & Ferse, 2010, p. 5) and intensive pearling denuded once fantastically abundant pearl oyster beds in the Sulu sea (Butcher, 2004, pp. 130-132). These early resource frontiers spanned large areas in the area around Tarakan, and they led to *localized* ruination and depletion through coerced hierarchical organizations of labor.

In the late 19<sup>th</sup> century, new technologies and inventions were made in the West that created the need for new resources, thereby creating a score of new commodities. When oil became a global commodity in the last half of the 19<sup>th</sup> century, the east coast of Borneo which had long evaded direct colonial rule, suddenly became the focus of attention from other people, eager to appropriate the newfound riches. The administrators and businessmen of the Dutch East Indies.

## THE OIL FRONTIER

Even though the Dutch had been present in Indonesia since the last years of the 16<sup>th</sup> century, the trading networks and petty sultanates of East Kalimantan did not fall under the control of the then Dutch colonial state until after 1900. This was the time when the Dutch initiated their final expansion in the archipelago, covering much of Sumatra, Kalimantan and the eastern islands. By 1900, the naval supremacy and territorial independence of the Sulu had already been diminished significantly, mostly by the Spanish. Operating from the Philippines in the last two centuries of the 19<sup>th</sup> century, they led a series of bloody campaigns to diminish the influence the Sulu (Warren, 2007). The former client sultanates on the east coast of Borneo subsisted as independent entities until the Dutch arrived. Over a period of 10 years, the Dutch then forced the

sultans to sign a series of agreements that by 1910, transformed the local aristocracies into, more-or-less, paid administrators in the Dutch colonial state, with their lands incorporated, at least in effect, into the Dutch East Indies (Black, 1985).

The Dutch expansion was generated by a variety of factors. Although the British and the Dutch had divided Borneo in 1891 (Colson, 2003), it was felt in that there was a need to secure the area against the intervention of other western colonial powers in the area. Equally, if not more important, was the economic prospect of taxing the profitable trade, and intercepting the old trading networks, as well as opening large areas up to European investors in coal, oil and rubber especially (Black, 1985, p. 282).

Even though the Dutch placed administrators in the courts, and reinforced trading posts<sup>25</sup>, they initially only controlled the coastline and the lower parts of the major rivers. Tarakan was special. Here, oil was found by Dutch geologists already in 1897 - it was said that one could smell the reservoirs without even digging (Lindblad, 1985, p. 88), and production started in 1906 (Wight, Hare, & Reynolds, 1992, p. 266). The output exceeded a million tons a year in 1924. The sultan was parked on a lavish pension that greatly exceeded his former income, and led a sheltered life in luxury. Meanwhile, the population of the island sky-rocketed, and Tarakan became the economic center in the northern part of Dutch East Borneo (Broersma, 1927, p. 241).

---

<sup>25</sup> Joseph Conrad's novel *Almayer's Folly* (Conrad, 1895), takes place in and around such a trading post in the sultanate Berau on the river Pantai, just south of Tarakan. The tragic figure of Kaspar Almayer, a trader in "gutta-percha and rattans, pearl shells and birds' nests, wax and gum-dammar" (Conrad, 1895, p. 10) is driven by fantasies of the untold riches reputedly existing upstream, but he never succeeds in finding them. Conrad himself had intimate knowledge of this trade, as he had worked along the east coast of Kalimantan as a sailor in the merchant marine, and it is acknowledged that he drew heavily on his own experiences in the story (Sherry, 1966). The novel depicts, among other topics, the European fantasy of intercepting those flows of riches still outside European control, and the unromantic failures of the early Western traders.

Production continued to increase almost exponentially, as Dutch engineers brought thousands of Javanese and Chinese workers to the island and started drilling on the neighboring islands as well and in the shallow waters of the estuaries. In 1924, some 12.000 people worked in the oil industry on Tarakan, and it produced a third of all oil in the Dutch East Indies (Lindblad, 1989). Roads and an airstrip were built, as wells as simple housing for the thousands of coolies. Large swathes of land were cleared, and a landscape dominated by the oil infrastructure of pipelines, oil derricks and storage tanks arose. Extravagant villas for the Dutch administrators and engineers were raised on the hills, overlooking the oilfields and the harbor was considerably expanded. Although production was hit hard by the depression, exports recovered in the 30s (Lindblad, 1985, p. 87). Tankers from Java, Singapore and Japan lay anchored alongside newly constructed piers, ready to transport the oil to the refineries in Balikpapan, until a refinery was built in Tarakan in 1940.

The oil extracted from the Tarakan wells had a certain chemical composition<sup>26</sup>, which meant that in a pinch, it could be used directly in ship engines without being refined at all (Lindblad, 1989, p. 59), a characteristic which was to be of great significance in the coming years. The ascension of oil elevated Tarakan to the forefront of colonial attention, as production continued to climb.

---

<sup>26</sup> Tarakan crude is heavy asphaltic, which means that it can, as a last resort, be burned directly in ship boilers without requiring any refining other than a removal of sand and silt. However, burning unrefined crude is dangerous, as the highly volatile (and explosive) petroleum naphtha can cause explosive vapors in the fuel tanks, and the unremoved sulphur is corrosive in the boilers over time. At the end of the WWII, the Japanese navy had to resort to use such unrefined Tarakan crude, and it is believed that the volatility and corrosiveness of the fuel contributed significantly to the devastating explosions that sunk the Japanese carriers *Shokaku* and *Taiho* in 1944 (Stille, 2017, p. 77; USSBS, 1946, p. 83).

The oil industry changed the physical as well as the demographic landscape of Tarakan. The Tidung, who before the oil rush had constituted a large part of the population of Tarakan, became heavily outnumbered by Javanese and Chinese coolies, and only very few of them ever worked in the oilfields. They were kept farming, fishing and collecting the same commodities that they had for centuries. Some profited by selling land to the Dutch whenever a new oil or gas find was made, but many moved across the Batagau Strait and up the rivers, away from Tarakan<sup>27</sup>. Chinese trading houses established before the advent of oil prospered, and new ones were established by new Chinese immigrants. They opened shops, trading houses and brothels and in some cases acted as foremen and translators<sup>28</sup>.

The Japanese declared war on the Dutch East Indies the 10<sup>th</sup> of January 1942, and landed troops on Tarakan the following day. The oil production facilities on the island were seen as vital, especially considering that Tarakan crude could be used unrefined in an emergency, should the need arise. Tarakan was the first landing point of Japanese soldiers in the Dutch East Indies, and locals today somewhat proudly refer to the attack as "Indonesia's Pearl Harbour" (Santosa, 2004). The invasion had been anticipated though, and much of the oil infrastructure was destroyed by the Dutch before the Japanese attacked. However, the Japanese managed quickly to get production up and running again. Until late in the war, when most of Japanese shipping had been destroyed, oil from Tarakan was the primary source of diesel fuel for the entire Japanese army (Grimes, 1946, pp. 8-11). At the end of the war, Tarakan was invaded by the Australian army, at the request of the Americans, who hoped to utilize the airfield on Tarakan in their

---

<sup>27</sup> Interview 13.02.2017.

<sup>28</sup> Interview 20.03.2017.

continuing campaign. The invasion and the following fighting turned out to be so destructive though, that both the city, the airfield and the oil infrastructure was ruined to such an extent that neither of it played a role in the remainder of the war (Long, 1973, p. 452).

A few years after Indonesia declared independence, Dutch assets were nationalized and extraction continued under a series of state-owned companies. Despite a lot of prospecting and drilling, no new major reservoirs have been found since the Dutch era, and production gradually decreased (Wight et al., 1992). Today, some gas is produced, most of which is used locally for electricity generation.

The ruins of the oil frontier have persisted though. On the island of Tarakan alone, there were more than 1400 oil wells, of which only 50 today are producing. As the city of Tarakan has grown, much of the oil producing area has been developed, and people now live among the ruins of oil extraction (Niaga-Asia, 2018), which extends beyond ruined infrastructure. In some of these former extraction areas the soil is black and pungent below the surface, and not much will grow. Standing water in puddles and open gutters is quickly covered with a thick sticky film after rains and in the worst affected areas, buildings crack as the ground below them settles (Republika, 2015).

## THE TIMBER FRONTIERS

While timber had always been cut for domestic, everyday purposes, export began in earnest in the early 20<sup>th</sup> century<sup>29</sup>. Although both British and Dutch companies acquired and attempted to develop

---

<sup>29</sup> Obidzinski (2003) analysis of the timber economy and politics in then-East Kalimantan is detailed and very well-researched and his analysis guides this section.

large-scale concessions, the most effective and profitable timber business was centered around a number of Tarakan-based timber exporters of Melayu/Bugis and Chinese descent, working through middlemen directly with upstream communities. These Chinese traders were known as *tukei*<sup>30</sup>, and consisted both of recent immigrants and previously established businessmen. Logs were sold both locally, and exported to Japan especially. Many of these traders had earlier been involved in the trade of birds-nests and rattans (and opium), but shifted towards timber alongside the expansion of the oil industry in Tarakan which in itself demanded a lot of timber (Obidzinski, 2003, pp. 52-55). In addition, many of the immigrants from China who initially found work in the oil industry as manual workers soon established themselves in all levels of the timber trade, benefitting from their networks among family and extended kin in Singapore and Hong Kong<sup>31</sup>.

Throughout the 1930s, timber exports from Dutch Southeast Borneo boomed, doubling from 147.000 m<sup>3</sup> to 373.000 m<sup>3</sup>, shipped principally to Japan and China (Obidzinski, 2003, pp. 69-70). Japanese timber entrepreneurs established themselves strongly in the Tarakan area, and exported directly to Japan, bypassing both *tukei* and Melayu businessmen. In the early 30s, one such Tarakan-based Japanese businessman had more than a 1000 workers cutting trees for him along the Sesyap and Sebatak rivers, transferring the logs directly to ships anchored off the coast, as Japanese ships were forbidden to use the (oil) harbor facilities in Tarakan for security reasons (Lindblad & Verhagen, 1988, p. 104). During WWII and the

---

<sup>30</sup> Alternative spellings include *tauke* or *taukei* (or *towkay/taukey* in Malaysian). These businessmen had strong connections across the border in Tawau and Sandakan in British controlled Sabah, but also to affiliates as far away Hong Kong (Obidzinski, 2003, p. 54). See Eilenberg (2012) for an in-depth study of similar Sarawak-based *tukei*, and their role in large-scale logging operations in cooperation with Indonesian borderland communities.

<sup>31</sup> Interview 13.02.2017.

occupation, all Japanese firms and traders remained active and took over the Dutch and British timber concessions.

In the chaotic aftermath of the war and eventual Indonesia independence, timber exports quickly rose again and this time, due to increasingly nationalistic sentiments and anti-Chinese economic policies being enacted, local *tukei* were dependent on having business fronts/partnerships with "ethnic" Indonesians (Obidzinski, 2003, pp. 95-98). Although technically mostly illegal, the logging was tacitly sanctioned by the local government and police, through a well-developed system of bribes and "donations" to officials and officers. In fact, Obidzinski (2003) convincingly argues that as most districts in East Kalimantan in much of the 1950s and 1960s experienced "a near total lack of resources for even the most basic government functions and needs" (Obidzinski, 2003, p. 24), income from illegal "barter trade" which not only enriched local officials, also practically funded local government. Most of the logs was shipped across the border to the town of Tawau in Sabah, where a great number of saw mills then processed it before exporting it further abroad. A smaller number of mills were active in Tarakan too, mainly supplying the domestic market. In the early years of the New Order regime, predominantly Japanese trading companies acted through local *tukei* brokers who again allied with the military, and logging boomed (Dauvergne, 1995, pp. 178-184). In the 1980s, three Tarakan-based *tukei* brokers dominated all timber export to Tawau (Obidzinski, 2003, p. 125).

The latest and largest logging boom in the area took place in the tumultuous years following the collapse of the New Order regime, as it did in many other parts of Indonesia (Eilenberg, 2011, 2012; John F McCarthy, 2000). The power vacuum left behind the rapidly receding central government made room for ambitious local elites. It is estimated that in the years 2001 and 2002, around 4 million



m<sup>3</sup> of timber was, most of it illegally, shipped across the border to Sabah, and some 2.4 million m<sup>3</sup> went unobstructed through the port of Tarakan to the sawmills in Tawau (Obidzinski, Andrianto, & Wijaya, 2007, p. 528). The boom continued more or less unabated until 2005, when there was a nation-wide crackdown on illegal logging following the issue of a presidential decree that directed both central and local government bodies, police and army to cooperate towards the "eradication of illegal logging" (INPRES-04/2005, 2015). In the years following the formation of North Kalimantan, the rate of logging grew again (BPS-Tarakan, 2019, p. 120), but never reached the levels of the early 00s.

## THE MARITIME SHRIMP FRONTIERS

In the 1970s, Japanese-financed cold storages were built along the east coast of Kalimantan, specifically in order to process and export frozen shrimp from capture fisheries to the Japanese market (Butcher, 2004, pp. 210-212), and a cluster of these cold storages were built on Tarakan. Some in the rural areas north and south of the city where there were only small fishing hamlets, not even connected to the city by roads, and at least two in the city itself. In the city, the cold storages benefitted from the harbor, airstrip and warehouses built during the oil boom but north and south of the city, the factories functioned more as independent islands, connected by sea-lanes to Japan. Building materials, engineers, everything was shipped in from the outside, and the frozen shrimp was loaded on ships and exported.

The cold storages were owned through opaque joint ventures between Japanese and Indonesian companies, with the Japanese bringing the capital and the market access, and the Indonesian companies ensuring the necessary permissions and licenses through connections with important stakeholders in the regime (ibid. 211),

much as had been the standard model of operation during the successive timber frontiers discussed above.

Due to the shallow waters surrounding Tarakan, Long jetties was built, to which larger ships could anchor - transferring the heavy machinery and materials needed for the factories itself. When operational, company trawlers would fish along the coasts of the Sulawesi Sea, unloading their catch at the company jetty (Levang, 2002, pp. 19-21). At the factory the catch was cleaned, sorted, packaged, frozen and stored until it was exported. Compared with the domestic market where shrimp were often consumed in dried or fermented form, the Japanese consumers craved fresh shrimp in large amounts.

Initially, the cold storages had their own fleets of company trawlers. The first ones to fish in the area around Tarakan arrived in 1970, when PT. Misaya Mitra, the company still running the largest cold storage in Tarakan, brought its fleet of 9 trawlers from Sumatra to what was then East Kalimantan. In 1979, 80 such trawlers fished in the area. Even though these wooden trawlers were relatively small by international standards of the time (typically around 30 GT and 100-200 HP), they were huge in comparison with the typical local non-motorized small-scale fishing boat<sup>32</sup> of the time, and several orders of magnitude more effective. Data from the northern coast of Java shows that while such trawlers constituted only 2% of the fishing fleet, they accounted for 40% of the catches between 1975 and 1979 (Bailey, Dwiponggo, & Marahudin, 1987, p. 31), and it can reasonably be assumed that the ratio was similar in the waters surrounding Tarakan.

---

<sup>32</sup> Even in 1982, 82 percent of the Indonesian fishing fleet was comprised of sail-powered boats (Bailey, Dwiponggo, and Marahudin 1987, 76).

Simultaneously, the numbers of small-scale fishermen increased dramatically. Between 1951 and 1967, the number of fishermen in Indonesia almost tripled from 315.000 to 840.000. While the accumulated landings in this period doubled, the catches per boat decreased significantly. Only rising prices on shrimp and fish however, made it possible for the fishermen to survive, a process Butcher terms static expansion (Butcher, 2004, pp. 207-208). The steady growth in the number of small-scale fishermen were "linked to problems of agricultural and industrial development, and specifically to the [lack of] employment opportunities outside of the fishery. Until new opportunities [were] created elsewhere, labor [continued to flow] into the fisheries sector" (Bailey, 1997, p. 234).

The static expansion that Bailey sees in the development of the Indonesian fishing sector, have much in common with Geertz's (1963) influential and much discussed macroanalysis of the Javanese peasant economy under and after colonialism. Geertz argued that when faced with the combined pressure of colonial demands of tribute, corvee labor and a rapidly growing population, there was a tendency to intensify the existing and elaborate wet rice farming complex over moving towards industrialization and social change. This meant argued Geertz, that while the output of rice produced per hectare rose, the output per capita stayed more or less the same over hundreds of years, despite tremendous leaps in technology elsewhere. Geertz termed this process of intensification and increasing elaboration in wet rice farming agricultural involution<sup>33</sup>. In fisheries literature, the ecological consequences of artisanal fisheries acting as a sink for landless immigrants

---

<sup>33</sup> His book *Agricultural Involution* have been subject of much debate since its conception, most of it arguing that most available empirical evidence contradicts Geertz's conclusions. For an overview of these debates, see (White, 1983).

from rural areas, has been called "Malthusian overfishing" (Pauly, 1994).

Conflicts between small-scale fishermen and the larger trawlers quickly became frequent, especially in Java. The reason is for this was twofold. First, the catches of the small-scale fishermen decreased as the number of larger company trawlers increased, especially in the shrimp fisheries. Secondly, there were an increasing number of reports of large trawlers ramming smaller fishing vessels at night, as well as complaints from small-scale fishermen about the destruction of their nets and stationary gear (Bailey, 1997, p. 229).

When the protests turned violent, the New Order government first legislated against the presence of trawlers in coastal waters. But as that turned out to be impossible for authorities to regulate, a general ban on trawl was passed into legislation in 1980 (KEPPRES-39/1980, 1980), and entered gradually into effect in the early 1980s (Bailey, 1997; Chong, Dwiponggo, Ilyas, & Martosubroto, 1987). The ban was remarkable in several ways, and unprecedented on an international scale. Before the ban in 1980, caught shrimp constituted by far the largest source of foreign exchange in the Indonesian fishing sector, and 70% of it was caught by trawl. It had been pushed by the All-Indonesia Fishermen's Association, a functional group in Golkar, the ruling party under the New Order Regime. The director general of fisheries at the time explained that it was a: "political decision" made with the "aim of reaching social peace and stability, by way of providing better protection to the poor fishermen masses" (Iman Sardjono 1980, quoted in Butcher (2004, p. 237). That the state was willing to forfeit such a large source of income is an indication of how serious they perceived the situation to be, both in terms of social unrest, and in the rapidly decreasing fish stocks. The pressure on

fish stocks were only lessened for a while though as an ever increasing number of small-scale fishing boats led to an eclipse of the size of pre-ban landings, already in 1984 (Bailey, 1997, p. 231). Reacting to the trawl ban, the cold storages changed their mode of operation from relying on the catches of their own fleets, to organizing small-scale fishermen as suppliers. The fleet of large trawling vessels was sold off or converted to using other forms of gear.

Inspired by contract farming schemes that had been promoted by the World Bank in the Indonesian plantation sector since the 1960s (Cramb & McCarthy, 2016; John F. McCarthy & Cramb, 2009, pp. 115-116), the government started subsidizing so-called Nucleus Estate Schemes (NES) in the fishery sector. In the NES model, the cold storage was the nuclei, and the surrounding community of small-scale fishermen the plasma. The cold storage offered subsidized loans to fishermen so they could procure boats, equipment and supplies, repayable through the sale of their harvests which they were then contractually obliged to sell to the factory. The NES schemes were initially introduced in the state owned companies, but soon some of the private ones followed suit (Nikijuluw & Naamin, 1994, pp. 406-407). The NES schemes became popular in the fishery of tuna and other high value species, but never really took hold in the shrimp fisheries, that were already dwindling.

Instead, the cold storages entered into agreements with entrepreneur middlemen who, backed partly through loans from the cold storages, set up trading posts and started buying shrimp from independent fishermen in systems of debt-based patronage.

The fishermen who took these loans were predominantly Bugis<sup>34</sup>, but the middlemen who provided them were both Bugis and Indonesian

---

<sup>34</sup> None of the Tidung fishermen I spoke to were (or had been) indebted to middlemen buyers. "My father was a fisherman, and his father was a fisherman

Chinese. Where the Chinese Indonesian *tukei* who traded in fish were fewer but had more clients<sup>35</sup>. The much more numerous Bugis middlemen generally operated smaller businesses, through mobilizing their extended kin networks as client fishermen, and assisted them with loans to buy and equip boats. These Bugis middlemen were known as *punggawa*, and their clients *sawi*<sup>36</sup>.

Historically, Bugis society was highly socially and politically stratified, and possessed an intricate vocabulary for the various complicated hierarchical (and reciprocal) ways in which individuals could be positioned in relation to one another (Lineton, 1975; Pelras, 2000). Where Pelras translates *punggawa* as simply leader or bos and *sawi* is the term for being inferior in relation to a leader, Lineton adds that the *punggawa* was more of an intermediary between the aristocracy and the common people (Lineton, 1975, p. 119). These terms are well-described in the literature of fishing among Bugis fishermen as term for both middlemen traders and financiers (Acciaiolli, 2000; Ferse et al., 2014; Ferse et al., 2012; Gunawan, 2012; Miñarro, Forero, Reuter, & van Putten, 2016), but also for captains or navigators, people with special knowledge of the sea (Stacey, 2007; Zerner, 2003).

For the cold storages, promoting the *punggawa* middlemen meant an even higher level of outsourcing both risk and responsibility than

---

[...] What we do not eat ourselves, we sell to a buyer here, we have no loans. We are free to sell where we want" (interview 06.03.2018).

<sup>35</sup> One such middleman, who worked with his elderly father told me they had "more than twenty" fishermen in their debt, and had many more come to sell their catch at their shop - which was also a hardware store and a canteen for the nearby cold storage. "My father started here in 1988. The cold storage was here already but there were no roads, you had to go by sea. We used to have many more [clients] but the fishermen do not catch much anymore." Where they had bought shrimp and fish from fishermen in the old days, today they focused on high value items such as shark fin and other rare maritime products (interview 23.01.2018).

<sup>36</sup> *Punggawa*, also at times spelt *pongawa* or *pongawa*, is (or rather was) also used elsewhere in Indonesia to describe a patron of a certain rank having a number of clients, for example in the classical courts of Banten (Ota, 2015, p. 172) or Bali (Geertz, 1980, pp. 63-64). However it is not a word many non-Buginese Indonesians would be familiar with today.

the NES schemes had done. For the Bugis fishermen, entering into a patronage relation with a middleman meant lower margins, but opened opportunities for much needed capital, combined with the safety-net of having access to credit during periods of bad catches. Soon villages grew up around the cold storages. While the fishermen fished on credit, the middlemen brought their catches to the cold storages, where wives and daughters labored on the production lines.

But the shift to largescale outsourced capture fishery of shrimp were only temporary. Between the combination of the ban on trawl, and the wide scale destruction the coastal seabed, the continued export of shrimp was threatened, and the cold storages went looking for a substitution. Eventually, the cold storages began to sponsor the opening a new frontier - largescale shrimp aquaculture (Bailey, 1997, p. 232; Butcher, 2004, pp. 281-287; Ilman, Dargusch, & Dart, 2016, pp. 452-453; Semedi & Schneider, 2021, pp. 49-51; Vandergeest, Flaherty, & Miller, 1999, p. 584).

## THE POND FRONTIER



Using the same model of financing through a network of middlemen and rejecting company ownership of ponds completely, the pondscape started to slowly develop. The number of ponds and middlemen increased steadily, and through the 1980s and early 1990s, both caught and farmed shrimp were fed into global supply-chains terminating in Japan, US and Europe.

Globally, shrimp aquaculture had been booming throughout much of the 1980s (Primavera, 1997, pp. 27-28), and shrimp had been farmed in ponds sporadically dotted around the mangroves surrounding Tarakan since the 1970s (Gunawan, 2012, p. 72; Sunderlin, 1999, p. 561). But it was the tumultuous effects of the Asian financial crisis of 1997 that brought the shrimp boom to the slowly expanding



pondscape around Tarakan<sup>37</sup> (Ilman et al., 2016, p. 453; Levang, 2002, p. 11; MMAF, 2017). While the crisis contributed significantly to the fall of the New Order regime, it had additional, radical effects in the burgeoning pondscape. The plummeting Rupiah meant windfall profits for export-oriented extractive industries, such as shrimp farming, who traded in dollars, as the devaluation of the rupiah decreased their expenditures and increased their income dramatically, relatively to the rest of the Indonesian economy. There was a rush to build new ponds, as everyone wanted to partake in the boom. The number of ponds proliferated, and the value of their harvests doubled or tripled almost overnight. The boom led to the creation of tens of thousands of ponds, as extensive areas of mangrove and nipa-forest were bulldozed, and embankments and sluiceways constructed. The high price of shrimp was constant for a couple of years, and the successful pond owners and middlemen invested much of their profit in even more ponds.

The pondscape was built to farm the coveted tiger shrimp<sup>38</sup> (*Penaeus monodon*, locally known as *udang hitam* or *udang windu*), a large nocturnal, mainly predatory shrimp that historically have fetched very high prices in especially Japan and the US. The tiger shrimp is endemic to the mangroves and estuaries of South East Asia, but is widely found in coastal waters in much of the Indo-Pacific.

In the mid-2000s, that is, during the last years of the shrimp boom, the global popularity of the tiger shrimp was eclipsed by the South American white-leg shrimp (*Litopenaeus vannamei*) for

---

<sup>37</sup> The boom resulting from the Asian financial crisis led to the expansion of several pondscapes. Of notice is the one in the deltas of the Berau, (Gunawan, 2012, p. 88) and the Mahakam (Bosma et al., 2012, p. 91).

<sup>38</sup> There is confusion between the terms shrimp and prawn in English, and there is no taxonomic basis for drawing a distinction between the two terms. The phylogeny of decapods is confused among taxonomists too, and the whole genus of *penaeidae* was reclassified as late as 1997 (Rudloe & Rudloe, 2009).

several reasons. The most prominent cause of this shift, was probably due to a number of viral epidemics that swept through much of South East Asia in the 90s and 00s (Walker & Mohan, 2009), killing shrimps in whole regions. Although both the tiger and the vannamei shrimp is susceptible to disease, it is much easier controlled in the vannamei shrimp as it can be fully bred in captivity which the tiger shrimp cannot, and a number of disease-free strains have been developed (Briggs, Funge-Smith, Subasinghe, & Phillips, 2004, pp. 15-16; Walker & Mohan, 2009, p. 139).

Contrary to the tiger shrimp, the vannamei is an omnivore, which makes it much more feasible than the tiger shrimp to use in intensive production with high stocking densities. So although the tiger shrimp command significantly higher prices per kilo, the vannamei shrimp can potentially be farmed in super-intensive systems that increase the output many hundred times over tiger shrimp farmed when in extensive pond aquaculture (Salas & Rendón, 2013, p. 67), but even in intensive ponds, the vannamei shrimp easily outclasses tiger shrimp in terms of production (Rubel et al., 2019, p. 12). As the trend in shrimp farming around the globe is to move towards more intensive and technologically advanced pond systems, the vannamei shrimp have become by far the most produced shrimp worldwide<sup>39</sup>, and its market share is still growing (FAO, 2020b, p. 30).

The tiger shrimp is still widely farmed worldwide though, and is very popular in Japan and the US, where it commands high prices (Rubel et al., 2019, p. 10)<sup>40</sup>. The high price make it profitable to farm in extensive and semi-extensive farms over the vannamei

---

<sup>39</sup> In 2018, global harvests of tiger shrimp was 750.605 ton, and the global harvests of vannamei shrimp 4.966.037 ton (FAO, 2020a).

<sup>40</sup> Of the shrimp farmed in the pondscape, the Tarakan Department of Fisheries estimates that 70% goes to Japan, 15% to EU and 5% to the US. All of the premium sized tiger shrimp goes to Japan (Interview 23.03.2018).

shrimp, as the higher price makes up for the lower output, especially in areas where intensive aquaculture is impractical or economically unfeasible, such as in the Tarakan pondscape. The "Tarakan Tiger" was marketed as a premium, high end product, promoted as "traditionally farmed" and "organic" (CW, 2014), but as shall be discussed below, these claims were highly dubious.

Although there has been the occasional experiment with vannamei shrimp in the pondscape, no one farms it at an economical scale - there is no intensive ponds in the pondscape around Tarakan. The lack of basic infrastructure such as roads and electricity means that converting the extensive ponds into intensive ones would be prohibitively expensive, as everything need to be transported by boat, and the pumps, active filters and aerators associated with intensive farming would have to be run on electricity from generators.

### Making way for the pondscape

As the pond frontier arrived with its lure of riches and possibilities, the "unused" land of the extensive mangrove forests suddenly became a potential. It became a "space of desire". A space that once seen, had to be explored and exploited (Tsing, 2003, p. 5102). It was the ready "availability" of "cheap" land that were considered to be one of the strengths of the pond business in North and East Kalimantan.

But the land was not readily "available" in the eyes of everyone. Rather, it was used by people who had lived there for generations, the Tidung, many of whom had vacated to villages in the estuaries and along the rivers during the oil boom and Japanese occupation. These Tidung communities were mainly artisanal fishermen, and were not involved with the cold storages in catching marine shrimp, and only to a small extent part of the Bugis/Chinese patronage networks

that financed the export based fisheries. Instead, the Tidung fished mainly for subsistence, selling any surplus at the local markets, favoring traps and large wooden fishing weirs over large expensive nets.

When the Tidung found themselves to be living on suddenly very valuable "empty" land, many chose to sell some of it to Bugis entrepreneurs. One leader of a Tidung ethnic organization described to me how this usually went. We were standing in his house, on a vinyl black-and-white checkerboard floor, rolled out over the uneven wooden floor. "This is how they do it" he said, and moved his foot to one of the black squares, resting it there for a while before he continued. "They buy a piece of land, like this black square [...] Then they build a pond" He stamped his right foot on the square, and was silent for a while. "But then, they also build ponds on these squares", he makes a sweeping motion with his left, marking the six adjacent squares. He pauses, and moves a step forward. "Then they also built their ponds there and there and there, and the same thing happened. Soon, they have taken everything [...] they have people in all the offices. They are better educated. We need to be united against them to stand a chance".

Old rights and claims to the mangroves came under pressure as the pond frontier moved through the estuaries. Gradually, the Tidung were excluded to make way for the investors and entrepreneurs buying/taking the land and gradually transforming the mangroves into pondscares. It was through the drastic transformation from mangrove to pondscape through the labor involved in physically altering the landscape (Peluso, 2018, p. 414), that the initial territorializations were made, and the exclusion of Tidung became final. Although the Tidung were dispossessed of land and left clinging to the riverbanks as "surplus populations" (Li, 2010),

struggles about ownership of the newly formed pondscapes continued between the initial claimants.

In the beginning, it was not predominantly Bugis who owned and operated ponds. Having a head-start in terms of capital and connections from earlier extraction and trade (Sellato, 2001), members of the old Chinese-Indonesian communities in Tarakan were well-represented among the early pond entrepreneurs. Many had bought up large expanses of land, eyeing the possible profits that were to be had. But in the words of a young Chinese-Indonesian man, a third-generation owner of a large trading post: "we suffered from attacks and harassment, people from a certain tribe on Sulawesi [an euphemism for Bugis] would attack us and steal our harvests, either at the pond or on the way back. Now, almost no ponds are owned by Chinese, we sold them or they were taken. Instead we finance them" he smiles. "It is a much better arrangement".

Populations of Bugis, have for centuries lived as minorities in the main harbor cities in Indonesia and Malaysia, and in the ports along the eastern coast of Kalimantan (Atsushi, 2010; Pelras, 1996). Initially, Bugis did not constitute a majority in Tarakan the same way as they did in other cities, such as Balikpapan to the south, as it was mostly Javanese who worked in the oil industry. A surge in Bugis migration came during the South Sulawesi Rebellion (1950-1965), where a faction of guerillas who had first fought the Dutch in the Indonesian War of Independence (1945-1949), rebelled against the new Indonesian republic, when they were refused integration into the new national Indonesian army (Dijk, 1983). Many farmers were caught between the warring factions, harassed by both rebels and the army, and in order to avoid being drafted many young men fled, and settled in East Kalimantan (Pelras, 1996; Vayda & Sahur, 1985), many initially as

pepper farmers. Since then, there has been a steady stream of Bugis to Tarakan, where they have formed an ever increasing majority for around half a century. The last census to disclose ethnic affiliation in Tarakan was the done in 2000. Here, Tidung constituted 7.47% of the total population, as opposed to the Bugis 33% (BPS-Tarakan 2000, C. Wilson, 2013, p. 111)). Since then, the population of Tarakan has more than doubled (BPS-Tarakan, 2018, p. 21), and the ratio between the Tidung and the Bugis has most certainly increased even more in favor of the latter.

Tension between Tidung and Bugis peaked in 2010, when a fight between youngsters ended up with a man being killed. Hours later, crowds from both groups assembled and clashed several places on the island, and many houses were burnt, leaving a number of people dead<sup>41</sup>. After a few days more than 40.000 people had fled their homes, seeking refuge in mosques and schools (C. Wilson, 2013, p. 113). A cautious national police blockaded the island for weeks, with the aim of preventing especially the warring groups from getting outside assistance, as had happened in similar clashes in post New Order Indonesia<sup>42</sup>. After a couple of days, a peace agreement was made, and life slowly returned to normal. Although the local police initially were slow to intervene, eventually the Governor of East Kalimantan intervened, and even then-president of

---

<sup>41</sup> According to the official numbers, 5 people were killed, Wilson, who interviewed police officers and participants in the aftermath of the riots, reports a number between 7 to 50 killed (C. Wilson, 2013, p. 113). I spoke with people who had participated as well, and the general story was that the true number of killed had been underreported, in order not to stir up further violence. One story I heard repeatedly, was that the police in secret had buried several bodies behind their barracks in order to keep the official body count low.

<sup>42</sup> There was a dramatic increase in communal conflict and violence in aftermath of the fall of New Order regime, often, but not always, along ethnic and religious lines. For more on the violence that swept through the Maluku islands from 1999 to around 2002, see Bubandt (2000) or Duncan (2005). For more on the conflicts in West Kalimantan between indigenous Dayak groups and Madurese immigrants in 1997 and 1999, see Tanasaldy (2012, pp. 209-255) or (Peluso & Harwell, 2001).

Indonesia, Susilo Bambang Yudhoyono publicly asked for the warring parties to show restraint, and the media not to escalate the situation (Kompas, 2010).

According to Wilson (2013), the clashes escalated, because ethnic organizations on each side took advantage of the long-standing grievances between parts of the Tidung and Bugis communities over land and access to government positions. Such ethnic organizations, known in Indonesia under the umbrella term *organisasi kemasyarakatan* or *ormas*, are vigilante groups who “apply discourses of democracy and civil society to claim rights and resources for specific local, ethnic, and religious groups, whom – they argue – the government fails sufficiently to take into account” (Bakker, 2016, p. 252). The riots in Tarakan escalated when uniformed members of at least two of such *ormas*, all claiming to speak on behalf of the Tidung community as a whole, took part in the riots. Both of these *ormas* were well-known for their everyday engagement in blackmailing and protection rackets, and Wilson (2013) argues that their participation also was part of a contest of influence, and thereby access to lucrative state patronage networks (pp. 127-129).

Whatever the cause for the riots, and I have heard a few, there still exists a lot of tension and resentment between Bugis and Tidung in the pondscape. When asked why no Tidung build and own ponds, a second-generation Bugis bos responded: “The Tidung<sup>43</sup> are too lazy, they are too poor. They cannot afford the machines needed. They are fishermen and some of them work in our ponds.” He

---

<sup>43</sup> I surprised me that he was this blunt. In post-2010 Tarakan, normally, people would go out of their way to avoid naming ethnic affiliation directly, using “some other tribe”, “a certain group” or “some other people” instead. This way of speaking even extended to discussions about the relationship with Malaysia, where people will go to great oratory lengths to avoid saying the country’s name, instead using terms like “neighboring country”, “neighbors” or “a certain country”.

pauses and adds "but I only use family [other Bugis] as workers. Tidung people are lazy and quarrelsome. Bugis people you can trust", he said with a smile.

He guides me through the procedures necessary for the making a new pond. The office, as everything else on the waterfront, is built entirely of wooden planks, and I can see and smell the water beneath us. On a table before us lies stacks of paper, some of it turned yellow by time, some of it laminated, and compared with the sheer amount of paperwork you normally need to do anything in Indonesia, this is nothing.

"This is Indonesia" he laughs. "It is very simple. You go to the Tidung village which owns the place, and ask their leader [*kepala desa*] for a piece of land, and pay him maybe 10 million for a tillage letter [*surat garapan*] This gives you one *kavling*<sup>44</sup> for the pond, and you can get several if you want. This is what I did. This is what most people did [...]. You only have to go to the government offices, if you wish to get ownership, but that is expensive, it is not worth it".

De juré, the tillage letter he mentioned, only gives right to farm the land in question for three years, but de facto it lasts indefinitely. No pond owners I met during my fieldwork had opted for formal ownership (*hak milik*) of their ponds. Such an act was seen as downright stupid, unnecessary, expensive as it would mean they had to pay taxes. Although the tillage letters are only semi-legal in an official sense, they are the only legal foundation that the vast majority of the pond owners have<sup>45</sup>. In practice though, they are respected in all matter of dealings with local government, and when buying and selling ponds, these documents are

---

<sup>44</sup> A *kavling* is corrupted form of the Dutch term *verkaveling*, meaning plot, or parcel. In current usage among pond entrepreneurs in Tarakan, it has become synonymous with the 10 ha you can get on one *surat garapan*.

<sup>45</sup> This is echoed by (Kusumawati & Bush, 2015, p. 11).



the sole proof of ownership, even though village heads technically cannot give permission for the clearing of state forest land. The bos with whom I spoke had inherited 15 (now mainly ruined) ponds from his father, who had migrated to Tarakan in the 1970s, and built his ponds during the boom in the 1990s. His sole legal basis of ownership over these old ponds, was the old laminated tillage letters he had on his desk, there existed no official recording anywhere.

Indonesian land law is a complicated and contentious affair, and I will not go into the details here<sup>46</sup>. Suffice to say, current land laws are contradictory, and there is no such thing as a comprehensive map<sup>47</sup> of Indonesia, where all concessions, plots and land-use-zones are depicted. Often, different government agencies will grant overlapping concessions, leading to situations where two competing claims to a single plot of land can both be regarded legal (Indrarto et al., 2012, pp. 22-27).

In October 2017, the president of Indonesia, Joko Widodo visited North Kalimantan. Accompanied by the governor, they flew on a helicopter from Tarakan to Tanjung Selor, the administrative capitol of the province, a trip that takes you across some 50 kilometers of uninterrupted pondscape. Looking out of the window, the president reportedly asked the governor who owned all these ponds, and the governor told him that they were "community-owned", but not registered. According to the governor, who referred the incident in an instruction upon arriving in Tanjung Selor, the president immediately instructed him to make sure the ponds were gazetted and properly certified (Bisnis-Indonesia, 2019).

---

<sup>46</sup> For a good introduction to Indonesian land law, see (John F McCarthy & Robinson, 2016) or (Indrarto et al., 2012) For a very thorough review, see (Slaats, Rajagukguk, Elmiyah, & Safik, 2009).

<sup>47</sup> One such database have been in the process of being made since 2011, but is still not complete (World-Bank, 2018).

Recently, as the first step in this process, the department of fisheries have begun requiring so-called land clarification letters (*surat keterangan*) for newly established ponds. Although these do not clarify ownership in any way, these letters state that there are no conflicting claims over the plot of land in question. Newer ponds have this, but few of the old ones. In December 2018, a year after the president's instruction, I asked one of the officers from the Department of Forestry in Tarakan, in charge of registering ponds why so many ponds are constructed even today, without the necessary papers, some even in Forest Reserve Areas. The officer in charge shrugged his shoulders and said: "We are only two officers tasked with this. We do what we can, but there is no way we can check all of those ponds". Despite promises to the president himself, the local government have not managed (or prioritized) formalizing the ownership of ponds. Thus, ponds are bought and sold without much involvement of local or national government, and the majority of ponds exist with no formalized legal basis, despite it being prioritized by national government.

Christian Lund (2006) describes the dynamics of local authorities, entities not directly affiliated with the state, but making decisions of a public nature and exercising political power (Lund, 2006, pp. 686-687). He terms them twilight institutions, and describe how they bolster their power of and authority through references to the state, in this case, such as the practice of buying tillage letters from village leaders, and using them as proof of ownership. This, Lund argues, has the paradoxical effect of simultaneously circumventing and strengthening the authority of the state (here local government), through using its paraphernalia. If we consider the shrimp supply chain as having some characteristics of Lund's twilight institutions, despite being a loose conglomerate of relations tied together through cold

storages, the foot-dragging and tacit acceptance of the status quo by the local government makes sense. It also highlights the primacy of the supply chain as the source of public authority when it comes to matters of pond ownership. The fact that pond owners do not pay taxes, invariably leads to lower operating costs for the cold storages, and thus a greater margin of profit. Even though few pond owners do pay taxes (Bisnis-Indonesia, 2018), the whole industry surrounding the shrimp supply chain constitute the second largest source of city income in Tarakan today, after the service sector (BPS-Tarakan, 2018, p. 11). But it is not only from such a vantage point that the spreading pondscape and local government are connected and reinforce each other. I found that it was very common that government employees - especially the ones in related departments - were pond entrepreneurs themselves:

A young extension officer from the department of fishery and agriculture corrected me when I asked about the "illegality of a majority of the ponds". He leaned back in his chair, took a sip of his coffee and replied: "Actually I wouldn't use the word illegal. They just do not possess the papers [and] the business license. And, also they don't have [the] certificate for land ownership. But I would not call them illegal". Later, when we were sitting in a small shop by the docks, drinking yet another cup of tooth-achingly sweet coffee, he invited me to participate in a project of his. I had become accustomed to such offers, but it was the first time I got one from a government officer: "I have obtained 250 ha of land upriver at [...]. So far, I have developed 8 ponds, 1 kavling each. I made the design myself. The sluiceways will last 20 years - cold molded concrete - the best option. But I need capital for developing the rest - 250 million for one kavling - so if you are interested?". I nodded and he proceeded: "I have done all the tests myself: for the salinity, for the water, for the

soil. Everything is promising, I just need more funds". I asked him about the paperwork, and he assured me, that he had the *surat garapan* in order, "no problem".

As such, in the pondscape, the authority to define who has claim and use rights to ponds lies primarily among the collection of owners and bosses themselves, buttressed by the indifference the cold storages show on questions of formal legality, and tacitly supported by the local administration. The prime objective for everyone involved is to have as many as possible shrimp grown, processed and fed into the supply chain.

The confusion between, or one could say combination of, the legal and illegal is one of the characteristics of the shrimp frontier, as is the fluidity between state and non-state (Timmer, 2010, pp. 707-710). The industrious extension officer encapsulated this frontier spirit, and there are many entrepreneurs like him. The frontier and the resulting pondscape is a fertile space for capital, deals, plans. Ever-enticing, full of promises and great gains to be had if one has the means and the courage (Tsing, 2003, p. 5104).

