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Local impacts of the global shrimp industry: Mangrove clearings, shrimp farms and environmental justice in Sabah, Malaysia

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David Michael Buchwinkler

Masterarbeit

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Österreichische Forschungsstiftung
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Preface

An increasing variety of exotic foods including shrimp and other seafood has become readily available for consumers in Austria as well as in other advanced countries. The development from seafood commanding the status of a delicacy served only at special occasions to becoming almost a household staple is in fact a rather recent phenomenon. It has all to do with reconfigurations having taken place in global economy during the last three decades. Propelled by the debt crisis of the 1980s, a large number of low-income countries in Africa and Asia was advised by the World Bank and other international agencies to conduct economic reforms to diversify their exports. In many cases, this included the promotion of non-traditional agricultural and food commodities. Their production for export promised countries to earn much-needed foreign exchange as well as to boost employment. While the benign economic consequences of this policy can be seen in our supermarket shelves, it is hardly noted that the large-scale expansion of non-traditional agricultural production came at the price of significant social and environmental impacts upon local communities in the Global South.

David Buchwinkler takes up this important issue in his Master's thesis. He is precisely writing on the environmental and social consequences of intensive shrimp aquaculture in the Malaysian state of Sabah. He focuses on a case study of the large-scale aquaculture project in the Pitas district, where he analyzeses the impacts on the local population and how the local population perceives and deals with the economic, social and environmental consequences of this project. Hence, the thesis adds a relevant country case to the literature on the social and environmental consequences of aquaculture.

Key findings of the thesis state that shrimp producers are in a precarious economic and social position given large price fluctuations and declining margins. Besides these economic and social issues, native customary practices and land rights are central issues in the case study and illustrate how the negligence of the identities of local indigenous communities and of the environmental heritage have led to distributive, participatory and procedural injustices. These injustices are rooted both in local power structures, but also in practices and dynamics in the global shrimp aquaculture industry and in power asymmetries in the related global production network.

The results of this study are thus not only a critical reminder for consumers in Austria and other advanced industrial countries to critically reflect on their consumption habits, or, for that matter, for supermarket chains to interrogate their sourcing practices. They also provide important lessons for European development cooperation. Economic programms to foster exports of non-traditional agricultural and food products from the Global South to Europe need to address the social and environmental dimension of production and mitigate negative impacts on local populations and the environment.

Werner Raza

ÖFSE Director

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Abstract

This thesis analyses the environmental and social consequences of intensive shrimp aquaculture in the Malaysian state of Sabah on the island of Borneo. A special focus is placed on the impact of a large-scale aquaculture project in the Pitas district on the local population and how those affected deal with these environmental and social challenges. Environmental and social impacts have been little researched in Malaysia's shrimp sector. The thesis therefore provides valuable insights into the concerns, perceptions and coping strategies of different actors affected by this project. A novel conceptual framework combining environmental justice, intersectionality, and global production networks (GPN) is applied that picks up Habermas' concept of systems and lifeworld and shows that socio-cultural structures and the economic system are deeply entangled. Methodologically, the thesis draws on expert interviews and a wide range of secondary data. Shrimp producers are confronted with large price fluctuations and a trend towards private regulatory frameworks, which leads to declining margins and higher risks in the industry. The thesis portrays native customary practices and land rights as central issues in the case study and illustrates how the negligence of the environmental heritage and the identities of the local indigenous communities have led to distributive, participatory, and procedural injustices. These injustices are not only rooted in local power structures of the lifeworld, but also in the system of the global shrimp industry and form a complex and entangled relationship where they shape and (re-)produce each other. The thesis illustrates that it is mainly workers and local communities who bear the risks in the global shrimp industry.

Kurzfassung

Diese Masterarbeit analysiert die ökologischen und sozialen Folgen von intensiven Shrimp-Aquakulturen im malaysischen Bundesstaat Sabah auf der Insel Borneo. Ein Schwerpunkt liegt dabei auf den Auswirkungen eines Aquakultur-Großprojekts im Bezirk Pitas auf die lokale Bevölkerung und auf deren Umgang mit den damit verbundenen ökologischen und sozialen Folgen. Die ökologischen und sozialen Auswirkungen des malaysischen Shrimp-Sektors wurden bisher nur wenig erforscht. Die Arbeit bietet daher wichtige Einblicke in die Anliegen, Sichtweisen und Bewältigungsstrategien der von diesem Projekt betroffenen Akteure. Es kommt ein neuer Ansatz aus Umweltgerechtigkeit, Intersektionalität und Globalen Produktionsnetzwerken (GPN) zur Anwendung, der Habermas' Konzept von System und Lebenswelt aufgreift und zeigt, dass soziokulturelle Strukturen und das globale Wirtschaftssystem tief miteinander verflochten sind. Als methodische Grundlage nutzt die Arbeit Expert:inneninterviews und eine Vielzahl von Sekundärdaten. Shrimp-Produzenten sind mit straken Preisschwankungen und einem Trend zu privaten Regulierungen konfrontiert, was zu sinkenden Gewinnspannen und hohen Risiken im Sektor führt. Die Arbeit beschreibt indigene Gewohnheits- und Landrechte als zentrale Themen in der Fallstudie und veranschaulicht, wie die Missachtung des ökologischen Erbes und der Identitäten der lokalen indigenen Gemeinschaften zu ungerechten Verteilungs-, Partizipations- und Verfahrensstrukturen geführt hat. Diese Ungerechtigkeiten sind nicht nur auf lokale Machtstrukturen in der Lebenswelt zurückzuführen, sondern sind auch im System der globalen Shrimp-Industrie verankert. Sie bilden eine komplexe und verflochtene Beziehung, in der sie sich gegenseitig beeinflussen und (re-)produzieren. Die Arbeit zeigt, dass es vor allem Arbeiter:innen und lokale Gemeinschaften sind, die die Risiken in der globalen Shrimp-Industrie tragen müssen.

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1 Introduction

Shrimp farming has been practiced by subsistence farmers for centuries across many Southeast Asian countries. By using natural ponds near coastal waters and relying on tides for water exchange, feed, and shrimp fry, this form of aquaculture requires hardly any direct input or care. These small-scale and subsistence shrimp farming practices rely on traditional knowledge like multi-species and rotation systems that are less prone to diseases, required little capital input, and produce mainly for local markets, which makes it both socially and environmentally sustainable. Bryceson (2002) refers to these practices as small-scale integrated polyculture systems and praises their social and environmental advantages over corporate intensive monocultures. While extensive aquacultures required little direct input or care, semi-intensive and intensive aquacultures require pumps for water exchange, artificial high-protein feeds, and fry that are either cultured in hatcheries or caught in coastal waters. With yields up to 50 times higher than extensive farms (Primavera 1997), this capital and technology-intensive type of aquaculture promised high profits for foreign investors and economic growth and foreign exchange earnings for countries in the Global South.

Since the 1970s, the so-called Blue Revolution changed aquaculture production dramatically in both quantity and form. Production shifted from extensive systems in natural ponds to intensive systems in artificial ponds that rely on inputs and know-how from around the globe and its focus gradually turned from "basic" foods for local consumption to "high-value" foods for international markets (Islam 2014). The global aquaculture shrimp industry is blamed for numerous ecological (Boyd/Clay 1998), social (Primavera 1997), economic (Stonich/Bailey 2000), political (Vandergeest et al. 1999), and cultural (Islam 2014) problems. Estimations suggest that 38 percent of global mangrove forests have already been lost due to aquaculture projects (EJF 2004). Mangrove forests are one of the richest ecosystems on earth and play a crucial role in the marine ecosystems and the livelihood of local communities. They are a habitat for animals and a "nursery" for numerous marine organisms. The loss of mangrove ecosystems will therefore lead to a decline of biodiversity and reduces fish stocks (Rönnbäck 2001), which in turn leads to a downfall of the local fishing industry (EJF 2004). Coupled with the loss of resources that people often gather from mangrove forests (seafood, honey, building materials, traditional

medicine, etc.), shrimp aquaculture projects threaten the very thing that they promised to promote, food security and local livelihood (Stonich/Bailey 2000).

The master thesis aims to study the environmental and social consequences of intensive shrimp farms in the Malaysian state of Sabah on the island of Borneo. A special focus will be placed on the impact of large-scale aquaculture projects on the local population and how those affected deal with these environmental and social challenges. My research area is the Bengkoka peninsula in the Pitas district. There, a project for a large-scale shrimp farm, backed by the state government in Sabah, was presented in 2010. The shrimp farm was planned in an area with coastal mangrove forests next to the Tun Mustapha Marine Park, a protected marine reserve. The project, which is intended to be the largest and most modern shrimp aquaculture in Malaysia, initially received strong support from the local population, as over 3.800 new jobs were promised. The plans for the shrimp aquaculture project in Pitas aimed for the construction of over 1.000 shrimp ponds, which would then be used to cultivate whiteleg shrimp and black tiger shrimp. However, critics claim that there was insufficient consultation with the affected communities when the shrimp farm was planned and that the environmental impact assessment was not properly carried out. The construction of the shrimp aquaculture project in Pitas led to the clearing of over 1.000 ha of land, which consisted mostly of mangrove forests. By the clearing of the surrounding mangroves, one of the few sources of income (seafood, building materials, traditional medicine, etc.) for the local communities were lost, leading to local protests and the launch of an initiative to protect the remaining mangrove forests.

For my case study, three research questions are particularly interesting:

How has the local population been involved in the planning process of the shrimp farm?

Were any participatory mechanisms or other forms of involvement of the local population included in the planning process of the farm? Did they take place and in which form?

How does the local population perceive their role in these mechanisms and the overall planning process? How does the local population perceive the role of other actors in the planning process?

Did different groups have the same access to participatory mechanisms?

What are the environmental and social impacts of the shrimp farm on the local population?

What were the expectations of the local population related to the shrimp farm? Were they fulfilled?

What are positive and negative experiences for the local population related to the establishment of the shrimp farm and the mangrove forest clearings?

Are different groups affected differently in terms of positive and negative impacts?

How does the local population cope with these impacts?

How are the local communities coping with the loss of the mangrove forests?

Do people leave their village, protest against it, continue to support the project, or have other strategies?

Do different groups have different coping strategies?

These questions will be analysed using environmental justice, intersectionality, and global production networks (GPNs) as conceptual frameworks. In the last years, the concept of environmental justice became popular outside the US. Together with an intersectional perspective that looks at multiple forms of marginalisation, this research will also contribute to an emerging theoretical body of environmental justice. The majority of the existing chain and network literature places their main focus on global lead firms and their relations to other firms and therefore neglects the crucial role of non-economic actors in shaping a production network (Plank/Staritz 2010). The combined approach of environmental justice, intersectionality, and GPNs in this thesis aim to offers a comprehensive framework to analyse local impacts of the global production networks.

With my research, I do not intend to speak for the affected people, but rather show their concerns, perceptions, and coping strategies. By focusing on the environmental and social impacts on the local population and their coping strategies, my research aims to address an aspect that has been little researched in Malaysia. In doing so, I want to analyse the global production networks and the political economy of the global shrimp industry and take a critical look at local and global power relations.

My thesis is divided into seven chapters. Following the introduction, chapter 2 deals with the theoretical foundation of this thesis. In the first section of this chapter, I

discuss the relationship between nature and society. In the second section, I describe the history of environmental justice, intersectional perspectives, and framework to evaluate environmental justice. The third section provides an overview of chain/network approaches and describes the Global Production Networks (GPN) concept and highlights social and environmental issues in GPN. The final section of this chapter develops a framework to combine environmental justice, intersectionality, and GPN. Chapter 3 shows the methodology of my research. There, I present my preliminary methodology, describe the adaptation of methods, and show limitations and problems during my research. In chapter 4, I analyse environmental and social issues in the global shrimp sector. In the first section of this chapter, I show the history of shrimp production and trade. In the second section, I analyse shrimp aquaculture production networks with the GPN approach from chapter 2. The final section of this chapter environmental and social impacts of shrimp aquacultures. Chapter 5 deals with environmental justice and the shrimp sector in Sabah. There, I describe the environmental (justice) movements in Malaysia, environmental legislation and Native Customary Rights (NCR), and the shrimp aquaculture sector in Sabah. In chapter 6, I deal with the shrimp aquaculture project in Pitas, analyse this case with the environmental justice framework from chapter 2 and connect the results with my findings on shrimp aquaculture production networks. The chapter portrays native customary practices and land rights as central matters in the case study and illustrates how the negligence of the environmental heritage and the identities of the local indigenous communities led to distributive, participatory, and procedural injustices. These injustices are not only rooted in local power structures, but also in the system of the global shrimp industry and form a complex and entangled relationship where they shape and (re-)produce each other. In the final chapter, I draw together the findings from the previous chapters and discuss the local impacts of the global shrimp industry.

2 Theory

2.1 The Production of nature

Debates on climate change gave rise to environmental and ecological topics in social science in the last decades. However, many of these issues are often regarded either as deterministic or as socially constructed. While a constructivist approach negates the influence of nature on society, a naturalistic perception looks at limited recourses and their effects on the growing population. In order to analyse the underlying power structures in the relationship between nature and society, Köhler and Wissen (2010) argue that the subject should be observed from three main perspectives: the social production of nature, the boundaries of this production, and the power structures in the production.

Social production has a material and a symbolic aspect. The first aspect is based on the fact that humans can't live without nature. To Marx (1887), a central feature of all human labour is the "appropriation of natural substances to human requirements" (175). The symbolic aspect deals with the issue that natural substances and human requirements are not fixed definitions, but are shaped by discourses, and therefore change over time. It is important to note that nature and human needs can't be arbitrarily constructed, as there are both ecological and humanly boundaries for their (re-)production. The neglection of these boundaries is seen as a characteristic of capitalistic production (Köhler/Wissen 2010). The third central aspect of the social production of nature is the inscription of discrimination and unequal power structures into the relationship. What is regarded as nature and environment and who has access to its recourses is often based on highly asymmetrical power relations. Discriminatory practices may simply arise because ecological and humanly boundaries person's environment is neglected or the person's needs, history, and identity are not recognised in this relationship. Or as Harvey (1993) argues,

> "all ecological projects (and arguments) are simultaneously political-economic projects (and arguments) and vice versa. Ecological arguments are never socially neutral any more than socio-political arguments are ecologically neutral." (25)

Therefore, to overcome ecological and environmental problems, one has to overcome discrimination and unequal power structures rather than to rely on technological solutions and the "invisible hand" of the market.

As "competition makes the immanent laws of capitalist production to be felt by each capitalist" (Marx 1887: 555), capitalist production thrives to accumulate and further

invest capital to survive the competition. These "coercive laws" of capitalism force people to increase productivity, lower costs, and find new areas of accumulation. This leads to increased pressure on workers, the privatisation of common goods, expansion of capitalist production, and the externalisation of costs (O'Connor 1998). Like the externalisation of the reproduction cost of the workforce – i.e. care work – into the private sphere of the household, the cost of environmental pollution is also externalised to increase the profit rate. As Faber (2018) states, "[w]ithout prohibitions and the threat of punitive actions by state regulatory agencies or the courts, it is simply more profitable for corporations to pollute and leave ravaged landscapes unrestored" (61). Nevertheless, people are differently affected by this, as environmental risks and burdens in capitalist production are distributed "economically efficient" and "politically expedient" (ibid.), meaning that cooperation seek the way of the least resistant and therefore pick the most marginalised people and communities to target. As the master plan from 1984 for waste incineration sites in California expectedly states:

> "Members of middle or higher-socioeconomic strata (a composite index of level of education, occupational prestige, and income) are more likely to organize into effective groups to express their political interests and views. All socioeconomic groupings tend to resent the nearby siting of major facilities, but the middle and upper-socioeconomic strata possess better resources to effectuate their opposition. Middle and higher-socioeconomic strata neighborhoods should not fall at least within the one-mile and five-mile radii of the proposed site." (Powell 1984)

Such discriminatory practices are perfectly logical in a system of profit maximation and may not even be the result of an intention to discriminate people and communities, but this practice nevertheless inscribes (highly asymmetrical) power relations in the society and shapes the relationship that people have with nature and the environment. These inequalities and power structures in the relationship that people have with nature are not only local issues but are also manifested on a global level. Brand and Wissen (2017) analyse the practice of externalisation of risks and internalisation of benefits from a global perspective and call it the imperial mode of living. Through unlimited recourse appropriation, cheap labour and unequal distribution of environmental benefits and burdens, the imperial mode of living maintains the material wellbeing and social stability of the Global North at the cost of the Global South. Contrary to theories that focus primarily on local communities, nation-states, or a global scale, the imperial mode of living emphasises looking both at global power structures and structures within a given society in the Global North

or South. Conflicts on the unequal appropriation of nature – and therefore access and distribution of risks and benefits – happen either within a system or against the hegemonic structure of the system. Structural inequalities can only be challenged when the very basis of the hegemonic system and the powers that are safeguarding it (dominant classes, institutions, and the state) are contested. In the following parts, I will now look at the appropriation of nature and the environment from local and global perspectives. The local level will be examined from an environmental justice perspective and look at local struggles and affected communities. A global production networks (GPN) approach will be used to link local issues with the power structures in the international economic system and shows how global power asymmetries are reproduced.

2.2 Environmental justice

Environmental justice as a research paradigm emerged out of the struggles of diverse grassroots movements against the unequal distribution of environmental burdens. Due to this diverse background and struggles, it is important to understand that even basic definitions and concepts of environmental justice are controversially discussed among scholars and activists (Schlosberg 2007). Environmental justice can serve as a term to describe observed environmental inequalities, a normative concept for inequality and justice, a political idea and mobilization tool, and a legal term for laws and regulations (Holifield et al. 2018). Nevertheless, one subject that is extensively discussed among activists and scholars is how environmental justice differs from the "traditional" of "mainstream" environmentalism in both their views on the environment and justice (Taylor 2000, Pellow 2009). The environmental approach of environmental justice is outlined in an interview by one of the pioneering activists and scholars of this field, Robert Bullard:

> "The environmental justice movement has basically redefined what environmentalism is all about. It basically says that the environment is everything: where we live, work, play, go to school, as well as the physical and natural world. And so we can't separate the physical environment from the cultural environment. We have to talk about making sure that justice is integrated throughout all of the stuff that we do." (Schweizer 1999)

Scholars and activists emphasise a wide concept of environment, ranging from the physical environment to the cultural environment. This idea also implies that environmental problems always have an underlying social basis, and therefore are also social problems:

> "[I]f we approach environmental inequalities through a purely ecological lens, not only do we ignore the social basis of these problems, we implicitly accept the 'techno-fix' orientation that much of the mainstream environmental movement has embraced for the past four decades." (Pellow 2009: 4)

Grassroots movements tackle social problems by demanding justice. But these justice claims cannot be treated as pure juridical issues but range from distribution and compensation issues to recognition issues where people are demanding fair and transparent decision-making processes and the right to participate in matters that are affecting them.

To get a better understanding of the diverse aspects of the environmental justice approach, it is crucial to look at the history of environmental justice movements, see how environmental justice discourses are shaped over time and how they can be distinguished from "mainstream" environmental movements. Environmental justice as a movement and a research field first emerged in the US and placed a strong focus on racial struggles, so it is necessary to keep in mind that not all ideas and concepts can and should be applied in the Global South. Therefore, when I examine the concept of environmental justice, I will deal with it on a rather abstract level and will only become concrete when I look at certain national characteristics and key events. In this chapter of the thesis, I will deal with the history of environmental justice, intersectional approaches to environmental justice, and concepts and frameworks to evaluate environmental justice. Later, in chapter 5, I will deal with the special case of environmental justice in Malaysia.

2.2.1 History of environmental justice

The US Environmental Protection Agency, one of the few institutions that incorporated environmental justice ideas into their working principles, defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, colour, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies." (Environmental Protection Agency 2020) But what led a state institution to adopt ideas and principles of grassroots movements? Movements from low-income and people of colour communities that struggled against the unequal distribution of environmental hazards. To answer this question, we have to look first at "mainstream" environmental movements in the US.

Dowie (1996) categorises environmental history in the US into four waves. The first wave was concerned with the conservation and preservation of the "natural" environment. It started in the ninetieth century and as a response to capitalist overexploitation and was strongly influenced romantic concepts of the "wildness of nature". Before the first wave, environmental destruction was simply viewed as a by-product of production and a sign of growth. The main debates during that time were not on social issues or participatory practices from diverse movements, but between conservationists and preservationists about the exploitation of natural recourses. Conservationists argued for better management of recourses, while preservationists advocated keeping the natural environment in its primal state (Taylor 2000). Since the beginning, the conservation and preservation movement – which was formed and led mostly by religious, middle-class, white males – never challenged dominant power structures and the capitalist production logic (Dowie 1996).

The second wave started in the 1960s and was marked by broader public awareness and stronger environmental legislation. Still concerned with conservation and preservation of the natural environment, environmental movements broadened their agenda and also looked at social problems, health concerns, and were critical of large infrastructure projects and technologies like nuclear energy (Taylor 2000). The second wave led to the first anti-pollution legislation in the US and increased public awareness with events like Earth Day. During this time, the environmental movement in the US became younger, broader, and more politicised, but "in contrast to the militancy of the antiwar movement [...] environmentalism would remain genteel, white, and very polite" (Dowie 1996: 3).

For Dowie (1996), the neoliberal reforms and the weakening of the environmental legislation under the Reagan administration marked the end of the second wave. This essentially led the environmental movements in the US to evolve in two different directions. On the one hand, the more conservative groups and movements tried to work within the structures together with cooperation on best practices to reduce emissions and save the environment. On the other hand, environmentalists joined forces with the civil rights and social justice movement to fight environmental destruction on a local level. The newly formed grassroots movements would provide the basis for the fourth wave of environmentalism in the US, the environmental justice movement. Taylor (2000) stresses the different experiences that people of colour had with the environment throughout history:

> "Throughout history, Whites have accumulated and controlled resources by appropriating land and labor and by controlling the movement of people of color. In addition, the period of conquest was characterized by destruction of indigenous cultural systems. Whites, however, were free to express themselves and develop the kinds of relations with the land as they saw fit. Although some exploited the land, others sought alternative ways of relating to the land. The latter developed paradigms to reflect their beliefs." (533f)

Therefore, environmental movements from people of colour did focus on their living and working conditions rather than on wilderness and natural recourses, from which they were excluded anyway. Already since the 1940s, people of colour were actively campaigning for environmental topics like pesticides, workers' health, or segregation of public spaces, but they were viewed as civil rights rather than environmental movements (ibid.).

Many scholars trace the beginning of the environmental justice movement back to the late 1970s and the early 1980s (Mohai et al. 2009, Taylor 2000, Elvers 2011). First in the "Love Canal" neighbourhood near the Niagara Falls, where predominantly working-class residents fought for compensation because chemical waste in their area caused widespread health problems, and a few years later in Warren County (North Carolina), where a toxic waste dump was planned near a people of a colour residential area. Especially the case of Warren County triggered mass protests and received nationwide attention. The mass protests against unequal distribution of environmental burdens not only inspired other people to start a movement in their community but also sparked several empirical studies on this issue. Before the environmental justice movement, toxic waste sites near residential areas, dangerous working conditions, and segregation were considered an issue of social inequality and civil rights. Therefore, it comes as no surprise that the research on environmental justice issues wasn't first conducted by environmental organisations or biologists, but by civil rights activists, religious groups, and social scientists.

Following the protests in Warren County, the civil rights activist and delegate to the House of Representatives, Walter Fauntroy, initiated a study to review the decisions of the US Environmental Protection Agency on toxic waste sites. In 1983, the US General Accounting Office published this study and showed that three out of four toxic waste dumps in eight southern states were located in neighbourhoods mainly inhabited by working-class communities of colour, although they make up only one-fifth of the general population (General Accounting Office 1983). This was the first

time that race and class were proven to be factors that lead to disproportionate environmental burdens. The United Church of Christ Commission for Racial Justice under the supervision of Benjamin Chavis conducted a similar study in 1987 and concluded, that "race proved to be the most significant among variables tested in association with the location of commercial hazardous waste facilities" (Chavis 1987). Only that this time, the study was conducted on a national level and the findings were consistent across the US. Taylor (2000) calls this key study a "cognitive liberation" for environmental activists that later become prominent advocates of the environmental justice movement.

From the beginning, the environmental justice movements in the US were very much centred on racial discrimination and the unequal distribution of environmental burdens, which is often referred to as environmental racism. The concept of environmental racism looks at the experiences that people of colour have with the environment and describes the relationship between the environment and different forms of racial discrimination. Environmental racism also provided a concept that liked "past social justice activism that focused on racial injustice and civil rights with past and present environmental experiences" (Taylor 2000: 535). Robert Bullard published in 1990 his book *Dumping in Dixie*, which was the first major study that looked at environmental racism from a historical and sociological perspective and analysed the major social, economic, and psychological impacts related to the siting of poisonous waste sites. Through the examination of various contemporary and historic cases, he traced the origins of placing toxic waste sites into communities of colour back to institutionalised racism.

In 1990, the University of Michigan's School of Natural Resources held a conference on race and toxic waste and confirmed in a meta-analysis of recently published studies the findings of the United Church of Christ Commission for Racial Justice (Bryant/Mohai 1992). The results of the conference were also handed over to the US Environmental Protection Agency, which led to the creation of the Office of Environmental Equity, which was soon after named Office of Environmental Justice. Following a report from the US Environmental Protection Agency on Environmental Equity which acknowledged the existence of widespread environmental inequalities and a call for action (Environmental Protection Agency 1992), several legislations on environmental justice were passed and President Bill Clinton signed an executive

order (Nr. 12898) that all federal agencies must take environmental justice concerns into account in their decision making.

The establishment of an Office of Environmental Justice and the executive order was also deeply influenced by the First National People of Color Environmental Leadership Summit in 1991, where representatives of communities and movements across the US met to establish 17 principles for environmental justice. These principals show that environmental justice is more than waste facility siting (Bullard 1996). The topics covered in these 17 principles range from ecological principles to justice, autonomy, corporate relations, policy, politics, and economic processes to ideas about the movement itself (Taylor 2000).

Since the 1990s, the research field and the movement were both growing rapidly in terms of spatiality and scope. From the beginning, and researchers and activists were in constant exchange (Schlosberg 2013), which both enriched activism and the research field. Most of the studies that have been conducted in the early 1990s have been looking at the distribution of different environmental goods (i.e. public transport, hospitals, fresh food) and burdens (i.e. air pollution, toxic waste) from a race and/or class perspective (Taylor 2000). During the early years of environmental justice research, gender and intersectional perspectives played only a marginal role and the research scope was still largely focused on the US. As environmental justice advanced through the decades and the spatiality and scope widened, debates became increasingly more complex. There were still two major debates that are prominent since the beginning. The first one is on "who was first there?", environmental burdens or marginalised communities? Or in other words, were toxic facilities placed into the communities, or did people move intentionally into toxic environments, and were there clean affordable alternatives? In the case of the US, scholars tend to agree that marginalised communities are systematically targeted and that there is no strong evidence for a "minority move-in hypothesis" (Mohai et al. 2009). The second debate is on what is the driving force behind environmental injustices. What started as a debate between race or class in the US eventually led many scholars to adopt an intersectional perspective to analyse multiple forms of marginalisation and injustices.

2.2.2 Intersectional approaches to environmental justice

Since the beginning, environmental justice research was not only the description and documentation of environmental inequalities but an in-depth analysis of the factors

for these injustices (Bullard 1990, Schlosberg 2013). Initially, these inequalities were explained with institutional discrimination based either on race, class, or both. Some scholars even argued that the concept and the movement should only be limited to people of colour (Schlosberg 2013). Mohai et al. (2009) claim, that this is not only a sociological debate, but a political one as well. As grassroots movements depend on broad participation, calling a specific group particularly affected has a strong effect on its mobilisation potential.

Not only working-class communities and communities of colour are present in the environmental justice movement, but women also took a central role in the movement since the beginning. Krauss (1994) argues that gender-based division of labour gave rise to women in the environmental justice movement:

> "By and large it is women, in their traditional role as mothers, who make the link between toxic wastes and their children's ill health [...] This is not surprising, as the gender-based division of labor in a capitalistic society gives working-class women the responsibility for the health of their children [...] Ideologies of motherhood, traditionally relegated to the private sphere, become political sources that working-class women use to initiate and justify their resistance." (260f.)

Care work, traditionally happening in the private and depoliticised domain, led working-class women and women of colour to become political subjects and resist harmful practices to protect their families and communities. Like feminist movements, environmental justice also emphasises that "the private is political". It is estimated that in the early days of the environmental justice movement in the US, about 90 percent of its members and 60 of the leadership were women, especially working-class and/or women of colour (Stein 2004) Despite the prominence of women in the environmental justice movement, there were only a few campaigns that focused primarily on gender issues and injustices in the 1990s (Gaard 2018). Taylor (1997) explains this issue by the strategy of the movement to reach as many marginalised people and communities as possible and therefore primarily focusing on race and class struggles.

