

Rendering social: Rethinking the role of shrimp aquaculture certification in Thailand

Phatra Samerwong



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Phatra Samerwong

Thesis committee

Promotors

Prof. Dr S.R. Bush
Professor of Environmental Policy
Wageningen University & Research

Prof. Dr P.J.M. Oosterveer
Professor of Environmental Policy
Wageningen University & Research

Co-promotor

Dr H.M. Toonen
Assistant professor, Environmental Policy Group
Wageningen University & Research

Other members

Prof. Dr J. van Zeben, Wageningen University & Research
Prof. Dr D. Little, University of Stirling, United Kingdom
Dr F. Corsin, Sustainable Trade Initiative, Utrecht
Dr G. Schouten, Erasmus University

This research was conducted under the auspices of the Wageningen School of Social Sciences (WASS).

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Phatra Samerwong

Thesis

submitted in fulfilment of the requirements for the degree of doctor
at Wageningen University
by the authority of the Rector Magnificus,
Prof. Dr A.P.J. Mol,
in the presence of the
Thesis Committee appointed by the Academic Board
to be defended in public
on Monday 19 October 2020
at 1.30 p.m. in the Aula.

Phatra Samerwong

Rendering social: Rethinking the role of shrimp aquaculture certification in Thailand,
184 pages.

PhD thesis, Wageningen University, Wageningen, the Netherlands (2020)
With references, with summary in English

ISBN 978-94-6395-486-0

DOI <https://doi.org/10.18174/528362>

Acknowledgements

This PhD has been a long and difficult journey but a very memorable one for me. Looking back on this journey, many things were different from what I originally imagined. At many times I wanted to give up, felt lost, questioning myself, and even doubting myself. It is not an overstatement to say that reaching the finish in the form of producing this PhD thesis feels like I have accomplished a significant chapter of my life that I am very proud of. This PhD has required a lot of patience, efforts and commitments, but it has also made me a stronger person. I could not have done this without the support and encouragement from many people for which I am sincerely grateful. Their support has given me confidence and strength to believe that I could reach the end of this PhD journey.

First and foremost, I have been very fortunate to have such an incredible and supportive supervisory team that guided me throughout the journey. There were countless times when they saw me crying and telling them I wanted to give up, but they all kept pushing and encouraging me to believe in myself. These simple words left a great impression on me and made me not give up. I would like to take this opportunity to thank all of them. My promoter, Simon, whom I first learned about as an ENP lecturer who can speak Thai right before I took an MSc course in which he was a guest lecturer. Little did I know that he would have a very significant influence on my long journey here in Wageningen. Thank you for always guiding me and keep pushing me to become a better person. You have given me continuous support both through feedback on my work and support on my personal concerns. I have learned a lot from you, not only in relation to my research and writing, but also how to deal with pressure and expectations. You have always pushed me and challenged me to go beyond what I thought was my ability. I am very thankful for your patience, suggestions, and for motivating me to finish this PhD. My co-promoter, Peter, who was integrated to the supervising team after Arthur was appointed as Rector Magnificus. He is the first ENP staff that I met during my MSc program. I remember that he was very kind to me, and explained how to improve my essay for the course. From that moment until the end of my PhD he has kept giving me advice on how to improve my analysing and writing skills. He has always been so kind to me, explaining little details when I was not sure about what to do or whether I understood things correctly. And Hilde who was the latest addition to the team and who has really helped me to make enormous progress in the last chapters of the thesis. She is very friendly and kind to me which has made me feel comfortable in expressing my concerns and ideas. I have come to terms of not to be afraid of asking for help and that it is okay to say no or to disagree. All three of you have

taught me so much and I am very thankful for having so much patience and for pushing me until I reached the end.

Next, I would like to say thank you and give the biggest hug ever to my biggest cheerleaders, my parents and my family who have always been so supportive and encouraging me to never give up. Even though we mostly stayed in different time zones, thanks to online communications those distances were never a problem. In addition to all the love and support they have given me, they have also assisted me on my data collection in Thailand on several occasions. Mom, thank you for always taking care of me when I am at home and becoming my personal driver when I had to go to interviews and fieldwork. And to my dad for accompanying me when we had to go to fieldwork and shrimp events. Without both of you the arrangement of my data collection in Thailand would have been much more difficult, which would have added even more stress to my situation. P'Mars for visiting me and letting me travel around Europe throughout the years. It is good to see family members every now and again and this makes me feel like I am never far away from home. And to other family members, my grandmother, aunts, uncle and cousins, thank you for always passing along warm and encouraging messages. ขอขอบคุณคุณพ่อ คุณแม่ คุณย่า สำหรับความรัก แรงบันดาลใจ และกำลังใจ ขอขอบคุณพี่เบียร์ ญาติ และเพื่อนๆ ทุกคน สำหรับกำลังใจและความห่วงใย

I would like to also extend my gratitude to my colleagues at the Environmental Policy Group (ENP). Thank you for making me feel like home and for many good memories. I am grateful to have been part of this ENP group and for the opportunity to have met all of you. It is time for me to say goodbye, but I will forever cherish the friendship I have made. Pamela and Nila, thank you for always cheering me up and listening to me when I was feeling down. And special thanks to Corry for her kindness and all the help. Words cannot describe how much you have helped me, answering all the questions and arranging so many things for me.

Special thanks to all my friends in the Thai community for the wonderful memories. You have really made Wageningen feel like home to me for the past ten years. I have so many memories with my Thai friends. All the warm welcoming and support which made my staying here feel like home. Thank you to P'Aum, P'Tom, P'Mam, P'Plar, P'Veow and Kees for your encouragement during the last stage of my PhD. And to Alice and her family for cheering me up and helping me with the English corrections. Special appreciation to those who helped with the arrangements for the interviews and to my respondents for giving me all of the valuable data for my research. And lastly, an acknowledgment to the Office of the Higher Education Commission, the Royal Thai Government for the Humanities and the Social

Sciences Scholarship program for giving me this opportunity for pursuing my study and to experience this PhD journey.

One important thing I have learnt is that this PhD journey is not just about conducting fieldwork, reviewing literature and writing papers, but also about the interactions with other people, which is both work-related and personal. Through so many ups and downs, this PhD has been a life lesson for me. Learning and experiencing to grow up, reflecting, dealing with all the stress to survive, and be independent on my own - is for me the biggest lesson of all. Reaching the end of this PhD is not the end of the journey but only a closing of one chapter of my life. This is a start for a new journey that is waiting for me.

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Abbreviations

ACFS	National Bureau of Agricultural Commodity and Food Standards
ADCC	Aquaculture Development and Certification Centre
ASEAN	Association of Southeast Asian Nations
ASEAN Shrimp GAP	Association of Southeast Asian Nations Good Aquaculture Practices for shrimp
AIPs	Aquaculture Improvement Projects
ASA	ASEAN Shrimp Alliance
ASC	Aquaculture Stewardship Council
ASIC	Asian Seafood Improvement Collaborative
BAP	Best Aquaculture Practices
BMPs	Better Management Practices
CCRF	FAO's Code of Conduct for Responsible Fisheries
CoC	Code of Conduct
DoF	Department of Fisheries
EMS	Early Mortality Syndrome
EMT	Ecological modernization theory
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDA	Food and Drug Administration
GAA	Global Aquaculture Alliance
GAP	Good Aquaculture Practices
GAP-7401	Thai Agricultural Standard Good Aquaculture Practices for Marine Shrimp Farms 7401
GIZ	German development agency
GSSI	Global Sustainable Seafood Initiative
ha	Hectare
HACCP	Hazard Analysis and Critical Control Points
IDH	Sustainable Trade Initiative

ISEAL	International Social and Environmental Accreditation and Labelling Alliance
ISO14001	International standard for Environmental Management Systems
ISO/IEC 65	General requirements for bodies operating product certification systems
kg	Kilogram
MSC	Marine Stewardship Council
NGO(s)	Non-Governmental Organization(s)
ONEP	Office of Natural Resources and Environmental Policy and Planning
SD	Standard deviation
SEAFDEC	Southeast Asian Fisheries Development Center
SEASAIIP	Southeast Asian Shrimp Aquaculture Improvement Protocol
SFT	Seafood Task Force
ShAD	Shrimp Aquaculture Dialogue
TAAF	Thai Frozen Foods Association
TAS 7401	Thai Agricultural Standard Good Aquaculture Practices for Marine Shrimp Farms 7401
THB	Thai Baht
US	United States
USAID	United States Agency for International Development
USD	United States dollar
WWF	World Wide Fund

Chapter 1

Introduction

1.1 Certifying sustainability

Aquaculture is one of the fastest growing food production sectors (Bush and Oosterveer, 2019; Jayanthi et al., 2018; Jonell et al., 2013; Little et al., 2016). For the past three decades, shrimp aquaculture has expanded dramatically (Hall, 2004; Lebel et al., 2002; Little et al., 2016), especially in Asia where 90 percent of global production is located (Anderson et al., 2017; 2018; Little et al., 2016). This growth is expected to continue in response to regional and global demands (Subasinghe, 2017).

The growth of shrimp aquaculture has also, however, led to a range of sustainability related impacts. First, shrimp aquaculture practices have contributed to environmental degradation through the misuse of chemicals and antibiotics, over-extraction of wild brood stock, and increasing waste flows to ambient ecosystems (Clayton and Brennan, 1999; Delgado et al., 2003; Little et al., 2016). Second, negative impacts have also emerged from the expansion of pond areas leading to mangrove loss (Hamilton, 2013), as well as the conversion of agricultural land, and the salinization of water supplies and nearby agricultural land (Samerwong, 2012; Szuster, 2007). Third, food safety concerns are linked to the misuse of pharmaceutical inputs (Nguyen et al., 2019). These three concerns have turned a spotlight on the shrimp aquaculture industry and driven the emergence of public and private governance approaches for pushing the industry to change its practices.

Three general responses to these sustainability concerns have emerged. First, technical innovation for farm level production (Joffre et al., 2017). For instance, the development and adoption of closed-system farming which controls interactions between pond systems and the wider ecosystem (Joffre et al., 2018; Lebel et al., 2002; Nguyen et al., 2019). Second, defining and implementing prescriptive management guidance by states and international organisations. For example, Better Management Practices (BMPs) that standardize on-farm practices by translating concerns into the local context and set technical indicators as the target for producers to improve their practices (Kusumawati and Bush, 2015; Vandergeest, 2007). Third, supply chain responses like voluntary sustainability certification, which establishes market rewards as motivation for producers to improve production practices (Jonell et al., 2019; Thlusty and Tausig, 2015; Ward and Phillips, 2008).

Voluntary certification has become one of the dominant mechanisms that promotes and drives the sector towards responsible aquaculture production (Bush et al., 2013b). Certification works by identifying ‘responsible’ or ‘sustainable’ farms (depending on the claim being certified) by verifying farm compliance against performance-based standards. Once enough individual farms have been certified it

is assumed a region and/or sector can address the issues raised above so that the overall sustainability performance is improved (Jonell et al., 2013). Certification as such provides fundamentally ‘technical’ guidance of best practices as defined by experts, and acts as an improvement tool that pulls producers to a predefined level of performance (Tlusty, 2012; Tlusty and Tausig, 2015). The range and use of certification has proliferated to more than 30 across the seafood sector operating in both domestic and international markets and developed by governments, NGOs and industry organisations alike (Phillips et al., 2003; Wijen and Chiroleu-Assouline, 2019). Despite this growth, however, questions over the effectiveness and ambiguity over the mechanisms through which they operate have emerged. These questions have not only focused on the technical performance of standards alone. They have also focused, with increasing consistency, on the social constraints of certification; ranging from the inclusion of diverse types of farmers (e.g. Mutersbaugh, 2002) to the kinds of changes certification brings about in public policy processes (e.g. Bush and Oosterveer 2019).

Building on this wider ‘social turn’, this thesis explores the role of certification in steering responses to aquaculture sustainability as a set of social rather than technical challenges. In doing so, this thesis rethinks what certification is beyond a set of standards, by exploring the role of certification in the wider governance of aquaculture from local to national and international scales using the case of Thai shrimp.

1.2 Certifying Thai shrimp aquaculture

The Thai Shrimp aquaculture demonstrates the growth, challenges and ongoing potential of certification as a means of shaping progress to more sustainable production. Shrimp aquaculture expanded dramatically from the 1970s onward (Lebel et al., 2010; Szuster, 2006), with peak expansion reached in the 1990s resulting in the country becoming and maintaining a top 10 global producer (FAO, 2019). Today ninety percent of Thai shrimp products are destined for export markets (OAE, 2015).

The country also has a rich diversity of shrimp farming systems, including extensive and intensive farms ranging from farms less than a hectare to large farms owned by multi-national corporations (Engle et al., 2017; Vandergeest and Unno, 2012). The expansion of the sector has been facilitated in large part by the combined effort by government and the private sector (Goss et al., 2000; Vandergeest et al., 1999). The Thai Department of Fisheries together with the industry, dominated by Thai-based internationalized corporations (e.g., Charoen Pokphand, Thai Union), have invested

in a range of technical innovations, farming techniques and contract arrangements that continue to shape the performance of the industry. Central to these efforts is the ongoing ambition to transition to intensive forms of shrimp production in order to maintain of the country's position in the global export markets.

While the success has brought benefits to shrimp farmers, however, the long term sustainability of the industry has long been questioned (Dierberg and Kiattisimkul, 1996; Flaherty et al., 2000; Szuster, 2006; Vandergeest, 2016; Vandergeest et al., 1999). The industry has experienced a series of 'boom and bust' cycles linked predominantly to diseases such as EMS, pathogen transference, white spot and yellow-head (Flaherty et al., 2000; Szuster, 2006; Vandergeest, 2016). The outbreak and management of these diseases is linked to a combination of on farm practices, bio-secure seed production and the status of coastal ecosystems in controlling ambient conditions that affect the spread, pathology and virulence of these diseases (Szuster, 2006). The Thai government and industry alike have shown their concern and have provided numerous efforts to respond to the ongoing environmental management and the long-term sustainability of the shrimp aquaculture. As argued by Lebel et al. (2010) Regulations and the application of both national better management practices and international certification standards have been central to the governance of the sector, in large part because they are seen as supporting the long term goals of maintaining international competitiveness.

The Thai government was early in anticipating the growing importance of certification in the global market as reflected by the development of multiple national standards (Samerwong et al., 2018; Vandergeest and Unno, 2012). International third-party certification including the Aquaculture Stewardship Council (ASC) and Global Aquaculture Alliance (GAA)) have been adopted in Thailand - although with only a small number of, almost exclusively large-scale, farms or processor-contracted farms, currently certified (ASC, 2020; BAP, 2020). Nonetheless, the government and industry alike has continued to encourage certification as a means of meeting export market demands and promoting ongoing improvement of the sector.

1.3 What is certification?

Certification is a mechanism of assurance that operates by verifying compliance to specified requirements written in a set of 'expert defined' standards. Certification is, however, far from a single approach. There is considerable variation in the claims verified by different certification schemes (ranging from sustainability to food safety, labour and organic to name a few), how these claims are translated into standards (metric or qualitative), and the geographical scope covered (national, regional or

global) (Nadvi and Wältring, 2004). However, common to nearly all sustainability focused certifications is the goal of incentivising environmental and social performances of producers, and in some instances food processors and other related chain actors (Tlusty, 2012). Performance is translated and verified through a set of criteria and related indicators in the standard that prescribe measures of performance against which producers need to demonstrate compliance (Hatanaka et al., 2005).

The wider ‘theory of change’ of certification is to generally recognise best performers and incentivise poor performers along a pathways of improvement pre-defined by experts (Rogers, 2014; Roheim et al., 2018; Romero et al., 2017; Sayer et al., 2017; Stein and Valters, 2012). Core to this theory of change is to incentivise producers through price premiums, preferential access, new market access and/or potential for added-value for differentiation of products and longer-term advantages (Kobayashi et al., 2015; Roebuck and Wristen, 2018; Roheim et al., 2018; Ward, 2008b). Eco-labelling is then assumed to provide the ability for consumers to differentiate products and offer a price premium for certified products. Thus, leading to the increasing demand of certified products and the transfer of economic incentives trickling down the value chain.

The most robust model of assuring compliance to certification standards is perceived to be third-party conformity assessment. This entails the criteria and indicators being verified by ‘third-party’ conformity assessment body that is independent of the standard owner (see Ward and Phillips, 2008). Once positively assessed, the unit of certification - be it a farm, group of farms, a feed mill and/or processing facility - is awarded a certificate of compliance. In most, but not all cases, this certificate also allows products produced and sold from the unit of certification to display a ‘label’ on their products (Bain and Hatanaka, 2010; Ward and Phillips, 2008). This label, and the certificate behind the label, provide a degree of assurance to buyers (including consumers) that these products comply to the claims set out by the standard holder - such as responsibly or sustainably produced.

The 30-plus certification schemes relevant to aquaculture cover a diverse range of claims from organic, to responsible and sustainable aquaculture and cover everything from production practices, to environmental impact, social issues related to labour, and the environmental performance of key inputs like feed and seed (see Bush and Oosterveer 2019). This thesis includes an analysis of three international certification standards in addition to three Thai national aquaculture standards.

The three international standards are the Best Aquaculture Practices (BAP) standards developed by Global Aquaculture Alliance (GAA), the Aquaculture

Stewardship Council (ASC) standard and the Southeast Asian Shrimp Aquaculture Improvement Protocol (SEASAIP) standard, all of which are applied to shrimp. GAA is a non-governmental organisation aiming to improve the most impactful farmers in the industry (Tlusty and Tausig, 2015). GAA's BAP standard covers a comprehensive range of issues from environmental, social, to food safety and traceability and is designed as specific farmed-species standards but also cover various stages of operations (FAO, 2018; Lee, 2009). Currently it is the most prevalent international certification in the Thai shrimp sector with 269 farms certified (BAP, 2020). The ASC is a third-party business-to-consumer certification that is founded through collaboration of World Wide Fund (WWF) and the Dutch Sustainable Trade Initiative (IDH). It certifies aquaculture operations and covers various species including shrimp, tilapia and salmon. Despite its current low uptake in Thailand, however, globally its numbers have been rapidly increasing. SEASAIP standards is developed through a multi-stakeholder arrangement of Aquaculture Seafood Improvement Collaborative (ASIC). It focuses on criteria that are important from market's perspective including environmental, social and traceability and based on country GAPs and Seafood Watch criteria (ASIC, 2016). It is the most recent shrimp aquaculture standard introduced in Thailand.

Thailand also has three national standards to address environmental management of shrimp aquaculture. They are the Code of Conduct (CoC) developed in 1998, the Good Aquaculture Practice (GAP) developed in 2000 by the Department of Fisheries (DoF) and GAP-7401 developed in 2009 (Prompoj et al., 2011; Samerwong et al., 2018). The national GAP standards have also been developed by governments in other countries such as Vietnam and Indonesia to be applied in their own country (see Nguyen, 2015; Tlusty et al., 2016). The three Thai national standards although share some similarity in their requirements, but they also differ in the issues covered and their level of stringency. The three standards however have not received the same level of attention by farmers with GAP having the highest number of certified farms.

1.4 Challenges to (aquaculture) certification

Concurrent with the growth certification in the aquaculture sector as a means of assurance for major importing seafood markets is the emergence of various challenges to its effectiveness as a mechanism for promoting sustainability. These challenges can be grouped into three main categories: (1) the apparent exclusion of smallholders who remain highly prevalent in aquaculture production around the world, (2) the perceived 'confusion' over the number, scope and methodologies used

by different certification schemes, and (3) the apparent lack of evidence of sustainability improvement at regional scales.

1.4.1 Accessibility

It is estimated that only five percent of global aquaculture production is currently certified (Seafood Certification and Ratings Collaboration, 2019). While this still amounts to 5.4 million tonnes of aquaculture products, the rate of expansion of certified production remains lower than the overall growth of global production (FAO, 2020).

Relatedly, certification is also criticised on its weak inclusion of small-scale farmers that still make up around 85% of all producers in major producing countries like Thailand (Bondad-Reantaso et al., 2009). The reasons for this weak inclusion are related to weak knowledge, skills and insufficient land and financial resources for compliance (Hatanaka et al., 2005). Certification is also seen as creating a market barrier due to high costs of compliance and/or auditing (Swinnen et al., 2015). The proliferation of certification is also thought to add complications because it prescribes new and often costly production practices, duplicates or overlaps tasks for producers and, again, higher auditing costs (Bush et al., 2013b; Lambin and Thorlakson, 2018; Ponte and Gibbon, 2005).

There is also limited evidence that economic incentives driving certification are taken positively by farmers. Certification is more commonly perceived as a trade barrier by farmers (Leadbitter, 2008; Maertens and Swinnen, 2009) since the cost of implementing certification is often higher than the profits and price premium which are even not always guaranteed (Klooster, 2006). The lack of economic incentives makes it difficult to attract farmers (and especially small-scale farmers) to participate, and tends to exclude those who have financial difficulties to invest in compliance (Belton et al., 2011; Bush and Belton, 2012). These barriers are also thought to create inequality between farmers (Gómez Tovar et al., 2005). It is easier for larger-scale farmers to profit from economies of scale because of certification and, therefore, they are gaining competitive advantage over smaller-scale farmers (Nebel et al., 2005). Small scale-farmers are instead excluded from major (and sometimes, but not always, more lucrative) importing markets like the European Union (EU) and the United States (US) (Belton et al., 2011).

In sum, it is questionable whether the market-based theory of change behind certification motivates producers to participate in certification schemes and/or engage in any systematic programme of sustainability improvement. This in turn

raises two opposing questions. Does this mean that certification as a market-based tool is redundant? Or can certification be adapted to better support the motivations of farmers to improve?

1.4.2 Proliferation

There are currently more than 30 seafood certification programmes in the market developed by NGOs and governments (Roheim et al., 2018). They share similar goals in achieving sustainability for the sector, but also differ in their definition of techno-scientific values, practices and objectives (Bain and Hatanaka, 2010). Their interpretation of how sustainability, as a credence product quality, is defined also drives this proliferation (Roheim et al., 2018), as does their competition for market share (Derkx and Glasbergen, 2014).

The proliferation of standards could be seen as a means of matching diverse consumer preferences with diverse producer practices. Overall, however, proliferation is seen in negative terms. Linking to the same themes driving small holder exclusion, proliferation is seen as driving unnecessary duplication of effort, increasing cost for aligning to different certifications, causing confusion for consumers and creating further fragmentation of governance in already complex food systems (Derkx and Glasbergen, 2014; Lambin and Thorlakson, 2018). As various documented (Bitzer, 2012; Derkx and Glasbergen, 2014; Fransen, 2011; Glasbergen, 2013; Lee et al., 2012; Washington and Ababouch, 2011), these concerns in turn feed back on certification by undermining the stringency, credibility and legitimacy given to certification as a means of governance by producers, consumers, states and NGOs alike.

The proliferation of certification is in part a function of the governance system of which it is a part. Certification emerged through a shift in responsibility over monitoring food safety and quality away from government agencies under conditions of economic globalisation (Djama et al., 2011; Hatanaka et al., 2005). Central to this shift is the role of NGOs and businesses in the Global North, who have driven a market for ‘private certification’ within which market share is competed for (Jonell et al., 2013; Ponte and Cheyns, 2013). In response to the rise of private certification there has been concurrent investment by governments in major producing countries like Thailand to develop their own national certification systems (see Glasbergen and Schouten, 2015; Hospes, 2014; Schouten and Bitzer, 2015; Vandergeest and Unno, 2012; Wijaya and Glasbergen, 2016). These national or ‘public certifications’ are in some instances recognised by export markets, with the effect of further contributing to the proliferation of standards available to

producers and consumers (Lambin and Thorlakson, 2018; Schouten and Bitzer, 2015).

The outcome of competition between aquaculture standards also remains unclear. While stronger competition can in theory drive a ‘race to the top’ among schemes it is also possible that competition leads to a ‘race to the bottom’ as schemes seek increased market share (Bitzer et al., 2008; Lambin and Thorlakson, 2018; Ponte and Riisgaard, 2011; Roheim et al., 2018). While evidence is scattered, the overall image of proliferation and subsequent competition between certification schemes is perceived as negative. In spite of its market-based underpinning, certification appears to fail to provide an efficient means of promoting more sustainable production (Fransen, 2011).

Overall, however, the implications of proliferation continue to be debated. How multiple standards affect the inclusion and performance of producers, represent different interests and collectively influence the sustainability of the sector remains an open question.

1.4.3 Impact

The third challenge to certification in the aquaculture sector is its material impact on sustainability. Questions over the impact of certification stem directly from its relatively low coverage of producers and open up new questions about the trade-offs between increasing coverage vs. maintaining or increasing the ambition of standards and/or the stringency of standard compliance.

Three main observations can be made on the link between the ambition and stringency of standards and their sustainability impact.

First, the competitive nature of certification schemes to enrol farmers and subsequently increase market share raises the concern that certification schemes might lower the stringency of their standard in an attempt to increase the number of certified farms (Lambin and Thorlakson, 2018). While there is little evidence of existing standards doing so, the variety of standards available to farmers shows different levels of ambition and stringency. A direct consequence of weak ambition and stringency is that farmers self-select certification standards that match their existing level of performance and, as a consequence, undermine overall improvement (Gulbrandsen, 2010; Ponte, 2012). Such a scenario is the direct consequence of the race to the bottom outlined above.

Second, in contrast to this race to the bottom, the impact of certification can be undermined by having levels of ambition and stringency that are unrealistic for farmers. In short, farmers are unlikely to be pulled up a certifiable level if the degree of improvement is too great (Marschke and Wilkings, 2014). As a consequence, certification may paradoxically exclude those farms with the highest (potential of) environmental impact (Jonell et al., 2013).

Third, it remains unclear whether the farmers will continue to improve once certified (Tlustý, 2012). This observation raises concerns about the aspirations of standards to focus on the best performers as a means of promoting the benefits of sustainable performance. Such expectations go in two directions. It is either assumed that the demonstrated benefits of certification will either encourage weaker performing farmers to improve (with or without being certified), or that sustainability benefits driven by better performers have wider ‘regional’ effects that positively affect non-certified performers. All of these assumptions are, however, premised on the continued improvement beyond a ‘just certified’ level. At this point in time such improvement is not clearly documented.

Overall, the evidence in demonstrating the effectiveness of certification in reducing environmental impact is still lacking and therefore this makes it difficult to truly attribute the impacts of certification in addressing environmental problems (Boyd and McNevin, 2012). There are a number of reasons for this documented in the literature. First, causal improvement is difficult to measure and likely takes a longer period of time to measure than is currently done (Ward, 2008b). Second, reiterating the points above, it is unclear what critical mass of certified farmers are needed to have a positive effect on ecosystem function (Jonell et al., 2013; Jonell et al., 2019). Third, the auditing practices only verify the compliance at time of inspection rather than the long-term impacts and benefits of certification (Boyd and McNevin, 2012). This means that auditing is unable to measure how much was improved compared to the previous gap as there are challenges on proper measurement that assesses and tracks improvements and impacts of standard compliance.