It is impossible to tell exactly what happened in the early days, what was sold and what was taken. But as the dust settled, the end result was clear - prior claims to land were erased, new ones established, and the pondscape had expanded enormously.

### Financing the pondscape

Prices, sizes, weights. These numbers are of utmost importance to the pond owner his pond, and to the thousands of men like him in the pondscape. They are maybe even more important for the many thousands of men hired as caretakers and workers at the same ponds, as they commonly are paid in percentages of this quarterly harvest. Most owners are heavily indebted to post owners in town, who

finance their ponds, the shrimp fry, their nets, the ice, the antibiotics and poisons needed for shrimp aquaculture. In turn, these post owners will have exclusive rights to the catch, one part of which the post owner will take to pay off a bit of the loan, another part he will buy at a discounted rate. The post owner himself is often indebted too, either to larger buyers of shrimp, or directly to the cold storages who ultimately buy, process, freeze and export most quality shrimp farmed in the pondscape.

These debt based patronage relationships have been subject to much scholarly attention when it comes to South East Asian seafarers and fishermen, and that literature has been sampled and discussed above. Concerning shrimp aquaculture specifically in areas where the production is predominantly dominated by Bugis, these systems of patronage are often mentioned in connection with *punggawa-sawi* relationships.

Pelras described *punggawa-sawi* agreements in aquaculture among Buginese in Sulawesi in 1979 as a pyramidal combination of loans and sharecropping agreements. Town-based traders lent members of the landowning, aristocratic class money to build ponds, on the condition that they received the rights to buy the harvest at a discounted rate. The landowners then entered into sharecropping agreements with landless tenants, under the condition that they received the lion's share (up to 80%) of the harvests. These manager-tenants would then again hire additional tenant-caretakers out of their share. In this case, both the landowner and the manager-tenants were effectively both *punggawa* and *sawi* simultaneously, while the trader in town was acting as a *punggawa* for all (and the caretakers-tenants as *sawi* to all). Despite the vast difference in income from this arrangement, there was security in it too. All levels of *punggawa* (and ultimately the town-based trader) was expected to extend credit if the harvest failed, giving

all *sawi* some form of security not to be had outside the *punggawa-sawi* relationship. Additionally, *punggawa* were expected to help their *sawi* in case of misfortunes such as illness or death, as well as with expensive events such as weddings (Pelras, 2000, pp. 421-423).

In the pondscape surrounding Tarakan, it was different. As Tidung claims were effectively ignored, there was no landowning aristocratic class who could enforce their ownership over the mangroves that were rapidly being converted to ponds. Instead of entering into sharecropping agreements with landowners, pondowners borrowed money to establish ponds from town-based middlemen who termed themselves *punggawa*, many of whom had had established themselves during earlier resource frontiers. These middlemen were predominantly first or second generation Bugis immigrants, or third or fourth generation Indonesian-Chinese traders.

Bugis middlemen engaged into the *punggawa-sawi* relationships with "their" pond owners financing the ponds and marketing the produce<sup>48</sup>. The *punggawa* occupied the middleman position between the cold storages and the individual pond owners, financing the pond owners on the condition that they may only sell their harvest to them, and at a discounted rate at that. A single *punggawa* could have anywhere from a handful to scores of pond owners in his debt. In addition, these middlemen *punggawa* were often themselves indebted to cold storages<sup>49</sup>, similarly bound to sell their

---

<sup>48</sup> (Bosma et al., 2012; Bourgeois, Gouyon, Jésus, Levang, & Langeraar, 2002; Gunawan, 2012, 2016; Ilman, Wiharyanto, & Desyana, 2009; Kusumawati et al., 2013; Levang, 2002; Timmer, 2010).

<sup>49</sup> I have only been able to obtain sporadic data on the number of *punggawa* indebted to cold storages in Tarakan at the height of the shrimp boom. For comparison, Appendix III.3 in Bourgeois et al. (2002) details cold storage credit to *punggawa* in the similar but roughly three times smaller pondscape (approx. 810 km<sup>2</sup>) in the Mahakam delta south of Tarakan in the 2000s. Here were the two oldest and largest out of six cold storages operating with a revolving fund of credit worth 2 billion rupiah each to respectively 30-40 and 100 *punggawa*. Two other cold storages did not operate with credit but bought their

collected shrimp to their debtors. Pond owners hired caretakers as sharecroppers, who were paid a fixed percentage of the harvests, to look after the daily functioning of the pond. Like the description of Bugis pond aquaculture in Sulawesi above, these *punggawa* are described as upholding the reciprocal part of the bargain with their indebted client pond owners, and assisting their *sawi* with financial assistance in times of need (Kusumawati et al., 2013, pp. 906-907; Timmer, 2010, p. 708). During my fieldwork, I often heard pond owners or middlemen reminiscing about this practice, as put by an older Bugis post owner: "During the time of good prices, I brought much family here, helped them with ponds. Helped them with schools, hospitals, everything. One was working very hard, so I helped him with a house. I was like a father to them <sup>50</sup>".

Chinese Indonesian traders were heavily involved in the shrimp business too. Where most Bugis were relative newcomers, many Chinese Indonesian businessmen belonged to families who had been established in Tarakan for a long time, and although fewer in number, they were often richer and economically independent of the cold storages. Where some Bugis *punggawa* had been in business since the marine shrimp frontier of the 1970s, most of the Chinese families had been in business since way before that, as explained by the son of a well-established buyer: "My grandfather came to Tarakan just before the war. He married my grandmother [who was also Chinese]. She was born here in Tarakan around 1920. He had learned Dutch, and that helped him a great deal - everything was in Dutch back then. He was a goldsmith from Guangdong, and my father was a goldsmith too. But really, he earned his money in the

---

shrimp from 9-10 regular large *punggawa* and no numbers were obtained from the last two cold storages. Extrapolating those numbers would suggest that there were at least 400 *punggawa* in the Tarakan pondscape in the 2000s.

<sup>50</sup> Interview 11.01.2018.

timber business. [...] Tarakan owes its wealth to timber and oil. He used money from [his timber business] to start with shrimp in the 1980s, before the ponds [...] So you see, we were in the pond business from the very beginning, we are not indebted... People are indebted to us"<sup>51</sup>. The cold storages entertain special prices for such independent middlemen, who will constantly probe the market for the best price, before reselling the shrimp from their clients.

"When someone comes and ask for money for a new pond, first I check him. I ask around. Has he debts elsewhere? Has he family here? Has he any knowledge about it? If he wants to build, we go there and check the area ourselves. If he wants to buy, we go there and have a look. If we trust him, we help him [...]. There is no paper - no contract. Trust means everything in the shrimp business". As explained by this young middleman, countless of prospective pond owners entered into debt arrangements. The newcomers were drawn by the, at the height of the shrimp boom, very real possibility of profit, and with the easy access to capital from the town-based middlemen, the relational infrastructure of the pondscape was in place, and the construction of the physical infrastructure boomed.

### Building the pondscape

When an area was found and the (limited) paperwork was in order, the pond entrepreneur could start building his pond in the mangroves. Before the boom in the late 1990s, this was mainly done manually (Ilman et al., 2009, p. 18; Levang, 2002, p. 9), but as the price of shrimp rose, entrepreneurs brought excavators into the mangrove on barges. The excavators made the building of ponds much faster, but also more expensive. But as middlemen were eager

---

<sup>51</sup> Interview 13.02.2018.



to finance new ponds, the increased price did not stop a veritable explosion in the number of ponds being opened.

To build a pond, first the trees and palms had to be cleared. This was done by teams with chainsaws, who cut the mangrove or nipa palms in the desired area. Areas of nipa-palm were preferred, as they were much easier to remove than the sturdier mangrove, "although the roots can be difficult". Then the excavator would arrive on a barge, and commence removing the roots and debris left by the cutters. When the area is relatively clean, the excavator started digging a canal (*parit*) all around the pond boundary. These canals were around 5-7 meters wide, and between 1-2 meters deep. The excavated soil was pushed and lifted to the edges of the pond, forming a barrier, or embankment (*tanggul*) of mud encircling it. The barrier was made the thickest towards the river, and less so on the sides, where neighboring ponds would be constructed. This left the large center of the pond area (*plataran*) higher than the canal, and only just submerged when the pond is filled. Simultaneously, a concrete sluice gate (*pintu*) would be constructed on the side of the embankment facing the river. Through this, the pond could be filled during flood, and emptied during ebb. While the construction was going on, the workers lived on the site in a small shack next to the sluice gate. When the work was done, this building became housing for the caretaker of the pond and any eventual family he had managed to bring along. Some pond owners improved these houses, while others kept them at a bare minimum. While some prospective pond owners had capital to finance the construction of a pond themselves, most ponds were built on credit from *punggawa* or Chinese Indonesian traders. Some middlemen developed whole areas of ponds, and sold them on credit.

When compared with other places in Indonesia, the size of the individual ponds that were developed in the pondscape were much

larger than elsewhere. When I asked pond entrepreneurs why, they explained that the whole east coast of Kalimantan was attractive, only because land was plenty<sup>52</sup>: "In Sulawesi or even in Java, the ponds are smaller. Maybe 0.5 ha or maybe 2 ha. Here, the ponds are big, the land is empty! They are, what do you call it, not intensive, natural! We do not use feed and no machines like pumps [...] We have smaller harvests per ha than in Sulawesi, but then we make our ponds much bigger, [as] the soil is not good here<sup>53</sup>". This way of building ponds, combined with the lack of artificial feeding, pumps and aerators was termed the "traditional" way (*tambak tradisional*) among my informants, and it is the way most if not all ponds were, and are, run in the Tarakan pondscape. In the literature, this largescale, low-technology way of shrimp aquaculture is termed extensive (Kungvankij, 1985, p. 15) or semi-extensive (Apud, 1985, p. 107).

After a pond was dug, it was left for a couple of years or more before they entered into production, depending on the kind of vegetation that had grown on the site before. Accumulated organic material and leftover debris from the construction left on the bottom had to rot away, otherwise the shrimp would suffocate in the stagnant, oxygen-poor water. Sometimes a few live mangrove trees were left on the *plataran* "to provide shade and food for the shrimp", but this again was a matter of discussion between pond entrepreneurs. After a while, the quick growing nipa-palm sprouted on the embankments facing the river, concealing the ponds almost completely in the flat landscape.

---

<sup>52</sup> Gunawan (2016) was given the same explanation when asking about pond size in the Berau delta south of Tarakan (Gunawan, 2016, p. 96).

<sup>53</sup> Ilman et al. (2009) echoes the same concerns of the quality of the soil (pp. 18-19), but adds that the extensive ponds also are consequence of a strategy to maximize the amount of wild shrimp that are brought into the pond when it is filled - more water means more wild shrimp (p. 17).

Although the enormous pondscape was built by thousands upon thousands of individuals, each with individual histories, hopes and ambitions, their combined frenzy of cutting, digging and piling formed the recognizable cellular pondscape with its predictable shapes and amorphous yet standardized construction. The resulting pondscape had what Cronon (2009) describes as "a coherent collective shape consistently structured by the market" (p. 223), an organic expression of "symmetry and order" (Tsing, 2003, p. 5101), optimized towards production and export. As neighboring ponds were built, and embankments connected, the pondscape soon covered the entire coastal region surrounding Tarakan.

### Farming the pondscape

Before taking a pond into use and between each harvest, it is common practice to empty sacks of agricultural lime over the dry pond bottom. Every pond owner knows that this significantly increases his chances of good harvests, but rarely knows why, except that it "helps control the quality of the water". Then, many pond owners add a variety of chemicals hoping to reduce or control pests<sup>54</sup>. These products are expensive and not always used. As with most running costs, indebted pond owners buy these products in shops owned by family or business associates of the post owner, adding to their credit. A widespread pre-boom practice of stocking the ponds was to just open the sluice gates during flood, and let the river water fill the pond with wild shrimp and fish, which would then multiply in the sheltered pond until they were harvested. This practice was abandoned after the Asian financial crisis, as prices on tiger shrimp were so high that everybody shifted to farming it specifically.

---

<sup>54</sup> I will go more in depth with the reasons for and the consequences of these practices in the following chapter.

Initially, tiger shrimp postlarvae (*benur*) was bought from specialized fishermen who caught them along the coasts and in the estuaries using very finely-meshed nets<sup>55</sup> and transferred directly to the ponds, but later they were hatched in local hatcheries stocked with wild broodstock<sup>56</sup> - a much more efficient and predictable way than transferring them directly into the ponds. The pond owners don't buy their *benur* directly from the hatcheries, but through specialized sellers. As finding the best quality of *benur* is considered to be very important for securing a good harvest, the pond owners take great care in examining the *benur* for any defects. The color, shape, size and movement of the minuscule larvae are scrutinised in an attempt to judge their quality. Many pond owners buy their *benur* with credit provided by the post owners to which they are already indebted. Where the pond owners without debts often visit several sellers in the hope of finding the best quality at the best possible price, indebted pond owners have to buy from certain sellers - often family or business associates of the post owners to which they are indebted. In the later years, some sellers also began to market *benur* brought in by air at great expense from more advanced hatcheries in Java, but as of today, both the cheaper local and the more expensive imported *benur* are used. Most ponds are farmed with a polyculture of tiger shrimp and milkfish (*Chanos chanos*, locally known as *ikan bandeng*), with the high value tiger shrimp farmed solely for export, and the

---

<sup>55</sup> This practice is considered enormously destructive to coastal ecosystems. Working in the bay of Bengal, Islam, Islam & Ahmed (1999) estimated that due to by-catch, catching a single wild tiger shrimp larvae, means destroying 45 other shrimp larvae, 12 fin-fish as well as a large amount of macro-zooplankters (p. 110).

<sup>56</sup> Modern hatcheries producing tiger shrimp larvae need a constant input of wild broodstock, as it is very difficult to make the tiger shrimp breed effectively in captivity. If this continuous stream of wild broodstock is not screened thoroughly, it can (and have) been a vector for introducing disease into shrimp ponds.

less valuable milkfish sold both at local markets and to some extent also exported.

Stocking the pond with *benur* is done during spring tide<sup>57</sup> (*puncak air*), when the high tides are the highest and the low tides are the lowest. For the next 2.5 to 3 months, the shrimp are left to grow. During these months, the caretaker ventilates the pond a couple of times a week by emptying it partially through the sluiceway when the tide is low, and filling it again during high tide. This is done in order to add new microorganisms for the shrimp to feed on, as well as to control the quality of the water somewhat. When not occupied with the sluiceway, the caretaker is (supposed to be) constantly working on maintaining the embankments that are surrounding the pond. Piling new mud on the sides and the top of the embankment as well as closing any possible leaks is a Sisyphean task done with shovel and hoe.

Harvesting is also done during spring tide, to leverage the difference in water level between the pond and the outside river when the tide is low. By tying a net to the sluiceway and opening it, the shrimp and fish inside are trapped. By tying off an end of the net, it can be partially emptied while the water is still flushing through the other end, a process which is repeated many times if the harvest is good. Taking care not to empty the pond completely, it is then typically filled and emptied again over one or two successive high and low tides in order to harvest as much of the shrimp as possible.

During and after the harvest the catch is sorted. The tiger shrimp is separated from the fish and wild shrimp, and packed in boxes

---

<sup>57</sup> Spring tide (when the sun and moon aligns during new and full moon creating stronger tides) occurs twice a month, as do neap tide (when the sun and moon are at an right angle, creating weaker tides). Tarakan experiences two tide cycles a day of different heights, what is known as a mixed semi-diurnal system (Ray, Egbert, & Erofeeva, 2005, p. 75).

with ice brought to the pond for the occasion. As the value of the shrimp is determined by size, condition and the freshness, it is packed as carefully and quickly as possible, before it is taken back to town in a fast boat. The money for buying ice and for renting the boat, is also commonly paid for by the post owner to which the pond owner is indebted.

When done, the boat will head straight to one of the many posts located on one of the many piers either in Tarakan or on one of the smaller villages north and south of the city. Indebted pond owners take their harvest to the post where they have their debts, while the ones without debts either already have arranged or will arrange with a post before they arrive. At the post, the boxes of shrimp will be lifted out of the boat and inside, where the harvest will be sorted and weighted. In smaller posts, this is usually done by the post owner himself, but most of the time a manager (*mandor*) will be in charge of this very important job. Anxiously watched by the pondowner<sup>58</sup>, the manager sorts the catch into size categories, discarding damaged or diseased shrimp. The size and quality of the shrimp is of utmost importance, as the price per kilo increases almost exponentially the larger and fresher the shrimp is.

After the grading, the *mandor* writes a receipt detailing what the post will pay for the different grades of shrimp, and then adds the quantity of each grade in the harvest. A total is reached, and if the pond owner is indebted at the post, a percentage is subtracted as down payment, while the rest is paid in cash. In general, the prices for indebted pond owners are lower across all

---

<sup>58</sup> And with good reason. As a *mandor* at a middle-sized post told me: "Just by looking at the harvest, I can estimate the percentages of the different sizes, very precisely [...] I get a salary and a commission - so, I grade it low when we get it from the ponds, and I grade it high when I sell it [to the cold storage]".

size categories<sup>59</sup>. From this cash, the pond owner then pays his caretaker the percentage agreed upon, which is typically 10-20 percent.

If the post owner is himself indebted, he will then take the shrimp to his creditor, either a larger post owner or more commonly a cold storage. Here the exact same situation will play out again with the roles reversed. The *mandor* assumes the role of the seller, looking carefully while the sorting and grading being done all over again, trying to argue over the slightest size differences. A new receipt is written, money exchanges hands, and in the case where the post owner is indebted, a down payment will be subtracted and the prices will generally be lower. Larger independent post owners, who are free to sell where they want, tend to sell at better prices, and in larger volumes. At the cold storage, the shrimp is washed, sorted (again) and processed according to whatever end product is wanted. The shrimp is packaged, frozen and stored. At some point they are packed in a refrigerated container and shipped off towards a distant network of wholesalers, retailers and finally consumers.

The "golden years" of shrimp farming followed. Caretakers earned a living and sometimes advanced, owners and middlemen prospered, new cold storages opened. Huge mansions were built in Tarakan and children were sent abroad to study. Migrants from especially rural Sulawesi migrated to Tarakan in large numbers to find work in the booming shrimp sector. Fortunes were made, fortunes were lost. Sit down with any old salt in a coffee shop in Tarakan, and he will tell tales of fantastic harvests, of the money he earned and spent foolishly during the "golden days" of shrimp farming, how he

---

<sup>59</sup> There is no interest on these loans, perhaps in deference with the prohibition on usury in Islamic law.

managed to work his way from caretaker to owner over a few harvests and how it has not been the same ever since.

## SUMMARIZING THE CHAPTER

The pondscape at its height in the mid-00s, with its promise of incredible riches for those willing to risk it, put Tarakan back on the lips of many Indonesians. "Tarakan is famous. They have the best tiger shrimp in the world. It is the capital of seafood!" as one of my Jakarta friends, a self-declared foodie, told me. "But I have heard that it is a wild place, so take care!" she added.

In this chapter the unpredictable messiness of everyday life has been pushed aside, for now, in order to make room for the broader strokes of a *longue durée* inspired description of a genealogy of extractions that have unfolded around the city of Tarakan. Considering the scope of this chapter - tracing the parentage of the pondscape, the result is of course both somewhat simplified and schematic, and might even come across as overly deterministic. Instead of seeing this as purely a lack, I think one should remember that while a lot of established middlemen and lucky (and brutal) newcomers cleverly managed to assert their agency and shape the succeeding frontiers to their advantage, an unknown number of people was violently cast aside, disenfranchised and dispossessed while others prospered. While their stories will form the two succeeding chapters, this chapter has mainly described the outcomes of those who were successful, those who carved the flows and gave direction to the extractions which eventually formed the pondscape.

Before the tiger shrimp, Tarakan had been known for other commodities. It had been a wild place before. People had both prospered and suffered, as different frontiers swept through the forests and along the coasts. The main argument in this chapter is



that the rapid proliferation of the pondscape drew upon a long genealogy of past extractions. In other words, the arrival of the pondscape was neither an isolated occurrence nor was it inevitable. Would the pondscape had come into being in this exact place and time had it not been for this past genealogy of extractions? As impossible as it is to answer that question, as possible is it that an interconnected succession of past extractions, connections and ruins paved the way for the pondscape at its height, and as we shall see in the following chapters, eventually for what was to come.

As a frontier, the pondscape was assembled from a number of recursive elements, (Cons & Eilenberg, 2019, p. 2; Middleton, 2019, p. 196): the ones highlighted here being a long history of extraction, long established systems of patronage and debts, the presence of competing forms of public authority as well as ruined environments and -infrastructures from earlier resource booms. This recursive frontier assemblage "encourage[ed] ever-intensifying forms of resourcefulness" (Tsing, 2005, p. 32), leading to a succession of increasingly all-encompassing and ruinous generations of extraction.

### Past and present flows

Each generation of extraction is telling a story both of global demand and one of local supply; the vast majority of the resources extracted and the commodities exported were destined for export, a constant thread running through the genealogy. Patronage relations fused with early commodity chains, and later with supply chains, as markets expanded and technology increased the scale of possible extraction (Barney, 2009, p. 146; Fougères, 2008); chainsaws, trawl nets, excavators, ice factories, refrigerated containers - the whole world a market.

Large-scale shrimp farming was already widespread across much of South East Asia when the proliferation of the pondscape took speed in the years following the Asian financial crisis. In fact, the popularity of the tiger shrimp, to which the entire pondscape was built around producing, was already being eclipsed by other more manageable and profitable species of shrimp elsewhere, both in Indonesia and in the wider region, but the pondscape grew undeterred. As such, the Tarakan pondscape was a latecomer in the global boom in shrimp aquaculture, and could at first glance easily be considered an ill-advised relic with its extensive ponds, low yields and decentralized and all-pervading systems of patronage-based financing. But paradoxically, these very qualities fitted extremely well into a supply chain economy where production, risk and ruination were outsourced by foreign owned cold storages to layers of middlemen, pond owners and caretakers, thereby "rationaliz[ing] inventory at the same time as sustaining disparate cultures and politics of production" (Tsing, 2016, p. 330).

Although the cold storages did not create the system of debt based patronage, through supporting the hereditary middlemen dynasties with special discounts and introducing a class of smaller middlemen equipped with loans, the cold storages not only used the debt-based system of patronage to their advantage, they maintained it and reshaped it (ibid 331). By sponsoring these webs of patronage, hundreds of new middlemen were introduced into the shrimp-business and equipped with loans to form new patronage relations with immigrant would-be pond owners, and the pondscape grew accordingly. By relegating the cumbersome production and management of shrimp ponds to a veritable watershed of caretakers, indebted pond owners and middlemen, the cold storages outsourced much of the risk and uncertainty inherent in large-scale

aquaculture - harvest failures and volatile market prices, while also distancing themselves from the messy aspect of land grabbing, environmental destruction and the dubious legal status of the vast majority of the pondscape.

Despite having thus separated themselves from the production of shrimp, the cold storage had a de facto monopsony on more or less every shrimp farmed in the pondscape, whether it was farmed by indebted or independent pond owners and resold by indebted or independent middlemen. Contrary to many of the other commodities that have fueled the different generations in the genealogy of extraction presented in this chapter, the tiger shrimp once caught, is highly perishable, which made speculation against the cold storages very difficult, thus further cementing their position. Without proper refrigeration in the tropics, long term storage of shrimp is impossible and even large independent middlemen with easy access to ice, wouldn't wait long for marginally better prices before selling<sup>60</sup>. Thus, despite not owning a single pond, the cold storages could buy practically every single tiger shrimp produced in the pondscape, at prices they ultimately set themselves<sup>61</sup>. This coexistence of prosperity and precarity, is both a requirement and a result of capitalist supply chains, a juxtaposition that is "one of the conundrums of our time" (Tsing, 2016, p. 330).

### The public private

During the oil frontier in the early 20<sup>th</sup> century, the city was run, more or less, by the Bataafsche Petroleum-Maatschappij (BPM), a company owned by, and today merged with Royal Dutch Shell. Though

---

<sup>60</sup> Interview 13.02.2018.

<sup>61</sup> Although there was some smuggling of shrimp across the border to Tawau, Malaysia during the boom years of the mid-00s, this was carried out by the larger independent middlemen, not the ones indebted to the cold storages (Interview 13.02.2018).

a private company, the oil industry was of critical importance to the Dutch colonial state, and all of Tarakan was considered to be of the highest military significance. The company built all infrastructure and imported a workforce that dwarfed the original population of the island. Likewise, during the timber frontiers following Indonesian independence, the rent from the illegal trade in logs was a significant source of income for the officials tasked with eradicating it, and the local government at large. The timber entrepreneurs involved had effectively *carte blanche* to continue selling logs across the border, as long as the bureaucracy and military received a share.

In the genealogy of extraction, such twilight institutions (Lund, 2006), not part of the state *per se*, exercise a *de facto* authority when it comes to resource extraction, simultaneously enforcing and challenging local state authority<sup>62</sup>, most of the time, to no apparent opposition from the local government. In fact, when it comes to extraction during resource booms, it is often meaningless to distinguish between public and private at all, the private becomes public and the public becomes private (Tsing, 2005, pp. 35-36). At the height of the pond frontier, the cold storages took on the *de facto* authority over managing the pondscape. As shown above, they promoted the proliferation of ponds and expanded their networks of indebted middlemen, and they welcomed the shrimp produced in "paperless" ponds. Their often very close relationship with both local government officials and military, made them more often cooperating rather than competing with local officials and bureaucracies<sup>63</sup>.

---

<sup>62</sup> For a more exhaustive discussion of the current interplay between local and national levels of government and the private sector in Tarakan, see (Mikkelsen & Eilenberg, 2021).

<sup>63</sup> The role of cold storages in farmed shrimp booms across the world is well described. See for example (Bourgeois et al., 2002, p. 10; Levang, 2002, pp. 7-8 & 20-21; Vandergeest et al., 1999, p. 584).

Take PT. Mustika for example. The largest cold storage in Tarakan, managed by a joint venture between two multinationals: Gallant Ocean International, a Japanese owned, Taiwanese based seafood company, and Dachan Great Wall Group, an enormous Taiwanese agro-food conglomerate. With more than a 100 other subsidiaries all over the world, the cold storage in Tarakan is only a minuscule part of Dachan Great Wall Group's wider involvement across a range of supply chains, their diversity ranging from intensive poultry farms in China, feed factories in Vietnam and high-tech vaccine research in Japan to, in this case, tiger shrimp in Indonesia (Asia-Today, 2020).

But in Tarakan, with more than 1000 workers employed in its production line, PT. Mustika were the biggest private employer and probably the largest single taxpayer<sup>64</sup>. The company had a close but opaque relationship with local government and law enforcement - many of the fishery officials tasked with regulating the pondscape sold their own shrimp at PT. Mustika. Tellingly, the local fisheries department had worked hard towards securing the company an export permission to the EU, which paradoxically required that the fisheries office attested that the production of shrimp was traceable and conformed to the very same laws that they readily profited from ignoring. The paradoxes continue: the "Tarakan Tiger", was marketed as "organic" and "traditionally grown", but was actually a recently introduced boom crop, grown by Bugis migrants on land appropriated from the indigenous Tidung. Additionally, as shall be discussed in the following chapter, neither was it in any way organic. In the frontier, paradoxes are an integral part of reality (Tsing, 2005, p. 33), and they are rife throughout the genealogy of extraction.

---

<sup>64</sup> Interview 06.03.2018.

## Layered ruination

Oyster beds were depleted in the hunt of pearls, forests cut in pursuit of timber. The seafloor torn up by increasingly heavier and bigger trawl-nets. Around the derelict oil wells, the soil still oozes with the hazardous waste of past oil production.

Ruins persist. After large-scale extraction, large-scale destruction remains. Through the genealogy of extraction, ruins are reconfigured in new ways, their presence giving life to some futures while simultaneously restricting others (Stoler, 2008, p. 194). The oil frontier which catapulted Tarakan into the global markets in the early 20th century, left it transformed. As the oil industry expanded pre WWII, so did the timber frontier. Although oil never peaked after independence, the oil infrastructure - substantial harbor facilities, the power plant and the airport were reconfigured, and made Tarakan an attractive place for both sawmills and later cold storages. The cold storages profited as trawlers emptied and ruined the fertile coastal ecosystems, and later sponsored the massive expansion of the pondscape, much of it on land previously logged.

Ruined ecologies profited some, but ruined others (Stoler, 2013, pp. 10-14). The pre-colonial trading networks in birds nest fueled wars between upriver peoples and the largescale procurement of trepang and pearls was carried out by slaves caught in raids across much of South East Asia. As the reefs were plucked dry, and swallow caves emptied, the hunt for new commodities was continual. In a similar vein but on a much larger scale, the oil installations on Tarakan prompted two invasions, first by the Japanese, and again at the end of the war by the Allies, who flattened the entire city in the process. As timber frontiers had denuded the low lying forests, the oil frontier left much of the city of Tarakan an poisoned underground. Concurrently the ruination brought along by

the maritime shrimp frontier and the expansion of the pondscape effectively destroyed most of the resources so many fishermen depended on for their livelihoods, and left them in a state of precarity.

But this is not the last chapter in the genealogy of extraction, with all its accompanying ruination. Ruination is a continual process, and the pondscape will not be the last generation of extraction. Today, it is the pondscape that is slowly falling apart in a creeping process of ruination.

The mud embankments that encircle the ponds invariably fall apart, slowly dissolving and collapsing. Successive cycles of parching heat bake the piled-up mud into a rock-hard substance, while tropical torrents slowly but steadily eats at the stomped and sunbaked soil. This process is accelerated by burrowing animals, crabs of all sizes digging into the embankments from below - undermining them. The heavy sluice gate is ever so slowly sinking into the ground, capsizing in slow motion. At the bottom of the pond, the refuse of billions of shrimp accumulate, while poisonous compounds are washed out of the embankments and into the pond every time it rains. As long as the pond is productive, the caretakers will repair the damages as well as he can. Piling mud on top of the embankments, closing the leaks with mud. This is backbreaking work, done manually with hoe or shovel, each and every day. A Sisyphean task.

At one point, the pond start failing. Occasionally at first - a mishap maybe, that is what happens. Were the shrimp larvae of bad quality? Was the caretaker lazy and did not do his job? Did too many predatory fish enter the pond during refilling? The explanations are many. But at one point the failures start becoming more frequent. The pond is sick - something is wrong. After conferring with the middleman bos to which the pond owner is

indebted, the pond owner might buy a bag or two of antibiotics or some of the many kinds of pesticide available (on credit of course), he might even leave the pond in fallow for a while. It might help at first, but soon the failures become ever more frequent.

A large part of the pondscape is in a process of ruination. An increasingly larger area of older, downriver ponds have started failing on a regular basis, many are abandoned, and livelihoods change for everyone involved.

.o000o.

This chapter has taken a broad, top-down perspective on the genealogy of extraction in the attempt to trace the parentage of today's ruined pondscape. Ending the tale at the height of the shrimp boom, this chapter form the context for the two following chapters. These chapters will describe the present situation in the genealogy of extraction, the scope will be narrowed down and the pace of writing slowed considerably, as each of the two chapters engage in a separate yet connected tale from the bottom of the ruined pondscape.



## CHAPTER III - A CRABBY TALE



In this chapter, we will visit the core of the pondscape, a vast and empty place, the core of which is increasingly falling ruins. Spread along the deltas and low-lying riverine areas along the coast of North Kalimantan, aging shrimp ponds in varying stages of decay and neglect have turned out to offer some possibilities for the continued extraction and sale of aquatic products within old modes and networks of production and accumulation. In a strange turn of events, creatures initially seen as a pest and a nuisance, the omnivorous mangrove crabs (*Scylla* spp.), have become a new, highly sought after, commodity in parallel with the decline in farmed tiger shrimp (*Penaeus monodon*) around which the entire pondscape was initially constructed.

This tale from the ruined pondscape shows how in some ruins, there are new ways to turn to, new resources to extract, new ways of maintaining one's livelihood, adding a new chapter and dynamic to the genealogy of extraction that has taken place here. But as we shall see, these new openings quickly get entrenched in the well-established arrangements of debt and exchange, bureaucracy, the machinations of rent-seeking officialdom and a violent criminal underworld.

But the possibilities offered by the collecting and selling of mangrove crabs are not within reach of everyone. They drip down to the hired pond workers, the people at the bottom of the shrimp business, while bypassing the pond owners, who are rarely present at their ponds, except during harvests. As state and non-state actors race to close this nascent resource frontier, as with past generations of extraction, the trade in this new commodity richly rewards those new and old businessmen who were quick to establish themselves, or were already well-established, in middlemen positions along the emerging commodity chain. Where the tiger shrimp is still considered the prize crop by the district and province administration and its supply chain is almost exclusively controlled by cold storages, the commodity chain of the mangrove crab is unruly and still not territorialized (yet).

In the following sections we will visit what is left behind the pond frontier: stagnant pools, collapsed embankments, derelict sluice gates, unpayable debts. Some new ponds have bad harvests, some old ones have good ones, but over time, all ponds produce less and less. After some 20 years, most ponds become economically unviable and are either sold to gullible newcomers or abandoned. The first ponds were built along rivers close to or even on the island of Tarakan. This is where the ruination begun, and this is where ruination today is most evident.

The mangrove crab, a big bulky creature endemic to the mangroves and estuaries that were converted into the pondscape migrate into and thrive in both healthy and ruined ponds, but it is in the ruined ones where shrimp harvests have failed, that pond-workers supplement or wholly substitute their income by collecting and selling crabs, often contrary to the wishes of the absentee pond owners. To the owners, the mangrove crabs are considered pests, as they feed on the shrimp stock and their burrowing undermines the pond embankments, accelerating the ruination. When caught, the still live mangrove crab are bound, bought and sold several times, and finally shipped across the border to the Malaysian border city of Tawau in a Styrofoam box on the deck of a high-powered speedboat. From here they are flown to buyers, wholesalers and ultimately consumers across much of South East Asia, but most notably to Kuala Lumpur, Hong Kong and Singapore where they are considered a prized delicacy.

The state, at district, province and national level, alongside a collection of other state and non-state actors, have varying, often competing, interests in controlling, taxing and restricting the collection and sale of mangrove crabs, of damming and redirecting the flows. While gravid mangrove crabs recently became illegal to export, per decree of the national Ministry of Maritime Affairs and Fisheries, they are also by far the most sought after and expensive. This has led to a significant and surprisingly well-organized clandestine trade, where smugglers engage in a risky game of high-speed tag with the authorities, at times bribing patrolling navy and police vessels, at times attempting to sneak past, or even outrun them in break-neck pursuits in the dark.

.o000o.

This chapter will commence with a description and discussion of the process of ruination, and how the failing harvests put uneven

strains on the reciprocal part of the patronage-come-debt-relations between middlemen, pond owners and cold storages. Next, we turn to the ruined ponds, and the opportunists that inhabit them, human and nonhuman alike. The habits of the mangrove crab are briefly discussed, and the caretaker's shift from sharecroppers of shrimp to roaming the ruined pondscape for crabs is discussed. Sharecropping in the ruined pondscape is an increasingly hopeless endeavor, and most if not all, caretakers spend a substantial amount of their time looking for mangrove crabs, or resting after their nightly collecting-trips.

Then, we follow the mangrove crab as it is sold to a collector and taken back to Tarakan, where it, along with hundreds if not thousands of other crabs from all over the pondscape, are graded, sorted and packaged, already reserved by a Malaysian trader in neighboring Tawau over phone. After being shipped from the jetties of Tarakan, the crabs become the prize in a complicated game between a handful of actors of varying provenance, affiliation and persistence. Arriving in Tawau, as most of them do eventually, they are bought by agents, checked for quality and shipped off by air, eventually ending their lives on the dinner-plates of affluent seafood connoisseurs in the metropolises of South East Asia.

## RUINATION



*Squatting around the impromptu bonfire, the sweet smoke from our clove-cigarettes mixes with the suffocating fumes from the water-logged firewood. We are harvesting the pond tonight for tiger shrimp, the larvae of which, flown in from Java, was put in here three months ago, and which should now have attained maximum size. It is spring tide - the conditions for harvests are as good as they get.*

*The whole day has been heavy with anticipation. Everyone, myself included, is tense. Will this be one of those fabled harvests you hear about? The usually foul-mouthed man who owns the pond has not uttered a single swear-word all day, and has prayed four times already. Several workers from the neighboring ponds have joined us; if the catch is good there will be a need for quick and skilled*

hands in sorting and cleaning. The wife of the owner arrived yesterday, bringing enough food and drink for a veritable feast, which we have already started. One of the travelling traders has moored his boat at the jerry-rigged quay, and will stay here during the night, although hopefully no one will get any sleep. Someone lights a few more egg-trays on fire. The acrid smoke from burning glue and fiber is the best way to keep the swarms of blood-sucking insects at bay, but the smell is chokingly similar to that of melting plastic. Combined with liberal amounts of citronella oil, we can work in relative peace though.

There is a small generator running at the house, but we don't turn on the electric lightbulb dangling from a roughly hewn pole above us. Although bandit raids most often target the upriver ponds, the owner doesn't want to tempt fate. There are too many stories of armed bandits raiding ponds during harvest, tying down (or worse) owners and caretakers alike, and disappearing mysteriously in the night with the valuable harvest. It is on the front pages of newspapers every new moon, when the ponds are harvested, and it is a public secret that the bandits have some kind of deal with the police. It is a favorite topic for discussion among shrimp-men, along of course, with the ever changing prices of shrimp, and the causes for rising number of failed harvests.

There is a rush of water as the caretaker manages to wriggle loose the wooden planks that close the sluice gate. As the water inside the pond is almost two meters above the water in the stream, the pressure is immense. The caretaker deftly escapes to safety as the water rushes through the opening, he must have tried it many times before. One slip and you will end up inside the long net suspended from the gate into the river behind us, when the water comes rushing through, not a place you want to be. We watch as the pond slowly drains through the net. After 20 minutes, the end of the

*net is tied off and pulled ashore, its contents poured onto a dirty tarpaulin. This is the crucial moment. How much will it hold? How big are the shrimp? The owner of the pond bends down and unties the cord and a wet, squirming mass of life flows out.*

*There are barely any shrimp.*

*"The big ones are strong. They don't come in the first haul", the caretaker says, eyeing the pathetic pile of tiger shrimp, among all kinds of wriggling fish. The owner is quiet at first. "Everyone knows that", he replies after a while. In the following silence, one can hear the movement of the squirming mound of bycatch left gasping for air in the darkness, the buzzing of the mosquitoes, the crackling of the flames. The net is thrown back. The pond will take three or four hours to empty, the net will be pulled in many times.*

*The next haul produces the same miserable ratio between bycatch and tiger shrimp; even a banded sea snake has been trapped in the net. It is killed with a machete. After three hauls, the bottom of the first Styrofoam box is still visible. It becomes evident that this harvest will fail - it might not even cover the food, smoke and drink that the owner had bought for the event. The shared disappointment makes my presence awkward. What was supposed to be a celebration has turned silent.*

*When the old caretaker from the neighboring pond gathers his few possessions and heads into the darkness with his crab net without a word, I excuse myself and follow him.*

*Old ponds like this one, are the least attractive. They are often sold, cheaply to speculators or dearly to gullible newcomers. Sometimes they are even abandoned. This pond is the only one the owner has, he bought it last year. It was intended to secure him and his wife financially when he retires from his government job.*

*Luckily it has been paid off, and although he has incurred some debt from this failed cycle, he is not ruined. Maybe the next harvest will be better. Maybe won't.*



## Ruined ponds

Today, even as more and more ponds are being constructed at the fringes of the ever expanding pondscape, the overall production of tiger shrimp has stagnated at best. "We have spare capacity these days. I could sell what I can produce twice - no problem" the manager of the largest cold storage in Tarakan, PT. Mustika, told me, sitting in his clean air-conditioned meeting room by the harbor. "The downriver ponds, close to Tarakan just don't produce that well anymore. The good ones lie far upstream, or in Bulungan [an area only recently developed into ponds, south of Tarakan]. You have to travel further and further away to find the good ones<sup>65</sup>".

In this corner of North Kalimantan, as in many other places where pond-based aquaculture has been practiced on a large-scale for decades, productivity is decreasing especially in downriver areas<sup>66</sup>. Older ponds fall into disuse, quickly deteriorating. The mud embankments that encircle them, once laboriously maintained by hard-working men, crumble and leak while the abandoned sheds that once held families are scavenged for building material.

Around these ruins are clusters of ponds that are still maintained, restocked and harvested as in the old days, but which now produce only erratically. Failed harvests happen frequently, and can sometimes be predicted. Some signs are subtle; an overrepresentation of a certain kind of freshwater snail; too much or too little of certain kinds of algae. At other times the

---

<sup>65</sup> Interview 06.03.2018.

<sup>66</sup> The average lifespan of a shrimp pond has been estimated to be between 2-10 years (Gräslund & Bengtsson, 2001, p. 96), 5-10 years (Gujja & Finger-Stich, 1996, p. 36; Primavera, 1997, p. 28), 7 years, (Dierberg & Kiattisimkul, 1996, p. 657), 7-15 years (with improved management) (Flaherty & Karnjanakesorn, 1995, p. 34). For an older discussion on the scale of abandoned ponds across South East Asia, see Stevenson (Stevenson, 1997).

disaster is obvious even to the untrained eye: the water smells decidedly foul, has an unusual color or might even be covered by a sticky oily film. But most of the time, the failure is not evident until the pond is emptied for harvest. Even in a healthy pond, you don't see the shrimp when walking along the embankments, so it is difficult to estimate their number beforehand. Anticipation can turn into disappointment in a few hours during a harvest, when nothing of value gets caught in the net.

Why do these failures happen? Explanations vary. Most of the owners and caretakers I spoke to blame things outside their control: poor seed stock, or the toxic runoff from the expanding palm-oil plantations upstream - their herbicides, pesticides and fertilizers foul the water I am told. The clearing of upriver forests changes drainage dynamics, which during heavy rainfall, leads to surges of fresh water through the otherwise brackish river systems, fatal to the shrimp, say others. Some blame the upstream hydraulic mining, where riverbanks are washed away with high-pressure hoses, and mercury is used in the process of extracting the precious flakes of gold. There are plenty of external factors that could possibly be to blame.