Although environmental justice has a large mobilisation potential even without focusing on gender issues, they are still curial in understanding and analysing the factors that lead to environmental injustices. As Gaard (2018) argues:

> "Frameworks that incorporate gender, sexuality, age and ability along with race and class are largely absent from environmental justice discourse, thereby obscuring the ways that gender and gendered labour shapes women, men, and trans* persons' experiences of environments and environmental problems." (74).

Likewise, feminist scholars and activists in the 1990s paid little attention to the environment as an analytical concept, with the notable exception of ecofeminism. Like environmental justice, ecofeminism emerged out of a variety of earlier feminist movements, including reproductive rights, animal rights, anti-nuclear, anti-toxics, and spirituality movements. Ecofeminism placed its focus on feminist environmental issues (issues that disproportionally affect women), like breast cancer, toxins during pregnancy and lactation, and health in gendered workplaces (Gaard 2018). Nevertheless, ecofeminism was criticised for universalising women and therefore neglecting racial differences (Gaard 2011).

Black feminists always criticised such a single-issue focus, as Audre Lorde stresses in a speech at the Harvard University in 1982: "There is no such thing as a single-issue struggle because we do not live single-issue lives" (Lorde, in Blackpast 2012). The black feminist scholars and activists Kimberlé Crenshaw and Patricia Hill Collins developed in the early 1990s out of Lorde's idea the concept of intersectionality to analyse differently, but entangled forms of marginalisation and oppression. Intersectionality rejects the idea that there is one fundamental category of oppression – like gender, race, or class – and that this category has the same effect for all people ascribed to it (Klapeer 2014). For instance, it rejects that class has the same effect on working-class women as it has on a working-class man or that gender has always the same effect, regardless of the person's race and class. Intersectionality is not about showing different forms of marginalisation side by side or adding them up to see who is the most oppressed. It is about how multiple forms of discrimination are intersecting and shows how they (re-)produce and shape each other.

Ecofeminists responded to this critique by adopting a broader and often explicitly intersectional approach, connecting feminism and the environment with racism, colonialism, speciesism, and sexuality (Gaard 2018, King 2017, Salleh 1997). Despite having different roots, ecofeminists and environmental justice activists formed alliances on issues like environmental health, food production, and urban livelihood (Kirk 1997). These alliances were formed by the end of the 1990s and consequently, environmental justice scholars adopted intersectional concepts and theories from ecofeminist researchers. Wide-ranging alliances happened especially in the field of climate justice:

> "Collaborations across these woman-powered movements emerged as activists and scholars within each movement listened to one another, utilizing one another's insights and critiques while responding to the escalating problems of climate

> change. [...] Across the spectrum of race, class, nation, and sexuality, women have founded organizations and been active in the struggle for climate justice." (Gaard 2018: 82)

Pellow (2016) describes two "generations" of environmental justice scholars. The first one was mainly concerned with environmental inequality arising from racist and/or classist discrimination. The second-generation widened their research scope beyond issues of distribution and looked at how other forms of oppression shape peoples' and communities' experiences with the environment. Pellow advocates for a wider scope of environmental justice research and proposes the concept of critical environmental justice studies, which he places on four pillars.

1. Analysing multiple and entangled forms of social inequality.
2. Looking at problems on multiple scales.
3. Not only looking at actors but how structures and systems (re-)produce inequalities.
4. Acknowledging that all humans (and species) are indispensable for a just and sustainable environment.

An intersectional approach provides the concept to analyse marginalisation and oppression from a critical environmental justice perspective. Malin and Ryder (2018) conclude that "deeply intersectional" environmental justice, meaning that problems should be tackled by the root and not just on the surface, should analyse multiple forms of marginalisation and injustices by "tracing threads of oppression across relevant historical and contemporary social contexts and injustices at multiple levels and/or social locations" (4).

There are two major obstacles in using an intersectional perspective in practice. The first one is finding the main inequality generating categories in a specific context, as a holistic approach and inclusion of every form of inequality is simply unfeasible. The second obstacle is on working with inequality generating categories without reproducing them. (Klapeer 2014) I will reflect on what these first obstacles mean for my field research and my privileges and situatedness in the methodology chapter of my thesis. The second obstacle is reflected by McCall (2005), who distinguishes between three conceptual approaches to intersectionality. Anticategorical, which completely rejects the use of categories and attempts to deconstruct them. Intercategorical, which strategically uses existing analytical categories to show inequalities, marginalisation, and power relations. Intracategorical in paced between anticategorical and intercategorical approaches. This means that "it acknowledges

the stable and even durable relationships that social categories represent at any given point in time, though it also maintains a critical stance toward categories" (1774). This means that intracategorical is not looking at intersections of different groups but at the relationship between constructed social categories. For a more detailed introduction into wide-ranging debates and theories on intersectionality, see (Crenshaw 2017).

2.2.3 Evaluating environmental justice

After looking at the historical development of environmental justice in the US, the underlying concept of the environment, and processes that lead to injustices, I will now show the different concepts of justice and how they can be evaluated. Early environmental justice studies focused on distribution issues of environmental benefits and burdens and many quantitative studies still deal with that field. In addition, scholars have looked at issues that could not be addressed by distributive perspective alone, like fair and transparent decision-making processes and the right of communities to participate in them (Holifield 2018 et al.). Others place a strong focus on political recognition of those who are affected (Figueroa 2006) or apply a capabilities approach to environmental justice (Schlosberg 2007). To evaluate my case study and to answer my research questions, I will analyse distributive, participatory, and procedural aspects and look at the interrelations between them.

Distributive justice deals with the distribution of environmental benefits and burdens and environmental justice movements aim to achieve a just balance between risks and benefits (Figueroa 2006). The concept of distributive justice can be traced back to Aristotle's Nicomachean Ethics (Kuehn 2000) and is central to many liberal political theories. Dworkin (1977) describes it as "the right to equal treatment, that is, to the same distribution of goods and opportunities as anyone else has or is given" (273). In the context of environmental justice, scholars argue that distributive justice is not about the equal distribution of hazards, but for the equal protection against them (Kuehn 2000). Benefits and burdens don't have the same impact on different groups, as children and women suffer more from toxins and air pollution and benefit less from industrial jobs than men and so an action that harms one group may very well benefit another. To analyse distributive justice from a critical perspective, it is

not only necessary to look at both risks and benefits, but always ask who is at risk and who is benefitting?

Another important aspect of justice is the idea of fair compensation after a person or a community was harmed. While compensation is a central demand of many environmental justice movements, it may even cause further injustices. Compensation, typically in the form of monetary payments, often doesn't stop harmful practices or reduce environmental burdens and limit future claims against the polluter. Such problems are especially prominent in out-of-court settlements. Other problems are social stigma for receiving compensation or permanent discord in the community over the amount and form of compensation (Figueroa 2006).

To provide equal protection against environmental burdens, looking at the distribution of risks and on the form of compensation is not sufficient, as it doesn't tackle the structural courses of injustice. Young (1983) criticises the concept of justice that provides the foundation of compensation and distribution issues:

> "A philosophical ground for the distributive orientation of modern theories of justice lies in the assumption that reasoning about justice takes place from the point of view of an 'ideal observer' neutral among conflicting parties. This ideal observer assumption, moreover, has a political counterpart in the assumption that the liberal democratic state functions as such a neutral arbiter among conflicting claims to right and justice." (171)

Viewing the state as a "neutral among conflicting parties" ignores the role states have in distributing resources and neglects the structural inequalities and power asymmetries within its institutions. Therefore, Young (1983) argues that fair and participative decision-making processes rather than compensation and distribution issues are the goal of many of the affected communities. Or as Figueroa (2006) states, "[d]istributive justice cannot adequately address fundamental questions about who has the power to redistribute" (367). Of courses, this critique shouldn't mean that distributive justice should be ignored in the analysis. It provides the material foundation that shapes the daily lives of people, but it can't fully grasp the socio-cultural structures in which inequalities are generated. Therefore, it is necessary to take a closer look at the process of controlling and distributing resources.

Participatory justice looks into the right of people to participate in matters that are affecting them. It deals not only with the legal suctions for public participation but is also asking about who is considered to be "the public" and who can participate in these structures. As Jamieson (2007) argues, participatory justice is often about political recognition:

> "Poor people and those who live on the margins are effectively voiceless in many environmental debates. In some cases participation is denied not because of institutional or political failure, but because those in question are not recognized as in the domain of justice. Historically, at various times and places, slaves and women have been denied justice not only in the sense that they have borne disproportionate burdens or that their voices have been muted, but also in that they have not been regarded as the proper subjects of justice." (92)

The political recognition of the affected people is a central aspect of participatory justice, as it is crucial for institutional participation mechanisms. As Arendt (1973) claims, in a "completely organized humanity", "the loss of home and political status" becomes "identical with expulsion from humanity altogether" (297). Recognition justice is, therefore, a key demand for environmental justice movements, as it enables them to participate in matters that are affecting them. As marginalized groups often don't have the chance to participate in the decision-making processes and therefore can't voice their concerns, the idea of a "public interest" becomes just the interest of the ruling class. Unreflective concepts of "the public" and who can participate in debates conceal the different forms of marginalisation that people face in their daily lives. It is, therefore, necessary to look at who can participate in institutional processes and mechanisms, how are they able to participate in them, and also look beyond institutionalised forms of decision-making. While consensus-based participation mechanisms provide important insights, the field of political recognition is often more conflict-oriented and contested (Pichler 2016).

Recognition justice is not only concerned with political recognition but also recognizing individual and collective environmental identities from people.

> "Recognition justice involves not only giving victims a voice in environmental decision-making, but also cultivating an authentic respect for the ways in which local groups experience the policy process, and for their traditional ways of knowing and responding to environmental concerns." (Figueroa 2006: 372)

Environmental heritage and identities are some of the most neglected aspects of environmental justice and even if distributive justice and political recognition are achieved, people and communities may still be harmed and perceive injustice. Therefore, scholars argue that self-determination is one, if not the main aspect of justice (Schlosberg 2004).

Procedural justice is concerned with a fair and transparent decision-making process. Its main focus is on how decisions are made and how fair and just these procedures are, and it is seen as an important tool to achieve political recognition and distributive justice (Schlosberg 2007). Hunold and Young (1998) argue that five procedural criteria have to be met to make a decision-making process just:

1. Inclusiveness: Enable affected people to participate in matters that are affecting them.
2. Consultation over time: Give people and communities the chance to voice their ideas and concerns at every stage of the process.
3. Equal resources and access to information: All affected parties should have access to information. As not all the affected groups have equal recourses and training, "weaker participants" should be supported to give them access to all the relevant data and enable them to provide their data.
4. Shared decision-making authority: Decisions are made by all participants of the process and no single party – like state officials – should have the full decision power.
5. Authoritative decision making: The decision reached jointly by all parties should be the final one and be respected by the government.

Bell and Carrick (2018) argue that even in the most progressive conventions and rules on environmental decision-making, states are reluctant in giving up the full decision power and the final say in these processes and it would require significant political changes to achieve points four and five. However, more radical and conflict-oriented concepts of justice and democracy could also lead to shared decision-making authority and authoritative decision-making (Pichler 2016). Hunold and Young (1998) include participatory justice in their idea for a fair and transparent decision-making process. As participatory justice is a key issue in my research and procedural justice focuses more on institutionalised forms of decision-making, use it as a separate analytical category to look at conflict-oriented and non-institutionalised justice claims. It is not only necessary to look at participatory justice and political recognition in the decision-making process, but also at the recognition of environmental identity and heritage, as decisions that are based on the hegemonic concepts of environment and neglect other perspectives may never be just.

Figure 1 shows the relationship between the different concepts of justice. Many scholars propose a multidimensional approach to analyse and evaluate environmental justice calms. Most prominent are a connection of distributive justice, recognition, and procedural justice (Figueroa 2006, Schlosberg 2007). Recognition and social justice have both effects on participatory and procedural justice. Participatory justice deals with issues of political recognition, which in turn has effects on the inclusiveness of procedural justice. To make a decision fair, it must also recognize

the heritage and identity of the affected group. A fair decision is the basis that leads to a just distribution of environmental benefits and burdens. This, in turn, provides the material basis which shapes their daily lives and upon which they are acting.

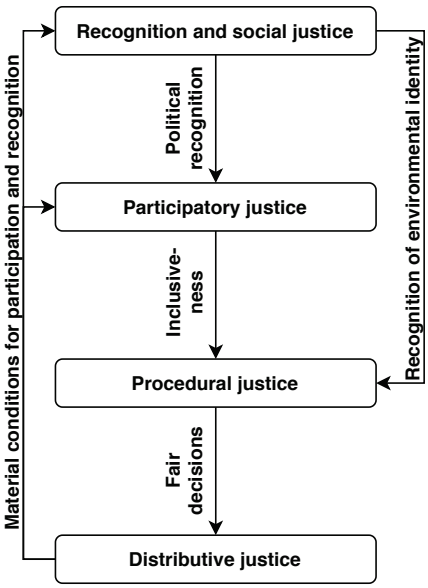


Figure 1: Relationship between justice concepts

Pichler (2016) argues that justice should be approached with a multidimensional conception based on socio-ecological principles:

> "[A] multidimensional conception of socio-ecological justice has to highlight the political and specifically democratic dimensions of self-determination and equality in the access to and control over nature and natural resources. This requires the recognition of diverse modes of living, the inclusion in and the control over decision-making power and problem-solving (that require representation), and the democratic allocation of responsibility to challenge the existing order, enlarge the public sphere, and only then enable the redistribution of nature and natural resources – among humans, social groups, and states." (47).

The importance of self-determination of people and communities is a central aspect to many scholars (Schlossberg 2004). By using a multidimensional approach that uses concepts of distributive, participatory, and procedural justice with a special emphasis on recognition issues (see Figure 1), I will look at issues of self-determination, access to and control over nature, recognition, decision-making, and challenges to dominant power structures. However, due to the focus of grassroots movements on the local or national level, the analysis is usually also limited to these levels (Elvers 2007). Although the rise is a growing focus on global aspects of

environmental justice, these often use the social movement approach to look at transnational ties between the movements and communities (Pellow 2009).

2.3 Global Production Networks (GPN)

As local and regional inequalities can never be analysed in isolation but must be embedded in a global context (Hopkins/Wallerstein 1986), the global production networks (GPN) approach is useful in highlighting inequalities in global production processes and help to show its effects on local communities. This part of the thesis deals with the development and overview of the different chain and network approaches, specific characteristics of the GPN theory, and how it looks at social and environmental issues. There are numerous ideas and concepts from different scientific fields that led to the development of the GPN approach (Coe et al. 2008). Although the chain and network approaches all have different backgrounds and aims, many of these concepts and methods can be applied mutually and in practice, produce quite similar results (Fischer et al. 2010).

2.3.1 Development and overview of chain/network approaches

Unsatisfied with the strong focus on states of many social science theories and scholars, Immanuel Wallerstein (1974) proposed a world-systems perspective to analyse how global inequalities are (re-)produced. Looking beyond states as the major actor in the global economy doesn't mean that states aren't important actors. It is rather a theoretical assumption that the state level is not the main sphere where global production and trade happens (Fischer/Parnreiter 2007). Rather than looking at a linear path of development, the world-systems theory looks at the global division of labour and capital accumulation and shows how courtiers in the core gain a hegemonical position in the production process. Wallerstein (1974) has shown that although the mode of production has largely changed over decades and centuries, the countries in the core have accumulated capital and therefore managed to maintain their dominant position in the world system, leaving the counties in the semi-periphery and periphery subordinated and dependent on the core.

As a methodological concept to analyse the (re-)production of inequalities and power structures in the world system, Hopkins and Wallerstein (1977) proposed the concept of commodity chains. Instead of looking at economic growth and characteristics like

consumption, they took a different approach and started their analysis with a commodity and showed how it is produced over time and space:

> "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. If the ultimate consumable were, say, clothing, the chain would include the manufacture of the cloth, the yarn, etc., the cultivation of the cotton, as well as the reproduction of the labor forces involved in these productive activities" (128)

By focusing on the inputs that result in an item, the commodity chain approach can analyse the global division of labour beyond national economies and borders, getting, on the one hand, a holistic picture of the development of the global economy and on the other hand a tool to show the impacts on different entities like communities. Hopkins and Wallerstein (1986) later summarised the concept of a commodity chain as a "network of labor and production processes whose end result is a finished commodity" (159). Due to the control of technologies and capital, the core of the world system can control the organisation of labour and production in the commodity chain, which leads to an unequal distribution of the wealth among the chain, which in turn reproduces the semi-periphery and periphery of the world-system.

The concept was picked up by Gary Gereffi in the early 1990s, who transformed it into a research paradigm with a coherent and operational framework to analyse historical and qualitative aspects of the world economy (Fischer et al. 2010). This new approach, which Gereffi (1994) calls global commodity chains (GCC) has two major differences compared to the world-system concept of commodity chains. The first one is the timespan of the analyses. While the world-system theory advocates for studying issues on the "longue durée", from the beginning and spread of capitalist production in the "long" 16th century till now, the GCC approach usually starts in the second half of the twentieth century. The first difference leads directly to the second one, the purpose of the research. Whereas the world-system theory is interested in how global production stratified and hierarchised the world over centuries, GCC analysis is interested in how global industries are structured and organised. Through this focus, the GCC approach lost many critical and holistic aspects of the world-system theory (Bair 2005). Gereffi (1994) describes four main dimensions of a GCC:

1. The input-output structure looks at services and products that add value to the commodity on different parts of the chain.
2. Territoriality deals with the special concentration or dispersion of the production process.
3. The governance structure shows who has the power and authority to control resources (capital, technology, humans) within the chain.
4. The institutional framework, which shows local, national, and international institutions, regulatory measure, and their effects on the chain.

This concept sheds light on the different inputs into a chain, the places where these inputs happen, the power structures, and the institutional embeddedness of the chain. The governance structure in GCC is especially important, as it strongly shapes the input-output structure and the territoriality of the chain. Gereffi (1994) distinguishes between buyer-driven and producer-driven governance of the chain. Producer-driven chains – like the automotive and aviation industry – require a large input of capital and technology from the producers, which allows them to control the production system and set the standards for the chain. Buyer-driven chains on the other hand are controlled by big brands and large retailers that source their – often labour intensive – products from a variety of producers. The global buyers can set the standards and regulations – including social and environmental standards – for the chain. Suppliers, who are in direct competition with each other, have little choice but to comply with rules. Suppliers are facing strong global competition in sectors where little input of capital and technology is required. This global pressure is then often imposed on the workers, as Frederick and Staritz (2011) have shown in the global apparel industry or Plank and Staritz (2010) in the Eastern European electronics sector.

Another prominent approach that developed in the early 2000s is the concept of Global Value Chains (GVC). Like GCC, GVC places its focus also on the meso (sectors) and micro (firms) level of the world economy rather than on the holistic macro perspective of the world system theory. Both concepts place a strong focus on the organisation and governance structure of global industries and sectors, but the GVC approach proposes a more differentiated concept of chain governance and looks more into the development opportunities and strategies of global suppliers. Gereffi et al. (2005) further stratified the governance structures of the GCC and suggests five types of governance relationships within a chain (see Figure 2).

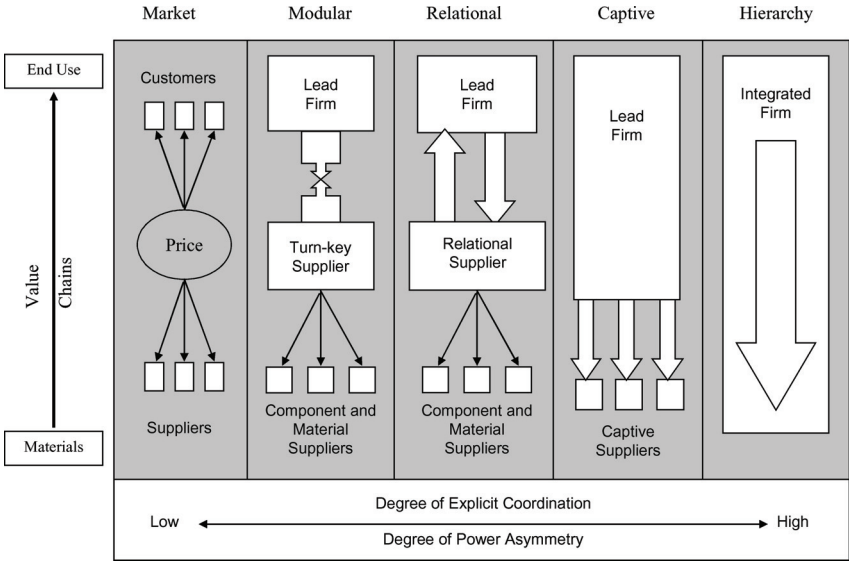


Figure 2: Five global value chain governance types (Gereffi et al. 2005: 89)

Besides market and hierarchy governance structures that rely either on market linkages or inter-firm relations, there are captive, relational, and modular structures in GVC. Captive governance relationships are marked by a (highly) hierarchical control of suppliers by big brands of lead firms. The suppliers are usually dependent on the technological or organisational input of lead firms and are facing strong global competition, which makes it hard for them to gain a higher position in the value chain. In relational governance structures, suppliers and lead firms both have technologies and knowledge that are necessary for production. This leads to mutual dependence and suppliers have a stronger position in negotiating prices and can capture more value from the production process. Modular relationships in GVC can be observed in sectors where the production process is modularised and standardised and "turn-key" suppliers can offer their products to different firms and buyers. The suppliers are not dependent on the input of a single lead firm, which makes them less dependent and gives them the chance to adopt (higher value) activities along the chain.

Rather than looking into the comprehensive transformation of the chain, central questions in the literature on governance structures are concerned with the development opportunities and strategies of firms and suppliers (Fischer/Parnreiter

2007). Upgrading, which describes the concept of moving from a lower value into a higher value position was first adopted in GCC frameworks and later advanced in the GVC approach. Humphrey and Schmitz (2002) argue that "[d]ifferent forms of chain governance have different upgrading implications" (1023).

The concept of governance structures in GCC and GCV has been criticised for only focusing on chain-internal criteria like transaction complexity and neglecting chain-external factors like workers' agency. Likewise, critique has also been voiced on the predominant focus of GCC and GCV on transnational corporations and intra-firm relations and ignoring thereby the important role of the state and other actors in those chains (Fischer et al. 2010). Furthermore, upgrading focuses mainly on the paths of firms to get a higher value position in the chain and not on social and environmental issues of workers and communities. Research has shown that upgrading does not necessarily result in better working conditions and higher wages for workers and may even have negative effects on them (Plank/Staritz 2010). Taking a narrow and deterministic approach to governance structures and upgrading also brings the danger of adopting a modernisation theoretical approach of development that are neglecting structural inequalities and are proposing a uniform path of development.

2.3.2 The GPN approach

Critical reflections on the linear structure of GCC and GVC and their strong emphasis on governance structures gave rise to a fourth concept, global production networks (GPN) approach. Coe and Yeung (2015) define a GPN as "an organizational arrangement, comprising interconnected economic and non-economic actors, coordinated by a global lead firm, and producing goods or services across multiple geographical locations for worldwide markets" (2f.).

This definition has several advantages over the concept of GCC and GVC. Firstly, instead of using the term commodity, which implies a standardised and repetitive process of making (Fischer et al. 2010), the idea of production is much more open and focuses on the social processes (Henderson et al. 2002). Secondly, acknowledging that the dynamics and complexities of global production happen not only vertically like on a chain (Sturgeon 2001), but also horizontally and are entangled as a complex network provides a more sophisticated scope to analyse these relationships. Thirdly, the GPN approach looks also not at actors directly involved in the production process like NGOs, trade unions, regional and national governments,

and international organisations. Fourthly, the broad approach on actors in GPNs allows to examine their relationships across multiple locations and shows the special distributing and concentration of global production (Coe et al. 2004). Finally, this offers the opportunity to analyse GPNs out of a broad political-economic perspective that incorporates different aspects like ecological, institutional, cultural, or geographical accounts (Coe et al. 2008). On the downside, the broad approach of the GPN concept loses much of the theoretical simplicity of the GCC and GCV concepts (Coe et al. 2008) with their strong focus on governance structures and upgrading.

Henderson et al. (2002) propose a framework with three main categories to analyse four dimensions of a GPN (see Figure 3). This framework will be used in chapter 4 to investigate environmental and social issues in the global shrimp sector.

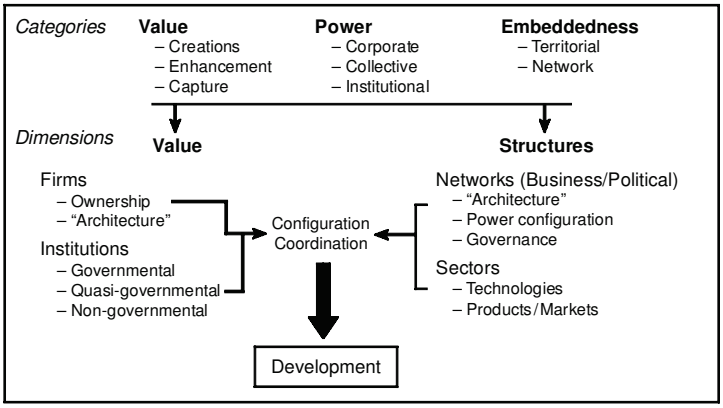


Figure 3: A framework for GPN analysis
(Henderson et al. 2002: 448)

The main analytical categories are:

1. The creation, enhancement, and capture of value deal with a Marxian concept of surplus value as well as conventional concepts of economic rent. In the Marxian sense, surplus value is the differential between the value created by a person's labour and the cost for the person's reproduction. Under this aspect, major questions are under which conditions (technology, skills, employment and working conditions, etc.) value is created and under which conditions (wages, care work, recreation, etc.) the workforce is reproduced. Concepts of economic rent show how firms create value by asymmetric

access, organizational skills, inter-firm relationships, brand-names, and trade policies (Henderson et al. 2002). The enhancement of value involves similar issues like upgrading in chain approaches and looks at the transfer of knowledge and technology, but explicitly recognizes the importance of value enhancement outside the given GPN. While value may be created and enhanced at a location doesn't necessarily mean that it is also captured there. Questions on how value is capered and who can capture are centred around issues of government policies, ownership structures, and corporate governance. Some economic rent may be easier captured by local actors (e.g. organizational skills) than others (e.g. brand-names) (Coe et al. 2004). The sphere of value capturing is strongly influenced by national policies and international agreements and frameworks and is, therefore, a highly contested field in economic treaties and agreements.

2. The power of corporate, collective, and institutional actors is central in understanding how value is enhanced and captured, but it is also a key issue in other aspects of this thesis. Corporate power, similar to governance structures in value chains, deals with the ability of lead firms to control the network and pursue their interests and the capacity of suppliers to make independent decisions and follow their upgrading strategies. The capacity to collect and analyse information globally plays a major role in the corporate power of lead firms and their bargaining position (Coe et al. 2004). Institutional power looks at how different institutional actors and frameworks (regional and national governments, supranational and international organisations, trade agreements, financial institutions, and rating agencies) are affecting corporate power structures in production networks. Collective power is concerned with a neglected field of GCC and GVC research, the influence and power of collective agents. Henderson et al. (2002) list NGOs, industry associations, and trade unions as potential collective agents. I would also argue that grassroots movements are major actors in this filed. These actors try to influence decisions, pursue their interests either directly at different locations of the GPN or try to influence institutional actors to act on their behalf.
3. The territorial and network embeddedness deals with the aspect that firms are not only territorially and functionally connected, but also by "social and

spatial arrangements [...] which influence their strategies and the values, priorities, and expectations of managers, workers and communities alike" (Henderson et al. 2002: 451). Territorial embeddedness shows that firms are not simply sited in an area but are spatially embedded in geographic locations and connected to their social structures and dynamics. Territorial embedded firms are connected to local production networks, regional and national institutional actors, communities, and the environment. The positive and negative effects of these territorial linkages are not constant, and firms may become territorial disembedded by reducing local workforce and investments. Another dimension that is closely related to territorial embeddedness, but often analysed separately is the embeddedness in society, values, and norms (Hess 2004). This dimension helps to analyse why actors chose a certain strategy and are organised in a specific way. Firms are not only embedded in a geographical location but also their production network. They are in a complex and often asymmetrical relationship with other members of the network. These relationships are complex because they are not only based on the power structures in the GPN, but also on expectations and trust. The relationship between firms as well as their connection to collective and institutional actors from the formal and informal structures of the production network.

The creation, enhancement, and capture of value, the power of corporate, collective, and institutional actors, and the territorial and network embeddedness will be used to analyse four (broad) conceptual dimensions of the GPN:

1. Firms are a central analytical dimension in all chain and network approaches. Even if they are part of the same GPN, their structures, strategies, and priorities may differ strongly from each other. These differences are – among others – the result of the ownership structure and the "architecture" of firms and shape how they structure and participate in production networks.
2. Networks are a central sphere in which governance structures shape who has the power and authority to control recourses and what upgrading opportunities and strategies firms have. Governance and upgrading concepts from GCC and GVC help to analyse the "architecture" of and the power structures within the network.