The inability to provide evidence of the impact of certification appears to risk its legitimacy as a farm-level sustainability tool. If there is no impact, the argument goes, producers are increasing individual cost at the expense of an unattained public benefit. It also seems to be contributing to the continuing proliferation of standards, as different groups of actors develop newer schemes to demonstrate (different) impacts of certification. The question is, however, whether the impact of certification is being assessed in the right way. Is the direct measurable ecological outcome the only measure of the effectiveness of sustainability certification?

1.5 Rendering certification technical

The challenges outlined above all stem from an understanding of certification as a technical assessment tool that aims to incentivise farmers to improve production practices which directly contribute to sustainability.

Just as the problems outlined above are all framed in technical terms, the solutions to these problems are also seen as technical challenges. Accessibility is seen as a problem remedied by improved training, setting better incentives or setting standards at a level that enables more inclusive levels of compliance (ISEAL, 2020). Proliferation is seen as a problem that can be addressed through harmonization of standards and/or aligning compliance assessment methodologies (Amundsen et al., 2019; Tlustý and Tausig, 2015). Impact is seen as a problem that can be overcome by more precise definition of standards or uncovering causal links between changes in practice and improvements in ecosystem functioning (Phillips et al., 2003; Ward, 2008a). However, rendering certification technical also restricts how challenges to its role, function and impact can be understood and addressed. In other words, rendering certification as a technical tool also renders solutions to its limitations as technical.

Rendering technical refers to the characterisation of complex problems like ‘development’, ‘poverty’ or ‘sustainability’ by the government or development agencies as apolitical and, as a consequence, best solved through technical solutions or technical fixes (Ferguson, 1990; Li, 2007). This means that the social and political drivers of poverty, inequality and/or unsustainable behaviour are framed in technical terms - such as GDP, skills training and investment - rather than understood as the outcome of social conflict, marginalisation, and actively produced regulatory voids (Li, 2007; Paranage, 2019). Rendering complex societal challenges as technical is as such a means of depoliticization of social and political issues or conflicts that contribute to their cause.

There is a considerable literature exploring the consequences of rendering certification technical. Central to this literature is the observation that certification has been positioned as a technological solution, which reframes the reality of the problem as a bio-physical problem to be addressed by technical fixes at the farm level and not via political or structural solutions (Béné, 2005). By making certification a purely technical problem the social and political conditions that affect changes to production practices are either not seen or ignored. For instance, the application of prescriptive Better Management Practices in Indonesian shrimp culture can ignore the limitations placed on farmers by trader-patrons (Kusumawati and Bush, 2015).

Similarly, the success of organic certification in Vietnam is a function of its alignment to the goals of the Vietnamese government in controlling marginal mangrove regions rather than the technical precision of the standards (Ha and Bush, 2010).

As summarised in Figure 1.1, these cases demonstrate a technical, linear and unidirectional application of certification based on the translation and implementation of expert knowledge to steer production practices (Figure 1.1). It is precisely this simplistic understanding that this thesis seeks to address. But in doing so this thesis does not seek to reject certification outright. Far from it. Certification, like any institution, is able to reflexive change (Bush et al., 2015). To do so new ways of understanding the role of certification in creating change needs to be opened up and this, this thesis argues, should be based on the role of certification in shaping the social conditions under which its sustainability goals can be reached.

There are already grounds within the literature to assume that a new social understanding of the form and function of certification is possible. Certification is already understood as shaping public policy (Gulbrandsen, 2014; Savilaakso et al., 2017), enhancing the transformative capacity of public institutions (Schouten et al., 2016), and empowering community-based organisations to reorganise production practices (Pérez-Ramírez et al., 2012). Certification is also seen as a means through which political influence can be exerted on both government and industry (Cashore et al., 2004; Gehring and Oberthür, 2009; Vormedal and Gulbrandsen, 2020). All of these cases illustrate the potential of rethinking certification beyond a narrow technical tool to incorporate a rich diversity of social processes that are affected by its application beyond the level of the farm. How certification can be reimaged in the case of aquaculture certification is the challenge taken up in the rest of this thesis.

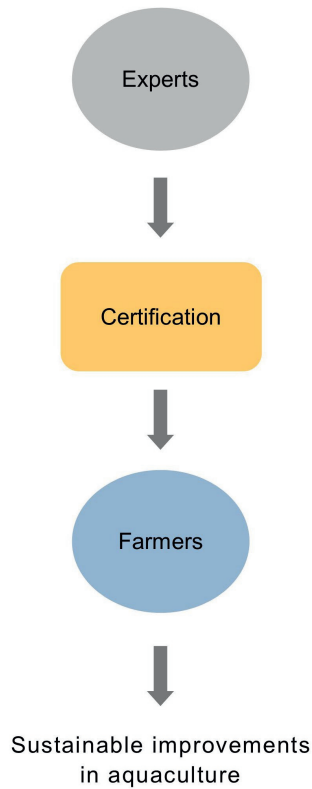


Figure 1.1. Rendering certification technical and its one directional relation.

1.6 Towards a social understanding of certification

We now turn to the theoretical basis upon which this thesis builds. As already indicated, attempts have already been made to understand the role of certification in social terms. What emerges from the literature is a number of competing theoretical perspectives that highlight different social processes in which certification operates. These theoretical perspectives not only affect how we understand what certification is and what it currently affects, but also influence the potential to imagine what certification ‘could be’ if reimagined in stronger social terms - that is, *rendered social*.

1.6.1 Political Economy

The first body of literature that has focused on certification as an object of social analysis falls broadly under the heading of political economy. Central to this literature

is the role of certification in redistributing power (or not) among different groups of actors aligned (or not) with its goals. This literature emphasizes the role that certification also plays in shaping access and control over means of production - land, labour and material inputs. In doing so attention is given to how certification reifies rather than challenges existing relations of control over these means of production (Bush et al., 2013b; Ha et al., 2012; Hall, 2004; Hatanaka et al., 2005; Vandergeest, 2007).

Political economy analysis of certification also draws attention to the realignment of power relations between public and private regulators over certification. For instance, how certification becomes a site of conflict over the definition of sustainability (Foley and Havice, 2016) or an object of power that reshapes or reaffirms relations in global value chains (Hatanaka et al., 2005; Mutersbaugh, 2005; Ponte, 2008). Both as a site and object of power, certification in the market is complicit in shaping who does and does not benefit from sustainability certification (Schleifer and Sun, 2018). This as such also extends to the influence of multiple distant markets (with different consumer demand and certification standards) over the means of production, economic policies, and conditions for production. Power is therefore embedded within competing interests among actors within the same certification and between different certification schemes in gaining dominant market share.

Political economy analysis has raised key concerns over the performativity of sustainability certification. As argued by Ponte (2008), the emphasis placed by certification on market actors and market mechanisms as mechanisms of change distracts from the underlying *cause* of unsustainable practices (Ponte, 2008). This he argues leads to ‘sustainable’ products, but not ‘sustainable’ production systems. Certification is as such criticised for not emphasizing the underlying social, economic and political drivers of ecological degradation.

1.6.2 Political Ecology

Political ecology studies how power, social, economic, and political relations can arbitrate or influence the human-environment relations, the cause, and the management of environmental problems (Biersack, 2006; Forsyth, 2003). Building directly on political economy, it enables an understanding of material and discursive conflicts over environmental issues that affects control and power over people (Vandergeest and Roth, 2016).

Political ecology scholarship on certification has particularly emphasised the role of narratives in shaping the rationale for certification and representing particular realities of ecology and people (Forsyth, 2003). Environmental problems and solutions, it follows, are identified, shaped, and/or produced by power relations among actors within a particular historical or political context (Forsyth, 2003; Robbins, 2012). For instance, certification enables actors like NGOs and retailers to define narratives of ‘appropriate’ environmental activity based on their values and exert control over sites of production (Jonathan and Tad, 2015; Klooster, 2006; Vandergeest et al., 1999). These narratives of what certification is and can be also define whose knowledge, values and concerns count as problems and solutions (Barham, 2002; Klooster, 2006). Certification therefore becomes an object and a means of social control *through* sustainability.

Political ecology is different from political economy in that it emphasises environmental justifications for control. In doing so political ecology focuses on environment as a means rather than an only outcome of access, control and distribution. Both theories emphasise the important of power dynamics. However, they offer little in the way of reform of certification. The outcomes presented are commonly absolute - certification is inherently a tool of power and control - and as such offers little guidance on how certification can be reimagined and reformed to contribute to equitable and sustainable outcomes.

1.6.3 Ecological modernization

The third body of literature falls within the domain of ecological modernization theory (EMT). EMT contrasts markedly with political economy and ecology by arguing for the reorganization of public and private institutions to contribute to sustainable development (Mol and Spaargaren, 2000). The theory explores the ways in which ecological principles or ‘rationalities’ can be integrated into economic and political institutions and practices in a way that decouples economic growth from environmental decline (Brey, 2017; Mol and Spaargaren, 2000). While EMT focuses on a range of institutional arrangements, a key area of research has been on the emergence of certification, exploring the ways in which it represents the integration of ecological and economic rationales for environmental improvement (Spaargaren and Mol, 1992; Spaargaren et al., 2009).

The integration of ecological rationalities through institutions like certification are theorized as enabling the reflexivity of actors in a given field like aquaculture. By fostering reflexivity these actors are being enabled to change those practices that contribute to environmental decline without radically breaking completely from

those practices (Mol, 2001; Mol and Spaargaren, 2000). It is, as such an instrument that guides both technical *and* social changes for the purpose of sustainability (Lynch-Wood and Williamson, 2010). EMT also opens up the possibility for understanding processes of reflection and redesign of institutions like certification as they are exposed to new information on the consequences of their application. That is, these institutions are presumed to be able to reflexively ‘modernise’ as they are confronted with the (un-)intended side-effects of their application. This again opens certification up as more than simply a fixed technical tool of environmental reform.

EMT has also come under considerable critique. For instance, it is argued to focus too much of processes of decoupling of economic growth from environmental degradation (Spaargaren and Mol, 1992) rather than challenging economic growth as the cause of environmental degradation and sustainability (Backstrand, 2010). In being too optimistic, EMT is thought to overlook the risk of exceeding the environmental capacity of primary production processes such as those seen in aquaculture. In contrast to political ecology and political economy approaches it is also seen as weak on power.

1.6.4 Rendering social?

Each of the theoretical perspectives outlined above provides insights into certification as means of environmental management through markets whereby structural conditions are set for improved producer performance. However, they differ in their intentions and outcomes. Political economy and political ecology understand certification as part of a broader liberal capitalist approach that exerts power over producers to conform to standards. Certification is as such seen as a mechanism of capitalism rather than an actor that is able to reflexively adapt in order to positively influence environmental outcomes. EMT, in contrast, argues for the incorporation of an ecological rationality to reshape markets for positive environmental outcomes (Mol, 2001; Mol and Spaargaren, 2000). It tends to emphasise the role of certification in enabling farmers to change their practices at the expense of engaging with the structural limitations to this change. In summary, while these approaches hold key insights into the role and function of certification they tend to objectify certification as a *technical* means of either control or reform without explaining the potential for certification to simultaneously engage with the myriad of actors that shape the *social* conditions under which environmental improvement takes place.

This thesis explores how certification can be rendered social; that is, reimagining the form and function of certification as simultaneously responding to and reshaping the social and political conditions that enable sustainability improvement. Instead of controlling the means of production, and in doing so setting control over producers, the thesis explores how certification can shape the means of improvement, and in doing so enable producers and regulators alike to foster positive change towards sustainability. Can certification be reimagined as an agent of change that reflexively adapts and shapes the political, economic and social relations between key actors and thereby enable such improvement?

1.7 Research question

This thesis explores the social dynamics that constitute and are affected by certification using the case of Thai shrimp aquaculture. In doing so, the thesis contributes to a social theoretical understanding of certification that offers a new perspective on the possible roles and broader impacts of certification beyond farm-based technical performance and standard compliance.

The overall question addressed is:

To what extent can rendering certification ‘social’ broaden our understanding of its effect on improving the sustainability of shrimp aquaculture in Thailand?

This overall question is further divided into three sub-questions designed to more specifically elicit the social dimensions of aquaculture certification.

- 1. In what ways does certification support Thai aquaculture farmers to access and comply with sustainability standards?*
- 2. What is the effect of state and non-state strategies to deal with the proliferation of sustainability aquaculture standards and foster sustainability improvement in the sector?*
- 3. In what ways does aquaculture certification contribute to sustainability seafood governance beyond its role as a farm improvement tool?*

These three questions guide the analysis of different sets of social relations embedded around certifications. They are designed to elicit an understanding of the agency, social structure, and social interactions of certification with other public and private, state and non-state organisations.

The rest of this thesis addresses these questions through four empirical studies that identify and elaborate the social dimensions of aquaculture certification. The first case examines the relationship between the Thai government and national standards, together with the implications for farmers (Chapter two). The second case analyses of the relationship between multiple certification schemes within global and regional meta-governance arrangements aiming to manage the proliferation of standards (Chapter three). The third case evaluates the relation between farmers and certification schemes through a capabilities lens (Chapter four). The fourth case explores the function of a certification organisation (the ASC) in shaping the broader governance landscape in Thailand (Chapter five).

1.8 Research methodology

1.8.1 Case study approach

A case study is an empirical method that presents empirical data that investigates a particular contemporary phenomenon and addresses research questions with a more in-depth and extensive description of social phenomenon (Yin, 2017). It is the preferred method for answering how or why questions when researchers have little control over the events. A case study allows for retaining a holistic understanding and knowledge on individual, organization, social, and related phenomena in a natural setting (Punch, 2005; Yin, 2009). This thesis answers the research questions through a case study of Thailand to enable the generalisation of the answers to establish theoretical propositions.

This thesis examines certification as rendering social inductively. That is, a social understanding of certification is developed based on comprehensive empirical results and uses these results to reflect and theorise on the themes addressed in the research objective and questions (Thomas, 2006). The analysis is also convergent in nature. Four different conceptual frameworks are applied in the four empirical chapters - the Devil's Triangle (Bush et al., 2013a), metagovernance (Sørensen, 2006; Sørensen and Torfing, 2005), the capability approach (Sen, 1999) and the Aquaculture Governance Indicators framework (Toonen et al., 2018). While generating different insights these conceptual frameworks enable the common elements among the studies to be identified and are used as a basis for generalisation and reflection on the main objective (Punch, 2005).

1.8.2 Methods

This thesis is based on a range of qualitative research methods that allow for the study of people or events in their natural settings. It is suitable for understanding a

new developing field in which concept and theoretical elaboration emerge from data collection (Bryman, 2004; Punch, 2005). Multiple methods of data collection and strategies are used in this thesis to best understand the realities of the situation.

Two of the chapters employ a mixed methods approach, combining the analysis of qualitative and quantitative data in a single study (Tashakkori and Creswell, 2007). Both types of data were integrated into one database and used to reinforce each other and strengthen the overall study (Creswell, 2009; Creswell and Plano Clark, 2007; Tashakkori and Teddlie, 1998). A concurrent mixed method approach is applied in chapter two; where both types of data are merged for a more comprehensive interpretation of the results and analysis (Creswell, 2009). A sequential mixed method is applied in chapter four; seeking to elaborate the findings emerged from one method and following up with another method (ibid).

The following is the description of the four (qualitative and quantitative) methods that were used in this thesis (as summarised in Table 1.1).

Table 1.1. Different data collection methods applied in this thesis.

Chapter	Data Collection Methods
Chapter 2	Document review Qualitative interview Survey
Chapter 3	Document review Qualitative interview
Chapter 4	Document review Qualitative interview Content analysis
Chapter 5	Document review Qualitative interview

Semi-structured qualitative interviews were employed throughout this thesis that allowed for the collection of rich and detailed information through a person-to-person interaction; including information from respondents on behaviours, attitudes, norms, beliefs, and values (Bryman, 2004; Kumar, 2014). The interviews allowed for more flexibility to follow up on respondent's replies and the adjustment in response to significant issues that might emerge during the interview (Bryman, 2004). In this thesis, a semi-structured interview is employed over a total sample of

99 people (Table 1.2). The content of these interviews was analysed with the aim to identify the main theme or argument that emerged from respondents in relation to the research questions.

Table 1.2. Numbers of interview respondents.

Chapter	Numbers of respondents
Chapter 2	42 Farmer and government organisation representatives 24 Farmers
Chapter 3	21 Meta-governance representatives
Chapter 4	5 Certification representatives
Chapter 5	7 Organisation representatives

A survey methodology was used to collect data in chapter 2. The method was used to generalize the views, opinions, trends, characteristics, attitudes or behaviours of a sample of farmers and a sample of the population (Babbie, 1990; Creswell, 2009). The Survey data was collected by a questionnaire from a sample using convenience sampling (Babbie, 1990; Creswell, 2009).

Document analysis was also used throughout this thesis (Bretschneider et al., 2017; Bryman, 2004; Punch, 2005). These documents provide written evidence as a means for tracking change and the development of the phenomenon (Bowen, 2009) which can be developed into a narrative, argument, and supportive evidence. It provides advantages in terms of availability, is indispensably verifiable as a source of information, and less costly compared to other methods. To avoid potentially contradictory information among different secondary sources, the results of all document analysis conducted was triangulated for accuracy with empirically derived results.

The content of the documents was analysed using “predetermined categories and in a systematic and replicable manner” (Bryman, 2004, p.181). Employing content analysis enabled transparent procedures to be developed to categorize raw data in a systematic and consistent manner. Data was categorized and analysed by specification of rules and measurements that are in accordance to the initial research question. This method is applied in chapter four through a guidance providing instruction on the interpretations of the rules that analyse and convert data into categories. Data is then statistically analysed which allows multiple sets of data to be comparable.

1.9 Outline of the thesis

The rest of this thesis is divided into four empirical chapters and discussion.

The following chapter focuses on the challenges the Thai government has faced in developing multiple certification standards. Based on the 'Devil's Triangle' model of private certification (Bush et al., 2013a) the chapter analyses the extent to which accessibility, credibility and continual improvement have been achieved by each of the Thai standards. The chapter then analyses the implications these multiple standards have on farmers in standard compliance and sustainability practice improvement.

Chapter three analyses the emergence and effect of 'metagovernance arrangements' (Sørensen, 2006; Sørensen and Torfing, 2005) in managing the proliferation of certification standards and their effectiveness. Three metagovernance arrangements are analysed and compared on their goals, level of inclusiveness, and governance structure. In doing so the chapter examines how these arrangements differ in their approach and operation and what implications this holds for the alignment and credibility of certification standards.

Chapter four draws on Sen's capability approach (Sen, 1999) to assess the ways in which four sustainability standards and their internal improvement programmes enable farmers to develop the necessary capabilities to achieve standard compliance. The application of the capabilities approach not only provides a means of understanding the challenges faced by farmers in complying with standards, it also presents a new means of assessing the role of standards in fostering alternative pathways to compliance and sustainable production.

Chapter five analyses the position and role of certification as part of the broader landscape of aquaculture governance using the Aquaculture Governance Indicators framework (Toonen et al., 2018). The chapter focuses on the case of the ASC in Thailand to characterise the multiple roles certification organisations take beyond holding and applying prescriptive farm-level standards. The results contribute to the identification of multiple pathways of problem solving and sustainability improvements of the sector that certification can foster.

Chapter 2

Implications of multiple national certification standards for Thai shrimp aquaculture

This chapter has been published as:

Samerwong, P., Bush, S.R., Oosterveer, P., 2018. Implications of multiple national certification standards for Thai shrimp aquaculture. *Aquaculture*. 493, 319-327.

Abstract

Uptake of the government of Thailand's three national certification standards for shrimp aquaculture (CoC, GAP and GAP-7401) has remained limited. Using the Devil's Triangle framework, which highlights trade-offs between accessibility, credibility and improvement, this paper examines the Thai government's rationale for developing these national certification standards, and compares this rationale with farmers' perceptions surrounding standard compliance. The findings demonstrate that different groups of farmers experience different trade-offs between accessibility, credibility and improvement under each of the three standards. The paper concludes that improved coordination of these national certification standards could promote credible and inclusive step-wise improvement pathways for the Thai shrimp industry as a whole.

Key words: shrimp aquaculture, national certification, Thailand, certification development, credibility, accessibility, improvement

2.1 Introduction

Thailand has paid considerable attention to the production and trade of safe and responsibly produced aquaculture products in order to achieve credibility and competitiveness in international markets (see Chuchou, 2013). The development of the Thai Quality Shrimp label in 1998 was among the first national certification standards, preceding global private certifications such as the Global Aquaculture Alliance (GAA) and Aquaculture Stewardship Council (ASC). Today, Thailand has three national certification standards: Good Aquaculture Practice (GAP), Code of Conduct (CoC) and the new GAP-7401 (alternatively labelled TAS 7401). Each of these standards differ with respect to the issues they cover and the stringency of their requirements, making them more or less amenable to producers with different capabilities.

Certification involves the definition and enforcement of standards that set norms, levels and values for different aspects of the production process (Hatanaka et al., 2005). Pressure from buyers and NGOs in key export markets for aquaculture products, such as the US and EU, has been key to the development of private certification schemes - owned and controlled by non-state actors. Similar to sectors like capture fisheries, forestry and palm oil (Gulbrandsen, 2014; Schouten and Bitzer, 2015), these private aquaculture standards not only reflect the norms of buyers and NGOs, but also create expectations for producers and their governments in regulating domestic production. State-initiated standards also set norms, levels and values for production, either in addition or in reference to national legislation. But as Schouten and Bitzer (2015) note, they are also an attempt to take regulatory control back from international rule makers and standard setters, and foster greater legitimacy of the state by including those producers that are excluded from international standards (see for example Bush et al., 2013b; Kusumawati and Bush, 2015; Vandergeest, 2007).

Another driver for extending the number and scope of national aquaculture standards by the Thai government has been its ambition to improve overall farming practices and increase aquaculture production in face of declining production due to disease. The Early Mortality Syndrome (EMS) outbreak, for instance, caused an estimated 33% decrease in shrimp production between 2012 and 2013 (Encarnação, 2014; Pratrungkrai, 2015). As a consequence farmers dropped out or took temporary leave from aquaculture production. Since then Thai shrimp production has slowly recovered (Arunmas, 2014; Pratrungkrai, 2015), but EMS remains a serious risk. The Thai state-initiated standards therefore represent an attempt to be inclusive of a wide range of producers to mitigate the effects of disease; from small

independent family owned farms, who make up the majority of producers in the country, to more capital intensive and technologically advanced farms owned by or contracted to processing companies. However, just how effective the introduction of multiple standards has been in meeting these national goals, while also addressing the concerns of buyers, remains unclear.

This study analyzes why the Thai government developed multiple national certifications and what implications these different systems hold for different groups of farmers. We address this question by analyzing what Bush et al. (2013a) have labelled the 'Devil's Triangle', referring to the dilemmas involved in balancing accessibility, credibility and continual improvement by certification schemes. We extend the application of this framework from private to national certifications and examine the challenges and opportunities faced by the Thai government in developing multiple differentiated standards rather than a single standard for all farmers. In doing so we explore the degree to which these multiple national standards can achieve their collective goal of including a broad range of farmers, leading to measurable on-farm improvements and promoting credibility in export markets.

The following section outlines the Devil's Triangle framework. We then turn to a two part analysis. We first examine the motivation of the Thai government to develop the three national standards. We then analyze shrimp farmer experiences in applying these different standards - focusing on their perception of accessibility, credibility and improvement. Finally, we discuss the Thai government's strategy for using all three standards to improve production into the future.

2.2 Assessment framework for national level certification

The Devil's Triangle is a relational framework that explores an inherent trade-off between credibility, accessibility and improvement in certification schemes (see Figure 2.1) (see Bush et al., 2013a). The framework does not assume there is an optimum balance between these dimensions. Rather it highlights choices of design and strategy that influence the overall relevance and influence of a certification scheme in a given sector. The following outlines the variables used to assess credibility, accessibility and improvement from the perspective of both standard owners (in this case government) and producers.

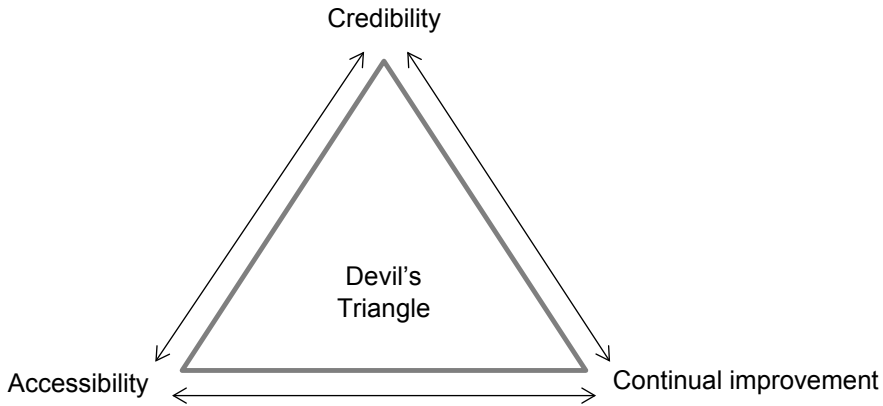


Figure 2.1. The ‘Devil’s Triangle’ of private certification.
Source: (Bush et al., 2013a)

2.2.1 Credibility

Certification has emerged in part as a mechanism for assuring and communicating product qualities (such as food safety) and credence qualities (such as sustainability) to both the market and society (Petrović et al., 2017). The credibility of certification schemes is therefore directly related to the “perception and assumption” that their role and method in providing such assurance is “trustworthy, responsible, desirable and appropriate” (Boström, 2006, p.351).

The credibility of standards as a policy tool can be assessed through three key variables (see Table 2.1). First, the credibility of a standard is dependent on the inclusion of a wide range of stakeholder’s perspectives associated with the issues being standardised (see Boström, 2006). Second, credibility is derived from a requisite level of scientific rigor, including the inclusion of expert knowledge in the design of metrics and verification systems (e.g. Eden, 2009; Miller and Bush, 2015). Third, credibility is derived from the transparency in the standard making procedure, related to the openness of the decision making and adjudication processes, the outcome of assessments against the standards and the accessibility of information needed to determine whether and how regulation is effective in meeting its goals (Vermeulen, 2007). As Auld and Gulbrandsen (2010) note, the higher the degree of transparency a certification system adopts, and the more accountable it makes itself to external scrutiny, the more credibility and legitimacy it is presumed to command.

Table 2.1. Indicators for analysis of national and local level.

Dimensions of the Devil's Triangle	National level indicators	Producer level indicators
Credibility	<ul style="list-style-type: none"> • Inclusion of a diverse range of stakeholders • Scientific rigor (expert knowledge and verification systems) • Transparency of the standard making process 	<ul style="list-style-type: none"> • Level of farmers' adoption • Pragmatic benefits - improved yield or farm gate price • Moral conviction that compliance is the 'right thing to do'
Accessibility	<ul style="list-style-type: none"> • Availability of services to farmers to support standard compliance • Ability of farmer to reach and engage in those services • Setting minimum requirements for degree of adoption and broader range of producers 	<ul style="list-style-type: none"> • Sufficient land and capacity to adopt certification • Access to capital investment to cover costs of standard adoption • Access to information • Access to compliance training
Continual improvement	<ul style="list-style-type: none"> • Changes in production process for efficient resource use, reduced production risk and social wellbeing • Degree that improvement principles are incorporated at all levels of certification 	<ul style="list-style-type: none"> • Changes in production practices and operational systems • Reduction in production costs or improved profitability • Improved farming performance on diseases, chemicals

At the production level, the credibility of standards can be linked to the level of farmers' adoption, which is in turn linked to both pragmatic benefit and moral conviction. As Cashore (2002) argues, producers are likely to choose a certification scheme based on whether adoption is aligned with their own production interests, such as improving market access and/or delivering well-being, reducing risk or increased profitability (Bernstein and Cashore, 2007; Suchman, 1995). Second, Cashore (2002) notes that producers may have some moral conviction that adoption is the right thing to do, assuming that standards align with their wider goals of responsible, safe or sustainable production.