But other explanations are plausible too. The soils in mangrove swamps are rich in acid sulfates, formed over thousands of years of anaerobic decomposition of accumulated organic material. As long as the soil is waterlogged, these acid sulphates form stable, inactive minerals. But when the mangrove is cleared, drained and developed into a pond, these compounds quickly react with the sudden available oxygen and form sulphuric acid, which turns the water acidic. This again triggers the release of a range of heavy metals such as iron and aluminum into the water, both of which are poisonous to shrimp and fish alike (Gavira, Schmittou, & Grover, 1986, pp. 100-104). While the bottom of the ponds are only dried

out between harvests, the embankments, which are made from piled up soil from the pond bottom, dry out completely. During heavy rains, the accumulated acidic substances are washed out of the dikes and into the pond (ibid, p. 106). The vigilant caretaker can mitigate this somewhat, by constantly flushing the pond, especially during rainfall, but he cannot avoid it completely. Such effluents from large areas of acid sulphate soils, have even been shown to seriously affect the ecology of entire estuarine ecosystems (Dent, 1986, p. 37; Sammut, 1996; B. Wilson, White, & Melville, 1999).

One could also seek an answer on the shelves of one of the many shops selling equipment to pond owners. Here you will find a collection of products to match the chemical shelf of any plantation: piscicides, molluscicides, herbicides, fertilizers and an assortment of unlabeled and cryptic powders and mixtures<sup>67</sup>. I have heard that some people even add broad-spectrum antibiotics to their ponds, in a desperate attempt to halt the ruination. Much concern has been expressed over these practices. The impact of the widespread use of pesticides and antibiotics in pond aquaculture, especially as products become mixed in the warm, stale waters of the pond, are little-researched but potentially horrifying in the long-term (Gräslund & Bengtsson, 2001, p. 118ff; Holmström et al., 2003).

---

<sup>67</sup> By the ponds, I have seen discarded containers of Thiodane (a brand name for endosulfan) (Gräslund & Bengtsson, 2001, p. 112) and saponine (ibid, p. 114), both of which are piscicides, as well as Bestnoid (brand name for fentin acetate) which is used as a molluscicide (ibid, p. 113). Although Bestnoid (Also known as Brestan) is illegal to use in aquaculture in Indonesia and much of South East Asia, and have been shown to accumulate in fish (Coloso & Borlongan, 1999), I saw these products marketed openly in shops in Tarakan.

Others again, with a nod to past histories of bacterial and viral epidemics that have dogged shrimp aquaculture since the industry began, talk about the lack of know-how and technological inventions to limit these devastating events. Without them, disease spread easily through the extensive shrimp ponds, where the accumulated buildup of waste from billions of shrimp form a hotbed of infection. Once disease has hit, it easily spreads from pond to pond through the waterways connecting them all (Corea, Johnstone, Jayasinghe, Ekaratne, & Jayawardene, 1998; Flegel, 1997). Such epidemics have occasionally wiped out entire populations of shrimp across countries, and pond owners tell harrowing stories about these feared antagonists with names such as Whitespot or Yellowhead, responsible for dramatic die-offs, bankruptcies and crippling debts across the whole world (Vandergeest, 2008, p. 216; Walker & Mohan, 2009, p. 126). Such spectacular epidemics have occurred in the pondscape too in the past, killing almost all shrimp, but they do not appear explain the slow and steady drop in productivity that is taking place outside these events.

In short, the possible reasons for the largescale ruination of the pondscape are many, and the causes certainly multifaceted, contingent and unfortunately, it seems, unavoidable. They accumulate, interact and linger (Tsing, 2015a, p. 6). But while the ruination of the individual pond is due to such a constantly fluctuating combination of factors (Deb, 1998; Dierberg & Kiattisimkul, 1996, p. 657; Páez-Osuna, 2001, pp. 132-133), it is the fundamental interconnectedness of the pondscape that makes the ruination so widespread. It is the ease with which ruination scales from the singular to the whole, from singular pond to plural ponds. As each individual pond is connected to every other upstream pond, they all rely on the same water; they all rely on the same river. When a caretaker in a downriver pond opens his sluiceway, the

water that rushes in has already been past hundreds of ponds upstream, and he gets an unfiltered share of whatever there was in the water in every single one of them. And as the rivers reverse during flood, upstream ponds are at threat too, carrying downstream water upstream all the way to the tidal limit (which is also the limit of brackish shrimp aquaculture). The connectedness that made large-scale, extensive shrimp farming possible, eventually accelerates its ruination. In the ruined pondscape, the choices of the past are determining the possibilities of tomorrow (Paprocki, 2019).

Old downriver ponds are being abandoned every season. In some of the remaining struggling ones, owners maintain production, at least for a while. Some out because of sheer stubbornness, others because of mounting debts that desperately needs repayment. As the prospect of good harvests decreases, so does the reciprocity and solidarity between many patrons and clients. Indebted pond owners struggle with loans repayable only by that windfall harvest that grows ever more unlikely, leaving the middlemen to face their own creditors increasingly empty-handed.

### Patronage in flux

As discussed in the preceding chapter, the emergence and expansion of the pondscape, and past generations of extraction, was to a large degree managed and financed through extensive webs of patronage connecting caretakers, pond owners and middlemen, ultimately terminating at the cold storages.

Among Bugis, who throughout the lifetime of the pondscape have constituted the vast majority of caretakers, pond owners and middlemen, such patronage relations were cast along the lines of

the conventional *punggawa-sawi* relationships<sup>68</sup> discussed in the preceding chapter. Here the pond owner provided a middleman post owner with his loyalty and exclusive rights to his harvest at a discount, in exchange for access to loans and financial assistance in times of hardship. As previously discussed, there was in general at least some reciprocity involved in these relationships, securing to a certain extent, the pond owner against harvest failures and the post owner a stable supply of shrimp at a premium price.

However, during my fieldwork, I was hard pressed finding people who would recognize the *punggawa-sawi* relationship as a current institution in the shrimp supply chain, despite my insistent inquiring. Caretakers, pond owners, middlemen and cold storage spokespersons alike, all acknowledged the terms, but repeatedly told me that they held no meaning today, that people did not use them anymore. "*Punggawa* is the old word, we do not use it today. Maybe some of the old people do. We just say *bos*, that is it"<sup>69</sup>. Likewise, among the larger Indonesian-Chinese middlemen, the term *tukei* was falling out of favor, as the son of a major Chinese-Indonesian middleman put it: "Today it is the word people call us kids of Chinese descent right before we get mugged.[...] Personally I don't like it anymore. Some of my father's older associates use it out of respect, but in general, we just use *bos*"<sup>70</sup>.

And it was not only the terms that had changed – so had the meaning. The assistance to struggling pond owners offered by *punggawa*, crucial to the institution (Pelras, 2000) and highlighted in the Tarakan shrimp business by Kusumawati et al. (2013), seemed to be

---

<sup>68</sup> "[T]he entire [shrimp] value chain in the region [around Tarakan] is determined by multiple interdependencies of *pongawa*" (Kusumawati et al., 2013, p. 904).

<sup>69</sup> Interview 06.01.2017.

<sup>70</sup> Interview 20.03.2017.

far from ubiquitous among middlemen of today, many of whom now only provided loans for expenditures solely associated with shrimp farming. Although, as attested by several pond owners I spoke with, some of the larger and well-established middlemen still assisted and “looked after<sup>71</sup>” pond owners indebted to them, these were predominantly older, few in number and had been in the business for a long time with the same bos.

The majority of smaller pond owners I spoke to, repeatedly stressed that loans now were for business only: “I took a loan from my bos for the pond, and for buying the shrimp seed, and other things I need. I pay it back with my harvest. [...] I cannot take loan for myself, only for these things [related to shrimp farming]”<sup>72</sup>. A middleman bos elaborated: “I only give loans for business. I make a receipt they can take to the shop and buy seeds. Or a receipt they can take to buy supplies. For me it is pure business, I do not give loans to other things, I do not give them cash”<sup>73</sup>. These kinds of loans lack most, if not all, of the reciprocity of the *punggawa-sawi* relationships that is described in the literature and reminisced about among old pond owners and middlemen.

Timmer (2010) anticipated such a development among *punggawa* patrons and *sawi* clients engaged in a similar shrimp supply chain in the smaller pondscape stretching across the estuary of the Mahakam river in East Kalimantan. The changing patterns of patronage, he argues, makes: “the poor poorer, especially when, as today, harvests are poor, debt repayment is inescapably delayed, and new loans are hard to get. The functioning of the *punggawa* as provider of services, insurance, and pensions, [...] is possible in the delta as long as the aquaculture business supports it. [...] Not

---

<sup>71</sup> One of the larger middlemen even acted as a bank for some of his oldest clients, keeping a separate book for deposits.

<sup>72</sup> Interview 16.03.2018.

<sup>73</sup> Interview 11.01.2018.

surprisingly, as harvests decline, *punggawa* lose significantly in status as bringers of welfare, yet they receive little criticism from their clients because of clients' own shame [...] and debt" (Timmer, 2010, p. 704).

Acciaioli (2000) described a similar situation, where new generations of Bugis fishermen and fish buyers around Lake Lindu in Sulawesi, in opposition to an entrenched system of traditional patronage dominated by a few powerful middlemen, shifted towards a system of (kin-based) debt instead: "[Where] kinship provided the form or idiom, debt functioned as the social agglutinant. [...] [S]ubsequent fish contractors were never referred to as traditional patrons or *punggawa*, but simply as *bos*[,] [i]n contrast to the traditional patterns of reciprocal moral obligation between differentially ranked patron and client" (Acciaioli, 2000, p. 218).

In Timmers account, the *punggawa-sawi* system is losing legitimacy as harvests are becoming poorer, and by Acciaioli's account, due to the power of a few entrenched patrons dominating the market. In the ruined pondscape, it is a combination. Here, as harvests increasingly fail, a handful of cold storages hold a veritable monopsony over the undergrowth of middlemen. What reciprocity there was in these arrangements is being washed away. In all practicality, patronage increasingly becomes more akin to debt bondage. As exemplified by one *bos*: "We share information on bad pond owners among each other [other middlemen] [...] We do not accept people who have unpaid loans at other posts that we know off [...]. We try to keep their debts not too low, not too high. We want them to stay. Too little and they pay it off and leave, too high and they [become desperate and] disappear<sup>74</sup>".

---

<sup>74</sup> Interview 20.03.2017.



The "social ruination" (Stoler, 2008, p. 194) of what had been stable and recognized relations, diluted reciprocity in already unequal patronage relationships. accelerating the difference between prosperity and poverty along the various links in the supply chain of shrimp - it led to a further increasing heterogeneity within connection (Tsing, 2016, p. 331). Keeping the privileged position as sole buyers and exporters of shrimp, the cold storages operated business as usual, adjusting by letting workers go in pace with the decreasing input. Having outsourced the production of shrimp, the changes taking place further down in the supply chain have minor repercussions, they just mean less profit.

But as the relationship between middlemen and pond owners changes, the situation for the caretakers, the manual workers of the pondscape, changes too. A mixture of new and old immigrants, the caretakers are more mobile lot. While not (yet) heavily indebted to bos-middlemen, being sharecroppers, they are the first to suffer from the failing harvests. While many still hope to earn enough to save enough for a down payment on a pond of their own, the widespread ruination of the pondscape has made this increasingly difficult.

The relationship between the caretaker and the owner is often strained, especially in the in ponds where harvests are declining or failing at a regular basis. Since the owners doesn't live by the ponds as the caretakers do, they only see the state of affairs during harvest, where most of them are present, either personally or through an intermediary. Sometimes owners take part in the seeding of the pond, but I have mostly seen it being done by caretakers alone. As the majority of the owners have jobs in Tarakan, they simply cannot visit their pond(s) on a regular basis.

In ponds that are producing well, this is not necessarily a problem, as the caretakers are sharecropping. Good harvests can mean a rather good income for the caretaker, which incentivizes constant maintenance and improvement work on the pond, such as periodic ventilation of water through the sluice gate and the constant strengthening embankments to reduce risks of leakage. In the ailing ponds however, the poor prospects for a good percentage have the opposite effect. Here, the caretakers will be up most of the night to scavenge for mangrove crab, and rest for much of the day. This leaves less time and energy for maintenance, and contributes yet again to the accelerated ruination of the stricken ponds.

## SCAVENGING FOR POSSIBILITIES



*Interrupted, the old man pauses, temporarily blinded by the flash from my camera. A still life in a long series of movement. Taking a moment to readjust to the darkness surrounding him, he continues his walk along the embankment, while I hurry after him.*

*His hands and legs, are covered in the white silt. He will wash when he is done with his round, in the bucket of water standing beside his shack, but his clothes will not be cleaned before he returns to Tarakan in a week or so. And why bother? This will not be the last round tonight, and tomorrow morning he will be standing knee-deep in the water again, digging more mud atop the embankment on which we now walk. In his bag, he carries his phone, money,*

*cigarettes, a lighter, pre-cut plastic string, and some pills he takes for what I think is gout. He never leaves these things in his shack when he is out - you can trust no one in the dark he tells me.*

*In his one hand, but normally on his head, is a headlamp. I asked him to turn it off, and remove it for the photo, otherwise I would catch nothing but its orb of intense light. I brought a headlight too, an expensive one from Denmark, but everyone laughed at its pathetic light, until someone gave me a strong one.*

*The net he carries, is as long as himself. I wonder how many crabs he has caught with it?*

*On his back, he carries a cut-open plastic container suspended from his shoulder by two straps of braided nipa leaves. In it, two crabs struggle in vain to escape the string with which they are expertly bound. Without it, they would tear each other to pieces, making them unsellable. Back at his shack, he will put them into a fish trap, so they can survive until the collector arrives - which could be any day now.*

*At his place, we talk about his life. Born in Bone, Sulawesi, he worked as a farmer in his youth. Buffaloes he told me. When he grew older, he travelled to East Kalimantan where there was work to be had in cutting timber in the forests. He earned much more than as a farmer and was adventurous. He joined a chainsaw gang that was working the hillsides. They would fell the good trees, cut them up and drag them down to the river. Always on the move, sometimes spending months in the forest before going back to town. It was laborious and dangerous work, there were accidents and people got sick from living in the forest he told me.*

*After some years, he took a job in Papua, also in timber. This time though, he worked in a lumber mill by the coast. Better to be*

*away from the forest he says, although you still had to be very careful around those whirring sawblades. Work was good, and he stayed there for a long time. He had money, so he could travel back to Bone to visit his family when he wanted. On these trips he tried to find a wife, but he never succeeded. As he grew older, his strength started to leave his hands, and he became afraid of getting caught in the sawblade.*

*And so, he travelled back to East Kalimantan. Back then, you always went by ship he said. It could take weeks. From Nunukan, he got into Sabah, where he worked in the palm oil plantations. He quickly became a foreman of a gang of men from his ancestral village, and they went wherever they wanted to, work was easy to find as they were hard working. Pay was also good, and he met an Indonesian woman with whom he married and had children.*

*Lured by the stories of the money to be earned in shrimp business in what was then East Kalimantan, he left his wife and children in Sabah, and travelled to Tarakan. Here he pauses his tale, to emphasize that his plan always had been to bring them here when he had earned enough, but that he just never managed to do that. He never managed to save enough. He never managed to get the loan, to get the pond that should have sustained them all. So they stayed in Sabah and he lost contact with them over the years. It is his children that he misses the most, he says and pauses for a while. He has been here for 12 years now, and is the oldest caretaker in the area.*

*For the last five years he has been working for the same owner, but the two ponds he maintains have failed for three consecutive harvests, which has cost him his savings - he is paid a percentage by the owner of the pond. "15 percent of nothing is still nothing. This pond is dead. I doubt there are a single live shrimp in it anymore. You can smell it". He pauses again. As he takes a long*

*drag on his clove cigarette. His face briefly illuminated from below.*

*That is why, he explains, it is so important for him to catch crabs at night. They have provided him with his only income for almost a year. He sells them to a collector who travels past his shack a couple of times a week. The collector also peddles in cigarettes, foodstuff and, the old man lowers his voice as he tells me this, even though safe for my assistant we are alone, plastic bags full of the larvae of crabs. Spread in the ponds that he manages and the neighboring ones, he can get even more crabs at night. The owner mustn't know though, as the crabs feed on shrimp, and dig tunnels in the embankments, undermining the pond.*

*"The crab gives us work too - he burrows into the embankments, making holes so that the water gets through. We work every day to fix the holes, every night to catch the crab. We really are workers of crab!" His teeth flashes in a grin, then he becomes silent again. "I need to work for three more years, before I can retire" he says. Looking at his swollen hands and bent back, I really hope he will succeed<sup>75</sup>.*

---

<sup>75</sup> Interview 10.01.2017.

## Introducing the mangrove crab



The crabs that the caretaker spend every night looking for, was *Scylla* spp., also known as mangrove crab or mudcrab<sup>76</sup>. They are big and bulky creatures with two massive claws that can reportedly cut off a finger. Fully grown adults can weigh-in at over a kilo, making them an impressive sight, even when bound. A prized delicacy, sold alive in the metropolises of Asia, cooked and eaten in up-scale restaurants or in the homes of those who can afford it - the meat in their claws, legs and carapace is delicious and everything but the lungs and gonads is eaten. Their roe is highly

---

<sup>76</sup> My informants used *kepiting* (crab), or rarely *kepiting bakau* (mangrove crab).

sought after, so the gravid females fetch double to triple the price of equally sized males.

It is a voracious omnivore, and the largest invertebrate predator in the mangroves that used to cover coasts and estuaries. Despite its size and popularity, the phylogeny of the mangrove crab was for a long time confused, and there has been a lively debate among taxonomists about whether the species as a whole, consisted of several very similar looking species, or if it was just one species with very different phenotypes. Part of this confusion stemmed from the fact that the type specimen, which was collected in the Red Sea during the Danish Arabia expedition (1761-67) was lost, and Peter Forsskål, the naturalist who collected it, died of malaria in Yemen, before he was able to thoroughly document his findings (Davie & Mann, 1998, pp. 217-218). Because of the difficulty in drawing the line between intraspecies variance and interspecies difference, it was thought for a long time that the genus of *Scylla*, consisted of only one species, *Scylla serrata*, which was thought to vary considerably morphologically (Stephenson & Campbell, 1960). However, recent advances in genetic testing have showed that *Scylla serrata*, actually consists of four different, but remarkably similar species. Thus, the genus of *Scylla* was reorganized to comprise of four genetically different species of mud crab: *Scylla serrata*, *Scylla paramamosain*, *Scylla olivacea*, and *Scylla tranquebarica* (Davie & Mann, 1998, p. 218ff). The people I worked with who caught, bought and sold mangrove crabs differentiated between some of them as *merah* (red) and *hitam* (black), judging not only by their color, but also by their taste, shape and size. I highly suspect that they could, contrary to biologists until recently, differentiate between at least two species of *Scylla*.



Naturally occurring in the brackish waters of estuaries and mangroves in the Indo-Pacific, mangrove crabs hide during the day in tunnels dug in the intertidal zone, and forage along the bottom during night. The mangrove crabs are omnivores, but primarily feed on other crustaceans, particularly those of the genus *Penaeus* spp. (Viswanathan & Raffi, 2015, p. 704), which includes the tiger shrimp. From an ecological perspective, the mangrove crabs are an ecologically important species. Their burrowing is a significant contributing factor in aerating the benthic zone and increasing the soil turnover rate, which makes some biologists term them "ecosystem engineers" (Kristensen, 2008). They create new niches for other species to inhabit, as they accelerate the further decomposition of organic material (Kristensen, 2008; Ridd, 1996). Before the shrimp boom, mangrove crabs were caught in traps or poached in the mangroves, carefully dug out of their holes in the riverbanks in daytime. Traps such as the *ambau*, which are essentially fish pots either weaved in rattan or made in nylon and plastic, are still in use along the rivers, their positions marked by long sticks pushed into the mud whereupon the markings of the owner are cut, or by floating soda-bottles tied to trap below. These tools are most associated with the Tidung fishermen. "We have always caught crab. My father, and his father did it, long before the ponds. Back then, we ate them ourselves or took them to the market in Tarakan. Today we bring all of them to the bos<sup>77</sup>".

As the pondscape spread, instead of dis-appearing along with so many other specialized species of the mangrove forests, the mangrove crabs moved into and proliferated in the sheltered ponds. Kept free from many of their natural predators by the sluicagate, the poisons of shrimp aquaculture, the vigilance of the caretaker,

---

<sup>77</sup> Interview 22.03.2018.

the mangrove crabs found the ponds stocked with plenty of feed in the form the shrimp, excellent habitats. Caretakers say that now there are more mangrove crabs inside the ponds than outside. But their digging, which in the mangrove makes room for a profusion of multiplicity, is problematic in the pondscape. Their habit of making extensive tunnels in which they hide at day, undermine the thin embankments that enclose the separate ponds, leading to leaks that if unchecked, can cause entire segments of the embankment to collapse, ruining the ponds. Thus, they are considered to be among the worst pests plaguing the pondscape, threatening not only the crops of shrimp but the very production infrastructure itself, their dynamic industriousness incompatible within the confines of shrimp aquaculture. In older days, some people even tried eradicating them with poisons, although it proved impossible, without killing the shrimp as well<sup>78</sup>. Therefore, in healthy, functioning ponds, the damages done by the mangrove crabs are constantly repaired by the caretakers. "Back then, mangrove crab was worthless. It was trash! We only wanted the shrimp, there was no market for craps"<sup>79</sup>

But paradoxically, as the pondscape slowly falls into ruin and entire crops of shrimp die off, the tough mangrove crabs seem to endure, and even thrive. Maybe because they can tolerate much higher concentrations of ammonia, (Romano & Zeng, 2007, pp. 281-282) maybe because they can escape ponds temporarily when oxygen or salinity levels drop rapidly (Shelley & Lovatelli, 2012, p. 7) as they are mobile and can breathe air. Maybe they are just tougher. Whatever the cause, somewhat ironically, the worst pest in the pondscape is better suited to the long-term life in it, than are the shrimp it was built to produce.

---

<sup>78</sup> Interview 08.01.2017.

<sup>79</sup> Interview 15.02-2017.

## Productive ruins



In the downriver patchwork of ruins and struggling ponds of the pondscape, all caretakers I met supplemented their income by collecting and selling mangrove crab<sup>80</sup>. Collecting them constitutes

---

<sup>80</sup> The importance of collecting of mangrove crab in shrimp ponds, and especially in ruined ponds, is rarely mentioned in the literature. Among the few articles describing the shrimp industry in Tarakan, (Ilman et al., 2009; Kusumawati & Bush, 2015; Kusumawati et al., 2013; Kusumawati & Visser, 2016), there is only a single line devoted to this important practice: “[...] [C]lients are able to generate further income from harvesting other aquatic products from the ponds, including white shrimp and mud crabs – an income that often exceeds what they receive under their shrimp farming partnership arrangements” (Kusumawati et al., 2013, p. 903). Writing on the smaller pondscape in the Mahakam delta, Bosma et al. (2012, pp. 92-94) and Bourgeois et al. (2002, p. 75) offers a bit more information, mentioning that the income from collecting mangrove crab

the best opportunity for a relatively stable income for caretakers in struggling ponds, often exceeding the percentages earned from sharecropping for the pond owner. Working the failed ponds, claiming what is left among the ruins (Navaro, 2012, pp. 152-153), is an increasingly important source of revenue. As the old man said above, many of the caretakers really are workers of crab.

At night when the mangrove crabs wake up and scurry out of their tunnels to hunt, so does most caretakers. Donning their headlights and rubber boots, net in hand, they walk along the embankments looking for crabs to catch. The interconnectedness of the pondscape, makes it possible for caretakers to wander far, from embankment to embankment, from pond to pond, cones of light sweeping back and forth in their search. The embankments of ruined and abandoned ponds are searched too, but one has to be careful. Not only crabs are attracted by these stagnant ponds, so are saltwater crocodiles. In the lower, more ruined parts of pondscape, the large majority of them are fortunately juvenile. But occasionally a caretaker goes missing, save for a foot or a disgorged sandal (Metro-Kaltara, 2016). Therefore, the caretaker sweeps his torch back and forth across the surface of the pond every minute or so, and the reflections from numerous pairs of

---

contributes substantially to the caretakers income, and that crabs are bought by specialized *punggawa* middlemen in town.

White shrimp (Udang putih in Indonesian), or *Penaeus indicus*, is a wild shrimp that enters and breeds in the ponds when they are filled or the water is changed. So too does the speckled shrimp (Udang bintik in Indonesian) *Metapenaeus monoceros*. Although I have heard about caretakers getting all the wild shrimp in the early days, when big harvests of tiger shrimp were more the a rule than an exception, today the common way is that the wild shrimp is sorted and sold by the pondowner alongside the tiger shrimp, and the income shared according to whatever ratio was agreed upon (typically between 9:1 and 8:2).

eyes betray the lurking crocodiles. The spacing between those glowing dots indicates the size of both distant and not so distant onlookers. "As long as you don't swear or throw things at them, the grandmothers [as they are called], will not attack you<sup>81</sup>".

The caretakers live in small shacks next to the ponds they are sharecropping. It is a lonely life, so caretakers from the same area know each other, and often assist each other during harvests, or if there is any other largescale task at hand. The ones without family, especially, often choose to stay together for company and protection, choosing the best shack between them to sleep and cook in. Among the caretakers I met, there existed an agreement that anyone could scavenge for crabs in any pond, not just the pond or ponds they were working. "For the crab, we can collect them wherever we want. The crabs belong to those who find them. So, I often walk far, until I am tired<sup>82</sup>". At night, sitting in the old man's shed, the light from the headlamps of other caretakers could be seen dancing over great distances in the flat and treeless pondscape. "Everyone is out at night", as the old caretaker said.

Difficult to spot with the untrained eye, the brown shape of the shell of the mangrove crabs betrays them, when caught by the headlight. Subtle differences among nuances of browns, greys and yellows are enough for the caretaker to spot it. Ever so slowly, he lowers his long net into the water behind the crab, moving closer and closer, until, with a sudden flick of his hand, it is helplessly caught in the net amidst a cloud of silt. He empties the net unto the embankment and often instead of fleeing, the crab will raise itself on its legs in a desperate last stand, faintly hissing with claws threateningly held aloft. But against the rubber boot of the caretaker, it is helpless. Pushed into the mud, its

---

<sup>81</sup> Interview 08.01.2017.

<sup>82</sup> Interview 30.01.2018.

claws and legs are tied with a piece of string in a blink of an eye. Thus immobilized, it is safe to handle. "It is a good one, a female" the old man mutters as he inspects it, hanging from the string. Females are recognizable by the shape of their abdomen, which is rounder than that of males. He drops it into his bag and continues his walk.

Most of the time, crabs are collected from the embankments, as far as a net can reach. But in the days after a pond is harvested, when the water in the pond is emptied so that the large raised central area of the pond (the *plataran*) surface, this becomes a popular haunt for caretakers looking for crab. Although incredibly muddy to navigate, skilled caretakers can catch crabs hiding here, by digging out their burrows. For this task, you cannot use a shovel or a digging stick, as you risk damaging the crab, making it as good as worthless. Instead, caretakers use their bare hands, digging and probing with their fingers, first localizing the crab, then estimating how it is turning. You have to grab it from the back to avoid its claws, so you have to be quick, skilled and nimble. I never dared this, but a skilled caretaker can spot the burrows and collect them without being bitten<sup>83</sup>. Others set baited traps in the filled ponds, tending them from small rowboats.

Several times a week, a collector (*pengumpul*) in a small speedboat will visit the caretaker's shack, seeking to buy any live crabs the caretaker might have to offer. His visit is a welcome break from the monotonous life at pond. News is exchanged and cigarettes smoked. Not exclusively buyers, the collectors also peddle in everyday items such as cigarettes and instant noodles, which the

---

<sup>83</sup> It is a sight to behold, when out of the mud comes a giant crab, caught by hand, and I am not the only one who thinks so. Youtube user Anak Kampoong (<https://www.youtube.com/c/AnakKampoong/videos>), has many videos of him catching crab like this in the pondscape of Tarakan, and some of them have several million views.

caretaker can buy on credit if he has no crabs to sell. Some collectors also dabble in more clandestine wares such as *sabu sabu*, the nickname for methamphetamine, a relatively common drug among the young men working in the isolated ponds for months at a time. North Kalimantan, with its countless rivers and streams, crooks and crannies, are one of the main entry points of Pilipino and Cambodian drugs into Indonesia (KALPOS, 2020b).

But some collectors also bring crab larvae, which daring or desperate caretakers plant in the ponds, to further increase the number of crabs they can collect, to the benefit of both the crab businessmen in town, collector and caretaker. These larvae come from hatcheries in Java or Sulawesi, as does the shrimp fry. The practice is clandestine, and it is not without any risk though to the caretaker. If the owner learns of it, he will surely be fired. "Sometimes we put the seeds in so we can get more. Not too much, as it is a parasite, but some. We don't ask for permission, no owners allow it<sup>84</sup>".

In several of the failing ponds I visited, the relationship between owner and caretaker was strained. I heard stories of pond owners keeping the ID cards of caretakers "for safety", but never encountered any who had experienced it themselves. Normally, the pond owner supplies rice, cooking oil and other basic necessities, which the caretaker supplements through fishing in the nearby river. Some caretakers are lucky or hardworking enough to be offered a fixed salary in combination with a (lower) percentage, instead of a pure sharecropping arrangement. "See the pond over there? [points]. [That caretaker] gets 500.000 every month, and 10% of the harvest. That owner is very good. Not many get that around here [in the old, downstream ponds]<sup>85</sup>". This option is very

---

<sup>84</sup> Interview 30.01.2018.

<sup>85</sup> Interview 30.01.2018.

attractive in the older, downriver ponds, where failed harvests happen at an ever increasing rate, but many owners are reluctant to offer a fixed salary. "It will make the caretakers lazy" One owner confided in me. "In the shrimp business, choosing a good caretaker is most important. They might work hard when you visit during harvest, but as soon as you leave, they will go to sleep. They are up all night catching crab, you cannot stop them. Pay them in percentages, and they will work harder to improve the pond<sup>86</sup>".

This practice of making a living by secretly adding pests to the pond could be considered along lines everyday resistance (James C Scott, 1989), a small-scale and relative safe way accomplishing tacit but concrete material gains - a meagre livelihood but a livelihood none the less. But although the caretakers obviously were engaging in "[...] foot-dragging, dissimulations, false compliance, feigned ignorance, desertion [and] pilfering (James C Scott, 1989, p. 34)", casting the relationship between caretakers and pond owners as solely one of power and resistance, would be to miss the point. They are all in it together.

It is midnight, and again we sit in the shed of the old man. One of the young caretakers from a neighboring pond has joined us. "In Sulawesi I was a farmer. I took care of oxen, goats and chicken, it was hard work. I have a wife and a daughter back home in Bone, and I send my money there, but I also try to save some, one day I will be a pond owner myself. I need to have 50% of the money myself, then the bos will provide the rest". The young man is my age. He sleeps in this shed from time to time for company, and because it is much better than his own, the old man has added enough solar panels to the roof to charge a phone. My assistant

---

<sup>86</sup> Interview 04.01.2017.



has gone to sleep on a mat and so have the old man, snoring loudly. But it doesn't matter, we manage. "We are from the same village as the owner of these ponds, and I have been working here for three years now. But I have never tasted the good shrimp<sup>87</sup>". He laughs. "I asked the owner for 15% and a fixed salary but he said no. He will only give 10% and no salary. I said OK. I had no choice". "But it is a problem that there are no shrimps here anymore. [...] I have been trying to get a job further upstream. It is more dangerous, but it would be better". He pauses. We change the topic, and discuss badminton instead, and when our cigarettes are finished, I follow him out onto the embankments, looking for crab. The dream of buying a pond, of becoming a pond owner oneself, was a story I heard repeated over and over again among caretakers, young and old. "Just one good harvest" or "The next one will be better, God willing". When talking to pondowners, there would often be one taking great pride in how he had worked himself up from being a caretaker, although most of those I knew had bought their first ponds with money from elsewhere. To put these statements into perspective, in a survey conducted by Gunawan (2012), when he asked caretakers in the Mahakam pondscape in East Kalimantan about their plans for the future, 82% responded that they hoped to open their own pond one day (p. 118). In Tarakan, the typical way to do this, was through a combination of savings and loans from family and friends, combined with a large loan from a bos. Here, an introduction is very important, as explained by one of the shrimp bosses: "A new pond owner will always get introduced by someone who knows him. Maybe the pond owner he worked for, maybe someone else. We always ask around before giving a loan"<sup>88</sup>. So open resistance was out of the question.

---

<sup>87</sup> Interview 31.01.2018.

<sup>88</sup> Interview 20.03.2017.

In the pond, the caretaker keeps the crabs he finds bound and alive in submerged rattan cages or fish traps. For the caretakers working in the ruined pondscape, the collecting of crab is of great importance, not only for the day to day livelihood, but also for that dream of advancing in life, which for a majority of caretakers means becoming pond owners themselves

They are sold to one of the many collectors, who tour the pondscape in small speedboats, some of whom are employed by bosses, some have debts with a boss and others are independent (*preman*<sup>89</sup> some call themselves). The collectors, sailing from pond to pond, buy the crabs from those caretakers that they do business with. "Sometimes we make deals among each other, I take these and you take these. But these agreements change all the time. I have many friends here though<sup>90</sup>", as one collector told me, as we sailed from pond to pond. The negotiation with each caretaker over the weight and quality of the crabs they have waiting in their traps is rapid, out in the ponds the prices don't fluctuate much. If in doubt, the collector brings out his weight, and the matter is settled. When the collector takes the crabs onboard his boat, they become alienated commodities (Tsing, 2015a, p. 122) and their journey through the commodity chains begins.

---

<sup>89</sup> The term *preman* is loaded with connotations. Originating from the Dutch word, *vrijman* which was used for non-contracted laborers or overseers in plantations and free traders with permission to trade under the auspice of VOC (Verenigde Oost-Indische Compagnie). During the New Order regime, it was used for thugs, vigilantes and petty criminals sometimes working for, sometimes against the interest of the state. Although it still carries connotations of legal ambiguity, today, a *preman* is often seen as a man free from restrictions, able to do what he has to do. For more, see Ryter (1998, pp. 41-51).

<sup>90</sup> Interview 09.01.2017.

## THE COMMODITY CHAIN OF MANGROVE CRAB



*It is afternoon when the collector puts his engine in neutral and lets his boat float towards the warehouse, perched above us on hundreds of poles. He leaves the rudder and moors his boat on one of the many posts on the sea-side of the building, with a carelessness I cannot help but admire. Eager hands from above grabs his dirty Styrofoam boxes full of mangrove crabs as he lifts them up, one by one. He has three in total, collected throughout the day from the very early morning. I hitched a ride home with him halfway through his tour, and it has been a good day. We refueled on our way home in one of the villages along the Sesayap, chatting with some of the other collectors also on their way back home to Tarakan.*

*Climbing the stairs, we enter directly into the warehouse. People are sitting and standing among the mountains of colorful folding crates and new Styrofoam boxes with holes poked in them. Except*

*for a tiny office in one end, it is one big room - full of activity. We have to wait a bit. Another collector is waiting while his crabs are being sorted, but it doesn't take long, the two mandors are quick. A number of piled up crates lets the men sort the crabs in nine different categories. They sort in weight without weighing them, once in a while lifting the abdomen with a dull knife to check if the females are carrying eggs.*

*At a desk in the corner, a third collector meticulously studies the receipt he received for his crabs, while the two women who writes them are blowing bubblegum and playing with their phones. Finding nothing over which to complain, he leaves with his now empty boxes on a motorcycle parked outside on the pier.*

*Now it is our turn, the sorting boxes have been emptied. They pause, waiting for me. The two mandors starts sorting the first box, their hands moving quickly as they pick up the deftly tied crabs, estimating them for a few seconds before they carefully throw them in the box corresponding to their grade. Once in a while the collector mutters something and one of the mandors pauses for a second, before putting the crab in question on a scale standing on the floor next to them. The collector nods, the mandor was right. It takes them not ten minutes to sort all three boxes.*

*Then the different grades of crabs are weighted, the numbers written down by a boy who then passes the note to the two women. On the wall behind them hangs a whiteboard with today's prices, but the collector already knew them when he was in the ponds negotiating with the caretakers, he showed me the message on his phone. "I always check around" he told me, "so I know when I buy". He is preman, free to sell wherever he wants. It is the price of gravid females that changes the most I am told.*

*While laughing at my presence, one of the women does the numbers on a calculator, the other writes a receipt and hands it to the collector. He glances it over as the first woman leaves the desk and goes into the small office beside her. She returns with a pile of notes: 7.3 million. Subtracting what he had paid the caretakers for the crabs and the fuel he used sailing from pond to pond, he has earned almost half a million today. Not a bad day at all.*

*The collector bids farewell and leaves, but I stay a little longer with my assistant, who is mesmerized by three young men who are retying all of the incoming crabs incredibly fast, and I quickly become fascinated as well. "We do it all over with all of them. They are not always tied in a good way" one of the men tells me, "our way is better, we need as many of them to survive as possible".*

*We are joined by the owner of the business, who is eager to show us around. After presenting himself, he shows us a two meter long basin cast in concrete in one corner, full of brown, bubbling water fitting six plastic crates of crabs. "I am the only buyer who has one of these". A tube connected to a pressure cylinder is fed into the water. "100 % pure oxygen" he tells us, "makes them live longer". He smiles, "I do not get paid for any dead crabs".*

*Continuing the tour, he takes us to another whiteboard, this one hanging by the door. "These are my buyers for tonight", he explains. "I have some regular buyers in Tawau. Five regular buyers for now. It changes, sometimes I lose them, sometimes they cheat - it is always a risk". The whiteboard shows how many crates of different qualities each buyer has ordered for this shipment. His phone rings, interrupting us. He looks at the display, raising an eyebrow. With one hand he gestures us towards two plastic chairs standing at the desk, and hurries into his office. A while later a woman comes out of the office, inviting us to join tonight, when the crabs are packaged and sent off.*

*When we arrive at the warehouse later that night, the place is bustling. On the pier, outside the warehouse, crabs are being packed neatly into boxes around a soda bottle filled with ice, wet newspapers separating them in layers. Sorted, bound and packed like this, the crabs look less like living creatures and more like items or things. Identical, ordered, homogenous, ready for export. When one box is full, a lid is put on, and it is thoroughly secured with brown tape, then weighed and labeled with a marker detailing its contents, receiver and sender. The owner greets us, "Sorry about earlier - business you know". He smiles. "These are going to Tawau tonight".*

*Five buyers, 22 boxes among them. Each box weighing approximately 22 kilos. "This is the Malaysian standard. When we ship to Jakarta we use the Indonesian boxes, 32 kilos". As the boxes are finished, they are transported to the end of the pier on pushcarts, and loaded carefully aboard a sleek speedboat, rocking slowly on its moorings in the cool evening breeze. A silent man in a motorcycle helmet with the collar of his leather jacket turned up sits in the cockpit, smoking a cigarette through his vizor. He is not saying a word. "It will be in Tawau early in the morning" the owner tells me. "My boats are very fast"<sup>91</sup>.*

---

<sup>91</sup> Interview 10.01.2017.

## Flows



The bos's warehouses are all situated at the dockside so that boats can moor directly beneath them, crabs are sorted and bought, commissions are given and debts are paid or taken. As the mangrove crab, contrary to the tiger shrimp, is only valuable when alive and unharmed, great care is taken to keep them in good condition. But time is of the essence, and they are shipped off as fast as buyers can be found, if they haven't already been found before the crab was collected at the pond and ordered in advance. These deals are made by phone and rely on a large network of contacts in Tawau and abroad, and the game of securing them is frantic and treacherous. "It is all about trust. I have been cheated, that is

how it is. Sometimes they never pay, sometimes they do not want to buy when we arrive, and I have to sell elsewhere at a loss<sup>92</sup>".

At nighttime crabs are packed and shipped by fast speedboats to Tawau, where they arrive in the morning. As discussed in the previous chapters, there has always been a lively traffic between Tarakan and Tawau, and there still is, mangrove crab being only one of many commodities taken across the border. As one crab exporter told me: "90%, maybe 95% of all crabs I have goes to Tawau. A few goes to Jakarta by air, but that is not very many - shipping by air is expensive and we pay per kilo<sup>93</sup>".

In the past, the local fishery department (DPPP) in cooperation with the Ministry of Maritime Affairs and Fisheries (KKP) had attempted to compel the crab exporters to sell to Jakarta instead of Tawau, by offering subsidized air freight to the capitol. But this flow never became popular. The idea was "to ship it abroad from Jakarta instead of from Tawau. Instead of the tukei in Tawau profiting, to have Indonesian companies do it". The attempt was doomed from the beginning. Infrequent flights and random quality samples (something nighttime shipping to Tawau largely avoids), combined with commissions to the shipping agency, made this detour too expensive, slow and cumbersome. "I have contacts in Tawau, I get the best price there, it is faster. I do not bother with Jakarta<sup>94</sup>". Old flows carved through centuries of trade flow strong.

In some aspects, the trade in mangrove crab shares many characteristics with the trade of valuable live fish species, caught and kept alive at great expense right until consumption in expensive restaurants in the South East Asia and beyond (Fabinyi,

---

<sup>92</sup> Interview 19.03.2017.

<sup>93</sup> Interview 11.01.2018.

<sup>94</sup> Interview 11.01.2018.



2013, 2016; Fougères, 2008). Although this trade started in the 1980s (Fabinyi, 2016, p. 187), a bit earlier than that of mangrove crab, it became possible with the advent of cheap air transport, easy access to ice factories and high speed boats (Fougères, 2008, pp. 167-169), all brought together by long-standing networks of patrons and clients.

The networks of businessmen who trade in mangrove crab are tight-knit, and often based on influential dynasties, who have been active in resource extraction and trade throughout the genealogy of extraction, as discussed in the preceding chapter. The two bosses I spent most time with, came from families that had lived in Tarakan for three generations - a remarkable feat in a city of immigrants. Their fathers and grandfathers had been businessmen too, trading in everything from timber to swallow nests. Many of these "big bosses" as they were called in Tarakan, were in various ways clients themselves to businessmen in Jakarta, Singapore, Kuala Lumpur and Hong Kong, shadowy figures and names I heard mentioned in passing, or occasionally overheard on the phone.

But dams are being raised. One of the first actions when Susi Pudjiastuti became minister of KKP in 2014, was to make it illegal to catch undersize and gravid mangrove crabs (PERMEN-KP-01/2015, 2015), and shortly thereafter (somewhat confusingly) to ban all export of gravid mangrove crabs (PERMEN-KP-56/2016, 2016). During her tenure (2014-2019) the lines between KKP and other traditionally powerful actors in marine affairs became drawn up sharply, as shall be discussed in greater detail below. Although controversial in some circles for her hardline approach to fishery conservation, Susi's popularity was very high among the general population - and by far the highest in the cabinet of ministers at the time (Jakarta-Post, 2019).

This development was highly controversial in Tarakan. The roe of the females is highly sought after, especially by wealthy Chinese in the metropolises of South East Asia, and the females fetch correspondingly good prices<sup>95</sup>. But as legislation were passed that made it illegal to export these, often smaller, but ever so more desired specimens, the whole commodity chain was affected, from caretakers to exporters.