3. Institutions and frameworks have a significant impact on the structure of the GPN. By setting standards and rules – among others – on environmental protection and working conditions, the influence strongly affects how value is created, enhanced, and captured locally and globally and what environmental and social issues a GPN has.
4. Sectors underline structural similarities even if the firms that form them may differ from each other. As Henderson et al. (2002) argue, "similar technologies, products and market constraints are likely to lead to similar ways of creating competitive advantage and thus broadly similar GPN architectures" (454). These similarities also lead to sector-specific organisations and institutions – both on the industry and workers' side.

The framework from Henderson et al. (2002) emphasises the complex and entangled relationship between firms, institutions, and collective actors on the local as well as the global level. These relationships and the resulting power structures are more complex than intra-firm governance structures can grasp. Henderson et al. (2002) argue, that to understand these complexities, the evolution of the network should be analysed to trace the path-dependency of former decisions and events to the current structure of the network and possible paths for its future development.

Coe and Yeung (2015) stress the importance that competitive dynamics have in the formation and reconfiguration of GPN. They criticise the limited theoretical development in a chain and network literature that goes hardly beyond governance structures, strategic coupling, network configurations, and upgrading strategies and propose a dynamic and actor-centred GPN approach. Coe and Yeung (2015) identify cost-capability ratios, market development, and financial discipline as key dynamic competitive drives that shape the strategies of economic and non-economic actors in a GPN. Ponte (2019) adds that sustainability management and "green capital accumulation" has become a key driver of GPNs in the last two decades.

2.3.3 Social and environmental issues in GPN

The majority of the existing chain and network literature places their main focus on global lead firms and their relations to other firms and therefore neglects the crucial role of non-economic actors in shaping a production network (Plank/Staritz 2010). Nevertheless, the GPN theory offers an approach to analyse a wide range of social and environmental issues from a critical perspective and to understand that global

production is not simply an economic phenomenon, but a social and environmental (and special, cultural, political, etc.) one as well. To better conceptualise social and environmental issues in GPN, this part of the thesis deals with the relationship between embeddedness, society, and nature in production networks, the role of social and environmental upgrading in chain/network approaches, and the power and activism of non-economic actors in these issues.

As global production and its networks are never an isolated phenomenon, "the precise nature and articulation of GPNs are deeply influenced by the concrete socio-political, institutional and cultural 'places' within which they are embedded, produced and reproduced" (Coe et al. 2008: 279). The relationship between nature and society – as argued earlier – should be analysed from three main perspectives: the social production of nature, the boundaries of this production, and the power structures in the production (Köhler/Wissen 2010). As every element of the GPN is embedded in territorial, social, and network structures, and nature is both materially and symbolically produced in these structures, production networks are also deeply embedded in nature itself. On the one hand, nature places risks and boundaries on global production, which in turn shape the structure of the network and the strategies of its actors. On the other hand, natural resources appear in capitalism as a "free gift" that can be appropriated to create value and a way to externalise costs – i.e. waste – and increase the profit rate (Campling/Havice 2019). Nature provides therefore both risks and benefits for a GPN, but who benefits from nature and who bears the risk is subject to power structures in the network. Alongside the material production "with, through and against nature" (ibid.: 215), the power structures within GPNs are also symbolically produced and reproduced into nature. This affects not only network-internal actors but local communities as well (i.e. air pollution, toxic waste).

Control over recourses and the distribution of their risks and benefits is a central aspect of all chain and network approaches. When it comes to natural resources, states play a major role in production networks as they are often the "owner" of these resources and seek to capture value from the GPNs themselves. The control over common natural resources is strongly contested in two ways. On the one hand, local communities struggle with states over land rights, livelihood issues, and the recognition of their environmental heritage and identity (Goldman 1998, see the part on Environmental justice). On the other hand, as the "resource owner", states have a major influence on firms and the structure of the GPNs and can therefore affect the

working condition and environmental standards of the networks. Another central aspect in the control of resources is to "improve" the productivity of nature through industrial agriculture, aquaculture, fertilizers, and genetic modification (to name only a few). Campling and Havice (2019) argue that lead firms who control the relations inside the chain/network as well as the intellectual rights and technologies for "controlling industrial production of nature" (218), can capture the value of these new technologies whilst pushing the new (increased) risks onto other actors of the chain/network.

As a materialistic and naturalistic perception of nature bears the risk of it becoming deterministic (Köhler/Wissen 2010), it is crucial to also look at the symbolic aspect of nature in GPN. As GPNs are not simply an economic phenomenon, but social, environmental, cultural, political, special – etc. – one as well, Coe et al. (2008) call for a critical cultural political economy approach to GPN. The critical cultural political economy picks up Habermas' concept of the lifeworld (identity, everyday practices, habitus, etc.) and systems (bureaucratic and market structures, mode of production, etc.) and criticises that political economy is reduced to the analysis of systems while culture is only regarded to be present in the lifeworld (Sayer 2001). Rather than reinforcing this dichotomy or assuming that systems dominate the lifeworld, cultural political economy acknowledges the cultural embeddedness of systems as well as the important role of economic actors (e.g. firms) in both systems and the lifeworld. In the last part of this chapter, a critical cultural political economy approach will be used to connect intersectionality, environmental justice, and GPN.

Coming back to social and environmental issues in GPN, the concept of upgrading not only provides a robust framework to look at strategies and potentials of firms to get a higher value position in the chain/network but also helps to analyse environmental, social, and livelihood upgrading possibilities As it became increasingly clearer that economic upgrading of firms does not necessarily lead to increased environment standards (Rossi 2019) or better working condition (Plank/Staritz 2010), a new research focus in the chain and network literature emerged that deals explicitly with social, environmental and livelihood issues. The firm-centred concept of economic upgrading often assumed that firms would be able to capture more value after successful upgrading and that a higher position in the chain/network would allow firms to increase wages and standards. But firms may not

be able to capture the value of their upgrading efforts and even if, the captured value does not automatically "trickle down". Therefore, the concepts of environmental, social, and livelihood upgrading adopt a broader approach and look expectedly at both firms and chain-external/non-economic actors and the structures and drivers that enable or hinder the specific form of upgrading.

Environmental upgrading is regarded as "any change that results in the reduction of the firm's ecological footprint" where "the net gains in environmental improvements are more than the losses" (De Marchi et al. 2019: 312). This definition takes into account that strategies and actions of firms may have positive as well as negative effects at the same time. De Marchi et al. (2019) identify environmental upgrading strategies in the process (energy and material efficiency), product (environmentally friendly inputs and outputs), and organizational (sustainable management practices) improvements. Similar to social upgrading, economic upgrading is often required for, but doesn't necessarily lead to, environmental upgrading (Rossi 2019). As this concept is interested in the environmental improvements of upgrading, more critical approaches take the power structures of chains/networks into account and look at who is profiting from the upgrading efforts. Ponte (2019) argues that lead firms especially profit from environmental upgrading and that sustainability management has become a key driver of GPN. Lead firms can capture the surplus that consumers are willing to pay for a "green" commodity while the expenses are pushed down to the suppliers, thus creating a "sustainability supplier squeeze". He calls this strategy of lead firms "green capital accumulation" and argues that even though this may reduce the ecological footprint of a single unit, it doesn't challenge the growth imperative of capitalist production.

Social upgrading is concerned with the improvement of both quantity and quality of employment, whereby the quantitative side looks at wages and job creation and the quantitative side focuses on the rights and entitlements of workers (Staritz/Morris 2013). The most prominent concept of social upgrading derived from the ILO's decent work agenda and its four pillars – employment creation, social protection, rights at work, and social dialogue – that became an integral part of the sustainable development goals. The decent work agenda has been criticised by Selwyn (2013) for being a top-down approach of international organisations, national states, and firms that disguises the root causes of capitalist exploitation. To challenge these neo-liberal and institutionalist concepts of labour and its relationship with capital and the

state, he proposes a bottom-up approach on labour that acknowledges the exploitive nature of capitalism and the agency of workers in struggles for social upgrading. However, some form of economic upgrading is almost always necessary for successful social upgrading, as suppliers are often "squeezed" by low-margin contracts with lead firms that make higher wages and better working conditions impossible (Rossi 2019). While social upgrading makes an important contribution to social issues in the chain and network literature, its focus on workers and labour agencies makes it challenging to apply the concept to smallholder-based forms of production. Likewise, treating smallholders as firms and applying concepts of economic upgrading also causes challenges, as they often don't (fully) operate for-profit. To bridge this gap, Neilson (2019) proposes the idea of livelihood upgrading to capture upgrading drivers and strategies of smallholder households and their "social and economic identity as both capital and labour" (296). While both workers and smallholders produce for lead firms in highly asymmetrical power relations, the livelihood strategies of smallholders are often based on diverse forms of production and for multiple chains/networks. This makes the livelihood and upgrading strategies of smallholders highly complex and outside interventions that promote a single commodity highly problematic, as they may increase the dependency or the risk of smallholders in global production. Instead, he proposes a holistic perspective on their livelihood strategies that takes all the chains/networks of smallholders into account.

Palpacuer (2019) argues that the role of non-firm/civil society actors in chain/network approaches is mainly theorised through a "cooperative paradigm" that focuses on jointly established standards and schemes, inclusive governance structures, and awareness-raising. More conflict-oriented accounts that focus also on the power structures within the chains/networks are often based on social movement literature, transnational activist networks, or on a (Neo-)Gramscianism approach (ibid.). As production networks have undergone a rapid special and organisational transformation in the last decades, the activism within these networks has also changed. Just like lead firms, activist groups are often centred in the Global North and coordinate a loose network of groups and activists in the Global South who provide input into campaigns in form of protests, testimonies, or on-site information. Not only the special and organisational structures of global activism have changed in the last decade, but also the focus has shifted away from the state to lead firms and brands (Raynolds 2002, Busch/Bain 2004). This focus shift is problematic on

multiple accounts: Firstly, a single focused target assumes that lead films have full control of the network and therefore neglects the complex governance structures that are present in GPN. Secondly, states still have a major role in structuring and shaping GPNs through trade agreements, regulations and taxes. Although firms take advantage of different regulatory and legal systems, states may also outplay firms against each other (Coe et al. 2008). Furthermore, to make jointly established schemes binding, the legal autonomy of states is also needed. Thirdly, the actors in the "global activism networks" have different, and sometimes contradicting goals. Global activist groups often don't have the mandate to speak on behalf of workers or local communities and when they establish a global set of rules and codes with lead firms, they may neglect local identities, practices, and objectives. They may even unintentionally reproduce global (North-South) inequalities. On the other hand, a focus on lead firms and brands also sheds light on consumers and their strategies in GPNs. This can provide valuable insight, as the role of consumers in the chain/network literature is largely ignored (Coe et al. 2008). Although activists started to refocus on binding state legislation and advocated for a binding UN treaty on business and human rights, Palpacuer (2019) concludes on these efforts:

> "GVC-based activism has entailed GVC-constrained outcomes that could reach neither the far-end of long and complex value chains, where workers and other GVC-impacted actors may hold the least protected and most vulnerable positions nor the now-prominent unbranded markets such as China or India". (208)

When looking at power and activism in GPN, it is crucial to acknowledge the embeddedness and the different strategies goals of local and global activist groups and analyse the underlying power structures within these "global activism networks". Especially when local perspectives are ignored, global activists may even be supporting lead firms and power structures in GPNs and are reproducing global inequalities.

2.4 Combining environmental justice, intersectionality, and GPN

When looking at theories about socio-economic issues in the last decades, an interesting transition can be observed. While critical political economy perspectives like Wallerstein's (1974) world-system theory not only approached economic issues like unemployment and inequality as inherent to the capitalistic production but also came with the idea that an alternative system would be possible where many of these issues could be resolved, structural inequalities relating to race, gender, sexuality –

and especially intersecting perspectives – were largely neglected in these political-economic theories. In the last decades, however, the "cultural turn" in social sciences brought much-needed attention to these issues. Yet, as theories dealing with race, gender and sexuality became more critical, theories that focused on class and challenged the current production system started to decline political economy research (Sayer 2001). As the positions now seem to be reversed Sayer (2001) argues:

> "With respect to the more cultural issues of the politics of recognition, this turnaround looks radical and progressive, and these are the areas in which postmodernism and poststructuralism have been influential. From the perspective of political economy they look less progressive, for they offer no means for challenging the economic system, indeed, there are many unacknowledged affinities between postmodernism and neoliberalism"

Instead of just following this shift from politics of distribution to politics of recognition in a political-economic analysis, Sayer (2001) proposes a critical cultural political economy approach that takes a critical stand on economy, society, and culture. As explained earlier, the critical cultural political economy picks up Habermas' concept of lifeworld and systems to show that socio-cultural structures and the economic system are deeply entangled.

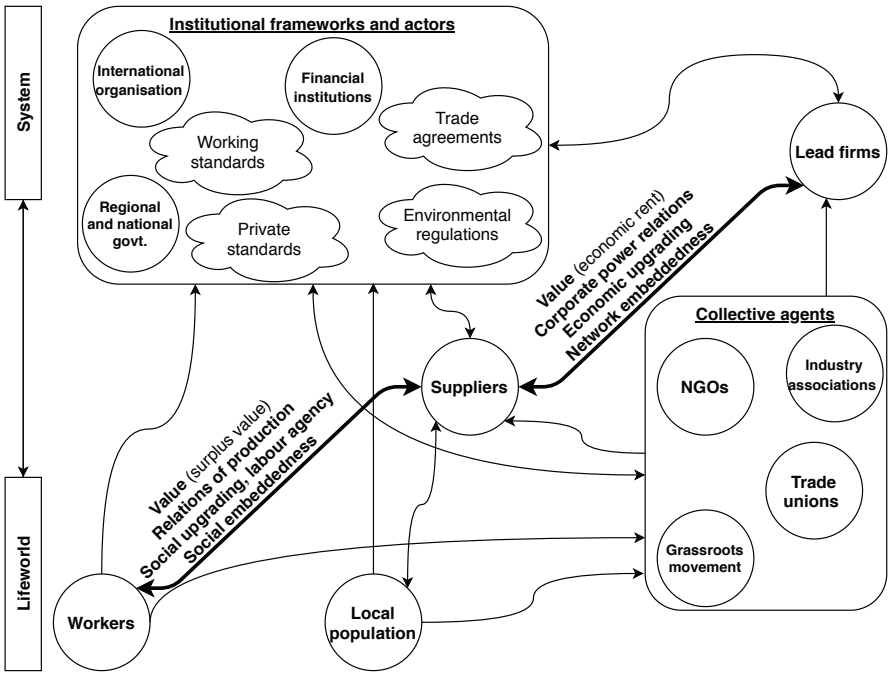


Figure 4: Lifeworld and systems in GPN

Environmental justice movements and their struggle for distributive, participatory, and procedural justice happen in the lifeworld, whereas chain/network approaches often focus on the system of global production and their governance structures. Figure 4 schematically shows how GPNs are both present in systems and the lifeworld. Workers, local population, suppliers, lead firms, collective agents, and institutional actors are differently embedded in systems, the lifeworld, or both. For example, workers are in a relationship with suppliers, contribute to grassroots movements and trade unions, and can influence institutional actors like governments. Figure 4 describes the multifaceted relations between workers, suppliers, and lead firms along with the production network and shows the complex connections between different actors inside a GPN. Of course, this figure is a simplified and rather an abstract description of the complex relationships between actors in a production network and specific GPNs may be much more complex and may involve more or different actors.

As systems have their dynamics and structures, it is crucial not to reduce systems to lifeworld as this would neglect the centuries of political-economic research, overlook structural dynamics and misinterpret socio-economic issues. Likewise, assuming the dominance of systems over the lifeworld would neglect the social and cultural embeddedness of systems. It is, therefore, necessary to study both, systems and lifeworld, show the relations between them and how they are affecting and shaping each other.

Systems, as well as the lifeworld, have a material as well as a socio-cultural base. The distribution of environmental benefits and burdens provides the material basis of the lifeworld of people which shapes their daily lives and social structures and thus provides the foundation upon which they are acting. In GPN, the creation, enhancement, and capture of value focus both on the lifeworld of workers and the system of economic rent. On a material basis, environmental justice movements and production networks are linked in two aspects. On the one hand, people are working under potentially harmful conditions to create surplus value for a firm and the network. On the other hand, nature is appropriated to create value, and products with no market value – e.g. waste and toxins – are externalised into nature to increase the profit rate. Workers' health, land grabbing, and toxic waste are major environmental justice issues that help to build a bridge to social and environmental issues in GPN. The power of corporate, collective, and institutional actors is strongly connected with

issues of participatory and procedural justice. Who has the power to (re-)distribute resources are both central questions to GPNs and environmental justice? Both argue against the liberal perception of the state as a "neutral among conflicting parties" (Young 1983) and look at the structural inequalities and power asymmetries within its institutions. The notion of participatory justice has the advantage that it looks at institutional processes and mechanisms as conflict-oriented and contested participation processes and therefore goes beyond the "cooperative paradigm" that dominated much of the chain/network approaches (Palpacuer 2019).

The five procedural criteria for a fair decision-making process – inclusiveness, consultation over time, equal resources and access to information, shared decision-making authority and authoritative decision making – proposed by Hunold and Young (1998) can also be a useful approach to analyse power structures within GPN. Participatory justice and the recognition of environmental identities are major aspects of the inclusiveness of procedural justice. Coe et al. (2004) argue that the capacity of lead firms to globally collect and analyse information provides a major advantage to them in bargaining and decision processes. GPNs also provide a valuable insight into decision-making in procedural justice, as it is not always the state who has the authority and the final word in the process. Institutional frameworks and settlement mechanisms place limits to a state's decision-making authority and give locally as well as global actors more possibilities to intervene in the decision-making process (for better or for worse). They must therefore be taken into account in an analysis of procedural justice.

Recognition and social justice have both effects on participatory and procedural justice. Institutionalised forms of participation require some form of political recognition and a fair decision must recognise the heritage and identity of the affected group. Not only people are embedded in socio-cultural structures with their heritage and identity, but firms are also territorially and socially embedded in them. However, firms are not only embedded in the lifeworld but also the system of a production network with its structures and dynamics. The socio-cultural structures of the lifeworld and the structures and dynamics of the system often contest each other (Sayer 2001) and form a field of tension in which firms are acting. How strongly a firm is territorially and socially (dis-)embeddedness has a major effect on the recognition of local heritage and identity (Hess 2004), and therefore the decision-making process in a production network.

Fraser (1995) argues that every inequality-generating category – like gender, race, or class – is rooted both in politics of recognition and politics of distribution. While class struggles are mainly about distributive issues, they have also socio-cultural aspects like when poverty and unemployment are blamed on a person's mindset or identity rather than the economic system. Gender and race are "bivalent" categories where the inequalities are both rooted in political-economic and socio-cultural issues. For example, political-economic issues of gender are the division between productive and reproductive labor or gendered labor and socio-cultural issues are domestic violence or the exclusion from the public sphere. Likewise, race does not only lead to a lower income and dangerous working conditions, but people suffer also under Eurocentric norms. These political-economic and socio-cultural issues are not an isolated phenomenon, but in relation and often reinforce each other. So, to analyse multiple – and often intersecting – forms of discrimination, it is important to look at political-economic as well as socio-cultural inequalities and show how they produce and shape each other. It is important to note that political-economic, as well as socio-cultural inequalities, are created in systems as well as the lifeworld (Sayer 2001), and therefore, both spheres must be taken into account.

Figure 5 schematically shows the combined approach of environmental justice, intersectionality, and GPNs for this thesis. It describes the embeddedness of actors in systems, lifeworld, or both and shows that the social and environmental issues in GPNs are rooted in politics of recognition as well as politics of distributing. In the complex relationship between suppliers and lead firms, two aspects are particularly important. Firstly, when firms participate in global production and become embedded in production networks, they will in turn become more territorially and socially disembedded as they adopt values and norms of the network. Secondly, suppliers are often "squeezed" by low-margin contracts with lead firms that limit their ability for better working conditions and higher environmental standards. As firms become disembedded and are under increased pressure from lead firms, both political-economic and socio-cultural issues are placed upon local communities and workers. Out of these issues, environmental justice movements emerge that struggle against these injustices. As environmental justice argues for a broad concept environment that is ranging from the physical environment to the cultural environment, it can look at political-economic as well as socio-cultural problems. Participatory justice is concerned with both institutional and conflict-oriented

participation processes and therefore deals with conflicts and protests against firms, the fight for recognition and social justice on an institutional level as well as with the inclusiveness in decision-making processes. A decision-making process, which is often complex and may involve many different actors, then leads to the distribution of social and environmental problems and benefits in the network.

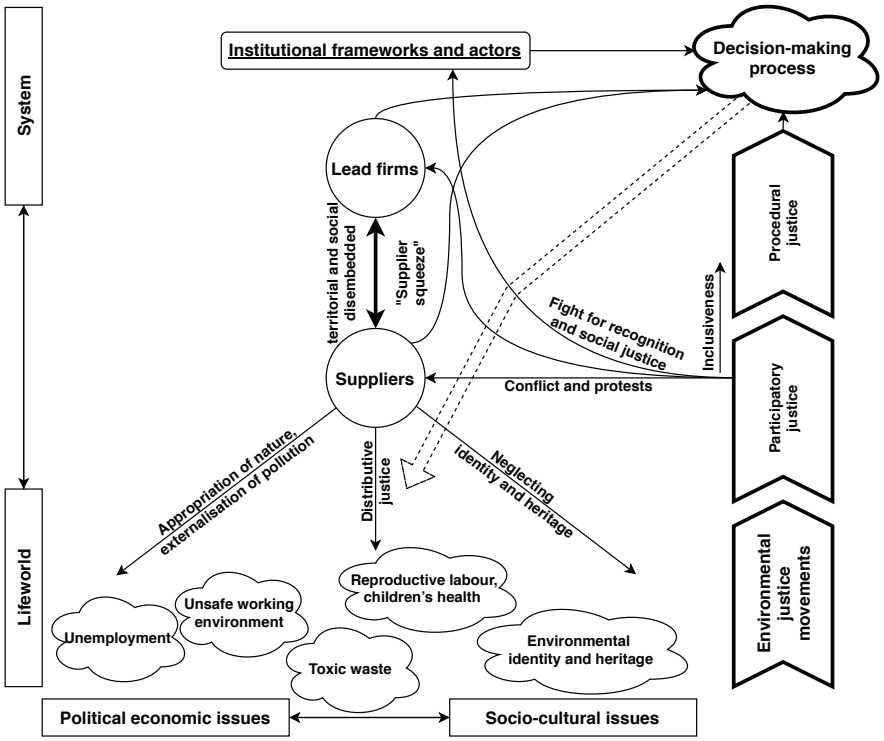


Figure 5: Combining environmental justice, intersectionality, and GPN

Due to the global COVID-19 pandemic, I faced several major problems during my research and was only able to interview only a limited number of actors for my case study. Therefore, some important aspects of this combined approach may fall short in the empirical part of this thesis. It is nevertheless important to have a comprehensive theoretical approach to lay the foundation for future research in this area. This combined approach of environmental justice, intersectionality, and GPNs look at issues ranging from the appropriation of nature and the externalisation of pollution to the neglection of environmental identities and heritage, and is, therefore, able to highlight issues of self-determination, access to and control over nature, recognition, decision-making, and challenges to dominant power structures (Pichler 2016). To

analyse the social and environmental impacts of global production, it is important to take both political, economic as well as socio-cultural issues into account and look at inequalities created in systems and the lifeworld. Therefore, the critical cultural political economy approach helps to look at the embeddedness of different actors in systems and the lifeworld, the complex relations and power structures among them, and social and environmental issues that are arising in global production from different perspectives.

3 Methodology

3.1 Preliminary methodology

With this thesis, I want to analyse the local impacts of shrimp aquaculture projects as well as the global production networks of the shrimp industry to show hierarchies and power relations within the industry. At the local level, I explore the case of the intensive shrimp aquaculture project in Sabah, its environmental and social impacts, and the coping strategies of the local population. Using a case study to analyse the local impacts does not only shed light on multiple forms of marginalisation and injustices but also helps me to better understand the complex dynamics between different actors. Yin (1994) describes a case study as an "empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (13). Case studies allow for a wide range of "tools" to collect in-depth data on a specific case. They range from interviews, surveys, and observations to the analysis of documents and artifacts. For this case, I will analyse secondary data on the research area and the case study (trade data, maps, official documents, "grey" literature, etc.) and conduct expert interviews with different stakeholders.

At the global level, existing research on global shrimp value chains and production networks will be used to analyse how the global shrimp industry is spatially distributed, who can define rules for the production network, what power hierarchies exist between firms from the Global North and the Global South and finally, how much of the profits of the shrimp industry reach the local population. For this purpose, the concepts of global commodity chains (GCC), Global Value Chains (GVC), and global production networks (GPN) are useful, as they deal with power structures in international trading systems and shows how global power asymmetries are reproduced (Gereffi 1994, Bair 2005). This research, therefore, does not only look at the local impacts but also links its findings with the global production networks of the global shrimp industry to show hierarchies and power relations within the industry.

The first step of this research was the examination of secondary data on the research topic, area, and case study. At the global level, a broad literature review was conducted to look at firms, networks, institutions, and sectors in the global shrimp aquaculture production network, analyse value, power, and embeddedness within

these networks and discuss the environmental and social impacts of shrimp aquacultures. At the local level, I gathered information on environmental justice in Malaysia and the shrimp sector in Sabah. One of these topics was on native land rights in Malaysia and especially in Sabah. This was mainly done using relevant research, but also looking at important legislature and judicature. It is crucial to know the basics of the legal system in Malaysia to better understand different justice claims. A particular focus was given to Native Customary Rights (NCR) as this is the main legislature that handles the land rights of indigenous people (Majid Cooke/Toh 2012). Besides native land rights, the historical background and the current state of shrimp farming in Malaysia and especially in Sabah were analysed. There, trade data had an important role to show the challenges of shrimp production in Malaysia and to better understand current policies on shrimp farming.

There are two broad strategies for collecting data, theoretical sampling and statistical sampling (Flick 1996). In theoretical sampling, the size of the population is not known in advance, whereas in statistical sampling the size of the population is known. As my research strategy has an "unfolding" approach and is not based on predefined statistical methods, it is not necessary to the population size in advance. As the aim of this thesis is to study the local impacts of shrimp aquaculture projects and how those affected deal with these environmental and social challenges, I chose a theoretical sampling because it gives me the chance to respond to new empirical findings and change the focus of my research. In addition, sampling is also determined by another factor: the available resources. Time and money – or the lack of – determine the sample size as well as the research approach in general.

Thanking into account the theoretical reflections on environmental justice and the chain and network literature, two groups of actors, in particular, were important for my case study. The first one was the communities affected by deforestation and shrimp aquaculture in the surrounding villages in the Pitas district (about 2000 people in the villages of Kampung Telaga, Kampung Gumpa, Kampung Ungkup, Kampung Boluuh Skim, Kampung Datong, and Kampung Sungai Eloi) and the second one were institutional actors (non-governmental organisations, industry associations, governmental institutions) related to shrimp aquaculture. Therefore, my research focuses mainly on two regions in Sabah. Firstly, in Kota Kinabalu, the capital of the Malaysian state of Sabah, where most of the institutional actors are located, and secondly in Pitas, one of the poorest districts in Sabah, where the

indigenous population is affected by the establishment of a shrimp farm and the clearing of the local mangrove forests. Since shrimp aquaculture is a relatively small field of expertise, I applied a snowball sampling strategy in which my interview partners will help me to select additional interview partners.

Due to the colonial past, English is still one of the official languages in Malaysia and is also widely spoken. However, people with little or no formal education do not know English. This applies to the people affected by shrimp aquaculture. Although institutional actors can be interviewed online, interviewing people in rural areas with limited infrastructure, little formal education, and no knowledge of the local language is not possible.

To collect the primary data for my thesis, I planned to conduct expert interviews with institutional actors in Kota Kinabalu as well as in affected communities in Pitas. In general, expert interviews are regarded as a semi-structured interview type used for investigative and "unfolding" research (Meuser/Nagel 2009). Their aim is, as the name already describes, to collect expert knowledge. There are, however, major debates on who is considered to be an expert and who is not. While some researchers argue that everybody is an "expert of their livelihood" (Gläser/Laudel 2009, Dannecker/Vossemer 2014) others claim that expert knowledge is linked to a profession (Sprondel 1979) or at least to people "who are active in community affairs regardless of their position in the social status system" (Gorden 1975: 199). Meuser and Nagel (2009) argue that experts are people who are in any way responsible for the planning, development, implementation, and/or control of a problem solution, and therefore have privileged access to information about groups of people, social situations, decision-making processes, policy fields, etc.

This definition includes non-governmental organisations, industry associations, governmental institutions, universities/research institutes as well as grassroots movements such as the one in Pitas where the local community started a protest against an intensive shrimp farm and launched an initiative to protect the remaining mangrove forests. Sampling experts for interviews should be done in such a way that the spectrum of different expert perspectives and the diversity of problem definitions are represented (ibid.). The actors above come from diverse backgrounds and therefore have most likely different perspectives on the same issues and propose a solution to the same problem. Meuser and Nagel (2009) separate two forms of knowledge that are relevant for expert interviews. On the one side, there is

management knowledge from actors involved in some form of decision-making to look at the structural conditions of a decision-making process and to obtain information based on which practicable measures can be developed. On the other side, there is context knowledge of actors not directly involved decision-making process that provides information about the actions, and strategies and of certain people and groups. With my sampling strategy, I intended to collect both management and context knowledge by interviewing actors that are directly involved (e.g. governmental organisations), actors that are not directly involved (e.g. industry associations), and actors that can provide both insights to management and context knowledge (e.g. grassroots movements).