2.2.2 Accessibility

Accessibility is defined as “the ability of people to reach and engage in opportunities and activities” (Farrington and Farrington, 2005, p.2). This might relate to the availability of services or the ability of individuals to gain access to those services (Gulliford et al., 2002). Accessibility also relates to the role that (private) standards can play in creating a market barrier for smallholders because of the high cost of compliance (Swinnen et al., 2015). Unlike private standards, which are often based on rewarding the ‘best’ performers, state-led standards are usually oriented towards setting minimum requirements that foster a higher degree of adoption by a broader range of producers, including small-holders (Lemeilleur, 2012).

As argued by TASC (2008), the accessibility of a standard reflects why some groups are excluded from making future improvements to their production practices. At the producer level various indicators of accessibility are related to standard compliance, including sufficient land, financial resources, knowledge and skills (Hatanaka et al., 2005). Successful compliance is also related to access to information to improve practices, farm infrastructure, and training to build capacity for producers (ISEAL, 2013). These indicators are used to assess if and how producers can comply with certification standards, with the assumption that a higher rate of compliance leads to increased opportunities for market access.

Taking the relational nature of the Devil's Triangle into consideration, accessibility has a direct impact on the credibility of a certification program (Bush et al., 2013a). Said differently, increasing the accessibility of a standard should not come at the expense of the rigor of the standard (ISEAL, 2013). This presents a key dilemma for state-initiated standards as governments have to deal with the challenges of allocation and apportioning resources for inclusive growth to ensure accessibility across the population (Bisht et al., 2010), while also promoting long term improvements in production.

2.2.3 Continual improvement

Continual improvement in production practices is one of the goals of certification. Several certification programs have, however, been criticised for lowering this ambition by rewarding those producers that already demonstrate a compliant level of performance (Gulbrandsen, 2010; Ponte, 2012). The consequence is that not only are ‘good’ performers less likely to continue to raise their performance beyond the requirements of certification, but that such a strategy will also not push the worst performers to improve their production practices (e.g. Bush and Oosterveer, 2015; Tlustý, 2012).

Government strategies and ambitions for continual improvement are assessed in terms of the degree to which principles improvement are incorporated in standards, auditing and progress monitoring (Zwetsloot, 2003). At the farm level, operational improvement focuses on changes in production practices and the operation system that close the gap between current and desired performance (Bettley and Burnley, 2008). Such improvement is made observable in this study by focusing on the perception farmers have of their capacity to close this gap for improved disease control (Waite et al., 2014), economic efficiency (Liao and Chiu Liao, 2007) and social responsibility (Hatanaka et al., 2005).

Returning to the Devil’s Triangle, the degree to which improvement is emphasised by a standard may directly affect both its credibility and accessibility. A rigorous standard that aims for high levels of improvement and high market credibility may exclude producers from participating. This in turn can mean that overall improvements to production across a sector are not realised. Alternatively, certified farms might fail to continue improving once they have been certified - again affecting the credibility of a standard to bring about systemic change to a sector. We aim to understand how Thailand deals with the challenge of balancing these three elements both in and across its multiple standards.

2.3 Methodology

The first round of data collection was completed through 42 semi-structured interviews conducted between March and September 2015 with organisations and individuals involved in establishing and/or implementing the three national certifications. This included officials from the Department of Fisheries (DoF) and other governmental agencies, as well as processing companies and shrimp farmers.

On the basis of these interviews a survey was developed and subsequently conducted among 157 shrimp farmers at a national shrimp convention jointly organised by shrimp farmers associations, the DoF, and the postharvest sector in August 2015. Such conventions are held multiple times per year across the country. Each meeting has between 700 and 900 farmers participating, representing the full spectrum of the Thai shrimp sector. More than half of the respondents (54%) who attended this event are members of farmers clubs association or cooperatives. The other half are individual farmers. As outlined by Kongkeo and Davy (2010), a common reason for attendance is to access information on various aspects of aquaculture innovation, including certification.

After the survey it became apparent that 91% of respondents were GAP certified and there was only limited data on the experience of farmers with CoC and GAP7401. An additional 24 interviews were therefore conducted with farmers who were aware of CoC or GAP-7401 using a semi-structured topic list. The questions were specifically focused on their expectations, experiences, and challenges in adopting CoC or GAP-7401. Since farmers who adopt these two schemes had also adopted GAP, they were able to provide details on the differences between the standards.

Throughout this study respondents are characterised into the DoF categories of small, medium and large producers based on farm area. Reflecting on Belton et al. (2012), we recognise that the farm area does not necessarily reflect the social or economic conditions of production. However, we maintain this categorisation because it is used by the DoF. Based on these categories, 53% of the respondents are small scale farms, smaller than 30 rai (4.8 ha); 19% medium scale between 30 and 50 rai (4.8-8 ha); and 28% large scale farms larger than 50 rai (8 ha). More than half of the GAP-certified respondents are small-scale, while the numbers of respondents who adopted CoC or GAP-7401 (in addition to GAP) are comparable across all scales.

2.4 National level analysis

The following analyses the motivation of the Thai government to develop the three national certification standards, as well as the role they play in the government's current 'From Farm to Table' strategy designed to promote sustainability along the entire supply chain (Supaphol, 2010).

2.4.1 Code of Conduct (CoC)

The Thai CoC standard was developed in 1998 by the DoF in response to the detection of antibiotic residues in shrimp products from Thailand by the EU leading to import restrictions, as claimed by respondents from the National Bureau of Agricultural Commodity and Food Standards (ACFS). Based on a combination of international environmental, aquaculture and food safety guidelines, including the FAO's Code of Conduct for Responsible Fisheries (CCRF), ISO14001 and HACCP (Corsin et al., 2007; Tookwinas and Songsangjinda, 2003), the aim of the CoC standards is to satisfy EU import requirements related to environmental sustainability and antibiotic residues (Serrano, 2005). A wide range of stakeholders from the industry including shrimp associations were consulted during the development of the standards (Dao et al., 2009).

According to Lebel et al. (2002) only a small number of farmers were exposed to the CoC standards after they were completed. As illustrated in Figure 2.2, the number of farmers complying with the CoC has remained low. Key respondents from the government argued that the limited impact of CoC was largely due to its voluntary nature, coupled with the perception that the standard is too demanding for the farmers that it targets (also see Lebel et al., 2016). As a result the CoC standard is not seen as a credible standard that can meet the government's goal of improved production quality and secure market access. Having recognised this early on in the development of CoC, the DoF decided to develop the Good Aquaculture Practice (GAP) standards.

2.4.2 Good Aquaculture Practice (GAP) in shrimp farming

The GAP standards were launched by the DoF in 2000 with the aim of including a larger number of farmers than the CoC standard. GAP does this by providing minimum criteria for hatcheries or farms for food hygiene, food safety and prevention of chemical residues (Wilkins, 2012). It is also noted that GAP puts less emphasis on environmental management than the CoC standard (ADCC, 2010; Prompoj, 2013a).

Despite the promotion of GAP by the DoF in the early 2000s, the standard faced a similarly low level of uptake as CoC. Nonetheless, a respondent from the Aquaculture Development and Certification Centre (ADCC) made clear that the DoF continues to support GAP as an assurance measure to deliver safe products to the market. The DoF made a strategic change in its cooperation with the industry by setting up GAP as a pre-condition for selling harvested shrimps to processing plants, essentially making the new standards mandatory (Miranda, 2010; Mungkung

et al., 2010). To stimulate further adoption the government also provided training, assistance and financial support through subsidies (Prompoj, 2013a). Since this change in policy the number of GAP-adopted farms grew to cover nearly 20,000 farms in the first years after its introduction (Figure 2.2), making it the most implemented certification scheme among Thai farmers (Miranda, 2010).

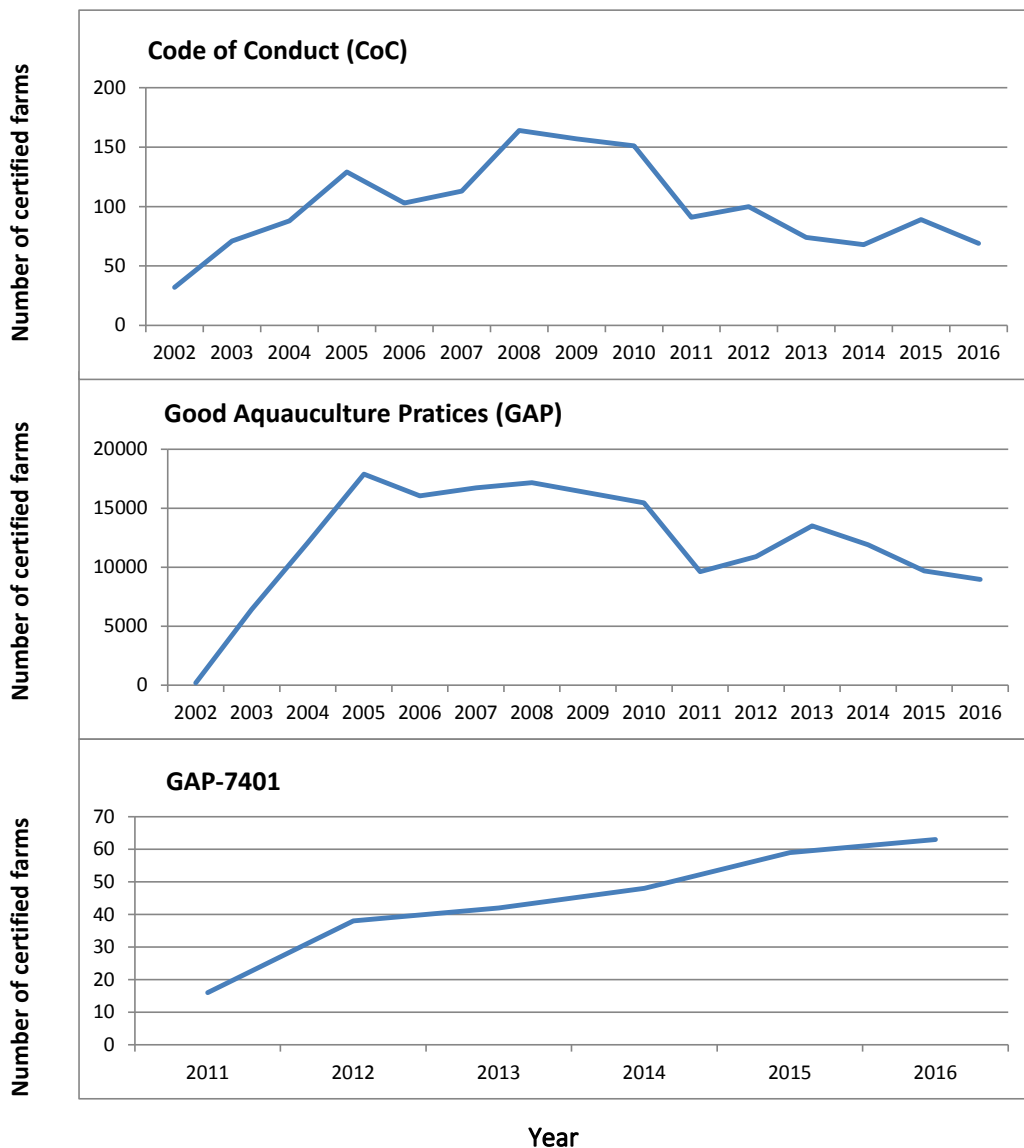


Figure 2.2. Farms compliant to national certification standards from 2002 to 2017.
Source: Department of Fisheries database (FCSTD, 2017)

Despite the apparent inclusiveness of the GAP standard, and the significant reduction of chemical use attributed to the standard (Mungkung et al., 2010), the credibility of GAP continues to be questioned. As recognised by the DoF, the GAP standard is perceived as lacking transparency given the apparent conflict of interests of the DoF being the standard developer, owner and auditor (see also Prompoj, 2013a). To remedy this the Thai government established the ACFS in 2002 to oversee accreditation of government certification bodies in compliance with FAO Technical Guidelines on Aquaculture Certification and the ISO/IEC 65 General requirements for bodies operating product certification systems (ACFS, 2015; Prompoj et al., 2011). Nevertheless, the perception that the GAP standard was in fact intended “to create as little management practice change as possible for farmers to meet the standard” (p. 135) has persisted in the market (Dao et al., 2009). The result is that the credibility of all the GAP standard continues to be questioned outside Thailand.

2.4.3 GAP-7401 (TAS 7401)

In 2009 the Thai government developed the GAP-7401 standard in an attempt to improve the international market credibility of Thai shrimp aquaculture (ACFS, 2009). GAP-7401 was developed by the ACFS in accordance with the FAO CCRF and combined principles from both the CoC and GAP standards (Prompoj, 2013a). GAP-7401 attempts to meet growing market demands for securing the environment, worker welfare and social responsibility. However, by copying criteria from CoC the GAP-7401 standard reproduces some of the same barriers for farmer compliance, such as changing the layout of farms and reporting demands. As one farmer pointed out, “why is a new certification needed when it does not appear to be better than CoC, only because it was developed by different experts?”.

In 2014, GAP-7401 was revised to be aligned with the ASEAN Shrimp GAP, in an attempt to improve certified shrimp production in ASEAN in the future (see Chuchou, 2013). The revision also sought to reduce the administrative burden for producers. Farmers can now submit their application to the nearest local DoF office with no auditing fee required. The DoF has also begun outsourcing auditing to external companies in accordance with the ISO/IEC 65 standards (Prompoj et al., 2011). The government expects GAP-7401 to enable Thai producers to maintain the country’s position as top five shrimp exporters. According to staff at the ACFS, GAP-7401 is also seen as a platform for preparing farmers to meet requirements from all existing international standards.

Despite these efforts the Thai national certification standards are still seen as less credible in the eyes of foreign buyers. The managers and owners of processing plants interviewed argued that although Thai certifications are accepted by some countries, the major retailers from the US still require third-party certification even though the products are already certified by the Thai standards. The Thai Frozen Foods Association added that GAP standards are sometimes seen as a 'minimum requirement', further reducing interest from buyers. The Thai Government continues to try and increase the credibility and market penetration of GAP-7401 by working with processing companies and the Ministry of Commerce (Prompoj, 2013b). The government has also expressed interest in being benchmarked against the Global Sustainable Seafood Initiative (GSSI) benchmark standard - which is based largely on the FAO CCRF (see Samerwong et al., 2017).

By creating three different standards over the last 19 years, questions may be raised about the consistency and overall impact of the Thai government on improving shrimp aquaculture. According to respondents from the ACFS, the next phase of standard development is to abandon CoC and GAP in favour of GAP-7401. The aim being to reduce confusion in the market while ensuring the participation of the majority of the shrimp farmers in the country. However, GAP remains the most common of the three standards, with 12,000 certified farms compared with 36 CoC and 104 GAP-7401 farms (Figure 2.2). It therefore appears necessary to maintain both GAP and GAP-7401. In spite of the government's ambition to harmonise standards it appears the ongoing challenge will be to maintain multiple standards in a way that maintains the overall credibility of Thai shrimp certification for both producers and market alike.

2.5 Farmer level analysis

We now turn to the results of the survey and interviews with farmers, to better understand the choices and challenges that producers face with three national standards.

2.5.1 Credibility

The credibility of standards in the eyes of farmers is dependent on them meeting their own expectations of what compliance to these standards can deliver. Reflecting calculations of pragmatic benefit, the results of the survey show that 42% of respondents would comply with any of the national standards because they expect such compliance to reduce the risk of disease or the incidence of environmental impacts that can feed back on the resilience of their own production system. Overall,

however, three quarters of the farmers stated that the main reason they adopt GAP is because it is a (mandatory) requirement for selling their shrimp to both domestic and export markets. A lower proportion of farmers (56%) responded that they expect certification to increase their market access beyond current levels, and only 33% said they expected standards to deliver a higher farm gate price.

The results show different expectations of pragmatic benefits for each of the three standards. The same one third proportion of farmers expect to receive an economic return from compliance to GAP. Just two out of the ten respondents who adopted CoC expect a return and a slightly lower proportion of respondents (17%) expect a return from GAP-7401 certification. Contrary to the expectations of the government, the farmers interviewed thought that compliance to GAP would give them market recognition. However, farmers who had invested in compliance to CoC or GAP-7401 said they did so to go beyond the basic requirement of GAP, with the intention of getting ahead of their peers and avoid future non-compliance with ever more stringent export market requirements. For example, changes in food safety regulations for exporting to EU countries in 2002 required full chain traceability with the consequence that many farmers were excluded from this market (Tavornmas, 2013).

The majority of respondents (60%) stated that all three standards contribute to some degree of environmental improvement. However, they were not sure there was a causal link between standard adoption and disease prevention. As one farmer commented “certification only shows if the farm passes or fails the criteria. It does not guarantee that all your shrimps will survive”. Quality and size of the shrimp is thought to be more dependent on other factors, such as weather, than on the certification criteria. Moreover, some farmers still object to certain criteria in GAP-7401, such as those on labour, which they argue do not reflect the reality of the continuous 24 h a day nature of farming. As one surveyed respondent claimed, the “labour criteria are not practical, because farming labour is not a normal working routine if we have to follow an eight hour working shift”.

The majority of respondents (60%) indicated they had no idea how credible the national standards were in export markets - some even stated they did not think of it as their concern. This lack of knowledge (or care) appears to reflect the lack of information producers have about consumer markets. Reflecting the importance of local market relations in Southeast Asian value chains (see for e.g. Ha et al., 2013; Kusumawati et al., 2013), most farmers indicated, that meet the requirements of their brokers or processing factory was their only concern. In short, if these buyers ask for a standard, the producers follow. The results of the survey indicate that those

selling to brokers are more likely to follow the mandatory GAP standards, while 50% of respondents who adopt CoC or GAP-7401 sell their shrimp to processors. The remaining 50% sell to other channels. The importance of these relations are reflected in the result that 64% of respondents sell their shrimp at the farm gate to brokers while only 29% sell directly to processors.

Farmers are far less clear on a moral rationale for adopting standards. Those complying with the GAP standard acknowledged it offers some form of intrinsic ‘good’ practice. However, they also note that their willingness to follow these standards was weakened by their belief that their own experience and techniques were more applicable for dealing with diseases and environmental improvements than what they consider ‘theoretical’ solutions embodied in the standards. Several surveyed farmers indicated that this skepticism about the contents of the standards stems from their exclusion during the design of the standards. The results also indicate that nearly one third (31%) of farmers have concerns that the three standards overlap and, as such, create confusion over what good practices actually entail. Nevertheless, the majority of farmers maintain compliance to at least GAP because, in the words of one farmer, “it took a lot of effort to be certified, so we have to [continue] maintaining that farming quality”.

2.5.2 Accessibility

The accessibility of all three standards, in terms of the capabilities of farmers to comply, are largely determined by the scale of production (Leepaisomboon, 2014) - which we use here as a proxy for the level of capital investment. According to (DoF, 2013) statistics 75% of Thai shrimp farmers are ‘small-scale’, with lower capital requirements for upgrading to meet Thai government standards. These farmers also have limited access to formal credit (Szuster, 2006). In contrast medium- and large-scale farmers have relatively higher capabilities in terms of land tenure security and (as a result) access to finance. But they also face higher capital requirements for upgrading their production systems to comply with certification standards (Leepaisomboon, 2014).

One example of these constraints is the requirement for on-farm wastewater ponds. Although no specific requirement is defined in any of the standards, the general guideline from the Thai Department of Fisheries is that the minimum area required for proper water-supply ponds is 15-20% of the production pond area, and at least one pond is needed for wastewater management (DoF, 2007). However, GAP only requires a wastewater pond for large farms, while CoC and GAP-7401 require wastewater ponds on all farms regardless of size. Both the farmers and DoF officials

interviewed commented that this makes GAP easier for farmers with limited land and financial resources. Survey data revealed that almost three quarters of the small-scale farmers have only 2-4 ponds that already take up 2-6 rai for each pond, while their space is generally limited to less than 30 rai. Either converting or adding a wastewater or sedimentation pond, a toilet and sanitary system, would require taking space from those existing ponds. This would result in changing their farm layout and less production ponds, thus this would make it difficult to upgrade their farms to adopt CoC or GAP-7401. Medium and large scale farms are not likely to have the same constraint given they generally have sufficient land and capacity to adopt more demanding requirements (Leepaisomboon, 2014).

Larger farmers also appear to realise better economies of scale in production and therefore in their ability to make a return on their investment in standard compliance (also see Lebel et al., 2016). The average production cost are 3.52 USD/kg for small-scale farmers, 3.11 USD/kg for medium-scale farmers and 2.83 USD/kg for large-scale farmers (Srisaeng et al., 2010). As Mungkung et al. (2010) demonstrate, the costs associated with upgrading for compliance with standards includes investments for toilets, chemical storage, offices, a data recording system, water treatment, and fences. The average cost involved in complying with GAP is 80,733 THB (2,404 USD) per rai, while a transition from GAP to CoC costs around 118,000 THB (3,513 USD) per rai, making the upgrading to CoC becomes more difficult. Srisaeng et al. (2010) also show the cost of reconstructing shrimp ponds, is 0.066 USD/kg, 0.033 USD/kg and 0.019 USD/kg for small, medium and large farms respectively. In addition, the prescription of minimum labour requirements of GAP-7401 add 8.63 USD (300 THB).

The smaller farms interviewed particularly noted that the costs of compliance are not only unrealistic, given their limited economies of scale, but also bear no relevance to the family-based labour structure of their farms (also see Szuster, 2006). As noted by Srisaeng et al. (2010) the additional labor costs for small farms are comparatively higher than for larger farms given the improved economies of scale associated with intensive production.

Farmers perceive a difference in the costs of compliance between the three standards. Two thirds of the respondents claimed that the cost of compliance to GAP is not prohibitive. However, the majority of the respondents agreed that moving from GAP to GAP-7401 would entail far more significant costs, especially given that it is unclear whether the market is willing to pay more for certified shrimp. Among respondents who adopted GAP-7401, nearly half (42%) of them had to invest in on-farm changes to comply with GAP-7401, while only 17% of them

claimed that GAP-7401 has increased their shrimp's price. The uncertainty over a return on investment in GAP-7401 has further contributed to the far wider adoption of the lower cost GAP standards. Interviews with provincial DoF officials revealed that small and large scale farmers alike are more likely to sell to the local market or to domestic buyers who do not require certification.

Finally, farmers acknowledged that the accessibility of any of all three standards is largely determined by the information provided to them. Eighty-seven percent of respondents receive information about either one of the standards through training and ongoing DoF extension services. However, the decision of farmers to invest in standard compliance is more strongly influenced by the information they receive from local shrimp clubs, brokers, and processing plants. Overall brokers play a key role in informing farmers to adopt GAP - again reflecting its mandatory and therefore 'best known' status of the three standards (92% of respondents, see Figure 2.3). Yet it also appears that information alone does not increase adoption rates. The DoF provides both free technical advice to assist small scale farmers (e.g. disease diagnosis, diatom stocks, water and soil analysis, market advice) (Kongkeo and Davy, 2010). Shrimp clubs and processing plants also provide information on CoC and GAP-7401. However, such information provision does not appear to have been translated into high levels of adoption by any size of farmer.

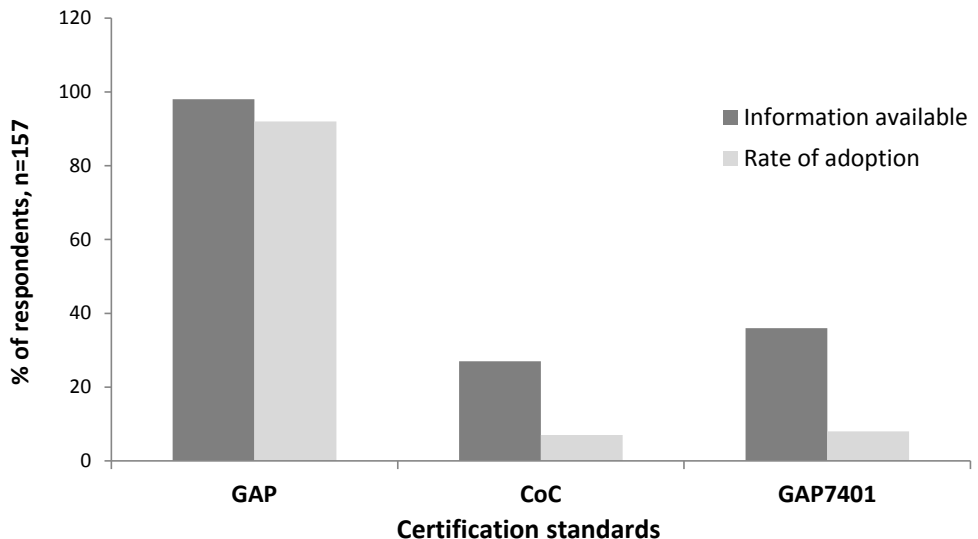


Figure 2.3. Comparison of information availability and rate of adoption for three Thai national standards.

2.5.3 Continual improvement

All three standards aim to minimize disease risks associated with shrimp farming, but with different requirements. CoC covers improvements in on-farm management, farm layout, larval stocking, shrimp health management, the use of chemicals and drugs, social responsibility, community relations, and monitoring (DoF, 2002). GAP addresses improvements in farm management, hygiene, monitoring, and registration, as well as feed quality, and the prohibits the use of prohibited drugs (DoF, 2010). GAP-7401 addresses farm management and farm sanitation, fallowing ponds, and the storage of waste, refuse and/or chemicals (ACFS, 2014). GAP-7401 also cover additional aspects of worker's hygiene practices, labour and welfare, social and environmental responsibilities, and farmer training.

Farmers perceive the standards to hold limited potential for improving farms. Just over half (60%) of respondents acknowledged that the standards contribute to improvements in sanitary conditions, water management, farming facilities and the quality of traceability records. But only one third of respondents changed their practices or invested in improving farm management in order to comply with GAP. Furthermore, only 30% and 42% of the respondents who adopted CoC and GAP-7401 respectively needed to make changes to their farms in order to be certified - indicating a relatively high degree of compliance bias

The high levels of compliance to GAP has led to sector wide improvements. As outlined elsewhere, the incidence of chemical use in the industry has dropped substantially (Mungkung et al., 2010; Pongthanapanich and Roth, 2006). This is also confirmed by the reduced incidence of safety alerts by the U.S. Food and Drug Administration's (FDA) for Thai shrimp imports from 15 rejections in 2003 compared to 2 rejections between 2004 and 2016 - a small number of rejections compared to other countries (Kearns, 2017).