As the young caretaker put it: "I only get a good price on the [gravid] female crabs during *imlek*, the rest of time, I am not paid much. But I still catch them of course, I need the money [...] I wish we could sell the pregnant crab to Malaysia legally you know. Because now they sell it anyway, but the police and the bosses get all the money<sup>96</sup>".

---

<sup>95</sup> In general, prices on especially the premium sized mangrove crabs fluctuate, but the gravid females are in a league of their own. During *imlek* when prices are the highest, gravid females can be sold to agents in Tawau for as much as 500.000 IDR (35 USD) per kilo (in 2018). In comparison, big, high quality males goes for half or less.

<sup>96</sup> Interview 31.01.2018.

## Dams



*"KKPNews, Tarakan - Ministry of Maritime Affairs and Fisheries (KKP) together with the Fish Quarantine and Inspection Agency (BKIPM), The Directorate General of Marine and Fisheries Resources Surveillance in Tarakan (PSDKP), the Main Navy Base XIII Tarakan (Lantamal XIII Tarakan) and Tarakan district Maritime Police (POLAIR) succeeded in thwarting the delivery of around 1.6 tons of gravid female crabs on Monday (30/04/2018). The egg-laying crabs were stored in 55 boxes, and the plan was to smuggle them into Tawau, Malaysia.*

*The EFQR Team of Tarakan Lantamal XIII (Patkamla Sebatik) caught a nameless 400 PK speed boat carrying contraband crabs on Monday (30/04/2018) morning local time. 1 engine and 1 crew member were also secured. Tarakan's XIII Danlantamal Sigit Setiyanta said:*

*"Around 3:30 a.m. central Indonesian time, a speed boat 400 PK without a name was intercepted and brought back to the Tarrol XIII Satrol dock for further investigation. The smuggler and engine were secured at the Tarakan police station to undergo further legal proceedings.*

*The prohibition on export of gravid female crabs has been regulated in the Minister of Maritime Affairs and Fisheries Regulation (Permen KP) Number 56 of 2016 concerning catching and or export of Lobster (*Panulirus spp.*), Mangrove Crab (*Scylla spp.*), and Blue Crab (*Portunus spp.*) from the Republic of Indonesia. In the regulation mentioned, crabs that are laying eggs or weighing under 200 grams per head are prohibited from being captured or exported. This was conveyed by the Head of the Tarakan Umar KIPM Center.*

*According to Umar, the mangrove crabs was secured and released to nature on Monday (30/04/2018) afternoon with all the agencies involved in the arrest participating. "We release it again to the nature so that these gravid females can breed" he said.<sup>97</sup>*

Erecting barriers and damming flows. Throughout the genealogy of extraction, various state and non-state actors have with varying degrees of success attempted to territorialize the extraction and movement of commodities, and the ban on export of gravid mangrove crabs was no exception. The ban was extremely unpopular in Tarakan. Everyone involved in the crab commodity chain, from struggling caretakers to wealthy and influential bosses stood to lose a significant part of their business.

Even the local fisheries office in Tarakan (DDDP) had disagreed with the decision to ban the export of crab, and had pushed hard for a compromise with KKP: "In Indonesia, when they make new

---

<sup>97</sup> The above text and picture is from a news article posted on KKP homepage 01.05.2018 (KKP, 2018).

regulation, they always look at Java [...] They see a declining number of crabs in Java, they ban it. But here in the provinces it is not like Java! Susi says, there is no crab in Java, so we must ban it. Always Java!" The usually calm and smiling senior DDDP officer shifts on his chair uneasily, "The people here do not farm the crab, they occur in the ponds where they are a pest!" The fisheries officer continued: "Before Susi, the bosses could send everything to Tawau, there was no regulation on size, and it didn't matter whether they were carrying eggs or not [...] At first, the sellers of crab disagreed with the law, as they couldn't legally export the [gravid] females at all. But after we had meetings with them and the KKP, it was agreed to make an exception during *imlek*<sup>98</sup>, because of the situation here<sup>99</sup>".

After the meetings, it was agreed to make an exception from the new law, legalizing the export of gravid females from the 15<sup>th</sup> of December to the 5<sup>th</sup> of February each year, as a compensation for not being allowed to export the remainder of the year. This took some of the air out of the protests, although the crab bosses still disagreed with the ban in its entirety. Realizing that the ban would not be removed, some bosses adjusted their argument that mangrove crab was an all too plentiful pest, and cleverly argued that the mangrove crabs from shrimp ponds should count as farmed, not caught (KALPOS, 2017a), and thus exempt from the export ban. Some bosses rallied caretakers and organized several large demonstrations to support their cause, culminating in a large demonstration in 2019, in front of the Fish Quarantine office (BKIPM)<sup>100</sup>. This demonstration, which was supported by the DDDP,

---

<sup>98</sup> *Imlek* is the Indonesian word for Chinese New Year, a time when demand for a range of luxury foodstuffs rises sharply across much of Asia, and the prices of gravid mangrove crab soars accordingly.

<sup>99</sup> Interview 23.03.2018.

<sup>100</sup> BKIPM is tasked with controlling that exported seafood is meeting the requirements on food safety, but also that it complies

called for the governor of North Kalimantan to issue a decree overriding the export ban, something he has so far refused to do (KALPOS, 2019b).

The reluctance of the governor to override the export ban should be understood in the context of the at times uneasy relationship between city and province. When North Kalimantan was formed in 2012, the much smaller town of Tanjung Selor was, as mentioned earlier, chosen over Tarakan by the national government as the capitol of the new province. This caused much resentment from the elites in Tarakan, and to this day there is in many cases competition between the financially and demographically stronger district administration in Tarakan, headed by a mayor and the provincial administration in Tanjung Selor, headed by a governor. As the DPPP officer lamented: "We struggle with Tanjung Selor in many aspects. Working with the province is very slow. But the rules are, that it is the province that has the discussion with Jakarta, not us<sup>101</sup>".

Among the many consequences of the rapid decentralization process Indonesia went through following the collapse of the New Order regime, has been an increasing competition of influence between the national, province and regional level of government (Aspinall & Fealy, 2003; Hill, 2014). Disputes have especially concerned the regulation of resource extraction and most importantly, on redistributing the associated income (Eilenberg, 2012, 2016; Morishita, 2008; Peluso, 2007), and the regulation of the extraction of marine resources is no exception (Fox, Adhuri, & Resosudarmo, 2005, pp. 92-97; Wever, Glaser, Gorris, & Ferrol-Schulte, 2012). In a review, Dirhamsyah (2006) finds a bewildering

---

with the export regulations. BKIPM is a national institution that answers directly to the KKP, circumventing both the district and provincial level.

<sup>101</sup> Interview 20.03.2018.

number of separate national laws regulate resource extraction in the coastal zone, and that there exist numerous conflicts, inconsistencies, gaps and overlaps between them. On top of that, Dirhamsyah estimates that regions across Indonesia have enacted more than 7000 regional government regulations regarding resource use in the coastal zone that do not comply with abovementioned state level laws (p. 78).

Theories abound as to why the governor in Tanjung Selor refuses to challenge the ban, often variations of the widespread theory that Tanjung Selor and the government of East Kalimantan are somehow determined to hamstring the development of Tarakan<sup>102</sup>. But speaking with the local fisheries office, "Tanjung Selor don't prioritize ponds and they don't prioritize fishermen because they have almost none. We have almost 5000 fishermen and 150.000 ha of ponds! They get no income from fisheries, so they do not want to anger Jakarta over it<sup>103</sup>".

Although still hotly disputed, it is to this day, illegal to export gravid mangrove crab to Tawau for most of the year. But, despite the ban, it is being done all the time anyway. The traffic is organized clandestinely by the large bosses and their buyers and patrons abroad, either alone or in various constellations of partnerships between exporters and most of the time with the tacit approval of the very agencies tasked with enforcing the ban.

---

<sup>102</sup> Even a former mayor in Tarakan mentioned that "East Kalimantan worked hard to prevent Tarakan becoming the capitol [of North Kalimantan] and they still work closely with Tanjung Selor" (Interview 03.03.2017).

<sup>103</sup> Interview 20.03.2018.

## Leakages



*"Either you bribe them, or you trust your luck", the bos tells me. We are sitting in a boat belonging to one of his many clients, leisurely fishing in the estuary of the Sekata, but so far without any luck. He is wearing an old pair of trousers and a worn-out leather jacket with a matching cap. My assistant mentions that he looks much like a fisherman himself. It is a nice day, and we have brought one of the now ubiquitous Styrofoam boxes, but this one full of ice and beer instead of the usual crab or shrimp. "I really love fishing, I could do it all day! But of course, I have my business to attend to". He grins, the sun reflecting in his row of gold teeth.*

*The bos, who lives in a big mansion in one of the most expensive quarters of town, joins the fisherman in stamping sandworms along*



the river bank, in throwing the cast net and in being generally foul-mouthed. The client fisherman baits my hook with one of the wriggling worms. Being helped like this makes me feel uncomfortable, but the fisherman does not seem to care, the bos have paid him for taking the whole day off from fishing. "Bribing the police is of course the safest, but it is expensive", the bos continues, taking his time as he senses my interest in the subject. "The minimum amount of [gravid] females you send to Tawau is three ton. Otherwise, it is simply not worth it. The police want money, 50-100 juta<sup>104</sup> depending on how much you bring [...] Best to go in the night, when the weather is bad - rain and waves. Then the police might not be there. If they are and they are so close you can't run, hope there is only one or two crew, and talk to the senior one only! If you are unlucky though, they will still catch you". He takes a long suck on his cigarette. "All my boats have 3x 200 pk<sup>105</sup>, so they are very fast!" He smiles again. "When you make it across the border, just give the Malaysian police a box, and they will let you through".

"Those who get caught, are the ones who took the chance, the ones who didn't pay"<sup>106</sup>, the bos smiles and makes the universal sign for money with his right hand<sup>107</sup>.

Since the advent of large-scale collection and sale of mangrove crab in the pondscape, there has been a lively traffic of fast boats carrying cargoes of carefully packaged boxes with male and gravid female crabs worth many times the salary of a lifetime for a pond caretaker, from the piers of Tarakan to those in Tawau. This trade has been going on since the infrastructure of fast

---

<sup>104</sup> 50.000.000 - 100.000.000 IDR equals 3500-7000 USD.

<sup>105</sup> He uses the Dutch word for horse power, paardenkracht.

<sup>106</sup> Interview 11.01.2018.

<sup>107</sup> Interview 14.03.2018.

boats, ice factories and air travel from Tawau made it affordable to ship live seafood across South East Asia. But after the bans in 2015 and 2016, the females have continued to be exported in secret. Monthly reports about intercepted smugglers fill the local newspapers. "Police Foiled the Smuggling of 3 Ton of Female Crabs" the archetypical caption reads, detailing how a fast speedboat was seized, above a picture of serious-looking police officers laboriously cutting the plastic cords off a mountain of confiscated crabs, and dropping them in the water from the pier at the police station (KALPOS, 2017b). But in many aspects, this is a show. In practice, most of those fast speedboats get through.

The patrolling of the waters surrounding Tarakan and especially along the border with Malaysia, is done by no less than three separate institutions. The maritime police (POLAIR), the local navy contingent (LANTAMAL XIII) and the fisheries inspection (PSDKP), in cooperation with the fisheries quarantine office (BKIPM). But it is a public secret in Tarakan, that both the navy and the maritime police are part of the trade, providing "security" to the shipments but demanding bribes. Furthermore, people in the business will tell you that the navy is "too greedy" in their demands, that the police "can be talked to" and that PSDKP "are tough". As I was told by one of the men working with illegally shipping crab to Tawau: "If you are caught, hope that the boat catching you belongs to the police, then you might manage. But if it is the navy they will rip you off! They are the biggest bloodsuckers!<sup>108</sup>".

Since its demilitarization in 2001, the police in Indonesia have been organized according to the many tiered political division of the country (John F McCarthy, 2007, p. 169), making local police

---

<sup>108</sup> Interview 30.01.2018.

at city level (POLRES) more locally entrenched than it had been under the New Order regime, where all officers were almost exclusively Javanese. Thus, the POLRES branch of the POLAIR was considered to be "more reasonable" in their demands for bribes, and people explained it with them being predominantly local, by virtue of having stayed for so long in Tarakan that they had become locally entrenched<sup>109</sup>.

The "navy" on the other hand, resided in LANTAMAL XIII, a fenced-off navy base with barracks and a pier in the middle of the city. This base fall under the command of the Indonesian navy's Second Fleet, which is situated in Surabaya, Java, meaning that almost all of the officers as well as the enlisted men living behind the gates, were Javanese on a short-term rotation. The locals pointed to this, as the explanation why the "navy" was considered to be "too greedy" in their demands for bribes.

The third agency tasked with patrolling the waters between Tarakan and Tawau, is the PSDKP. Operating directly under the national ministry, as do BKIPM, PSDKP has a reputation of being strict in reinforcing the (fisheries) laws, and not accepting bribes. "Since 2017, we have caught more than 50 boats smuggling crab to Tawau together with BKIPM, we are like sisters. We invite their staff to help us". The young PSDKP official is sitting at a desk in his small office. After a pause, he adds: "we do not really cooperate with the navy or the police<sup>110</sup>". Although he refuses to say the words, there is no doubt as to what he means.

For those attempting to do the run to Tawau without having paid for the tacit approval of either police or navy, the Malaysian border is a haven. Judging by the number of boats caught, many

---

<sup>109</sup> See Eilenberg (2012, pp. 233, 253) or (Obidzinski, 2003, pp. 223-226) for similar situations.

<sup>110</sup> Interview 23.03.2018.

more must get through. As the chief of the PSDKP station laments: "Sometimes we lose them right at the border, we cannot touch them when they cross it, just like the Hollywood movies. Although we have an MoU with the Tawau authorities, we have no chance. In reality, the Malaysian officials all work for the smugglers and the tukei<sup>111</sup>".

Where the PSDKP and the BKIPM by all accounts intercepted smugglers and confiscated contraband in order to uphold the export ban, both POLAIR and LANTAMAL XIII were deeply involved in siphoning from the illicit stream of high-value mangrove crab to Tawau and only occasionally made arrests. The history of rivalry between and endemic corruption among different law-enforcing agencies and government institutions in Indonesia is well described (Baker, 2013; Cribb, 2010; Lindsey, 2001; Rieffel & Pramodhawardani, 2007), especially when it comes to the extraction of natural resources (Eilenberg, 2012; John F McCarthy, 2010; Obidzinski, 2003). Both institutions are chronically underfunded, and dependent on off-budget income to cover their expenses. "In the practical, everyday lives of Indonesia's 380,000-plus police officers, [...] there is no economy outside of the off-budget economy" (Baker, 2013, p. 141). There was an almost co-constitutive relationship between the resource frontier of mangrove crab, and the plurality of more or less independent state-actors with their own agendas and methods. As mentioned by Tsing (2003): "It seems fair to say that the military [have] a central role in creating the 'wildness' of the frontier" (p. 5100).

A wilderness that could be violent. When I arrived in Tarakan for the second part of fieldwork (December 2017-April 2018), I learned that the collector I had followed, and whose arrival at a crab

---

<sup>111</sup> Interview 23.03.2018.

exporter's warehouse I detailed above, had disappeared and was presumed killed in the meantime. People were sad, but told me that people got killed in the ponds all the time. The only trace of what had happened was his boat, now engineless, which had been found floating upside down in the Batagau Strait. Although it is impossible to say what had happened exactly, as there never was any proper investigation, a lone and independent collector carrying a lot of cash if outbound or a lot of mangrove crab if homebound (and who knows what else), was an attractive target.

The contested and partial territorializations over control of the revenue stream from the mangrove crab commodity chain, was clearly not a straightforward dichotomy between the state and a rebellious border population. Financing some of the most influential crab bosses, were businessmen who lived in Jakarta, Kuala Lumpur and Singapore, and chasing them were institutions ultimately responsible to the government in Jakarta. Territorialization is not reserved for states only, and it is always in transition.

## FUTURE TERRITORIALIZATIONS?



"Shining<sup>112</sup> is forbidden, there are crab seeds [in the pond]".

A few pond owners have experimented with farming crabs in ponds too ruined for reliable shrimp harvests, which entails a quite radical shift in methods from shrimp farming. While there were several isolated attempts at farming mangrove crab specifically, it was not being done on any economical scale (yet), and in practice, all mangrove crabs that entered into the commodity chain were collected from shrimp ponds by caretakers.

Although rarely seen in the pondscape surrounding Tarakan, in other places in the world, the farming of mangrove crabs is commonplace, ranging from extensive aquaculture in expansive earthen ponds, to

---

<sup>112</sup> One term for collecting mangrove crab is *menyenter*, which means "to shine", or "to go shining [with a flashlight] (*senter*)".

intensive systems with aeration, addition of feed and individually caged crabs. China is by far the largest producer of farmed mangrove crab, and also the place where intensive farming techniques were first developed in the 1990s (Shelley, 2008, p. 258), but Vietnam, Australia, the Philippines and also other areas in Indonesia are producing significant amounts of farmed crab (ibid, p. 260). The largescale farming of mangrove crab is more difficult than shrimp farming, due to the extremely aggressive and territorial behavior of the mangrove crabs. This means that the densities of crabs that can be farmed in an extensive pond are comparably much lower than what is possible even with tiger shrimp, so farming them is in general less profitable (Salam, Ross, & Beveridge, 2003, p. 486). They can however be farmed in arrangements alongside shrimp and other fish. Although yields then will be smaller for each species, it might make for a more long-term sustainable aquaculture, but will on the other hand require more skill, and a willingness to forego the chance of windfall harvests<sup>113</sup>.

Despite the care put into shaping and painting the sign pictured above, the message it carried was largely ignored. Caretakers took no notice at night, treating this experiment as any other pond. As one caretaker put it: "The crabs eat each other, and so do we. There will never be enough crabs in a pond to feed both owner and caretaker"<sup>114</sup>.

However, the sign might be telling of what will become of the commodity chain of mangrove crab in the future. The manager at P/T Mustika, the largest and most influential cold storage in Tarakan, hinted at what the future might bring: "We are always looking to

---

<sup>113</sup> For a comprehensible introduction to the possibilities of farming mangrove crab, see Shelley & Lovatelli (2012).

<sup>114</sup> Interview 18.03.2018.

expand our business. Tiger [shrimp] is still the most important, but it is not as good as it used to be. Our frozen and cooked crabs are very popular, but until now we have not entered the market of live seafood. But that might change of course<sup>115</sup>". Then later in 2019, the director of Dachan Great Wall Group, the agro-food conglomerate who owns P/T Mustika together with the smaller Gallant Ocean International, visited Tarakan, and among other things, met with the mayor of the city, to discuss the possibilities of Mustika to entering the business of live mangrove crabs. He explained that Mustika had "problems with the falling shrimp supply" and that they were interested in farming and exporting the "Tarakan [mangrove] crab, as Dachan has sophisticated technology and there is an increasing demand for crabs worldwide". The director signed an MoU with the mayor of Tarakan, in order to express their intentions of jointly applying to KKP for an export permission for farmed mangrove crabs<sup>116</sup> (KALPOS, 2019a).

While MoUs are being signed in Indonesia all the time, and the outbreak of COVID-19 certainly put a lid on new developments, there was, as mentioned above, a debate in Tarakan about what exactly constituted a "farmed crab". Crab exporters lobbied hard to recognize all mangrove crabs caught in shrimp ponds as farmed, as a way to avoid the export ban, and if a well-connected cold storage such as P/T Mustika were to enter that debate, it would put much political and economic weight behind that argument. But it would probably also mean an (attempted) movement away from a decentralized and chaotic commodity chain, towards a somewhat more centrally managed supply chain resembling that of shrimp, not necessarily a closing of the frontier but certainly a step towards

---

<sup>115</sup> Interview 09.02.2018.

<sup>116</sup> What is written between the lines here is: if Mustika moves into the crab business, they need a guarantee that they can export any crab, gravid females included.



it. A frontier that would, as it had been several times throughout the genealogy of extractions discussed in the previous chapter, be increasingly territorialized by cold storages - the cooperate shadow institutions of the pondscape<sup>117</sup>.

What such possible enclosure of the would mean for the tens of thousands of caretakers currently relying on collecting mangrove crabs at night in the ruined pondscape, the collectors, the bosses and the racketeering police and navy officers, only time will tell.

---

<sup>117</sup> Similar blurred lines and codependence between the early trailblazing of "wild" frontiersmen, and the later arrival of large, concessioned firms, is characteristic of resource frontiers. See (Casson & Obidzinski, 2002, pp. 2138-2140; Tsing, 2003, p. 5102) for a similar dynamic in logging and Tsing (2005, p. 65) for one in gold mining.

## SUMMARIZING THE CHAPTER

The pondscape around Tarakan was always a latecomer. Shrimp aquaculture had boomed in many places long before it did in Tarakan, and it had declined or intensified towards *vannamei* in many places too, before ruination struck the Tarakan pondscape in earnest. As ruination spread, and mangrove crabs became more economically important, commodity chains formed around sending them abroad, but they too was late. Mangrove crabs had already been farmed intensively in many places around South East Asia, and even in Indonesia.

The frontier assemblage that came together to form the pondscape along the estuaries of Tarakan, was chiefly characterized by the availability of somewhat useable, practically free land and a history of extraction that had left a physical, relational and financial infrastructure geared towards exactly this kind of short-lived, large-scale extraction for export. Combined with an absence of unison and willingness among the many government institutions tasked with regulating the extraction, it blossomed, for a while.

As the shrimp frontier disassembled in pace with the creeping ruination, and its increasingly territorialization by the twilight complex of both local government and the ever-present cold storages, a smaller frontier of mangrove crab reassembled among the ruins of the pondscape. The violence and general lawlessness of this new generation of extraction was easily comparable to the frontiers of the past, and a large number of state and non-state actors scrambled to profit from it while others attempted to suppress it. The flows of this new frontier followed past paths of extraction and connection, as well as past patterns of rent seeking and endless intragovernmental infighting.

When the mangrove crab ends up on the plate in a Singaporean restaurant, it has become an object of luxury, of desire. Often used to treat business contacts, officials or senior colleagues, they are offered on big plates, whole in their carapaces. It is said that the meat of mangrove crabs is an aphrodisiac, and eating them is definitely a multi-sensory experience. Breaking the tough shell, dismantling the massive claws, sucking the juice out of hard-to-get places is a messy business. But just as the mangrove crab and shrimp are shredded from their carapaces when they reach their final destinations, they are also shredded from their biology, and the conflict, politics and the vastly unequal histories of the people handling them along the links of their respective supply and commodity chains.

Constant through these trajectories that all ultimately culminates in such culinary excess, is an utter indifference to destruction, and an establishment of longstanding physical and relational infrastructures that facilitate the continual extraction and transportation of commodities, salvaged and moved from one place to another, perpetuating and solidifying relationships of immense inequality in order to create profit, even among the ruins of past extractions. "Difference becomes a resource; gaps widen. Precarious wealth and precarious poverty sit side by side [...] heterogeneity and ruin are structural features of capitalism" (Tsing, 2016, p. 336).

### The rot remains

Even as the pondscape is in a continual process of ruination, it continues to proliferate, its borders ever advancing, as pond entrepreneurs funded by cold storages are seeking out new areas further and further away from Tarakan to develop. In a process opposite but analogue to Geertz's ideas of agricultural involution

(Geertz, 1963), no substantial refinement and no improvement is being done to the way shrimp are farmed. Ponds have been constructed in more or less same way, ever since the onset of the boom in shrimp aquaculture. The pattern is repeated over and over again: more ponds, more sluice gates, the gradual development of hitherto intact mangroves into new ponds. New middlemen, new pond owners and a continuous stream of new sharecropping domestic immigrant caretakers. Even as the output of the pondscape drops over time or is stagnant at best, the only answer to constantly expanding ruination seem to be the opening of new ponds. There simply isn't any attempt at improving. Instead, what happens is drawn out stagnation, a process comparable to static expansion (Butcher, 2004, p. 209). The result is that the ruination of the pondscape is constantly but temporarily offset by the continuing expansion - total harvests somewhat constant even as harvests per pond is falling. Environmentally unsustainable and economically unfeasible in the long run, but profitable for some, for a while. The rot remains. In the old core of the pondscape, ruination persists, spreading slowly outwards even as new ponds are built on the edges, undeterred. The physical and relational infrastructure of the pondscape is proliferating in a warped form of fractal self-similarity (Green, 2005, p. 134), from the physical infrastructure of each single newly dug pond, built to the same blueprint as those now in ruin, to the ever increasing relational infrastructure tying new owners through new middlemen to the same old cold storages. Whereas the new ponds being built mirror those falling into ruin in the core of the pondscape, the web of debt relationships between middlemen and pond owners become increasingly skewed towards debts over reciprocity, towards sharecropping over smallholding. Paraphrasing Stoler (2008), in the pondscape, the formations of past and present large-scale extractive regimes persist, not only

in the material debris and the ruined landscapes, but also in the social ruination of people lives (p. 194). This is both a cause and an effect of an ever increasing heterogeneity and ruination within connection (Tsing, 2016, p. 330), which leads to increasing precarity: "the condition of being vulnerable to others, not to be in control, [...] [u]nable to rely on a stable structure of community" (Tsing, 2015a, p. 20). So amidst this static expansion, plantation-style aquaculture becomes unpredictable to the extent that caretakers turn to foraging, confusing the usual teleological assumptions of progress. When farmers become foragers, crops become weeds.

## Crops and weeds



With the construction of the pondscape, shrimp ponds erased the mangrove forests, and mangrove crabs were deemed “weeds or waste” (Tsing, 2015a, p. 6). But stubbornly wandering through the pondscape that supplanted their native mangrove forests, the mangrove crab invaded the ponds, and reclaimed them by burrowing and digging, by making leaks and by undermining pond embankments, while they ate all the shrimp they could catch. This was tolerated as long as the ponds yielded good harvests. Constant repairs kept destruction at bay, so that the production of shrimp could continue, “commercial [aqua]culture has aimed to segregate a single crop and work towards its simultaneous ripening for a

coordinated harvest" (Tsing, 2015a, p. 24). When shrimp harvests fail, the weeds became the prize.

The shrimp is *farmed*. Shrimp farming to a large extent means working with, forming the soil and managing the water. Excavators, shovels, hoes and chainsaws, hard work, requiring a cheap reliable workforce in the form of the sharecropping caretakers working on contracts for the city-based owners, themselves indebted. When harvested by the thousands by emptying a pond through a net secured in the sluice gate at spring tide after some three months of growth, the shrimp is taken to the huge cold storages, production units where the shrimp is carefully sorted, graded, cleaned, packaged by rubber-gloved men and women along long conveyer belts on an industrial scale. They are stored, deep frozen, until container ships from Taiwan, Singapore and Japan will collect them, shipping them to customers all over the world.

The crab is *collected*. Its whereabouts are uncontrollable, it has to be stalked, caught and immobilized at night, one at a time, taking care not to lose a toe or a finger to its massive claws in the process. It is sold to collectors passing by, exchanged for goods or used to pay off debts and then taken by the collectors to the bos exporters in town. They never enter the cold storages with their huge freezing and storage capacity, instead they go to simple warehouses along the docks, where they are packed and sorted by cautious yet dexterous men. As they can only survive a handful of days out of the water, they need to be sold quickly, and the owner of the warehouse are constantly on the phone, negotiating and renegotiating deals with buyers abroad. Often the crabs are shipped the very same day they enter the warehouse.

Although the tiger shrimp is fierce when compared to the vannamei as discussed in the previous chapter, the difficulties in farming them pales when compared to the entrepreneurial and troublesome

mangrove crab: much bigger, extraordinarily voracious, violently territorial and cannibalistic. Two crabs in a net will tear each other to pieces if not immobilized in some way. When so compared, the tiger is the docile one.

Processing and transporting the shrimp is easy, they are quickly cleaned and the meat does not suffer from being frozen. Crabs on the other hand, are only valuable when they are alive and undamaged right until their final destination, making packaging and transporting them a costly and cumbersome process.

The shrimp industry is somewhat regulated, taxed and today, at least some ponds operate under at least some form of permit. Random quality samples are occasionally taken by the fisheries quarantine (BKIPM), in state owned laboratories. When the frozen shrimp is packed and shipped, export taxes and harbor tariffs are paid, and the amounts duly reported to the national Ministry of Fisheries, making statistics of exports possible and available. For the crab, it is different. It requires no permit (thus, brings no revenue to the city coffers) to scavenge them. They do not enter the cold storages, but are instead collected in warehouses scattered in the seaside slum, and sold in deals that are utterly opaque. The most valuable of them, the gravid females, are illegal to export, and all kinds of subterfuge is being done to ship them off anyway.

The flows that arise from these two creatures are intertwined, and mirror each other. But they are different in scale and in organization. Compared with the regularity and relative safety of work as a mono-cropping worker in a producing shrimp farm, the precarious livelihood of day to day scavenging of crabs on the edge of legality ought to be unattractive. But the creeping ruination of the pondsapes turn this commonsense logic on its head, making the scavenging option the most attractive and stable, and the fixed farm work unpredictable and precarious. This



inversion I believe, might be the reality for a class of poor and landless peasants in North Kalimantan, but it may also be a dystopic vision of life in a future of global environmental and agri/aqua-cultural collapse.

.o000o.

This chapter took to the core of the increasingly ruined pondscape where harvests of tiger shrimp have decreased or stagnated at best, leading to upheaval in the supply chain. Through collecting and selling mangrove crabs, caretakers have avoided complete precarity, and a new commodity chain emerges, unruly and contested.

In the next chapter we move along the rivers, to the estuaries, islets and stretches of open water. Although the ponds are not in sight, their presence is still, however, acutely felt. Here in the periphery of the pondscape, artisanal fishermen are struggling with failing catches, ruined spawning grounds, increasing costs, restrictive national legislations and each other.

## CHAPTER IV - FISHING IN MUDDY WATERS



In this chapter, we turn to the people fishing on the periphery of the pondscape, in the rivulets and rivers that connect it and in the river mouths and estuaries into which they empty. This tale from the periphery of the ruined pondscape shows how the upstream legacies of the genealogy of extraction and ruination are fluid, form sediments and have huge concrete consequences for the present and future of downstream fishing communities. But it is also a tale of how new ruins are created, as extraction intensifies and attempts at central territorializations fought.

Small villages of fishermen are scattered around the core of the pondscape, clinging to the edges of the main waterways. But the largest communities of fishermen live on the island of Tarakan, many in the seaside neighborhoods of the city, but also in the

fishing villages of Juata Laut on the northernmost point of the island, as well as the villages of Tanjung Pasir and Tanjung Batu on the southern point.

Many of the people who are now now fishermen, had initially arrived from Sulawesi to work in the past booms of oil and gas, marine shrimp and later in the boom in shrimp aquaculture that formed the pondscape. As past frontiers stagnated, people moved to new occupations in new frontiers, or became, as many did, artisanal fishermen. Thus, while people have been fishing these coastal waters throughout the genealogy of extraction and unarguably long before that, the different resource frontiers that have moved through this part of North Kalimantan have not only strengthened each other as shown in the past chapters, they have also become part of a dynamic that has increased small-scale extraction, such as artisanal fishing.

After the boom in trawling for shrimp in the 1970s, a ban on trawling effectively made artisanal fishers into independent but indebted suppliers for the cold storages. Linked yet unpredictable effects of this development throughout the 1980s and 1990s ended up greatly affecting the lives of fishermen a generation later. The numbers of fishermen increased steadily throughout the years, and when the shrimp boom came, for many, it was profitable. The successful invested in shrimp ponds, paid for the education of their children, built big houses by the waterfront and became patrons for the newly arrived hopefuls from Sulawesi. But the shift towards ponds made fishermen change from shrimp to fish, which combined with the destruction of large areas of mangrove forests quickly put pressure on the remaining fish stocks.

Although the fishermen fishing in these waters are as diverse as one would expect, they have much in common, some of which I will highlight here. They all fish a number of target species for the

market, much of which are sold through middlemen and eventually exported to Tawau or Jakarta. With the exception of the Tidung fishermen, most owe credit to a middlemen bos, who finance them in return for the option to buy their catch at a discount. What is not exported is sold locally or consumed in the fishermen's households. Secondly, more or less every fisherman I met would tell me his catches were dwindling. Be it the Tidung setting fish traps along the river banks or the Bugis with their trawls, longlines or gillnets. Everyone would agree that catches were much poorer than they had been just five years ago, and only a fraction of what they were ten or twenty years ago.

Why this was happening, was much discussed and heavily contested. Fishermen pointed to developments that over the past decades had taken place inland: the ever growing pondscape, which had turned most coastal mangroves in the area into shrimp ponds, but also the new palm oil plantations that were expanding further upstream. They also added that the influx of illegal foreign fishing vessels and the ever increasing number of fellow fishermen, were all putting increasing pressure on the diminishing stocks. Those fishermen that did not trawl themselves argued that the trawls were to blame, that they were destructive and ruined the seafloor. Government experts agreed.

As one frontier fuels the other, ruination accumulates. Ruination wrought by the pondscape added to the pressure on fishing grounds already heavily combed, first by company trawlers and later by a fleet of artisanal trawling fishermen. Today, with the increasing numbers of artisanal fishermen, many of whom are castaways from past frontiers themselves. Now, intensifying seems to be the only option in order to survive, to catch the fewer and fewer fish. Yet, intensifying accelerates destruction, adding new layers of ruination to the legacy of the genealogy of extraction.

Concurrently, in a poorly planned attempt to stop the destruction of the marine environment, the newly appointed minister of the national Ministry of Marine Affairs and Fisheries (KKP), Susi Pudjiastuti, was set on enacting a nationalist and environmentally hardline set of fisheries policies, as also discussed in the past chapter. A popular move among many Indonesians, as the ruination and overexploitation of marine resources is severe, and happening all across the nation. Besides the ban on the export of undersize and gravid mangrove crabs as discussed in the past chapter, she reactivated a set of laws prohibiting the use of trawl nets in all Indonesian waters and adopted a hardline approach towards foreign vessels fishing illegally - blowing confiscated vessels up in front of rolling cameras. The ban on trawling met resistance from fishermen all across the country, but it was especially contentious in Tarakan, where trawls were the preferred equipment for around 1700 fishermen already struggling for a livelihood in the depleted waters in the periphery of the pondscape. To answer the protests of the fishermen, orchestrated by their middlemen patrons, a series of exceptions and extensions of exceptions of the ban on trawling were extended both officially and unofficially.

Additionally, both the trawling ban and the hardline policy against foreign fishing vessels reactivated past histories and developments in the Ambalat sector, a part of the Sulawesi Sea disputed by both Indonesia and Malaysia. For the national government, this was a straightforward issue of national sovereignty, but locally part of a much more complicated dynamic, as transboundary kinship and patronage networks, as well as commodity chains, were long-standing and economically important.

Adding to the frustration of the fishermen, were the activities of some of the agencies tasked with regulating the fisheries and enforcing the bewildering flow of bans and exceptions. At times

they acted along lines of affiliation to either the national ministry, the provincial authorities or the city of Tarakan.

.o000o.

This chapter will start with an account of how the trawl net was introduced to Indonesia and later to artisanal fishermen in Tarakan, who became suppliers to the cold storages. Later, as the emergent pondscape reduced the need for caught shrimp, many fishermen starting trawling for fish instead, increasingly creating conflict with users of other gears. After Indonesia lost two nearby islands in a border dispute in 2002, fishing in the border area became a matter of national interest. The national government legalized trawling in the border area and commenced sporadic campaign of patrolling and seizing Malaysian fishing ships.

Then follows an account of a community of artisanal trawlers in the periphery of the pondscape, engaged in the intense but small-scale fisheries of a threatened fish. The role of middlemen bos as financiers and buyers of the fish is highlighted, leading into a discussion of the widespread ruination of the fishing grounds in the periphery of the pondscape, and the role the debt-structures that sustain failing fisheries amid the creeping ruination wrought both by the presence of the wider pondscape, and by the intensive artisanal fishing. The policies introduced by Susi Pudjiastuti in an attempt to curb some of the destruction were attempted implemented in the periphery of the pondscape, but met resistance among fishermen, politicians and officials at various levels, and were never fully implemented.

## THE FIRST TRAWL BAN

*Scattered around in the labyrinthine pondscape are small communities of fishermen, predominantly Tidung. In front of the*

houses are open porches where their gear is mended and fish cleaned, while others are sleeping on colorful mats, playing cards or tinkering with their phones.

During flood, one can step from the pathway right into one of the countless boats moored alongside every building. Long slender craft, built for travelling the rivers and estuaries. At ebb, the village is perched, spider-like several meters above the water, revealing the mounds of thrash and driftwood caught underneath the many-legged buildings; the haunts of rats, monitor lizards and the occasional mongrel dog. The people living here used to be almost exclusively fishermen, setting nets and building the complicated fish traps you see along the river outlets. Many fishermen still remain, but they complain at the lack of fish to be caught. Sometimes, they tell me, there are no fish in the river at all, and they have to go to sea in their small boats - accidents are not unheard of. Only a select few work in the ponds that now surround the village. It is difficult to secure a job with the Bugis and the pay is low. No one here owns a pond themselves.

"We did not have the money to build them" them man tells me. "Some of us sold our land, some of us lost it". He continues. "We have fished from here all of our lives. My father was a fisherman, and so was his father [...] We are Tidung, sons of the soil. We do not use trawl like the Bugis, we use our fish traps [tamba in Tidung], but today it is difficult to find the wood you need to build them. Now the mangroves are gone from here, so we have to go far. My trap is 10 liters [of gasoline] south from here, it takes one hour with my outboard". He laughs. "With the trap you can just relax, not like with other tools". A woman puts rice and some dried fish in front of us. "Please eat".

*After finishing, we wash our hands and he continues. "There used to be many fish. Now, so many people use trawl around here. There are too many bosses, too many buyers and too many fishermen now".*

*I ask him what he thinks about the whole debate about the trawl nets. He pauses for a while, and then says: "There are good and bad things about the trawl net. For one thing, it flattens the bottom of the sea so that there are less fish. But on the other hand, it gives income to the fishermen, it feeds their families".*



## The introduction of the trawl net



Trawling is the term for pulling or dragging fishing gear behind a ship. Bottom trawling, which is different from midwater trawling, is the term for techniques that involve dragging equipment along the seafloor, in order to catch demersal species, and it is the kind of trawl that the fishermen in this chapter are engaged in.

Various forms of bottom trawling have long histories, and have been practiced for a long time from vessels powered by either sail or oars, in both Europe (Jones, 2018) and in Asia (Oberle, Puig, & Martín, 2018, p. 506). With the advent of the steam engine and later coal and diesel engines to drive the trawlers and haul in the nets, the efficiency of bottom trawls underwent a veritable quantum leap in efficiency, range and the scale of equipment that could be used (Gabriel, Lange, Dahm, & Wendt, 2008, p. 9). This

early mechanization of fisheries started in northern Europe, where large companies able to shoulder the burden of the up-front costs, earned great profits as the new techniques could catch hitherto unseen amounts of fish (Cushing, 1988, p. 102 ff). The bottom trawl was continually improved, and the "beam trawl", where a long stick or pole keeps the mouth of the trawl open was mostly replaced with "otter trawls", where two "otter boards" made of reinforced wood or metal were fastened obliquely on each warp, so that the current pushed them away from each other when the boat is sailing, keeping the trawl open horizontally. Additionally, chains or weights were added on the bottom of the mouth, to help it keep, and even dig into, the bottom of the seafloor, and floaters were added to the top of the mouth, to keep it open vertically (Gabriel et al., 2008, pp. 394-399).

The first recorded mention of trawling being utilized in the region was in 1894, when "Captain Eddie", a British trader captaining a steamship sought a four-year monopoly to trawl in the waters around Penang, Malaysia. His request was reportedly denied though, and it was not until the early 1900s, that the Netherland Indies government started looking into the advantages of implementing the new technology (Butcher, 2004, p. 137), but had little luck in doing so. While the colonial governments in the area had been unable to make trawling profitable, Japanese fishing companies had been trawling in the area with great success in the 1900s, first using sailing ships rigged to haul several beam trawls while drifting, pointed perpendicular to the wind, and later to pull a large beam trawl behind a motorized vessel. While some of the catch were sent directly to Japan, much of it was sold at markets in Indonesia. The quantities of fish landed by the prewar Japanese fishermen brought down fish prices and prompted complaints by

fishermen and officials (Butcher, 2004, pp. 143, 166-167), as well as suspicions of espionage (Robertson, 1979, p. 341).

After the war, Japanese fishermen were prohibited from fishing in much of South East Asia, and only in 1952, after the so-called MacArthur line was lifted, did Japanese trawlers again start fishing in Indonesian waters. In the 1960s, a few Japanese trawlers fished in Indonesia (Butcher, 2004, p. 176), but, as discussed in detail in chapter 2, by the late 70s and up to the ban in 1980, fleets of large company trawlers from joint Japanese and Indonesian owned cold storages trawling for shrimp, had fished popular species close to economic extinction along the coast of East Kalimantan (Butcher, 2004, pp. 211-212).

The 1980 presidential ban on all forms of trawl (KEPPRES-39/1980), was put into place in response to a surge of violence between small-scale fishermen, and the owners and crews of the larger (often Chinese-Indonesian owned) trawling vessels, primarily along the coasts of Java and Sumatra. In Tarakan, as discussed in chapter 2, the cold storages met the ban by changing from having their own fleets of large shrimp trawlers, to financing middlemen entrepreneurs who would then again finance a large number of indebted fishermen. These fishermen borrowed money from the middlemen to build boats with engines, capable of pulling a new kind of gear, small shrimp trawls, introduced by the cold storages and modelled after the larger trawls that had been used by the company trawlers, but scaled down to match the boat and engine size of the client fishermen. Although still technically illegal as per the 1980 trawl ban, such small-scale trawling apparently did not prompt any coordinated crackdown from the central authorities<sup>118</sup>.

---

<sup>118</sup> "[F]rom 1988 to 1992, the police would catch us fishermen using the small trawl for shrimp. I don't know what happened in 1992, or why they changed it in

Equipped with these small shrimp trawls (and other types of equipment for catching shrimp), artisanal fishermen were able to feed the cold storages, not only in Tarakan, but in the rest of Indonesia too, as reflected in the rapidity with which shrimp exports rebounded (Bailey, 1997, p. 231).

As explained by an old fisherman: "I came here to work with petroleum, but was let off, when we had a leak of natural gas. Me and many others started fishing. We used to depend on the shrimp business. Long before the ponds, the big [cold storage] companies such as Misaya, Mustika, SKA, and Malindo were only supplied by us trawl fishermen, they didn't have ponds back then, all shrimps were from the trawl catch. Not anymore<sup>119</sup>". Although there were temporary halts, fishermen kept on trawling and the cold storages kept on exporting. In 1997, possibly to align the law with what was already common practice in many places, the then director of fisheries in the Ministry of Agriculture<sup>120</sup> issued a decree, that in practice excepted small-scale fishermen with boats under 5 GT from the ban on trawl (KEPDP, 1997). While only a directorate decree, it was not challenged and the cold storages continued sourcing shrimp from the trawling fishermen despite the somewhat muddy legality.