The expert interviews for this thesis were conducted as semi-structured interviews, as this form of interview allowed me to place a clear focus on my research topic and still leave room for the interviewed person to go into depth on specific issues and disclose more information on their role in and the structural conditions of a decision-making process. Narrative expert interviews entail the risk of being perceived as an incompetent interviewer, loosing focus of the interview topic, or only talking about the biography of the interviewed person. Structured interviews can miss out on important issues that are not covered in the interview questions or lead to descriptive answers that do not reveal the role and strategies of the actor. Semi-structured expert interviews require the interviewer to have a certain knowledge about the interview topic to engage in a meaningful conversation and to show the counterpart that one is interested in this topic (Trinczek 1995). To analyse and evaluate expert interviews, Meuser and Nagel (2009) propose a six-step process:

- Transcription: Contrary to narrative interviews, not the whole recorded interview must be transcribed, and intonations and pauses have limited importance.
- Paraphrase: The paraphrasing should follow the course of the conversation and describe the main views of the experts.
- Coding: The coding process should be done following the text and using the terminology of the interviewed persons.
- Thematic comparison: This approach follows the same logic as the coding process, but thematically comparable text passages from different interviews will now be brought together, and if necessary, revised.

- Sociological conceptualisation: Here, the terminology of the interviewed persons is replaced by theoretical concepts, and similarities and differences are conceptualised.
- Theoretical generalisation: The categories are theoretically ordered in their specific context. The results are then presented from a theoretically informed perspective on the empirically generalised "facts".

This six-step process was used to analyse and evaluate expert interviews for my thesis.

3.2 Limitations and adaptation of methods

Due to the global COVID-19 pandemic, I faced several major problems during my research. To answer my research questions with an environmental justice approach and talk to the relevant actors, it was important to conduct field research in Sabah and organise a local translation when necessary. I intended to travel to Sabah in April 2020, however, the situation in Sabah and Austria soon made it clear that I had to postpone my field research.

While the situation improved during the summer month, travel restrictions were still in place during that time. In September 2020, the situation in Sabah significantly worsened and the state became the epicentre of COVID-19 infections in Malaysia. The situation in Sabah and the restrictions that followed made field research impossible for the next months. In November 2020, Austria became a global COVID-19 hotspot and put a major restriction in place, including international travel warnings on almost every country in the world. Over the flowing months, the situation in Sabah gradually improved months and many restrictions were lifted. These uncertainties led to a major delay in my research. When it became clear that field research would be impossible for the few next months, I asked relevant actors if they are willing to do online interviews with me. However, as describes in the previous section, it was clear that I would only be able to interview institutional actors that speak English, have the required technical equipment, and have a stable internet connection. Therefore, it was not possible to interview the affected communities online. In addition, the struggles that people are now facing due to the global pandemic lead also to the limited response from institutional actors to my interview requests. To take local perspectives into account, I mainly interviewed

actors who were already in contact with the local population. I conducted two online interviews with NGOs (four people in total) and one with a government organisation that was in contact with the local population for several years. In addition, I contacted a governmental agency that was involved in the decision-making process of the shrimp farm and interviewed an industry representative who provided me in-depth inside in the shrimp aquaculture sector in Malaysia.

In this thesis, the focus will be therefore on global shrimp production networks and the power relations within the industry. It, therefore, relies strongly on secondary data like trade data, maps, official documents, "grey" literature research in the relevant areas. In addition, my research in this thesis relies heavily on newspaper articles, the environmental impact assessment (EIA) of the aquaculture project in Pitas, and similar research conducted in this area. This helped me to provide a broad overview of the context of my research and shed light on the local impacts of the global shrimp industry.

Spivak (1988) argues that the voices of subaltern groups are often unheard. When interviewing institutional actors on issues of marginalised communities, there is always the danger that they speak on behalf of these groups rather than to enable them to speak for themselves. This issue must be taken into account when conduction interviews with these actors and especially if one is not able to speak to marginalised communities directly. In my in-depth interviews, I specifically asked if some actors try to speak on behalf of the affected communities and what kind of support the communities get from them.

In April 2021, I was finally able to travel to Malaysia and conduct field research in Sabah. During my five weeks of field research, I conducted 18 expert interviews with different actors in Pitas. However, due to time constraints and space limitations, these interviews will only be referenced as personal communication is this thesis. As I promised anonymity ta all my interviewees, no names will be provided in the reference. The limited number of interviews analysed for my case study is also the reason why some important aspects of the combined approach of environmental justice, intersectionality, and GPNs described in the theory chapter may fall short in the empirical part of this thesis.

4 The global shrimp sector and environmental and social issues

4.1 History of shrimp production and trade

Starting in the 1970s with the so-called Blue Revolution, aquaculture production changed dramatically in both quantity and form and connected local communities and ecosystems with global markets. Following similar paths as the Green Revolution, the Blue Revolution also came with the promise of ending world hunger and alleviating poverty, but instead lead to severe environmental problems and the displacement of the local population in urban slums (Stonich/Bailey 2000). Although the Blue, as well as the Green Revolution, initially aimed to increase the yields of local fish and basic grains by applying new agricultural technologies and inputs, its focus gradually shifted from "basic" foods for local consumption to "high-value" foods for international markets (Islam 2014). It is no coincidence that this shift in production happened when the Bretton-Woods-System started to erode. The World Bank Group and regional development banks, who were the main drivers in enforcing structural adjustment programs (SAPs) that lifted both capital controls and trade restrictions, also played a key role in promoting and financing large-scale aquaculture projects in the Global South with over USD 200 million per year (Public Citizen 2005). Islam (2014) argues, that

> "[t]he emergence of the Blue Revolution, in fact, is largely due to the neoliberal global governance project to open up the natural resource pool of the global South to satisfy the appetites of wealthy consumers in the global North." (48f.)

Since the 1970s, the output of the global aquaculture sector has increased about 9 percent per year to 82 million tonnes in 2018 and now provides more than half of the fish products for human consumption (FAO 2020). One of the most prominent commodities in the shift to "high-value" foods in aquaculture is shrimp, as they have not only one of the highest market values in the aquaculture sector (USD 45 billion in 2018, FAO 2020), but also severe environmental and social problems.

Chart 1 shows the evolution of the global shrimp price from 1980 till now. Since early 1980, the global shrimp market has had high volatility with price fluctuations of more than 15 percent per month. Since 1992, the shrimp price in Chart 1 is adjusted with the index for primary commodity prices and the index for food and beverages from the IMF. The adjusted graphs show that around 2000, the price of shrimp started to decline relative to food, beverages, and other primary commodities. When considered that intensive shrimp aquacultures, which are major producers for

the global shrimp market, are capital and technology-intensive and rely on a variety of inputs (feeds, pharmaceuticals, etc.), the relative decline of shrimp prices pose major challenges on aquaculture operators (Interview 4).

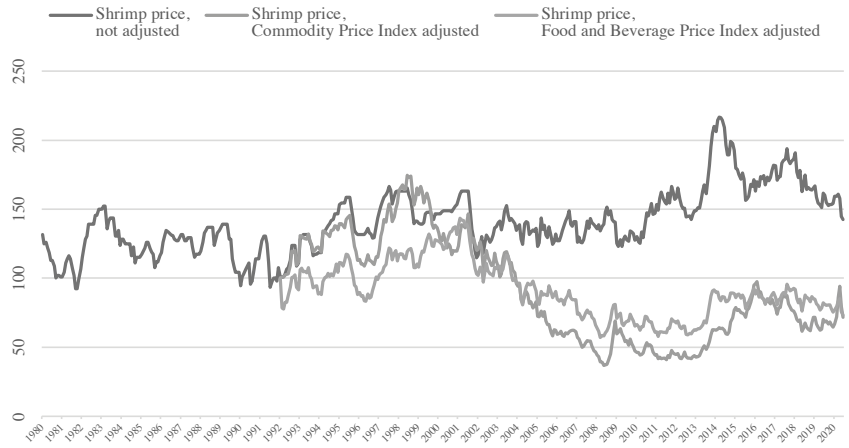


Chart 1: Global price of shrimp
Index: 1992 = 100 (IMF 2020)

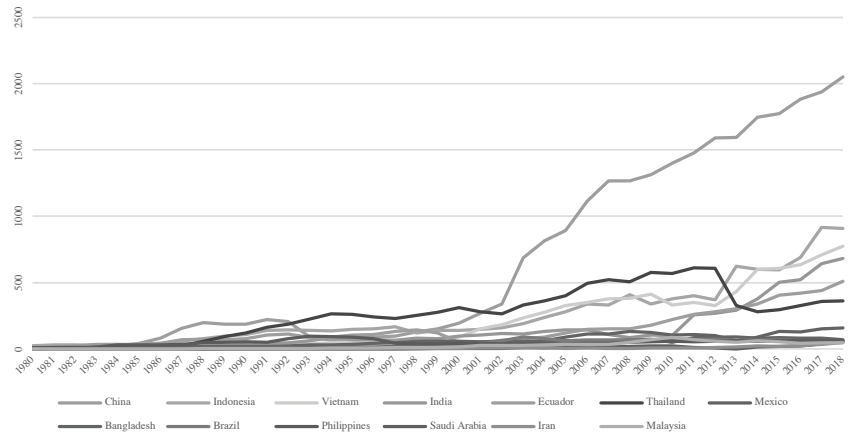


Chart 2: Global shrimp aquaculture production
Quantity (1.000 t) (FAO 2020)[1]

Chart 2 presents the shrimp aquaculture output in the 13 largest producing countries. In the last two decades, China's shrimp aquaculture sector grew strongly and now produces almost one-third of all global farmed shrimp. Together with Indonesia, Vietnam, India, Ecuador, Thailand, these six countries are responsible for almost 90

[1] The FAO's fishery and aquaculture data should be used with caution, as it relies on reporting of countries or FAO's estimations. The data can be inconsistent and illegal aquaculture projects may not be covered.

percent of global shrimp aquaculture production. Five of these six countries are located in Asia, which makes the area between India and China the major production site for farmed shrimp. Besides China, the main consumers for shrimp life in the European Union, Australia, the United States, Japan, and South Korea (FAO 2020), which underlines the argument that the Blue Revolution was not intending to feed the growing local population, but to "satisfy the appetites of wealthy consumers in the global North" (Islam 2014: 49).

The high vulnerability of intensive aquacultures to diseases and pollution together with the price fluctuations on the global shrimp market led to the description of the shrimp farming sector with a boom-and-bust pattern (Primavera 1997, FAO 2020) that is neither socially nor environmentally sustainable. The first big bust happened in 1987, when the output of Taiwan, who the largest producer of farmed shrimp was back then, dropped by 70 percent due to diseases and pollution (Boychuk 1992). Similar problems happened in 1989 in the Philippines, 1991-92 in Indonesia, and 1993 in China (Primavera 1997). One of the most recent examples was a disease outbreak in Thailand that cut the country's output nearly in half. Other environmental and social impacts of shrimp aquacultures will be discussed later in this chapter.

4.2 Shrimp aquaculture production networks

Early on, agri-food systems were a major research area in the different chain and network approaches. A strong research focus is placed on industrialisation (Atkins/Bowler 2001), standardisation (Busch/Bain 2004), and regional integration (Goss et al. 2000) of different agri-food sectors. However, more recent studies place a greater focus on the local and regional impacts of these global chains and networks, especially on environmental (Vandergeest 2007), labour (Kritzinger et al. 2004), and gender (Gammage et al. 2006) issues. Islam (2014) distinguishes between three research directions in agri-food systems:

1. The governance structure of the agri-food chains and networks and how they evolved and changed over time.
2. Environmental and social problems of agri-food systems, with a particular focus on environmental, labour, and gender issues.
3. The transformation of the form of agricultural production.

All of these research directions are centred around the question of how these chains and networks and the dynamics within them influence rural communities and enable or hinder development prospects. In this section of my thesis, I will analyse shrimp aquaculture production with the GPN approach and place a special focus on the governance structures in the network. In the next section, I will show in detail the local and regional environmental and social impacts and changes led by global shrimp production.

Agri-food chains and networks served as a prime example for buyer-driven governance in commodity chains (Gereffi 1994) and many scholars have studied the restructuration and transformation of agricultural production led by transnational corporations (Atkins/Bowler 2001), their dominant role in coordinating these chains and networks (Goss et al. 2000) and the upgrading strategies of different actors (Vandergeest 2007, Kritzinger et al. 2004). Other studies however show the complexities and dynamics of agri-food chains and networks highlight the role of governments (Gellert 2003), financial markets (Gibbon 2001), NGOs (Raynolds 2002), and private certifications (Busch/Bain 2004) in driving them. These findings emphasise that agri-food systems are not solely controlled by transnational corporations, but that there are multiple, overlapping, and sometimes conflicting governance structures within these chains and networks. Different parts or segments of these systems are controlled by different actors, making them highly complex, multifaceted, and far-reaching (Tran et al. 2013).

More recently, the rise of private regulatory power in agri-food chains and networks and the decline of public regulatory institutions have been analysed by a variety of scholars (Busch/Bain 2004, Vandergeest 2007, Tran et al. 2013). With the promise of a higher price and the threat of losing market access, many producers adopted private certification schemes that are based on production and monitoring standards as well as on codes of conduct "that govern and attest not only to the corporations' behaviour but also to that of their suppliers around the world" (Gereffi/Kaplinsky 2001: 1). Advocates of private certification schemes argue that this new form of governance finally provides accountability measures for transnational corporations that previous public regulators weren't able to enforce (Corsin et al. 2007). Critics however claim that these schemes are a neoliberal response to the multiple environmental and social crises that are inherent to capitalistic production (Brand/Wissen 2017).

A study of aquaculture standards and certification schemes from the FAO (Corsin et al. 2007) found about 30 certification schemes and eight international standards and intergovernmental agreements that govern the global aquaculture sector. The schemes and standards range from animal welfare, organic agriculture, and fair trade to quality standards and best management practices and are promoted by retailers, the aquaculture industry, governments, and NGOs – often in the form of an alliance between these actors. Unlike intensive aquaculture operators who are often part of industry associations and have the necessary capital and technology to adopt private certification schemes, small-scale extensive producers are not involved in the development of these schemes and are often struggling to adopt them (Tran et al. 2013). Despite the social and environmental sustainability of small-scale extensive aquacultures (Bryceson 2002), producers are at risk of losing market access and getting lower prices for their non-certified products, which makes arguments about the sustainability and accountability of these private schemes highly contradicting.

Extensive shrimp farming genially refers to aquacultures that have a low density of shrimp per square meter. Under the right environmental conditions, these farms rely on no inputs, as tides exchange the pond water and bring in new feed and shrimp fry. Mangrove forest areas provide optimal conditions for shrimp farming because of their climate zone, the salinity of the brackish water, and the natural occurrence of shrimp fry. However, shrimp ponds do not only rely on neural ponds in coastal areas. Weak environmental regulations and oversight led to the construction of extensive, semi-intensive, and intensive shrimp ponds in mangrove areas (Primavera 1997). Some critics even claim that the construction of extensive shrimp ponds has worse effects on mangrove forests than semi-intensive and intensive ponds (Béné 2005). This, however, only looks at the issue of deforestation and doesn't take other environmental impacts of semi-intensive and intensive aquacultures into account. While traditional forms of extensive shrimp farming don't rely on direct inputs, modified forms of extensive framing add extra shrimp fry to increase the yield (Tran et al. 2013).

Semi-intensive and intensive shrimp farming genially refers to aquacultures that have a high density of shrimp per square meter. They, therefore, rely on added shrimp fry and feed and depending on the density, water treatment, chemicals, drugs, and antibiotics. A lower stocking density usually reduces the risk of diseases and

environmental pollution, as crowded ponds create stress for the shrimp and diseases can more easily spread. In addition, heavy feeding lowers the water quality. High-stocked shrimp aquacultures, therefore, need a lot of technical inputs, skilled labour, and management experience (ibid.). The favoured approach of the many aquaculture advocates would be close systems that would treat and completely recline pond water and – theoretically – no wastewater would harm the environment (Béné 2005). However, such systems are only possible with very high capital and technical inputs. Intensive shrimp aquacultures that rely on direct input and water treatment do not require the environmental conditions that mangrove forests provide, yet these farms are still situated in these areas. This is largely due to the fact mangrove forest have a low market value (Primavera 1997) and are often described as swamps or wasteland (Primavera 1998). This, however, completely neglects the rich ecosystem in these areas and their economic and cultural importance for the local population.

4.2.1 Firms, networks, institutions, and sectors

This part will now describe in detail firms, sectors, institutions, and networks in shrimp aquaculture production networks in the next part, four conceptual dimensions will be analysed using the analytical categories of value, power, and embeddedness proposed by Henderson et al. (2002). The organisation forms of economic actors in shrimp aquaculture chains and networks reach from seasonal self-employment in fisheries and smallholder farms to large chemical and pharmaceutical companies, banks, and retailers. Firms as a conceptual dimension in shrimp aquaculture production networks should be therefore regarded as economic actors operating in formal and informal sectors and are linked by governance structures that range from simple market linkages to complex relationships embedded in social structures. A prominent case for informal activities is the fishing for shrimp fry in brackish water. Although this practice has been banned in most of the shrimp-producing countries due to the severe environmental effects, it is often not sufficiently enforced (Islam 2014). As the collection of fry in the wild must follow the natural life cycle of shrimp, this occupation is only seasonal, the ban of fry collection makes the work precarious and informal and most of the workforce in this sector consists of women and children (WorldFish 2012). The wild-caught shrimp fry then gets collected by fry traders or hatcheries, who deliver them to the farmers. Besides wild-caught fry, shrimp hatcheries use wild broodstock or get the shrimp to artificially reproduce and

grow the hatched eggs into fry. Contrary to fry collection in brackish water, broodstock has to be collected in the deep sea, which is expensive and is therefore only done by fishing companies or large hatcheries that have their fleet. Some hatcheries are specialising in reproducing shrimp in captivity as a response to diseases and the declining number of shrimp in the oceans. This practice is relatively new and requires a lot of know-how and technological inputs, which is why the shrimp aquaculture sector – and especially in Asia – depends largely on broodstock collection in the oceans (Cascorbi 2004). Similar to shrimp production in ponds, hatcheries have also different scales that range from small tanks that require access to sea-, freshwater, and wild broodstock to large-scale closed systems that reproduce their shrimp artificially.

The "high-value" shrimp that dominate the international market are omnivorous species that depend on animal proteins in their feed. While traditional extensive farms rely on tides for new feed, modified extensive and semi-intensive systems may also add fertilisers to increase plankton and algal growth in the ponds for extra feed (Rönnbäck 2001). Semi-intensive or intensive shrimp farms, however, require additional feed which comes often in form of fishmeal and fish oil. Around 10 percent of the global captured fish as well as by-products from the processing of the remaining 90 percent are used for fishmeal/oil production (FAO 2020). Although some farmers use homemade or locally produced feed (WorldFish 2012), the market for fishmeal/oil production is dominated by transnational corporations (Wijkström/New 2002).

As shrimp fry have a major share of the direct production cost (WorldFish 2012), their survival is crucial to stay profitable. Especially high stocking densities create conditions where diseases can easily spread. Semi-intensive or intensive shrimp farms try to avoid these issues with special water treatment, chemicals, and pharmaceuticals. To maintain a high oxygen level and a stable water quality, pumps, filters, and aeration systems get installed in high stocked ponds. In semi-intensive farms, up to 25 percent of the pond water gets exchanged per day. In intensive farms, this number can even be higher (Rönnbäck 2001).

Water exchange requires sea- and freshwater that gets pumped in from coastal and brackish waters, rivers, canals, or groundwater and releasing the wastewater into sewers, rivers, coasts, or nearby lands. Especially the use of groundwater supplies and the discharge of saline and contaminated water onto agricultural land has severe

effects on local water supplies and food security (EJF 2003). Although (semi-)closed water-treatment systems have been developed in the late 1990s and are actively promoted by the aquaculture industry (Béné 2005), their high cost, the required know-how, and the boom-and-bust pattern in shrimp production is keeping farm operators from making such investments (EJF 2004). In addition to mechanical water treatment, chemicals and minerals are also frequently added to recreate a natural shrimp habitat and respond to sudden salinity and acid level changes. Chemicals and pharmaceuticals are also used to treat the soil in the pond, prevent harmful algal and plant growth, treat diseases, and disinfect ponds after an outbreak (Rönnbäck 2001). Amongst the most problematic inputs in semi-intensive and intensive aquacultures is the widespread use of antibiotics.

Many – and especially smaller – farm operators obtain their inputs not directly from feed manufacturers, chemical or pharmaceutical companies, but from a larger number of local input retailers (Tran et al. 2013). They do not only provide the different input for shrimp farming but also instructions on how to use them, as knowledge of farm operators on their application tends to be rather small (WorldFish 2012). As the boom-and-bust pattern in shrimp production leads – at first – to a fast expansion of the industry, new producers with little experience and know-how enter the field and are dependent on consultation and training. The lack of knowledge from shrimp farmers can be highly problematic, as input retailers and suppliers may wrongly advise them to increase their profits. For example, the EJF (2004) reported widespread prophylactical use of antibiotics or even used it against viral infections – which is completely ineffective – due to lack of knowledge, false advertising, and bad consultation.

The classification of production systems into extensive, semi-intensive, and intensive is widely used in the literature. The production systems, however, do not necessarily determine the strategies and priorities of the firms and people that operate them, as not only large firms but also small-scale producers can operate semi-intensive and even intensive ponds. While small-scale producers in countries like Bangladesh and Vietnam mainly operate traditional and modified extensive ponds (Islam 2014, Tran et al. 2013), production in Thailand happens almost exclusively in semi-intensive and intensive ponds (Primavera 1997). These country-specific characteristics in production can be partially explained due to different national policies and regulatory frameworks towards shrimp aquacultures. For example, in 1996, the Supreme Court

of India banned all semi-intensive and intensive shrimp aquacultures along its coastlines due to social and environmental issues. Other factors that shape the production systems like access to capital and technology depend on the "architecture" of the production networks and the structures that govern them. While the production system determines which inputs are required, the organisational structure, experience, capital access, social relations, etc. of the farm operators shape how they get their inputs (directly from producers or through retailers) and what kind of relationship they have with input suppliers and retailers. These points will be discussed in detail in the next part of this chapter.

The collection of the harvested shrimp is a central aspect of the production networks that link aquaculture operators with the processing and export sector. Shrimp collection can have different linkages and forms and are less dependent on the production systems than it is on the production volume and the geographic location of the farms (Tran et al. 2013, Islam 2014). The first-level traders frequently visit small or remote farms with small trucks or by boat and buy up their harvest. At this stage, the shrimp gets already (loosely) graded based on their weight to negotiate the price. The shrimp then get sold to larger traders, wholesalers/depots, or are traded through intermediaries (WorldFish 2012). The collection and trading of shrimp is a complex and often unregulated aspect of shrimp production networks (Tran et al. 2013), where prices are either prefixed, based on different kinds of gradings, or are determined by auctions. Governmental regulations are often only enforced at the wholesalers or depots level, where the shrimp get cleaned, sorted, and accurately graded. Shrimp with a good grading will get sold to processing facilities and exporters, while the ones that don't meet international norms and standards or would fetch low prices will be sold on domestic markets. Although wholesalers/depots are not allowed to process shrimp because they don't have the required facilities, some may already perform some basic processing tasks like beheading to increase their profit (WorldFish 2012).

Processing facilities are responsible for preparing and exporting the shrimp according to public and private standards. The most common and basic form of processing is frozen block shrimp, which require little know-how and equipment. But as consumers demand shifts towards highly processed foods and labour cost is high in the major imploring countries in the Global North, processors in the production countries increasingly carry out sophisticated pressing tasks requested by

importers and retailers (Kagawa/Bailey 2006). Processing facilities are the main sphere where the different foreign food safety standards and monitoring programs are enforced and controlled. It is their responsibility to ensure that they meet quality and food safety standards and that their products are not contaminated with antibiotics and hazardous chemicals. As they buy the shrimp from wholesalers/depots with unknown origins, supply chain management that is often demanded in these regulations poses major challenges to processors and many are in fear of losing market access if some form of contamination occurs (Tran et al. 2013). So, even basic shrimp processing requires access to capital, technology, know-how, and skilled labour to comply with these regulations.

Importers/wholesalers play a major role in ensuring quality and food safety standards are met. For example, Japanese importers provide technical and financial assistance to processing facilities in Thailand and Vietnam (Kagawa/Bailey 2006). The importers send technicians to install processing equipment and provide staff training to meet the high quality and sanitary standards demanded in Japan. In addition to basic training, Japanese importers also built up the capacity for highly specialised pressing tasks that are required to meet the demand for processed food for the Japanese market. Although Japanese importers seem to be the only ones to provide this kind of direct technical assistance (ibid.), importers usually have close relationships with processors to ensure a constant level of quality and to swiftly respond to new food trends on their markets (Tran et al. 2013). However, if a major crisis occurs or if the partnerships with the processors are simply not profitable anymore, importers quickly shift to other regions and processing facilities (Kagawa/Bailey 2006) and therefore placing much of the risk of shrimp production on processors and actors further down the network (Islam 2014).

Retailers and large restaurant chains have quite similar relationships with processors. Processing facilities get strict instructions on the product and the processing process must quickly respond to shifting demands and new trends on foreign markets and bear the risk if the product doesn't meet the required specifications. In addition to product specifications, retailers invest in marketing and create their brands. Much of the advertising of agri-food products – and especially seafood – is based on aspects like freshness, quality, organic production, and fair trade that consumers cannot detect upon tasting the product, and thus trustworthy labels and certificates are placed on the product that should guarantee that these promises are met (Busch/Bain

2004, Vandergeest 2007). The role of retailers in governing the shrimp production networks will be discussed in detail in the next part of this chapter.

Firms that operate in the shrimp aquaculture sector are likely to have similar products and technologies and often face the same market constraints which in turn leads to similar strategies and priorities of films and therefore similar "architectures" of their GPNs (Henderson et al. 2002). While the most common final product across different countries and regions is frozen block shrimp, states, importers, retailers, etc. often have specific requests for the final product that varies in terms of product form, preservation method, size, and species (Gillett 2008). Clay (2004) reports that there are over 70 standards and classifications for processed shrimp in the US and other major markets like the EU and Japan have their requirements. The technological base for shrimp aquaculture production is built on extensive research on technical and feasibility aspects financed by international and regional development banks, bilateral development agencies, and international organisations. In addition, consultation and training play also an important role in a growing industry were new producers with little experience and know-how. This role of research, technological consultation, and knowledge transfer will be explained in detail in the sections about institutional actors and networks. The shrimp aquaculture sector faces two major market constraints. The first one is the strong public and private regulation in form of food safety standards and private certification schemes. While this alone may not be a major problem for some (large-scale) producers, the second problem is that since 2000, the price of shrimp has started to decline relative to food, beverages, and other primary commodities (see Chart 1). As producers often have to bear the cost of additional regulations, this poses major challenges for aquaculture operators around the globe (Interview 4).

Not only firms but also institutional actors have a significant impact on the structure of a production network. Although often neglected in different value and commodity chain approaches, states have a major role in structuring and shaping GPNs as recourse owners and through taxes, trade agreements, and regulations. Governments in the Global South actively promoted – and still promote – shrimp aquacultures in their countries by providing low-interest loans, tax incentives, and leasing land to farm operators (Gillett 2008). Although promises of alleviating poverty and increasing food security are rarely fulfilled (EJF 2003), shrimp farming nevertheless promotes foreign investment, earns foreign exchange, and helps to build up an export

industry (Tran et al. 2013). Besides land concessions and taxes, production/exporting countries also try to facilitate trade by lowering tariffs with trade agreements and help processors to comply with food safety standards of importing countries (ibid.). Although trade agreements have a major role in shaping the relation between exporting and importing countries, the main issue for governments in seafood chains and networks is food safety (Busch/Bain 2004, Vandergeest 2007, Islam 2014). Food safety systems like the Hazard Analysis and Critical Control Points (HACCP) from the US or the principles on traceability and food safety from the European Food Safety Authority (EFSA) give importing countries extensive regulatory power over agri-food chains and networks, as they can reject shipments or place-specific exporters under scrutiny and upon repeated violations, put entire countries on watch lists or even impose trade bans due to safety concerns (Tran et al. 2013). Governments in exporting countries are therefore pressured to impose and enforce these strict standards and regulatory regimes, as losing market access would endanger the whole sector in that country.