Farmers expressed their lack of confidence in any of the standards ability to assist them in reducing the incidence of disease. Exactly half of the respondents had stopped farming for some time in recent years because of EMS outbreaks. Follow-up interviews revealed a more nuanced picture. For example, some farmer clusters argued that compliance to GAP-7401 has improved production by reducing the incidence of disease by forcing farmers to adopt new practices. One group of farmers in Sam Roi Yod observed improved survival rates of post larvae after stocking (National Farmers Council and Thai Chamber of Commerce, 2016). Overall, however, farmers do not associate the success or failure of shrimp farming

to standard compliance. This is supported by Saenrak et al. (2010) who demonstrated that GAP compliance did not affect disease incidence.

Farmers expected standard compliance to improve their overall economic performance. Just over half of respondents (56%) believed that certification would provide additional export opportunities. But only 38% of the respondents had been granted new export opportunities and only 16% claimed to receive a higher price. Seven percent of the respondents even claimed standard compliance had resulted in economic losses. The weak market response to the standards has been compounded by decreasing prices in both the domestic and export market (Blank, 2015; FAO, 2016a; OAE, 2016). High price volatility is attributed to the EMS outbreak in Thailand in 2013, which allowed producers from other countries such as China, Indonesia and Vietnam to increase their share in export markets (Wanasuk and Siriburananoon, 2017). Because farmers are yet to receive any market benefit for their investment in GAP compliance, they are more reluctant to invest in complying to the more demanding GAP-7401. Nonetheless, some farmers who had complied with GAP-7401 revealed that despite their large investment and limited return they were hopeful that they would be more competitive in the market over time. As for the social responsibility aspect, several surveyed respondents claimed they have no conflicts with neighbours or local communities.

2.6 Discussion

The three standards represent consecutive attempts to redress deficits in credibility or inclusiveness or continuous improvement. But instead of moving closer to balancing the 'Devil's Triangle' each new standard created a new set of challenges. CoC focuses on strengthening improvement, but has proven too exclusive. GAP aims to be less stringent and more inclusive, but has weak credibility and market recognition. Finally, GAP-7401 focuses on (re)gaining credibility in the market and on (environmental) improvement while limiting accessibility. Instead of developing a coherent program that addresses all three elements of the Devil's Triangle, the result has been the development of a parallel 'program of standards', each with different capacities for dealing with credibility, inclusiveness and continuous improvement.

Our findings indicate that the choice of farmers to adopt one of the standards (or not) is dependent on the trade-off between the investment needed to improve their farms to comply with the standard and the potential benefits they receive (cf. Blackman and Rivera, 2011; Chen et al., 2010). Farmers know that the more stringent criteria of CoC and GAP-7401 have the potential for greater levels of improvement,

but they also aware that these two standards come with high adoption costs. The farmers are also aware that all three standards result in similar (and low) economic benefits given their poor market recognition. However, the very fact there is a choice of standards available to farmers also influences their compliance choices. By having alternative standards farmers are able to make a rational 'lowest cost' choice for GAP that results in the lowest level of farm and sector level improvement.

Instead of a stepwise pathway of continual improvement moving from GAP to GAP-7401 (corresponding to A and B in Figure 2.4 respectively), farmers of all scales appear likely to limit their ambitions to GAP. Smaller scale farmers appear unable or unwilling to comply with even the mandatory GAP standards. But farmers with greater capacity and better access to information appear unwilling to move from GAP to GAP-7401 because there is no clear evidence available to them that compliance would result in higher economic returns or improvements to disease prevention. The overall result (corresponding to C in Figure 2.4) is that overall participation in the Thai standards programme will remain skewed towards meeting mandatory basic requirements rather than putting in place sector wide (and market credible) improvements independent of farm scale or capability. We argue that this may lead to unintended consequences. By making the least effective standard mandatory the Thai government appears to have institutionalised a 'race to the minimum' (cf. Cashore et al., 2004). Farmers seek minimum improvements against low costs, rather than a gradual ratcheting up through competition and reward.

As a public policy tool, national standards aim to ensue improvement across an entire sector. The three parallel shrimp standards in that sense present a natural experiment on how to balance improvement, inclusiveness and credibility at different standardised 'levels' (cf. Bush and Oosterveer, 2015; Tlusty, 2012). National standards are assumed to effectively deal with local diversity and enable interactive learning because of the duty of care the state has to both its citizens and the environment (Overdevest and Zeitlin, 2014; Schouten and Bitzer, 2015). But because GAP has been the most successful standard of the three in terms of inclusiveness there is little ambition by farmers to improve to a higher level standard. The Thai government now faces the dilemma of maintaining the mandatory GAP standard with the ongoing risk of poor credibility in the market and among farmers. Alternatively the government may choose to promote GAP-7401 to boost improvement and better position Thai shrimp in export markets, but this in turn may exclude the majority of farmers.

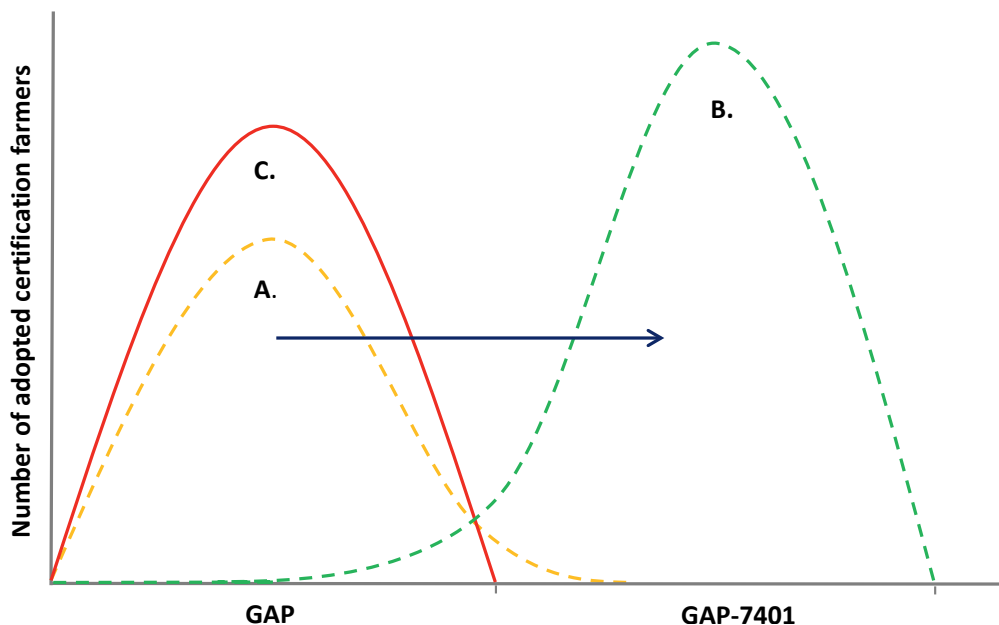


Figure 2.4. Conceptualization of inclusiveness and improvement between GAP and GAP-7401 standards.

Notes: A. Initial population of farmers involved in GAP; B. Expansion farmers (A) to larger and improved GAP-7401 adopting population of farmers; C. Observed narrowing or ‘race to the bottom’ of farmers under GAP (unwilling to move towards B despite having the capability).

There is, nonetheless, potential for improved coordination between the different standards to achieve all three dimensions of the Devil's Triangle. Instead of trying to harmonise the three standards or pick one ‘winner’, the Thai government could alternatively coordinate a more explicit step-wise improvement pathway using GAP and GAP-7401. Each standard could be more explicitly tailored to provide a coordinated set of step-wise improvements as represented by the movement from A to B in Figure 2.4. This could mean developing GAP and GAP-7401 as modular requirements that could be added on as farmers invest in different levels of compliance that better recognise the constraints of different scales of farming (as suggested by Molnar et al., 2004 for forest certification). If national standards can align benefits from compliance with farmer capacities all the way through to GAP-740, these multiple standards could serve as stepping stones towards sectoral change.

Ultimately for national standards to be adopted more widely in Thailand they also need to be seen as credible in the international markets. To achieve this the Thai government will need to invest in internationally recognised meta-governance arrangements that assess the quality standards such as ISEAL or GSSI. Contrary to arguments supporting greater sovereignty over the industry (Vandergeest and Unno, 2012; Vandergeest et al., 2015), the Thai standards program remains dependent on recognition and credibility in international markets, and thereby compete with global standards. If national standards (GAP-7401) are to offer an alternative improvement and assurance model to international standards, they need to clearly demonstrate their role in ensuring quality and credibility to buyers in international markets.

2.7 Conclusion

This study has explored the development of multiple national certification schemes in Thailand. Using the Devil's Triangle framework, we conclude that all three national standards in Thailand, although developed at different times, face the same challenge of balancing credibility, accessibility and improvement. Despite the desire of the government to develop national standards to provide an alternative means of (sovereign) aquaculture regulation, it appears they remain subject to the same governance dilemmas as the global standards they compete with.

The Thai government now has to decide how they will develop their national aquaculture standards system further. One option would be to harmonise GAP, CoC and GAP-7401 into one standard. But given the diversity of farming systems this is unlikely to balance inclusiveness and credibility. Alternatively the government could maintain the two remaining standards, GAP and GAP-7401, in parallel. In doing so these standards could be turned into a step-wise improvement pathway for sectoral change. To achieve this the government will need to better coordinate these standards to ensure that as a system of standards they only promote inclusive and credible improvements for the aquaculture sector. For farmers to move along this pathway from GAP to GAP-7401, both economic and farming benefits, such as terms of sustainability or disease prevention, need to be made explicit for farmers to invest in standard compliance.

National standards do not, however, exist in isolation from international standards. Further research should explore the division of roles and responsibilities between national and global standards, so the potential for complementarity can be explored when developing inclusive and credible improvement pathways. Doing so would place national standards in a clearer role either supporting or replacing these global

standards, which will reduce confusion for both buyers and producers alike and increase the likelihood for credible and inclusive improvement in the industry.

Chapter 3

Metagoverning aquaculture standards: a comparison of the GSSI, the ASEAN GAP, and the ISEAL

This chapter has been published as:

Samerwong, P., Bush, S.R., Oosterveer, P., 2017. Metagoverning aquaculture standards: a comparison of the GSSI, the ASEAN GAP, and the ISEAL. *The Journal of Environment & Development*. 26, 429-451.

Abstract

The presence of multiple eco-certification standards for sustainable aquaculture is thought to create confusion and add cost for producers and consumers alike. To ensure their quality and consistency, a range of so-called metagovernance arrangements have emerged that seek to provide harmonized quality assurance over these standards. This article aims to answer the question of how these metagovernance arrangements differ and whether they actually reduce confusion, with a focus on aquaculture in Southeast Asia. We compare three metagovernance arrangements, the Global Sustainable Seafood Initiative, the International Social and Environmental Accreditation and Labelling Alliance, and the Association of Southeast Asian Nations Good Aquaculture Practices, with respect to differences in their goals, their levels of inclusiveness, and their internal governance arrangement. The findings indicate that these metagovernance arrangements differ with respect to their goals and approaches and do not seem to directly reduce confusion. More critically, they represent a new arena for competition among market, state, and civil society actors in controlling the means of regulation when aiming for more sustainable aquaculture production.

Key words: aquaculture standard, metagovernance, GSSI, ASEAN GAP, ISEAL, environmental governance

3.1 Introduction

There are currently more than 29 government, nongovernmental organization (NGO), and corporate-led eco-certification standards available for assessing and assuring the environmental and social performance of aquaculture production and trade (Parkes et al., 2010). Common to all these standards is a process of setting norms and rules, conflict resolution, learning, and exerting authority toward the improvement of aquaculture production and trade (Hatanaka, 2014; Hatanaka and Busch, 2008; Pattberg, 2005). However, these standards also differ because they represent a diverse set of public and private actors, have diverse internal procedures, and provide assurance against divergent claims, including ‘responsible’, ‘legal’, ‘organic’, or ‘sustainable’ aquaculture production (Bingen and Busch, 2006; Ponte et al., 2011). The result is a highly varied landscape of eco-certification standards and labels, with different levels of credibility in the market, accessibility for producers, and (ultimately) effectiveness in steering the improvement of production.

There are differing ideas on what implications this multiplication of standards holds for improved production. On one hand, having multiple standards is thought to increase competition for achieving higher overall improvement toward broadly defined sustainability goals a so-called ‘race-to-the-top’ scenario (Cashore et al., 2007). The consequence of more stringent ‘top’ standards may then be the exclusion of some producers because of the added costs of complying with their requirements (e.g. Lee et al., 2012; Neilsno and Pritchard, 2010). On the other hand, multiple standards might lead to a ‘race-to-the-bottom’ if standards put accessibility by producers above measurably improved production practice (Ponte and Riisgaard, 2011). In this scenario, the credibility of the standards may come into question as criteria for producer compliance are relaxed. For consumers and producers alike, the consequence of multiple standards is also thought to be confusion over multiple and ambiguous claims by eco-labeled products (e.g. Harbaugh et al., 2011; Kolk, 2013). But despite these various claims, the actual effect of multiple standards for producers and consumers remains unclear.

One response to the proliferation of standards in a number of industries has been the emergence of so-called ‘metagovernance’ arrangements that essentially set standards for standards (Derkx and Glasbergen, 2014; Glasbergen, 2011). Metagovernance arrangements provide a framework for standards to ensure their performance and ultimately strengthen their legitimacy to producers, buyers, and consumers alike (Washington and Ababouch, 2011). Multiple types of metagovernance arrangements are observed, ranging from initiatives designed to assess the equivalence of standards against a set of (normative) metastandards, such

as codes of conduct or principles (Derkx and Glasbergen, 2014; Loconto and Fouilleux, 2014) to initiatives that seek harmonization of different standards by creating a new ‘super-standard’ (Möckel, 2015; Mutersbaugh, 2005). As the number and type of these metagovernance arrangements proliferate each with different goals, methodologies, levels of accessibility, and requirements for improved performance of the standards they seek to govern it is unclear what the consequences are for producers and consumers.

This article examines three metagovernance arrangements aimed at strengthening the effectiveness of public and private standards in the aquaculture sector: first, the Global Sustainable Seafood Initiative (GSSI), which is a global public-private partnership initiative that developed a benchmarking tool for comparing different sustainable seafood certification schemes; second, the International Social and Environmental Accreditation and Labelling Alliance (ISEAL), a global NGO-led membership-based organization that sets codes of conduct for its members, which includes the Aquaculture Stewardship Council; and, third, the Association of Southeast Asian Nations Good Aquaculture Practices for shrimp (ASEAN Shrimp GAP), which is a Southeast Asian intergovernmental effort to set up a common recognition mechanism to strengthen national standards in a region that leads global aquaculture production.

We compare how these metagovernance arrangements differ with respect to their goals, inclusiveness, and governance with respect to sustainable aquaculture standards. In doing so, we contribute to debates around impact of metagovernance arrangements in the perceived proliferation of aquaculture standards, by assessing their legitimacy and influencing the range of interests behind both public and private sustainability standards. In doing so, we explore the apparent politics of metagovernance arrangements and the struggle over what we term the ‘means of regulation’ over a sector that contributes 50% of global fish protein and is predominantly located in the tropical low and medium income countries of Asia (FAO, 2016b).

The following section elaborates the conceptual framework used for our comparison of the three different metagovernance arrangements. We then present the results of this comparison before reflecting on these findings and concluding on the significance of these benchmarking arrangements for the promotion of sustainable aquaculture in Southeast Asia.

3.2 Comparing Metagovernance Initiatives

3.2.1 Defining Metagovernance

Metagovernance refers to arrangements designed to create order and coordination across a number of public and private standards (Sørensen, 2006; Sørensen and Torfing, 2005) while allowing those in control of these initiatives to maintain a requisite level of autonomy to pursue their particular aims (Jessop, 2003). Metagovernance arrangements also provide a basis for controlling standard proliferation while strengthening the legitimacy, effectiveness, and fairness of governance initiatives (Kooiman and Bavinck, 2005). In doing so, they can seek control and coordination over the process of developing steering instruments (such as standards, rules, and incentives), their content, and their outcomes (Peters, 2006).

Like the standards they seek to control, metagovernance arrangements also have divergent interests and goals. The actors developing these arrangements vary and may include private sector, civil society, and local, regional, or supranational governmental actors (Sørensen, 2006). Moreover, metagovernance arrangements may steer interactions among the different standards in directions that reflect the interest of the actors that control them (Derkx and Glasbergen, 2014; Steurer, 2013). This might mean market actors may seek commercial gain, while civil society led initiatives seek environmental outcomes and states seek alignment with national legislation. However, metagovernance arrangements may alternatively exhibit overlapping or entwined commercial, environmental, and legislative goals (Foley and Havice, 2016). When taken together, these metagovernance approaches represent a diversity of approaches that lead to different outcomes for the standards concerned.

Smith and Fischlein (2010) argue that the presence of multiple standards should be seen as the consequence of competition between rival private governance networks, which seek to exert control over a particular issue (like sustainability) in a particular sector (like aquaculture). However, they argue it is difficult to compete on the basis of the content of a standard. It is therefore not the quality of the standard that defines success in this competition, but the composition of the actors in the network and their relation-specific capabilities and resources.

Others, like Reinecke et al. (2012), claim that the presence of multiple standards results in the creation of a ‘standards market’ that promotes convergence between these standards on their core aspects at a higher level. They argue that standards accept each other because they have a shared goal of promoting sustainability, even though they differ on the particular dimensions of sustainability they put central, the target group they address, and on the position they take in the market as basic or

premium standards. This combination of convergence and differentiation results in a process of partial metastandardization, where some standard elements converge (to some extent) while competition is maintained over other attributes that allow standard-setting organizations to maintain their individuated identities.

We therefore expect that the form and function of metagovernance arrangements have direct consequences for the content of the standards and the relationship between them. When starting from the perspective developed by Smith and Fischlein (2010), we can expect the development of another field of competition where multiple metagovernance arrangements represent different networks of actors and their interests. From the perspective of Reinecke et al. (2012), however, we can expect metagovernance arrangements to offer opportunities for the (partial) harmonization of standards through the formulation of general rules. This in turn opens the question of whether we will see a convergence of continued proliferation of standards over time in direct response to metagovernance arrangements.

3.2.2 Comparing Metagovernance Arrangements

To understand the influence of the three metagovernance arrangements relevant for aquaculture standards, we explore how they self-regulate, what relationships they create between the actors involved, and what level of (self-)reflexivity they foster in the further improvement of standards (Torfing, 2012). We translate these dimensions of metagovernance into three observable variables: their goal orientation, degree of inclusiveness, and internal governance structure.

Goal orientation refers to how objectives of metagovernance arrangement are determined, by whom and with what outcome in mind. Is this goal recognized by those standards the metagovernance arrangements seek to control and coordinate? Is the stated goal of the arrangement to foster competition by creating a best practice 'benchmark', or do they aim to create harmonization of existing standards? As argued by Busch (2011), by identifying this goal, we can determine the direction of a metagovernance arrangement and assess its influence and legitimacy claims in steering multiple standards.

Inclusiveness refers to the degree to which the metagovernance arrangement allows for the participation of members, those affected by standards and other institutions either in support or opposition to sustainability claims and their standardization. Inclusiveness plays a direct role in establishing the credibility and authority of metagovernance arrangements (Dingwerth, 2007). Both the inclusion of relevant and the affected actors are considered key to establishing legitimacy and authority,

as well as willingness to participate in the exchange of resources and the identification of solutions (Torfing, 2012). The more inclusive a metagovernance arrangement is, the more likely it is to foster interactions between actors or members, formulate a joint mission, and build capacity through the creation of collective rules. The identification of who is included or excluded also reveals the dominant interests that are present. As Sørensen and Torfing (2005) argue, the way in which a metagovernance arrangement is organized influences who determines the inclusion or exclusion of certain actors and their ability to steer the scope of the scheme.

Finally, understanding the internal governance structure of a metagovernance arrangement shows how it establishes and renews rules over its subjects, resolves disputes, and exerts enforcement. Metagovernance arrangements govern standard setting, either by controlling its network through a series of subtle or indirect forms of governance instruments (Sørensen and Torfing, 2009), or by shaping participant's actions in accordance with predefined procedure (Sørensen and Torfing, 2005). They may also apply formal elements, such as strict entrance and exit rules or measures to secure consensual results (Meuleman, 2011) or develop clear procedure for adjusting conditions or resolving conflicts (Torfing, 2012). Furthermore, relations between the metagovernance arrangements and the standards concerned not only involve how these standards are regulated, but they also influence interaction between standards, including how conflicts between them are settled (Temmerman et al., 2015) and how their diverging interests are dealt with.

3.3 Methodology

The GSSI, the ISEAL, and the ASEAN Shrimp GAP were selected to get a more in-depth understanding of different kinds of metagovernance arrangements and how they interact and influence certification standards in a single sector (Flyvbjerg, 2006; Yin, 2013). As outlined earlier, each case is regarded as independent to the extent that they represent different governance arenas (see e.g. Levy and Newell, 2005), that is, market (the GSSI), civil society (the ISEAL), and the state (the ASEAN GAP). As such, it is assumed that the three metagovernance selected compete with each other in terms of the level of legitimacy that offer standards that are able to subscribe to more than one metagovernance arrangement. But it is also recognized that such a strict separation in these arenas is blurred by the interaction observed between them, through advising, informing, or even by benchmarking each other. The comparison of these metagovernance arrangements, therefore, offers an opportunity to take into account both their independence and interaction and in doing so seeks generalizable observations of the phenomenon of metagovernance.

Table 3.1. Variables and topic list used during the interviews.

Indicators	Topic list
(1) Goal - interests behind development of benchmarking	<ul style="list-style-type: none"> • Identify the objective and direction of metagovernance arrangement • Understand how the goals of metagovernance arrangement are agreed upon • Determine how the direction of metagovernance arrangement assess its influences and legitimacy in steering standards in toward their directions • Identify different actors and their input in the process of setting the goals • Examine the goals of the arrangement to enhance positive coordination between standards, develop joint solutions or cooperation strategies • Steering interaction in specific direction of benchmarking, harmonization of standards, or creating methods for assessment
(2) Inclusiveness - accessibility to participate in benchmarking	<ul style="list-style-type: none"> • Inclusiveness as an instrument for establishing credibility, authority, and legitimacy • Participating in the exchange of resources or solutions • Establishing joint mission through the creation of institution or collective rules • Degree of metagovernance arrangement in coordinating and facilitating between standards or members • Degree of freedom members have in maintaining their own rules • Degree of interaction within the network and metagovernors and improve interactions among actors • Identifying who is included or excluded and dominant interests
(3) Internal governance - membership and representation	<ul style="list-style-type: none"> • Understand how metagoverning practices are established and shaped by internal rules • Identify procedures, activities, and rules of metagovernance arrangement • Enforcing or shaping member's participating through subtle or indirect forms of instruments or rules • Monitoring member's action against predefined procedural standards to ensure accordance with defined objectives • Introduce hierarchical elements, such as entrance or exit rules to secure consensual results • Use of knowledge and authority to influence benchmarking or rules framing process, and monitoring and evaluation of the outcome

The basis of the case comparison are the three analytical variables: goal, inclusiveness, and international governance structure, broken down into subvariables, as described earlier (see Table 3.1). Multiple sources of data are drawn upon to operationalize these variables. First, data were collected through a review of policy documents, reports, and press releases associated with GSSI, ISEAL, and ASEAN Shrimp GAP. Second, 21 semistructured interviews were conducted with representatives of each arrangement, with standard-setting organizations and individuals who have acted as advisors to both the standards and metagovernance arrangements between October 2014 and April 2015. All interviews were transcribed and systematically analyzed with respect to the three core issues of goal, inclusiveness, and internal governance structure.

3.4 Comparison of Three Metagovernance Arrangements

3.4.1 Global Sustainable Seafood Initiative

3.4.1.1 Goals

GSSI was launched in 2016 as a public-private multi-stakeholder platform funded by the German development agency GIZ and a consortium of retailers to create a precompetitive evaluation of the equivalence of the multiple seafood certification schemes. As claimed by an advisor to GSSI, its goal is to assess the content of standards, and their governance with respect to developing and renewing environmental sustainability criteria (see Figure 3.1). In doing so, the GSSI aims to reduce confusion throughout the seafood value chain over the claims and quality of different public and private seafood standards. In the words of the GSSI, “certified once, recognized everywhere.” It also aims to create both competition and collaboration, with the goal of reducing duplication and increasing comparability between different seafood certification schemes (GSSI, 2016b; d; Nolting, 2011).

3.4.1.2 Inclusiveness

The GSSI benchmarking tool is based on a set of baseline criteria against which the performance of standards can be individually measured and relative improvement demonstrated (Mallet, 2014a). Interviews with aquaculture standard organizations (considering) themselves to GSSI benchmarking see both risks and opportunities.

Private standards generally see a risk that GSSI recognition will lead to greater cost and bureaucracy, given they already comply with the Technical Guidelines on Aquaculture Certification on which the GSSI is based or the ISEAL codes (described later). They argue that the perceived need to subscribe to multiple benchmarks can

undermine their credibility. However, one respondent argued that this is a pessimistic perspective and that the GSSI in fact represents an opportunity to consolidate their market position. Some national standards, including those interviewed from Southeast Asia that are widely regarded as less stringent but more inclusive of producers (Samerwong et al., 2018), are overall more critical of the role of GSSI, arguing that their already marginal recognition in export markets would be further eroded. Others, however, see an opportunity to critically evaluate themselves, with the expectation that GSSI benchmarking will lead to a level playing field in the global market.

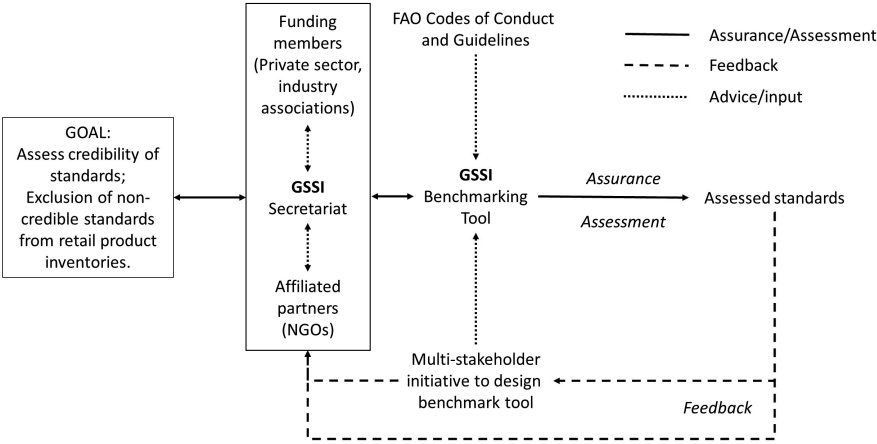


Figure 3.1. GSSI governance and assurance process.

Notes: GSSI = Global Sustainable Seafood Initiative; FAO = Food and Agriculture Organization of the United Nations; NGO = nongovernmental organization.

Retailers and food service respondents were overall positive about the potential of GSSI to identify credible standard and reduce proliferation and consumer confusion. They were generally positive about the potential to reduce the number of standards but fitting with their wider corporate sustainability goals also voiced concern that the GSSI would simply recognize already stringent standards, rather than improving standards that are inclusive of a wider group of producers and global production.