Although shrimp were the target species for the fishermen, trawls are notorious for being indiscriminate, and the finely meshed shrimp trawls especially so (Butcher, 2004, p. 212). While trawling for shrimp, fishermen must have caught huge amounts of bycatch of

---

the first place, we were not able to demonstrate back then [during the New Order regime]" (Interview 28.03.2018). I was never able to learn why the police reportedly upheld the ban only during in this period.

<sup>119</sup> Interview 17.03.2017.

<sup>120</sup> During the New Order regime, fisheries and marine affairs fell under the jurisdiction of the Ministry of Agriculture, hence the decree was issues by a director there.

all kinds, and some of this undoubtedly was sold either on the local markets, to middlemen or consumed in the households. As the pondscape spread, slowly throughout the 1990s and explosively in the years following the Asian financial crisis and subsequent fall of the New Order regime, the cold storages became less and less dependent on caught shrimp, as the production of farmed shrimp exploded.

"So many people came here to make ponds, in those years, but only the first ones were really successful. After 2005, the pond business was not so good any more, and many people began trawling instead<sup>121</sup>", explained one fisherman. But caught shrimp never again constituted the majority of the shrimp processed at the factories: "Today, we get 10 maybe 20 percent of our shrimp from the ocean" explained the manager at P/T Mustika. "The fishermen catch them, when the ponds cannot be harvested<sup>122</sup>, then we can keep the production line running. But there are not as many shrimp in the sea as there used to be<sup>123</sup>".

Many fishermen who had started trawling for shrimp and through middlemen sold their catches to cold storages, diversified and either changed or added new trawl nets for catching fish as the cold storages oriented themselves more and more towards pondscape. As one net maker explained: "The main difference between a trawl net for shrimp, and one for fish is the mask size. We use the shrimp trawl for small fish. The masks on the shrimp trawl are small, and become smaller and smaller down to the end. The trawls for big fish have larger masks<sup>124</sup>". "We saw the tools from the

---

<sup>121</sup> Interview 15.02.2017.

<sup>122</sup> During neap tide, for a handful of days twice a month when the tides are the lowest.

<sup>123</sup> Interview 09.02.2018.

<sup>124</sup> Interview 07.03.2017.

Malaysian vessels trawling for fish here in our waters and copied them, but on a small-scale", a fisherman told me, a variation of a story I had heard several times. But in reality, the differences between a shrimp trawl and a trawl for fish, are few on these small gears, which are often locally made<sup>125</sup>.

---

<sup>125</sup> Trawl size depended on boat size. Larger boats with stronger engines could pull larger trawls. The typical boat was 2-5 GT, and pulled a net of around 30 meters of length, with a mouth circumference of 15-20 meters. The chain at the bottom of the mouth (typically 5-10mm galvanized steel), would be 4-6 meters long, depending on the size of the boat, and the top of the mouth would be of an equal width, and have a number of floats attached, spaced evenly. Each side of the net were extended to form two "wings", each connected to a reinforced wooden otter board, which keep the mouth of the trawl open when the boat sailed. These were connected to the towing warps, which would be around 30 meters long, depending on the depth of the water. The cod end of the net was shaped as a bag, a few meters long. The mesh size of the net decrease from the mouth, where they were the largest, towards the cod end where they were the smallest (1.5 inch for ikan nomei and shrimp, 3.0 inch for bawal)

## New and old tools



Of the 4562 fishing boats registered in Tarakan in 2018, the local fisheries office (DPPP) estimated that around 1700 used trawl. This number had increased from around 800 in 2012<sup>126</sup>. The rest used a combination of other tools, most notably gillnets, long stationary nets that are set along the seafloor and retrieved after a number of hours.

Where the artisanal trawlers use boats with big, noisy and expensive engines, gillnetters can make do with much smaller and cheaper ones. "It is much cheaper to buy a boat for gillnetting, but the catches are not as good as those using trawl". Gillnetters

---

<sup>126</sup> Interview 20.03.2018.

primarily target what is locally known as ikan bawal<sup>127</sup>, which was then sold to middlemen buyers and then almost exclusively exported via Tawau. "When I came in 1989, there were almost no houses here, and there was no road. The cold storage was here, buying shrimp from fishermen, back then there were not many ponds. I have always been fishing with a gillnet, selling my bawal to the bos, who took it to Tawau<sup>128</sup>".

He was, as almost all fishermen are, indebted to a middleman bos, who financed his equipment and boat. The bos extended credit for the running expenses of the fisherman, for nets, fuel or repairs in exchange for an option to buy his catch at a discounted price. "When bring my fish to the bos, I ask for maybe 500.000, the rest goes to the loan. We call it panjar. All fishermen have panjar<sup>129</sup>". Similar relationships are well described in the literature on artisanal fishing in South East Asia (Foster, 1963, pp. 1282-1283; Merlijn, 1989, p. 691). The longevity of these relationships, some even spanning generations, highlights a classic insight: the debts are most often not meant to be fulfilled, just maintained, as the benefits of having access to credit outweighs the discounted price that is to be had through a bos, an aspect of patronage relations in fisheries that again is well-described (Acciaoli, 2000; Ferrol-Schulte, Ferse, & Glaser, 2014, p. 71; Ferse et al., 2014, p. 2063).

---

<sup>127</sup> Bawal hitam (*Parastromateus niger*), called black pomfret in English and bawal putih (*Pampus argenteus*), called white pomfret in English.

<sup>128</sup> Interview 23.01.2018

<sup>129</sup> While this system of credit based patronage was more or less identical to the way post owners financed owners of shrimp ponds, cold storages financed post owners and the large buyers of mangrove crab financed collectors, as discussed in the previous chapters, I only heard the word panjar used to describe the relationship between fishermen and their middlemen buyers. Compared with panjar, pond owners have *much* higher loans, often by a factor 10.



Setting a gillnet takes skill, and requires two persons working in unison, deploying the long net from the bow while the boat slowly goes astern, either in the current or with the engine in reverse. "It was no problem before, when there was plenty of fish. But now, it can be difficult" explains the fisherman. "When you are two, you need to split the money from the catch. Sometimes there is not enough to live on after that<sup>130</sup>".

The trawl however could be employed by a single fisherman, which was one of the reasons why it was becoming increasingly more popular, despite it requiring bigger loans from the middlemen bos to both acquire and to run. Thus, over the years, more and more fishermen bought, on credit, boats and nets for trawling. "I choose the trawl net because it can be used by one man only. That is very important. Also with the trawl, I will always catch something - fish or shrimp. If I get no fish, I switch to the shrimp net [...] the gillnet is complicated, and it catches less<sup>131</sup>".

Many gillnetters blamed the trawlers for the decline in fish. "I have been fishing with gillnets for 30 years. Back then, I could put it anywhere, so I did not have to go far, I just put it here by the coast. But now I have to go far away. The trawls have ruined the bottom of the sea". The worse prospects for fishermen using gillnets, meant that bosses were reluctant to finance new fishermen using the tool. "Back when I started using gillnet, it was easy to get panjar. The bos would pay half the boat, the fisherman would pay the other half, and bring him fish, but not anymore. It is

---

<sup>130</sup> The usual way was to split the earnings in three, one third for each fisherman and one third for the boat. The boat owner, which was almost always also one of the fishermen, would take the share of the boat.

<sup>131</sup> Interview 27.03.2018.

difficult to find a bos that will give the panjar to gillnets now, they all want trawl<sup>132</sup>".

This preference of trawl from the bos middlemen further enhanced the popularity of the trawl, and in 2012, the tension between users of gillnets, and users of trawls caused a split in Persatuan Nelayan Kecil (PNK) which at the time was the largest association for artisanal fishermen in Tarakan. There had been a disagreement over whether the association should continue to support fishermen using trawls, or whether the union should decide to adopt restrictions on their trawling members. Many of the fishermen using gillnets were against trawls, and they accused the trawling fishermen of destroying their livelihoods, and of emptying the nearby waters of fish. The discussion ended with the pro-trawl faction winning the vote, and the former leader who had been vocal in his criticism of trawl, was ousted in favor of a pro-trawl candidate. He then went to form a local office of Kesatuan Nelayan Traditional (KNTI), a national association, along with many other unsatisfied gillnetters<sup>133</sup>. The associations helped fishermen with the many forms and permits required: Fishing permits, papers of boat size and ownership, papers for gear use as well as the numerous forms fishermen had fill in order to apply for subsidized fuel, (minimal) state insurance and eventual government aid programs. While the ousted leader of PNK was a fisherman, the new leader was a middleman bos, and a former vice manager at the local cold storage. "I am a businessman you know. The [trawling] fishermen choose me. They came to me, because I fight for them. My job is to increase their prosperity and attract new investors, so they can get better prices<sup>134</sup>". However, some fishermen, trawl users

---

<sup>132</sup> Interview 28.03.2018.

<sup>133</sup> Interview 21.03.2018

<sup>134</sup> Interview 03.30.2018.

included, accused the new leader of PNK of profiting from the paperwork, by keeping some of the government subsidies for himself, as well as for storing the boat ownership papers in his house, and renewing them in his own name, in principle making him the owner of those boats. Accusations he denied.

While tension increased between fishermen using different gears, for a while, tension flared up between Indonesia and Malaysia too. Suddenly, an area not far from Tarakan became the topic of conversation not only among the fishermen who went fishing there, but among Indonesians all across the country.

## Effectivités and the first exceptions



*"Those boats are Malaysian, but registered here. They did not have all the papers though". The officer points at the boats in the distance. "We caught them fishing illegally in our waters, they tried to escape but we can go 35 knots, much faster than them. They had fake papers, that was why they were running". The officer grins and continues: "They were all crewed by Indonesians but are owned by Malaysian bosses. They supply the provisions and pay salaries to the fishermen and sell their catch in Tawau". I can see silhouettes moving around on the boat. Some of the kids from the neighborhood peddled cigarettes to the sailors who had been on the boats for a week now. "We brought them here while the police process their cases. The crew can go into town to buy rice and to the mosque, but they have to stay on their boats until we are done*

*with the paperwork. But will eventually be set free of course, they are Indonesians*<sup>135</sup>.

The Malaysian trawlers that fished in Indonesian waters were larger, built for longer trips and often crewed by Indonesian fishermen. "The crew Indonesians, from Tarakan or Nunukan, the owners were from Tawau. The local crew knew all the right places to fish, all the good places. They sold their catches in Tawau, where the price was better. We all did<sup>136</sup>". As there were no trawl ban in Malaysia, some Indonesian owners bought and registered boats in Tawau and used them for trawling in Indonesian waters, while some Malaysian businessmen registered their boats in Tarakan or Nunukan in order to fish more freely in Indonesian waters, but sold in Tawau where the prices were better (Adhuri & Visser, 2007, pp. 121-129).

Not far from the sprawling seaside neighborhoods of Tarakan lies the islands of Sipadan and Ligitan. Here, a seemingly unrelated event was to influence what would happen next with both the increasing number of small-scale fishermen from Indonesia, and the few but large Malaysian vessels trawling for fish and shrimp in the northern waters of what was then East Kalimantan. As mentioned in the introduction, part of the border between Indonesia and Malaysia in Sulawesi Sea had been contested since 1969 when both countries were in the process of awarding concessions for offshore oil drilling. In 1998, both countries had agreed to let the International Court of Justice (ICJ) settle the matter, and it did so in 2002, awarding Malaysia sovereignty over part of the disputed area, the two minuscule islands.

---

<sup>135</sup> Interview 30.03.2018.

<sup>136</sup> Interview 04.01.2017.

The Indonesian delegation argued that Indonesia was the inheritor state of two sultanates that had supposedly ruled the area, islands included, in the 15<sup>th</sup> century. But since no historic evidence could be produced that demonstrated that the sultanates had ever exercised their sovereignty over the two islands, the court dismissed the argument. Malaysia though, could prove that the British North Borneo Company, in the early 1900 regulated the collection of turtle eggs on the islands, had declared the islands a bird sanctuary in 1933 and built lighthouses on both islands in 1961 and 1962. This proved to the court that the British colonial authorities, of whom Malaysia was a successor state, historically had exercised sovereignty over the islands through "*effectivités*"<sup>137</sup>, and led the court to award the islands to Malaysia (Colson, 2003; ICJ, 2002). Indonesia protested but accepted the outcome, but has since refused to let ICJ work on a solution for the remainder of the Ambalat sector (Butcher, 2013, p. 251). The loss created an uproar in Indonesia, and the governor of East Kalimantan was publicly blamed for not having done enough to secure the islands under Indonesian control.

Continuing in the years after the ruling, there were several close-calls and even collisions between Malaysian and Indonesian navy and coast guard vessels, as each zealously patrolled the disputed area (Butcher, 2013, p. 250). Additionally, and contrary to past practices, the Indonesian authorities started confiscating Malaysian vessels that trespassed and fished in Indonesian waters. "They came in the night and fished through the morning, stealing the fish for so many hours. So, we called the police, and the PDSKP came here and caught them"<sup>138</sup>.

---

<sup>137</sup> Here, *effectivités* refers to "state conduct that evidences its authority in, or in relation to, specific disputed territory" (Colson, 2003, p. 399 n9).

<sup>138</sup> Interview 27.23.2017.

In a case illustrative of the transborder mobility of fishermen across the border, 11 Malaysian fishing boats was caught fishing in Indonesian waters over a two month period in 2009. It does not say in the article, but they were almost certainly trawlers. All crew turned out to be Indonesian citizens, and one even turned out to be the harbormaster of Sungai Nyamuk, an Indonesian village on the island of Sebatik only 15 kilometers south of Tawau. He worked for a boss in Tawau, who had 50 such boats, and the harbormaster, besides captaining one of them, was tasked with providing fake paperwork for all of them. Another crewmember, a man from Sulawesi, explained how they changed boat numbers and names when they crossed the border, as well as changed their Malaysian flags to Indonesian ones. Additionally, it turned out that one of the boats had been confiscated by the Indonesian maritime police in January the same year, and as was the practice, had been auctioned off, only to be bought by its original owner for a fraction of its value, and put back into fishing illegally in a matter of months (Tempo, 2009).

Anxious to prevent losing more of the Ambalat Sector in the future, Indonesian authorities started encouraging Indonesian fishermen to fish in the waters of the Ambalat (Adhuri & Visser, 2007, p. 124ff), to make sure effectivités would not become an issue, if the dispute were ever to be laid before the ICJ again. To make the national position clear, and in an attempt to lessen the incentives for Indonesian boat owners to register their ships in Tawau, in 2008 the Ministry of Maritime Affairs and Fisheries by decree, legalized trawl in the northern waters of what was then still the province of East Kalimantan (PERMEN-KP-06/2008), "stretching from the waters of the district of Tarakan, with the coordinates 3°10'N to the island of Sebatik" (ibid). Thus, although not specifically mentioned in the decree, matters of national sovereignty trumped environmental concerns; the decree

unequivocally excepted the waters around Tarakan from the 1980 trawl ban. Legislation which itself had not prevented, but in fact made trawling in the waters legal ubiquitous.

As explained by an official from DPPP: "The north part of East Kalimantan had an exception [to the ban]. They said the exception was so that fishermen could catch fish and shrimp on the muddy bottom, but really, most important was nationalism, the fight against illegal fishing from Malaysia. Their big boats came and our fishermen needed help. Even our biggest boats were 10-26 GT, theirs much more modern and much bigger, their tools bigger and stronger<sup>139</sup>". His perspective echoed the rationale of the original 1980 ban on trawl: illegal fishing was a social, not an environmental issue.

When North Kalimantan became a province in 2012, new steps were taken to ensure the trawl fishery of ikan nomei, a species of fish which was considered to be "of special importance to the city of Tarakan<sup>140</sup>". This was partly due to the fact that the 2008 blanket permission to trawl had only been valid for people with "residence in East Kalimantan" living in either the district of Nunukan, Bulungan, Tana Tidung or the city of Tarakan (PERMEN-KP-06/2008). Since these districts along with the district of Malinau now had formed North Kalimantan in 2012, there was a risk of trawl now becoming illegal, depending on how you interpreted the 2008 decree.

The two 1999 decentralization laws on regional government (UU-RI-22/1999; UU-RI-25/1999) (and their 2004 revisions) created the legal basis for the massive transfer of power from the central government to local governments that happened in the aftermath of the fall of the New Order regime. Relevant here is the way regions

---

<sup>139</sup> Interview 20.03.2018.

<sup>140</sup> Interview 20.03.2018.



and provinces, with a few exceptions, were granted wide authority to manage their own resources. Specifically, districts (and cities) were granted jurisdiction over most marine resources up to 4 nm from the coast, and the provinces were given jurisdiction over marine resources from 4-12 nm from the coast (UU-RI-22/1999), with the national government having jurisdiction from 12 nm to the exclusive Economic Zone (EEZ) boundary. Additionally, it was stated that revenues from fishing were to be split with 80% belonging to the region and 20% to the state (UU-RI-25/1999).

Although the 2008 exception was not removed (but technically void), the new governor of North Kalimantan and the mayor of Tarakan in almost unison issued respectively a provincial decree (PERGUB-26/2014) and a city decree (PERWAL-24/2014) legalizing trawl for ikan nomei specifically, in a delineated area north of the island of Tarakan. Additionally, the decrees also established zones deep in the river mouths where trawling was explicitly forbidden.

Just south of the area where the local government had decreed trawl to be legal, lies the village of Juata Laut. Marked on a 1942 Dutch map only as Tanjung Djoeata, as not much more than a site of a small coastal battery (Militaire-Spectator, 1949, p. 204), later maps show a few houses. One can still find some of the ruined bunkers in wooded hills below the city, but it is not what brought people here. It was trawling for shrimp. There had only been a few houses and a large sawmill before a cold storage was built somewhere in the late 70s, but in the following years the village ballooned in size, as a steady stream of new arrivals from Sulawesi settled in the village as fishermen. During the boom in shrimp, a new wave of hopefuls came. While some succeeded in getting a pond, many others started trawling for shrimp and for ikan nomei, a certain fish that were found in great numbers in the estuary just north of the village.

## TO TRAWL OR NOT TO TRAWL



*The infernal noise from the engines makes all communication except gestures nearly impossible. The engine is not silenced by any means, and the exhaust bellows smoke across the top of the deckhouse where I sit, the hot fumes have cracked the green paint, and smeared the wood underneath in a filthy black. It feels as if my brain rattles around in my skull like a handful of marbles in a metal box, and after a couple of hours I start hearing voices and complex rhythms in the asynchronous roar of the two 27 HP, machines working hard to pull the trawl along the bottom. Despite our engines going at full speed, the boat is moving at a snail's pace. Just as the other fifty or so boats doing exactly the same as us: ever so slowly pulling their trawls up and down the northernmost part of the Batagau Strait, between the island of Tarakan and the smaller Tibi. From the small middle mouth of the Sesyap to where the strait opens up into the large estuary of the*

*Sebawang and the wider Sulawesi sea. Whenever we go westwards, we have the current against us and we come to an almost complete standstill, although I estimate that we travel through the water at some three knots. It takes us more than two and a half hours to cover a distance that cannot be longer than three kilometers.*

*At the end of the stretch, the fisherman orients himself, and starts turning the boat around just by tightening the left towing warp, and the boat quickly veers off, tilting some twenty degrees towards the inside of the turn. "This is the most dangerous maneuver" the fisherman yells at the top of his lungs. "You need to go full speed to keep the net open, but if you turn too hard, the boat will pull itself under!". He looks around, chewing on the morsel that is all that is left of his kretek. But no waves capsize us and no other boats interfere with the ellipsoid we are tracking.*

*The water is calm, and the sun is up on a sky dotted with clouds. The fisherman has crept back down the hatch into the low deckhouse, and I take refuge from the screaming exhaust pipe by moving to the stern. Here the cacophony from the engine is notably less loud, but it is as if the blanket of smoke follows us. As soon as we finish our turn, the fisherman is back on the roof again, with a newly lit kretek in the corner of his mouth, and his left foot on the helm, a repurposed steering wheel from a car.*

*Not much happens doing the day-long trip. We go back and forth two times. Normally the fisherman does two such trips a day in the season, but today he started late, as he had been up all night fishing squid. The water around us is littered with boats, crewed by one or two men each, except for two canoes we just overtook, toiling away with small outboard motors. Both of them were piloted by women, wearing balaclavas under their hijabs to protect them from the sun. "Those are the poorest of us" he screams and nods in*

their direction. The size of the trawl they can pull must be minuscule.

There is a lively traffic of small fast speedboats, but once in a while, one of the large regular boats rushes by. Their speed seems extraordinary when compared to our sluggishness. I envy the breeze the lookout must feel, standing out there in the open. Some of these boats ferry passengers and goods to and from the many riverside communities along the rivers, but most of these are heading for Tawau in Malaysia, some 80 kilometers to the north. Fitted with an array of powerful outboards, they skip across the water as pebbles, jumping effortless from one wave to other.

The fisheries based in Tarakan is mainly characterized by small fishing vessels of less than 5 GT, predominantly engaged in small-scale coastal fishing in the shallow waters of the Sesayap, Sebang and Sekatak estuaries. The boats in use are long and slender, elegant and often painted in vivid colors. They are built in wood, here or across the border, and have little keel, so they can be beached with ease. When not in use, they are often allowed to dry out pulled ashore. The foredeck is not decked, except for a raised platform at the stern, and is mainly used for storage. Often a number of fuel drums and a Styrofoam box with ice will be squeezed between the ribs. The deckhouse is so low that one can only sit inside, and because of the limited view and the deafening noise from the engines which is installed just underneath, the steersman will spend most of the time peeping out through a hatch in the roof, steering with a foot, while smoking an endless number of sweet clove cigarettes. On the roof is a short mast and boom, used for securing the trawl. Furthest aft is a decked platform from where nets are handled and the trawl deployed and emptied.

Today we are after ikan nomei, the key species targeted by the fishermen here in village of Juata Laut. It is fished in the days

around the first and last quarter of the moon, typically no more than eight days a month. The rest of the month, boats will typically go further away to trawl for bawal or shrimp. "The nomei is the best fish for us to catch, because we can get a good price for it from the bos", He explained to me before setting out. After some eight hours, the fisherman judges that his net is full, and makes ready for landing his catch.

Everywhere on the boat you spot things that are repurposed, or solved by frugal workarounds. The throttle, for example, is operated by a piece of string running from deckhouse all the way aft, so that the engine can be controlled from anywhere on the boat. Some of the larger vessels, such as this one, have a second engine that are engaged on the driving shaft when trawling, but which can be disengaged and connected to a winch, in order to aid the deckhand in retrieving the heavy trawl. I have seen winches made out of modified car axles, drums cut in replaceable hardwood, with no transmission in between, the whole boat yanking violently when the driving shaft is engaged or disengaged.

While we trawl, a maritime police (POLAIR) inspection ship sails past, zig zagging in order to avoid the many trawlers. It is heading north, towards Malaysia. The fisherman waves and jeers, although they cannot possibly hear him above the noise from our engines. "Our policemen!" he laughs, "on their way to catch Malaysians!". The police disappear behind Pulau Tibi, as we take our final turn.

On this boat, a motorcycle seat is bolted to the floor so that the fisherman can sit somewhat safely while operating the winch. The net is only retrieved when sailing against the current, in order to keep it open and minimize the loss of fish in the process. We sail so slowly that I fantasize that the fish in the net all swim out again, overtaking us while laughing. But I guess they are all

*pushed together in the cod end of the trawl. After engaging the wrench, the machine starts pulling the warp up, ever so slowly. The last part with the otter boards and the chain at the mouth of the trawl is retrieved manually before the machine is reengaged and the net is hauled on deck. The net, which the fisherman's uncle has knotted, is opened, and the catch is squirming out in a large, wet heap on the deck. We turn homeward. I would guess that the total weight of our catch after eight hours of work is no more than 25 kg in total, only half of which are ikan nomei.*

*On closer inspection the boats are roughly built and shows signs of heavy use and numerous repairs. Planks have been replaced, fresh stains of vivid color betray the numerous repairs. "A boat like this", says the fisherman "will last maybe 10 years. Now that the net is out of the water, the boat is fast, even without full throttle. "The best ones, like this one here, are all built in Sungai Nyamuk. I have family there". On our way back, we pass a stretch of mangrove that separate two parts of the village. On the sand between the knotty trees lies the stripped hulks of older boats, everything of value have been removed and reused.*

*A few minutes after we moor the boat and disembark, I become violently ill and throw up, only barely making it from the house to the water. "It is the exhaust. You get used to it" the fisherman grins as I return.*

*The ikan nomei is gutted, split, and dried for two weeks in the sun and wind on large wooden frames clad with a fine mesh. Fresh, the fish have no significant taste or odor, dried, it becomes savory and tasty. This is the job of the women and a few men who do not fish themselves, gathering whenever a boat comes in. They prepare the fish for their families or close kin, and sometimes help others for pay. The only fish prepared this way and sold is the ikan nomei, the bycatch is consumed in the household or used*

*as bait. If the fisherman did not own the boat, the catch is measured in buckets and divided between boat owner and fisherman, so that the owner of the boat gets one half and the crewman the other. Costs of gasoline are shared evenly.*

*While the catch was being sorted, one elderly lady slowly approached with a pot in her hands, which the ladies promptly topped with fish. "This is our custom" she explained "the old ones with no family here to take care of them can come and get what they need. We are poor, but we help each other". The old lady leaves with her pot, now full, without saying a word<sup>141</sup>.*

---

141 Interview 22.02.2017.

## Making a living from the ikan nomei



Today, Juata Laut is a sprawling fishing village stretching along the northern coastline of the island of Tarakan. Some of the early fishermen in Juata Laut had been pioneers in the boom in farmed shrimp, and profited greatly, several people owned large areas of ponds on the island across the sound. The majority of people here however, made a living trawling for *ikan nomei* (*Harpodon nehereus*), or Bombay duck as it is called in English. The *ikan nomei* is a lizardfish native to the tropical waters of the Indo-pacific, usually living in the deep water offshore. A predator with a huge mouth and a slimy skin, it seldom grows more than 25 cm from tip to tail<sup>142</sup>. For some reason it gathers in the estuaries just north of Juata Laut in large numbers twice a month: "Here, when the moon is crescent and the weather is good, we can catch *ikan nomei* for four or five days. Then everyone goes trawling. There are more

---

<sup>142</sup> For a detailed biology of the species, see Bapat (1970).



than 300 boats here in Juata Laut catching the nomei with trawl<sup>143</sup>. During these days, the aural backdrop of hundreds of pounding four-strokes combines into an unseparated, droning hum, reminiscent of a that of a distant surf or highway. Everybody is either fishing the waters in front of the village, or working hard on land to prepare the catch. The rest of the month, people go further away to other fishing grounds to catch different species - bawal and shrimp, as discussed above.

The ikan nomei an ugly and slimy little fish, and disregarding its huge mouth it looks rather insignificant. It is gutted, split and dried, and then sold to travelling collectors or to the middlemen bos in town to whom the fishermen are indebted. The finished product, called *ikan tipis* or *ikan pepija*, is very popular in both Indonesia and Malaysia. It is either fried and eaten as a tasty snack, or rehydrated and used in rich curries. As I learned during the earliest days of my fieldwork, the fisherwomen I spoke to in Tarakan were adamant that the ikan nomei was unique to their area, that it was their "famous fish". But the ikan nomei is actually fished elsewhere in the world too. There is an important fishery of the Bombay Duck in Gujarat and Maharashtra on the west coast of India<sup>144</sup>, where it is one of the key species landed. It is from these fisheries that the Bombay Duck got its peculiar colloquial English name<sup>145</sup>. It is difficult to catch in the gillnets that many other fishermen use, so trawl is by far the easiest way to catch them.

---

<sup>143</sup> Interview 07.03.2017.

<sup>144</sup> For a description of the Indian fisheries, see Balli, Chakraborty, & Jaiswar (2006).

<sup>145</sup> Although there are several theories about the exact etymology, one popular version is that the name stems from the British mail trains that also transported large quantities of these pungent dried fish from Bombay to the interior of India. As the word dak means "mail", the wagonloads became known as "Bombay Dak" (BBC, 2020).

On the days when the ikan nomei is being fished, walking along the houses built on stilts on the tidal flats or further out in the water, it seems as if every horizontal surface has become part in the production of ikan tipis: "All of these fish, they belong to several people. We will weight when it is done, then divide it". The woman sits among a landscape of fish in various stages of curing. She is preparing a frame for a new batch. It takes 3-4 days in good weather she tells me. The now ivory, completely dry fish sticks to the frame a little, are light and have a texture a bit like rawhide. The smell is delicious. The woman takes a handful of fresh ones from today's catch, already gutted and cleaned, and arranges them neatly, fleshy side up on the now empty frame. "We will sell the finished ones to a bos here in Juata Laut, then she will sell them where the price is best, Jakarta or Tawau"<sup>146</sup>. The finished ones, somewhat translucent when set against the sun, are filled in large baskets and put aside.

"The nomei that the fishermen catch here, I sell to Malaysia, Indonesia, sometimes also to Canada!" The little lady sits on the tiled floor of her house, surrounded by huge sacks, almost four tons, full of dry, prepared ikan tipis. The smell in the house is incredible. The sacks contain almost one month's worth of produce from her client fishermen. "I have been buying ikan tipis for twenty-five years here in Juata. It was much smaller when I arrived, and there were almost no women. Only a lot of fishermen and the cold storage. I have had my children and now also grandchildren here, the business has fed us all". She goes on to describe life in Juata Laut during the early years, when it was essentially a factory town: "Back then it was all about fishing.

---

<sup>146</sup> 21.02.2017.

Some worked in the sawmill, but most were fishing. Later they brought their wives from Sulawesi”.

She runs a post where she buys the finished ikan tipis from around 25 fishermen, and provide them with loans for boats and equipment, as well as to cover running expenses such as diesel and reparations. Although she has bought from some of them for more than 20 years “it is strictly business. I do only provide credit for what is related to the business. No weddings” she laughs. “The fishermen come to me with their catch, I do not have any collectors. It is a small business, just me my husband and son”. She sold some of the fish to a couple of sellers at the local markets, to Tawau and also exported to Jakarta and a number of other Indonesian cities. “I earn 15.000 IDR<sup>147</sup> per kilo, it is not much but I do not complain. We call the system panjar. We have no contracts, just trust. The amount fishermen owe me is different. From 0.5 to 11 million”. When she told me she also sent her ikan tipis to Canada, I was surprised. She showed me a Facebook page<sup>148</sup> on her phone, “My son helped me with this. People write in there what they want and pay with Western Union. Then I ship it, minimum 25 kilos”.

Her post, and the many like hers both in Juata Laut and in the city of Tarakan solely buying ikan nomei, differed from most of the middlemen shrimp posts, as well as the large crab exporters discussed in the chapters above, by not being indebted, and in general having a much smaller turnover. “I will count the amount of fish they supply to me, and usually they will say how much I must subtract from their loans. They will just ask two hundred

---

<sup>147</sup> Around 1 USD.

<sup>148</sup> <https://www.facebook.com/IkanKerupuk/>

thousand out of five hundred thousand for that day for example. The rest goes to the loan<sup>149</sup>".

As one of the fishermen explained: "Everybody here has panjar. That is how it is. The fisherman sells the fish for 2000 to the bos, then the bos sells it for 10.000 to the market. The bos earns more than the fisherman!" He laughs. "That is just how it is. We are not free men [preman], all of us have panjar. We cannot sell where we want, maybe only 1% of the village [makes a sweeping motion with his hand] are preman. The advantage of preman is that you can sell where the price is best. The advantage of panjar is that when there is no fish, you can eat the panjar". However, as was discussed in the last chapter, the stability of this relationship is dependent on a continuous supply of fish, otherwise one or both parts in the relationship will be squeezed. "If I cannot catch the nomei, how can I pay my bos? I need to fish<sup>150</sup>"

The ikan nomei is listed as "near threatened" on the IUCN red-list (Russell, Govender, & Borsa, 2019). While historically there was commercial fisheries of ikan nomei in both Pontianak in West Kalimantan and off the coast of Sumatra, the ikan nomei is now considered economically extinct in Indonesia except in the waters north of Juata Laut<sup>151</sup>. But here, landings were decreasing too, and had been so since the early 2000s (Nugroho, Faizah, Prasetyo, & Badrudin, 2015, p. 53) despite restrictions put in place in 2014 that banned trawling in the inner part of the estuaries, where the ikan nomei was thought to spawn (PERGUB-26/2014; PERWAL-24/2014). As explained by the middleman buyer: "The last couple of years, the fishermen has provided me with fewer and fewer fish. Five years

---

<sup>149</sup> Interview 11.03.2017.

<sup>150</sup> Interview 04.01.2018.

<sup>151</sup> Interview 20.03.2018.

ago, I got so much ikan tipis. More than 10 ton from the them. Now I don't even get half of that<sup>152</sup>".

---

<sup>152</sup> Interview 11.03.2017.

## Ruined fishing grounds



*"It is the trawl, it is not good. They catch everything, big fish, small fish, shrimp. That is the explanation" - A fisherman<sup>153</sup>*

*"We are getting less and less. Maybe it is the weather, maybe it is the foreign fishing boats, I do not know why" - A buyer of fish<sup>154</sup>*

*"The pesticides from the shrimp ponds are killing our fish. You can see the bottles in the shops on every corner here in Tarakan" - A fisherman<sup>155</sup>*

---

<sup>153</sup> Interview 04.01.2017.

<sup>154</sup> Interview 27.12.2017.

<sup>155</sup> Interview 21.03.2018.

*"The trawl is dragged over the bottom. That is the problem. It catches everything, the microorganisms that the shrimp and fish eat, the plants. It is indiscriminate" - A fishery extension officer<sup>156</sup>*

*"It is actually the shrimp ponds. As we know, fish and shrimp, they only breed in the sea or the river, but the owners of shrimp ponds use particular substances in their ponds and when the water from the ponds flows to the sea, it poisons all the baby fish in the sea" - A fisherman<sup>157</sup>*

*"The trawls are flattening the bottom of the seafloor, destroying everything. They might be small, but there are thousands! Just go take a look, count them! They are the reason why the fish are disappearing, not the ponds" - A pond owner<sup>158</sup>*

*"It is illegal in Indonesia to use poisons and antibiotics in the shrimp ponds, it is not allowed. We sometimes confiscate it from the shops - they bring it from Malaysia and the Philippines" - A fisheries extension officer<sup>159</sup>*

Everyone was concerned with the decreasing number of fish, and everybody had a theory of why it was happening.

The fishermen, the buyers and middlemen, the local fishery department, the customers complaining about the rising prices at the local markets. Although there were many explanations as to why, it was more or less agreed upon that the decline in fish had been going on for a handful of years or more. The only thing that

---

<sup>156</sup> Interview 07.01.2017.

<sup>157</sup> Interview 17.03.2017.

<sup>158</sup> Interview 04.01.2018.

<sup>159</sup> Interview 23.03.2018

kept the fishermen fishing, was that with the decline in fish, prices went up, so that fishermen would get better and better prices for fewer and fewer fish. "Our potential for a living, or what it is. Our potential for a living is decreasing, and has been so for two or three years, maybe more. Today, what the fishermen can hold onto today is the price, that is all what we have left. The price is very high now. We cannot count on the numbers of fish anymore. Because the numbers are so small. If the price fall, we are all done. We go bankrupt. For example, if you compare with just five years ago, it was the other way around. We caught many, many fish, but the price we could get at the bos was very low. We could catch 10 or 20 kilos in one trip, no problem. We did not have to go far away. But now, we catch two, maybe five kilos on a good day<sup>160</sup>".

Although the roughly inverse proportionality between the numbers of fish caught and the price paid by the bos middlemen assured the fishermen a meagre "potential for a living", as the fishermen put it, it was only a temporary relief. The longer and longer days at sea required, meant increasing expenses for the fishermen, which translated into increasing debts. As one trawling man put it: "yesterday I got 300.000, today one million. My two engines use maybe 70 liters of fuel in one day. The expenses for one day are 700.000. Luckily my family can eat what I cannot sell, but still for the last two days, I have been eating the panjar even though I have been fishing everyday<sup>161</sup>". Butcher (2004) uses the term "static expansion" to describe a similar historic situation in Indonesian fisheries where total catches were somewhat constant,

---

<sup>160</sup> Interview 21.03.2018.

<sup>161</sup> Interview 28.03.2018.



while the number of artisanal fishermen more than tripled (pp. 207-208).

It can be argued that the situation among many artisanal fishermen in Tarakan were even more grim, as the fisheries were maintained only through gradually increasing their debts with the *bos*, a downward spiral for both parts, but a necessity in order for the fishermen to service their loans, and for the middlemen not to go bankrupt. As such, the *panjar* relationship between the fishermen and the middlemen, which was certainly robust and somewhat mutual beneficial when the catches were just fluctuating along a "normal" baseline, became a shackle when the catches kept getting worse. If the fisherman were to stop going to sea, he would have no way of paying off his debts, beside continuing increasing the number of hours at sea and intensifying his tools. Similar arguments have been put forth in other studies of long term results of similar kinds of patron-client relations among artisanal fishermen and middlemen buyers in the region, when faced with decreasing catches (Fabinyi, 2013, pp. 52-53; Ferse et al., 2014, p. 2063).

The estuaries surrounding Tarakan before the boom in farmed shrimp were covered in lush mangrove forests. There is substantial literature describing the crucial role that mangroves play in the coastal ecosystems as shelters hatcheries and feeding grounds for a wealth of riverine and marine life (Deb, 1998; Dierberg & Kiattisimkul, 1996; Ellison, 2008; Lee et al., 2014; Manson et al., 2005; Mumby et al., 2004). Today, except for a few isolated patches there is hardly any mangrove to be found in the vicinity of the island of Tarakan. The coasts are covered with ponds some fifty kilometers north and south of the island, and all mangrove within that area, on every island and islet, along every stream and river, has been converted to shrimp ponds. This loss of almost 1500 km<sup>2</sup> of mangrove swamps must have had wide-ranging and long-

lasting effects on the surrounding marine life (Aburto-Oropeza et al., 2008; Macintosh & Ashton, 2002), part of which form the basis for the fisheries centered around Tarakan.

As discussed in the previous chapter, effluent from the pondscape was acidic and rich in heavy metals due to the acid sulfate soils upon which the ponds were built (Dent, 1986, p. 37; Sammut, 1996; B. Wilson et al., 1999), as well as containing both the refuse and possible disease vectors from billions of shrimp (Walker & Mohan, 2009, p. 138) some capable of infecting other species of crustaceans as well (Flegel, 1997, pp. 436-437). Additionally, the water from the ponds contained whatever range of chemicals pond owners were using as well, most of which have well-described detrimental effects on marine life (Gräslund & Bengtsson, 2001; Holmström et al., 2003). As all the ponds were regularly emptied unfiltered into the adjacent rivers and streams, everything that was in the ponds eventually ended up in the estuaries and river mouths which thousands of fishermen fished every day. The trawling fishermen, who were slowly displacing the gillnetters, dragged their trawls through the mud deposited from the rivers, disturbing whatever was in the mud over and over again, to catch the diminishing shrimp, ikan nomei and occasional bawal.

As with the gradual ruination of the pondscape discussed in the previous chapter, the reasons for the equally large-scale ruination of the periphery of the pondscape are many. The multitude of local explanations all describe the reality of seeing the foundation of local livelihoods gradually but surely being eroded. They all describe different aspects of a ruination that is multifaceted, and contingent on multiple interconnected histories of resource extraction. Ruination accumulates and lingers (Tsing, 2015a, p. 6), but it also interacts and develops as past histories become today's legacies.

## "IN THE SEA WE WILL TRIUMPH"



*"We have to work as hard as possible to turn Indonesia into a maritime nation once again. Oceans, seas, straits and bays are the future of our civilization. We've turned our back on the seas, oceans, straits and bays for far too long. It is time for us to realize "jalesveva jayamahe"<sup>162</sup>, "in the ocean we triumph," a motto upheld by our ancestors in the past. We want to make that happen again<sup>163</sup>", - excerpt from the inaugural speech of President Joko Widodo 20.10.2014.*

---

<sup>162</sup> "Jalesveva jayamahe" is Sanskrit and translates to "in the ocean we triumph/are victorious". It also happens to be the motto of the Indonesian Navy (TNI-AL).

<sup>163</sup> Jakarta Globe (2014) quoted in Chapsos and Malcolm (2017, p. 178).

## Dynamite Politics



When president Joko Widodo, also known as Jokowi, was inaugurated as the seventh president of Indonesia in July 2014, his inauguration speech was riddled with maritime metaphors, and he made it clear that a strong maritime policy would be one of the cornerstones of his administration (Connelly, 2015). In his first cabinet was, among 34 other ministers, Susi Pudjiastuti, appointed as the new minister of KKP. Susi was a politically unaffiliated businesswoman, the owner of both a seafood business and an aviation company. From the onset of her tenure as minister, Susi Pudjiastuti, or ibu Susi, as she quickly became known, was unconventional. Both in her appearance; she had tattoos and was a chain-smoker, and in her unusual hardline approach towards ensuring sustainability in Indonesian fisheries (Jakarta-Post, 2014).

Among the very first actions Susi took when she became minister of KKP, was to impose a moratorium on new registrations of foreign built fishing vessels (this included vessels owned by Indonesians but built abroad), as well as a temporarily suspension of the fishing permit of all such vessels currently fishing in Indonesia (PERMEN-KP-56/2014, 2014). When the moratorium entered into effect, any foreign ship that was caught fishing in Indonesian waters was confiscated. Many of these ships were scuttled. Blown up in spectacular fashion, in front of crowds of notables and journalists with their cameras rolling, sunk to form "reefs" (Jakarta-Post, 2018b).

In 2016, after investigating the licenses of the 1132 foreign built vessels that had complied with the request to have their papers checked (an unknown number of ships chose to leave the country instead), those who were found to have committed no breaches of the law were struck from the Indonesian vessel register and allowed to leave the country. The majority of the 1132 ships however were found to have breached one or more laws, and were confiscated (Ikrami, 2017, pp. 321-323), and many of them were dynamited. This sinking of confiscated vessel became regular events, and by October 2019, 556 confiscated had been sunk (Antara-News, 2019).