International and regional development banks like the World Bank Group or the Asian Development Bank (ADB), bilateral development agencies like US AID, and international organisations like the FAO or UN DP played a major role in supporting aquaculture projects in the Global South and "acted as catalysers" for foreign private investment in the sector (Public Citizen 2005). Development banks acted as major financiers of aquaculture projects during the 1980s and 1990s and placed a particular focus on Asia. During the early 1990s, they provided almost 70 percent of all external funding for aquaculture projects (ibid.). Apart from directly financing projects, these actors undertake extensive research on technical and feasibility aspects, provide technical assistance and help to secure financial support from additional sources. In addition to direct support of aquacultures, trade negotiations between the World Trade Organization (WTO) members led to a general reduction of tariffs on agri-food products and promoted trade in this sector (Tran et al. 2013). Yet, nontariff trade barriers on health and food safety standards are still possible under WTO terms, giving governments the ability to impose stricter regulations than specified in international norms (ibid.). With reduced tariffs on agri-food products, standards and regulatory frameworks have become the driving force in governing and shaping agri-food production networks (Béné 2005, Vandergeest 2007, Islam 2008).

Yet, importing states are not the only ones that can define standards and set up regulatory frameworks to govern these global production networks. When in the late 1980s and early 1990s the first NGO reports and scientific publications emerged about the severe environmental and social problems in global shrimp production, prominent environmental NGOs like Greenpeace, WWF and lesser-known ones like the Mangrove Action Project (MAP) started to raise consumer awareness on shrimp production and campaigned against the development of new shrimp aquaculture projects (Béné 2005). In 1995, two major meetings happened between NGO representatives from the Global North and South. In the first meeting, 25 NGOs signed the "NGO Statement on Unsustainable Aquaculture" and submitted it to the United Nations Commission on Sustainable Development (CSD) meeting (ibid.). The second meeting adopted the Choluteca Declaration, which demanded a "global moratorium on any further expansion of shrimp aquaculture" (Greenpeace 1998). These two meetings were echoed in international media and governments in both producing and importing countries were pressured to take action, as the ban of all semi-intensive and intensive shrimp aquacultures coastlines was issued by the Supreme Court of India in 1996. Although at first, NGOs the Global North and South demonstrated unity in their struggle against the global shrimp industry, internal tensions emerged in late 1990, leaving the movement fragmented and resulting in NGOs pursuing theirs owns strategies in tackling the environmental and social problems of the sector (Stonich/Bailey: 2000).

As a response to the increased attention on the environmental and social problems in shrimp farming, industry members together with affiliated consulting and research institutions founded the Global Aquaculture Alliance (GAA) in 1997. One of its first tasks was the preparation of a code of practice for mangrove conservation together with prominent researchers in that field. Shortly after, additional codes of practices were published that range from chemical use and pond siting to working conditions in the sector. Although these codes of practices acknowledged widespread problems in global aquaculture production, the GAA shifted the blame mostly on small-scale farmers that lacked know-how, technical abilities, and capital to shift to sustainable forms of production (Béné 2005). Subsequently, many exporting states, international organisations, and research institutions produced similar research that placed their focus on guidelines, best management practices, and technical aspects. Béné (2005) argues, that

> "[w]hile they differ in detail, these different codes all put a large emphasis on technical pond management issues, reflecting the consensus that the current main challenge of shrimp activity is related to technological externalities that should be addressed through the wide adoption of appropriate technical 'fixes' – such as those proposed by the GAA codes." (591)

These technical guidelines and best management practices laid the foundation on what eventually developed into private certification schemes that now govern large parts of the global shrimp production networks.

Universities and research institutes are important institutional actors in production networks that should not be neglected. Their research and publications make the arguments of other institutional actors "fact-based" and "objective" rather than "subjective" and "biased" and are highly influenceable in shaping discourse in agri-food systems (Béné 2005). Early shrimp aquaculture research focused mainly on technical issues like stocking density or water treatment. In the 1980s, economists became also interested in shrimp aquacultures and began analysing the benefit-cost ratio and evaluating economic data on micro, meso, and macro levels. Only when grassroots movements began protesting against the environmental and social impacts of shrimp farms and critical newspaper articles were published about the impact of shrimp farming on the local population, research interests shifted towards these issues. While research focus again shifted after the GAA published its codes of practices, critics claim that shift is just a "backward loop" to the kind of research undertaken in the early days, neglecting the findings on environmental and social problems that have since emerged (Béné 2005). It is important to note that the institutions and researchers producing knowledge on the aquaculture sector often have other functions in the production networks as well. For example, a major study on shrimp aquacultures and the environment that picks up many arguments from the GAA's codes of practices was published by a consortium that included the World Bank, Network of Aquaculture Centres in Asia-Pacific (NACA), WWF, and the FAO. Both the World Bank and FAO played a major role in supporting aquaculture projects in the Global South and in early 2000, the World Bank was still financially supporting new aquaculture projects (Public Citizen 2005).

A central aspect of the governance structures and consequently the "architecture" of shrimp aquaculture production networks is the control of and the access to capital. As "conventional" credits are not available the all network member, different financing schemes have emerged in the sector that includes a variety of actors.

Shrimp farm operators in Vietnam claimed that while access to bank loans was rather easy in the early 2000s, banks have become reluctant in financing shrimp farms (Tran et al. 2013). While the government and international agencies tried to compensate for this issue with rural development programmes, they are short-term, have a small volume, and are not easily accessible. Input suppliers are often willing to give shrimp farmers loans during harvesting season, but the farmers usually pay an unfavourable price for their inputs. In Bangladesh, wholesalers/depots and/or trading intermediaries provide loans to farm operators, as the interest rate for shrimp farms is high due to the risk of crop failures (WorldFish 2012). These loans are usually not provided in cash but come in form of inputs and have many requirements like exclusive trading rights and an unfavourable fixed price. To get cash loans, farmers rely on family networks, other farm operators, or local money lenders, but these are not sufficient, as small-scale producers in Vietnam and Bangladesh report having capital shortages (Tran et al. 2013, WorldFish 2012).

Apart from shrimp production, traders, wholesalers, and processing facilities require working capital to operate. In Thailand and Vietnam, processors provide the working capital, which is in turn financially supported by importers (Kagawa/Bailey 2006). In Bangladesh, processors lack these ties and financial resources and so-called account holders are responsible for providing working capital for the local shrimp production networks (WorldFish 2012). The account holders take care of the supply chain management and establish ties with international buyers, tasks usually performed by processors, and have therefore become dominant actors in the Bangladesh shrimp sector. Financial support from international and regional development banks, bilateral development agencies, and international organisations for shrimp aquaculture projects come in a variety of forms. While, for example, many large-scale aquaculture projects have been supported by the International Finance Corporation (IFC), the private-sector division of the World Bank Group, small-scale producers may be indirectly supported by rural development and small enterprise programmes (Public Citizen 2005). While these programmes nowadays may not be sufficient enough for small-scale farm operators, they certainly helped to expand the shrimp aquaculture sector in the past (Tran et al. 2013).

Not only financial support is provided by shrimp production network members and institutional actors, but technological consultation and knowledge transfer are equally important aspects. International consulting firms have close business

relationships with investors, government agencies, and different international and regional organisations. They conduct technical and economic feasibility studies for new large-scale aquaculture projects, advise farm operators on who to increase productivity and avoid diseases, and may even operate shrimp farms themselves (Skladany/Harris 1995). Local input retailers do not only provide the different input for shrimp farming but also instruct farm operators on their usage, as knowledge and experience of newer operators in an expanding sector is often limited. Yet, input suppliers and retailers may also wrongly consult farm operators to increase their profits (EJF 2004). Importers/wholesalers have close relationships with processors to ensure quality and food safety standards are met and quickly respond to new food trends. Japanese importers even provide technical and financial assistance in the form of processing equipment and training of food safety and quality standards to processing facilities in Thailand and Vietnam (Kagawa/Bailey 2006). Production/exporting countries play a major role in supporting and consulting processors so that they comply with foreign food safety standards. However, due to the traceability problems in countries with many small-scale producers, governmental support on safety standards may only take place on the processor and wholesale level (Tran et al. 2013). Certification schemes often include best management practices that must be followed and, in some cases, offer support to firms in shrimp production networks in implementing them. International and regional organisations played a key role in supporting the shrimp aquaculture sector feasibility studies in different areas and research on technical issues. In addition to their research activity, they consulted firms on how they secure additional findings for new aquaculture projects (Public Citizen 2005).

In the last two decades, private regulatory power in form of certification schemes has joined food safety standards defined by governments of the importing countries as a second major driver in global shrimp production networks. While certification schemes are developed and promoted by a variety of actors and target either the production process or the final product, Corsin et al. (2007) describe four major elements of such schemes:

- The organisation is responsible for developing the scheme and setting the standards.

- The overall objectives of the certification scheme. They can range from animal welfare, organic agriculture, and fair trade to quality standards.
- Clearly described certification standards that the production process or the product needs to comply with. While some standards are mandatory, others may only require that a certain percentage of them are fulfilled.
- The certification process describes a set of rules on how the certification can be obtained. All of them require at least some form of periodic inspection and may also include unannounced and random controls. This includes also rules on inspection and/or certification bodies and their relationship with production network members.

While there are about 30 different certification schemes for farmed shrimp, the three most popular – GLOBALG.A.P, GAA/ACC, and ASC – are led by retailers, an industry association, and an NGO, respectively. The GLOBALG.A.P was initially founded by a group of European retailers responding to growing consumer awareness on food quality and social and environmental problems. Although it later opened up to other industry members, is still largely dominated by retailers. Shrimp producers get certified through an independent certification body which is accredited by GLOBALG.A.P and have to pay the certification body for their inspecting their facilities as well as a licence fee to the GLOBALG.A.P for unsung the certification. As the certification scheme targets the production process rather than the product itself, the label cannot be used on the final packaging. This is also one reason why retailers do not offer producers a premium price for certified products. Their main benefits are argued to be support in archiving food safety standards, preferred market access, and harmonising buyer requirements. Yet, producers have to bear the whole cost of the certification process without getting higher prices and if they do not comply, are at risk of losing market access. Furthermore, small-scale producers complain about the extensive paperwork required in the certification process and standards that are almost impossible for them to meet, like the frequent requirement of veterinary supervision (ibid., Interview 4).

The Aquaculture Certification Council (ACC) with its Best Aquaculture Practices (BAP) certification scheme was founded by the Global Aquaculture Alliance (GAA) and is largely based on their codes of practices. The cost for the BAP certification process can easily add up to USD 10.000 and like with the GLOBALG.A.P

certification, producers get no premium price for certified products. When in 2005, the world's largest retailer – Walmart – declared that they would be only selling BAP-certified shrimps at their stores, many producers were forced to adopt the certification scheme, or otherwise, they would have lost market access. One year later, a large restaurant chain and seafood wholesaler partnered with the ACC and also required a BAP certification from the producer (Tsantiris et al. 2018).

The Aquaculture Stewardship Council (ASC) is promoted by the WWF and industry representatives. The ASC started operation in 2010 and completed its certification program on farmed shrimp in 2014. They claim to have one of the highest certification standards, yet the scheme has been criticised by environmental groups for only looking at a very limited part of shrimp production. For example, while the ASC has strict standards on antibiotics in shrimp ponds, hatcheries – where antibiotics are also frequently used – are not checked by the scheme. In addition, certification bodies are accused of truing a blind eye to violations of certification standards and incomplete documentation (SSNC 2019).

4.2.2 Value, power, and embeddedness

These four conceptual dimensions – firms, sectors, institutions, and networks – will now be analysed using the analytical categories of value, power, and embeddedness. The creation, enhancement, and capture of value deal with conventional concepts of economic rent as well as the Marxian concept of surplus-value. Natural recourses and the distribution of their risks and benefits play a key role in the creation and distribution of value in shrimp production networks (Primavera 1997, Islam 2014). Commons like mangrove forests play a central role in the livelihood of local communities because they provide recourses like food, building materials, and traditional medicine for their daily lives and are often strongly liked with their cultural heritage (Joyiemin et al. 2017). Although the non-market value of mangrove forests (habitat for animals, clean water, etc.) is ten times higher than its market value (aquaculture, lodging, etc.) (Primavera 1997), their importance for the local population and ecosystem is often neglected and they are described as swamps or wasteland with little economic value (Primavera 1998). As the non-market functions of mangrove forests do not provide any form of economic rent for states, they sell or lease these lands to timber companies and aquaculture operators to earn revenues and taxes. In addition, SAPs demanded the opening of domestic natural resources for

foreign investors to build up an export industry and to repay debts (Islam 2014). Apart from states, many smallholders in coastal regions sold – or were pressured to sell – their lands to investors wanting to build new aquaculture projects. The shrimp aquaculture boom in some regions led to a dramatic increase in land prices up to a hundredfold, as a report from a shrimp farming region in Thailand suggests (Vandergeest et al. 1999). Smallholders near large-scale aquaculture projects often face crop losses, the local fish population starts to decline, and coastal areas are blocked for fishing boats by large aquaculture complexes. As smallholders faced severe livelihood issues cannot build shrimp aquacultures themselves due to lack of capital, many people are forced to sell their land leave their villages (Rönnbäck 2001).

In countries with a large semi-intensive and intensive shrimp aquaculture industry, the sector is often dominated by large national and transnational corporations, because they have strong ties with government officials and international actors and can therefore more easily obtain land concessions, subsidies, and credits (ibid., Skladany/Harris 1995). As a response to these disadvantages faced by local communities, many of them organised protests and joined forces with NGOs (Primavera 1998). Some of these protests have turned violent and shrimp farm operators hired armed guards and started intimidating protesters and local landowners. The EJF (2003) reported murders and killings related to shrimp farming in almost every major shrimp-producing country. In Thailand – which has many intensive shrimp farms – local communities even took up arms to prevent the privatisation of local mangrove forests and the subsequent development of a shrimp aquaculture project (Boychuk 1992).

Most of the employment opportunities in the shrimp sector are in processing and shrimp fry collection, which are low-paid jobs mainly done by women and children. The employment situation in processing facilities may be formal or informal, is often seasonal, and regarded as unskilled and "light" work (WorldFish 2012), although the workers carry out sophisticated pressing tasks requested by importers and retailers (Kagawa/Bailey 2006). Shrimp fry collection is an informal and highly precarious task, as this practice is prohibited in most shrimp-producing countries. Due to the natural life cycle of shrimp, this occupation is only seasonal. Women working as fry collectors take care of the family the rest of the year while men often work in other agricultural sectors (WorldFish 2012). While modified extensive and semi-intensive

shrimp farms are labour-intensive and are providing the local population – mainly unskilled – jobs, intensive shrimp farms are technically sophisticated and highly automated and offer only high-skilled jobs for a small number of specialists (Skladany/Harris 1995). These high-skilled jobs are for technical specialists, academics, and consultants, while the local population may only get temperately employed or work as guards. While farm operators and people working in high-skilled jobs may switch to other sectors in times of crisis, low-paid and informal workers have difficulties in finding other employment opportunities. These precarious working conditions allow the firms in the shrimp aquaculture sector to externalise the risks – harvest failures and market volatility – and the costs – food safety regulations and certification schemes – on the (mainly female) workers in the sector (Islam 2014). In addition to this asymmetrical access to natural resources and the externalisation of risks and costs, shrimp producers also profit from low-interest loans, subsidies, and tax incentives while the local communities work in precarious and low-wage jobs, lose their livelihoods, and often get displaced (Stonich/Bailey 2000).

A value chain analysis conducted by the research organisation WorldFish (2012) on the shrimp sector in Bangladesh shows that about two-thirds of the value addition in shrimp production takes place in shrimp farms. Production in an extensive shrimp pond – which is the main form of production in Bangladesh – costs about USD 1 – 3 per kg. Shrimp production in semi-intensive ponds costs between USD 2 and 6 per kg and in intensive ponds USD 4 and 8 per kg (Rönnbäck 2001). Shrimp fry accounts for 30 percent of production costs for shrimp farmers in Bangladesh, followed by cost for land concessions and wages for workers. While semi-intensive and intensive aquacultures have lower costs on land and labour, operators also need to spend money on feed, technical equipment, and other inputs. Shrimp farmers in Bangladesh have a profit margin of around 20 percent, but this might be much lower for semi-intensive and intensive aquacultures with higher input and production costs. Actors involved in the collection and trading of shrimp in Bangladesh have a profit margin of 3 to 5 percent. As wholesalers/depots trade much larger quantities, this small margin may nevertheless lead to large revenue. In addition, some wholesalers/depots perform basic processing tasks to increase their margins. However, because they lack the required facilities, much of this processing is done informally under highly precarious conditions (WorldFish 2012). The first-level

traders, who only trade small quantities, have a much lower income. Some of these traders, therefore "push" the weight of the shrimp by injecting water or barley to increase their margins, which in turn leads to further quality and food security problems. Processing facilities have the second-highest value addition in the shrimp sector in Bangladesh. As processors in countries like Thailand and Vietnam also provide the working capital for other the local shrimp production networks and often perform sophisticated pressing tasks (Kagawa/Bailey 2006), they probably have a much higher value addition and larger profit margins than processors in Bangladesh. However, higher labour costs also pose a challenge to processors in Thailand who are competing with processors from low-income countries.

The price of shrimp is generally set by exporters and processing facilities and is based on global market prices and their grading (WorldFish 2012, Interview 4). The price then gets passed on to members further down the production network. Actors involved in the production, collection, and trading don't have the bargaining power to set the price (ibid., Tran et al. 2013, Interview 4). Shrimp farm operators sell their harvest either for prefixed prices, on auctions, or negotiate the price (loosely) based on grades to traders and wholesalers/depots. The price-finding mechanism is either chosen by the farm operator's preferences or is defined in the loan agreements that framers have with traders and collectors. These agreements often have unfavourable conditions for the farmers, either by charging for inputs above the market price or by requiring framers to sell their harvest below the market price (Tran et al. 2013). The grading of shrimp is based on the weight of the shrimps and is defined as the number of shrimps per kg. A lower grading means it takes only a few shrimps to reach 1 kg, which in turn means that a single shrimp has a high weight. Large shrimps are generally preferred on international markets and therefore reach higher prices. The shrimp take 3 to 4 months in the grow-out ponds to reach harvesting size, but when operators observe high mortality in the ponds, they often harvest earlier to counter the risk of crop failure (WorldFish 2012). Smaller shrimp, however, get a higher grading and therefore fetch a lower market price.

Another important aspect of value creation in shrimp production networks is through marketing and branding, which is mostly done through attributes like freshness, quality, organic production, and fair trade. As consumers cannot detect these attributes looking at or tasting the product, they require a trustworthy label to ensure that these promises are kept. Vandergeest (2007) argues, that the advertisement of

agri-food products through labels makes "the regulation of food production a way of producing new quality-based values that can be marketed to consumers" (1154). However, certification schemes are not merely a result of branding and marketing efforts by large retailers but also started as a response to the increased pressure from NGOs and growing consumer awareness about the environmental and social issues in the aquaculture sector (Béné 2005).

With one of the highest market values in the aquaculture sector and often being a major exporting commodity for countries in the Global South, shrimp farming is a highly profitable business. Yet, the risks and benefits are unequally distributed among the network members and value enhancement strategies in the shrimp sector are limited and often challenging to implement for smaller producers due to unequal access to capital, information, and technology in these production networks. While the owners of hatcheries, large-scale shrimp aquacultures, wholesalers/depots and processing facilities in the Global South and importers/wholesalers and retailers in the Global North are the biggest beneficiaries, shrimp fry collectors, small-scale traders, and workers in depots and processing facilities have precarious working conditions, little income and bear much of the risks. Government policies on natural recourses – either voluntarily or pressured through SAPs – play a major role in the unequal distribution of risks and benefits. As many rural communities lost a major income source through the privatisation for commons like mangrove forests, blocked coastal fishing areas, or agricultural land destroyed by the discharge of shrimp farms, many of them got displaced and turned to wage labour as an alternative source of income. Yet, many of the jobs in the shrimp aquaculture sector are precarious and/or informal and do not provide a living wage for the workers and their families (Primavera 1997, Islam 2008, WorldFish 2012).

Since the early 1990s, there has been a general trend towards intensifying production, which was partly led by national policies and partly by large national and transnational corporations seeking to expand to new markets (Skladany/Harris 1995). For example, the Thailand-based Charoen Pokphand Group is one of the largest producers of shrimp, shrimp feed, shrimp fry in the world. In addition, they are also one of the world's largest poultry producers and operate supermarkets throughout Asia. In Thailand, Charoen Pokphand dominates the sector with their feed production, hatcheries, shrimp aquaculture, and processing facilities and also owns large areas of land which they lease to contract farmers (Vandergeest et al. 1999). In

contrast, many shrimp farmers in Vietnam operate on state land and use extensive production systems that require fewer inputs. Consequently, the industry in Vietnam is not yet largely dominated by large national and transnational corporations (Tran et al. 2013), although companies like Charoen Pokphand also operate intensive shrimp aquacultures in Vietnam. A major advantage that transnational corporations in the shrimp sector are their ability to quickly move to other countries and markets when problems emerge. A strategy that Skladany and Harris (1995) call "slash-and-burn". Yet, in contrast to the agricultural technique of "slash-and-burn", where the ash fertilises the ground, the legacy of shrimp ponds make agriculture impossible for several decades or even centuries.

Relations between members of shrimp aquaculture production networks range from inter-firm relations of large integrated firms to simple market linkages between largely independent actors. Even actors performing the same tasks (e.g. shrimp farming) have different access to capital, technology, and know-how, which in turn shapes how these actors structure and participate in the production networks (Interview 4). Although agri-food production networks are generally described as buyer-driven (Gereffi 1994), the different production systems, organisation forms, and the diverse economic and social relations between the actors demand a closer look at the power structures in these production networks that goes beyond buyer-driven governance. In addition, the rise of certification schemes shifted regulatory power away from lead firms onto certification alliances and the actors behind them. Islam (2008) proposes to treat shrimp aquaculture chains and networks not solely as buyer-driven, but rather as twin-driven, where "the wealthy buyers control supply network, while a third-party certifier [...] and some environmental groups define the regulatory aspects of production, codification, certification" (210). Corporate power, therefore, controls what is produced in the production network – species, product size, quantity, and processing methods – while institutional and collective actors define how the product is produced and under which conditions – social and environmental standards.

Global buyers like retailers, restaurant chains, and seafood wholesalers are in control of shrimp aquaculture supply networks (Vandergeest 2007, Islam 2008, Tran et al. 2013). They pass on product requirements and quality standards to processing facilities and exporters, as actors in the Global South often don't have to capacity to analyse global market trends and consumer demands to establish product upgrading

strategies (WorldFish 2012). There is a relatively small number of global buyers which source from a large number of processing facilities and exporters, which in turn source from an even larger number of shrimp farm operators. Global buyers are also the ones who have access to market information and therefore have a competitive advantage. Meanwhile, processors and framers face strong global competition and depend on global buyers for knowledge transfer and technological consultation. Yet, some processing facilities follow the strategy to diversify their products and enter new markets to avoid a captive relationship with a single buyer (Kagawa/Bailey 2006).

States in the Global South played a major role in the rise of the global shrimp aquaculture sector and still shape the local industry through taxes, loans, and land concessions. However, the role of the state in shrimp aquaculture production networks was and is contested for several reasons. Firstly, supporting the domestic aquaculture industry was not always by choice, as many governments were pressured by SAPs to open up their domestic natural resource for foreign investors and built up an export industry (Islam 2014). Secondly, exporting states are in direct competition with each other, which often results in a "race to the bottom" on social and environmental standards to stay cost-effective. Thirdly, the role of exporting states shifts from being a regulator to enforcing foreign public and private regulations. As violations of foreign food safety standards can threaten the whole industry of a country, governments adopt and enforce these strict regulations to maintain access to foreign markets. In addition, some private standards do not only regulate the shrimp sector but governmental bodies as well, which would shift the role of exporting states even further from being the regulator to becoming the regulated (Islam 2008).

Members of shrimp aquaculture production networks are spatially embedded in different geographic locations in the Global South and North and in various social structures, values, and norms that influence strategies, priorities, and expectations of these different actors. Even actors performing the same task in the network (e.g. shrimp farming) are differently territorially embedded, based on their ownership structure and their ties with local communities. Vandergeest et al. (1999) found in their study on shrimp aquacultures in Thailand that a high level of local participation – especially by local elites – makes resistance against new aquaculture projects less likely, whereas projects financed by foreign capital with little local participation experienced strong resistance. In addition, norms and values regarding private

property and common goods also affect the actions that can and will be taken against these projects. It is not uncommon for aquaculture operators to have strong ties with local and national elites, hire employees to form local institutions as "weekend consultants" or use violence to intimidate protesters and local landowners (Skladany/Harris 1995, EJF 2003).

Small-scale shrimp aquacultures generally have more linkages with the local production and have stronger ties to local communities than large-scale aquaculture projects. Small-scale farm operators often use locally produced or homemade feed, while large-scale intensive farms that need large quantities of feed rely on inputs from national and transnational corporations, as feed production is a labour-intensive task and local availability may be limited (WorldFish 2012). In addition, certification schemes may require producers to only use certified feeds, which limits the use of local and homemade products. Small-scale producers are also dependent on local networks and social ties to make new investments, as their access to bank loans is limited, whereas large-scale operators often have ties with foreign investors and local and national elites that provide financial resources (Tran et al. 2013). Large-scale aquacultures mainly use intensive production systems that require inputs and equipment that are not produced locally and offer only employment opportunities for high-skilled workers and consultants, but not for the local population. During times of crisis, large-scale aquacultures led by transnational corporations can quickly move to other countries and markets, while the local communities are the ones who have to deal with the environmental problems caused by the operators.

The shrimp aquaculture sector strongly benefited from seafood processing facilities that were already present because of the strong fishing industry in many coastal countries (Kagawa/Bailey 2006) and shrimp fry and feed production also rely on inputs from the local fishing industry. New shrimp aquaculture projects took advantage of pre-existing capacities in the fishing industry and supported the strong expansion of the sector. Some operators of small-scale farms also formerly worked in the local fishing industry but switched to shrimp farming due to the declining number of fish in the sea and the high profits that the sector promised (Vandergeest et al. 1999). Certification schemes promise to provide accountability measures for transnational corporations and safeguard local communities from social and environmental problems. Yet, small-scale producers are struggling to fulfil the regulations and finance inspections required for these schemes and seldomly give

workers and local communities a strong voice in the development of their schemes (Vandergeest, 2007). Thus, the marginalisation of small-scale producers, consolidation tendencies caused by certification schemes, and the high mobility of transnational corporations may even further territorially disembed the shrimp sector from local communities, firms, and workers.

4.3 Environmental and social impacts of shrimp aquacultures

Extensive, semi-intensive, and intensive shrimp aquacultures are often built-in or near mangrove forests, because they provide access to both sea- and fresh water and tides can be used for water exchange, feed, and shrimp fry. However, the more technologically advanced these systems are, the less they are depending on these environmental conditions. Yet, many operators of semi-intensive and intensive shrimp farms still choose mangrove areas for pond construction. This is because of two reasons. Firstly, mangrove forests are mostly state-owned and secondly, they have a relatively low market value (Primavera 1997). Estimations suggest that 38 percent of global mangrove forests have already been lost due to aquaculture projects (EJF 2004). Mangrove forests are one of the richest ecosystems on earth and play a crucial role in the marine ecosystems and the livelihood of local communities. They are a habitat for animals and a "nursery" for numerous marine organisms. The loss of mangrove ecosystems will therefore lead to a decline of biodiversity and reduces fish stocks (Rönnbäck 2001), which in turn leads to a downfall of the local fishing industry (EJF 2004). Coupled with the loss of resources that people often gather from mangrove forests (seafood, honey, building materials, traditional medicine, etc.), shrimp aquaculture projects threaten the very thing that they promised to promote, food security and local livelihood (Stonich/Bailey 2000).

Mangroves are not only a rich ecosystem, but also filter water from rivers that go into the sea, protect against floods and storms, and reduces erosion from shores and rivers (Rönnbäck 2001). Without the reduction of erosion and the filtration of rivers, nutrient-rich water can overwhelm nearby marine and coastal ecosystems and trigger diseases. In other words, they provide the foundation for many economic activities in coastal regions. Primavera (1997) calculates, that all non-market "services" of mangroves are ten times higher than the market value for activities like lodging or shrimp farming. Mangroves and the nearby marine ecosystems play a crucial role in the life cycle of shrimp and the local shrimp population suffers from fishing

declining forests and diseases. As many shrimp farms rely on wild-caught shrimp fry or broodstock, mangrove deforestation is threatening the very existence of the industry itself. Shrimp farms are therefore usually only five to ten years in operation (EJF 2004). After that period, diseases and pollution lead to such a production decline that the farms are simply not profitable anymore, leaving behind degraded lands that take decades to recover. Rönnbäck (2001) argues, that the only reason that the global shrimp production has not decreased is because of the rapid development not new shrimp farming projects.