3.4.1.3 Governance

The GSSI assessment framework has been developed through a consultative multi-stakeholder process. During this developing stage, the GSSI involved working groups that provided strategic briefings to an international Steering Board consisting of 15 representatives from retailing companies (including Grobest, Metro, Ahold

Delhaize, and Sodexo), NGOs (including WWF, SeaWeb Europe, and New England Aquarium), public institutions (FAO, GIZ, and the Dutch Initiative for Sustainable Trade), and ISEAL. These working groups consist of experts from NGOs, public and private organizations, industry, and academia who translated a series of FAO normative frameworks and guidelines such as the Code of Conduct for Responsible Fisheries, as well as ISO normative standards and the ISEAL Codes, into a benchmark assessment tool (GSSI, 2016c; Nolting, 2011).

Overall, the governance structure of the GSSI, by its own admission, sets an appropriate and achievable level of compliance for standards that allow standards to demonstrate a requisite level of legitimacy (GSSI, 2016c). But GSSI also provides as an add-on to allow standards to showcase their diversity and differences (see also GSSI, 2015). The review process for standards that apply for GSSI recognition is then carried out first by experts before public consultation and before being sent to a steering board for final review (GSSI, 2016a).

Seafood importers and retailers participating in GSSI reported that the main benefit of GSSI to them is the simplification of the sustainability claims represented by standards for consumers and reducing the duplication of effort created by each buyer conducting their own benchmarking. Other partners, like the FAO, see the GSSI as an opportunity to identify gaps in national standards, as well as an opportunity to assist developing countries to develop partnerships across the global seafood value chain (Subcommittee on Aquaculture, FAO as cited in GSSI, 2016d). NGOs participating in the multi-stakeholder process saw the GSSI as an opportunity to move beyond the minimum acceptable criteria sought, they claim, by retailers and the industry. Instead, they see the GSSI as a means of setting different expectations above such a baseline to encourage overall improvement of standards and practices (Mallet, 2014b).

3.4.2 ISEAL

3.4.2.1 Goals

The ISEAL was founded in 2002 by a group of sustainability standard-setting organizations including the Forest Stewardship Council, the International Federation of Organic Agriculture Movements, Fairtrade International, and Marine Stewardship Council (ISEAL, 2016). The ISEAL initially developed a Code of Good Practice for Setting Social and Environmental Standards to assure and promote the credibility of private sustainability standards. Conformity to the code was also the main requirement for becoming a member of the organization (see Figure 3.2).

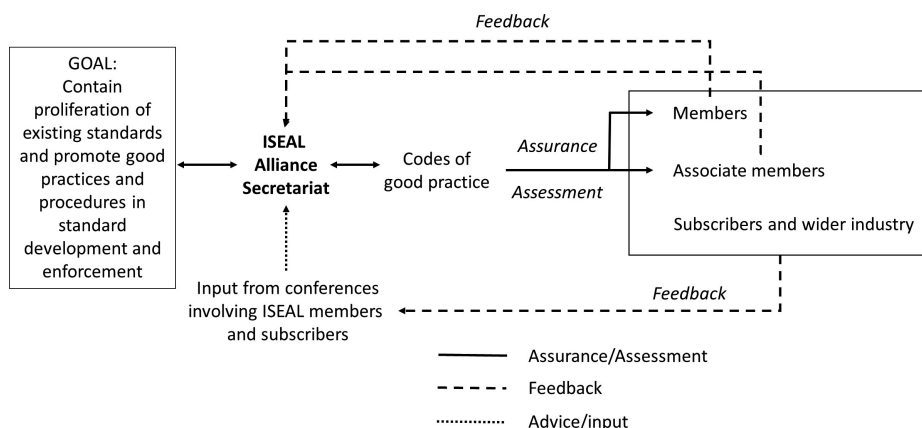


Figure 3.2. ISEAL Alliance governance and assurance process.

Notes: ISEAL = International Social and Environmental Accreditation and Labelling Alliance.

In setting this code, ISEAL aimed to contain the proliferation of existing standards through benchmarking against best practices and promote good practices and procedures in standard development and enforcement (Djama et al., 2011). ISEAL's Codes of Good Practice has three separate codes for assessing standards: (a) a Standard-Setting Code, which provides guidance on the standards development process, and the structure and content of the standard; (b) an Impacts Code, which provides guidance on the expectations and approaches for assessing short- and long-term impact of a standard; and (c) an Assurance Code, which provides guidance for assuring that a standard supports sustainability and setting measures of effectiveness for verification and certification models (ISEAL, 2017).

3.4.2.2 Inclusiveness

ISEAL's Codes of Good Practice are applied by leading standards and acts as a guidance for their implementation. As such, the ISEAL sets a bar for membership by developing an improvement path through these codes against which ongoing membership is defined (Djama et al., 2011). Any organization is welcome to use its codes as a guidance, but only those that go through the evaluation process and show their compliance with the codes over a longer time period can be recognized as ISEAL members. For instance, despite the fact that other aquaculture-related standards (e.g. GAA, GLOBALG.A.P.) have been assessed as being compliant with ISEAL codes (Casey, 2017), only the Aquaculture Stewardship Council is a member.

The ISEAL includes a wide range of actors in the revision of their codes, including standard-setting organizations, accreditation organizations, consumer-facing companies, NGOs, researchers, and governments (Djama, 2011). It is notable that despite the ISEAL's involvement in the development of the GSSI, the GSSI is not a subscriber of the ISEAL. This network of so-called 'subscribers' extends beyond the ISEAL's immediate membership to assist greater input and recognition of the ISEAL's codes as a reference for good practice (ISEAL, 2015d). Nonetheless, membership has continued to grow because, it is argued, of the increased scrutiny and therefore demand for assurance of private standards in the international market. Member standards are able to draw more credibility and legitimacy to themselves by being associated with the ISEAL and are able to use their membership to provide greater assurance to the business community that credibility has been accredited.

The ongoing legitimacy of the ISEAL appears dependent on its own expansion. If the ISEAL can increase its membership, it can strengthen its position as an arbiter of standard oversight (Loconto and Fouilleux, 2014). However, respondents from standard organizations and the private sector argue that expansion of membership alone is not an effective strategy. From their perspective, the overall impact of the ISEAL on its members remains limited by the generality of the codes and the lack of measurable improvement that can be used to hold members to account. Over the long term, this opens up the possibility for alternative metagovernance models.

3.4.2.3 Governance

The ISEAL is governed by a board of directors (ISEAL, 2015a) along with subcommittees composed of ISEAL members to oversee its strategic plan and approve new membership applications after a review by independent evaluators (ISEAL, 2015b). In addition, a Stakeholders Council, comprising sustainability experts, provides strategic advice on the further development of the codes (Leipziger, 2009). Within this internal governance setting, the ISEAL manages the different interests of its diverse members by using pragmatic and strategic objectives that are 'fit for purpose' (Loconto and Barbier, 2014). This means they discuss issues case by case or, alternatively, leave some specific issues out of discussions to achieve general consensus on the major issues.

The way the ISEAL frames credibility also differentiates them from other metagovernance arrangements. For instance, external stakeholders can collaborate with members of the Technical Committee on the content of new and revised codes (ISEAL, 2015c). In addition, members can provide input to discussions and the code revision process, with the ISEAL secretariat moderating the views of different

stakeholders. As outlined by Loconto and Barbier (2014), the ISEAL also interacts with its members through annual individual meetings and its annual conference. During these meetings, the ISEAL provides a platform for members and non-members to interact and discuss their experience, offers learning opportunities, provides recommendations for improvement, and during the peer-review process among members when discussing the development or revision of their codes.

3.4.3 ASEAN Shrimp GAP

3.4.3.1 Goals

The ASEAN Shrimp GAP was established in 2011 by the ASEAN Shrimp Alliance (ASA): An intergovernmental initiative consisting of 10 ASEAN member countries aimed at harmonizing existing shrimp production standards (SEAFDEC, 2013; Yamamoto, 2009). Despite there being more aquaculture species standards at the national level, shrimp was selected because of its contribution to regional economic development and because of the proliferation of national level shrimp standards.

Similar to the GSSI, the ASEAN Shrimp GAP process followed the FAO Technical Guidelines for Aquaculture Certification to develop its modules (SEAFDEC, 2014; see Figure 3.3). It, as such, serves as a guidance and encouragement for member states to align, develop, or improve their national standards and shrimp farming operations (ASEAN, 2011) and for ASEAN member countries aiming to align their national GAP standards. One potential outcome in the future may be a regional standard for all aquaculture species that combines the ASEAN Shrimp GAP and the ASEAN GAP (SEAFDEC, 2016).

The first rationale for the ASEAN Shrimp GAP standard is to counter the proliferation of standards for shrimp that had emerged in major producing countries like Indonesia, Thailand, and Vietnam (ASEAN, 2011). The second rationale is to increase the overall credibility of Southeast Asian shrimp production in export markets, which supplies 80% of the global shrimp output (ASEAN, 2011). Market access to the European Union and United States is a particularly important goal for ASEAN countries, given their experiences with non-tariff barriers for shrimp around quality and food safety issues. The third rationale is to promote greater harmonization between countries in the region in the ongoing transition to the ASEAN Economic Community which aims to integrate regional markets and regulation following a (long-term) model similar to the European Union (see for e.g. Jetschke and Murray, 2012).

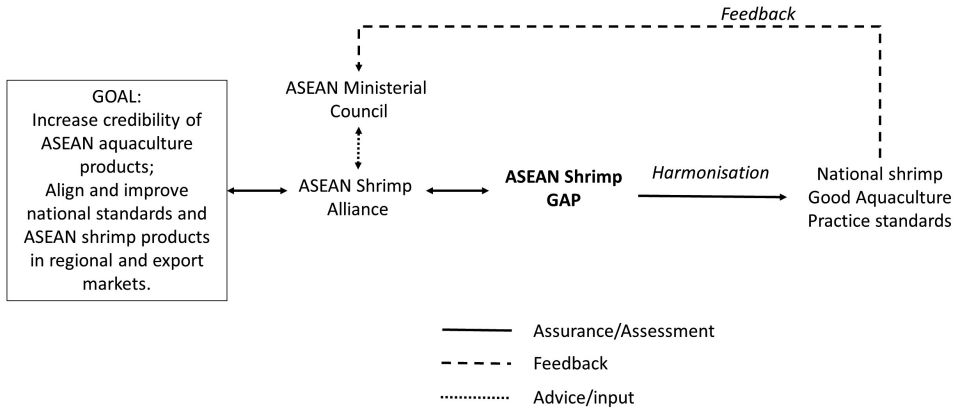


Figure 3.3. ASEAN Shrimp GAP governance and assurance process.

Notes: ASEAN Shrimp GAP = Association of Southeast Asian Nations Good Aquaculture Practices for shrimp.

3.4.3.2 Inclusiveness

The ASEAN Shrimp GAP is a voluntary standard for member countries. This means it covers only national standards and not any private standards. However, according to respondents, while the ASEAN Shrimp GAP has not had interaction with the GSSI or the ISEAL, some of the national standards (notably Vietnam and Thailand) have had preliminary discussions by GSSI for developing an improvement plan with the goal of being benchmarked. Concern was also expressed over their involvement, particularly with respect to losing sovereign control over standard development to what they perceive to be the private sector.

As a regional state-led initiative, the ASEAN Shrimp GAP has brought together a range of countries to align their national shrimp standards. But there remains a high degree of variance in how the standards and harmonization process is interpreted. This means that harmonization in the future will remain complex, and as seen in the implementation of other ASEAN ‘good agricultural practices’, individual countries are likely to introduce GAP based on their own priorities rather than those of the region (Premier and Ledger, 2006). According to respondents reflecting on the experience of these ‘good agricultural practices’, it also appears that greater efficiency might be sought in moving to equivalence and mutual recognition of existing national standards, rather than formulating a harmonized regional standard and associated label. This may allow for wider impact of the ASEAN Shrimp GAP, given

it is currently only Thailand, Vietnam, and Indonesia that have currently aligned their national standards (ACFS, 2014; Nguyen, 2015).

3.4.3.3 Governance

The ASEAN Shrimp GAP standard was developed by the ASA through a series of meetings between public and private sector experts and subsequently endorsed by the ASEAN and announced to its members (SEAFDEC, 2012). The alliance supports its member countries to improve ASEAN's negotiation power in the international market and to establish joint coordination mechanisms among regional governments and private commercial sectors (ASA, 2009). The alliance also acts as a communication hub for sharing information on shrimp product development and for collaborative action among its members. Its functions include annual reviews to provide recommendations for member countries on the alignment process with the aim of improving the performance of national standards (SEAFDEC, 2013).

ASEAN member states, led by Thailand, have been discussing the creation of a regional certification scheme based on the ASEAN Shrimp GAP that could be recognized within the region and beyond (SEAFDEC, 2014; Suntornratana, 2014). But while the ASEAN Shrimp GAP aligns to national standards across the region, it is also noted by government respondents that it still lacks an institutional body at the ASEAN level to govern such a regional standard in terms of implementation and auditing.

3.5 Discussion

Common to all three metagovernance arrangements is the ambition to curtail the proliferation of aquaculture standards, as well as create trustworthy and therefore effective sustainability standards. As outlined in our analysis earlier (and summarized in Table 3.2), each arrangement attempts to foster control and coordinate standards; they set out to varying degrees of rules for inclusion, dispute resolution, enforcement, and control. Each of the arrangements also sets out reflexive processes of internal governance, through which multiple stakeholders from a variety of sectors are involved in setting guidelines, codes, and standards for the standards they seek to steer. While there are clear differences between exactly how these metagovernance arrangements operate, they ostensibly seek the same outcomes for the standards that subject themselves to assessment, guidance, and ultimately improvement

Table 3.2. Comparison of three metagovernance arrangements.

Variables	GSSI	ISEAL	ASEAN Shrimp GAP
(1) Goal - interests behind development of benchmarking	<ul style="list-style-type: none"> Assess credibility of standards Exclusion of noncredible standards from retail product inventories 	<ul style="list-style-type: none"> Guide development of standard-setting procedures by members standards Implicit exclusion of non-credible standards based on membership 	<ul style="list-style-type: none"> Increase credibility of ASEAN aquaculture products Align and improve national standards and ASEAN shrimp products in regional and export markets
(2) Inclusiveness - accessibility to participate in benchmarking	<ul style="list-style-type: none"> Industry, retail in development stage. Limited to only fisheries and aquaculture standards Experts contribute to benchmarking tool Standards voluntarily engage in benchmarking process 	<ul style="list-style-type: none"> Membership limited to standards and accreditation organizations from various fields. Wider network interaction with ISEAL 'subscribers' Platform for knowledge sharing among standards 	<ul style="list-style-type: none"> Membership restricted to ASEAN national shrimp standards Voluntary assessment depends on interests and capacities of shrimp sector and standards Countries with expertise and experience lead development
(3) Internal governance - membership and representation	<ul style="list-style-type: none"> Multi-stakeholder platform of seafood industry, retailers, experts, and governments Criteria developed through negotiation among industry, NGOs, academia, buyers, and standard organizations 	<ul style="list-style-type: none"> Moderates members to focus on collaboration with solution orientation Conferences and network interaction extends influence of Code of Best Practice to wider community of practitioners (subscribers) 	<ul style="list-style-type: none"> Lead countries (in particular Thailand) takes initiative in discussions and meetings Voluntary benchmark for member states to follow and not a mandatory regulation Ambitions to develop 'harmonised' regional certification

The analysis also shows that each of the metagovernance arrangements differs considerably in terms of its approach to ascribing legitimacy to the standards they govern. In selecting these arrangements as comparative cases, it was assumed that each represents the governance arenas within which their members, subscribers, or partners stem from. For the GSSI, this means the market; for ISEAL, its wider civil society partners; and the ASEAN Shrimp GAP, its member states. However, the results show that these governance arenas and metagovernance arrangements are not mutually exclusive.

Reflecting the findings of other research on multi-stakeholder initiatives and private standards, each of the metagovernance arrangements seeks legitimacy through hybrid combinations of market, civil society, and the state actors and institutions (see Auld, 2014; Foley and Havice, 2016). The GSSI builds the legitimacy of its assessment framework on a combination of FAO guidelines and Codes of Conduct, as well as the participation of public funding organizations, industry, and academia, participating in its stakeholder and technical advisory boards. Similarly, the ISEAL builds its legitimacy through engagement with both NGO and company members and subscribers. The ASEAN Shrimp GAP is different to the extent that it draws on the democratic legitimacy of ASEAN member countries (similar to the model of the European Union; Fouilleux and Loconto, 2017). But an underlying assumption is that this legitimacy reflects the wider concerns and interests of broad societal support. Based on such observations, and reflecting the findings of others (Derkx and Glasbergen, 2014; Sørensen, 2006; Steurer, 2013), each of the metagovernance arrangements constitutes a vehicle for shaping social dynamics of power sharing, communication, negotiation, and conflict resolution between sectors.

But despite this mixing of governance arenas, and related sources of legitimacy, what is also apparent from each of the cases is the dominant role of the market. The consequence of this being that while these arrangements provide assurance of market-oriented standards, there appears to be a clear differentiation between the dominance of market actors and the representation of their interests in influencing their goal orientation, inclusiveness, and internal governance. Said differently, the legitimacy of each of these initiatives draws on the interests of the market actors by (aspiring to or already) providing assurance over market standards. This in turn affects the way in which they set their goals and ultimately the degree and ways in which they support the improvement or inclusion or exclusion of standards.

For instance, although the GSSI is outwardly open to a wide range of standards, the goal of the commercial partners appears to favor assurance for standards already active in European and US markets rather than supporting the improvement of

apparently lower performing ASEAN national standards (Samerwong et al., 2018; Vandergeest and Unno, 2012). Similarly, the membership model of the ISEAL explicitly favors standards that have been developed through civil society-led multi-stakeholder processes rather state- or private sector-led standards. While it might be considered as exhibiting greater independence from the market than the GSSI, the greater civil society involvement in the ISEAL has created suspicion that it is not representative of the wider interests of commercial (seafood) buyers. Indeed, it appears this suspicion contributed to the development of the GSSI in the first place. The ASEAN GAP standard is clearly focused on both setting a harmonized standard, improving the quality of the national standards, and defending interests of the region (and regional political organization) it represents. But given their wider aspirations to take back sovereign control over aquaculture production from global standards, these standards are also marginalized from the market by their lack of commercial support (Vandergeest and Unno, 2012).

Following Reinecke et al. (2012), the results indicate that plurality of metagovernance arrangements does appear to provide a vehicle for partial metastandardization, which in turn maintains an (albeit more limited) plurality of claims and procedures. However, the trend appears to be toward the convergence of standards in the more narrow interest of key market actors. Partial metastandardization, nonetheless, still means that there is still room for metagovernance arrangements to distinguish themselves enough to allow for an ongoing plurality of claims and procedures. The result in practice might then be the ongoing ‘secondary market’ for metagovernance arrangements, building on the already established ‘primary market’ for the standards they seek to metagovern (Reinecke et al., 2012). As a result, standards will continue to undertake forum shopping, selecting an arrangement that suits the claims and level of rigor they require for market access (Schleifer, 2013). Under such a scenario, it appears unlikely that metagovernance arrangements will achieve their wider goal of limiting the proliferation of standards. It is even questionable whether they will contribute to the ongoing improvement of standards and therefore of aquaculture production (or any other form of primary production) if, as Smith and Fischlein (2010) argue, ongoing competition is linked more to the composition of their legitimacy networks than the specific content of their assessment frameworks.

Less pessimistically, the existence of multiple metagovernance arrangements might alternatively provide an opportunity for promoting standards with widely different levels of performance and inclusiveness in the industry. Indeed, the divergent standard requirements, internal governance, and assurance (auditing) processes of aquaculture standards raises the possibility of setting out a stepwise improvement

pathway for standards placing emphasis on different market claims or societal objectives.

There are different possible ways of structuring improvement pathways for standards and producers alike. the GSSI and the ISEAL currently work on the basis of a binary 'in or out' form of assessment that does not necessarily reflect a pathway of improvement for standards. In a different way, the ASEAN Shrimp GAP aims to harmonize potentially 10 different national standards. While reducing a perceived confusion between these standards such harmonization will also remove any differentiation between goals and ultimately undermine the capacity of producers in these countries to comply with a single (and most likely higher level) standard. However, all three metagovernance arrangements could choose to supplement their focus on high performing standards by providing entry to poorer performing standards within their own assessment methodology - akin to a tiered assessment framework (e.g. Bush and Oosterveer, 2015; Tlustý, 2012). Alternatively, they could achieve a similar improvement pathway from one metagovernance arrangement to another. Within or between metagovernance arrangements standards would be mapped out from lower to higher levels of compliance, which could in turn provide an improvement pathway for producers and standards alike to follow.

3.6 Conclusion

The main goal of the three metagovernance arrangements are to reduce confusion related to the proliferation of standards in the marketplace by excluding poorly performing standards while providing assurance over the credibility and hence legitimacy of others. But all three differ to a large extent in how they build legitimacy for themselves and standards alike. Like the standards they seek to assess, metagovernance arrangements are neither homogenous nor converging. They instead provide a platform for market, civil society, and state actors to come together to make a variety of claims and structure assurance procedures and processes according to their interests. While there is some tendency for market interests to prevail in these metagovernance arrangements, either directly or indirectly, they ultimately open up alternative venues for standards to (where possible) select one or more venues for assessment and assurance. Paradoxically, the existence of multiple metagovernance arrangements may in fact open up opportunities for an ever-growing number of standards to gain market recognition, rather than limiting their number.

There are already signs that these different metagovernance arrangements can and do cooperate, as is shown by the involvement of the ISEAL in the formulation of

the GSSI. While this shows that benchmarking schemes can collaborate at the same time as they compete, either directly or indirectly, it also opens up the possibility for mutually agreed-upon improvement pathways for multiple and differentiated standards. If such cooperation can be strengthened, and shaped into more strategic shared goals, then together these metagovernance arrangements may be able to strengthen the role that voluntary eco-certification standards can play in fostering credible, effective, and more inclusive improvement for the sector as a whole. Doing so would also move the goals of metagovernance arrangements beyond the curtailment of standard proliferation and the defense of specific interests in various governance arenas. Instead, it could place attention on the coordination and improvement of standards and ultimately the practices of primary producers. The form and function of such mutual coordination should be the focus of further research.

Chapter 4

A capability approach to assess aquaculture sustainability standard compliance

This chapter has been published as:

Samerwong, P., Toonen, H.M., Oosterveer, P., Bush, S.R., 2020. A capability approach to assess aquaculture sustainability standard compliance. *PLOS ONE*. 15, e0227812.

Abstract

Sustainability standards are used to assure improved environmental performance in the aquaculture sector. But standard setters face limitations in including a broad range of producers with different capabilities, which in turn reduces their scope and impact. Drawing on Sen's capability approach, we introduce a novel way to assess the extent to which sustainability standards can support the capability of farmers to make prescribed improvements to their production practices. In doing so, we compare four shrimp aquaculture standards (Aquaculture Stewardship Council, Global Aquaculture Alliance, Southeast Asian Shrimp Aquaculture Improvement Protocol and the Thai Agricultural Standard) based on an analysis of what we label the 'prescribed capitals' and 'bundle of capitals' that underpin the compliance capability of producers. The results show that standards narrowly prescribe standards requiring human capital, while there is potential for prescribing a wider bundle of social, financial and physical capitals that can allow more flexible standard compliance. The findings raise the prospect of redesigning sustainability standards to support a broader diversity of producer capabilities and, in turn, increase their overall impact.

Key words: aquaculture certification, bundle of capitals, capability approach, prescribed capitals, shrimp standard

4.1 Introduction

As in many food sectors, sustainability standards have emerged as a primary market-based assessment and assurance tool for ‘sustainable’ aquaculture production (Komives and Jackson, 2014; Tlusty and Tausig, 2015). There are currently more than 30 aquaculture standards available, ranging from certification schemes to recommendation lists, and representing a diverse set of claims related to food safety, quality, traceability, environmental and social impact (Parkes et al., 2010). What these standards hold in common is the prescription of principles, standards and criteria aimed at restructuring producer practices towards ‘improved’ forms of production (Tlusty, 2012).

The impact of sustainability standards depends to a large extent on the voluntary compliance of producers to their principles and indicators. This means that farmers are required to change their farming practices, farm management systems and/or shared water infrastructure between farms to meet the expectations prescribed within these principles and indicators (Boyd and McNevin, 2014; Tlusty and Tausig, 2015). However, standard setters neither discriminate nor differentiate between producers based on their ability to make any improvements necessary for compliance. Instead the so-called ‘theory of change’ of these standards is based on the assumption that preferential market access will provide incentive enough for producers to invest in these improvements (Roheim et al., 2018).

The assumption that market access provides adequate incentive for standard compliance is, however, questionable given that only between one and five percent of global aquaculture production is currently certified (Bush et al., 2013a; Potts et al., 2016). In the shrimp aquaculture sector, for instance, the uptake of certification standards has been limited by the high diversity of production practices, location and farm size (Ashton, 2010), as well as the differences in sectoral development and government capacities across different regions (Weimin et al., 2013). Another challenge is the presence of multiple standards, each requiring compliance to different standards with different ‘sustainability’ claims serving domestic and export markets. For example, producers in Thailand, a top five shrimp exporting country, have to comply with both national and international standards to meet the sustainability demands of buyers in the US and EU market (Samerwong et al., 2018). For producers, non-compliance with these standards therefore means exclusion from these markets. For standard holders, the non-compliance of these producers limits the overall volume and area of production that meet their environmental and social goals, which in turn undermines the overall effectiveness of standards as a sustainability governance mechanism.

If sustainability standards are to increase the number of farms that are certified globally, we argue they need to move beyond a technical understanding of compliance to instead assess and support the capabilities of farmers to improve their production. ‘Technical compliance’ refers here to the voluntary performance of improved farming practices in response to standard criteria and their related indicators (Amundsen et al., 2019; Bosma et al., 2011). Failure to comply with these technical criteria is generally thought to reflect the poor knowledge and/or skills of farmers, which is in turn commonly translated into the need for training programmes (Hatanaka et al., 2005; Henson and Jaffee, 2006). Following the work of Sen (Sen, 1993; 1997), a capabilities approach to standard compliance contrasts with this focus of ‘skills and knowledge’ by focusing instead on the socially mediated conditions that determine access and use of a portfolio of diversified ‘capitals’ (human, social, natural, physical and financial) by farmers that provide the means by which technical changes to their farming practices can be made (see also Kalfagianni, 2014; Nussbaum, 2000; Robeyns, 2005). A capabilities approach also focuses attention on the degree of freedom farmers have to recombine different capitals to increase their capability to comply with standard requirements (Sen, 1999).

In this paper we develop a framework based on the capability approach of Sen to explore the extent to which aquaculture standards currently enable farmers to employ different capitals to comply with their technical requirements. Our analysis is divided in to two parts. First, based on the capability framework we analyse the extent to which four aquaculture sustainability standards (Aquaculture Stewardship Council, Global Aquaculture Alliance, Southeast Asian Shrimp Aquaculture Improvement Protocol and the Thai Agricultural Standard) enable producers to mobilise different combinations of capitals and therefore different capabilities for compliance. Second, we analyse how standard setters through their support programmes, designed to directly support producer compliance (see Bottema, 2019), contribute to enhancing farmers’ capabilities. Our assumption is that by supporting a more diverse bundle of capitals standards and their support programmes will more effectively support farmers to achieve standard compliance; which can potentially increase the volume and area of certified production and improve the likelihood these standards will reach their environmental and social sustainability goals.