In the waters of Tarakan where, as discussed above, a significant number of especially Malaysian fishing vessels, since the 2002 loss of Sipadan and Ligitan had been almost routinely caught and auctioned off, the new policy made the sinking of confiscated foreign fishing ships caught in the nearby waters a relatively common occurrence (KALPOS, 2015c, 2018), and also one often commented on by fishermen. Some thought it was good that the navy and POLAIR were active in protecting "their" fishing grounds, while others were more nuanced: "It is difficult to know where the border is, it is not like on land you know? There you can see the border

posts, and you would know. The policy of destroying those boats is bad for us, many people here earn good money as crew! Why not give them a warning first? The owners might lose everything if they lose the boat. They have no GPS, no navigation, how can they know if they cross the border?<sup>164</sup>".

There was much polemic about whether sinking the ships was the right thing to do. "Business interests" were calling for auctioning the vessels rather than sinking them, an approach which Susi rejected. She argued that auctions would lead to the boats being sold way below market price, and pointing to several recent cases, probably by their original owners, and would soon be back again, fishing illegally (Jakarta-Post, 2017a, 2017b). But her critics continued. In a dispute that eventually took to national media, the coordinating minister for maritime affairs<sup>165</sup> ordered her to stop sinking any more boats, which she refused. The conflict between the ministries continued to escalate, as the vice president Jusuf Kalla joining the critics calling for her to stop, but Susi kept refusing (Jakarta-Post, 2018a). In the end, president Jokowi intervened, and tried to mend the split between his ministers by on the one hand reiterating his support for Susi's ship sinking policy, while also reminding her that she ought to focus more on improving the production and export sector of Indonesian maritime products. While the intervention of the president muted the public critique of Susi among members of his cabinet (Jakarta-Post, 2018c), it continued locally, where local dissent echoed local positions.

---

<sup>164</sup> Interview 04.01.2017.

<sup>165</sup> Indonesia has a system of coordinating ministers, who are tasked with coordinating policy between the different ministries. The first cabinet of Jokowi consisted of 30 ministers and four such coordinating ministers.

Referring to past episodes where the same Malaysian owned fishing ships had been caught and auctioned off only to be caught again fishing illegally, the local leader of KNTI, the anti-trawl union of fishermen, said: "Just sink them, it is ok. It is good. Because if the boat is auctioned, the buyer will definitely be a Malaysian, because that is normally how it works. Then it is returned to them and they will operate that boat again. So it is good. Just sink those boats<sup>166</sup>". In opposition was the leader of PNK, the pro-trawl union, who argued that sinking them was a waste. "Those confiscated vessels, just lying there on the beach by the POLAIR base. Those boats are bigger, stronger and more technologically advanced than what we have, we should give them to our fishermen instead of blowing them up! Why not improve the livelihoods of our own fishermen by giving them better boats?<sup>167</sup>".

But the confiscated boats were never given to local fishermen. "A waste" as one of them told me when I asked him about it. "Why would you sink these ships? They are perfectly fine! We need better boats to improve our lives. They do no good for anyone on the bottom of the sea. In the television, she claims to work for the small fishermen. But we don't feel that. Why deny us that income?<sup>168</sup>". Others claimed that the "dynamite politics" of Susi and the threat of having their ships sunk, had removed many of the Malaysian boats that used to compete with the local fishermen. "Since they started with the dynamite, there have been fewer foreigners, and there are more fish<sup>169</sup>". This was however disputed.

One day sitting at a waterfront kiosk drinking coffee, the fish seller I was visiting showed me a picture on his phone, a large

---

<sup>166</sup> Interview 21.03.2018.

<sup>167</sup> Interview 15.02.2017.

<sup>168</sup> Interview 16.03.2018.

<sup>169</sup> Interview 27.12.2017.

ship looking to be pulling a trawl. "That one, that one is Malaysian. It has been fishing here for two or three days now. People have complained to the police, showed them pictures, but nothing has happened". The ship did indeed look rather much larger than any fishing boat I had seen in Tarakan. "That is the problem with the policy of Susi" he said, as he sipped his coffee. "Strict but not strict. The rules are just not equal. Some fishermen can fish outside the rules with no limits, without permits. Others need all the paperwork. It is all about having the right contacts you know?" As he took another sip of his coffee, I fully expected him to continue with a critique of the Indonesian crewmen who almost always crewed the Malaysian trawlers but instead he said: "I don't care if it is Indonesians, Malaysians or Filipinos fishing here. They are just looking for a living, just as we are". The man sitting next to us interrupted us: "Same. I don't care about where they are from, as long as they don't get in the way when I am trawling. We all sell our fish to Tawau anyway<sup>170</sup>". Statements such as these are a reminder of the muddiness, or ambivalence of state authority in borderlands in general (T. Wilson & Donnan, 1998), and along the Indonesian-Malaysian border in particular (Eilenberg, 2012; Obidzinski, 2003; Tagliacozzo, 2008).

---

<sup>170</sup> Interview 04.01.2017.



## The second trawl ban and the first exceptions



At the beginning of January 2015, only three days after the decree that banned the export and capture of undersize and gravid mangrove crab and lobster, Susi introduced another set of legislations<sup>171</sup> (PERMEN-KP-02/2015). This time it was a ban on a range of fishing tools, here among trawl nets, from all Indonesian waters, citing their ecological destructiveness. A director general in KKP said that he considered the new law “a reminder” of the fact that trawl had been illegal in Indonesia, since 1980 (Detik-Finance, 2015). While the legislation on mangrove crab and lobster had prompted resistance from fishermen and exporters as discussed in the preceding chapter, the 2015 ban on trawl was even more controversial as it affected a large number of fishermen across

---

<sup>171</sup> Amongst the number of tools banned in this law (NOMOR 2/PERMEN-KP/2015) was not only trawl (*pukat hela*), but also various forms of seines (*pukat tarik*). In Tarakan however, the whole debate was about trawl. Thus, from here on, I will refer to this law as the “2015 trawl ban”.

the nation. Shortly after the decree, there were large demonstrations in Jakarta calling for the law to be revoked and even for Jokowi to replace Susi as minister for KKP (Tempo, 2015). Not long after these initial demonstrations in Jakarta, meetings between organizers of the demonstrations and the minister was held, whereupon Susi agreed to introduce a nationwide "transition period" of three months, so that fishermen had time to change their gear (Kompas, 2015). This transition period was later extended until September 2015 (Detik-Finance, 2015). In July, the Indonesian ombudsman institution criticized KKP, of the lack of consultation procedures with fishermen organizations before the law was implemented, as well a lack of sufficient transition time (Ombudsman-RI, 2015).

In Tarakan, there was confusion too. Before the transition period was announced, PSDKP arrested 9 fishermen and confiscated their nets, but let them and their boats go after a lecture "on the destructiveness of their trawl nets"<sup>172</sup>. Some fishermen had thought they were exempted from the trawl ban, because of the exception fishermen had gotten from the 1980 trawl ban back in 2008 (PERMEN-KP-06/2008), but they were informed by the provincial fisheries office that the "2018 law actually had been cancelled since the independence of North Kalimantan in 2012". The exception had been valid only for people with "residence in East Kalimantan" although that change had neither been communicated or upheld in practice<sup>173</sup>. As the transition period was to run out, then incumbent governor of North Kalimantan, Triyono Budi Sasongko declared at a press event that he, in opposition to KKP, hereby decreed that fishermen in North Kalimantan could continue to trawl until 31 of December

---

<sup>172</sup> Interview 23.03.2018.

<sup>173</sup> Interview 20.03.2018.

2015, when his period as governor would be over. He argued that he had decided to go against KKP due to several considerations. One was the objections of the Indonesian ombudsman, another was the importance of upholding the "activities of trawlers in the northern Kalimantan waters to maintain the integrity, or effective occupation<sup>174</sup>, of our territorial waters and the sovereignty of Republic Indonesia". In his announcement, he also stressed that there was the (void) decree excepting trawl in the northern waters of East Kalimantan (PERMEN-KP-06/2008), implying that it had been and still were necessary. Representatives from TNI-AL, POLAIR and POLRES were present at the event where the governor announced his exception, and first admiral Wahyudi, commander of the Lantamal-XIII navy base in Tarakan declared: "As this is what the local government has decided, we as the law enforcement officers will, in this case, support that decision by not arresting the fishermen who catch fish using trawl" (KALPOS, 2015b).

While the governor's choice of temporarily suspending the ban on trawl was supported by the trawling fishermen and spearheaded by PNK, it was also criticized from several fronts. The rector of the largest university in North Kalimantan concluded that "the weakness of the local government is that it cannot stand the pressure [from the pro-trawls associations] [...] the trawl is destroying our marine resources, especially when used where the fish spawn". KNTI and other associations of fishermen not using trawl condemned the decision as well, and expressed regret that they had not been invited to a meeting that apparently had taken place between the governor and PNK in the days before the governor issued his exception, complaining that PNK did not represent all

---

<sup>174</sup> He used the English word "effective occupation", synonymous with the concept of *effectivités*, which was used as basis for the ICJ ruling over Sipadan and Ligatan (ICJ, 2002).

fishermen in the province (KALPOS, 2015a). The exception required trawling fishermen to fill a number of forms, in order to apply for being included in the exception. PNK offered its members to take care of this for a small fee.

At the end of the year as the extension from governor Triyono ran out, the provincial fisheries office in North Kalimantan decided to wait and see what the new governor's position was, before starting to enforce the ban (KALPOS, 2016). Similar discussions took place in other places of Indonesia, and local exceptions to the ban were also being granted in other provinces. In Java, powerful associations of fishermen, boat owners and businessmen were successful in getting KKP to issue a nationwide, two-year exception (72/MEN-KP/II/2016) from the ban on another tool, *cantrang*<sup>175</sup>, widely used on the north coast of Java (Semedi & Schneider, 2021, p. 55), but in 2015 and 2016, no such official exception came for trawl.

Instead came a number of "informal agreements" as one fishery extension officer explained. "We in Tarakan understood the difficult position of the fishermen, and were waiting for KKP to present a viable alternative to the trawl, as they had promised us. So we made agreements with POLAIR and the navy, to make an exception not to catch the fishermen until they have an alternative ready<sup>176</sup>"

---

<sup>175</sup> Cantrang, or Danish seines, are different kind of nets that to some extent is also dragged along the seafloor, but envelop fish when retrieved, unlike trawl nets which traps fish as they are pulled through the water or across the seafloor.

<sup>176</sup> Interview 20.03.2018.

## Extensions of extensions



*It is early morning. The sun has only just risen, and every outer surface of the boat is still wet from last night's rain. On our way out into the sound, we are hailed by a nearby boat, a man on the foredeck gestures at his engine. "Let us help him in" the fisherman says, and maneuvers alongside the stricken boat. Using an old tire for a fender, we tie the boats together and pull him back to Juata Laut. "This happens all the time these days" The fisherman tells me. When we near the coast, he unties the rope and throws it back, and the man in the green boat uses his anchor to warp himself the rest of the way.*

*We deploy the net and start trawling. After a while the fisherman starts fiddling with a dirty portable pump. "No one wants to repair their boats these days. And why should they, if Susi are going to*

*confiscate them anyway?“. Water splashes around in the bilge below the engine. The fisherman manages to start the pump, which quickly drains the bottom of the boat. This process is repeated several times during the day, as water keeps seeping into our leaky boat while we trawl<sup>177</sup>.*

The years following the 2015 trawl ban were characterized by frustration and uncertainty. Trawling fishermen and the bos middlemen financing them, feared that the trawls eventually would be confiscated. “Back then, I was careful with giving too much panjar. What if it would all be lost? We did not know what would happen<sup>178</sup>”. And with good reason. PDSKP, the fisheries surveillance directly operating under KKP, reputedly caught fishermen fishing with trawl in 2016, contrary to POLAIR and the navy, who were following the local exceptions. As one fisherman using trawl recalled “I was afraid all the time. I was afraid of getting arrested, but I had to fish. How else could we eat? I would use short cuts to go where I wanted<sup>179</sup>”

In early 2017, provincial government declared an official extension of the (unofficial) exception from the trawl ban, promising that all fishermen using trawl would get a new set of “environmentally friendly” fishing gear before the new extension would expire in mid-2017. “We will implement the change as a barter system, where we will swap fishing gear by taking the old [trawl] gear and replace it with the new environmental friendly one” the leader of the provincial fishery office explained (KALPOS, 2017d). Part of the agreement was that fishermen could continue fishing with their trawls until they were provided with new tools.

---

<sup>177</sup> Interview 27.12.2017.

<sup>178</sup> Interview 16.03.2018.

<sup>179</sup> Interview 28.03.2018.

But it was not all agencies that were part in this agreement. Patrols from PSDKP occasionally confiscated trawls that were allowed by both POLAIR and navy. "The police and the navy, they leave us be. But ibu Susi's police don't always. They don't come here often, but when they do, we have our friends in POLAIR warning us. They tell us: don't go fishing today<sup>180</sup>". As one of the PDSKP officers explained: "The situation is complicated. The fishermen don't use the new tools offered by the KKP. In 2017, we took more than 20 nets. When we take the trawl from the fishermen, we say: forgive me. We are sorry. Because there is no alternative for them. Ibu Susi has promised new tools, but the provincial government has not been able to find them. For me, confiscating mangrove crabs from smugglers is easy, those men are rich. But it is different with the fishermen<sup>181</sup>".

Then in May, another extension was given, this time until the start of 2018, as it was realized that no substitute nets would be ready. According to the district fisheries office, the province had not even started testing the potential alternative kinds of gear. Where the first 2017 extension had been given "by discretion of the province" (KALPOS, 2017c), the new extension was extended directly from KKP (B.664/DJPT/PI.220/VI/2017).

The prospect of getting new tools from KKP was debated amongst the fishermen using trawls and their unions. "Our boats, they are expensive and made for trawling. It would be difficult to use them for other kinds of fishery. Give us an equipment that is better, that catches more fish and we will use it. If not, we will not give up the trawl. How else can we eat? The replacement needs to

---

<sup>180</sup> Interview 07.03.2017

<sup>181</sup> Interview 23.03.2018.

be compatible with our boats, and for one man only. Otherwise, buy them! We want 200 million<sup>182</sup> for each boat<sup>183</sup>".

The gillnetters, many of whom were organized in KNTI, were frustrated too. "How can the government continue to give them exceptions? Everybody knows that the trawls are ruining the fishing here. It is clearly illegal. It is hard enough for us already. How come the government invite us gillnetters to workshops, teach us not to harm the environment, and then let them continue fishing with the trawl net? I fear they will make the exceptions permanent<sup>184</sup>".

When the alternative tools finally arrived from the province in October, they were tested by the regional fisheries office, who found them ill-suited to the waters around Tarakan, The head of the regional fisheries office complained that the provincial fishery office had taken so long to find and deliver a few sets of tools, which weren't useful. "Have pity on the fishermen. We have waited for a very long time on the provincial government [to provide an alternative]. Trawl is about to be banned from the 1<sup>st</sup> of January!" (KALPOS, 2017e). When I met him in his office, he elaborated: "Working with the province is very slow. They don't care about fishermen. But the rules are so, that we have to go through them in our communication with KKP. We have almost 5000 fishermen, they have only 100!<sup>185</sup>".

No trawling fishermen were optimistic about the alternative tools provided by the province. When I asked one of the fishermen who had tried one of the "environmentally friendly" nets about his

---

<sup>182</sup> Around 14.000 USD.

<sup>183</sup> Interview 15.03.2018.

<sup>184</sup> Interview 21.03.2018.

<sup>185</sup> Interview 20.03.2018



opinion, he said: "it is actually just a gill net, made from a different material. I am not interested", and added "if there were tools that were more effective than trawl, everybody would be using them already, and then the government would not have all this trouble. Any new tool will be worse<sup>186</sup>". For the nomei fishermen in Juata Laut, the news that the alternative tools were to be a variation of a gillnet, was not well-received, as it was widely-known that the nomei could not be caught with such gear. "We will continue fishing, and we will continue to make more demonstrations<sup>187</sup>". Meanwhile, PNK was lobbying hard to make a permanent exception from the trawl ban for the fishermen of nomei, arguing that "the ikan nomei is special. It is the famous national fish of North Kalimantan<sup>188</sup>". Headed by PNK, the fishermen wanted a reiteration (now defunct) 2014 provincial and district exceptions (PERGUB-26/2014; PERWAL-24/2014) from before the 2015 trawl ban to be made to supersede the national legislation regarding the nomei. This position was agreed upon by the district fishery office, who attempted to convince the province to support the idea.

And as 2018 arrived without any new credible substitute for the trawl net, the regional fisheries office, POLAIR and the local navy commander met again, and agreed upon yet another unofficial exception. "There exists no paper, no MoU for this. But we cannot take the nets without offering them an alternative"<sup>189</sup>. And once again, PDSKP conducted sporadic patrols and once in a while caught a fisherman using trawl. "It is becoming more of a show now, their patrols. To show that they uphold the trawl ban when really,

---

<sup>186</sup> Interview 26.12.2017

<sup>187</sup> Interview 28.03.2018.

<sup>188</sup> Interview 30.03.2018.

<sup>189</sup> Interview 20.03.2018.

everybody knows it will not last" the PNK leader explained. He had just announced that he was running for a seat in the provincial assembly (DPRD), urging both members of PNK and their families to vote for him. "I was urged to run for the seat by the members of PNK. My platform is to improve the lives of small fishermen. I will fight for the trawl, and for better prices on fish<sup>190</sup>". However, many of the fishermen I spoke to, complained that the leader of PNK had charged a fee for doing the paperwork for each of the many exceptions that had been given. "I did not want to pay, but I had to. Even though it is free at the government office, I cannot spend several days waiting. Better to pay him to do it"<sup>191</sup>. Meanwhile, a series of meetings between the Juata Laut fishermen and the district fishery office were conducted, which resulted in an informal agreement that in all essentiality was a continuation of the 2014 pre-ban exceptions. The nomei fishermen celebrated. "The new rules are good for us. They say only to fish ten days each month, and no fishing inside the rivers. That is ok. You only catch nomei during neap tide anyway<sup>192</sup>". Despite not being formalized, the fishermen considered the agreement a confirmation of their rights to trawl, in spite the decreasing number of fish to catch.

In practice, this informal agreement extended to all trawling fishermen on the island of Tarakan, not just the fishermen from Juata Laut. "We are very happy with the fishermen from Juata" said a fisherman in Lingkas, one of the seaside communities in Tarakan. "Since the agreement with the fishermen in Juata, we trawl whenever we want. The agreement says nomei, but the other fish are "allowed"

---

<sup>190</sup> Interview 30.03.2018.

<sup>191</sup> Interview 06.04.2018.

<sup>192</sup> Interview 28.03.2018.

as well" he says, making quotation marks with his hands and laughs. "No one interferes with us after the deal. How to know what we are trawling for?" He laughs again. "Thanks to the nomei, we can continue as we want<sup>193</sup>".

---

<sup>193</sup> Interview 06.04.2018.

## SUMMARZING THE CHAPTER



In October 2019, Susi Pudjiastuti was replaced as minister of KKP by Edhy Prabowo, who immediately started to revoke and unravel some of the legislation that had been made by his predecessor. Among these revisions, which were generally thought to be business friendly, was lifting a ban on the export lobster larvae (PERMEN-KP-12/2020), that had been put in place simultaneously with the ban on export of gravid mangrove crabs, but also removing many of the restrictions on the use of destructive fishing equipment, although not trawl (PERMEN-KP-59/2020). A little over a year after he took up office, the new minister was arrested and charged with corruption in a series of deals concerning the export of lobster larvae, although the revisions he made still stand.

The turmoil in KKP notwithstanding, fishermen continued to trawl in the periphery of the pondscape. Although the leader of PNK did not manage to get elected to the provincial assembly, throughout 2019 and 2020, unofficial extensions of the exemption from the 2015 trawl ban kept being given, as the province of North Kalimantan could not find tools that the fishermen trawling for bawal were willing to accept. In late February 2021, the province reinstated (PERGUB-26/2014) which legalized trawling for ikan nomei indefinitely (KALPOS, 2021) and the province aims to substitute all trawls not targeting ikan nomei with gill-nets in 2021 (KALPOS, 2020a).

Taking the long succession of extensions from the trawl ban into account and considering the readiness of new ministers of KKP to relax the restrictions put on gears considered destructive, it is entirely possible that the trawl ban will eventually be officially lifted. But whatever the outcome, the fishermen living in the periphery of the pondscape will continue to go to sea and fish.

## Shared ruins



Life in and around the pondscape is muddy.

The mud deposited in the mangrove swamps over thousands of years was, with the advent of the pondscape pushed up and formed into embankments, and smoothed to form the floors of ponds. Thus bereft of any vegetation to hold the mud in place, it was slowly washed away by the rivers and the rains. Combined with the deforestation of the palm oil plantations further upstream, the rivers and the estuaries turned a creamy brown<sup>194</sup>. It changes with the season, but you have to sail several kilometers away from the coast in order for the water to become more bluish. Over centuries, the rivers deposited mud, which gradually formed the estuarine

---

<sup>194</sup> "It was never clear, but before the ponds and palm oil, it was less brown" (Interview 04.01.2017).

seafloor. "Our waters here are very special, unique. The fish are born in the mangrove area, and the bottom of the ocean is muddy, no coral. That is why we trawl". Explained one fisherman. "It is not coral like in other places. That is what they don't understand in Jakarta!<sup>195</sup>". But the waters and livelihoods in the periphery of the pondscape are also muddy in a more figurative sense.

Malaysian owned boats with Indonesian crews, selling their catch in Malaysia but catching it in Indonesia, sailing through disputed waters at night, changing flags and identification numbers at will. What looks clear from a distance, turns out to be muddy when inspected more closely. In the same vein were the prolonged but futile attempts at implementing the ban on trawl in the periphery of the pondscape. The bewildering stream of extensions and exceptions and the tacit agreements between local government, police and navy not to enforce national law, muddied both the authority of the state, and that of the local governments. While such fluidity of cross-border relations (Eilenberg, 2012, pp. 232-234), as well as the internal competition between the numerous institutional actors of the Indonesian state (Barker & Van Klinken, 2009, pp. 26-27) are well-described, especially in a borderlands context, they added to the muddiness.

This turbidity also reflects the uncertainty that is so characteristic of many aspects of life for the fishermen here. What, or who is to blame for the declining fish stocks? Will there be a new extension of exception from the trawl ban? How will I be able to repay my debts? These topics have been discussed in the above, but they have been left unanswered, because those answers are uncertain, for fishermen and outside observers alike, and

---

<sup>195</sup> Interview 16.03.2018.

contingent just as much on past developments as they are on present decisions.

The livelihoods of the fishermen trawling the estuaries, and the history of the cold storages throughout the genealogy of extraction are intertwined. The systematic recruitment of new fishermen through debt-based patronage and the introduction of trawl nets for shrimp, helped establish large communities of artisanal fishermen around the cold storages. As did the growth and eventual decline of the pondscape. With the movement towards farmed shrimp, fishermen started trawling for fish, while still occasionally supplying the cold storages. Others, who had arrived in Tarakan hopeful to be part in the boom but failed, took to fishing instead. The shared history of the core pondscape and the fishermen trawling its periphery extends into the present, as the fishing grounds are nearing exhaustion. A shared ruination that is a byproduct of extraction on various scales.

while the mud that clouds the water is eroded and washed away by the rivers flowing through the bare pondscape, much of the muddiness stems from its presence, and the generations of extractive regimes that came and went before it. In the pondscape, the frictions that make and accelerate the flows of global capitalist supply chains (Tsing, 2005), connecting the divergent but related economies of pond owners, cold storages and fishermen along the way, contribute to an erosion that not only hollows out the dikes and embankments of the shrimp ponds, but also gnaws away at livelihoods outside the chains themselves. If "without even trying, friction gets in the way of the smooth operation of global power" (Tsing, 2005, p. 6), erosion is the aftermath of the encounter between unequally scaled forces.



In the periphery of the pondscape, it becomes difficult, if not outright impossible to disentangle the many sources of ruination that have layered throughout the genealogy of extraction. The composite legacy of large-scale ruinous erosion by equally large-scale resource booms have been further expanded by the activities of thousands of trawling artisanal fishermen, each pulling their trawl-nets through the estuarine mud, in the hope of catching their share of the dwindling fish.

Ruins give life to some futures while simultaneously restricting others (Stoler, 2008, p. 194). Contrary to the sharecropping pond caretakers, many of whom when squeezed by the creeping ruination of the core pondscape, turned to collecting and selling mangrove crab, the trawling fishermen had few if any alternatives to turn to, except intensifying their gear and increasing the time spent fishing, and the middlemen bos who financed them had little choice other than to finance their intensification.

That this intensification was not going to last in the long run, was something many fishermen were acutely aware of, and commented on when we talked about the future. "My children are going to school. They are getting an education, that I have paid for through this hard work. They are not going to be fishermen like me, I will be the last one. There is no future in being a fisherman<sup>196</sup>".

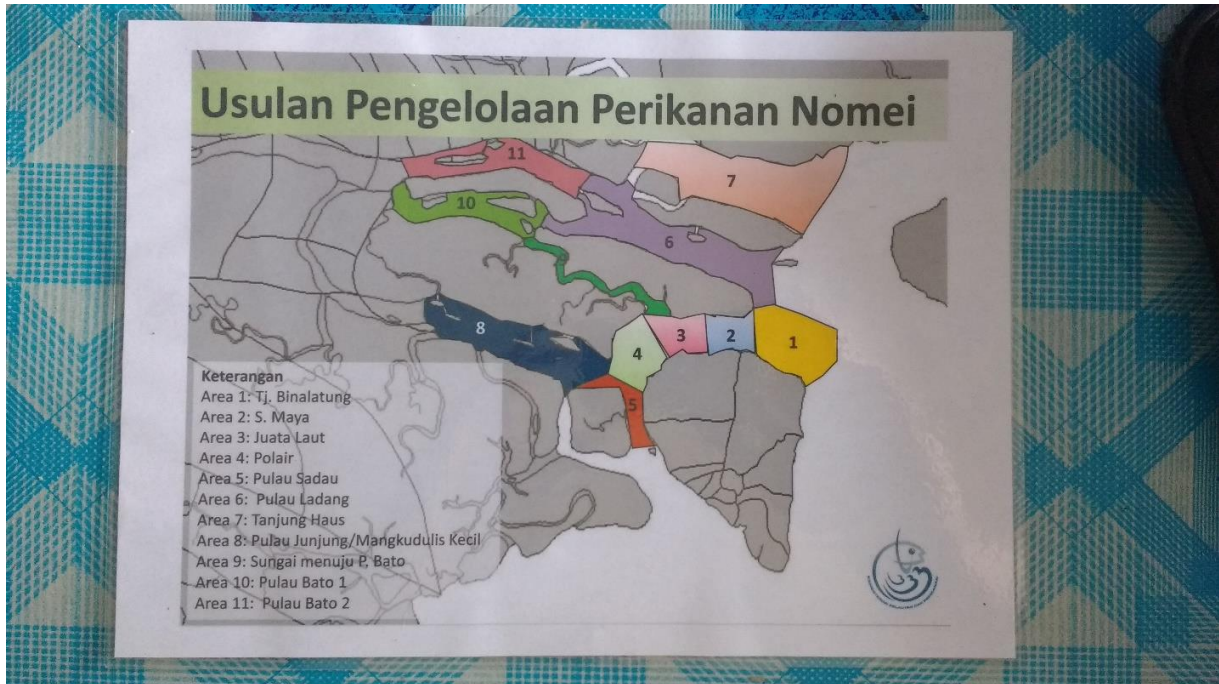
The series of exceptions, extensions and extensions of exceptions being issued, officially and unofficially, from both local and national level making the legal status of the trawl net so opaque, is a failing technical solution to a structural problem. Put succinctly, but precisely, by a Lingkas fisherman: "I trawl whether it is illegal or not. How else can I feed my family?<sup>197</sup>".

---

<sup>196</sup> Interview 07.03.2017.

<sup>197</sup> Interview 21.03.2018.

## Managing ruination



That trawl ceased to be controversial in the 1980s, when it was practiced by small fishermen instead of company owned trawlers, highlights that the 1980 was ban never about ensuring ecological sustainability, but a political decision of securing “peace and stability” (Iman Sardjono 1980, quoted in Butcher (2004, p. 237). It also had the effect of promoting the fishermen as individual entrepreneurs in the caught shrimp frontier, and ultimately incorporating them into the bottom of the pyramid of centralized clientelism so characteristic for the New Order regime (Aspinall, 2013b, pp. 33-34; Tsing, 2003, p. 5103). Thus introduced by the cold storages and implicitly approved by national and local governments, artisanal fishermen took to trawling in large numbers, and as the cold storages switched towards farmed shrimp, fishermen switched towards trawling for fish. Later, after the loss of Sipadan and Ligitan, trawling went from being tacitly

approved to being an activity of national importance, and was further bolstered after the formation of North Kalimantan.

As fish stocks declined, the newly elected, ambitious but inexperienced minister Susi Pudjiastuti came up with a plan to address the very real depletion and destruction of marine life in Indonesia. When explanations were sought, the culprits found were foreigners and local fishermen. Banishing foreign fishing vessels was a relatively easy, and among the general populace, popular move, and it certainly must have taken some pressure of the declining fish stocks. A swift ban of destructive fishing gears was pushed through, and fishermen and their patrons protested. The minister replied with both an extension and a threat: there would be no more extensions. This pattern repeated itself, and the ban never went into full effect.

Not only did the original trawl ban ignore the many livelihoods tied up in the use of these gears, not even providing an alternative or giving fishermen a realistic period of time to change them. The trawl ban also ignored the wider, historic, economic and political context which fueled the unsustainable extraction of marine resources and in which this extraction was embedded. It was a technical solution to a structural problem (Li, 2007, p. 7), and it is telling that the answer to environmental destruction was to regulate the fishermen trawling in the periphery of the pondscape, while leaving the thousands of ponds almost unregulated.

In Tarakan, the ban hit a group of fishermen who used trawls to secure comparably better catches than those who did not, in a fishery where everyone was catching less and less. Being more heavily indebted than the gillnetters, due to their stronger and more expensive boats, they were also more heavily entrenched in the fishery, as was the middlemen bos that financed them. And it

was also the middlemen bos who led the campaign against the trawl ban, organized demonstrations, lobbied politicians and led the meetings and workshops with the fisheries officials. It was a middleman bos who took control of PNK, the largest fishermen association at the time, who used it to fight the ban and later as campaign platform for his political aspirations. The debt-based patron client relations between fishermen and middlemen bos, not only hampered the implementation of regulation, but also fueled the extraction that partly mandated it in the first place.

While it is easy to vilify the bos middlemen, it must be stressed that fishermen actively seek them out, as having the security of flexible credit and easy access to the market is absolutely necessary in artisanal fisheries, especially in one where landings are decreasing. But, as argued above and pointed out by other studies (Fabinyi, 2013, pp. 51-53; Ferse et al., 2014, p. 2063), the resistance of these relationships to regulation and the propensity for intensification over adaptation in response to falling catches, favors short-term gains over long-term sustainability.

.o000o.

In this chapter, a tale from the periphery of the pondscape was told. Of fishermen struggling against the ruination of their fishing grounds but just as much against regulations intended to halt that very same ruination. While the fishermen, and their patrons, were successful in fighting of the immediate threat of the ban on trawl, the long-term threat of a collapse in fishing stocks only crept closer.

## CONCLUDING REMARKS



Successive generations of resource frontiers have swept through the forests, mangroves and seas of what is today the Indonesian province of North Kalimantan. As shown in this dissertation, this genealogy of extraction spans centuries.

But recently, within just a single (human) generation, within the lifetime of a generation still alive, still harvesting ponds, still going to sea, still buying and selling shrimp, mangrove crab and fish. The scale of extraction, destruction and ruination radically transformed vast land- and seascapes that had been formed over hundreds, if not thousands of years of human activity and trade, a “juxtaposition of financial booty, on the one hand, and the poverty of devastation of earlier projects of capitalist expansion, on the other” (Tsing, 2016, p. 330). Living in the

ruined pondscape, the aftermath of this acceleration has been the focus of this dissertation. Today's ruined pondscape, the ubiquitous backdrop to the tales unfolded in this dissertation, is formed and forming the flows, frictions of the commodity- and supply chains that are such an integral part of life in the waning frontier of farmed shrimp.

All tales have a beginning and all tales have an end, and the tale of the pondscape is no exception. Establishing the origin of the protagonist is important, as it forms the basis for the present, and hints at the future. Where the first chapter was occupied with the genealogy of extraction, surveying the past generations of the pondscape, the two following chapters revolved around current livelihoods in respectively the core and the periphery of the pondscape.

## Chapter I - Introduction

In chapter I, the tale of the ruined pondscape began. first I introduced the beginnings of the project and my reasons for the subsequent choice of cases. I argued for the importance of anthropology to engage in some of the tectonic shifts of our time: the rapid and worldwide emergence of aquaculture and the worrying decline in capture fisheries and I paid special attention to the social and historical dimension of cycles of boom and bust that seem to plague both industries. I then went on to present my research questions, the field and the outline of this dissertation. Next, I presented my thoughts on the pondscape, the focal point of this dissertation. I argued for the threefold use of the pondscape, as 1) the concrete physical and relational infrastructure of large-scale shrimp farming around Tarakan, as 2) an analogy for extractive supply chain capitalism and as 3), an assemblage of scholarly debates on extraction, ruin and the connection within

and beyond anthropology, all of which I employ in this dissertation. The chapter ended with a methodology section, where I discussed how both active choices and field conditions shaped both my data collection as well as the further analysis presented in this dissertation.

## Chapter II - A genealogy of extractions

The chapter started out with an overview of the history of precolonial extraction and export of a number of valuable commodities from the forests and the seas, a trade dominated by the Sulu and later occasionally the Bugis, external maritime polities who through slavery, coercion and tribute prospered by facilitating the flow of these commodities to China. Later, with the discovery of oil, Tarakan became a Dutch outpost, and later again, the center of a large oil industry and a military base. Thousands of Javanese and Chinese laborers were brought in as manual workers. After WWII, and the eventual independence of Indonesia, the oil industry was nationalized, but never regained the same importance as it had had before the war. With the oil boom, came the first of several booms in logging, with many people moving from industries related to oil, to businesses related to timber. Practically all logs went through the Malaysian border city of Tawau, funneled through patron-client networks operating on both sides of the border, under the bought protection of both army interests and local government officials in Tarakan.

In the late 1970s, with Japanese investors providing the capital and Indonesian businessmen providing the access, a number of cold storages, factories for processing, freezing and exporting shrimp, established themselves on the island of Tarakan. Initially, these cold storages had their own fleets of large fishing vessels which trawled the coastal areas, rich in shrimp. When trawling was

forbidden in 1980, cold storages outsourced the supply of shrimp by providing local businessmen with large loans, with which they gave credit to hundreds of client fishermen. With this credit, the fishermen bought boats and gear capable of catching shrimp, the profits from with which they used to repay their debts. Through this arrangement, the cold storages continued business as usual. Yet wild shrimp stocks were running low, and starting gradually from the late 1980s and early 1990s, more and more shrimp were being sourced from extensive shrimp ponds. These were built on cleared mangrove land, bought or taken from the indigenous owners and financed through similar debt-based systems of patronage. During the Asian financial crisis of 1998 and in the following years, high market demand coupled with a weak rupiah meant windfall profits for shrimp farmers and the numbers of ponds exploded accordingly, more or less replacing caught shrimp in a few years. The resulting pond-frenzy attracted many domestic immigrants to Tarakan, many of whom indebted themselves in order to join the boom. In the mid-2000s however, the boom started to slow down, and the older ponds began to produce less and less.

### Chapter III - A crabby tale

This chapter took off where the chapter II concluded; at the peak of the boom in farmed shrimp, just as the first signs of ruination started to show.

In this chapter I argue that, as the concrete physical infrastructure of the thousands of ponds that make up the pondscape slowly deteriorated, so did the relational infrastructure that existed in parallel to the cellular network of dams, waterways and rivers, gathering the produce of the entire pondscape and directing the flows towards the few cold storages on the island of Tarakan. The networks of patronage that ultimately tied the many thousand



pond caretakers together with a handful of cold storages, and which at the onset of the boom of farmed shrimp had provided at least some reciprocity and flexibility for participants in the supply chain, became strained in the face of failing harvests and profits. Loans increasingly became for business only, caretaking became risky sharecropping and unserviceable ponds and debts were abandoned. But amidst these ruins a new livelihood was found.

Mangrove crabs, endemic to the since-vanished mangrove swamps, and now considered pests to shrimp farmers, were collected by caretakers at night and sold to collectors navigating the labyrinthine pondscape in small speedboats. The crabs were bought, sized and sold in large amounts by entrepreneurial businessmen to Tawau, and from there bought and resold, until finally ending up as expensive dinners on the platters of well-to-dos across much of south east Asia.

Contrary to the supply chain of shrimp, this trade in mangrove crabs bypassed both pond owners and cold storages, and until recently local government as well. In 2015, new legislation was passed from the National Ministry of Fishery and Marine Affairs (KPK) that illegalized the collection and sale of gravid female mangrove crabs, due to concerns about the sustainability of collecting and trading them. As the gravid females were also the most sought after and expensive, this legislation was hugely unpopular among buyers, collectors and caretakers, who fought it through lobbying, demonstrations and arguments that mangrove crabs collected in the pondscape should be considered farmed and not wild. However, except for an exception for export around Chinese new year, neither national or provincial government acceded, although the regional government was more sympathetic.

In spite of the ban, there was a lively nighttime traffic of contraband crabs Tarakan to Tawau, organized by the crab bosses

and their contacts across the border. No quicker had this trade in illegal mangrove crab formed, than it became embroiled in long standing patterns of rent seeking. The waters between Tarakan and Tawau were patrolled by several agencies and although tasked with suppressing the illegal cross-border trade, it was a public secret that the crab entrepreneurs routinely bribed both the navy and the maritime police (POLAIR) to allow passage, leading to frustration among both the regional fishery department and the fisheries inspection agency (PSDKP) who also patrolled the waters, but operated directly under KKP.

The chapter concludes with signs that the cold storages, which so far had not been involved in the nascent commodity chain of mangrove crab, with the blessing of the political establishment, could be moving into this burgeoning trade.

#### Chapter IV - Fishing in muddy waters

Where the last chapter looked at some of the consequences of ruination in the core of the pondscape, this chapter turns the attention towards the periphery of the pondscape. For the thousands of fishermen living here, on the edge of the pondscape, ruination is an everyday fact of life, encountered whenever they go to sea, whenever they empty their half-full nets after a day of fishing and whenever they have to ask their boss for an extension of credit. Catches are declining, and there is a multitude of explanations as to why. In this chapter, I argue that for the fishermen living in the periphery of the pondscape, intensification and resistance to regulation seems to be the only answer to ruination. Additionally, this dissertation adds to the literature that argue that while the debt-based patronage relations that fund these fisheries might be beneficial for both fisherman and middleman in the short run, they

are part of a pattern of extraction that is unsustainable in the long run.

The tale of the small-scale fishermen, first introduced in chapter II, is continued. These fisheries have been intertwined in various ways with parts of the broader genealogy of extraction. Many of the fishermen arrived in Tarakan to be part of past generations of extraction, ended up as fishermen when livelihoods changed. After the 1980 ban on (company owned )trawl, artisanal fishermen were equipped with loans provided by the cold storages through middlemen buyers, and introduced to smaller versions of the industrial trawl nets and the more powerful boats needed to pull them. Through the middlemen, their catches were sourced by the cold storages and exported. With the boom in farmed shrimp in the late 1990s and early 2000s, the cold storages changed towards financing the pondscape instead, and fishermen adapted their gears to catch fish instead of shrimp. The loss of Sipadan and Ligitan in 2004 set a number of developments in motion that were to impact the fishermen in various ways. The use of trawl had, despite its popularity still technically illegal, suddenly become a matter of national sovereignty. National legislation legalized trawl, and fishermen were urged to go fishing. When North Kalimantan was formed as a province of its own, the importance of trawl was again reaffirmed through new provincial and regional legislation made possible by the newfound independence from East Kalimantan.

The increasing popularity of the new, more effective (and expensive) trawls created dissent among fishermen, when everyone's landings began to dwindle. Users of gillnets and other gears were concerned about the effects of trawl on the fish stocks, and the conflict led to the formation of two competing associations of fishermen, one pro- and the other against trawl. With trawling being significantly more capital intensive than the other forms of

artisanal fishery in the periphery of the pondscape, the middlemen bos who financed it were equally more vocal in defending it. When KPK in 2015 declared trawl to be illegal, citing its ecological destructiveness, the middlemen organized demonstrations and lobbied regional and provincial government to counter the national legislation. This led to a long series of official and unofficial exceptions and extensions of exceptions from the ban, from alternately national, provincial and regional government. While navy and POLAIR, in periods where there was no official exception, for the most part refrained from confiscating trawl equipment and fining fishermen caught using them, vessels from the fishery inspection (PDSKP) did. Although some were occasionally caught, trawling fishermen relied on warnings from sympathetic police officers and government officials to avoid PDSKP patrols. The uncertainty of this cat and mouse game, and the ever present threat of a definite ban, meant that middlemen were less willing to provide loans as the future of the trawl fisheries was uncertain.

### Ruined and repurposed infrastructures

There have always been extraction, commodification and trade of valuable natural resources from the forests, estuaries and reefs surrounding Tarakan. This extraction violently displaced populations and left ruins in its wake, while it connected Tarakan with a wider world of markets and consumers. I argue in this dissertation that these extractive regimes of the past were every bit as destructive and violent as are the frontiers of today, although of a smaller scale. I argued that the pondscape can be thought of as the physical and relational infrastructure of the latest iteration of this long succession of interrelated and mutually reinforcing resource frontiers which have swept through this particular part of (what today is) the Indonesian province of North Kalimantan. Each of these resource frontiers accumulated

ruins, some of which were incorporated and repurposed into future frontiers while others were left to linger and decay. Long standing networks of patronage and debt provided the relational infrastructure of extraction throughout much of the genealogy and was with the advent of ice factories, excavators and refrigerated containers incorporated seamlessly into the supply chains.

In classic literature on patronage, it was often assumed that patronage would vanish, or at least be constrained with the emergence of strong centralized states (Gellner, 1977, p. 4), an idea often carried on in fishery policy programs where the assumption is that improved access to fisheries extension services and bank loans will reduce the need for middlemen (Adhuri, Rachmawati, Sofyanto, & Hamilton-Hart, 2016, p. 199). In this dissertation I argue that, on the contrary, systems of patronage fuses very well with supply chain capitalism, although my research shows that these patronage systems are less reciprocal, often shorter and mainly based on "business only" debts, contrary to past forms of patronage described in the area. A "social ruination" (Stoler, 2008, p. 194) of what I term the relational infrastructure of the pondscape, resulting in precarity for the many and enormous wealth for the few, what Tsing describes as increasing heterogeneity within connection (Tsing, 2016, p. 331).