Mangrove forests are not the only site used for shrimp pond construction. Coastal areas like freshwater wetlands, mudflats or salt marshes (EJF 2004), and even inland locations are used for new aquaculture projects. While coastal areas have a rich ecosystem, they are often described as swamps or wastelands with little economic value (Primavera 1998). However, freshwater wetlands and inland agricultural lands were formerly often used for rice cultivation before being turned into shrimp farms. In many countries across South-East Asia, rice cultivation is not only an important economic sector but also plays a major role in people's heritage and identity. For example, the boom of inland shrimp farming in Thailand and the rapid conversion of rice paddies into new aquaculture projects led to nationwide protests and negative media coverage on the country's shrimp industry (Vandergeest et al. 1999). While shrimp farms in Thailand didn't get much attention as long as they were in remote areas near the coast, when operations moved into the central plains, the "rice bowl" of Thailand, they got a harsh response, as rice cultivation in this landscape is widely perceived to be a part of "Thai identity and citizenship" (ibid.: 2054).

Lands utilised for new shrimp aquaculture projects were previously often common goods or owned by smallholders. Commons like mangrove forests are one of the few sources of stable income for people in remote coastal areas and are often linked to their environmental heritage and identities (Joyiemin et al. 2017). The privatisation of mangrove forests for aquaculture projects, therefore, threatens not only the local ecosystem but also marginalises local communities and can even lead to their displacement (Stonich/Bailey 2000). There are also numerous murders and killings reported that are related to shrimp farming (EJF 2003), and in Thailand, local communities even took up arms to prevent the privatisation of local mangrove forests (Boychuk 1992). These problems are, however, not only limited to common goods, but many smallholders in remote coastal areas face similar issues. Vandergeest et al.

(1999) argue that some supporters of the shrimp aquaculture sector even promote shrimp farming on agricultural lands because they expect less resistance from environmental NGOs if ponds are constructed in rice paddies rather than in mangrove forests. When shrimp aquaculture projects start to boom in a certain region and people start to notice decreasing harvests and declining fish stocks, smallholders must face the tough decision of either selling their land or become shrimp farmers of their own. With a drastic increase in land prices and the intimidation of local landowners by shrimp farm operators, many smallholders were pressured to sell their land and leave their villages (Rönnbäck 2001). Those who managed to get loans and became shrimp farmers themselves benefited in the short term. Yet, in the long-term when shrimp farming becomes unprofitable due to diseases and pollution, many small-scale farmers are in high debt and are left with land that makes agricultural activities impossible (Vandergeest et al. 1999).

Environmental and social problems of shrimp farming arise not only from the consumption of land but also through environmental pollution (e.g. discharge of contaminated water, salination of agricultural lands and alien species), the various inputs (e.g. fishmeal, antibiotics, and hazard chemicals), and precarious working conditions (e.g. informal, low-paid and seasonal jobs). Environmental pollution comes in different forms is not only limited to the shrimp ponds but also affects rivers, maritime and coastal ecosystems, agricultural lands, producers, and consumers. One form of pollution is the salination of surrounding lands. As most shrimp farms frequently exchange the pond water by pumping in the sea- and freshwater and releasing the saline pond water into sewers and rivers, the salinity of the surface- and groundwater rise. In addition, pond water also seeps away directly into the groundwater, and storms or damaged ponds can lead to a direct release of saline water onto agricultural lands. The salination of agricultural land, surface- and groundwater threatens local water supplies and has severe effects on agricultural activities like livestock breeding and rice farming, which in turn threatens local food security (EJF 2003). In semi-intensive or intensive shrimp farms, the pond water gets exchanged more frequently to maintain stable water quality and avoid diseases and therefore have a larger impact on surrounding lands than extensive farming practices (Rönnbäck 2001). Although the technologies for closed systems in sealed tanks exists for decades, these systems are expensive and therefore not widely used (Public Citizen 2005).

In addition to saline water, other forms of pollution that are released into the environment by frequent water exchange include chemicals, antibiotics, nutrients, and organic waste (EFJ 2004). Chemicals and minerals used inside the shrimp ponds lead to the high acid level in rivers that often lead to a die-off of the remaining mangrove forests. Nutrients and organic waste can overwhelm nearby marine and coastal ecosystems and trigger diseases. In some regions, alien species are used for shrimp farming because they fetch higher market prices. When these species escape due to storms, flooding, or leaks, they can supersede native species and dramatically change local ecosystems (Bryceson 2002). The widespread use of antibiotics and pharmaceuticals does not only create multidrug-resistant bacteria inside the ponds and the local ecosystem but has harmful effects on producers and consumers as well (EJF 2004). That is why the use of antibiotics and pharmaceuticals is strongly regulated by importing countries. Yet, other aspects are rarely touched by public regulation and are therefore up to private regulators to decide (Tran et al. 2013). These negative impacts of shrimp farming are mainly due to the frequent water exchange, yet the production system that is less dependent on water exchange has the biggest challenges in adopting private environmental regulatory regimes.

The global shrimp market is dominated by two species, whiteleg shrimp (*P. vannamei*) and black tiger shrimp (*P. monodon*). Both species need animal proteins in form of fishmeal and fish oil in their feed. Farmed shrimp require roughly two times more protein to grow than what is ultimately harvested (Rönnbäck 2001), contradicting the promises of the Blue Revolution to end world hunger and increase local food security. Wijkström and New (2002) see the fast-growing demand for feed in the aquaculture industry as a "fishmeal trap". As by-products from processing are not enough to fulfil the demand anymore, the prices of feed tend to rise, and producers look for new sources of fish. Around 10 percent of the global captured fish is solely used for fishmeal/oil production (FAO 2020). These fish – referred to by the industry as "trash fish" – have a low market value because they have a small size or there is a low consumer demand (Gillett 2008). They were an important source of food for poor people in many countries (Chowdhury 2013), yet the boom of the aquaculture industry made it more profitable to sell the fish to transnational corporations for fishmeal production instead of selling the fish for low prices on local markets and therefore additionally endangering local food security. In addition, there are reports of precarious working conditions and even slave labour in the

fishmeal industry. For example, one of the largest producers of shrimp feed, the Charoen Pokphand Group, bought fishmeal from suppliers that used slave labour on their fishing boats (The Guardian 2014). People on these boats were sold "for as little as £250" (ibid.), had to work 20-hour shifts, and were subject to torture and killings. As one of the world's largest fishmeal suppliers and shrimp farm operators, many shrimps produced with slave labour ended up in shelves of supermarkets in the Global North. As a response to these findings, Charoen Pokphand Group promised to audited suppliers and certify their feed supply chain. This, however, imposes further challenges to small-scale farm operators who use locally produced or homemade feed, as further regulations in this area may force them to buy more expensive certified products from national and transnational corporations.

Another problematic input is the shrimp fry itself. Although some hatcheries specialised in reproducing shrimp in captivity, this process requires a lot of technological inputs and know-how. As shrimp fry makes up a major share of the production cost, farm operators tend to go for chapter sources (Cascorbi 2004), which are wild-caught shrimp fry and broodstock. The fine-mesh nets used for the collection of shrimp fry in coastal waters result in ha a large number of bycatch that leads to an overall decline of the fish population in that area, which in turn leads to conflicts between the local fusing industry and shrimp farmers. Estimations predict that it takes one hundred fish or shrimp in the wild to raise one shrimp raised in a pond (Boyd/Clay 1998). Although collection in coastal areas is banned in most of the shrimp-producing countries, the lack of enforcement makes wild-caught shrimp fry still an important source for farm operators and provides income for people in rural areas (WorldFish 2012). Wild-caught broodstock comes also with the problem of overfishing, which leads to a reduction of the local shrimp population (Gillett 2008). This leads to a vicious circle where fewer shrimp led to a smaller number of bloodstock and shrimp fry and fishing activities need to be increased to keep up with the demand. It also contradicts the notion that aquacultures can be a solution to declining numbers of fish and shrimp in the oceans, as it puts further stresses on the maritime ecosystem.

Global shrimp production networks offer only a small number of well-paid jobs for high-skilled workers and consultants, while the majority of people in the sector have informal, low-paid and seasonal jobs (Skladany/Harris 1995). Not only the fishmeal industry has precarious working conditions, but also shrimp fry collectors, small-

scale traders, and workers in depots and processing facilities benefit little from this multi-billion-dollar sector while bearing risks of harvest failures and market volatility and the costs of food safety regulations and certification schemes (Islam 2014). In general, much of the informal work in shrimp production networks – e.g. shrimp fry collecting, processing in depots – is carried out by women and children (WorldFish 2012). The general trend in the shrimp industry goes towards high-tech closed systems (Béné 2005) and the profits generated from shrimp farming are either used for intensifying the production system – and therefore providing even fewer jobs – or saving up for a new location after the burst of the local shrimp industry (Stonich/Bailey 2000). Such a situation offers only little prospect for social upgrading and especially the high mobility of transnational corporations in the sector poses challenges for workers on farms to organise, resulting in low wages throughout the shrimp aquaculture sector (Skladany/Harris 1995). Processing facilities on the other side rely still largely on workers. Although their work is often regarded as unskilled and "light" work (WorldFish 2012), the required knowledge about food safety regulations and skills for sophisticated processing tasks this job highly demanding. Processing facilities in countries like Thailand and Vietnam often perform sophisticated pressing makes and also provide the working capital for other the local shrimp production networks (Kagawa/Bailey 2006), therefore having a much higher value addition and larger profit margin than processors in other countries. Workers in these facilities have therefore better prospects of social upgrading, as they are performing high-skilled tasks and the large profit margin of their employer gives them room for negotiation. There are, however, also a lot of people working on an informal and/or seasonal basis in depots and processing facilities who lack social protection and have little chance of negotiating better working conditions.

With the globalisation of all stages of production, not only firms but also workers are in direct competition with each other. The global shrimp market has high volatility with price fluctuations of more than 15 percent per month and since the early 2000 and the price of shrimp started to decline relative to food, beverages, and other primary commodities (see Chart 1). Coupled with the trend in agri-food systems towards private regulatory frameworks and the "supermarketisation" of the sector (Busch/Bain 2004), small-scale producers are facing huge challenges. Smallholder production for lead firms often takes place under highly asymmetrical power

relations and the regulations set by retailers, industry associations and NGOs make it increasingly challenging to participate in shrimp aquaculture production networks. Many smallholders in the shrimp aquaculture sector do not fully rely on shrimp farming, but also work in the off-season as a fisher or in other agricultural fields. Yet, as shrimp farming tends to decrease local fish stocks and degrade agricultural lands, these additional sources of income disappear over time. As the diversification of production and the participation in multiple production networks as a major strategy for livelihood upgrading becomes impossible under these circumstances, many smallholders lose their income and get displaced (Stonich/Bailey 2000). All too often, it is the smallholders who lost their livelihood due to the environmental issues from shrimp farming who later take up the low-paid and precarious jobs in the global shrimp aquaculture production networks (Vandergeest et al. 1999).

Certification schemes do not only enable private actors to govern a production network but also serve as a strategy for environmental upgrading. While many certification schemes certainly bring environmental improvements through more efficient processes, environmentally friendly inputs and outputs, and sustainable management practices. Yet, the underlying power structures in production networks distribute the risks and benefits from these upgrading efforts highly unequally (Ponte 2019). The rise of private regulatory frameworks in the shrimp aquaculture sector is traced back to increased attention on the environmental and social problems and the lack of public policies on these issues (Béné 2005, Tran et al. 2013, Islam 2014). The three most prominent certification schemes in the shrimp aquaculture sector – GLOBALG.A.P, GAA/ACC nor ASC – do not guarantee a premium price for certified products and studies suggest that producers do not get a higher price for their upgrading efforts (Corsin et al. 2007). Producers are the ones who have to bear the costs for regular inspections and the certification process but retailers, restaurant chains, and seafood wholesalers are the ones who can capture the surplus that consumers are willing to pay for a "green" commodity, therefore creating a "sustainability supplier squeeze" that mainly benefit large cooperation from the Global North (Islam 2014). Since the 1970s, the total output of the sector has increased about 9 percent per year and there is no evidence that private regulatory frameworks slow down this trend or challenge the growth imperative of shrimp aquaculture production. They rather lead to "green capital accumulation" that leads

to consolidation and vertical integration of shrimp production while small-scale producers with extensive systems are excluded because are often not able to bear the extra costs or fulfil the certification requirements.

5 Environmental justice and the shrimp sector in Sabah, Malaysia

5.1 Environmental justice in Malaysia

Following the path of the "Four Asian Tiger" economies, Malaysia experienced between 1971 and 2019 an average annual GDP growth rate of 6.3 percent (World Bank 2020). This unprecedented economic growth was driven by rapid industrialisation and exploitation of natural resources and lead to many serious environmental problems throughout the country. The environmental movement in Malaysia started in the early 1970s with many environmental NGOs that started raising public awareness on environmental issues and lobbied the government for stronger environmental regulations (Ramakrishna 2003). However, as environmental problems became more common and diverse, new movements began to emerge that also regarded native land rights or unequal distribution of pollution as environmental problems (Majid Cooke/Hezri 2017).

With the implicit assumption of the Malaysian state "that social and economic well-being are prerequisites to the enjoyment of civil and political rights" (Weiss/Hassan 2003: 11), governments took, and still take a dominant role in decisions regarding economic development, leaving only limited political space for other actors on these topics. This can be seen for instance in the relative independence from donor agencies and the International Monetary Fund (IMF) during the 1997 Asian financial crisis, is leaves, however, also limited political space for movements campaigning against environmental harmful, but economically lucrative projects (Majid Cooke/Hezri 2017). Although political space for the environmental movement in Malaysia was often restricted, it has nevertheless constantly grown in the last decades, adapted its strategies to current political contexts, became more diverse, sensed new opportunities, and even became actors of political change (Lit/Tayeb 2019).

With thirteen states and three federal territories[2], Malaysia is a strongly federalised country, where each state or federal territory has its legal history (colonial and postcolonial) and political system (Harding/Sharom 2007). In addition, East Malaysian states have a higher level of autonomy than West Malaysian states, as

[2] 11 states (Johor, Kedah, Kelantan, Malacca, Negeri Sembilan, Pahang, Penang, Perak, Perlis, Selangor, Terengganu) and 2 federal territories (Kuala Lumpur, Putrajaya) in West Malaysia or Peninsular Malaysia and 2 states (Sabah, Sarawak) and 1 federal territory (Labuan) in East Malaysia or Malaysian Borneo.

they can pass laws is issues like immigration, land, and indigenous rights. Even though states in Malaysia generally have a high level of autonomy, they rely on the federal government for fiscal recourses and have no power over taxation (ibid.). As federal funding is often limited, states issue concessions for logging, mining, or land to private companies to generate extra income. As royalties and rents from natural resources make up a large part of state budgets (Toh/Grace 2005), and states heavily depend on this kind of income, environmental problems arising from the exploitation of natural resources are politically sensitive issues.

This section of my thesis gives an overview of environmental (justice) movements, environmental legislation, land classification, and native land rights in Malaysia. The first part of this section will give an introduction to environmental (justice) movements in Malaysia through many significant environmental issues and historical campaigns. The second section will focus on environmental legislation and land rights in Sabah. As much of the over environmental legislation and land rights in East Malaysia are state matters, I will only briefly cover federal laws and jurisdiction and put my main focus on the legislation in Sabah.

5.1.1 Environmental (justice) movements

Many scholars trace the beginning of the environmental movements in Malaysia back to the 1970s (Ramakrishna 2003, Majid Cooke/Hezri 2017, Lit/Tayeb 2019) when environmental NGOs like Consumers Association of Penang (CAP), Sahabat Alam Malaysia (SAM, Friends of the Earth Malaysia), WWF-Malaysia or Environmental Protection Society Malaysia (EPSM) were founded as a response to the environmental problems created by the rapid expansion of the countries agriculture and industry sector. Although groups that focused on nature appreciation and wildlife preservation like the Malaysian Nature Society (MNS) were founded during the colonial period, it took them until the 1970s to confront the government on environmental problems and campaign for stronger environmental legislation (Lit/Tayeb 2019). These NGOs were largely urban-based and well connected with governed officials and international environmental organisations. Although Ramakrishna (2003) argues that members of these NGOs often had an urban middle-class background, many of them nevertheless soon took social justice issues into account and solidarity with indigenous groups on land rights struggles (Majid Cooke/Hezri 2017).

The first instance of a broad NGO coalition was the "Save Endau-Rompin National Park" campaign in the 1970s when Pahang state turned against a proposal from the federal government to establish a national park and issued logging rights for a section intended to be part of the core area of the park. The Endau-Rompin region in the states Pahang and Johor had one of the last intact tropical rainforests in West Malaysia and the decision to deforest this area lead to a major dispute between the federal and Pahang government. MNS sensed this opportunity and formed a coalition with five other environmental organisations to start the first nationwide public campaign on environmental protection and conservation. The coalition placed advertisements, brought media attention to this issue, organised scientific expeditions and school trips to the area, lobbied the government, and started a partition to save the park (Lit/Tayeb 2019). Even though public attention and federal support led to a temporary stop of the logging activities, the Pahang government stood firm with its decision and continued its operations a few years later. However, the broad campaign of the coalition can still be viewed as a success, as the part of Endau-Rompin in Johor was turned into a national park in 1993 (Ramakrishna 2003) and is now the second-largest national park in West Malaysia.

During the 1980s, a time of rapid economic growth, the number of "pollution-driven protests" in Malaysia rapidly increased and NGOs started to campaign on issues like health concerns of residents near large industrial and agricultural sites (Tong 2005). One of the most prominent examples in this regard is the Asia Rare Earth (ARE) refinery and factory in Bukit Merah. ARE extracted and processed the rare-earth element yttrium form and mineral that contains radioactive elements thorium and uranium. When people started to discover that ARE dumped the radioactive waste near residential areas, they organised demonstrations and started a legal battle with the help of CAP and SAM against ARE. Although the company stopped its operation out of financial reasons, the anti-ARE movement managed to mobilise thousands to protest against harmful industrial activities, laid the foundation of resident-led protests, and led environmental NGOs to engage in issues beyond nature conservation (Lit/Tayeb 2019).

Meanwhile, in East Malaysia, people's organisations (POs) started to emerge to support indigenous communities in their struggle to protect the land and natural recourses on which their livelihoods depend on. While Lit and Tayeb (2019) argue that livelihood struggles were framed as an erosion of indigenous rights and not as

environmental issues, Majid Cooke and Hezri (2017) emphasise the broad concept of environment present in the movement and the numerous alliances with civil society organisations to tackle social and economic issues. The Bakun dam in Sarawak is a prominent example of indigenous livelihood struggles and the dynamics in the Malaysian environmental (justice) movements. The dam is sited in an area of tropical rainforests where roughly 10 000 indigenous people lived. When large-scale logging activities in that area started, a group of young Kayan founded a branch office of SAM in Sarawak to support the indigenous communities in their land rights struggles (ibid.). SAM Sarawak played a major role in making the struggles of indigenous communities against the Bakun dam visible, put up blockades to stop the logging company, and helped to bring land rights claims before the court (Raman 2006). In the mid-1990s, the protest again the dam was not only backed by different East and West Malaysian NGOs but also internationally by 120 NGOs from over 20 countries (Ramakrishna 2003). Although the plans for the dam changed numerous times, relocation of the indigenous communities and logging activities proceeded and the dam was eventually built. Even though there were debates and conflicts between different NGOs on the right strategy against this large-scale project, Majid Cooke and Hezri (2017) argue that "[t]he commonality found in the Bakun dam campaign lies in the expansion of the term 'environmental' to include environmental justice issues" (409). Especially NGOs in East Malaysia place a great emphasis on livelihood issues of indigoes communities, seeing it as one of their major tasks "to spread the notion that the loss of access to livelihoods is not an isolated experience confined to one ethnic group but rather is shared across ethnic communities" (ibid.: 402).

The government's stance towards the civil society and NGOs sector during the 1980s can be described as hostile (Lit/Tayeb 2019). In 1981, the federal government threatened to introduce a law that would require NGOs to register as a political society if they criticised government policies and in 1987, the Internal Security Act (ISA) was used to detain – among others – the organisers behind the anti-ARE protests. The government changed its stance towards environmental NGOs after the Rio Earth Summing in 1992 when sustainable development and environmental protection became central elements on the national and global agenda and Prime Minister Mahathir famously declared that "NGOs were no longer enemies of the government" (Gurmit 2007). Under the banner of sustainable development,

environmental NGOs received an important role as consultants and were included in decision-making processes. However, the policies towards economic development remained largely unchanged, and "policymakers believed that environmental problems are solvable through investment in technological tools without changing the orientation of economic development" (Lit/Tayeb 2019: 248). On the one hand, the strong cooperation allowed environmental NGOs to mobilise, form new coalitions and bring new issues on the government's agenda. On the other hand, the growth imperative of the economic development agenda and many environmental problems that are rooted in this imperative did not disappear (Poh 2015). Furthermore, organisations and grassroots movements that opposed environmentally problematic projects that were deemed necessary for economic development were not only viewed negatively by the government, but also by environmental NGOs cooperating with the government (Lit/Tayeb 2019).

The Reformasi movement in 1998 and the 2008 general election led to a significant increase in the influence of civil society organisations and opposition parties in the country and as a result, also opened up political space for environmental (justice) movements in Malaysia. Although there are still laws requiring NGOs to register as societies, trusts, or companies and disclose financial resources and funding (Majid Cooke/Hezri 2017), the ISA has been abolished in 2012. One of the most recent examples of the newly gained confidence of environmental (justice) movements in Malaysia was the Stop Lyans camping against a rare-earth refining facility in Pahang, operated by the Australian mining company Lynas. The campaign is led by Save Malaysia Stop Lynas (SMSL) and Himpunan Hijau (HH, Green Assembly), two groups that were founded over concerns of radioactive waste being released into their neighbourhoods. Like the camping against ARE, the Stop Lyans movement is an example of "pollution-driven protests" led by residents, but in this case, the movement is less dependent on established environmental NGOs, but rather forged broad coalitions civil society groups, opposition parties, and environmental activists (Lit/Tayeb 2019). SMSL followed the strategy of "work[ing] within the system", as they lobbied in the government, networked with different actors, and even travelled to Australia to protest in front of Lynas headquarters (Majid Cooke/Hezri 2017). HH, on the other side, had a confrontational strategy from the beginning, organised mass protests, and blocked rare-earth shipments from the port. While there were claims that politicians were trying to frame the Stop Lyans movement as a "Chinese matter"

that was lacking broad multi-ethnic support (Lit/Tayeb 2019), the campaign was nevertheless supported by numerous groups and opposition politicians. Lit and Tayeb (2019) argue that the broad support for the Stop Lyans campaign is a form of "trans-ethnic solidarity" that emerged in the Reformasi movement and is opening up the social structures that were previously based on ethnicity. Even though the refining facility is still in operation, the government set up a measuring station and formed an expert committee to monitor the facility.

The examples above illustrate the diverse structures and strategies of environmental movements in Malaysia. While the Endau-Rompin campaign was driven by established environmental NGOs and focused mainly on nature conservation and preservation, the protests against ARE and the Bakun dam show how the notion of environmental gradually opened up to include key environmental justice issues like resident's health and indigenous rights. Although rarely linked to the concept of environmental justice[3], the number of pollution-driven protests and grassroots movements led by indigenous communities show that Malaysia has had a strong environmental justice movement since the 1980s. Even though political space was often limited, groups used diverse strategies and formed broad collations to tackle environmental issues. Although many environmentalists in Malaysia are cautious not to be linked with any political movements or parties, the Stop Lyans protests were nevertheless supported by numerous politicians and highlighted that environmental movements themselves are significant actors of political change (Majid Cooke/Hezri 2017).

5.1.2 Environmental legislation and Native Customary Rights (NCR)

Like in many former British colonies, the legislative and judicative system in Malaysia is based in the Westminster parliamentary system, with a lower house (Dewan Rakyat), the upper house (Dewan Negara), and an elected king as head of state. The structure and methods of the parliamentary system in the states are similar to the federal parliament. A legacy of the British colonial rule is also the common law system, which took over British court rulings that happened before 1956 and any rulings happening afterwards still have an "authoritative influence" (Harding/Sharom 2007). Although there are some examples of environmental laws even during the

[3] With the notable exertion of Majid Cooke and Hezri (2017).

colonial rule (e.g. Waters Act from 1920), environmental problems during that time were relatively few compared to the present-day situation. As Malaysia started with its rapid economic growth, environmental problems also started to rise. The first major law in this regard was the Environmental Quality Act form 1974, which led to the establishment of the Department of Environment and provided the foundation of numerous rules and regulations on federal environmental matters. In Sabah, the Ministry of Manpower and Environmental Development established an environmental division in 1975. However, there was no state environmental law that assigned powers or responsibilities to the division and it had therefore only an advisory role. Over 20 years later, in 1996, the Conservation of Environment Enactment in Sabah was passed and when it came into force two years later, the Environmental Conservation Department was founded. A few years later, after the Environment Protection Enactment was passed, it was renamed Environment Protection Department.

The division of powers or responsibilities between federal and state governments is complex and not always clear-cut. While federal authorities can pass regulations over energy, water supply, and industry matters, state authorities are responsible for land, forestry, and mining (Harding/Sharom 2007). However, these areas are not independent of one another. For example, although mining is a state matter, when it affects the water supply in the region, it also becomes a federal matter. In addition, the federal Environmental Quality Act also deals with issues that appear to be state matters, which can lead to an overlapping of responsibilities and potential conflicts between federal and state agencies (ibid.). Besides the federal and state government level, there are also local authorities who are responsible for caring out planning, grant licenses, and permits. Since 1965, the local governments are not elected anymore but appointed by the state government. The lack of elections leads to the accountability of local authorities towards the state government rather than the local population and makes them "minor instruments of [state] policy rather than as dynamic and autonomous entities" (ibid.: 130).

The different administrative levels of the colonial, as well as the postcolonial state, played a central role in turning the decentralised and community-controlled land and forests in Southeast Asian countries into state-controlled centrally managed entities, a strategy referred to by Peluso and Vandergeest (2001) as territorialisation. State authorities produced knowledge through surveying and mapping, drew up

boundaries, created land laws, and establishing administrative units. This "symbiosis of knowledge and power" (Doolittle 2004: 822) provided the basis for the colonial and postcolonial rule. Although the strategies of colonial and postcolonial rule in Southeast Asia are not identical, they nevertheless share some important features. Doolittle (2004) highlights five of these aspects in her study on property and politics in Sabah:

1. States restrict access to and control over nature through legal instruments that are based on Western property law.
2. Concepts of protection of nature and commercialisation of resources often neglect local concerns.
3. States create powerful discourses and use ideologies that justify restricting access to and control over nature while neglecting people whose livelihood depends on these resources.
4. Rural communities are often blamed for the degradation of nearby resources while ignoring the structures (economic, political, legal) that shape how people are using these resources.
5. Unequal power structures are limiting the ability of marginalised communities to voice their ideas and concerns.

The British colonial rule claimed ownership of all land and forests in Sabah that is regarded as not continuously cultivated and therefore being idle. A central legal instrument for the British colonial control and ownership of land is the Sabah Land Ordinance (SLO) from 1930, which is almost 100 years after its emergence and more than 50 years after Sabah gained independence of still in use. Section 15, 76, and 78 of the SLO governs land rights of indigenous people and communities and is a central element for native land rights in Sabah. Toh and Grace (2005) identify three main types of property rights in Sabah:

- State property rights, which define all land owned and controlled by the state.
- Private property rights, which outline the rights and obligations of companies or individuals who own land.
- Communal property rights, which govern land rights of indigenous communities, ownership structure, and restrictions on its use.

Through the legacy of British colonial rule, the state government in Sabah still owns most of the land in the state, and about half of the total land area of Sabah is state-

owned forest reserves. The only land with a registered and approved claim can be owned by another entity. Forest reserves are grouped into seven classes (see Table 1) and most of them are under the jurisdiction of the Sabah Forestry Department (SDF). Class, I (Protection Forest), V (Mangrove Forest), VI (Virgin Jungle Forest), and VII (Wildlife Reserves) are protected areas where no human activities are allowed. As the ban of activities also includes the livelihood of local communities, Class III (Domestic) forests were established for people to collect food, building materials, and traditional medicine. However, Class III forests makeup only 0,13 percent of the total area of state-owned forest reserves and have therefore barely any effect on poverty alleviation in rural areas (Toh/Grace 2005). About half of the total forest reserve area is Class II forests that are open for commercial use like logging. In the 1970s, the state received between 80 and 90 percent of its budget through logging rights and royalties (ibid.) and the area in Sabah covered by primary forest was much larger. From the 1970s till the mid-1990s, the area covered by primary forest in Class II forests dropped from 98 to only 15 percent. As the forests struggled to recover from the intensive logging activities, many Class II areas were deforested and turned into agricultural land – mainly for palm oil production. Class IV forest reserves cover 0,32 percent of the total area and are mainly intended for recreational activities for the general public.