The following section presents the conceptual basis of the capabilities framework and its application to sustainability standards. We then outline the methodology used to operationalise the capabilities framework in our assessment of standards and their support programmes. The rest of the paper reports on the results of our analysis and discusses the potential contribution of the capabilities framework for reimagining the form and function of sustainability standards in the aquaculture sector and beyond.

4.2 Capability assessment framework

4.2.1 Capabilities, sustainability and standards

Sen's work on capabilities has been interpreted, discussed and applied in different domains, ranging from economic development, social justice and environmental governance (e.g. Burchi and De Muro, 2016; Conceição et al., 2016; Walby, 2012). Common to most if not all applications of a capabilities approach is to go beyond a simplistic view of cause and effect, and instead focus on the conditions which shape specific outcomes. For instance, instead of focusing on income as the cause of food insecurity, a capabilities approach draws attention to the wider social conditions that undermine a person's ability to access and employ resources and skills to realize food security as an entitlement (Conceição et al., 2016). The same logic applies to studies on environmental governance. The negative consequences of environmental degradation is then not only determined by poor resource management, but by the inability of resource users to access and employ (for example) the legal rights needed to engage in effective resource management (Bockstael and Berkes, 2017).

The notion of capabilities has been applied in certification to examine the extent that skills and knowledge are needed for standard compliance. For example, Lemeilleur's analysis of mango farmers in Peru identified the threshold capital requirements smallholder producers must have to improve their production practices to meet standard requirements (Lemeilleur, 2012). Studies applying Sen's capabilities approach to standards are less common. Those that have used his approach have focused on notions of 'rewarding regulation', by analyzing how standards foster learning by producers and new connections with them and private and public actors who can improve their competitiveness (Perez-Aleman, 2013). Others have focused on the role of standards in affecting rights to resources needed to fulfil sustainability and humanitarian objectives (Kalfagianni, 2014). None of these studies have, however, explored how the standards themselves limit or enable farmers to develop the capabilities to comply with their requirements. It is this gap in the literature we contribute to.

4.2.2 Capabilities and capitals

Sen defines a capability as "the ability (a person has) to do (or be) certain things that she has reason to value" (Sen, 1997, p.1959). Sen also argues that capabilities are not natural or intrinsic to an individual, or simply learnt. Capabilities are instead influenced by the social and political conditions within which an individual performs particular sets of 'doings' and 'beings' (which he labels 'functionings'), such as shrimp farming or, more specific in the context of 'sustainable' or 'responsible'

aquaculture, production practices compliant to requirements set by a standard. Improving the capabilities of individuals is then not only a matter of transferring the skills, knowledge or infrastructure to perform a given functioning (i.e. to comply), but instead the opportunities an individual has, or is provided, to acquire skills, knowledge or infrastructure necessary to perform the functioning (Kalfagianni, 2014; Sen, 1987).

Sen further argues that the expansion of capabilities affords individuals the freedom to employ various combinations of performing everyday ‘doings’ and ‘beings’ (Sen, 1999; 2002). People might need or want to ‘do’ or ‘be’ different things, while still aiming to reach the same goal (Robeyns, 2005). In the context of aquaculture, for instance, the more capabilities farmers have, the greater ability they have to not only meet basic needs and reproduce their practices, but to also actively engage in processes of change towards ‘improved’ or ‘better’ forms of production that can lead to wealth, wellbeing and/or sustainable production (Bebbington, 1999). The potential of such expansion or diversification leads to increased freedom for farmers to make choices about how they improve their production.

The performance and diversification of capabilities, Sen argues, is based on the acquisition and translation of a set of assets or ‘capitals’ (see also Devereux, 2001; Morse and McNamara, 2013; Robeyns, 2005). Capitals are commonly categorised into five types: human, social, natural, physical and financial capital (DFID, 1999; Morse and McNamara, 2013). Human capital refers to assets like knowledge, skills, health and labour. Social capital refers to for example informal networks, and membership of formalised groups or associations. Natural capital generally refers to natural resources (living and non-living), and/or to access rights to natural resources. Physical capital refers to basic infrastructure, like buildings, transportation, but also production technologies and tools. Financial capital refers to money and ‘savings’ (in various forms), as well as to access to financial services. Table 4.1 presents the five capitals and related capabilities, and how they enable a person to perform a functioning, or in other words, how capitals contribute to a producer’s ability to successfully perform sustainable aquaculture practices.

Table 4.1. Capitals and related capabilities.

Capital	Assets	Capability	Example
Human Capital	Knowledge, personal health, skills, labour, access to education and training	Ability to retrieve information, to understand, to reflect, and to physically carry out activities (e.g. to work)	An educated producer is more likely to correctly read drug prescriptions, thereby realizing the possibility of having a healthy stock
Social Capital	Social networks and informal relationships, memberships of formalized groups or associations	Ability to collaborate with, and learn from others, to engage in reciprocal interactions, to forge and maintain informal and formal relations	A producer connected to skilled/educated others (neighbours, co-producers, organization members) is more likely to easily ask for help and having broken tools or system errors fixed in a quick and cost-efficient manner
Natural Capital	Natural resources, both living and non-living (geology, land, soil, water, stocks, genetic resources), and/or rights to access to natural resources	Ability to situate one's practices in an environment/ecosystem which provides necessary inputs for operations, and/or is insensitive (or little sensitive) to a farm's waste outputs	A producer whose farm is located in an area with a year-round water supply of good quality is more likely to enable healthy stock growth
Physical Capital	Energy, irrigation and sanitation systems, buildings, transportation means and infrastructures, production technologies, and equipment	Ability to operate easily, efficiently and effectively or have infrastructures, systems or equipment in place for operating	A producer who has well-designed ponds or cages is more likely to avoid escapes
Financial Capital	Money and savings, access to loans, credits, financial services	Ability to purchase goods and services for production, to receive credit or make investments to sustain ongoing and future operations	A financially solvent producer is more likely to be able to do large or long-term investments in improving farm management

This typology of capitals is commonly used to assess the endowment of capitals available to an individual and the translation of these capitals into capabilities that enable them to achieve outcomes related to social wellbeing or environmental sustainability (Bebbington, 1999; Krantz, 2001). In this paper we argue that the performance of primary production-related functionings, such as feeding or harvesting shrimp, are also dependent on the capitals available to an individual. As Sen also notes, however, the translation of individual capitals and the expression of individual capabilities is also affected by the social, political, economic conditions in which they exist (what Sen refers to as ‘conversion factors’) (Crocker, 2008; Robeyns, 2005; Sen, 1999). These enabling conditions influence both the capitals available to an individual as well as the freedom that individuals have to employ these capitals in developing the capability needed to achieve a goal like standard compliance (Evans, 2002; Ibrahim, 2006). Conversely, as the rest of the paper argues, regulatory tools can also be seen and assessed as conditioning capabilities by enabling or limiting the freedom farmers have in meeting their requirements.

4.2.3 Application to sustainability standards

The role of sustainability standards is to prescribe the performance of functions related to primary production (Hatanaka et al., 2005). For shrimp aquaculture, this includes setting and assessing technical criteria for on-farm practices and infrastructure related to pharmaceuticals use, feed, water management, labour and biodiversity (for further detail see Potts et al., 2016). However, included in these criteria are also prescriptions of the capitals needed for successful compliance—including the skills and knowledge farmers need to perform ‘sustainable’ or ‘responsible’ feeding or health management, or the infrastructure required for water management or biosecurity. Standards are, as such, not only prescriptions of ‘practice’, but also prescriptions of the capitals required to develop the capabilities to perform the practices needed to comply with standard requirements. To illustrate, in setting a specified survival rate as a measure of animal health, a standard may also require farmers to calculate survival rates from stocking to harvest. As such, standards not only expect information on a technical indicator to be reported, but also prescribes specific human capital (knowledge, skills) to meet those reporting requirements.

The prescription of capitals reflects a utilitarian logic of standards that assumes all farmers need the same capitals to achieve a standardised set of capabilities for compliance. But, as widely shown, this logic of standardisation tends to ignore the diversity of farmers, and the diverse ways of mobilizing skills, finance or social support to be certified (e.g. Henson and Humphrey, 2010; Oosterveer et al., 2014;

Ouma, 2010). In short, the result of such a utilitarian logic is a narrow focus on specific capitals rather than the functioning they enable (Ortega Landa, 2004). Furthermore, this logic fosters high levels of ‘specialisation’ and narrows the possible number of pathways to compliance down to those prescribed by standard setters (Emmanuelle, 2011; Ponte, 2014). Such specialisation can also reduce the overall capability of farmers to respond to systemic issues like disease. But where farmers have greater freedom to diversify the capitals and therefore pathways to compliance they can also increase their capabilities for not only complying with a standard requirement but also more effectively dealing with the issues that negatively affect their production (see for e.g. Martin and Lorenzen, 2016; Whitney et al., 2017).

Following Robeyns (2005), we argue for a capabilities approach to standard design that focuses attention on the full ‘bundle’ of capitals that affect an individual’s freedom to develop compliance related functionings (see Ellis, 1999). Underlying this approach is the assumption that different bundles of capitals can be used in different combinations to develop the capabilities required for standard compliance. For instance, a standard can prescribe that farmers use their own knowledge (human capital) to change farming practices in order to comply with the health management criteria of a standard (as illustrated in Figure 4.1A). Alternatively, if farmers have access to diverse bundle of capitals, they may also use their social capital to learn from others what knowledge and skills are needed in order to comply (Figure 4.1B). In doing so farmers use their bundle of capitals to indirectly mobilize the prescribed capital. But a farmer can also use their bundle of capitals to directly draw on social capital to bring in external knowledge to comply with a standard criteria (Figure 4.1C); or use social capital to change the physical capital (e.g. shared labour for the construction of a pond) such that the health criteria of a standard can also be met (Figure 4.1D). Conversely, if a farmer does not have the knowledge to comply, and only weak social or financial capital, the approach more specifically illuminates why they have limited options for achieving the functioning required for standard compliance.



Figure 4.1. Bundle of capitals.

Notes: 4.1A: Capital directly prescribed by standard (standard direct); 4.1B: Alternative capital used to mobilize a capital prescribed by standard (standard indirect); 4.1C: Alternative (not prescribed) capital used to directly fulfil standard's criteria (alternative direct); 4.1D: Alternative (not prescribed) capital used to mobilize another alternative (not prescribed) capital (alternative indirect).

4.3 Methodology

4.3.1 Standards assessed

For comparative purposes we limit our analysis to four standards that are all applied in a single country: Thailand. Each scheme holds different assumptions of what motivates farmers to improve their practices, either through market incentives or guided non-market improvement. However, the four standards are similar in that they are based on criteria covering a similar range of issues related to responsible or sustainable aquaculture production. The four standards, with a short description, are as follows:

1. *The Best Aquaculture Practices (BAP) Finfish and Crustacean Farm Standards*, developed, and administrated by the Global Aquaculture Alliance (GAA) (Global Aquaculture Alliance, 2017). BAP is a global third-party certification scheme, and its Finfish and Crustacean Farm standard is divided into 19 criteria, individually indicated as ‘critical’, ‘major’ or ‘minor’. The criteria are related to issues like community, environment, animal health and welfare, food safety, biosecurity and traceability. In total, the criteria cover 157 requirements.

2. *The Aquaculture Stewardship Council (ASC) Shrimp Standard* (ASC, 2014). Like BAP, the ASC is also a global third-party certification scheme. The establishment of the ASC resulted from a series of Aquaculture Dialogues initiated by the World Wide Fund (WWF) and the Dutch Sustainable Trade Initiative (IDH). Its Shrimp Standard is based on seven principles, covering 110 metric-based indicators of farmer performance. A farm must achieve 100% compliance against all indicators in the ASC standard to be certified.

3. *The Southeast Asian Shrimp Aquaculture Improvement Protocol (SEASAIP) level one standard* set up by the Asian Seafood Improvement Collaborative (ASIC) (SEASAIP, 2016). ASIC is a regional multi-stakeholder arrangement, which has been funded by USAID and the Monterey Bay’s Seafood Watch programme. The SEASAIP level one standard has been designed to offer a roadmap for more inclusive improvement of shrimp farming. The standard is divided into eight principles related to production, environment and socio-economic criteria, which are developed based on the existing national standards the region with additional indicators of the Seafood Watch Aquaculture Sustainability criteria. Producers are required to demonstrate their compliance with all of the 78 criteria through a third-party audit.

4. *The Thai Agricultural Standard Good Aquaculture Practices for Marine Shrimp Farms* (TAS 7401, or GAP-7401) (ACFS, 2014). TAS 7401 is a national voluntary public standard developed by the Thai government’s standard setting agency of National Bureau of Agricultural Commodity and Food Standards. The 70 requirements of this standard are organised around 10 ‘items’ related to farm management, including energy use, labour, social responsibilities and shrimp health management. The production practices are assessed against these requirements in an initial audit and subsequently re-audited if any improvements are deemed necessary (Central Laboratory Thai, 2018).

4.3.2 Analysis of standards

The analysis is based on the identification and comparison of 1) the ‘prescribed’ capitals set out by the standards, 2) the ‘bundles’ of capitals, which comprise both the prescribed capitals and the ‘alternative’ capitals which farmers could use to develop the capabilities required for complying to the requirements of each standard, and 3) the capitals addressed in the support programmes aimed to assist farmers to improve toward or meet the requirements of the standards. All standards require producers to comply with requirements either at the time of auditing or after the implementation of corrective actions. Therefore, our analysis does not suggest that the employment of different capitals allows farmers to influence audit scoring - e.g. trading off one area of assessment against another. Instead we assess how different capitals can be used to changing production practices and make material improvements to production systems that underpin the overall improvements necessary for standard compliance.

The identification and comparison of the prescribed capitals and the bundles of capitals are made from the perspective of the standards, by interpreting which capitals are explicitly or implicitly included in the different criteria (Lebel et al., 2016). Notably, we were unable to address how farmers interpret which capitals are relevant for improving their capability to comply given the scope and limited resources available for our analysis.

The analysis is carried out in three corresponding steps through mixed methods of analysing both quantitative and qualitative data.

First, ‘prescribed’ capitals were identified for every criteria of the four standards. The identification of these prescribed capitals was based on our explicit interpretation of the text and allocation of one or more of the capitals that relate to the resources, knowledge, skills, relations that enable producers to develop the capability for compliance. While the schemes mostly prescribed one capital to fulfil a requirement, all present instances of requirements in which more capitals have to be used (BAP: 10 requirements; ASC: 6; SEASAIP: 5; TAS 7401: 2). To ensure accuracy, the allocation of one or more of the five capitals was done iteratively, going back and forth between the capitals (with related capabilities need for compliance in mind), and the interpretation of the standard texts. This involved the lead author making an initial identification of capitals for each criteria and then testing this identification with the other authors.

Once the allocation of capitals was completed, the proportional distribution of prescribed capitals across all criteria for each standard was calculated.

This distribution indicates the relative importance of the different capitals for standard compliance. The more skewed the overall distribution to 1.0, the more compliance to the standard's requirements depends on one capital, which in turn implies producers have limited degrees of freedom in how they can meet these requirements. Conversely, the closer the overall distribution of each capital to 0.2, the greater the degrees of 'freedom' (using Sen's terms) a standard affords to a producer for developing the capabilities necessary for standard compliance. A distribution of, or close to, 0.2 reflects a more equally distributed set of prescribed capitals allowing farmers greater freedom to employ different capabilities and, as such, more diversified compliance strategies. Comparing the four standards allows us to identify the variation in how these schemes address producers' capabilities.

Second, alternative capitals were identified, representing the potential alternative capitals that could be used to develop the capabilities necessary for standard compliance. The identification of the alternative capitals is based on the assumption that the capabilities needed for standard compliance can be realised through different combinations of the five capitals than those prescribed by the standards. These alternative capitals were identified by the authors by mapping out all the possible ways prescribed capitals could be substituted such that a producer could still develop the necessary capabilities to comply with each standard criteria. For example, a farmer can draw on social capital to meet a requirement for which human capital is prescribed, by asking either a friend or family member to provide the skills and knowledge necessary for meeting the requirements of a criteria. In such a case social capital represents one alternative pathway for a producer to develop the capability needed for compliance beyond the use of the prescribed capital.

The proportional distribution of the complete bundle of capitals, combining both the prescribed and alternative capitals, across all criteria was also calculated for each standard. Again, the closer to 1.0 the less degrees of freedom a standard confers to producer compliance, and the closer to 0.2 for each capital the greater the degrees of freedom. The difference between the proportional distribution of prescribed capitals and the bundle of capitals were also calculated, indicating the potential redistribution and therefore change in the degrees of freedom that standards afford to producers in order to develop their capability for compliance. Also, the variation of the set of five capitals was calculated for each standard, both for the prescribed capitals and the bundles. This variation is measured by the standard deviation (SD),

where a low SD indicates that combined the five capitals of a standard tend to be close to 0.2, so representing a larger degree of freedom.

4.3.3 Analysis of support programmes

The final step of our analysis was to assess whether and how the pre-certification support programmes of each of the four standards relate to both the prescribed and alternative capitals.

Publicly available information (online sources) was reviewed (Best Aquaculture Practices, 2015; Peterson, 2015; Towers, 2016) and semi-structured interviews were conducted in person and through Skype (between February 2017 and February 2018) with representatives from the four standard organisations and one official from the Thai Department of Fisheries. The interviews focused on the goal of the support programmes, and the kind of support activities they undertook with farmers. The specific questions asked related directly to the technical assistance, training, capacity building and network support provided by the programmes - with each question linking implicitly (not explicitly) to the five capitals. Based on these interviews we assessed the extent to which the goals and activities of the support programmes make use of the prescribed and alternative capitals identified in the analysis of the standards. This analysis assumed that programmes supporting the development of prescribed capitals stimulate specialised compliance that is achievable by a smaller range of farmers, while those supporting the development of alternative capitals are better able to incorporate diverse pathways for standard compliance that may in turn translate into higher levels of overall participation across the industry.

While systematic, the analysis of the standards and the support programmes remains interpretative (Booyesen, 2002). To counterbalance any subjective bias in our interpretation the allocation normalization and aggregation steps of our analysis are made available in Table S4.1 to S4.4¹ of the supplementary materials.

¹ Table S4.1. Assessment of BAP. <https://doi.org/10.1371/journal.pone.0227812.s001>
Table S4.2. Assessment of ASC. <https://doi.org/10.1371/journal.pone.0227812.s002>
Table S4.3. Assessment of SEASAIP. <https://doi.org/10.1371/journal.pone.0227812.s003>
Table S4.4. Assessment of TAS 7401. <https://doi.org/10.1371/journal.pone.0227812.s004>

4.4 Results

4.4.1 Prescribed capitals

Our analysis of the prescribed capitals shows that the four schemes assume a very limited range of relevant capitals for developing the capabilities needed for standard compliance

Human capital is the most dominant capital across all four standards, with an average proportional distribution of 0.62 - larger than the all the other capitals combined (see Figure 4.2). The standard deviation (SD) between the standards is 0.08, indicating a relatively high degree of similarity between these standards with regard to human capital (see Table 4.2). The variation between the standards shows that BAP and SEASAIP have the highest relative reliance on human capital and the Thai TAS 7401 the least. Across all standards human capital is focused on 1) skills and knowledge on farming practices, 2) knowledge on regulations and compliant inputs (e.g. pharmaceuticals and feed), and 3) management skills, including data and documentation skills.

Physical capital, referring to changes in on-farm infrastructure (including ponds, equipment and feed), is ranked second across all standards with an average proportional distribution of 0.20. TAS 7401 places the greatest emphasis on physical capital compared with the other standards with a proportional distribution of 0.27. Overall, however, the SD in physical capital is low at 0.05, again indicating a relatively high degree of similarity between the standards.

The remaining prescribed capitals are far less prevalent than human and physical capital. Natural and social capital have an average proportional distribution of 0.09 and 0.07 respectively, with very low SD between the standards (0.03 and 0.02 respectively). Financial capital was the least prescribed capital with an average proportional distribution of 0.02 (and with a SD between the standards of 0.01). Notably, SEASAIP makes no prescription of financial capital at all, which appears to reflect its aim to reduce the financial burden for farmers when complying with their standard.

When combined, the prescribed capitals show that BAP and SEASAIP are more specialized, both have a SD of 0.25. TAS 7401 presents, on average, the most degrees of freedom for the prescribed capitals, while ASC falls in between (with a SD of 0.17 respectively 0.21).

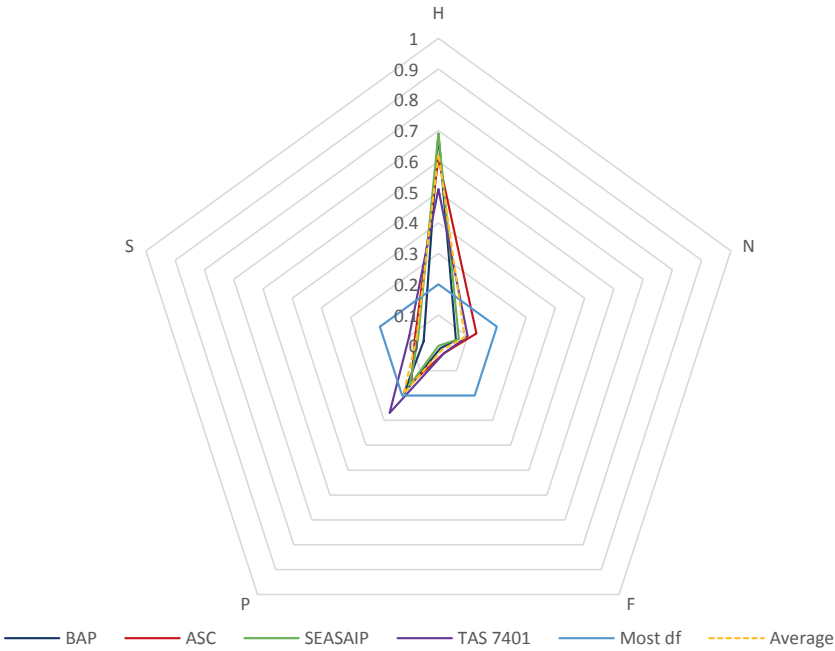


Figure 4.2. Comparison of prescribed capitals against a normalised capitals index across four aquaculture standards.

Notes: (BAP -Best Aquaculture Practices; ASC-Aquaculture Stewardship Council; SEASAIP-Southeast Asian Aquaculture Improvement Protocol; TAS 7401-Thai Agricultural Standard)

4.4.2 Bundles of capitals

The analysis of bundles of capitals shows that a more diverse set of capitals are possible for standard compliance than are currently prescribed. It is also apparent that these bundles, consisting of both prescribed and alternative capitals, offer a greater degree of freedom for developing the necessary capabilities for compliance than the prescribed capitals. The SD between capitals in these bundles is 0.03, which is half of the SD between prescribed capitals at 0.06. Of the four standards TAS 7401 has the most potential degree of freedom, with an SD between capitals of 0.1, followed by SEASAIP, with ASC exhibiting the same SD between capitals as BAP.

Table 4.2. Relative difference between prescribed capitals and bundles of capitals.

Standard	Capitals	H	S	N	P	F	SD
BAP	Prescribed	0.69	0.05	0.06	0.19	0.01	0.25
	Bundle	0.46	0.13	0.04	0.17	0.2	0.14
	Difference*	-0.23	0.08	-0.02	-0.02	0.19	0.14
ASC	Prescribed	0.61	0.08	0.13	0.15	0.03	0.21
	Bundle	0.47	0.08	0.1	0.16	0.19	0.14
	Difference*	-0.14	0	-0.03	0.01	0.16	0.1
SEASAIP	Prescribed	0.69	0.07	0.07	0.17	0	0.25
	Bundle	0.42	0.15	0.09	0.11	0.23	0.12
	Difference*	-0.27	0.08	0.02	-0.06	0.23	0.17
TAS 7401	Prescribed	0.50	0.1	0.1	0.27	0.03	0.17
	Bundle	0.36	0.12	0.08	0.2	0.24	0.10
	Difference*	-0.14	0.02	-0.02	-0.07	0.21	0.12
Average	Prescribed	0.62	0.07	0.09	0.20	0.02	0.22
	Bundle	0.43	0.12	0.08	0.16	0.21	0.12
	Difference*	-0.20	0.05	-0.01	-0.03	0.20	0.13
SD	Prescribed	0.08	0.02	0.03	0.05	0.01	Average 0.06
	Bundle	0.04	0.03	0.02	0.03	0.02	Average 0.03

* Difference between number of proportion of bundle of capitals increase or decrease from numbers of prescribed capitals

Human capital remains the most dominant capital in the bundles of capitals across all standards with an average proportional distribution of 0.43, but less important (0.20 lower) than when it is a prescribed capital (see Figure 4.3). SEASAIP and BAP show the largest redistribution with a 0.27 and 0.23 shift from the prescription of human capital respectively. Correspondingly, the proportional distribution of financial capital increases by 0.20 from its prescribed level to become the second most important capital; indicating (as expected) that capitals are able to be monetised and exchanged. Social capital has smaller increases, ranging from 0.02 to 0.08, except for ASC where no change was observed. Physical capital is the third most important capital in the bundles overall, with a proportional distribution of 0.16, but decreased from its prescribed level in all standards, except for ASC. Natural capital remains the least important capital, with a proportional distribution of 0.08.

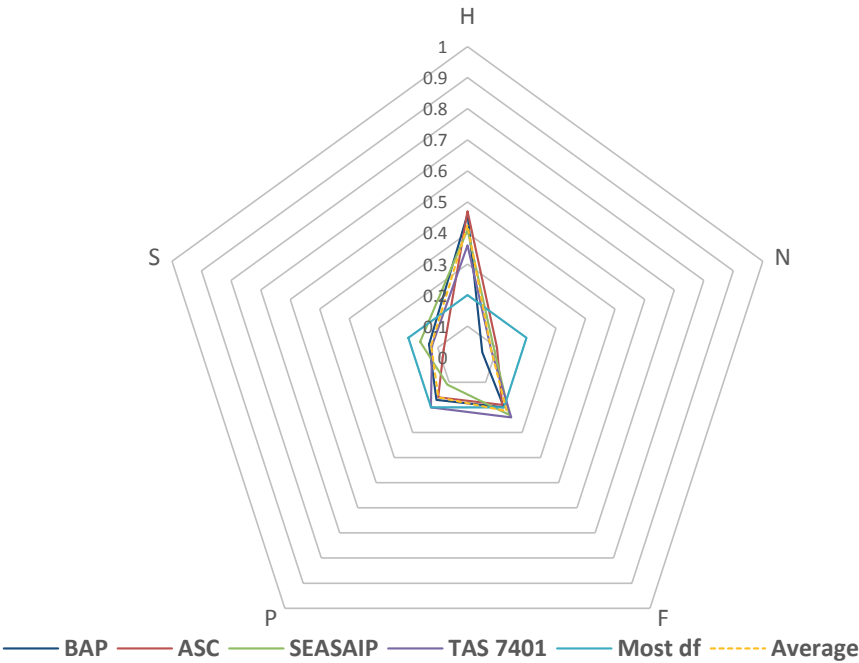


Figure 4.3. Comparison of bundle of capitals across against a normalised capitals index four aquaculture standards.