### Tropes of core and periphery

Good lives for some, but dispossession for the many (Nevins & Peluso, 2008, pp. 225-226); the pondscape brought riches to those who entered the frontier early. Entrepreneurial pond owners, already established middlemen and not least the cold storages who ultimately controlled the flows of frozen shrimp. Around these were thousands of progressively less-successful and more heavily

indebted pond owners, minor middlemen, caretakers and ultimately the artisanal fishermen, living at the periphery of the pondscape. Thinking of the pondscape as having a core and the periphery; the shrimp ponds and the affected coastlines, comparisons are evoked with the similar notions of core and periphery in world-systems theory (Hopkins & Wallerstein, 1977), from which the study of commodity chains originate, and the terms resonate with relationships within the state as well, especially in Indonesia. Since colonial times, there has been a distinction between the inner islands (Java, Bali and occasionally Sumatra) and the outer islands, which comprise the rest of the country. While this distinction has been rightly problematized e.g. Tsing (1993), in the pondscape, as shown in this dissertation, "Java" or "the national government" are often set against ideas and assumptions about local self-determination, especially when it comes to issues of resource extraction. Again, such debates are well-described, especially when it comes to questions of resource extraction in the borderlands, e.g. Eilenberg (2012).

The core and the periphery of the pondscape can be perceived in similar ways. In the core pondscape, the public and the private, state and non-state, effectively fuse together into a extractive complex I describe using Lund's idea of "twilight institutions" (Lund, 2006). The cold storages are intricately linked with the local bureaucracy and politicians, who protect and favor shrimp production, despite its history of violent dispossession, lawlessness and rampant destruction over peripheral activities such as the collecting of mangrove crab and that of artisanal fishing.

The massive expansion of the pondscape at the expense of the once vast mangrove forests, the original habitat of the mangrove crab and the breeding grounds for the fish stocks that thousands of

artisanal fishermen depend on, was and is promoted, while the collecting and selling of mangrove crabs is (at least on paper), heavily regulated. Likewise, trawling in the periphery of the pondscape is (again on paper) prohibited. The core production of shrimp is favored and protected by twilight complex of local bureaucrats, politicians and cold storages, while the minor activities of extraction taking place at its periphery are not. It paradoxically requires more paperwork to own and operate a small fishing boat, than to own a handful of ponds.

But as this dissertation also shows, a range of local frictions, leaks and adaptations remold these structures. A range of actors, from caretakers and fishermen, middlemen, smugglers, police and navy, politicians, officials and association leaders all intervene, to drain, circumvent and redistribute the flows of commodities and the livelihoods they make possible.

### Leaks and erosion

Raising dams across old, deep riverbeds are difficult. Flows are strong, and if not built solidly and duly maintained, dams soon start leaking and if not reinforced constantly, they collapse, letting the network of streams and rivers to eventually reorient themselves around even the largest of obstacles. Leaks spring up in unexpected places, as entrepreneurs seek ways to evade barriers, engineer passages and profit.

The frantic burrowing of mangrove crabs creates new niches, or assemblages, for other species to inhabit. The resulting disturbances in the soil bring oxygen and release nutrients to their surroundings that benefit a range of other organisms. Thus, the mangrove crabs inadvertently engineer miniature ecosystems around their burrows. In the pondscape, if left unchecked, these

burrows level embankments and frustrates any attempts at keeping the physical infrastructure of shrimp aquaculture intact.

Similarly the leakages circumventing the export ban on female crab frustrates the ideas of the central government, as well as the twilight complex of cold storages and local bureaucrats about territorialization, about orderly watertight borders and obedient, controllable border citizens. And similarly, these rogue flows of revenue inadvertently sustains an entire ecosystem of different actors. Some finding a living facilitating it, others are struggling to take advantage of it, siphoning and appropriating what can be caught passing by. Others again frantically tries to close the leaks, to little or no avail. "[S]ome thwart (or eat) each other; others work together to make life possible; still others just happen to find themselves in the same place" (Tsing, 2015a, p. 22). Thus, even when captured, bound and packed neatly in pristine Styrofoam boxes, the mangrove crab remains a spectacular ecosystem engineer, an anarchic leveler of barriers and a promoter of leaks and circumventions.

Indebted and lacking alternative livelihoods, the artisanal fishermen at the periphery of the pondscape did not have much choice but to intensify their fishery. For the fishermen, there were no awkward, unequal and unstable way to interact creatively with the ruins left behind the global commodity flows and the extraction that fueled them. A sole focus on the possibility of agency within positions of inferiority, risks trivializing the undeniably restricted field of agency enjoyed by structurally marginalized people. Friction not only produces motion (Tsing, 2005, pp. 4-5), it also keeps some things from moving at all. "Difference becomes a resource; gaps widen. Precarious wealth and precarious poverty sit side by side [...], heterogeneity and ruin are structural features of capitalism" (Tsing, 2016, p. 336).



As this dissertation shows, at the periphery of the pondscape ruination is acutely felt. As fish stocks dwindle, fishermen intensify and ruination accelerates. Attempts at managing the destruction focus exclusively on the already marginalized fishermen and leaves the core pondscape more or less unregulated. Creative resistance successfully orchestrated by influential middlemen and association leaders dilutes any attempts of management. Sometimes friction means long-term erosion for all.

.o000o.

The conclusions I have drawn from this dissertation have not been ones for determinism, either historic, environmental or economic. It was never inevitable, that these specific resource frontiers would form, but looking back at the genealogy I have outlined in this dissertation, a number of particular frontiers did, and they were directed and accelerated in various ways by the frontier assemblages of past generations of extraction. The genealogy of extraction is the history of recursive frontier assemblages (Cons & Eilenberg, 2019, pp. 9-10; Middleton, 2019, p. 196) and the ruins they leave behind when they disassemble.

Were the estuaries surrounding Tarakan a good place to create shrimp ponds? Yes. Did the cold storages sponsor the large-scale construction of ponds through networks of indebted middlemen? Yes. Did thousands of people build shrimp ponds in the estuaries of Tarakan? Yes. Could history have happened differently, and the pondscape have been built in another place instead? Of course it could have, and similar pondscales were indeed built in other places, "coherent collective shape[s] consistently structured by the market" (Cronon, 2009, p. 223). Each generation of extraction was a response, a manifestation of global demand for specific commodities, and as such, the development of the pondscape surrounding Tarakan is just a small part of global history.

## EPILOGUE



*As the end of my fieldwork drew near, I went to say farewell to the man who had invited me to take part in that first harvest long ago, the harvest that had drawn me into the world of shrimp, crab and fish.*

*I had visited his shop many times since then, and now knew his two sons who lived further down the pier and many of his neighbors well. Since that first failed harvest, he had not bothered himself to take part in harvesting his pond, letting his caretaker do it alone. None of the harvests since then had been very successful. "To me, pond business is like gambling. You pay money to play, but you cannot know how the result will be. All you can do is pray", he nods to the sky. "I try to live a good life, be a good man.*

*That is all you can do". I know he has been looking to sell his pond but has yet to find a buyer.*

*The last couple of times I visited him, he had been keen on talking about a new endeavor. "Look at these nests", he shows me his phone; I have seen many such pictures before. Today, as most of the caves where swallows used to nest have been emptied or destroyed, the valuable nests are produced in tall, empty buildings, from the roofs of which loudspeakers are blaring recordings of birdsong in the hope of attracting and convincing the elusive birds to move in. "I really consider renting one of these houses. It could be good, it could be". He is transfixed by the sizes of nests in the pictures sent to him by the owner of such a swallow house in one of the mainland villages. "It could be the next thing" he mutters. A few weeks after we had returned home, he sent me a picture on WhatsApp of a tall concrete building, followed by numerous dollar signs and exclamation marks. The next gamble was on.*

## SUMMARY (ENGLISH)

Tales from the pondscape - Living among the ruins of large-scale aquaculture in Tarakan, Indonesia

Overall, this dissertation is about what to do when livelihoods disappear and resources run dry. When your shrimp pond yield less and less, when former rich fishing grounds one day are depleted, when the loans on your pond or your boat need repayment and there is no more to sell. The dissertation is based on 11 months of fieldwork in and around Tarakan, the only city in the Indonesian province of North Kalimantan, a center for an extensive aquaculture-industry and a home for thousands of fishermen.

More specifically, the dissertation is about life in and around what I term the *pondscape*, a 1500 km<sup>2</sup> wide area, transformed in the late 90s from mangrove swamps to an endless sprawl of ponds built towards farming tiger shrimp (*Penaeus monodon*). But the farming of tiger shrimp have started to fail more and more often. Today many, especially older ponds, are abandoned and in spite of new ponds constantly being opened further and further from Tarakan, overall production has stagnated at best. Owners are left indebted and thousands of the sharecropping caretakers in charge of the daily work at the ponds lose their livelihoods. Fishermen living at the periphery of the pondscape started to experience decreasing catches already with the advent of the pondscape, and today most can only keep fishing because of the constantly rising prices of fish.

In the ruined pondscape, bereft of a reliable income, the caretakers left in charge of the failing ponds now rely on collecting mangrove crabs (*Scylla spp.*) for a living. Endemic to the mangroves that were cleared to make way for the pondscape,

these bulky creatures are considered pests to shrimp farming, but can be sold, as they are considered delicacies by many. From warehouses in Tarakan, they are shipped alive across the border to Malaysia in great numbers, and from there to buyers all across the metropolises of South East Asia. This trade is contested though, as the (also most valuable) gravid females are illegal to collect and export, and an array of actors are involved in patrolling the narrow stretch of water separating Tarakan from Malaysia.

The scarcity of fish has led many of the fishermen living at the periphery of the ruined pondscape to change to more intensive trawl gears, originally introduced to catch wild tiger shrimp. This has created tensions with other fishermen who blame trawls for being too destructive. Additionally, the national government did in 2015 reactivate legislation that banned trawl for those very same reasons. In Tarakan however, fishermen organized by middlemen buyers of fish, protested and lobbied successfully against the newly activated laws, leading to a series of exceptions and exemptions being given by local authorities. To this date, an increasing number of Tarakan fishermen use trawl gears, despite them being illegal. All the while, landings continue to dwindle.

.o000o.

In this dissertation, I explore themes of extraction, ruination and connection in the context of a faltering resource frontier of farmed shrimp in Indonesia. Looking back at the economic history of the area, I trace past frontiers and resource booms that have taken place in the area, and which have in various ways paved the way for the present. Amidst this disassembling frontier, past choices restrict the possibilities of the future, and in the lives of the people in the upstream parts of global supply and commodity chains, ruins feature actively. Some enable new frontiers - for a

while - while others encourage further destruction in the increasingly futile attempts of securing stable livelihoods.

I argue that the patron-client relationships that for centuries have fueled resource extraction and connected marginal places with global centers have, just as the crumbling physical infrastructure of past frontiers, been incorporated and repurposed in the present. Debt based patronage have proved, on the one hand, to be an efficient way to translate between non-capitalistic modes of production and streamlined global supply chains through outsourcing the violent dispossession and environmental destruction of the frontier to opaque arrangements of debt and despair. On the other hand, old webs of patronage and the possibilities they afford, empower some people on the bottom of the commodity chain, by giving them access to new markets and possibly better futures, if but for a while, as a twilight complex of large-scale economic interests and political interests constantly seek to territorialize any such openings.

The dissertation is an empiric contribution, to a sparse regional literature, but it also adds to the growing multi-disciplinary debates on ecological collapses, environmental ruination and the restricted possibilities and escalating consequences of living with and within accelerating extraction and increasing societal heterogeneity within connection.

Within these debates, the focus on the interplay between capture fisheries and freshwater cultivation is still underexposed, especially when taking into consideration the monumental shifts in the sources of humanity's consumption of seafood and the destruction being wrought in the process. A destruction taking place as we speak.

## RESUMÉ (DANSK)

Fortællinger fra dammene - At leve i ruinerne af stor-skala akvakultur i Tarakan, Indonesien

Denne afhandling handler overordnet om hvad man gør når levegrundlag forsvinder og ressourcerne rinder ud. Når udbyttet fra ens dambrug falder år for år, når tidligere ellers rige fiskebanker en dag er tomme, når lånene i ens dambrug eller båd skal betales tilbage og der ikke er mere at sælge. Afhandlingen er baseret på 11 måneders feltarbejde i og omkring Tarakan, den eneste by i den Indonesiske provins North Kalimantan, et centrum for en omfattende akvakultur-industri og hjemsted for tusindvis af fiskere.

Mere specifikt handler afhandlingen om livet i og omkring hvad jeg benævner et *pondscape*, et 1500 km<sup>2</sup> stort område, transformeret sidst i 90erne fra mangrovesump til et celleagtigt landskab af damme til produktion af tigerrejer (*Penaeus monodon*). Men dyrkningen af tigerrejer er begyndt at fejle oftere og oftere. I dag bliver mange, især ældre, damme opgivet og på trods af at der konstant åbnes nye længere og længere væk fra Tarakan, falder det samlede udbytte år for år. Damejere efterlades forgældede og tusindvis af de arbejdere der passer dammene mod en andel af høsten har mistet deres levebrød. For fiskernes vedkommende begyndte deres fangster allerede at falde i takt med at pondscapet bredte sig, og i dag er det for mange kun de stadig stigende priser på fisk der holder bådene i vandet.

Efterhånden som dammene producerer mindre og mindre, bliver de løsarbejdere som står for den daglige drift af dammene mere og mere pressede. Fremfor at leve af procenterne af fejlslagne høster, supplerer eller helt erstatter mange lønnen med indkomst fra at

samle mangrove krabber (*Scylla spp.*), som i velproducerende damme ellers betragtes som skadedyr. Krabberne var endemiske i de nu fældede mangroveskove, men har nu fundet sig til rette i dammene. De sælges gennem flere led af mellemmænd, og ender alle med at blive eksporteret fra Tarakan til købere over hele Sydøstasien, hvor pengestærke kunder især i de store byer betaler store summer dem. Meget af denne handel er dog ulovlig, da det er forbudt at indsamle og eksportere rognbærende hunner, som er klart de mest værdifulde. Derfor bliver de smuglet over grænsen til Malaysia i store mængder, hvorfra de bliver solgt videre. En lang række aktører patruljerer derfor dette farvand, både med hensigten at standse handlen eller at profitere på den.

Dalende fangster blandt fiskerne der lever og fisker i pondscape's periferi, har fået mange til at skifte til intensive redskaber såsom trawl, som tidligere blev introduceret i området for at fange vilde tigerrejer. Men dette skaber konflikter fiskerne imellem, da trawl-nettene beskyldes for at skabe yderligere overfiskeri, og for at ødelægge bunden i de lavvandede flodmundinger og stræder. Det er forbudt at fiske med trawl i Indonesien, et forbud der blev fornyet og forstærket i 2015, i et forsøg på at komme en landsdækkende nedgang i fisk i møde. Men modstanden mod restriktiv lovgivning i Tarakan er stor, og indflydelsesrige mellemmænd organiserer demonstrationer og laver lobbyarbejde mod lovenes implementering. Dette har ført til en række udsættelser og undtagelser, og i dag fisker flere med trawl end nogensinde før - på trods af at trawl er ulovligt. Samtidig fortsætter fiskernes fangster med at dale.

.o000o.

I afhandlingen afsøger jeg temaer som udvinding, ruindannelse og forbindelser i et ressourceboom under afvikling. Jeg gennemgår den økonomiske historie der ligger til baggrund for pondscape't som det



konkrete manifestation af det boom i dyrkede tigerrejer, og beskriver hvordan en vifte af elementer fra tidligere ressourceboom på forskellig vis var med til at bane vejen for at der netop langs flodmundingerne omkring Tarakan opstod hvad der i dag er Indonesiens største område af rejefarme. Tidligere tiders beslutninger sætter rammerne for fremtidens valg og blandt menneskene, hvis liv i høj grad er defineret af opstrøms produktion i globale værdikæder, er ruiner i forskellige former en del af hverdagen. Nogle af disse ruiner tilskynder nye former for udvinding, andre nødvendiggør yderligere ødelæggelse.

Jeg argumenterer for at de patron-klient forhold der i århundreder har drevet ressourceudvinding og som har forbundet marginale steder med globale centre, i lighed med infrastruktur efterladt fra tidligere ressourceudvinding, bliver inkorporeret og genanvendt i nye omfattende former i det nuværende, men nu overståede boom i dyrkede rejer. Gældsbaseerede patron-klient forhold viser sig, på den ene hånd, at passe godt som oversættelsesmekanisme mellem global kapitalisme, og ikke-kapitalistiske måder at producere på. Gennem disse forhold har fabrikkerne, gennem flere lag af mellemmænd outsourcet al produktion til stavnsbundne damejere og subsistensløse arbejdere. På den måde undgår fabrikkerne at have direkte andel i den volddige fravristning af land og den enorme miljømæssige ødelæggelse der ligger til grund det enorme pandscape, grundlaget for al produktion af rejer. På den anden side giver disse patron-klient forbindelser muligheder for folk på bunden af denne pyramide af udvinding og udbytning, da de gennem sådanne alternative kan få adgang til nye markeder og muligheder. Hvor længe sådanne lufthuller vil eksistere er dog ukendt, da stærke økonomiske og politiske interesser søger at underlægge sig de nye spirende markeder og muligheder.

Afhandlingen er et empirisk bidrag, både til en sparsom regional litteratur, men også et indlæg i den voksende multidisciplinære debat omkring økologiske sammenbrud, landskabsmæssige ruiner og de indsnævrede muligheder og voksende konsekvenser af at leve i og med grænseløs accelererende udvinding af begrænsede ressourcer samt den stigende ulighed på trods af den massive akkumulering af værdi.

I disse debatter fylder studiet af den grænseløse udvinding af marine ressourcer, og samspillet og bevægelsen fra at fange fisk og skaldyr til at dyrke dem, stadig ikke nok. Hvis man tager hastigheden, omfanget og potentialet for ødelæggelse i betragtning, er menneskets skift fra fangere til dyrkere af det marine ikke mindre end monumentalt. Og det finder sted netop nu.

## REFERENCES

- 72/MEN-KP/II/2016. (2016). *PEMBATASAN PENGGUNAAN ALAT PENANGKAPAN IKAN CANTRANG DI WILAYAH PENGELOLAAN PERIKANAN NEGARA REPUBLIK INDONESIA*. Jakarta: KKP.
- Aburto-Oropeza, O., Ezcurra, E., Danemann, G., Valdez, V., Murray, J., & Sala, E. (2008). Mangroves in the Gulf of California increase fishery yields. *Proceedings of the National Academy of Sciences*, 105(30), 10456-10459.
- Acciaoli, G. (2000). Kinship and debt: the social organization of Bugis migration and fish marketing at Lake Lindu, Central Sulawesi. In G. Acciaoli, R. Tol, & K. Van Dijk (Eds.), *Authority and enterprise among the peoples of South Sulawesi* (Vol. 156, pp. 589-617). Leiden: KITLV Press.
- Adhuri, D. S., Rachmawati, L., Sofyanto, H., & Hamilton-Hart, N. (2016). Green market for small people: markets and opportunities for upgrading in small-scale fisheries in Indonesia. *Marine Policy*, 63, 198-205.
- Adhuri, D. S., & Visser, L. (2007). Fishing in, fishing out: Transboundary issues and the territorialization of blue space. *Asia Pacific Forum*, 36, 112-145.
- Antara-News. (2019, 2019/10/07). Indonesia has sunk 556 illegal boats: Pudjiastuti. *Antara News*. Retrieved from <https://en.antaraneews.com/news/134238/indonesia-has-sunk-556-illegal-boats-pudjiastuti>
- Apud, F. D. (1985). *Extensive and semi-intensive culture of prawn and shrimp in the Philippines*. Paper presented at the Proceedings of the First International Conference on the Culture of Penaeid Prawns/Shrimps, 4-7 December 1984, Iloilo City, Philippines.
- Arquitt, S., Honggang, X., & Johnstone, R. (2005). A system dynamics analysis of boom and bust in the shrimp aquaculture industry. *System Dynamics Review: The Journal of the System Dynamics Society*, 21(4), 305-324.
- Arrighi, G., & Drangel, J. (1986). The stratification of the world-economy: an exploration of the semiperipheral zone. *Review (Fernand Braudel Center)*, 10(1), 9-74.
- Asia-Today. (2020, 07.11.2020). From Small Oil Mill to Asian Food Conglomerate. *Asia-Today*. Retrieved from <http://www.asiatoday.com/pressrelease/small-oil-mill-asian-food-conglomerate>
- Aspinall, E. (2013a). How Indonesia survived: Comparative perspectives on state disintegration and democratic integration. In *Democracy and Islam in Indonesia*: Columbia University Press.

- Aspinall, E. (2013b). A nation in fragments. *Critical Asian Studies*, 45(1), 27-54. doi:10.1080/14672715.2013.758820
- Aspinall, E., & Fealy, G. (2003). Introduction: Decentralisation, democratisation and the rise of the local. In E. Aspinall & G. Fealy (Eds.), *Local power and politics in Indonesia : decentralisation & democratisation* (pp. 1-12). Singapore: ISEAS.
- Atsushi, O. (2010). "Pirates or Entrepreneurs?" The Migration and Trade of Sea People in Southwest Kalimantan, c. 1770-1820. *Indonesia*(90), 67-95.
- B.664/DJPT/PI.220/VI/2017. (2017). *PERPANJANGAN MASA PERALIHAN ALAT PENANGKAPAN IKAN PUKAT TARIK DAN PUKAT HELA DI WILAYAH PENGELOLAAN PERIKANAN NEGARA REPUBLIK INDONESIA*. Jakarta: KKP.
- Bailey, C. (1997). Lesson from Indonesia's 1980 trawler ban. *Marine Policy*, 21, 225-235.
- Bailey, C., Dwiponggo, A., & Marahudin, F. (1987). *Indonesian marine capture fisheries* (Vol. 10). Manila: WorldFish.
- Bair, J. (2005). Global capitalism and commodity chains: looking back, going forward. *Competition & Change*, 9(2), 153-180.
- Baker, J. (2013). The Parman Economy: Post-Authoritarian Shifts in the Off-Budget Economy of Indonesia's Security Institutions. *Indonesia*(96), 123-150.
- Bakker, L. (2016). Organized Violence and the State : Evolving Vigilantism in Indonesia. *Bijdragen tot de taal-, land- en volkenkunde / Journal of the Humanities and Social Sciences of Southeast Asia*, 172(2-3), 249-277. doi:10.1163/22134379-17202001
- Balli, J., Chakraborty, S., & Jaiswar, A. (2006). Biology of Bombay duck, *Harpodon nehereus* (Ham., 1822), from Mumbai waters, India. *Journal of the Indian Fisheries Association*, 33, 1-10.
- Bapat, S. V. (1970). Bombay Duck, *Harpodon nehereus* (Ham.). *CMFRI Bulletin*, 21, 1-75.
- Barker, J., & Van Klinken, G. (2009). Reflections on the state in Indonesia. *State of authority: The state in society in Indonesia*, 17-45.
- Barney, K. (2009). Laos and the Making of a 'Relational' Resource Frontier. *Geographical Journal*, 175(2), 146-159. doi:10.1111/j.1475-4959.2009.00323.x
- Bauman, Z. (2013). *Liquid fear*: John Wiley & Sons.
- BBC. (2020, 2020/01/20). India's brilliant Bombay duck. *BBC*. Retrieved from <http://www.bbc.com/travel/story/20200120-indias-brilliant-bombay-duck>
- Béné, C. (2005). The good, the bad and the ugly: Discourse, policy controversies and the role of science in the politics of

- shrimp farming development. *Development Policy Review*, 23(5), 585-614.
- Berreman, G. D. (2007 [1963]). Prologue: Behind many masks: ethnography and impression management. In A. C. G. M. Robben & A. J. Sluka (Eds.), *Ethnographic fieldwork: an anthropological reader* (pp. 152-174): Blackwell Publishing.
- Bisnis-Indonesia. (2018, 2018/08/14). Tarakan KPP Pratama Will Maximize Pond Farmer Tax Potential. *Bisnis Indonesia*. Retrieved from <https://kalimantan.bisnis.com/read/20180814/407/827745/kpp-pratama-tarakan-bakal-maksimal-potensi-pajak-petambak>
- Bisnis-Indonesia. (2019, 2019/01/10). Land Certification of agriculture and ponds in Kaltara starting March. *Bisnis Indonesia*. Retrieved from <https://kalimantan.bisnis.com/read/20190110/407/877380/sertifikasi-lahan-pertanian-tambak-kaltara-mulai-maret>
- Black, I. (1985). The "Lastposten": Eastern Kalimantan and the Dutch in the nineteenth and early twentieth centuries. *Journal of Southeast Asian Studies*, 16(02), 281-291.
- Bond, N. (2017). Dayak Identification and Divergent Ethnogenesis among Tidung in North Kalimantan and Sabah. *Borneo Research Bulletin*, 48, 265.
- Bond, N. (2020). *Seeking the state from the margins: From Tidung Lands to borderlands in Borneo*.
- Borneo Post, T. (2012, 2012/10/23). House agrees on creation of Indonesia's 34th province: "North Kalimantan". *The Borneo Post*.
- Borneo Post, T. (2014, 2014/05/25). 'Land grab a non-issue, merely a diversion tactic'. *The Borneo Post*. Retrieved from <http://www.theborneopost.com/2014/05/26/land-grab-a-non-issue-merely-a-diversion-tactic/>
- Bosma, R., Sidik, A. S., van Zwieten, P., Aditya, A., & Visser, L. (2012). Challenges of a transition to a sustainably managed shrimp culture agro-ecosystem in the Mahakam delta, East Kalimantan, Indonesia. *Wetlands ecology and management*, 20(2), 89-99.
- Bourgeois, R., Gouyon, A., Jésus, F., Levang, P., & Langeraar, W. (2002). *A socio economic and institutional analysis of Mahakam delta stakeholders*. Retrieved from CIRAD: <https://agritrop.cirad.fr/536520/>
- BPS-Tarakan. (2018). *Statistik Daerah Kota Tarakan 2018*. Tarakan: BPS Tarakan Retrieved from <https://tarakankota.bps.go.id/publication/2018/12/26/fee21f65dcd580bd83c31422/statistik-daerah-kota-tarakan-2018.html>
- BPS-Tarakan. (2019). *Provinsi Kalimantan Utara Dalam Angka 2019*. Tanjung Selor: BPS Provinsi Kalimantan Utara Retrieved from <https://kaltara.bps.go.id/publication.html>

- Briggs, M., Funge-Smith, S., Subasinghe, R., & Phillips, M. (2004). Introductions and movement of *Penaeus vannamei* and *Penaeus stylirostris* in Asia and the Pacific. *RAP publication*, 10(2004), 92.
- Broersma, R. (1927). *Handel en bedrijf in Zuid- en Oost-Borneo*: s'Gravenhage, G. Naeff.
- Bubandt, N. (2000). Malukan Apocalypse. Themes in the dynamics of violence in eastern Indonesia. In *Violence in Indonesia* (pp. 228-253): Abera.
- Bubandt, N., & Tsing, A. (2018). Feral Dynamics of Post-Industrial Ruin: An Introduction. *Journal of Ethnobiology*, 38(1), 1-7.
- Butcher, J. G. (2004). *The closing of the frontier: A history of the marine fisheries of Southeast Asia, c. 1850-2000*: Institute of Southeast Asian Studies.
- Butcher, J. G. (2013). The International Court of Justice and the territorial dispute between Indonesia and Malaysia in the Sulawesi Sea. *Contemporary Southeast Asia: A Journal of International and Strategic Affairs*, 35(2), 235-257.
- Casson, A., & Obidzinski, K. (2002). From New Order to Regional Autonomy: Shifting Dynamics of "Illegal" Logging in Kalimantan, Indonesia. *World Development*, 30(12), 2133-2151. doi:10.1016/S0305-750X(02)00125-0
- Chapsos, I., & Malcolm, J. A. (2017). Maritime security in Indonesia: Towards a comprehensive agenda? *Marine Policy*, 76, 178-184. doi:<https://doi.org/10.1016/j.marpol.2016.11.033>
- Chong, K.-C., Dwiponggo, A., Ilyas, S., & Martosubroto, P. (1987, 1987). *Some experiences and highlights of the Indonesian trawl ban: bioeconomics and socioeconomics*. Paper presented at the Papers presented at the Symposium on Exploitation and Management of Marine Fishery Resources in Southeast Asia Jakarta.
- Coloso, R., & Borlongan, I. (1999). Significant organotin contamination of sediment and tissues of milkfish in brackish water ponds. *Bulletin of environmental contamination and toxicology*, 63(3), 297-304.
- Colson, D. A. (2003). Sovereignty over Pulau Ligitan and Pulau Sipadan (Indonesia/Malaysia). *The American Journal of International Law*, 97(2), 398-406. doi:10.2307/3100115
- Connelly, A. L. (2015). Sovereignty and the sea: President Joko Widodo's foreign policy challenges. *Contemporary Southeast Asia*, 1-28.
- Conrad, J. (1895). *Almayer's Folly*: Wordsworth Classics.
- Cons, J., & Eilenberg, M. (2019). Introduction. On the new politics of margins in Asia: Mapping frontier assemblages. In J. Cons & M. Eilenberg (Eds.), *Frontier Assemblages: The Emergent Politics of Resource Frontiers in Asia* (pp. 256).

- Corea, A., Johnstone, R., Jayasinghe, J., Ekaratne, S., & Jayawardene, K. (1998). Self-pollution: A major threat to the prawn farming industry in Sri Lanka. *Ambio*, 662-668.
- Cornea, N., Zimmer, A., & Véron, R. (2016). Ponds, power and institutions: The everyday governance of accessing urban water bodies in a small Bengali city. *International Journal of Urban and Regional Research*, 40(2), 395-409.
- Cramb, R., & McCarthy, J. F. (2016). *The Oil Palm Complex: Smallholders, Agribusiness and the State in Indonesia and Malaysia*: NUS Press.
- Cribb, R. (2010). A system of exemptions: Historicizing state illegality in Indonesia. In *The state and illegality in Indonesia* (pp. 29-44): Brill.
- Cronon, W. (2009). *Nature's metropolis: Chicago and the Great West*: WW Norton & Company.
- Cushing, D. H. (1988). *The provident sea*: Cambridge University Press.
- CW. (2014). Charles Han, Chairman of DaChan Greatwall Group - Choosing Blue Ocean over Red Ocean [Press release]. Retrieved from <https://english.cw.com.tw/article/article.action?id=316>
- Dauvergne, P. (1995). *Shadows in the forest: Japan and the politics of timber in Southeast Asia*. (PhD-thesis). MIT press, University of British Columbia.
- Davidson, J. S., & Kammen, D. (2002). Indonesia's Unknown War and the Lineages of Violence in West Kalimantan. *Indonesia*(73), 53-87.
- Davie, P. J., & Mann, D. (1998). A revision of the genus *Scylla* de Haan, 1833 (Crustacea: Decapoda: Brachyura: Portunidae). *The Raffles Bulletin of Zoology*, 46, 217-245.
- Deb, A. K. (1998). Fake blue revolution: environmental and socio-economic impacts of shrimp culture in the coastal areas of Bangladesh. *Ocean & coastal management*, 41(1), 63-88.
- DeLanda, M. (2016). *Assemblage theory*: Edinburgh University Press.
- Deleuze, G., & Guattari, F. (1988). *A thousand plateaus: Capitalism and schizophrenia*: Bloomsbury Publishing.
- Dent, D. (1986). *Acid sulphate soils: a baseline for research and development*: ILRI.
- Detik-Finance. (2015, 2015/04/03). KKP Ensures Use of Cantrang Tools Only Until September 2015. *Detik*. Retrieved from <https://finance.detik.com/berita-ekonomi-bisnis/d-2877722/kkp-pastikan-penggunaan-alat-cantrang-hanya-sampai-september-2015>
- Dierberg, F. E., & Kiattisimkul, W. (1996). Issues, impacts, and implications of shrimp aquaculture in Thailand. *Environmental Management*, 20(5), 649-666.

- Dijk, C. v. (1983). The rebellion of South Sulawesi: disaffected guerrillas. In C. v. Dijk (Ed.), *Rebellion under Banner of Islam*: VKI.
- Dirhamsyah, D. (2006). Indonesian legislative framework for coastal resources management: a critical review and recommendation. *Ocean & coastal management*, 49(1), 68-92.
- Disbun. (2020). *Kelapa Sawit*. Samarinda Retrieved from <https://disbun.kaltimprov.go.id/artikel/kelapa-sawit>
- Duncan, C. R. (2005). The other Maluku: chronologies of conflict in North Maluku. *Indonesia*(80), 53-80.
- Eilenberg, M. (2011). Flouting the law : vigilante justice and regional autonomy on the Indonesian border. *Österreichische Zeitschrift für Südostasienwissenschaften : ASEAS*, 4(2), 237-253.
- Eilenberg, M. (2012). *At the edges of states : dynamics of state formation in the Indonesian borderlands*. Leiden: KITLV Press.
- Eilenberg, M. (2014). Frontier constellations : Agrarian expansion and sovereignty on the Indonesian-Malaysian border. *Journal of Peasant Studies*, 41(2), 157-182.
- Eilenberg, M. (2016). A State of Fragmentation : Sovereignty and Citizenship at the Fringes of the Indonesian State. *Development and Change*, 47(6), 1338-1360.
- Ellison, A. M. (2008). Managing mangroves with benthic biodiversity in mind: moving beyond roving banditry. *Journal of sea Research*, 59(1-2), 2-15.
- Fabinyi, M. (2012). *Fishing for Fairness : Poverty, Morality and Marine Resource Regulation in the Philippines*. Canberra: ANU Press.
- Fabinyi, M. (2013). Social relations and commodity chains: the live reef fish for food trade. *Anthropological Forum*, 23(1), 36-57.
- Fabinyi, M. (2016). Producing for Chinese luxury seafood value chains: Different outcomes for producers in the Philippines and North America. *Marine Policy*, 63, 184-190.
- FAO. (2020a). Fisheries and Aquaculture Statistics. Global Aquaculture Production 1950-2018 (FishstatJ) (Database). Retrieved from [www.fao.org/fishery/statistics/software/fishstatj/en](http://www.fao.org/fishery/statistics/software/fishstatj/en). from FAO [www.fao.org/fishery/statistics/software/fishstatj/en](http://www.fao.org/fishery/statistics/software/fishstatj/en)
- FAO. (2020b). *The State of World Fisheries and Aquaculture 2020*. Retrieved from Rome, Italy:
- Ferguson, J. (1990). *The anti-politics machine : "development", depoliticization, and bureaucratic power in Lesotho*. Cambridge: Cambridge University Press.
- Ferrol-Schulte, D., Ferse, S. C., & Glaser, M. (2014). Patron-client relationships, livelihoods and natural resource



- management in tropical coastal communities. *Ocean & coastal management*, 100, 63-73.
- Ferse, S. C., Glaser, M., Neil, M., & Mánez, K. S. (2014). To cope or to sustain? Eroding long-term sustainability in an Indonesian coral reef fishery. *Regional environmental change*, 14(6), 2053-2065.
- Ferse, S. C., Knittweis, L., Krause, G., Maddusila, A., & Glaser, M. (2012). Livelihoods of ornamental coral fishermen in South Sulawesi/Indonesia: implications for management. *Coastal management*, 40(5), 525-555.
- Firth, R. (2006 (1966)). *Malay fishermen: their peasant economy*: The Norton Library.
- Flaherty, M., & Karnjanakesorn, C. (1995). Marine shrimp aquaculture and natural resource degradation in Thailand. *Environmental Management*, 19(1), 27-37.
- Flaherty, M., & Vandergeest, P. (1998). "Low-salt" shrimp aquaculture in Thailand: Goodbye coastline, hello Khon Kaen! *Environmental Management*, 22(6), 817-830.
- Flegel, T. W. (1997). Major viral diseases of the black tiger prawn (*Penaeus monodon*) in Thailand. *World Journal of Microbiology and Biotechnology*, 13(4), 433-442.
- Foster, G. M. (1963). The dyadic contract in Tzintzuntzan, II: patron-client relationship. *American Anthropologist*, 65(6), 1280-1294.
- Fougères, D. (2008). Old Markets, New Commodities: Aquarian Capitalism in Indonesia. In J. Nevins & N. L. Peluso (Eds.), *Taking Southeast Asia to market: Commodities, nature, and people in the neoliberal age* (pp. 161-175): Cornell University Press.
- Fox, J. J., Adhuri, D. S., & Resosudarmo, I. A. P. (2005). Unfinished edifice or Pandora's box? Decentralisation and resource management in Indonesia. In B. Resosudarmo (Ed.), *The politics and economics of Indonesia's Natural Resources* (pp. 92-108): ISEAS.
- Friedman, T. (2006). *The world is flat 2.0*. New York: Farrar, Straus and Giroux.
- Gabriel, O., Lange, K., Dahm, E., & Wendt, T. (2008). *Von Brandt's fish catching methods of the world*: John Wiley & Sons.
- Gan, E., Tsing, A., Swanson, H., & Bubandt, N. (2017). Introduction: Haunted Landscapes of the Anthropocene. In E. Gan, A. Tsing, H. Swanson, & N. Bubandt (Eds.), *Arts of Living on a Damaged Planet* (pp. 1-15): University of Minnesota Press.
- Garnaut, R. (2015). Indonesia's resources boom in international perspective: policy dilemmas and options for continued strong growth. *Bulletin of Indonesian Economic Studies*, 51(2), 189-212.

- Gavira, J. I., Schmittou, H. R., & Grover, J. H. (1986). Acid sulfate soils: identification, formation and implications for aquaculture. *Journal of Aquaculture in the Tropics*, 1(2), 99.
- Geertz, C. (1963). *Agricultural involution: The processes of ecological change in Indonesia*: Univ of California Press.
- Geertz, C. (1980). *Negara*: Princeton University Press.
- Geiger, D. (2008). *Frontier Encounters-Indigenous Communities and Settlers in Asia and Latin America*: University of Zurich.
- Gellner, E. (1977). Patrons and clients. In E. Gellner & J. Waterbury (Eds.), *Patrons and clients in Mediterranean societies* (pp. 1-6). London: Duckworth.
- Ghosh, A. (2016). *The great derangement: Climate change and the unthinkable*: The University of Chicago Press.
- Green, S. F. (2005). *Notes from the Balkans: locating marginality and ambiguity on the Greek-Albanian border* (Vol. 34): Princeton University Press.
- Grimes, C. G. (1946). *Japanese fuels and lubricants article I - Fuel and lubricant technology*. Index no. X-38(N) 1. Retrieved from [https://web.archive.org/web/20120501094027fw/http://www.fischer-tropsch.org/primary\\_documents/gvt\\_reports/USNAVY/USNTMJ%20Reports/USNTMJ-200K-0292-0390%20Report%20X-38%20N-1.pdf](https://web.archive.org/web/20120501094027fw/http://www.fischer-tropsch.org/primary_documents/gvt_reports/USNAVY/USNTMJ%20Reports/USNTMJ-200K-0292-0390%20Report%20X-38%20N-1.pdf):
- Gräslund, S., & Bengtsson, B.-E. (2001). Chemicals and biological products used in south-east Asian shrimp farming, and their potential impact on the environment—a review. *Science of the Total Environment*, 280(1-3), 93-131.
- Gujja, B., & Finger-Stich, A. (1996). What Price Prawn?: Shrimp Aquaculture's Impact in Asia. *Environment: science and policy for sustainable development*, 38(7), 12-39.
- Gunawan, B. I. (2012). *Shrimp fisheries and aquaculture: making a living in the coastal frontier of Berau, Indonesia*. (PhD-thesis). Wageningen University, Wageningen.
- Gunawan, B. I. (2016). The diversity of fisheries based livelihoods in the Berau Delta, East Kalimantan. *Wacana*, 17(1), 68-96.
- Hall, D. (2011). Land grabs, land control, and Southeast Asian crop booms. *The Journal of Peasant Studies*, 38(4), 837-857. doi:10.1080/03066150.2011.607706
- Hannerz, U. (2003). Being there... and there... and there! Reflections on multi-site ethnography. *Ethnography*, 4(2), 201-216.
- Haraway, D. J. (2016). *Staying with the trouble : making kin in the Chthulucene*. Durham: Duke University Press.
- Hardy, B. L., & Moncel, M.-H. (2011). Neanderthal use of fish, mammals, birds, starchy plants and wood 125-250,000 years ago. *PLoS One*, 6(8), e23768.