Class	**Type of Forest**	**Area (Ha)**	**Area (%)**
I	Protection Forest	1.386.615	39,16
II	Commercial Forest	1.659.900	46,88
III	Domestic Forest	4.656	0,13
IV	Amenity Forest	11.386	0,32
V	Mangrove Forest	232.039	6,55
VI	Virgin Jungle Forest	106.912	3,02
VII	Wildlife Reserves	139.241	3,93
Total		3.540.749	100,00

Table 1: Sabah forest reserves in 2018
(Sabah Forestry Department 2019: 175)

Claims of indigenous communities on land in Sabha are based on Native Customary Rights (NCR) called *adat*. NCR lands are regarded as and areas "bounded by geography and upon which usage is guided by memory, norms, and values

concerning access" (Majid Cooke 2013: 518) which aim to "create harmony, with flexible rules of access that respond to population, market and development pressures" (ibid.). Even during the British colonial rule, aspects of NCR regarding land matters were included in the SLO from 1930, namely individual (section 15) and community (section 76) native land titles and native reserves (section 78) (Majid Cooke/Toh 2012). However, laws regarding indigenous communities in the colonial as well as the postcolonial period were criticised for treating NCR as a static set of rules and only adopting aspects of NCR that were similar to Western property law (Doolittle 2004, Toh/Grace 2005). As a result, these laws often lack a broad recognition of the customs and livelihood of indigenous communities and how these practices are linked to their customary land (Sharom 2006). In addition, the lack of full recognition of NCR in state laws leads to pluralism in the legal system, as both customary and codified laws govern the same issues (Toh/Grace 2005, Majid Cooke/Toh 2012).

The provisions for native land in the SLO come with some serious shortcomings for indigenous communities. Except for burial grounds and religious sites, communities can only apply for land that is actively used, which poses problems for hunting and gathering communities or communities using shifting cultivation methods that set land idle for some time (Toh/Grace 2005). In addition, applications for native land rights can only be made for untitled state lands, which excludes all areas already established as forest reserves. Although before the establishment of new forest reserves, local communities need to be notified and consulted, several cases have been reported where these procedures were not followed (ibid., Majid Cooke/Toh 2012) and where people are afterward dependent on the goodwill of authorities managing these areas. If the area is on untitled state lands, a family is allowed to apply for 7 ha of land. Communities applying for collective land are allowed to apply for a greater area. All applications for native land have to be made through the district land office. Majid Cooke and Toh (2012) report that for 30.000 new applications each year, only 12.000 are processed with a backlog of 285.000 applications in 2009. Applications for native land therefore usually take several years and sometimes even decades, which lead to people working on and cultivating land that they do not formally own. If a land title is approved, there are, however, other obstacles and restrictions that indigenous communities are facing. The Land Acquisition Ordinance has 14 different provisions that allow the state to reclaim

native land (Toh/Grace 2005), which leads to insecurities for communities. Although native land may not be sold to non-natives, the land can be leased to any individual or company for up to 99 years. Scholars, therefore, conclude that land policies favour private land ownership and large-scale projects over land rights or indigenous communities (ibid., Majid Cooke/Toh 2012), as their "activities are regarded as 'consumption' not 'production for the market'" (Majid Cooke/Johari 2019: 131).

Different international conventions are addressing the rights of indigenous communities. The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and the International Labour Organization Convention on Indigenous and Tribal Peoples (ILO 169 convention) set out that self-identification is a fundamental principle for being recognised as an indigenous person. In Sabah, "a person who is a citizen, is the child or grandchild of a person of a race indigenous to Sabah, and was born [...] either in Sabah or to a father domiciled in Sabah at the time of the birth" (Federal Constitution 161A (6)(b)) is considered "native". People who have migrated from Indonesia or the Philippines but identify as indigenous are therefore excluded from native land rights in Sabah. Article 8(j) in the UN Convention on Biological Diversity (CBD) states each contracting party shall

> "respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices".

These provisions are, however, "subject to its national legislation" as many states – including Malaysia – were reluctant in giving sovereignty over these matters (Sharom 2006). In practice, while the CBD still follows a traditional conservation approach, Article 8(j) had nevertheless a great influence on authorities and NGOs, as many now follow the principle of free, prior, and informed consent (FPIC) when dealing with indigenous communities and their traditional knowledge and lifestyles (Majid Cooke 2013). FPIC is especially important when it comes to issues of participatory justice, as it gives indigenous communities the right to participate in matters that are affecting them. Although the right to participate in improving, Wook (2019) still sees an "unequal playing field" for the indigenous communities in courts, as people often have limited experience dealing with the administrative and judicative systems, have limited financial recourses to engage in lawsuits, and are

confronted with social norms that favour consensus over litigation. Disputes are typically settled with monetary payments. This type of compensation, however, often doesn't stop harmful practices or reduce environmental burdens and in the case of indigenous communities, neglects their connection with their ancestral land which cannot be measured in monetary terms. While courts in Malaysia are often considered "conservative" in overruling administrative procedures (Harding/Sharom 2007), there have nevertheless been rulings that go beyond monetary compensation and demand that customary rights and their connection to land must be taken into account in administrating decision-making processes. Majid Cooke and Johari (2019) therefore see a

> "contradiction in development policies which regard Indigenous lifestyles as an embarrassment to a modernising country, while simultaneously seeking to commodify Indigenous cultures for tourism purposes; both assume that Indigenous cultures are open to regeneration, without the natural resources upon which those cultures are based." (144)

5.2 The shrimp aquaculture sector in Sabah

Shrimp farming has been practiced in Malaysia since 1930 by using natural ponds and tides for shrimp fry, feed, and water exchange and in the 1960s, shrimp farms were established that relied on wild-caught shrimp fry or fry from hatcheries (Hashim/Kathamuthu 2005). Thereafter, the shrimp aquaculture sector in Malaysia changed rapidly in both quantity and form to become one of the world's main farmed shrimp suppliers. The industrialisation of shrimp farming and higher stocking densities also led to the rise of input supplying industries like shrimp hatcheries, fishmeal producers, and chemical companies. Despite major problems in the past with diseases and the sustainability of the production, shrimp farming is still a key area in Malaysia's current National Agrofood Policy, which aims to promote the sustainable production of high-value agri-food products (Witus/Vun 2016).

With vast coastlines and surrounded by the South China Sea, the Sulu Sea, and the Celebes Sea, Sabah has not only a large fishing industry but is also the main site of shrimp aquaculture production in Malaysia. While most of the shrimp in Malaysia are produced in semi-intensive and intensive ponds, the production capacity varies between Sabah and West Malaysia. Sabah is the main site for large-scale shrimp farms with several hundred ponds whereas West Malaysian producers usually only have 10 to 30 pounds (Interview 4). Most of the inputs are sourced from Thailand

and Vietnam, two of the most significant shrimp-producing countries, and the mayor exporting markets are Korea and Japan (Large-scale shrimp farmer, personal communication, April 30, 2021). With an initial investment on RM 500.000 (approx. USD 125.000) per shrimp pond and inputs worth RM 150.000 (approx. USD 37.500), a farm operator expects earnings of up to RM 250.000 (approx. USD 62.500) per faming cycle (Small-scale shrimp farmer, personal communication, April 26, 2021). However, problems are frequent, which makes shrimp farming a risky business.

Shrimp farming has by far the largest share of brackishwater aquaculture production in Sabah. Besides brackish water aquaculture, there is also a small section of freshwater aquaculture mainly operated by smallholders in inland regions and seaweed production in coastal waters. Chart 3 and Chart 4 show the value and quantity of shrimp aquaculture and brackish water aquaculture production in Sabah from 2012 till 2019. Even in this short period, the shrimp sector experienced changes in the production volume of up to 60 percent per year and fluctuations in the market price of more than 25 percent per year. Despite these challenges, the shrimp production in Sabah increased 37 percent in volume and 75 percent in value in the last seven years. During the global COVID-19 pandemic, the shrimp price dropped significantly and made shrimp farming unprofitable for most operators in Malaysia (Large-scale shrimp farmer, personal communication, April 30, 2021).

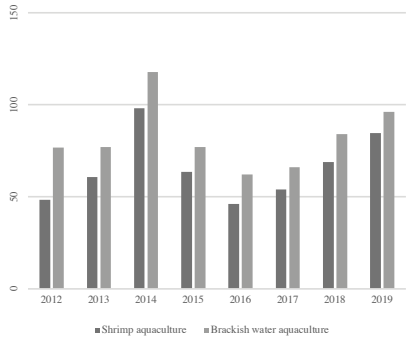


Chart 3: Sabah aquaculture value (USD 1.000.000) (Sabah DOF 2012-2019)

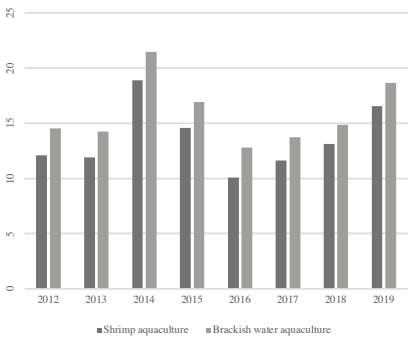


Chart 4: Sabah aquaculture quantity (1.000 t) (Sabah DOF 2012-2019)

The aquaculture sector in Malaysia is both a state and federal government matter. While both parties advocate for sustainable development in the sector and have policies on environmental sustainability, they are based on the assumption that that shrimp farming can be made sustainable through better management and

technological advances (Witus/Vun 2016). Sabah Department of Fisheries (DOF) advocated early on for public-private partnership to build large-scale vertically integrated aquaculture projects with processing facilities at the farm level to capture more value at the farm level (Galid 1999) and the Malaysian DOF encourages systems with higher productivity and efficiency to stay competitive on the world market and tackle environmental problems (Hashim/Kathamuthu 2005). Othman (2008) describes that there is an overall government policy in Malaysia that favour large-scale intensive shrimp aquaculture operations:

> "We promote mechanization and automation whenever feasible. Farms are encouraged to operate on an integrated and self-sustaining basis. Fry and feed production, processing and packaging, as well as marketing, are built into these vertically integrated systems. In achieving these Malaysia as well encouraged partnership. The government also interested in attracting foreign capital and appropriate know-how whenever is available to develop this sector through environment friendly technologies." (8)

However, the relative decline of shrimp prices poses major challenges on aquaculture operators, as Malaysia has higher labour costs compared to many other shrimp-producing countries, and intensification of the system leads to higher production costs (Interview 4). Many shrimp farm operators in Malaysia use foreigners to work on the farm to lower labour costs (Othman 2008).

Shrimp production in Malaysia is dominated by two species, whiteleg shrimp (*P. vannamei*) and black tiger shrimp (*P. monodon*). In the early 2000s, Malaysia produced almost exclusively black tiger shrimp end even implemented a ban on whiteleg shrimp production in 2003, as this shrimp variety originated in the eastern Pacific Ocean and is alien to Southeast Asia. Between the coasts of Mexico and Peru, where whiteleg shrimp have traditionally been caught and famed, there have been numerous reports of diseases and researchers fear that they may also infect or even oust native shrimp populations in other parts of the world (Funge-Smith et al. 2004). Whiteleg shrimp have the advantage of requiring less protein in their feed and are therefore cheaper to farm. However, it is also believed that the lower production cost of whiteleg shrimp led to an overall drop in the global price for shrimp (Chowdhury 2013) and is, therefore, a factor that led to the relative decline of shrimp prices. Only one year later, in 2004, the Malaysian government lifted the ban on whiteleg shrimp production, and subsequently, the farming of whiteleg shrimp strongly increased in the mid-2000 and now makes up the main share of Malaysia's shrimp production. The government still enforces checks of shrimp fry and bloodstock entering the

country and as the problem with diseases from whiteleg shrimp remains unsolved, the government tries to encourage operators to farm local shrimp varieties (Othman 2008).

A survey conducted by the Sabah DOF analysed the total coastal area in Sabah (929.889 ha) and concluded, that 0,4 percent (4.048 ha) of the area had high potential, 15,6 percent (145.551 ha) had a medium potential and 13,2 percent (123.060 ha) had a low potential for shrimp aquaculture production (Galid 1999). While most districts in Sabah have a relatively low potential for shrimp production, the district with the highest potential is Pitas. Pitas has one of the highest poverty rates in Sabah and is home to many indigenous communities (Majid Cooke 2013). Shrimp farms in Malaysia are typically constructed in mangrove forest areas and therefore have a major impact on the ecosystem and on communities that are dependent on the forests (Abdullah et al. 2013). Majid Cooke and Toh (2012) argue that subsistence production like gathering products of mangrove forests is often "perceived to be 'wasteful' because they are viewed as meeting the subsistence needs of a few, [...] while production for revenue, for example through timber production, is for the common good" (42). Therefore, only limited data on the importance of mangrove forests for the livelihood of local communities is available. Mojiol et al. (2016) conducted a survey in the Kudat district in Sabah on goods that local communities gather from mangrove forests and found out that mangrove forests are responsible for a large share of people's monthly income. While most of the people surveyed in this study are considered "hardcore poor" with a monthly income below RM 500 (approx. USD 125), they generate an additional average income of RM 432,75 from non-forest products like fish and crabs and RM 40,85 from forest products like firewood, nuts and medicinal plants per household. The discourses on poverty alleviation – which are often used to legitimise large-scale aquaculture projects – however, use concepts of poverty that are based on limited economic data and that "does not consider the deep and multi-faceted relationships between Indigenous Peoples and the territories and areas upon which they depend for their identity, survival, livelihoods and wellbeing" (Jonas et al. 2016: 8).

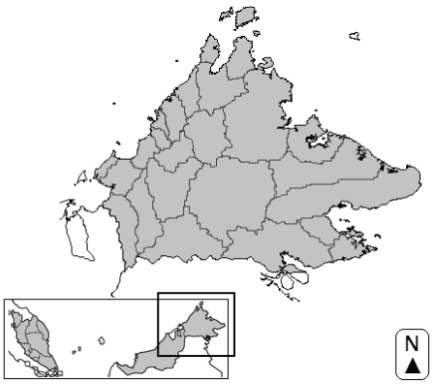
Not only local communities in Sabah are threatened by the degradation of mangrove forests. The United Nations Environment Programme (UNDP 2006) estimated that the 400 km^2 mangrove forest in Matang, Malaysia, supports a fishing industry in the region that is worth USD 100 million per year, which results in an indirect

productivity per square kilometre that is much higher than any intensive shrimp farm. A study conducted by Abdullah et al. (2013) found that there is only a little awareness among shrimp farm operators in Malaysia for environmental issues. The Consumers' Association of Penang (CAP 2010) has highlighted several instances where shrimp farms discharged polluted water into neighbouring mangrove forest areas and thereby threatened this crucial ecosystem for the fishing industry. They, therefore, called for a restriction of the Malaysian shrimp aquaculture industry and demanded a stop of all new intensive shrimp aquaculture projects in Malaysia. Othman (2008), however, claims that new shrimp aquaculture projects in Malaysia are slowly shifting away from mangrove areas and now are increasingly established on abandoned rice and coconut fields or other coastal areas.

In 1996, there has already been recorded a 32 percent loss of mangrove forests in Malaysia, and in 2009, the number has increased to roughly 50 percent (Abdullah et al. 2013). Economic activities like aquaculture and logging have been blamed for a large part of these losses. In 1998, the former National Agrofood Policy expected growth of the shrimp aquaculture sector of 20 percent per year. However, these expectations were not met due to diseases, high production costs, market price fluctuation, regulations, and land matters (Othman 2008). In addition, climate change has also been found to be a key factor in aquaculture production fluctuation in Sabah (Ann et al. 2017). While freshwater aquaculture operations are more affected by climate change shocks, brackish water aquaculture projects already suffer from drastic changes in humidity, rainfall, and temperature and are likely to be even more affected soon. However, there is an ongoing development in the shrimp aquaculture sector, and in 2007, the government allocated 5.300 ha of additional land through the Integrated Zone for Aquaculture Model (IZAQ) for shrimp farming (Abdullah et al. 2013). The Malaysian Economic Transformation Programme (2013) even seeks to establish 10.000 ha of IZAQs by 2020. Shrimp aquaculture projects under this model will be "[l]ed by an anchor company [and] each IZAQ will house hatcheries, grow-out areas, a processing plant and feed-mills" (ibid.: 236). In addition, this model should also encourage "the participation of smallholders and SMEs through contract farming or profit-sharing with the anchor companies" (ibid.: 236).

6 Case study analysis and findings

6.1 Shrimp aquaculture project in Pitas



Map 1: Districts and divisions of Sabah
(Wikimedia Commons 2007)

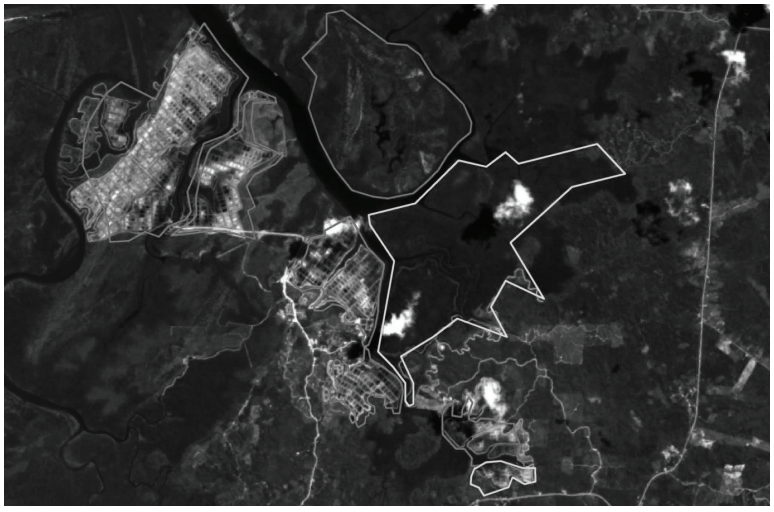
Map 2: Pitas district
(JTU Sabah 2021)

The case study for my thesis is a vertically integrated intensive shrimp farm under the Integrated Zone for Aquaculture Model (IZAQ) in the Pitas district, Sabah. The shrimp aquaculture project was established as a joint venture between the state-owned Yayasan Sabah Group and Sunlight Seafood Sdn. Bhd., one of Malaysia's largest producers, processors, and exporters of seafood products. Private investors pledged to provide RM 426 million (approx. USD 100 million) for the project, which was planned to be matched with RM 268 million (approx. USD 65 million) from the public side (DHI 2014). With an area of over 1.000 ha for the shrimp ponds alone, this project was intended to be one of the largest shrimp farms in Malaysia.

In April 2013, months before the Environmental Impact Assessment (EIA) of the project was completed, land clearings and earthworks for the shrimp ponds already started. Cedric Wong King Ti, CEO of Sunlight Seafood justified the clearing with the strict deadline of the project and argued that otherwise, they would have lost federal funding (Undercurrent News 2013). In September 2013, Environment Protection Department (EPD) Sabah issued a fine of RM 30.000 (approx. USD 7.500) and stop-work order after the Sabah Environmental Protection Association (SEPA) submitted a report of the unapproved land clearings and earthworks (Interview 1). However, until mid-December 2013, neither construction work stopped nor was the fine paid. In January 2014, EPD Sabah allowed infrastructure works on water and electricity to continue despite the pending decision on the EIA of the project. However, SEPA claims that not only infrastructure works, but also land

clearings and pond construction resumed (Interview 1). A few months later, in June 2014, the EIA of the project was rejected by the EIA review panel after SEPA submitted technical comments on the project and questioned the overall validity of the submitted EIA. In particular, SEPA claimed that the communities were given falsified information in the social impact assessment of the EIA. Despite the concerns voiced in the EIA review panel, EPD Sabah approved the shrimp aquaculture project in December 2014. The approval was given without further consultation of the EIA review panel. Even though the EPD director has the power to unilaterally approve an EIA (Interview 5), this action was seen step backward on environmental and social safeguards in Sabah (Interview 1).

Faced with an increasing loss of livelihood and plans to cut down further 500 ha of mangrove forests, six villages surrounding the project site started to protest and form a committee called G6. When heavy machinery arrived in mid-2015 to clear the remaining 500 ha, again without formal approval, the G6 committee set up barricades, prevented them to enter the forest, and forced them to turn back (Interview 1). In the following years, several NGOs engaged with the people close to the project site to turn the remaining 500 ha of mangrove forests into community-controlled land. After the Sabah State Legislative Assembly approved the 500 ha expansion of the shrimp aquaculture project in 2016 (see Map 3) and the shrimp farm operator received the land title of the area in 2017, the villagers brought the case before the court and continue to monitor the area to prevent further land clearings.



Map 3: Proposed project site in Pitas
Red: cleared area, Green: remaining area (SEPA 2015)

The shrimp aquaculture project is sited in the Bengkoka peninsula in the north of Sabah, next to the villages of Kuyu, Telaga, Gumpa, Ungkup, Boluuh Skim, Datong, and Sungai Eloi where about 2.000 people live. The people who live in these villages are indigenous from the Rungus, Tombonuo, and Suluk Sungai ethnic groups and most of them fall under the definition of "hardcore poor" and have limited access to water, electricity, and employment. For their livelihood, the villagers rely on farming, fishing, and the surrounding mangrove forests, which provide recourses like food, building materials, and traditional medicine for their daily lives. In addition to these recourses, mangroves are also crucial for the customary practices and the cultural heritage of the people, as burial grounds and secret sites are also located in the surrounding forests (Interview 1, 2, 3). Many people call themselves Orang Dua Alam (People of Two Worlds/Inbetweeners), which means that they spent half of their daily activities in the mangrove forests (Interview 1).

The mangrove forest of the project site is home to several vulnerable and endangered species like the sun bear (Helarctos malayanus) and the proboscis monkey (Nasalis larvatus) and borders directly to the Bengkoka Peninsula mangrove forest reserve. The reduction, fragmentation, and isolation of their natural habitat will have a major adverse impact on the population of these species in this area (DHI 2014). Proboscis monkeys are classified by the IUCN Red List of Threatened Species as endangered and are one of the nine animals that are "totally protected species" in Sabah. Besides the Bornean orangutan, the proboscis monkey is one of the major wildlife attractions in Sabah and even served as the official tourism mascot of Malaysia in 2014. A decline in their population is not only a severe ecological loss but also likely affects the potential of wildlife tourism in this area and villagers have reported increased human-wildlife conflicts (personal communication, May 1, 2021).

6.2 State-backed projects in the region

It is not the first time that people – and the ecosystem – near the shrimp aquaculture project are confronted with a large-scale state-backed development project. Just a few kilometers inland, an *Acacia mangium* tree plantation was established in the 1980s to provide cellulose fibres for the pulp and paper industry. In the early 1980s, the Sabah Forest Development Authority (SAFODA) established an afforestation and resettlement plan to provide housing, access to water and electricity, and employment to the region. The initial plan intended to include almost 2.000

households and an area of over 60.000 ha, where each household would cultivate an area of 6 ha with *Acacia mangium,* and after the first harvest (15 – 20 years), they would be able to use the cultivated land for their personal use (Majid Cooke/Toh 2012). Although thousands of applications were submitted to participate in the scheme, only 200 households were selected for the initial phase of the project due to limited funding. The other applicants were only able to participate as contract framers in this pentation scheme.

As the political landscape in Sabah changed over the last decades, so did the management of SAFODA and the aims and objections of the plantation scheme. In 1988, the total area of the *Acacia mangium* plantation coved over 17.000 ha. However, after the initial phase of the scheme, no more households were accepted to participate in the afforestation and resettlement plan. Subsequently, the area under the initial scheme makes up only a small fraction of the total planted area. Before the establishment of the plantation, about 80 percent of the people in that area lived there for over 15 years. However, only a small fraction of them had a formal land title or was in the process of obtaining one. This meant that many people lost access to land which they previously used for farming and livestock which resulted in land conflicts between SAFODA and the local villagers as well as between villagers themselves for the remaining resources (Joyiemin et al. 2017). By the end of the 1990s, SAFODA sold the harvesting rights for the pentation to a private company. After some areas got harvested, local villagers referred to the initial pentation scheme and demanded access to the land for their personal use. However, there is no written documentation of the initial agreement between SAFODA and the villagers, and conflicts arose after people panted crops other than *Acacia mangium* on the land. Majid Cooke and Toh (2012) argue that there is an

> "lack of an overall guiding strategy in Bengkoka especially with regard to land and resource planning, as well as the lack of communication and consultations with the affected communities and other stakeholders, who did not seem to have been informed on the changing policies." (92)

Many of these land conflicts have not been resolved so far and not many people formally own land in this area (Village head, personal communication, May 3, 2021). However, as the harvesting rights have changed ownership several times and the plantation eventually got Forest Stewardship Council (FSC) certified. Operations must be carried out more transparently and sustainably and the managing company

pledged more willingness to engage with local communities and resolve land conflicts (AFI 2017).

Map 4: Satellite image of the area 05/06/2011

Map 5: Satellite image of the area 03/08/2020

Similar to the *Acacia mangium* plantation, an initial expectation of the shrimp aquaculture project from the local population was high (Interview 1, 2). As shrimp aquaculture under the IZAQ model, the projects intended to vertically integrate the production process and establish a processing facility and a distribution centre in the region. Up to 3.800 new jobs were promised when the project would be in full operation, including 800 – 1.200 jobs at the shrimp farm (DHI 2014). However, there were critical comments on the project since the beginning. NGOs voiced their doubts on the promised jobs for the local population, as the water scarcity made a

processing facility in the region unlikely (Interview 1) and about 70 percent of the jobs at the shrimp farm required skills or experiences in the sector (DHI 2014). But not only NGOs voiced their doubts. The former minister of Manpower and Environmental Development ins Sabah, Datuk Yap Pak Leong, pointed out that many shrimp aquaculture projects failed in the past due to pollution, diseases, and high cost of feed and predicted that the project in Pitas will go down the same path (The Star 2014).

In 1983, the Sabah Department of Fisheries reserved an area of 3.600 ha of mangrove forest in Pitas for aquaculture projects. The shrimp aquaculture project in Pitas covers an area of over 1.000 ha and much of it falls within the previously reserved area. Since 2013, vast areas of mangrove forests have been cleared for this aquaculture project (compare Map 4 and Map 5). Even though the Sabah Shoreline Management Plan (2005) discouraged the clearing of mangrove forests for aquaculture projects, the almost 40-year-old plans for the reserved area of mangrove forest were never revised and NGOs called the state government to start an investigation into this matter (The Star 2014).

The plans for the shrimp aquaculture project in Pitas aim for the construction of over 1.000 shrimp ponds, which will be used to cultivate whiteleg shrimp and black tiger shrimp. With rectangular dimensions of 57 m x 85 m x 1.8 m, each shrimp pond will have an estimated output of 20 tons of shrimp per year. When all of these ponds are in normal operation, the aquaculture project is expected to have an output of over 14.000 tons of shrimp per year (DHI 2014), which would result in an annual turnover of USD 70 million. Consequently, expectations for such a lucrative project were high in the beginning and people believed that the shrimp farm would bring well-paid jobs to the area for the next 30 to 40 years (Local villager, personal communication, May 5, 2021).

Besides jobs at the shrimp farm, the project promised the construction of a new access road and water and electricity access for hundreds of households (Interview 1). However, the promises of jobs and new infrastructure have not materialised (Interview 1, 2, 3). As land clearings and earthworks for the shrimp ponds started months before the EIA of the project was completed, many rules and guidelines for a more sustainable shrimp farming were neglected. Regulations required the aquaculture project to keep a buffer zone of 100 m towards the edge of the mangrove forest and most certification schemes require a buffer of at least 50 m in mangrove

areas. However, inspections of the cleared area revealed that in some areas, there was no buffer zone remaining (SEPA 2015). In addition, clearing for the shrimp farm was also done in the Bengkoka Peninsula mangrove forest reserve, as workers were unaware of the clear boundaries of the project (DHI 2014). The Malaysian Economic Transformation Programme (2013) states that the goal of IZAQs should be the production of "high-quality, fully-certified shrimp targeted for the premium market" (236). However, due to the lack of a buffer zone, the project is unlikely to meet the requirements for any internationally recognized certification scheme (Undercurrent News 2015). In addition, Sunlight Seafood, the anchor company of the project, was placed on an import alert list in the US due to residues of banned antibiotics in their products (Import Alert 16-129), which also casts doubt on the quality of their products and if they will be able to reach "premium" markets.

Close to the shrimp aquaculture project, located between the districts of Kudat, Kota Marudu, and Pitas, the Tun Mustapha Park (TMP), the largest marine conservation area in Malaysia, was established in 2016. The park is part of the Coral Triangle, one of the richest marine ecosystems on the planet and home to large parts of the remaining marine turtle population. The pans for the TMP range back to 2003, when the state government proposed to establish a marine conservation area to conserve this rich ecosystem. During the 13 years, different stakeholders engaged in the planning process and came up with a multi-use concept that includes a marine area of almost 900.000 ha to protect the biodiversity and ecosystem as well as giving local communities the chance to sustainably use its recourses. However, the original draft of the park proposed an area of over 1 million hectares, including most of the coastal area and nearby mangrove forests, as they play a major role in the lifecycle of many marine species. Government agencies raised doubts over the proposed organisation structure to manage recourses that are under their jurisdiction if they were to be included in the park. Following this argument, the Sabah Forestry Department requested that mangrove areas should be excluded from that park and argued that the forest reserve policies already have conservation measures in place. However, Jumin et al. (2018) argue such fragmentation will likely have negative effects on the overall goal of the park:

> "Excluding these areas may influence the effectiveness of the Park in terms of marine resource management and biodiversity conservation. Most mangrove areas that are important for fish breeding will remain as mangrove forest reserves under the management of the Forestry Department, which does not regulate fishing

> activities, and turtle nesting beaches will remain as state land under the management of the Land Office, and will be subject to development." (782)

As the project site of the shrimp aquaculture in Pitas is built on a mangrove forest close to the marine park, the inclusion of the area in the final plan would have had a major impact on the project.