Notes: (BAP-Best Aquaculture Practices; ASC-Aquaculture Stewardship Council; SEASAIP-Southeast Asian Aquaculture Improvement Protocol; TAS 7401-Thai Agricultural Standard).

Overall, these results show that both financial and social capital present the most promising alternative means for farmers to develop the necessary capabilities for standard compliance. The increase in social capital in the bundles of capitals demonstrates the potential of social networks (and/or formal organisations such as shrimp clusters or cooperatives) to increase human capital by, for example, enabling shared learning of compliance related skills and knowledge. As expected, financial capital can enable producers to ‘buy in’ assistance, thereby bypassing their own lack of human capital, or invest in equipment or infrastructure. However, it is also noted that the combined proportional increase of social and financial capital indicates they may also be interlinked. As argued elsewhere (see Bush and Oosterveer, 2007; Kusumawati et al., 2013), the ability to secure financial capital is largely dependent on the social relations of farmers, especially when they do not have access to formal sources of finance and credit.

In comparing the standards, on average the bundles of capitals show that BAP and ASC remain relatively specialized, with a SD of 0.14 (see Figure 4.4). TAS 7401 has the lowest SD of 0.1, meaning that the capitals are more equally distributed, thereby providing higher degrees of freedom to farmers. Whilst SEASAIP represents the middle position, it does have the largest difference in SD between the prescribed capitals and the bundles of capitals.

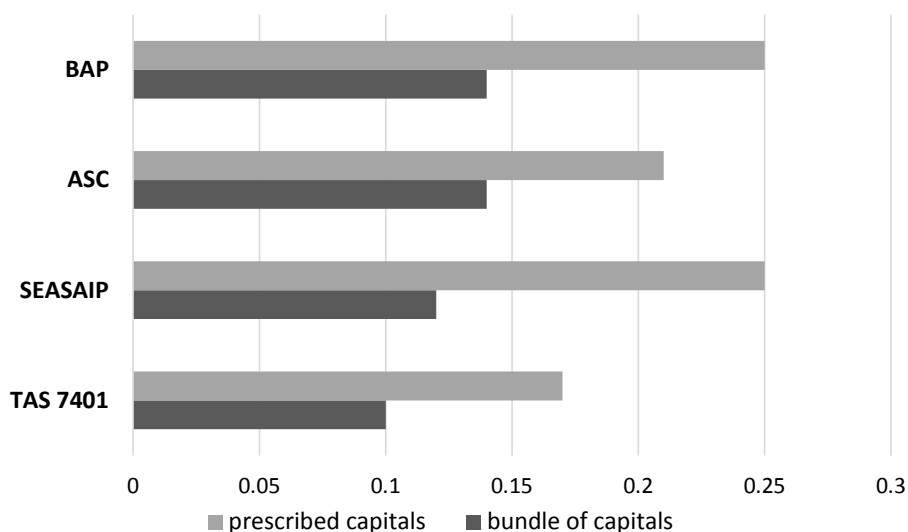


Figure 4.4. Comparison of average deviation between prescribed and bundles of capitals for four aquaculture standards.

Notes: (BAP-Best Aquaculture Practices; ASC-Aquaculture Stewardship Council; SEASAIP-Southeast Asian Aquaculture Improvement Protocol; TAS 7401-Thai Agricultural Standard).

4.4.3 Certification support program

Our analysis indicates that the support programmes are strongly aligned with the prescribed capitals found in the standards. However, they also appear to be shifting their support beyond these prescribed capitals to a more diversified bundle of capitals (see Table 4.3). We observe this apparent shift in five ways.

First, representatives of the standard's support programmes explicitly recognized the challenges farmers, who do requisite capabilities for compliance, face. They also acknowledged that, despite the often homogenising nature of the standard requirements, there is no archetypal farmer. Instead, the broad variation of 'capitals' held by farmers means there is a need for more flexible compliance strategies. For example, ASC expressed that they "should not only look at those producers who are close to ASC level [...] but also those below the level for whom it is very difficult to move forward due to a lack of money or technical resources (sic.)". Similarly, a SEASAIP representative argued that farmers who are "doing things differently" to what is prescribed by the standards, should also be given recognition because they might be moving towards the goals of standards. As summarised in Table 4.3, this translates into both direct support to prescribed capitals linked to the standard criteria and indirect support to alternative capitals that can also enable farmers' capabilities to comply.

Second, the support programmes place a strong emphasis on human capital in terms of training, albeit through different channels. For example, the BAP representative explained that the iBAP programme bring in farms into BAP certification programme in "a more step-wise fashion" by providing step-by-step improvement plan and training through collaboration with processors involved in their programme (Best Aquaculture Practices, 2015). ASC, while developing their own support programme, also collaborates with NGOs and processors to foster knowledge sharing in the form of deliver training or transition improvement programme (see Table S4.5²). By working with organisations beyond traditional extension services, BAP for instance collaborates with DoF in providing training through Seafood Taskforce, and ASC and TAS 7401 have partnered with organisations that are more connected to local farmers, such as WWF Thailand, local DoF and farmers cooperatives. These collaborations open up the possibility for different indirect channels of support for increasing the human capital of farmers required for compliance.

² Table S4.5. Summary of certification support programs.
<https://doi.org/10.1371/journal.pone.0227812.s005>

Table 4.3. Certification support programs and supported capitals.

Standard	Indicators	BAP	ASC	SEASAIP	TAS 7401
Human Capital	Skills	✓	✓	✓	✓
	Knowledge	✓	✓	✓	✓
	Labour management	X	X	X	X
	Farming, pound management	✓	✓	✓	✓
	Documentation, Data collection	✓	X	o	✓
Social Capital	General assessment	X	o	X	X
	Knowledge sharing	✓	✓	✓	✓
	Connections with others	✓	✓	✓	✓
	Communication with community	✓	X	✓	✓
	Communication with authorities	X	X	X	✓
	Social network, connection with suppliers	✓	✓	✓	✓
	Participate in social organization, collective representation	✓	X	✓	✓
Natural Capital	Farm location	X	X	X	X
	Natural barriers	X	X	X	X
	Water, soil quality	X	X	X	X
	Specific shrimp larvae species	X	X	X	X
	Restoring the area	X	X	X	X
Physical Capital	Infrastructure	o	o	o	o
	Approved equipment, devices, materials	o	X	o	o
	Container, storage	X	X	X	X
	Approved probiotics	X	X	X	✓
	Specific feeds	o	o	o	o
	Irrigation, feeding system	X	X	X	X
Financial Capital	Purchasing certified, specific feeds	o	X	o	o
	Hiring assistant	X	X	X	X
	Assistance for construction	o	o	X	✓
	Buying proper equipment, supplies	o	o	X	✓
	Hiring expert to conduct assessment	X	X	X	X

Notes: ✓ = Receives direct support on the capital, o = Receives indirect support through other capital, X = Does not receive support on the capital

Third, support to human capital is closely related to support to social capital. All of the support programmes provide support to developing cooperative or group certification. Both the iBAP programme and ASC, for example, promote group certification in collaboration with their processors. BAP highlighted that “a more structured and formalized environment helps the group move along step-wise

toward compliance”. SEASAIP and TAS 7401 engage farmers through a mix of NGOs, government extension and ‘pilot’ farmers. In all cases, the support programmes enrol farmers for training by a mix of peer-to-peer exchange, and by developing the capacity of groups to increase their economies of scale (for using compliant inputs and developing shared water infrastructure). Underlying these group activities is an implicit assumption that improved social capital will improve knowledge sharing for developing standard compliance capabilities, which in turn reduces the costs of certification.

Fourth, a mix of human and physical capital is observed through support given to what can be collectively labelled ‘information infrastructures’ by the support programmes. Most commonly this involves the development of reporting tools at the farm level and shared information systems at the cluster or group level. For example, SEASAIP attempted to develop a range of information technology systems for automatically measuring pond conditions which can feed into automated forms of compliance assessment. Integrating this with smartphone devices would allow to collect data directly from farms and cooperatives and digitalise them (Bourgeois, 2017). Similarly BAP intends to facilitate data collection with mobile devices. In all cases, the adoption of these ‘physical’ devices for data collection is aimed at supplementing the human capital (skills and knowledge) required for standard compliance.

Fifth, support to financial capital is provided across all support programmes, but often in combination with other capitals. The representative from BAP, for instance, stated that “there are actual investments to be made in farms, but farmers are either on their own or have processors as their sponsor”. Therefore, they focus on processors and collaborations with the Sustainable Trade Initiative (IDH) to provide financial support for changes identified in iBAP (Best Aquaculture Practices, 2015). SEASAIP shared a similar vision, stating that financial support or an investment fund is needed so “farmers can tap into support and make improvements like infrastructure building”. For this, SEASAIP emphasized social capital, the partnership with supply chain actors, to share responsibility for certification and compliance costs. ASC and TAS 7401 also emphasize building social capital, by highlighting the need of in creating linkages to facilitate credits from existing financial institutions.

Overall, a wider set of capitals are taken up in the support programmes than observed in analysis of prescribed capitals, which focuses more narrowly on human capital. This indicates that certification schemes recognise the role that multiple capitals can play in support capabilities to ultimately comply with their standards.

4.5 Discussion

The capabilities approach to aquaculture standards developed in this paper provides a new way of understanding producer compliance and improved production practices. Rather than evaluating compliance in terms of performing standard requirements, our approach focuses on the means by which producers can overcome limitations to and seek opportunities for improving their compliance capabilities.

Our findings have direct consequences for the content of standards and the conduct of their support programmes. Instead of (implicitly or explicitly) prescribing a narrow set of prescribed capitals for standard compliance, our analysis demonstrates there are bundles of capitals that farmers could draw upon for developing their compliance capabilities. While still exploratory, we also argue that if standards explicitly support the access or the development of alternative capitals they can in turn increase the potential number of producers who are able to respond to comply with their requirements. A capabilities approach could therefore enable standard organisations to respond to the key limitations they face in enabling producers, and especially small-holder producers (Marschke and Wilkings, 2014) who are far below the level required for certification, to comply and be certified and, as such, increase their overall environmental and social impact.

More specifically, the results indicate that the over-reliance on human capital as a basis for compliance is too narrow. As presented in Table 4.2, all four standards analysed predominantly prescribe human capital as a means of standard compliance rather than social, financial, natural and physical capital. This in turn indicates a highly specialised and uniform mode of mobilizing capitals to meet their specific requirements. This specialised and uniform prescription of capitals can be considered an efficient way to improve production practices and comply with the standard (similar to the findings related to livelihoods of Start and Johnson, 2004). But specialisation also comes at a cost, as it reduces the degree of freedom that farmers have to employ their wider capabilities to develop the ‘functionings’ required for compliance (e.g. Ellis, 1999; Martin and Lorenzen, 2016). Diversification through bundles of capitals, by contrast, can foster a higher degree of freedom that, when afforded to farmers, improves their capability to overcome limitations to standard compliance brought about by an over reliance on human capital alone. However, we also recognise that diversification can also come at a cost because it demands investments in capitals that may be ultimately redundant to compliance capabilities.

The results also reveal that, although largely unintentionally, all standards and their support programmes do currently allow for diversified bundles of capitals which can afford producers a greater degree of freedom in developing their compliance capabilities (cf. Ellis, 2000). Human capital remains the most important capital for standard compliance in these alternative bundles. But, as we demonstrate, human capital can be replaced by social and financial capitals for most standard criteria - for example, through mobilizing skills and knowledge through collaboration and hired assistance. Key to this 'substitution' is the assumption that capitals are able to be converted from one capital into another capital (see Bellwood-Howard and Nchanji, 2017; Ellis, 1999). While we find that such conversion is possible in a large number of instances, it is also evident that not all capitals are equally convertible. For instance, while financial and social capitals provide farmers with more flexibility, natural and physical capitals (e.g. ponds, farm location, equipment) are not easily converted into other capitals. Furthermore, the conversion of capitals, regardless of the capability of a producer, is also influenced by wider social conditions beyond the control of standards and individuals. For example, rules and norms that structure access and control to natural resources such as land and water can either constrain or enable the extent to which capitals can be transformed or substituted (Stewart and Deneulin, 2002).

Finally, our findings indicate that while standards continue to prescribe a narrow set of capitals they support a wider bundle of capitals in their support programmes. Again, while perhaps not intentional, the attention given to social, financial and physical capital (in addition to human capital) in these support programmes indicates a clear recognition of the breadth of the capabilities needed to comply with the standards. However, the ongoing mismatch between support programmes and prescriptive standards indicates that the standards are not yet fully aware of this potential. We see three opportunities for these support programmes to align their programmes with standards moving forward. First, they can explicitly identify the bundles of capitals, so both the prescriptive and alternative capitals, which producers need to improve their compliance with standard criteria and design their programme to support these capitals. Second, support programmes can attempt to change the social conditions that limit or enable producers to access their endowment of capitals or enable producers to convert one capital into another. Third, these programmes could support farmers to develop the capabilities needed to change the social conditions surrounding them that limit their ability to access or convert the capitals needed for improving the environmental and social performance of production and standard compliance.

4.6 Conclusion

This paper presents demonstrates how the adoption of a capabilities approach can enable aquaculture standards to better support producer compliance by moving from a narrow focus on prescribed capitals to a more diversified bundle of both prescribed and alternative capitals. We argue that by supporting the development of these bundles of capitals producers are more likely to have greater freedom in developing the compliance capabilities that best suit the often dynamic social and environmental context in which they are embedded. Adopting a ‘bundled approach’ to developing producer capabilities means changes to the content of standard requirements as well as standard support programmes. In both instances attention needs to shift away from the skills and knowledge farmers need for compliance and instead focus on the social conditions that limit access to the capitals producers require for developing more adaptive compliance capabilities.

The results presented in this paper remain preliminary in that our analysis of both the standards and support programmes was not conducted in situ - that is, analysing the compliance challenges producers face given their local context. Further research is needed to further explore the potential of a capabilities approach to standard design. Particular attention should be given to explore which capitals producers use to respond to standard requirements in practice, as well as the social conditions that affect their ability to access and convert capabilities to develop compliance capabilities. Furthermore, attention could also be given to the practicalities of translating the capabilities approach presented into the re-design of standards and their support programmes. In doing so questions should further explore how the ‘theory of change’ of standards can be redesigned to more effectively foster greater progress towards more sustainable production.

Chapter 5

Assessing the governance impact of ASC certification in Thailand

Abstract

The Aquaculture Stewardship Council's (ASC) certification only certified fifteen farms in its six years in Thailand. This raises the question as to why this private certification scheme would continue its presence in a country if it has not been successful with its apparent primary function of certifying farms. In addressing this puzzle this paper examines how the ASC certification fits within the wider landscape of aquaculture governance, including the multiple interactions certification has with legislation, collaborative arrangements and supporting governance capabilities. The findings indicate that while the ASC showcases its active role as a standard-holder, it also fulfils important functions as knowledge expert, partnership facilitator and in being used as a benchmark that supports sector level improvement. This shows that private certification can support and enable multiple pathways of improvement and problem solving in the aquaculture industry beyond just farm level and becomes more than an improvement tool.

Keywords: governance, aquaculture, certification, private standards, Thailand

5.1 Introduction

Aquaculture is one of the fastest growing sectors of food production (FAO, 2016b). This growth has raised concerns regarding the negative environmental and social impacts of the sector (Lebel et al., 2010; Lee, 2009; Little et al., 2016; Szuster, 2007). In response, several private and public assurance mechanisms, like third party certification, have been developed to evaluate the performance of producers and the industry (Barclay and Miller, 2018; Tlustý and Tausig, 2015). There are currently more than 30 certification programmes applied in export markets like the US and EU (Roheim et al., 2018). While these certifications generally feed into a common goal of responsible or sustainable aquaculture production, they differ in their approach and, relatedly, the coverage of species and production systems (Bush and Oosterveer, 2019; Parkes et al., 2010; Ponte et al., 2011).

Thailand, a top seven shrimp exporter (FAO, 2019), has seen the application of multiple public and private certification schemes. The Thai government has developed three public standards aimed at promoting improved production practices of both large scale and smallholder producers (Samerwong et al., 2018). The most successful of these is the Good Aquaculture Practice standard with a coverage of 80% of all producers in the country (ibid.). Two private certification schemes are also active in Thailand - the Global Aquaculture Alliance (GAA) and the Aquaculture Stewardship Council (ASC). While GAA, through Best Aquaculture Practices standard (BAP), managed to certify 269 farms in Thailand over eleven years (BAP, 2020; Global Aquaculture Alliance, 2009), the ASC has only 15 certified farms in Thailand, including those that are currently in assessment, in its six years history in the country (ASC, 2020). This limited number of certified farms appears to suggest that the influence of the ASC on sector wide sustainability improvements is minimal. Despite this apparently weak progress compared to its competitor, however, the ASC still continues to have a presence in the Thai market.

This chapter addresses why the ASC persists in Thailand in spite of its limited uptake. In exploring this puzzle, I analyse what additional roles the ASC plays in the wider governance of the Thai shrimp sector beyond farm level certification. This fits into a wider discussion on the role of certification in fostering change towards sustainability in a given sector.

I explore this question by applying the Aquaculture Governance Indicators (AGI) framework as developed by Toonen et al. (2018). This framework allows to focus on the role or position of ASC certification in steering towards sustainability through multiple institutional levels. Building on the work of Auld (2014) and Gulbrandsen

(2014), the framework draws attention to the interactions the ASC has with legislation, collaborative arrangements (between public and private actors) and the capabilities of the ASC as an organization to influence or be influenced by these different interactions.

This chapter proceeds as follows. First, I review current knowledge and assumptions regarding private certification organizations, like the ASC, and introduce the AGI framework to be able to assess the wider governance interactions of the ASC. Then, after describing the data collection methods used, I examine the interactions the ASC has with other actors and problem-solving processes in the Thai aquaculture sector. Fourth, I discuss and re-characterise the different roles or pathways that certification takes in problem solving under different interactions under the aquaculture governance. The paper then concludes with a broader understanding of the significant role of standard holders like the ASC in creating change towards sustainability governance of a given sector.

5.2 Certification and aquaculture governance

Third party private certification is commonly characterised as a market based mechanism designed to monitor and enforce compliance to a set of normative standards for ‘improved’ (across a wide range of aims including sustainability, responsible, organic and fair trade) production (Glasbergen, 2011; Glasbergen and Schouten, 2015; Hatanaka et al., 2005). Seen as such, farm level certification aims to steer behaviour of producers towards a set of baseline good practices, that reflects the particular interests or backgrounds of the institutions that set the standards (Overdevest and Rickenbach, 2006). When certification is demanded for market access, as seen in Northern European supermarkets, producers are incentivised to improve their production practices to comply with these standards (Bergleiter and Meisch, 2015).

Despite this broad theory of change, the impact of third party certification has been relatively limited (e.g. Djama et al., 2011; Ponte et al., 2011). In the aquaculture sector only around 6% of global production is currently certified (Seafood Certification and Ratings Collaboration, 2019). The two main third party certification schemes, the ASC and the Global Aquaculture Alliance (GAA) have together certified aquaculture products with a volume of 3.08 million tons globally (Vogt, 2019). It is apparent that different certification schemes have been taken up at different rates. For example, GAA represents around 4.5% of global production, while the ASC represents around 2% (Potts et al., 2016; Seafood Certification and Ratings Collaboration, 2019). The overall picture is one of poor coverage, leading scholars to question the overall

impact of farm level certification as sustainability governance tool (see for e.g. Bush et al., 2013b; Jonell et al., 2013).

Others, however, have explored the (potential) impact of certification beyond farm compliance. The role of certification has been explored in terms of its potential to empower private and public actors to cooperate to achieve shared goals (Pérez-Ramírez et al., 2012) or shifting to alternative (non-certified) modes of production instead (Bartley et al., 2015). An extensive literature has also explored the effect of certification on public rule making, including ratcheting up the content and stringency of national and international legislation and agreements (Ponte et al., 2011; Vandergeest, 2007). Gulbrandsen (2014), for example, characterised different interactions with public rules, including the alignment of goals, increased stringency, learning and reinforcement. However, most of this literature has focused on the interaction with rules and rule-making organisations. Less attention has been given to other potential effects of certification on the overall governance of sectors, including the networks that standard holding organisations create and maintain, and the competences that certification builds in both public and private actors beyond producers (notable exceptions are Auld, 2014; Loconto, 2010; Schouten, 2013; Termeer et al., 2019).

To analyse this wider set of potential impacts that aquaculture certification can have on the wider institutional context in which it operates in a given country, this paper uses the AGI framework developed by Toonen et al. (2018). The AGI framework incorporates rule interaction, so the interplay between legislation and certification. These two dimensions are perceived to be “governance outputs”, which are the result of (often collective) actions and activities of public and private actors, so certification (as legislation) interacts with collaborative arrangements, and the capabilities of actors to engage in aquaculture governance (Toonen et al., 2018; see Figure 5.1). Applying the framework to the case of Thailand, I look specifically at three interactions in which the ASC has (potentially) a key role to foster change (highlighted arrows in Figure 5.1).

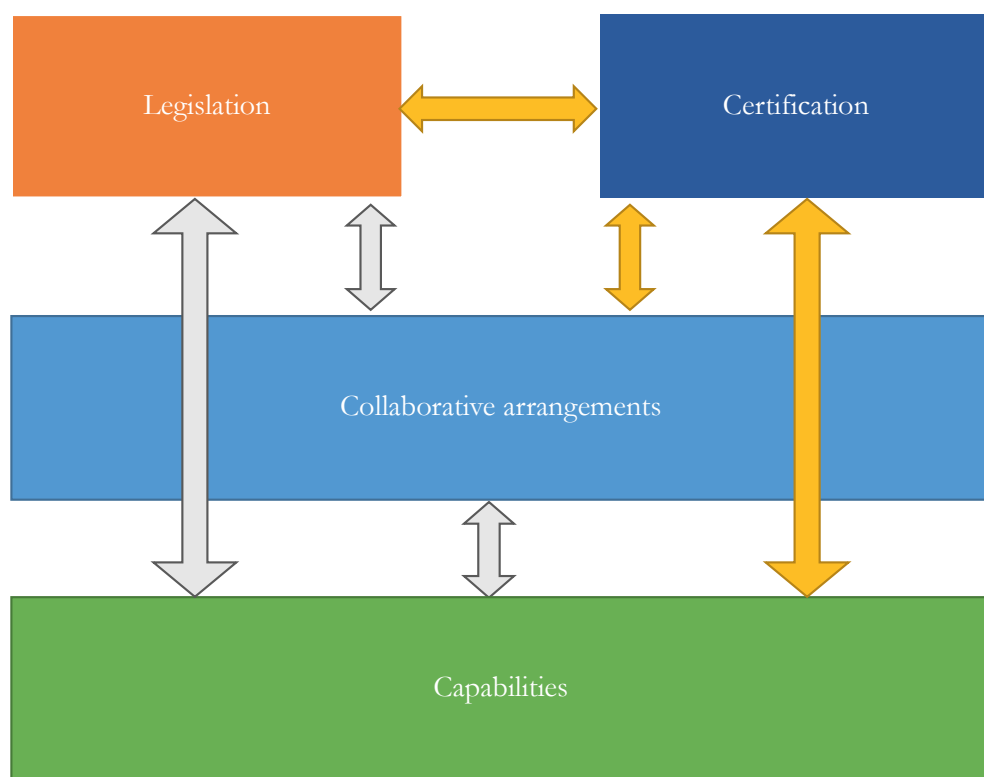


Figure 5.1. Interactions between governance dimensions as defined in the AGI framework, highlighted arrows are interactions of certification studied in this chapter.

Source: adapted from Toonen et al. (2018)

First, I analyse the interaction of ASC certification with national legislation. One of the founding assumptions of certification is that the inadequate state regulation needs to be supplemented with private rules. As outlined above, certification is assumed to ratchet up public rules (legislation), set norms in the absence of low or absent public rules or shape public policies such that new areas of regulation will be identified (Vince, 2018). Others argue that certification also plays a role in ‘bundling’ existing legislation together such that producers and governments understand what production, food safety, environmental issues are relevant to sustainability (Basso et al., 2011; Gulbrandsen, 2012). Others still argue that certification criteria can be taken directly in public policy, or certification can be specified as part of the legislative or policy process (Gulbrandsen, 2014). Furthermore, I examine the timing of certification interaction with the state. As Savilaakso et al. (2017) argues, interactions between certification and public legislation and policy can occur at

different stages of the regulatory process - including agenda-setting and negotiation, implementation and monitoring and enforcement of public rules and regulations. I build on these observations by focusing on the effect certification has on legislation; in particular on whether certification enhances the design and enactment of rules and regulations so legislation can become more effective in affecting sustainability practices.

Second, I examine the ways in which the ASC interacts with existing ‘collaborative arrangements’ between the state, market, and civil society. These collaborative arrangements are defined as mutually consenting formal and informal interactions between disparate actors to resolve existing issues related to addressing specific and/or broad ranges of environmental management issues that no single actor can solve on their own (van Tatenhove et al., 2000). Certification can play a role in enabling collective problem solving by providing a set of goals and criteria (Healey, 1998) which can stimulate a shared ambition for joint-problem solving. Certification can also provide a timeline for improvement, enabling actors within these collaborative arrangements to resolve key environmental issues (Thomas Travaille et al., 2019). Certification may also serve as a boundary object, providing a (at least perceived) neutral technical set of standards that can depoliticise issues that perpetuate ongoing conflicts between key actors (such as industry and NGOs), such as land tenure, the source of disease or responsibility for deforestation (Eden, 2009). Finally, certification may enable coalitions of industry actors to highlight the existing weak or limited state support or to better recognise the important and the need of state support to the management of public resource on which certifications and industry actors depend on for successful standard compliance (see Anitha, 2020; Ningsih et al., 2020).

Third, I investigate whether and how certification supports the capability of key actors in the aquaculture sector to observe, define and understand problems and to (re)act in a suitable way within the conditions shaped by their organisational (and political) position (Termeer and Dewulf, 2014; Termeer et al., 2013). Here I expect standard holders to either directly support capabilities through training, or indirectly (in relation to the other two dimensions) by affecting the resources, knowledge and rules that structure industry and state actors to engage in the resolution of environmental problems at the scale of the sector as a whole (see for instance Samerwong et al., 2020). I focus on a range of ways in which standard holders, like the ASC, can support the capabilities of others. For example, certification may enhance the reflexivity of actors to reframe or redefine the complexity of a problem in terms that make sense to themselves and is therefore communicable to others. This can in turn enable actors to engage with knowledgeable others, while also being

open to developing new solutions (either individually or in collaboration) (Toonen et al., 2018). Certification may also enhance the agility of actors, that is the ability to adapt when faced with changing rules and/or market conditions, and to reposition themselves (Toonen et al., 2018). Moreover, certification may enable actors to ‘rescale’ by being able to understand the different scales at which farm level problems occur, as well as the willingness of these actors to engage in collaborative arrangements or legislation at these higher scales when necessary (Termeer and Dewulf, 2014; Toonen et al., 2018)

5.3 Methods

This research followed a case study approach (Yin, 2014), using multiple qualitative methods for data collection and analysis, following a two-step approach.