- Harvey, D. (2009). The 'new' imperialism: accumulation by dispossession. *Socialist register*, 40(40).
- Hastrup, K., & Hastrup, F. (2015). *Waterworlds: Anthropology in fluid environments* (Vol. 3): Berghahn Books.
- Hatley, B. (1993). Constructions of "tradition" in New Order Indonesian theatre. In V. M. Hooker (Ed.), *Culture and Society in New Order Indonesia* (pp. 48-69). Oxford: Oxford University Press.
- Hill, H. (2014). An introduction to the issues. In H. Hill (Ed.), *Regional dynamics in a decentralized Indonesia* (Vol. 501, pp. 1-22). Singapore: Institute of Southeast Asian Studies.
- Holmström, K., Gräslund, S., Wahlström, A., Pongshompoo, S., Bengtsson, B. E., & Kautsky, N. (2003). Antibiotic use in shrimp farming and implications for environmental impacts and human health. *International journal of food science & technology*, 38(3), 255-266.
- Hopkins, T., & Wallerstein, I. (1977). Patterns of development of the modern world-system. *Review (Fernand Braudel Center)*, 111-145.
- Hossain, M., & Kwei Lin, C. (2001). Diversified uses of abandoned shrimp ponds: a case study in the Upper Gulf of Thailand.
- ICJ. (2002). *CASE CONCERNING SOVEREIGNTY OVER PULAU LIGITAN AND PULAU SIPADAN (INDONESIA v. MALAYSIA) (MERITS) Judgment of 17 December 2002*. The Haag: The International Court of Justice (ICJ).
- Ikrami, H. (2017). Indonesia's Reform of Its Fisheries Law and Policy & Cooperation with asean in Combating iuu Fishing. *Asia-Pacific Journal of Ocean Law and Policy*, 2(2), 318-330.
- Ilman, M., Dargusch, P., & Dart, P. (2016). A historical analysis of the drivers of loss and degradation of Indonesia's mangroves. *Land use policy*, 54, 448-459.
- Ilman, M., Wiharyanto, D., & Desyana, C. (2009). *Kajian Dasar Budidaya Udang di Pesisir Utara Kalimantan Timur Bagian Utara*. Retrieved from
- Indrarto, G. B., Murharjanti, P., Khatarina, J., Pulungan, I., Ivalerina, F., Rahman, J., . . . Muharrom, E. (2012). *The context of REDD+ in Indonesia: drivers, agents and institutions* (Vol. 92). Bogor: CIFOR.
- INPRES-04/2005. (2015). *TENTANG PEMBERANTASAN PENEBAANGAN KAYU ILEGAL DI KAWASAN HUTAN DAN PEREDARANNYA DI SELURUH WILAYAH REPUBLIK INDONESIA*. Jakarta: KSP - RI.
- Islam, M., Islam, M., & Ahmed, S. (1999). Colossal loss of shell and fin-fish larvae during collection of *Penaeus monodon* (Fab.) fry in the rivers of Satkhira. *Bangladesh Journal of Fisheries Research*, 3(1), 107-112.
- Jakarta-Post. (2014, 2014/10/29). Susi may not conform to style, but she means business. *Jakarta Post*. Retrieved from

- <https://www.thejakartapost.com/news/2014/10/29/susi-may-not-conform-style-she-means-business.html>
- Jakarta-Post. (2016, 2016/06/21). A call from the border: No more bartering. *Jakarta Post*.
- Jakarta-Post. (2017a, 2017/07/27). Boat auction called off over allegation of malfeasance. *Jakarta Post*. Retrieved from <http://www.thejakartapost.com/news/2017/10/21/minister-susi-to-display-10-arrested-foreign-flagged-fishing-vessels.html>
- Jakarta-Post. (2017b, 2017/07/24). Minister Susi rejects idea to auction off confiscated fishing boats. *Jakarta Post*. Retrieved from <http://www.thejakartapost.com/news/2017/03/12/indonesia-declares-more-outermost-islands.html>
- Jakarta-Post. (2018a, 2018/01/11). Business group supports end to ship-sinking policy. *Jakarta Post*. Retrieved from <http://www.thejakartapost.com/news/2018/01/11/business-group-supports-end-to-ship-sinking-policy.html>
- Jakarta-Post. (2018b, 2018/11/22). Indonesia's boat-sinking policy gets green upgrade: No explosives involved. *Jakarta Post*. Retrieved from <https://www.thejakartapost.com/news/2018/11/21/indonesias-boat-sinking-policy-gets-green-upgrade-no-explosives-involved.html>
- Jakarta-Post. (2018c, 2018/01/11). Jokowi sides with Susi on ship sinking controversy. *Jakarta Post*. Retrieved from <http://www.thejakartapost.com/news/2018/01/11/jokowi-sides-with-susi-on-ship-sinking-controversy.html>
- Jakarta-Post. (2019, 2019/10/23). No Susi, no party': Netizens lament departure of popular minister. *Jakarta Post*. Retrieved from <https://www.thejakartapost.com/news/2019/10/23/no-susi-no-party-netizens-lament-departure-of-popular-minister.html>
- Jones, P. (2018). The long 'lost' history of bottom trawling in England, c. 1350-1650. *International Journal of Maritime History*, 30(2), 201-217.
- KALPOS. (2015a, 2015/10/10). KALTARA University Rector Satirized the Acting Governor, Said that He Cannot Stand the Pressure. *Kaltara Pos*. Retrieved from <http://kaltara.prokal.co/read/news/624-rektor-unikal-sentil-pj-gubernur-katanya-tak-tahan-tekanan>
- KALPOS. (2015b, 2015/10/07). Triyono is ready to sacrifice himself. *Kaltara Pos*. Retrieved from <http://kaltara.prokal.co/read/news/572-triyono-pasang-badan.html>
- KALPOS. (2015c, 2015/12/15). Two Times Kapolda Click Button, Unexploded Boats. *Kaltara Pos*. Retrieved from

- <http://kalpos.prokal.co/read/news/2546-6-bulan-uji-coba-penerapan-larangan-trawl.html>
- KALPOS. (2016, 2016/02/06). The Acting Governor's Policy is Expired. *Kaltara Pos.* Retrieved from <http://kaltara.prokal.co/read/news/1758-kebijakan-pj-gubernur-kedaluwarsa.html>
- KALPOS. (2017a, 2017/10/24). Difference in Crab Cultivation Perception. *Kaltara Pos.* Retrieved from <http://kaltara.prokal.co/read/news/14733-perbedaan-persepsi-budidaya-kepiting.html>
- KALPOS. (2017b, 2017/09/09). Police Foiled Smuggling 3 Ton Crabs Laying Eggs. *Kaltara Pos.* Retrieved from <http://kalpos.prokal.co/read/news/4661-polisi-gagalkan-penyelundupan-3-ton-kepiting-bertelur.html>
- KALPOS. (2017c, 2017/05/10). Still Allowed Until December. *Kaltara Pos.* Retrieved from <http://kaltara.prokal.co/read/news/11236-masih-boleh-hingga-desember.html>
- KALPOS. (2017d, 2017/01/12). Tolerance for Hela Trawl Using is Extended. *Kaltara Pos.* Retrieved from <http://bulungan.prokal.co/read/news/5566-toleransi-penggunaan-pukat-hela-diperpanjang.html>
- KALPOS. (2017e, 2017/10/16). Unsatisfying Fishing Gear Trials. *Kaltara Pos.*
- KALPOS. (2018, 2018/08/21). Dua Kapal Illegal Fishing Ditenggelamkan. *KALPOS.* Retrieved from <https://rakyatkaltara.prokal.co/read/news/14049-dua-kapal-illegal-fishing-ditenggelamkan>
- KALPOS. (2019a, 2019/09/29). After shrimp, Taiwanese investors are interested in crab. *Kaltara Pos.* Retrieved from [https://fokusborneo.com/daerah/2019/09/29/setelah-udang-investor-taiwan-tertarik-kembangkan-kepiting-tarakan/&usg=ALkJrhiEz\\_Cb5cktMeFRa78YI6T-E1GYnw](https://fokusborneo.com/daerah/2019/09/29/setelah-udang-investor-taiwan-tertarik-kembangkan-kepiting-tarakan/&usg=ALkJrhiEz_Cb5cktMeFRa78YI6T-E1GYnw)
- KALPOS. (2019b, 2019/03/13). Calls for overriding the Ministerial Regulations. *Kaltara Pos.* Retrieved from <https://kaltara.prokal.co/read/news/27170-desak-pengecualian-peraturan-menteri>
- KALPOS. (2020a, 2020/12/17). 2021, Alat Tangkap Ikan Trawl Bakal Diganti. *Kaltara Pos.* Retrieved from <https://rakyatkaltara.prokal.co/read/news/22058-2021-alat-tangkap-ikan-trawl-bakal-diganti/6>
- KALPOS. (2020b, 2020/11/23). Tambak Turning Into a Storage Place for Narcotics. *Kaltara Pos.* Retrieved from <https://kaltara.prokal.co/read/news/35442-tambak-rawan-jadi-tempat-penyimpanan-narkotika.html>
- KALPOS. (2021, 2021/02/27). Ditangkap Terus Menerus, Ikan Nomei Terancam Punah. *Kaltara Pos.* Retrieved from

- <https://rakyatkaltara.prokal.co/read/news/22604-ditangkap-terus-menerus-ikan-nomei-terancam-punah/6>
- Kaskija, L. (2012). *Images of a forest people: Punan Malinau-Identity, sociality, and encapsulation in Borneo*. (Ph.D). Acta Universitatis Upsaliensis, Uppsala.
- KEPDP. (1997). *KEPUTUSAN DIRJEN PERIKANAN (KEPDJ No IK.340/DJ.10106/97)*. Jakarta: KSP - RI.
- KEPPRES-39/1980. (1980). *TENTANG PENGHAPUSAN JARING TRAWL*. Jakarta: KSP - RI.
- King, D. Y. (1982). Indonesia's New Order as a bureaucratic polity, a neopatrimonial regime or a bureaucratic-authoritarian regime: What difference does it make?'. *Interpreting Indonesian politics: Thirteen contributions to the debate*, 62, 104-116.
- King, V. T. (2017). Identities in Borneo: Constructions and Transformations. In V. T. King, Z. Ibrahim, & N. H. Hassan (Eds.), *Borneo Studies in History, Society and Culture* (pp. 177-207). Singapore: Springer Singapore.
- KKP. (2018, 2018/05/01). Pemerintah Gagalkan Penyelundupan 1,6 Ton Kepiting Bertelur di Tarakan. <https://news.kkp.go.id>. Retrieved from <https://news.kkp.go.id/index.php/pemerintah-gagalkan-penyelundupan-16-ton-kepiting-bertelur-di-tarakan/>
- Kompas. (2010, 2010/09/29). SBY Hopes Tarakan is Not Like Sampit. *Kompas*. Retrieved from <https://surabaya.kompas.com/read/2010/09/29/14561961/sby.ha.rap.tarakan.tak.seperti.sampit>
- Kompas. (2015, 2015/02/02). Nelayan Masih Bisa Gunakan Pukat Tarik dan Pukat Hela Sampai 12 Mil. *Kompas*. Retrieved from <https://money.kompas.com/read/2015/02/02/201800126/Nelayan.Masih.Bisa.Gunakan.Pukat.Tarik.dan.Pukat.Hela.Sampai.12.Mil>
- Kristensen, E. (2008). Mangrove crabs as ecosystem engineers; with emphasis on sediment processes. *Journal of sea Research*, 59(1-2), 30-43.
- Kungvankij, P. (1985). *Overview of penaeid shrimp culture in Asia*. Paper presented at the Proceedings of the First International Conference on the Culture of Penaeid Prawns/Shrimps, 4-7 December 1984, Iloilo City, Philippines.
- Kuper, A. (2014). *Anthropology and anthropologists: the modern British school*: Routledge.
- Kusumawati, R., & Bush, S. R. (2015). Co-producing Better Management Practice standards for shrimp aquaculture in Indonesia. *Maritime Studies*, 14(1), 1-18.
- Kusumawati, R., Bush, S. R., & Visser, L. E. (2013). Can patrons be bypassed? Frictions between local and global regulatory networks over shrimp aquaculture in East Kalimantan. *Society & Natural Resources*, 26(8), 898-911.

- Kusumawati, R., & Visser, L. (2016). Capturing the Elite in Marine Conservation in Northeast Kalimantan. *Human Ecology*, 44(3), 301-310.
- Latour, B., Stengers, I., Tsing, A., & Bubandt, N. (2018). Anthropologists Are Talking - About Capitalism, Ecology, and Apocalypse. *Ethnos*, 83(3), 587-606. doi:10.1080/00141844.2018.1457703
- Lee, S. Y., Primavera, J. H., Dahdouh-Guebas, F., McKee, K., Bosire, J. O., Cannicci, S., . . . Marchand, C. (2014). Ecological role and services of tropical mangrove ecosystems: a reassessment. *Global ecology and biogeography*, 23(7), 726-743.
- Levang, P. (2002). *Mangroves, shrimps and punggawa - A historical analysis of the development of the Delta Mahakam*. Retrieved from Jakarta:
- Lewis, B. D. (2017). Does local government proliferation improve public service delivery? Evidence from Indonesia. *Journal of Urban Affairs*, 39(8), 1047-1065.
- Li, T. M. (2007). *The will to improve : governmentality, development, and the practice of politics*. Durham: Duke University Press.
- Lindblad, J. T. (1985). Economic change in southeast Kalimantan 1880-1940. *Bulletin of Indonesian Economic Studies*, 21(3), 69-103.
- Lindblad, J. T. (1989). The petroleum industry in Indonesia before the Second World War. *Bulletin of Indonesian Economic Studies*, 25(2), 53-77.
- Lindblad, J. T., & Verhagen, P. E. (1988). *Between Dayak and Dutch: the economic history of Southeast Kalimantan, 1880-1942*: Foris Publications.
- Lindsey, T. (2001). The criminal state: premanisme and the new Indonesia. *Indonesia today: Challenges of history*, 283, 283-297.
- Lineton, J. (1975). *An Indonesian society and its universe: a study of the Bugis of South Sulawesi (Celebes) and their role within a wider social and economic system*. School of Oriental and African Studies (University of London),
- Lobel, J. W. (2013). Philippine and North Bornean languages: Issues in description, subgrouping, and reconstruction. *Unpublished Ph. D. dissertation*. Honolulu: Department of Linguistics, University of Hawai'i.
- Long, G. (1973). *The six years war: a concise history of Australia in the 1939-45 war*: Australian War Memorial.
- Lowe, C. (2000). Global markets, local injustice in Southeast Asian seas: the live fish trade and local fishers in the Togean Islands of Sulawesi. In C. Zerner (Ed.), *People, plants, and*

- justice: the politics of nature conservation* (pp. 234-258). New York: Columbia University Press.
- Lowe, C. (2002). Who is to blame? Logics of responsibility in the live reef food fish trade in Sulawesi, Indonesia. *SPC Live Reef Fish Information Bulletin*, 10, 7-16.
- Lund, C. (2006). Twilight institutions: public authority and local politics in Africa. *Development and Change*, 37(4), 685-705.
- Macintosh, D. J., & Ashton, E. C. (2002). A review of mangrove biodiversity conservation and management. *Centre for tropical ecosystems research, University of Aarhus, Denmark*.
- Malinowski, B. (1922 [2002]). *Argonauts of the Western Pacific: An Account of Native Enterprise and Adventure in the Archipelagoes of Melanesian New Guinea*: Routledge.
- Máñez, K. S., & Ferse, S. C. (2010). The history of Makassan trepang fishing and trade. *PLoS One*, 5(6), e11346.
- Manson, F. J., Loneragan, N. R., Skilleter, G. A., & Phinn, S. R. (2005). An evaluation of the evidence for linkages between mangroves and fisheries: a synthesis of the literature and identification of research directions. In *Oceanography and marine biology* (pp. 493-524): CRC Press.
- Marcus, G. (1986). Contemporary problems of ethnography in the modern world system. In J. Clifford & G. Marcus (Eds.), *Writing culture: The poetics and politics of ethnography* (pp. 165-193): University of California Press.
- Marcus, G. (1995). Ethnography in/of the World System: The Emergence of Multi-Sited Ethnography. *Annual Review of Anthropology*, 24(1), 95-117.
- Marcus, G. E., & Saka, E. (2006). Assemblage. *Theory, Culture & Society*, 23(2-3), 101-106.
- Marx, K. (2007). *Capital: A critique of political economy - The process of capitalist production* (Vol. 1): Cosimo, Inc.
- Matsui, N., Morimune, K., Meepol, W., & Chukwamdee, J. (2012). Ten year evaluation of carbon stock in mangrove plantation reforested from an abandoned shrimp pond. *Forests*, 3(2), 431-444.
- Mauss, M. (2002). *The gift: The form and reason for exchange in archaic societies*: Routledge.
- McCarthy, J. F. (2000). 'Wild Logging': The Rise and Fall of Logging Networks and Biodiversity Conservation Projects on Sumatra's Rainforest Frontier: Citeseer.
- McCarthy, J. F. (2007). Sold down the river: Renegotiating public power over nature in Central Kalimantan. In *Renegotiating Boundaries* (pp. 149-176): Brill.
- McCarthy, J. F. (2010). The limits of legality: State, governance and resource control in Indonesia. In *The state and illegality in Indonesia* (pp. 87-106): Brill.



- McCarthy, J. F., & Cramb, R. A. (2009). Policy narratives, landholder engagement, and oil palm expansion on the Malaysian and Indonesian frontiers. *Geographical Journal*, 175(2), 112-123. doi:10.1111/j.1475-4959.2009.00322.x
- McCarthy, J. F., & Robinson, K. (2016). *Land and development in Indonesia: Searching for the people's sovereignty*: ISEAS-Yusof Ishak Institute.
- Merlijn, A. G. (1989). The Role of Middlemen in Small-scale Fisheries: A Case Study of Sarawak, Malaysia. *Development and Change*, 20(4), 683-700.
- Metro-Kaltara. (2016, 2016/02/01). Looking for crabs, caretaker killed by crocodile. *Metro-Kaltara*. Retrieved from <https://www.metrokaltara.com/niat-cari-kepiting-penjaga-tambak-malah-diterkam-buaya-hingga-tewas/>
- Middleton, T. (2019). Frontier 2.0: The Recursive Lives and Death of Cinchona in Darjeeling. *Frontier Assemblages: The Emergent Politics of Resource Frontiers in Asia*, 195-212.
- Mietzner, M. (2014). Indonesia's decentralization: The rise of local identities and the survival of the nation-state. In H. Hill (Ed.), *Regional dynamics in a decentralized Indonesia* (Vol. 501, pp. 45-67). Singapore: Institute of Southeast Asian Studies.
- Mikkelsen, T., & Eilenberg, M. (2021). Genealogies of Extraction: De-facto Development Zones in the Indonesian Borderlands. In M. Chettri & M. Eilenberg (Eds.), *Development Zones in Asian Borderlands*.
- Militaire-Spectator. (1949). De strijd op het eiland Tarakan Januari 1942. *Militaire Spectator*, 1949, 198-207. Retrieved from <https://www.militairespectator.nl/sites/default/files/bestanden/uitgaven/1918/1949/1949-0198-01-0052.PDF>
- Miñarro, S., Forero, G. N., Reuter, H., & van Putten, I. E. (2016). The role of patron-client relations on the fishing behaviour of artisanal fishermen in the Spermonde Archipelago (Indonesia). *Marine Policy*, 69, 73-83.
- MMAF. (2017). *Indonesia - Marine and Fisheries Book 2017*. Jakarta: MMAF Retrieved from <http://kkp.go.id/2017/12/21/indonesia-marine-and-fisheries-book-2017/>
- Morishita, A. (2008). Contesting power in Indonesia's resource-rich regions in the era of decentralization: New strategy for central control over the regions. *Indonesia*(86), 81-107.
- Mumby, P. J., Edwards, A. J., Arias-González, J. E., Lindeman, K. C., Blackwell, P. G., Gall, A., . . . Renken, H. (2004). Mangroves enhance the biomass of coral reef fish communities in the Caribbean. *Nature*, 427(6974), 533. Retrieved from <https://core.ac.uk/download/60043.pdf>

- Murawski, S., Methot, R., Tromble, G., Hilborn, R. W., Briggs, J. C., Worm, B., . . . Folke, C. (2007). Biodiversity loss in the ocean: how bad is it? *Science*.
- Navaro, Y. (2012). *The make-believe space : affective geography in a postwar polity*. Durham, NC: Duke University Press.
- Naylor, R. L., Goldberg, R. J., Primavera, J. H., Kautsky, N., Beveridge, M. C., Clay, J., . . . Troell, M. (2000). Effect of aquaculture on world fish supplies. *Nature*, 405(6790), 1017-1024.
- Nevins, J., & Peluso, N. L. (2008). Concluding comparisons: Products and processes of commodification in Southeast Asia. In J. Nevins & N. L. Peluso (Eds.), *Taking Southeast Asia to market: Commodities, nature, and people in the neoliberal age* (pp. 225-230): Cornell University Press.
- Niaga-Asia. (2018, 2018/02/16). BPN Tarakan Issues Thousands of Certificates at WKP Pertamina. *Niaga-Asia*. Retrieved from <https://www.niaga.asia/bpn-tarakan-terbitkan-seribuan-sertifikat-di-wkp-pertamina>
- Nikijuluw, V. P., & Naamin, N. (1994). The evolution of NES systems in tuna and skipjack fisheries in Indonesia: Conceit, institutional and financial aspects. *RAPA Publication (FAO)*.
- Noy, C. (2008). Sampling knowledge: The hermeneutics of snowball sampling in qualitative research. *International Journal of social research methodology*, 11(4), 327-344.
- Nugroho, D., Faizah, R., Prasetyo, A. P., & Badrudin, M. (2015). Bio-exploitation status of Bombay Duck (*Harpodon nehereus* Hamilton, 1822) on trawl fisheries in Tarakan waters. *Indonesian Fisheries Research Journal*, 21(1), 53-59.
- Nurdin, N., & Grydehøj, A. (2014). Informal governance through patron-client relationships and destructive fishing in Spermonde Archipelago, Indonesia. *Journal of Marine and Island Cultures*, 3(2), 54-59.
- Oberle, F. K., Puig, P., & Martín, J. (2018). Fishing activities. In A. Micallef, S. Krasten, & A. Savini (Eds.), *Submarine Geomorphology* (pp. 503-534): Springer.
- Obidzinski, K. (2003). *Logging in East Kalimantan, Indonesia: The historical expedience of illegality*. (PhD-thesis). Universiteit van Amsterdam, Amsterdam.
- Obidzinski, K., Andrianto, A., & Wijaya, C. (2007). Cross-border timber trade in Indonesia: critical or overstated problem? Forest governance lessons from Kalimantan. *International Forestry Review*, 9(1), 526-535.
- OECD. (2008). *OECD Economic Surveys: Indonesia 2008* (Vol. 2008): OECD Publishing.
- Okushima, M. (2002). Commentary of the Sebuku Document: Local history of a minor polity of coastal Northeast Borneo. *Journal of Sophia Asian Studies*, 20(20), 147-172.

- Okushima, M. (2003). Ethnic Background of the Tidung: Investigation of the Extinct Rulers of Coastal Northeast Borneo. *Journal of Sophia Asian Studies*, 21, 233-260.
- Olwig, K. R. (1996). Recovering the substantive nature of landscape. *Annals of the Association of American Geographers*, 86(4), 630-653.
- Ombudsman-RI. (2015). *Rekomendasi nomor: 0006/REK/0201.2015/PBP-24/VI/2015*: Ombudsman-RI.
- Orlove, B., & Caton, S. C. (2010). Water sustainability: Anthropological approaches and prospects. *Annual Review of Anthropology*, 39.
- Ota, A. (2015). Toward a Transborder, Market-Oriented Society: Changes in the Hinterlands of Banten, c. 1760-1790. In *Hinterlands and Commodities* (pp. 166-196): Brill.
- Páez-Osuna, F. (2001). The environmental impact of shrimp aquaculture: causes, effects, and mitigating alternatives. *Environmental Management*, 28(1), 131-140.
- Paprocki, K. (2019). All that Is Solid Melts into the Bay: Anticipatory Ruination on Bangladesh's Climate Frontier. In M. Eilenberg & J. Cons (Eds.), *Frontier Assemblages: The Emergent Politics of Resource Frontiers in Asia* (pp. 25-39). New York: John Wiley & Sons.
- Pauly, D. (1994). From growth to Malthusian overfishing: stages of fisheries resources misuse. *Traditional marine resource management and knowledge Information Bulletin*, 3, 7-14.
- Pauly, D., & Zeller, D. (2016). Catch reconstructions reveal that global marine fisheries catches are higher than reported and declining. *Nature communications*, 7(1), 1-9.
- Pelras, C. (1996). *The Bugis*. Oxford: Blackwell Publishers.
- Pelras, C. (2000). Patron-client ties among the Bugis and Makassarrese of South Sulawesi. In G. Acciaioli, R. Tol, & K. Van Dijk (Eds.), *Authority and enterprise among the peoples of South Sulawesi* (Vol. 156, pp. 393-432). Leiden: KITLV Press.
- Peluso, N. L. (2007). Violence, Decentralization, and Resource Access in Indonesia. *Peace Review*, 19(1), 23-32. Retrieved from <http://www.tandfonline.com/doi/pdf/10.1080/10402650601181840>
- Peluso, N. L. (2008). A political ecology of violence and territory in West Kalimantan. *Asia Pacific Viewpoint*, 49(1), 48-67. doi:10.1111/j.1467-8373.2008.00360.x
- Peluso, N. L. (2018). Entangled territories in small-scale gold mining frontiers: Labor practices, property, and secrets in Indonesian gold country. *World Development*, 101, 400-416.
- Peluso, N. L., & Harwell, E. (2001). Territory, custom, and the cultural politics of ethnic war in West Kalimantan,

- Indonesia. In N. L. Peluso & M. Watts (Eds.), *Violent environments* (pp. 83-116). New York: Cornell University Press.
- Peluso, N. L., & Lund, C. (2011). New frontiers of land control: Introduction. *Journal of Peasant Studies*, 38(4), 667. doi:10.1080/03066150.2011.607692
- PERGUB-26/2014. (2014). *PENGELOLAAN IKAN NOMEI DE WILAYAH PERAIRAN PROVINSI KALIMANTAN UTARA*. Tanjung Selor: Provisinsi Kalimantan Utara.
- PERMEN-KP-01/2015. (2015). *PENANGKAPAN LOBSTER (Panulirus spp.), KEPITING (Scylla spp.), DAN RAJUNGAN (Portunus pelagicus spp.)*. Jakarta: KKP.
- PERMEN-KP-02/2015. (2015). *LARANGAN PENGGUNAAN ALAT PENANGKAPAN IKAN PUKAT HELA (TRAWLS) DAN PUKAT TARIK (SEINE NETS) DI WILAYAH PENGELOLAAN PERIKANAN NEGARA REPUBLIK INDONESIA*. Jakarta: KKP.
- PERMEN-KP-06/2008. (2008). *PENGGUNAAN ALAT PENANGKAPAN IKAN PUKAT HELA DI PERAIRAN KALIMANTAN TIMUR BAGIAN UTARA*. Jakarta: KKP.
- PERMEN-KP-12/2020. (2020). *PENGELOLAAN LOBSTER (Panulirus spp.), KEPITING (Scylla spp.), DAN RAJUNGAN (Portunus spp.) DI WILAYAH NEGARA REPUBLIK INDONESIA*. Jakarta: KKP.
- PERMEN-KP-56/2014. (2014). *PENGHENTIAN SEMENTARA (MORATORIUM) PERIZINAN USAHA PERIKANAN TANGKAPDI WILAYAH PENGELOLAAN PERIKANAN NEGARA REPUBLIK INDONESIA*. Jakarta: KKP.
- PERMEN-KP-56/2016. (2016). *LARANGAN PENANGKAPAN DAN/ATAU PENGELUARAN LOBSTER (Panulirus spp.), KEPITING (Scylla spp.), DAN RAJUNGAN (Portunus spp.) DARI WILAYAH NEGARA REPUBLIK INDONESIA* Jakarta: KKP.
- PERMEN-KP-59/2020. (2020). *ALUR PENANGKAPAN IKAN DAN ALAT PENANGKAPAN IKAN DI WILAYAH PENGELOLAAN PERIKANAN NEGARA REPUBLIK INDONESIA DAN LAUT LEPAS*. Jakarta: KKP.
- PERWAL-24/2014. (2014). *PENGELOLAAN PERIKANAN NOMEI YANG BERKELANJUTAN DI PERAIRAN KOTA TARAKAN*. Tarakan: Kota Tarakan.
- Primavera, J. H. (1997). Socio-economic impacts of shrimp culture. *Aquaculture research*, 28(10), 815-827.
- Primavera, J. H., & Esteban, J. M. A. (2008). A review of mangrove rehabilitation in the Philippines: successes, failures and future prospects. *Wetlands ecology and management*, 16(5), 345-358.
- Rasmussen, M. B., & Lund, C. (2018). Reconfiguring Frontier Spaces: The territorialization of resource control. *World Development*, 101, 388-399.
- Ray, R. D., Egbert, G. D., & Erofeeva, S. Y. (2005). A brief overview of tides in the Indonesian Seas. *Oceanography*, 18(4).

- Republika. (2015, 2015/11/10). Hazardous oil waste haunt Tarakan residents. *Republika.co.id*. Retrieved from [https://republika.co.id/berita/nasional/umum/15/10/11/nwlls\\_e384-limbah-minyak-berbahaya-intai-warga-tarakan](https://republika.co.id/berita/nasional/umum/15/10/11/nwlls_e384-limbah-minyak-berbahaya-intai-warga-tarakan)
- Ridd, P. V. (1996). Flow through animal burrows in mangrove creeks. *Estuarine, Coastal and Shelf Science*, 43(5), 617-625.
- Rieffel, A., & Pramodhawardani, J. (2007). *Out of Business and on Budget: The challenge of military financing in Indonesia*: Brookings Institution Press.
- Robertson, E. (1979). *The Japanese File: Pre-War Japanese Penetration in Southeast Asia* (Vol. 18): Heinemann Asia.
- Romano, N., & Zeng, C. (2007). Acute toxicity of ammonia and its effects on the haemolymph osmolality, ammonia-N, pH and ionic composition of early juvenile mud crabs, *Scylla serrata* (Forskål). *Comparative Biochemistry Physiology Part A*, 148(2), 278-285.
- Rubel, H., Woods, W., Pérez, D., Unnikrishnan, S., Meyer, A., Zielcke, S., . . . Lanfer, C. (2019). *A Strategic Approach to Sustainable Shrimp Production in Indonesia - The case for improved economics and sustainability*. Retrieved from
- Ruddle, K. (2011). "Informal" Credit Systems in Fishing Communities: Issues and Examples from Vietnam. *Human Organization*, 70(3), 224-232.
- Rudloe, J., & Rudloe, A. (2009). *Shrimp: The endless quest for pink gold*: FT Press.
- Russell, B., Govender, A., & Borsa, P. (2019). Harpadon nehereus.
- Ryter, L. (1998). Pemuda Pancasila: The last loyalist free men of Suharto's order? *Indonesia*(66), 45-73.
- Sachs, J. D. (2007). The promise of the blue revolution. Aquaculture can maintain living standards while averting the ruin of the oceans. *Scientific American*, 297(1), 37-38.
- Salam, M. A., Ross, L. G., & Beveridge, C. M. (2003). A comparison of development opportunities for crab and shrimp aquaculture in southwestern Bangladesh, using GIS modelling. *Aquaculture*, 220(1-4), 477-494.
- Salas, A. O., & Rendón, L. (2013). Hyper-intensive farming of white shrimp *Litopenaeus vannamei* in a freshwater tank under semi-controlled conditions (Decapoda: Penaeidae). *UNED Research Journal*, 5(1), 63-68.
- Sammut, J. (1996). Amelioration and management of shrimp ponds in acid sulfate soils: key researchable issues. *Australian Centre for International Agricultural Research, Songkhla*, 102-106.
- Santosa, I. (2004). *Tarakan: " Pearl Harbor" Indonesia, 1942-1945*: Primamedia Pustaka.

- Scott, J. C. (1977). *The moral economy of the peasant: Rebellion and subsistence in Southeast Asia* (Vol. 315): Yale University Press.
- Scott, J. C. (1989). Everyday forms of resistance. *The Copenhagen Journal of Asian Studies*, 4(1), 33.
- Scott, J. C., & Kerkvliet, B. J. (1975). How traditional rural patrons lose legitimacy - A theory with special reference to Southeast Asia. *LTC Reprint*, 125, 501-540.
- Sellato, B. (2001). *Forest, Resources, and People in Bulungan: Elements for a History of Settlement, Trade, and Social Dynamics in Borneo, 1880-2000*. Bogor: CIFOR.
- Semedi, P., & Schneider, K. (2021). Fishers' responses to the Danish seiner ban and the history of fisheries governance on the Java north coast. *Maritime Studies*, 20(1), 43-62.
- Shelley, C. (2008). Capture-based aquaculture of mud crabs (*Scylla* spp.). *Capture-based aquaculture. Global overview. FAO Fisheries Technical Paper*, 508, 255-269.
- Shelley, C., & Lovatelli, A. (2012). *Mud crab aquaculture: a practical manual*: Food and Agriculture Organization of the United Nations (FAO).
- Sherry, N. (1966). *Conrad's eastern world*. London: Cambridge University Press.
- Shore, C., & Wright, S. (2011). Conceptualising policy: Technologies of governance and the politics of visibility. *Policy worlds: Anthropology and the analysis of contemporary power*, 1-26.
- Sillander, K., & Alexander, J. (2016). Belonging in Borneo: Refiguring Dayak Ethnicity in Indonesia. *The Asia Pacific Journal of Anthropology*, 17(2), 95-101. doi:10.1080/14442213.2016.1152882
- Sjørsvlev, I. (2013). Boredom, rhythm, and the temporality of ritual: Recurring fieldwork in the Brazilian Candomblé. *Social Analysis*, 57(1), 95-109.
- SK, J., Pilipus, G., Muzakir, D., & Azram, S. (2013). *Kaltara, Lahir dari Kehendak Rakyat - Sejarah Notulensi Kelahiran Provinsi Kalimantan Utara*. Jakarta: Pustaka Spirit.
- Slaats, H., Rajagukguk, E., Elmiyah, N., & Safik, A. (2009). Land law in Indonesia. In A. J. Hoekema, M. J. Ubink, & J. A. Willem (Eds.), *Legalising Land Rights: Local Practices, State Responses* (pp. 493-527). Leiden: Leiden University Press.
- Stacey, N. (2007). *Boats to Burn: Bajo Fishing Activity in the Australian Fishing Zone*. Canberra: ANU Press.
- Stephenson, W., & Campbell, B. (1960). The Australian portunids (Crustacea: Portunidae). IV. Remaining genera. *Australian Journal of Marine Freshwater Research*, 11(1), 73-122.
- Stevenson, N. (1997). Disused shrimp ponds: Options for redevelopment of mangroves. *Coastal management*, 25, 425-435.

- Stevenson, N., Lewis, R., & Burbridge, P. (1999). Disused shrimp ponds and mangrove rehabilitation. In *An international perspective on wetland rehabilitation* (pp. 277-297): Springer.
- Stille, M. (2017). *The Philippine Sea 1944: The last great carrier battle*: Bloomsbury Publishing.
- Stoler, A. L. (2008). Imperial debris: reflections on ruins and ruination. *Cultural Anthropology*, 23(2), 191-219.
- Stoler, A. L. (2013). "The rot remains" - From ruins to ruination. In A. L. Stoler (Ed.), *Imperial debris - On ruins and ruination* (pp. 1-35). Durham: Duke University Press.
- Stonich, S., & Bailey, C. (2000). Resisting the Blue Revolution: Contending Coalitions Surrounding Industrial Shrimp Farming. *Human Organization*, 59(1), 23-36. doi:10.17730/humo.59.1.862811321884231k
- Stringer, C. B., Finlayson, J. C., Barton, R. N. E., Fernández-Jalvo, Y., Cáceres, I., Sabin, R. C., . . . Riquelme-Cantal, J. A. (2008). Neanderthal exploitation of marine mammals in Gibraltar. *Proceedings of the National Academy of Sciences*, 105(38), 14319-14324. doi:10.1073/pnas.0805474105
- Subramanian, M. (2019). Anthropocene now: Influential panel votes to recognize Earth's new epoch. *Nature*.
- Sudarmono, S., Sulehan, J., & Rahamah Hj Abu Bakar, N. (2011). Patron-Client Relationship of Urbanized Fishing Communities in Makassar. *International Journal on Social Science, Economics and Art*, 2(2), 1-5.
- Sunderlin, W. D. (1999). Between danger and opportunity: Indonesia and forests in an era of economic crisis and political change. *Society & Natural Resources*, 12(6), 559-570.
- Sutherland, H. (2000). Trepong and wangkang; The China trade of eighteenth-century Makassar c. 1720s-1840s. *Bijdragen tot de taal-, land-en volkenkunde/Journal of the Humanities and Social Sciences of Southeast Asia*, 156(3), 451-472.
- Swanson, H. A. (2017). Methods for multispecies anthropology: thinking with salmon otoliths and scales. *Social Analysis*, 61(2), 81-99.
- Swyngedouw, E. (1999). Modernity and hybridity: nature, regeneracionismo, and the production of the Spanish waterscape, 1890-1930. *Annals of the Association of American Geographers*, 89(3), 443-465.
- Swyngedouw, E. (2015). *Liquid power: Contested hydro-modernities in twentieth-century Spain*: MIT Press.
- Szanton, D. L. (1971). *Estancia in transition: Economic growth in a rural Philippine community*: Ateneo de Manila University Press.
- Tagliacozzo, E. (2008). *Secret Trades, Porous Borders*: Yale University Press.

- Tanasaldy, T. (2012). *Regime change and ethnic politics in Indonesia : Dayak politics of West Kalimantan*.
- Tempo. (2009, 2009/06/12). Steal fish, escape through Ambalat. *Tempo*. Retrieved from <https://ekonomi.kompas.com/read/2009/06/12/10282098/curi.ikan.kabur.lewat.ambalat?page=all>
- Tempo. (2015, 2015/01/19). Tegal Demo Fishermen reject Minister Susi's Regulation. *Tempo*. Retrieved from <https://bisnis.tempoco.com/read/635921/tolak-aturan-menteri-susi-nelayan-tegal-demo>
- Timmer, J. (2010). Being seen like the state: Emulations of legal culture in customary labor and land tenure arrangements in East Kalimantan, Indonesia. *American Ethnologist*, 37(4), 703-712.
- Tirtosudarmo, R. (2018). *The Politics of Migration in Indonesia and Beyond*: Springer.
- Tribun-Kaltim. (2018). The largest pond area in Indonesia is in Kaltara, ironically the shrimp production is still small. *Tribun Kaltim*. Retrieved from <https://kaltim.tribunnews.com/2018/01/26/tambak-terluas-di-indonesia-ada-di-kaltara-ironisnya-produksi-udang-masih-sedikit>
- Tsing, A. (1993). *In the realm of the diamond queen : marginality in an out-of-the-way place*. Princeton: Princeton University Press.
- Tsing, A. (2000). Inside the Economy of Appearances. *Public Culture*, 12(1), 115-144. doi:10.1215/08992363-12-1-115
- Tsing, A. (2003). Natural Resources and Capitalist Frontiers. *Economic and Political Weekly*, 38(48), 5100-5106.
- Tsing, A. (2005). *Friction : an ethnography of global connection*. Princeton, N.J.: Princeton University Press.
- Tsing, A. (2009). Supply Chains and the Human Condition. *Rethinking Marxism*, 21(2), 148-176. doi:10.1080/08935690902743088
- Tsing, A. (2015a). *The mushroom at the end of the world : on the possibility of life in capitalist ruins*. Princeton, New Jersey: Princeton University Press.
- Tsing, A. (2015b). Salvage accumulation, or the structural effects of capitalist generativity. *Cultural Anthropology*, 30. Retrieved from <https://culanth.org/fieldsights/salvage-accumulation-or-the-structural-effects-of-capitalist-generativity>
- Tsing, A. (2016). What Is Emerging? Supply Chains and the Remaking of Asia. *The Professional Geographer*, 68(2), 330-337. doi:10.1080/00330124.2015.1099186
- Tsing, A., Mathews, A. S., & Bubandt, N. (2019). Patchy Anthropocene: Landscape Structure, Multispecies History, and



- the Retooling of Anthropology: An Introduction to Supplement 20. *Current Anthropology*, 60(S20), S186-S197.
- Turner, F. J. (2008). *The significance of the frontier in American history*: Penguin UK.
- USSBS, O. a. C. D. (1946). *Oil in Japan's War*. Retrieved from UU-RI-22/1999. (1999). *TENTANG PEMERINTAHAN DAERAH*. Jakarta: Dewan Perwakilan Rakyat Republik Indonesia.
- UU-RI-25/1999. (1999). *PERIMBANGAN KEUANGAN ANTARA PEMERINTAH PUSAT DAN DAERAH*. Jakarta: Dewan Perwakilan Rakyat Republik Indonesia.
- Van Klinken, G. (2009). Patronage democracy in provincial Indonesia. In O. Törnquist, N. Webster, & K. Stokke (Eds.), *Rethinking popular representation* (pp. 141-159). New York: Springer.
- Vandergeest, P. (2008). New concepts, new natures? Revisiting commodity production in Southern Thailand. In J. Nevins & N. L. Peluso (Eds.), *Taking Southeast Asia to market: Commodities, nature, and people in the neoliberal age* (pp. 206-224): Cornell University Press.
- Vandergeest, P., Flaherty, M., & Miller, P. (1999). A political ecology of shrimp aquaculture in Thailand. *Rural Sociology*, 64(4), 573-596.
- Vayda, A. P., & Sahur, A. (1985). Forest clearing and pepper farming by Bugis migrants in East Kalimantan: antecedents and impact. *Indonesia*(39), 93-110.
- Viswanathan, C., & Raffi, S. J. S. j. o. b. s. (2015). The natural diet of the mud crab *Scylla olivacea* (Herbst, 1896) in Pichavaram mangroves, India. 22(6), 698-705.
- Walker, P. J., & Mohan, C. (2009). Viral disease emergence in shrimp aquaculture: origins, impact and the effectiveness of health management strategies. *Reviews in aquaculture*, 1(2), 125-154.
- Warren, J. F. (2007). *The Sulu Zone, 1768-1898: The dynamics of external trade, slavery, and ethnicity in the transformation of a Southeast Asian maritime state*. Singapore: NUS Press.
- Wever, L., Glaser, M., Gorris, P., & Ferrol-Schulte, D. (2012). Decentralization and participation in integrated coastal management: Policy lessons from Brazil and Indonesia. *Ocean & coastal management*, 66, 63-72.
- White, B. (1983). "Agricultural involution" and its critics: Twenty years after. *Bulletin of Concerned Asian Scholars*, 15(2), 18-31.
- Wight, A., Hare, L., & Reynolds, J. (1992). Tarakan Basin, NE Kalimantan, Indonesia: a century of exploration and future potential. *Geological Society of Malaysia Bulletin*, 33, 263-288.

- Wilson, B., White, I., & Melville, M. (1999). Floodplain hydrology, acid discharge and change in water quality associated with a drained acid sulfate soil. *Marine and Freshwater Research*, 50(2), 149-157.
- Wilson, C. (2013). 'Ethnic outbidding' for patronage: the 2010 riots in Tarakan, Indonesia. *South East Asia Research*, 21(1), 105-129. doi:10.5367/sear.2013.0135
- Wilson, T., & Donnan, H. (1998). Border identities. *Nation and State at international*.
- Wolf, E. R. (1982). *Europe and the People without History*: University of California Press.
- Wood, G. (2003). Staying secure, staying poor: the "Faustian Bargain". *World Development*, 31(3), 455-471.
- Wood, P., Greenwood, M. T., & Agnew, M. (2003). Pond biodiversity and habitat loss in the UK. *Area*, 35(2), 206-216.
- World-Bank. (2018). *Indonesia - Program to Accelerate Agrarian Reform (One Map Project) (English)*. Retrieved from Washington:  
<http://documents.worldbank.org/curated/en/393931532143851037/Indonesia-Program-to-Accelerate-Agrarian-Reform-One-Map-Project>
- Worm, B., Barbier, E. B., Beaumont, N., Duffy, J. E., Folke, C., Halpern, B. S., . . . Palumbi, S. R. (2006). Impacts of biodiversity loss on ocean ecosystem services. *Science*, 314(5800), 787-790.
- Worm, B., Hilborn, R., Baum, J. K., Branch, T. A., Collie, J. S., Costello, C., . . . Jennings, S. (2009). Rebuilding global fisheries. *Science*, 325(5940), 578-585.
- You, W., & Hedgecock, D. (2019). Boom-and-bust production cycles in animal seafood aquaculture. *Reviews in aquaculture*, 11(4), 1045-1060.
- Zerner, C. (2003). Sounding the Makassar Strait: the poetics and politics of an Indonesian marine environment. In C. Zerner (Ed.), *Culture and the Question of Rights: Forests, Coasts, and Seas in Southeast Asia* (pp. 56-108).





Түрк АУТРҰК  
Aarhus Universitet, ТТ: 87 16 8287