6.3 Analysis of environmental justice

As discussed earlier in this thesis, the environmental movement in Malaysia gradually broadened its scope from a "traditional" or "mainstream" environmentalism that is focused on nature conservation and preservation to a movement that includes key environmental justice issues like resident's health and indigenous rights. This part of my thesis contributes to the relatively new research field on environmental (justice) movements in Malaysia. I will now use the concepts of distributive, participatory, and procedural justice to analyse the environmental and social consequences of form an intersectional perspective. The next section will combine the results of this section and look at the interrelations between the three concepts. In the discussion section of this chapter, I will link this analysis with my study on the global shrimp aquaculture production network to illustrate the local impacts of the global shrimp industry.

6.3.1 Distributive justice

Distributive justice deals with the distribution of environmental benefits and burdens and environmental justice movements aim to achieve a just balance between risks and benefits (Figueroa 2006). The construction of the shrimp aquaculture project in Pitas led to the clearing of over 1.000 ha of land and expansion plans threaten a further 500 ha. The cleared land is covered mainly by mangrove forests, with are crucial for the livelihood of the local communities. Mojiol et al. (2016) showed in a survey in Kudat district in Sabah that mangrove forests are responsible for a large share of people's monthly income. A local fisherman reported a reduction of his catch my up to 70 percent (personal communication, April 27, 2021). Some villagers compensate this loss by planting cash crops like palm oil or rubber (Village head, personal communication, May 3, 2021). Research conducted by Joyiemin et. al (2017) in the village Sungai Eloi near the shrimp aquaculture project shows that even after the clearing of 1.000 ha of land, 39 out of 47 surveyed households (83 percent)

still rely on mangrove forests for their livelihood. The majority of these households use forest products for their consumption, while only a small minority sell those products on markets or use them as a building material. Before the clearings, more people would sell mangrove products on local markets or use it as a building material, however, due to the decline of available recourses, people now barely have enough for their consumption:

> "Previously, we sell our mangrove products (crabs, fish, clams) as it can be found abundantly in our mangrove area. For example, if we succeed in getting around 10 kilogrammes of fish or crab, we will use three kilos for own consumption and the rest is for sale in the nearest market. But it is hard to get such amount now. We only can get for own consumption only. We lost one of our side incomes. Sometimes, I have to buy crabs, fish and clams from the market". (Local framer, in Joyiemin et. al 2017)

The decline of available recourses also led to conflicts among the people for the remaining recourses (Interview 3). Joyiemin et. al (2017) argues that the construction of the shrimp aquaculture project changed the local economy "from one of land rich to one of land scarcity" (123). People facing major food shortages since the construction of the aquaculture project (Interview 1). Among the most affected by the declining resources are women, as they are more dependent on forest products than men (Interview 3). In addition, the farm management took measures to prevent people from entering the remaining mangrove forests and reported people to the local police to intimidate them (G6 member, personal communication, May 7, 2021). There have been reports that women have been harassed by people from the shrimp farm to prevent them from walking freely in the mangrove areas (Interview 1).

Older villagers typically rely more on the mangrove resources than the younger ones and many of them wouldn't give up their ancestral land (Interview 1). Although young villagers are involved in protecting the remaining forest, many of them are also leaving the villages and move to bigger cities, as they are struggling to find jobs nearby (Interview 2).

> "[T]he youth also depend on the mangrove, but because three are no mangroves, they have to work at other places. Yeah. And ironically, even though there's a, you know, there there's a shrimp farm nearby, they don't work there. So, they have to go outside the village." (Interview 3)

The project initially gained local support by promising 800 – 1.200 jobs at the shrimp farm and up to 3.800 new jobs when all facilities would be in operation. The CEO of Sunlight Seafood, Cedric Wong King Ti, even came to one of the villages to promote the project (Former village head, personal communication, April 30, 2021). Since the beginning, NGOs voiced their doubts on the promised jobs for the local

population, as 70 percent of the jobs at the shrimp farm require skills or experiences in the sector (DHI 2014) and the water scarcity in the region made a nearby processing facility unlikely (Interview 1). In addition, the electrical grid in the region is not able to deliver enough power to the complex, so most of the heavy equipment is powered by a noisy diesel generator (Local villager, personal communication, May 5, 2021).

In 2019, a newspaper article reported that during its five years of operation, the aquaculture project produced little over 17.000 tons of shrimp (Daily Express 2019), which falls short of the planned output of 14.000 tons of shrimp per year. In 2016, only nine out of over 1.000 ponds were in operation due to a problem with shrimp fry (Daily Express 2019). Even though the output of the project fell short (only 25 percent of the capacity), the employment of local people was even lower. Although the farm management claimed that almost 400 people worked at the farm during peak production times (personal communication, April 30, 2021) others claim that it were never more than 70 local people (Interview 1). Joyiemin et. al (2017) reported that the working conditions at the farm are harsh, the salaries are low, and that there are only a small number of vacancies. Although man and woman are paid equally or their work (Shrimp farm worker, personal communication, May 4, 2021), this may only be due to the fact most workers at the farm are only paid the minimum wage of RM 1.100 per month (approx. USD 275). One person even died in a work-related accident, however, the management has taken no measures to improve the unsafe working conditions at the farm (Union member, personal communication, May 4, 2021). They estimated that in 2016, less than 10 local people worked at the farm. At one point, there were also claims of up to 30 foreigners working at the shrimp farm (Interview 1). However, upon inspection by the labour department, no evidence was found.

Besides jobs at the shrimp farm, the project promised the construction of a new access road and water and electricity access for hundreds of households. And like the jobs, neither water nor electricity access has been materialised (Interview 1, 2, 3). That the promises of new infrastructure will be fulfilled shortly does seem unlikely, as the farm stopped operation due to the major shrimp price drop during the COVID-19 pandemic (Large-scale shrimp farmer, personal communication, April 30, 2021) and the many wages of their former workers are still unpaid (Shrimp farm worker, personal communication, May 4, 2021). Since the farm has stopped operating, local

fishermen are reporting that their catch is now increasing (personal communication, April 27, 2021).

The local communities are not only experiencing an unequal distribution of environmental benefits and burdens, but the unequal distribution is also creating discord within the communities. People working for the shrimp farm change frequently and the employment period is short (Joyiemin et. al 2017). Some people assume that this is a tactic of the farm management to create conflicts within the community:

> "[T]hey handle things like they will pay certain people within the community so they will be dependent on the project and then they will be better off than the rest of the community [...] Actually, those that are being paid are supporting it, those that are not being paid are not supporting it." (Interview 1)

This picture is supported by the observation that even after the clearing of large mangrove areas, some village leaders and villagers less affected by the clearings still supported the project. However, as it became evident that promises of jobs and infrastructure would not be fulfilled and land conflicts within the communities increased, most people in the area now oppose the project (Interview 3). The shrimp farm has also been referred to as a "white elephant" (Interview 1), a project with high expanses and no positive outcomes that are often linked to poor planning and/or corruption.

6.3.2 Participatory justice

Participatory justice looks into the right of people to participate in matters that are affecting them. The principle of free, prior, and informed consent (FPIC) is especially important when it comes to issues of participatory justice, as it gives indigenous communities the right to participate in matters that are affecting them freely (without intimidation or manipulation) before any decision and based on information about the benefits and risks of a project. While these basic principles had a great influence on authorities and NGOs when dealing with indigenous communities in Sabah (Majid Cooke 2013), it seems that FPIC was not conducted in the case of the aquaculture project in pitas (Interview 1, Chin Voon Oi 2018). Although most of the local villagers are part of ethnic groups that are recognised as "native" in Sabah and therefore have formal rights (right to vote, native land rights, etc.), many of them are still confronted with an "unequal playing field" (Wook 2019) when dealing with the administrative and judicative system, as they often have

limited financial recourses and no experience when dealing with these institutions (Interview 2). In addition, public consolidation is often not properly carried out when the project is supposed to be "in the name of development" (Majid Cooke/Toh (2012), Interview 2, 3). However, it is important to note that many villagers supported the project in the beginning because it promised to provided jobs and new infrastructure:

> „The plan to alleviate poverty was a good one [...], [b]ut the way they implemented it has caused even more problems for us. We were never consulted about this project and land clearing started even before the project had its EIA approved. The government and the company simply decided that they could take our land because they were doing it in the name of development." (Local villager, in Harbinson 2017)

Even in 2015, after many villagers faced an increasing loss of livelihood due to the clearings and were confronted with plans to cut down further 500 ha of mangrove forests, many local leaders in the region were still supporting the aquaculture project (Daily Express 2015). The continued support of the project despite concerns of other villagers – in the literature often referred to as elite capture (Platteau 2004) – led people to form six villages surrounding the project site to form a committee called G6. The G6 committee was the main actor that led the protests against the shrimp farm, held press conferences, wrote official complaint letters, petitions and hindered construction and clearings of the remaining mangrove forests. The committee is mainly led by local farmers and fishermen (Interview 3) and man and woman participate equally in the coalition (G6 member, personal communication, May 1, 2021).

To tackle the problem of the "unequal playing field", some NGOs from Sabah provided leadership and legal training for the local communities and engaged in capacity building so that they can better engage with external actors and properly participate in matters that are affecting them (SGP Malaysia 2015, Interview 3). In their strategy, the NGOs do not intend to speak on behalf of the affected communities, but rather try to enable them to speak for themselves (Interview 1, 3). A member for an involved NGO expanded their approach:

> "Basically, all the press statements that we conducted, that the community made, [our NGO] was behind them, yeah, so basically if they needed to have a press conference, we would either bring the media guys from the city up to them, or, we would bring the community down and them, we would call for a press conference, but [our NGOs] name was never mentioned. Because we wanted the community to take ownership of their fight as well." (Interview 1)

Mangrove forests are, however, not only crucial for the livelihood of many villagers in this area, they are also used as burial grounds and religious sites and therefore have a significant cultural value for many people in this area. „It's not only the forest that's being destroyed" argues a local villager in a newspaper article on the project, "It's our identity" (Green 2018). Figueroa (2006) argues the environmental heritage and identities are one of the most neglected aspects of environmental justice and even if distributive justice and political recognition are achieved, the people and communities may still be harmed and perceive injustice. Mangroves are the main area for customary practices by indigenous communities in this area (Chin Voon Oi 2018). People use a community protocol, a set of customary practices, to manage access and use of the forest recourses. One approach from NGOs supporting the affected villagers was to document these customary practices and draw maps of their customary territories, which can then be presented to authorities or in court as evidence that people are living in this area for generations and are deeply connected to the local mangrove forests (Interview 3). Chin Voon Oi (2018) describes the basic principles of the finalised community protocol for the village Sungai Eloi near the shrimp aquaculture project:

> "Their community protocol for the management of the mangroves, for instance, was based on village customs with rules for both their own community members and for outsiders. These rules dictate resource use, giving special care to limiting activities that may affect availability of resources, including those that are hazardous or cause overharvesting. Certain areas in the forest are also restricted from any resource collection. The protocol also states what must be observed when entering the mangrove area. Visitors who wish to enter the community mangrove forest are required to obtain permission based on FPIC and with respect to indigenous peoples' rights. Those found to have violated the rules set forth in the community protocol will be fined by the community and are required to replace the resource that has been affected." (15)

The affected communities now aim to turn the remaining 500 ha of mangrove forests into community-controlled land, where these customary rules and practices would apply.

In their research on the village Sungai Eloi near the shrimp aquaculture project, Joyiemin et. al (2017) also studied the cultural significance of mangrove forests and showed that the nearby mangrove forests are crucial for people practicing traditional religions. One of these practices is called *Momokan*, where people carry out worshipping rituals at sacred sites to maintain a close relationship with nature (Interview 3). *Momokan* is also practiced by villagers who practice Christianity or Islam as their main religion. A part of this practice is to use their traditional

ecological knowledge to take care of the land and sustainably use its recourses. When people were confronted with the clearing of the nearby mangrove forests, many of them volunteered to replant some of the trees and monitor the area to prevent further degradation (Chin Voon Oi 2018).

6.3.3 Procedural justice

Procedural justice is concerned with a fair and transparent decision-making process. The EIA of the aquaculture project in Pitas required a social impact assessment to be carried out to estimate the expected risks and benefits for the local communities. The EIA estimated that the shrimp farm would only have minor adverse impacts on land use and neglectable adverse impacts on culturally significant sites while attesting the effects of employment for the villagers as highly beneficial (DHI 2014). However, numerous reports and interviews show that this is not the case. So, how could the EIA so clearly misrepresent the risks and benefits of the aquaculture project?

Hunold and Young (1998) argue that there are five procedural criteria which have to be met to make a decision-making process just: inclusiveness, consultation over time, equal resources and access to information, shared decision-making authority, and authoritative decision making. As described in the section on participatory justice, it seems that FPIC was not conducted in the case of the aquaculture project in Pitas. There are also claims the only a small number of households were consulted for the EIA and that this limited data was used to misrepresent the socio-cultural and economic importance of the mangrove area for the local communities (Interview 1). Thus, it seems that only a limited number of affected people were able to participate in the decision-making process. In addition, consultation during the decision-making process of an EIA in Sabah does not happen over time, but only during the preparation of the EIA report (Interview 5). In the case of the shrimp aquaculture project, construction work started even before people were consulted about the project. Therefore, the principle of consultation over time is clearly not met in this case, as people and communities had not the chance to voice their ideas and concerns in every stage of the process.

In their comments on the EIA of the aquaculture project, SEPA questioned the overall validity of the submitted EIA and claimed the communities were given falsified information in the social impact assessment of the EIA. A member of an involved NGO claims that during the consultation period, the EIA consultants

carrying out the social impact assessment approached villagers claiming they were government officials and that the decision on the project has already been finalised (Interview 1). Other villagers were surprised that their names were on the participants' list of the social impact assessment, even though they were never consulted (ibid.). In addition, important documents were held back during the consultation: "When we took the map [of the aquaculture project] to show to the community, that was the first time they had seen it" (ibid.). As not all affected groups have equal recourses and training in a decision-making process, "weaker participants" should be supported to give them access to all the relevant data and enable them to provide their data. However, there are no special provisions to support "weaker participants" during an EIA in Sabah (Interview 5). Many villagers were already applied for land in this area before the establishment of the shrimp farm. However, their land applications often take up to several years or even decades, while companies who can afford legal counselling and carry out their land survey may receive a land title within six months. People in rural areas often have little or no formal education, so, without special training or support, they are experiencing an "unequal playing field" when participating in these matters:

> "How do you expect them to read a land ordinance in English language. That land ordinance, it was amended back in 1969. Even I still have a difficulties interpreting the land ordinance" (Interview 2)

Although some villagers revived leadership and legal training from NGOs, this was only after the EIA of the aquaculture project was finalised. In addition, there were hardly any commercial fisheries and aquaculture projects in the region before (Pitas DOF, personal communication, May 6, 2021), so the villagers had little experience in dealing with this kind of project. Therefore, the affected people had not equal resources and access to information during the decision-making process of the aquaculture project.

Apart from EPD Sabah, relevant technical departments, selected NGOs and experts are involved in the decision-making process of an EIA. The local communities were only able to participate only during the preparation of the EIA report. In addition, EPD Sabah has the full decision power and the final say in any EIA (Interview 5). Even local authorities were only partially involved in the decision-making process (Pitas DOF, personal communication, May 6, 2021). Despite concerns voiced in the EIA review panel on the aquaculture project, EPD Sabah approved the shrimp aquaculture project in December 2014 without further consultation of the EIA review

panel. The action led to heavy criticism among NGOs and SEPA even resigned from the EIA review panel. SEPA called this decision of the EPD Sabah "a breakdown of social and environmental safeguards as it allows for one authority to approve future EIAs without consultation" (Sario 2015). One person involved in this matter attested that "[s]ince then, it became more intransparent, more top-down, not that inclusive anymore" (Interview 2).

In this case study on the shrimp aquaculture project, none of the five procedural criteria for a just decision-making process proposed by Hunold and Young (1998) have been met. While states are almost always reluctant in giving up the full decision power and the final say in these processes (Bell/Carrick 2018), the principles of inclusiveness, consultation over time, and equal resources and access to information were also neglected. Only a limited number of people were consulted, the process happened without FPIC, consultation happened only during the preparation of the EIA report and the villagers are often experiencing an "unequal playing field" when dealing with large companies or authorities.

6.4 Results and discussion

When considering issues of distributive, participatory, and procedural justice regarding environmental and social consequences of the shrimp aquaculture project in Pitas, this research shows that local communities are confronted with political-economic as well as socio-cultural issues. On the political-economic side, people are confronted with the loss of livelihood, unemployment, and precarious working conditions at the farm. Coupled with the limited access to formal education, these socio-economic disadvantages lead to an "unequal playing field" when dealing with courts, authorities, or large companies. On the socio-cultural side, the villagers lost burial grounds and religious sites due to the clearings and are currently struggling to manage the remaining mangrove forests according to their customary rules and practices. Even if the local communities get compensation for the cleared areas, their environmental heritage and identities would still be neglected. Although laws are safeguarding the rights of indigenous communities, they are often criticised for treating NCR as a static set of rules and only covering aspects that are similar to Western property law (Doolittle 2004, Toh/Grace 2005).

In my analysis, there were different inequality-generating categories that led to distributive, participatory and procedural injustices. Among the most affected by the

declining resources are women (Interview 1, 2, 3). They are more dependent on forest products than man and they have been harassed by people from the shrimp farm to prevent them from walking freely in the mangrove areas. In addition, mainly men would have benefitted from the promised jobs at the shrimp farm, as women mainly work in the processing sector of shrimp production networks (Islam 2014). Since the beginning, people doubted that a processing facility would be built due to the lack of water in this area. However, the declining fish stocks in this area mainly affect men, as they are the ones who go out fishing or work at fishing boats. Older villagers typically rely more on mangrove resources than the younger ones (Interview 1, 2). For the older generation, mangrove forests are not only important or resource gathering, but they also have a major cultural value for them. While younger people reportedly have left the villages, older ones wouldn't give up their ancestral land. However, many young villagers are also engaged in the efforts to protect the remaining mangrove forest. Many local leaders in the region promoted the project since the beginning and some continued to support it even after many villagers faced an increasing loss of livelihood due to the clearings and some of them denied that the shrimp farm has any negative impacts on the local population (Daily Express 2015). Many of the local elites are employed in the government sector and rely little on the mangrove forests. A member of an involved NGO argues: "Actually, those that are being paid are supporting it, those that are not being paid are not supporting it." (Interview 1) The continued support of the project from local elites despite concerns of other people is often referred to as elite capture (Platteau 2004). To tackle this issue, people from six villages surrounding the project site formed the G6 committee to take matters in their own hands. The wrote official complaint letters, petitions and hindered construction and clearings in the remaining mangrove forests. The committee is mainly led by local farmers and fishermen and man and woman participate equally in the coalition.

The main factor that leads to the negligence of environmental heritage and identities is, however, the indignity of the local population. One of the traditional practices in the mangrove forests is called *Momokan*, where people carry out worshipping rituals at sacred sites to maintain a close relationship with nature. Though *Momokan* is typically done by people practicing traditional religions, villagers who practice Christianity or Islam as their main religion still respect these practices and rely on the traditional ecological knowledge of these practices to take care of the land and to

sustainably use its recourses. Some people also ask believers of traditional religions to carry out worshipping sessions for them to prevent unwanted incidents and rely on their expert knowledge on traditional medicines to cure diseases (Joyiemin et. al 2017). *Momokan* is also practiced when the land will be opened for agricultural activities. However, this was not the case for the aquaculture project, as clearings already started before the local communities were consulted. Even if the EIA would have been properly carried out – without prior clearings and participation of all potentially affected people – and the promises of environmental benefits – employment, new infrastructure – were fulfilled, villagers may still be harmed or perceive injustice when their environmental heritage and identities are neglected. Schlosberg (2004) argues that self-determination is an important, if not the main aspect of justice. The affected communities now aim to turn the remaining 500 ha of mangrove forests into community-controlled land, where these customary rules and practices would apply. The large-scale projects in the region are often promoted to alleviate poverty. However, Jonas et al. (2016) argue:

> „It is true that the government classifies many villages in this part of Sabah as 'poor' and 'hard core poor', but this classification is based on limited economic data. It does not consider the deep and multi-faceted relationships between Indigenous Peoples and the territories and areas upon which they depend for their identity, survival, livelihoods and wellbeing – or the devastating impacts of the industrial shrimp farm and acacia plantation on this way of life." (8)

So, as the villagers are the best experts in their livelihood, community-controlled land would give them the chance to determine themselves if they want such a large-scale project and how it should be implemented.

Since early 2000, the price of shrimp started to decline relative to food, beverages, and other primary commodities, and farmers are confronted with price fluctuations of more than 15 percent per month. At the same time, there was a significant trend in agri-food systems towards private regulatory frameworks and the "supermarketisation" of the industry. While producers are the ones who have to bear the costs for regular inspections and the certification process, retailers, restaurant chains and seafood wholesalers can capture the surplus that consumers are willing to pay for a "green" commodity. This creates a "sustainability supplier squeeze" on the back of small-scale producers that mainly benefit large cooperation from the Global North. Ponte (2019) calls this strategy of lead firms "green capital accumulation" and argues that even though the ecological footprint of a single unit may be reduced, the growth imperative of capitalist production doesn't get challenged.

To promote the countries shrimp production and to tackle the "squeeze" producers by low margins, the Malaysian IZAQ model promotes vertically integrated intensive shrimp faring where the producers can capture more value. The shrimp farm in Pitas – which is part of the IZAQ model – planed to vertically integrate the production process and establish a processing facility and a distribution centre in the region. However, the processing facility never materialised. Early on, NGOs argued that the water scarcity in the region made a processing facility unlikely (Interview 1). If this was due to bad planning or even linked to corruption, as indicated in some interviews, is up for debate. Still, the lack of a processing facility certainly limits the ability of the project to make profits, as it is confronted with rising prices for inputs and declining prices for their products. In addition, due to the lack of a buffer zone, the project is unlikely to meet the requirements for any internationally recognised certification schemes, the anchor company of the project, Sunlight Seafood, was placed on an import alert list in the US due to residues of banned antibiotics in their products and the output of the project fell short (only 25 percent of the capacity). During the COVID-19 pandemic, the farm stopped operation due to the major shrimp price drop and still owes wages to their former workers. Their failure to comply with foreign food safety regulations and certification schemes certainly limits the chance of the project being profitable. However, as Islam (2014) notes, it is mainly the workers and local communities who bear the risks in the shrimp industry. Depending on the output of the shrimp farm, 10 to 70 local people worked at the shrimp farm under harsh working conditions and for low salaries (Joyiemin et. al 2017, Interview 1). There were also claims of up to 30 foreigners working at the shrimp farm (Interview 1). In addition, promises of new infrastructure for the local communities have not materialised and many people lost their livelihood due to the land clearings (Interview 1, 2, 3).

7 Conclusion

The review of the chain and network literature shows that there is an increasing interest in the role of non-economic actors in shaping production networks. These actors are crucial in analysing social and environmental (and special, cultural, political, etc.) issues in GPNs and show that global production is not merely an economic phenomenon. To broaden the scope of GPNs beyond economic phenomenon, Coe et al. (2008) call for a critical cultural political economy approach to GPNs and proposed Habermas' concept of the lifeworld (identity, everyday practices, habitus, etc.) and systems (bureaucratic and market structures, mode of production, etc.) as an analytical framework. Environmental justice movements and their struggle for distributive, participatory, and procedural justice happen in the lifeworld, whereas chain/network approaches often focus on the system of global chains/networks and their governance structures. Together, these two approaches form a comprehensive framework to analyse the local impacts of the global production networks.

Shrimp farming has been practiced by subsistence farmers for centuries across many Southeast Asian countries. However, since the 1970s, the so-called Blue Revolution changed aquaculture production dramatically in both quantity and form. Production shifted from extensive systems in natural ponds to intensive systems in artificial ponds that rely on inputs and know-how from around the globe and its focus gradually turned from "basic" foods for local consumption to "high-value" foods for international markets. With yields up to 50 times higher than extensive farms, these capital and technology-intensive types of aquaculture promised high profits for foreign investors and economic growth and foreign exchange earnings for countries in the Global South. Islam (2014) argues, that

> "[t]he emergence of the Blue Revolution, in fact, is largely due to the neoliberal global governance project to open up the natural resource pool of the global South to satisfy the appetites of wealthy consumers in the global North." (48f.)

However, the opening of natural resource pools for foreign private investment led to severe social and environmental issues for local communities and ecosystems. Issues like the degradation of mangrove forests, land grabbing, and the undermining of local food security are common examples of the negative impacts of shrimp farming. In addition, other segments of the network like input and supply or processing cause environmental and social problems as well (precarious working conditions,

overfishing, etc.). Due to the lack of public policies on these issues and increased attention on the environmental and social problems, private regulatory frameworks have emerged in the shrimp aquaculture sector since the early 2000s. While many of these schemes and frameworks certainly bring environmental improvements through more efficient processes, environmentally friendly inputs and outputs, and sustainable management practices, the underlying power structures in these production networks distribute the risks and benefits from these environmental upgrading efforts highly unequal.

Sabah is the main site of shrimp aquaculture production in Malaysia and most shrimp are produced in semi-intensive and intensive pond systems. The production in Sabah relies on large-scale shrimp farms with several hundred ponds whereas West Malaysian producers usually only have 10 to 30 pounds. The relative decline of shrimp prices coupled with the relatively high labour costs in Malaysia (compared with other shrimp-producing countries) and the production cost of the intensive system pose major challenges for aquaculture operators in Malaysia. The Malaysian government responds to these issues with a model (IZAQ) that promotes public-private partnerships to build large-scale vertically integrated aquaculture projects where the producers can capture value at the farm level. The shrimp farm for my cases study is also part of the IZAQ program.

Months before the EIA of the aquaculture project in Pitas was completed, land clearings and earthworks for the shrimp ponds in Pitas already started. Faced with an increasing loss of livelihood and plans to cut down further 500 ha of mangrove forests, the six villages surrounding the project site started to protest and form a committee called G6. The G6 committee was the main actor that led the protests against the shrimp farm, held press conferences, wrote official complaint letters, petitions and hindered construction and clearings of the remaining mangrove forests.

In Malaysia, governments took, and still take, a dominant role in decisions regarding economic development. This left only limited political space for other actors like environmental movements on these topics. Nevertheless, the environmental movement in Malaysia has constantly grown in the last decades, adapted its strategies to current political contexts, became more diverse, sensed new opportunities, and even became actors of political change. While the campaign in the 1970s was driven by established environmental NGOs and focused mainly on nature conservation and preservation, the pollution-driven protests and grassroots

movements led by indigenous communities in the 1980s and 1990s show how the notion of environmental gradually opened up to include key environmental justice issues like resident's health and indigenous rights.

Claims of indigenous communities on land in Sabha are based on Native Customary Rights (NCR). However, the provisions for native land in Sabah come with shortcomings for indigenous communities, as land laws often lack a broad recognition of the customs and livelihood of indigenous communities and how they are linked to their customary land. In addition, applications for native land usually take several years and sometimes even decades, which leads to people working on land that they do not formally own. In addition, land laws in Sabah have several provisions that allow the state to reclaim native land. Scholars conclude that land policies in Sabah favour private land ownership and large-scale projects over land rights or indigenous communities (Toh/Grace 2005, Majid Cooke/Toh 2012) as the former is regarded as a 'production for the market' while the latter is viewed as 'consumption' (Majid Cooke/Johari 2019).

Native customary practices and land are also a central issue in the case of the shrimp aquaculture project in Pitas. In my analysis, there were different inequality-generating categories that led to distributive, participatory and procedural injustices. Women are among the most affected by the declining resources, as they are more dependent on forest products than man and they have been harassed by people from the shrimp farm to prevent them from walking freely in the mangrove areas. Older villagers typically rely more on the mangrove resources than the younger ones and they have also a major cultural value for them. Even though young people were leaving the villages and moved to bigger cities to find jobs, many of them also stayed and got involved in protecting the remaining forest. Many local leaders in the region promoted the project since the beginning and continued to support it even after many villagers faced an increasing loss of livelihood due to the clearings. To tackle this issue, people from six villages surrounding the project site form a G6 committee to take matters into their own hands. One of the main issues that led to distributive, participatory, and procedural injustices was the negligence of the environmental heritage and the identities of the local indigenous communities. Even if the EIA would have been properly carried out and the promises of environmental benefits were fulfilled, villagers may still be harmed or perceive injustice when their environmental heritage and identities are neglected. These injustices are not only

rooted in local power structures of the lifeworld, but also in the system of the global shrimp industry. They form a complex and entangled relationship where they shape and (re-)produce each other. The affected communities now aim to turn the remaining 500 ha of mangrove forests into community-controlled land, where these customary rules and practices would apply.

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