The first step involved a field visit to Thailand to obtain a general understanding of the role of the ASC and other public and private certification schemes in Thailand’s national system of aquaculture governance. Semi-structured interviews were conducted with two representatives from governmental agencies, two from industry companies, one from a farmers’ association, and one with an NGO respondent in July and August 2018. Each interview took approximately one hour and followed a semi-structured format of questioning aligned with the framework outlined above (the full interview schedule is included as an appendix). Specific terminology of collaborations and capabilities were not used during the interviews but more general terms based on definitions and indicators of those terms defined in AGI handbook developed by Toonen et al. (2018). For instance, their interaction with other organisations, driven reasons, key discussions, key outcomes of the interactions, questions were asked in a more general terms of private certifications Data was also collected through a review of the academic literature, technical and organisation reports which were found through online and database searches that highlight the (inter)actions of the ASC with other organizations in the Thai context. Documents analysed include governmental reports on their activities related to ASC standards or their meetings with the ASC, workshop reports by other organisations that collaborate with the ASC or have the ASC as a topic of discussion, reports of meetings, collaboration, or projects that are joined by the ASC, companies reports that include the ASC as a topic.

A second round of analysis involved an interview with an ASC representative in February 2019, and additional literature research. This supplementary interview enabled a more detailed and specific explanation of the different ways in which the ASC interacts in the governance of the Thai aquaculture sector. The interview with

the ASC further explored the interactions of ASC certification based on the three categories of interactions defined in the aquaculture governance framework. In particular, questions focused on the observable influence of the ASC on legislation, collaborative arrangements and capabilities or not, as well as whether this resulted in an outcome that contributed to the overall capacity of problem solving. In addition, literature research on organisation reports and news was conducted on specific points that emerged from the interview with the ASC to collect observations and evidence of others sharing similar views with the ASC and if anything has progressed or evolved since the time of the interviews. In the analysis, the results have been compared with the perspectives of others collected in the first phase.

5.4 ASC governance interactions

The following section presents the results of the interactions of the ASC in the broader aquaculture governance landscape in Thailand.

5.4.1 Certification and legislation

Thailand has a unique situation of already having three national standards for shrimp aquaculture practices - CoC, Good Aquaculture Practices (GAP) and GAP-7401 (see Samerwong et al., 2018). Therefore, to explore the interactions of the ASC with national legislation it is important to focus on its interactions with these public standards.

The Thai government has integrated and used public standards as a means of enforcing national legislation. According to government authorities of the Department of Fisheries (DoF) and the Office of Natural Resources and Environmental Policy and Planning (ONEP), the standards incorporate regulations relevant to reducing the risk of disease and, relatedly, the environmental performance of shrimp production. The Royal Ordinance on Fisheries B.E.2558 is specifically designed for responsible fisheries, but also covers issues related to aquaculture (see Government Gazette, 2015). Specifically, section 74 of the ordinance states that producers need to comply with the national (aquaculture) standard. The ordinance also appoints the DoF as the responsible agency with the duty to promote and provide guidance for producers to achieve compliance with the standard without compromising the ecological environment. The national standards also play an important role in promoting coherent engagement among governmental authorities. Public certification, therefore, is presented by the Thai state as a tool for more effectively implement existing legislation relevant for responsible aquaculture practices.

There is no direct evidence that the requirements of the ASC standard has been adopted or used as reference criteria in Thai public standards or wider legislation. During the interviews, the government indicated, also confirmed by the ASC, that there has not been any direct formal interaction between them to discuss the content of their respective standards. However, according to DoF, private certification plays an indirect role in influencing policies and strategies of the ministry to keep up with, and adapt to global market trends in which adoption of private certifications are promoted. Both DoF and ONEP authorities commented that the change of strategies is demonstrated in the rapid revisions of the national legislation on fisheries in 2015 followed by the amendments in 2017 (see also Government Gazette, 2017; Honniball, 2019). Although no specific criteria in the legislation explicitly mentioned international standards, the cluster application form for exporting black tiger shrimps to China reveals that the ASC is listed as one of the standards that farmers can use as evidence for supporting their applications (DoF, 2019b; 2020). Although this does not imply that the ASC is seen as equivalent to Thai standards or that it is being adopted into legislation level, it does reflect a degree of acknowledgement by the Thai government of the ASC as part of existing and available standards in Thailand. This even illustrates that the government has become more open and willing to include the ASC standard into its policy or policy practices.

In addition, the Thai government recognises the importance of international markets for farmers, and the relatively weak credibility of the Thai national standards in these markets (see Samerwong et al., 2018). This has led the DoF to turn their attention to benchmarking, either through the Global Sustainable Seafood Initiative (GSSI) (see Samerwong et al., 2017) or bilaterally with international standards. GSSI is arguably also an expression of the existence of multiple certifications. DoF has demonstrated an interest and preparation in driving the GAP-7401 standard towards GSSI (DoF, 2018). Moreover, because the ASC is GSSI ‘recognised’ (see GSSI, 2018), and as such is given priority by European and North American buyers, it places an indirect pressure on the Thai government to increase the recognition of its standard. This was reflected by a DoF comment on their aim to improve its own public standards, specifically GAP-7401, to a higher rigour level to compete with other international standards. The ASC itself has been planning a benchmarking approach to identify the potential overlap of their shrimp standard and the Thai standards, similar to benchmarking conducted in other countries. The ASC hopes that this would provide stepping stones for those farmers that already achieve national standards to pursue ASC certification (see ASC, 2018a). Potentially, the presence of this private certification can contribute to the improvement of the

country's own public certifications and legislation and increase the credibility of its own standards.

Although the Thai government acknowledges the presence of private standards, it does not see the ASC as a formal and direct means of improving legislation or its own public standards. Interviews with both government representatives revealed that the government still considers its own national standards as the core of its policies and legislation while private standards are to them still primarily related to market aspects, and as possible certification-related lessons they need to keep up with. However, some forms of interaction between the Thai government and the ASC have occurred since the time of the interviews. Since then an official meeting between the ASC and the DoF was arranged to discuss cooperation between them to support farmers and increase standard compliance in general (DoF, 2019a). Nonetheless, the extent to which the ASC will play a 'formal' role in further bilateral engagements or partnerships still remains an open question. Overall, these results imply that there is some degree of (direct) official interaction of the ASC with the Thai government, its regulations and public standards. Under the AGI framework, however, I suggest that the ASC's presence in Thailand may also be explained by the interplay with the other governance dimensions, as elaborated on in the next sections.

5.4.2 Certification and collaborative arrangements

Three arrangements demonstrate the ASC collaborating with other actors on sustainable aquaculture.

First, the ASC is a participant in the Seafood Task Force (SFT), an international multi-stakeholders collaboration set up to reform the Thai seafood industry (Stride and Murphy, 2016) by setting new targets for social and environmental improvement (Seafood Task Force, 2016). The SFT brings together EU and US retailers, their suppliers, major Thai shrimp processors and feed companies, the Thai government, and NGOs, including the ASC (Seafood Task Force, 2017; 2018). The ASC has contributed to discussions on the SFT related to improving the labour conditions of workers, following the 2015 seafood 'slavery' scandal that emerged in Thailand, and the long-term environmental performance of the seafood sector. More specifically, despite the ASC being a participating member of the SFT with no voting power, they have directly contributed to the development of a new Code of Conduct (CoC), which stipulates best practices in the seafood industry as a whole in tackling social issues. Furthermore, the ASC has contributed their expertise and experience on auditing methodology to the development of an Assessment Framework (Auditable

Standards) for the CoC (see Seafood Task Force, 2017). This enabled them to provide input on what they perceive to be 'best practice' and can be achieved in practice in relation to conformity assessment to standards. It also enabled them to transfer their knowledge, going beyond farm level and aquaculture, to affect the broader seafood chain beyond production and processing processes but also include other sea-related topics such as vessels and ports. Furthermore, it enabled ASC to ensure that the SFT's CoC did not overlap with the ASC standards.

From the perspective of the ASC, the SFT provided them an opportunity to engage with the Thai government in lieu of a direct bilateral exchange on the content of their respective standards. However, the government's side did not mention that the SFT provided a basis for engaging with the ASC. From the interviews with the DoF and industry representatives, it was clear that they mainly focused on the general usefulness of SFT, as the interactions with other organisations were mentioned in general terms rather than specifically related to the ASC. This demonstrates that while the ASC considers the SFT as a platform that helps them build mutual understanding with the Thai government and the international industry to solve the challenges that occur in Thai industry, the other actors do not specifically indicate that private certification plays an important role in this SFT platform.

Second, the ASC developed a strategic alliance with WWF to engage private sector and government actors in an attempt to socialise their approach to improved production. Building on their partnership that dates back to the Shrimp Aquaculture Dialogue (ShAD) meetings (ASC, 2014; Boyd and McNevin, 2014), the ASC has partnered with WWF Thailand which they see as essential because the ASC has no local staff in Thailand, thus needed this alliance to continue their operation in Thailand. Specifically, since 2016 WWF has organised a series of workshops aimed to introduce both the ASC and the Marine Stewardship Council (MSC) standards, in which the ASC provided content and highlighted the role private certification can play in transforming the seafood industry to more sustainable production practices (WWF Thailand, 2018). These workshops which were organised by WWF, created a forum for information sharing on the technical content of the standards, challenges, and the market demand for ASC certified products in local, regional, and global markets. Workshop participants included seafood companies, trade associations, academia and the DoF. The reception from the industry has been positive, as evidenced by the requests WWF received from the industry for the ASC to organise a subsequent workshop (ASC, 2018b; TFFA, 2017). The ASC argued that these workshops enabled a first step to formal collaboration with the government through the DoF. However, the DoF respondent did not recognise the workshop as a means of 'collaboration' but attended the workshops to gain more

information on private certification and on global market demand for certified product (DoF, 2017a). However, the already mentioned meeting between DoF and the ASC that was arranged in late 2019 (DoF, 2019a) shows that some ground for future collaboration had been established.

Third, the ASC engages in *ad hoc* collaborations with key actors in the Thai shrimp aquaculture sector on an ongoing basis. However, engagement or influence in these ad hoc collaborations are often best characterized as being indirect. For instance, DoF and industry representatives commented that international third party certification is often a point of discussion between the Thai Frozen Foods Association (TAAF) and other industry associations with the DoF (DoF, 2017a; 2018; 2019c). These associations challenge the government to support more farms to become certified by private certifications of BAP and the ASC to increase the number of private certified farms. This can, at least in principle, offer more choices to buyers and allow them to expand their share in export markets demanding certification like the ASC.

These industry associations also invest in meetings and workshops with both the government and farmers on increasing knowledge on several topics including updates on regulations and private certifications. Through the efforts of the industry, the ASC standards are used as a reference for raising wider sustainability issues affecting the sector and to structure discussions around improving producer practices, state policies and regulations. This is also evidenced in the fact that ASC standards are mentioned as part of objectives or strategies in the reports of leading seafood companies (Charoen Pokphand, 2017; Thai Union, 2017). Moreover, WWF argued the ASC social impacts assessment, a part of the ASC standard, would provide a focal point for collaboration with DoF, making such assessment a common effort and accessible for farms in local areas at low cost. Finally, there seems to be increased interest for ASC standards in the country, as a growing number of workshops and auditor's training courses that invite the ASC to take part, were observed (Bureau Veritas, 2019; SGS Thailand, 2018).

Even though the importance of the ASC's role is perceived differently, these interactions clearly reflect the ASC's value in deliberations between key actors about certification standards. Seen as 'boundary object' (Eden, 2009), such standards allow collaborating actors to focus on establishing shared goals, developing and exchanging knowledge and/or creating new relationships that can better enable the development of industry wide sustainability practices. By direct and indirect engagement, the ASC strengthens existing and new forms of collaboration that can in turn enhance the overall effectiveness of problem solving across the sector.

5.4.3 Certification and capabilities

The ways in which the ASC interacts with other key actors allows for supporting these actors' ability to solve problems and to steer towards more sustainable aquaculture production. This has been observed in three ways.

First, I observed that the ASC enhances the reflexive capability of the government and NGOs, particularly WWF. The presence of private standards, like the ASC, in the country has meant, according to WWF and the ASC, that the DoF is more sensitive to demands for product qualities, including credence qualities like sustainability, and not only price and quantity. For instance the ASC noted that the Thai government is interested in extending their resources to align better with international market and public certification. Moreover, the meeting with the ASC in late 2019 demonstrates that the DoF has become more willing to discuss and directly engage with private certifications rather than neglecting them as in the past (DoF, 2019a). In the interview, the DoF commented that generally they work with specific groups from the processors and industry associations to focus on the BAP standard and collaborate with the industry to facilitate the promotion of private certification to producers. Yet, the effort of organising a direct meeting with the ASC representatives seems to reflect a change in DoF strategy.

Moreover, the engagement with "knowledgeable others" is also a sign of reflexivity. This is demonstrated by the acknowledgment of the ASC that the DoF has hired external consultants to explore market demand around sustainability as a product quality in international markets. This is also illustrated by DoF's investment in training auditors to also be able to assess private certifications (DoF, 2017b). The ASC therefore contributed to the ways in which DoF's reflected and responded, and therefore increased the overall regulatory capacity to cope with market demands as well as improve overall monitoring and evaluation of the aquaculture sector. Furthermore, the ASC enabled WWF to better reflect on their objectives of promoting sustainability. According to WWF, they previously prioritised on individually advancing their primary focus on technical aspects of sustainability improvement, reflected in their previous projects that addressed the impacts of shrimp farming on mangroves or the promotion of ASC standards based on technical criteria but these were not considered successful. WWF also felt that it missed the chance to position themselves better to connect with farmers in promoting the ASC standards. Since then WWF has reflected on their unsuccessful projects and their limitations. They changed and moved to integrating and positioning themselves better in collaboration with the ASC to promote their sustainability goals through ASC standards beyond the technical aspects of farms.

Second, the ASC has also enabled the agility of the Thai government to adapt to the changing circumstances in global exporting market opportunities. By hiring external consultants to explore the market demand, the DoF showed not only reflexivity, as explained above, but also a move to (re)positioning Thai aquaculture in the international market. The DoF representative officer also confirmed that the DoF has sought information on the alignment of their public standards with other international standards through benchmarking. These examples indicate that, albeit indirectly, the DoF tries to become more agile in adapting to global market trends. This agility is also recognised (and welcomed) by Thai seafood companies who want to develop their strategy towards delivering certified products. The presence of the ASC (in addition to BAP) in Thailand enables discussion between the industry and the government to proceed with a degree of concreteness that has led to specific requests from the industry to the government to be more supportive in promoting private certification to producers in response to global demands for private certification.

Third, the ASC has enhanced the ability of key actors to operate strategically in response to different scales at which key issues in the seafood sector occur. For example, WWF's Market Transformation Initiative, a global project launched in 2009, focused for Thai shrimp aquaculture on helping the ASC to enter the market (see also WWF, 2017) was not perceived successful. WWF's approach to transforming the sector was deemed to have a strong technical focus on standard compliance on the farm level. Learning from this project, WWF started to expand its strategies to also creating awareness about ASC standards with other actors in the industry at multiple levels, so beyond limited groups of farmers or processors. When discussing the promotion of sustainability shrimp farming with ASC staff, WWF reconsidered the level they work best, and what collaborations they need to address issues at the local levels. As the result, the ASC contributed to the improving WWF's ability to rescale, learning how, and at what level, to make better use of strategic partnerships between government and industry, and to align the sustainability objectives of these other actors with their own goals, and specifically the ASC standards. During the interviews, WWF and the Thai DoF alike recognised, in response to questions about their interaction with the ASC, that focus should not just be on the local level but also on the global, since sustainable improvement is driven by the interests of and benefits to exporting processing companies operating directly in global markets rather than by local producers.

Although not directly, the presence of the ASC (along with BAP) also enabled the industry to work more closely with the local producers in providing training on private certification compliance. The comments revealed that rather than mainly

depending on the government to take the lead on this matter in providing the training and information to farmers they took the lead. The industry insisted that they would keep up with the trend of private certification with or without the collaboration with the government. This reflects that the industry can act on the basis of their strategic expertise and own resources when it comes to private certification as well.

In summary, the ASC plays different roles in contributing to developing the capabilities of key actors in resolving problems in the Thai shrimp sector. In contributing to the development of capabilities of reflexivity, agility, and rescaling, both directly and indirectly, the ASC is engaging in the governance of the sector beyond setting standards at the farm level, but strengthening the potential of key actors to enhance their capacity for solving problems.

5.5. Discussion

Certification, as an *instrument* of environmental governance, is often thought unable to systematically address environmental issues (Bartley et al., 2015; Ponte et al., 2011). Given the low proportion of ASC certified farms in Thailand, such an assessment appears fair. Systemic change is unlikely to come from improving the practices of very few farmers. However, my results indicate that, to the contrary, the ASC as a governance *actor* can foster systemic change through the governance interactions it has with legislation, collaborative arrangements, and building capabilities. All of these interactions extend far beyond the immediate function of the ASC as a farm level certification scheme and indicates that the role of certification organisations in creating systemic pathways of change can be broadened, as I argue, in the following three ways.

First, the ASC plays a role in promoting and transferring expert knowledge. Through their standards, the ASC defines and makes available expert knowledge to other actors in the industry. This is similar to what Gulbrandsen (2014) refers to as ‘cognitive interaction’. However, such interaction does not occur directly - that is, between ASC standards and state rules/legislation. The results show that the ASC displays and shares its knowledge through collaborative arrangements (see Doberstein, 2016), such as the WWF and the Seafood Task Force, and by doing so it can indirectly affect state rules and governmental practices, for example on auditing and traceability. The ASC is as such a dynamic “knowledgeable actor”, providing key technical and policy input to multiple actors through different collaborative arrangements, which in turn contributes to improving sustainability practices in Thailand aquaculture sector.

Second, the ASC has emerged in Thailand as a partner, to converse and collaborate with others, and in some cases the ASC then takes a facilitator's role by providing a platform which enables key actors, such as government representatives, industry, academia, and producers to make new forms of collaboration, and deepen existing ones. This role of partnership facilitator is especially relevant for establishing new linkages among knowledgeable organisations with diverse interests, capabilities and expectations and create new opportunities to solve key sustainability issues (Vince, 2018). However, the role of partnership facilitator in Thailand is not very evident yet, for example, if compared to the case of Indonesia where the ASC strengthens what Schouten et al (2016) refer to as 'the transformative capacity of state and non-state actors'. But in Thailand the ASC has also the potential of enhancing the capabilities of others, through the role of partnership broker. By being embedded in wider groups of local actors, including farmers associations, local NGOs and local industry actors, for example by participating in more local events such as shrimp day event (see Samerwong et al., 2018), the ASC can enable farmers and industry actors to engage with the expectations of international markets.

Third, the perceived credibility of ASC standards is used to benchmark and steer for change towards more sustainable practices at the scale of the industry as a whole and for the state to better manage the sustainability of the production processes (Wijaya and Glasbergen, 2016). This way the content of the ASC standard remains centrally important to the role the organisation plays in a wider governance context. This 'indirect' use of the standard aligns to what Gulbrandsen (2014) labels public comparison (i.e. improvement through competing public recognitions). The content of the standards provides a basis upon which international 'best practice' can be reflected on, by the Thai DoF, NGOs like WWF and the industry, which raises self-expectations in terms of adopting new goals and targets for sustainability. This refers to the interplay between legislation and collaborative arrangements. I argue, however, that this interaction does not, in the case of Thailand, extend to what Gulbrandsen (2014) refers to as mutual reinforcement (i.e. state dependency on standards for authority) given the reticence of the DoF to recognise the standards or align their own domestic standards (for further detail see Samerwong et al., 2018). But despite this reticence of the state the standards have been used to reinforce the authority of WWF in their attempts to drive change in the sector through workshops and improvement programmes (see also Bottema, 2019). Nonetheless, the ASC does not contribute to an extent of gaining an industry-wide level of regulatory control, nor result in a drastic change to the point of private certification sharing control with the government.

By understanding interactions of certification with legislation, collaborative arrangements and capabilities, I argue that the ASC has extended its role beyond its immediate function as a farm level standard holder. The three strategies for creating change beyond the farm scale outlined here demonstrate that the role of private certification is more complex than commonly thought in academic literature. For instance, it is clear that certification does not simply fill a regulatory void left by a weak or non-existent government (Howlett and Ramesh, 2016; Vince, 2018). It is also clear that the role of certification goes beyond public-private interaction; private certification also engages with other private actors beyond the application of their standards. The results also show that the assumption that private certifications is purely ‘market-based’ is misleading. The results clearly show that the ASC fulfils a range of functions that go beyond *directly* incentivising market-led improvement. The organisation promotes reflexive learning by state and non-state actors for instance, and do so with little acknowledgment from the market. Having said that, the global market does continue to loom over the ASC and the actors they engage with - providing indirect incentives for improved production and trading practices.

5.6. Conclusion

Despite having limited impact in improving farm level performance through compliance to their technical standards, the ASC has contributed to the overall sustainability of the Thai shrimp sector. The organisation has done this by performing a number of alternative roles that extend beyond farm level certification. These activities, I argue, are indicative of a diversification of functions private certification is undergoing as they recognise the limits of their production and producer focused improvement model. Instead, these private certifications can perform functions that support learning, support partnerships and enable the conditions under which the capabilities needed by producers and regulators alike can be developed

Reflecting on these new roles, this chapter recognises the need for a new generation of certification organisations that does more than holding up standards. If certification organisations embrace this broader role, they can open up opportunities to make a far greater contribution to the sustainability of industries, like the Thai shrimp aquaculture, than they are currently able to do. By taking the strategies into their explicit mission and goals, and in their funding and activity planning, they can move beyond the current limitations they face as a farm level and market-based mechanism. By rethinking their roles, they can also lead to the different ways of assessing the effectiveness of the so-called certification beyond just the restricted scope of farm performance.

Further research can expand the certification's arena to go further as an alternative approach in better utilising certification in creating change at a broader scale, or address the challenges in the industry with a low uptake of certification in the country. Similar research can also be conducted based on different dynamics among different groups of actors such as state or non-state actors in taking the leading role in the industry, therefore affecting the roles, relations and dynamics of certification within governance landscape in which certification can have a greater or smaller role and contribution. Studies can also expand to look at the dynamics of public and private standards and to how their competition and coordination in different countries can generate further understanding of other roles of certification. It is an interesting case of exploring whether certification then becomes less significant or more effective in other areas than they directly contribute to through enabling others to improve.

Chapter 6

General discussions and conclusions

6.1 Introduction

The objective of this thesis is to develop a new perspective on understanding certification, shifting from rendering it as a technical tool to rendering it social. Central to the preceding chapters was the examination of certification as constituted by multiple sets of social relations across multiple scales ranging from local farmers, to national governments and global markets and private policy arrangements. In doing so this thesis provides a different understanding of certification, one that reimagines certification as an instrument of social change aimed at increasing the sustainability of the aquaculture sector in Thailand and beyond.

The three research questions formulated in the Introductory chapter and answered in this final chapter of the thesis are as follows:

- 1. In what ways does certification support Thai aquaculture farmers to access and comply with sustainability standards?*
- 2. What is the effect of state and non-state strategies to deal with the proliferation of sustainability aquaculture standards and foster sustainability improvement in the sector?*
- 3. In what ways does aquaculture certification contribute to more sustainability seafood governance beyond its role as a farm improvement tool?*

The four empirical chapters of this thesis provide a basis for answering these questions. In summary, chapter two examined the role of multiple Thai national standards and their implications for the inclusion of farmers and the improvement of their practices. Contrary to concerns of standard proliferation causing confusion and redundancy, the results suggest their potential for developing a pathway for fostering inclusive improvement. Chapter three explored the role and challenges of meta-governance arrangements for creating greater coherence between certification schemes. Chapter four focuses on the capabilities of farmers to improve their farming practices. In doing so, the study evaluated various capabilities which would enable different ways in which farmers can improve and comply with standards and offered a new approach for understanding the role of certification in supporting sustainability improvement. Finally, chapter five identifies additional roles certification schemes may perform in facilitating and influencing the governance landscape that contribute to sustainability of the sector.

Common to all four chapters is the understanding of certification as social as covered in what this chapter presents as the Three R's: Relationality, Reflexivity and Restructuring. As outlined in Table 6.1, various relations incorporate certification

with a range of actors that include but also go far beyond farmers. They also involve relations between actors whom certification also affects and the relations of those actors with social structures such as markets and governance. Certification itself can act on their *reflexivity* and change the way in which it operates in response to the changing relations around itself while also affecting the relations and reflexivity of others on how they operate. The collective changes that occur include *restructuring* broader social structures such as market conditions and the broader governance setting. I argue that altogether this makes up the way in which we should understand certification.

Table 6.1. Different sets of social relations.

Chapter	Relations
Two	<ul style="list-style-type: none"> • Certification - producers (inclusiveness) • Certification - market (credibility)
Three	<ul style="list-style-type: none"> • Certification - metagovernance arrangement as an organisation • Certification - metagovernance actors such members • Certification - other standard holder organisations besides itself • Certification - supply chain actors • Metagovernance actors - supply chain actors
Four	<ul style="list-style-type: none"> • Certification - producers • Certification - partner organisations such as NGOs
Five	<ul style="list-style-type: none"> • Certification - government • Certification - supply chain actors • Certification - partner organisations, for example ASC - WWF

This concluding chapter proceeds as follows. The central research questions are first addressed to provide a basic understanding of the overall argument. This is followed by a synthesis of the empirical chapters that answer the research questions and address the research objective. The chapter then reflects on the key arguments for rendering certification as social, by identifying the Three R's. I then turn to a discussion on the consequences of the findings for policy and practice and set out key recommendations for shaping future research. The chapter ends with concluding remarks on how, when building on my findings, certification could play a role in moving towards more sustainability.

6.2 Synthesis

This section discusses three sets of social relations embedded around certification. The four empirical chapters provide the answers to the three research questions and these highlight the role of certification as a social process.

6.2.1 Supporting farmer compliance

The answer to the first research question relates to the different ways in which and the extent to which certification organisations provide support to farmers to improve their farming performance towards standard compliance. The results demonstrate multiple ways of support but also point at certain limitations. This opens up the possibility to rethink the role of certification and move toward a role of enhancing capabilities and allowing farmers to make choices when improving based on their capabilities and particular settings.

First, public and private standard organisations provide traditional support activities such as training, knowledge sharing, financial assistance (see Chapter two and four) as a direct response to criticisms on difficulties in compliance (Bush et al., 2013b; Hatanaka et al., 2005). This support is expected to reduce the limited personal capacity and financial constraints for improvement (Trifković, 2014). The capability approach introduced in chapter four argues that these forms of direct support could be broadened to enhance the capability and freedom of farmers to improve in different ways and to make use of a more diverse set of capitals. Here I observed that there are also differences between private and public (state) actors in overcoming some of these challenges in supporting farmers in managing natural resources since they have different capacities. For instance, Aquaculture Improvement Projects (AIPs) supported by the industry and NGOs enable the utilization of collective resources (see Bottema, 2019; Boyd and McNevin, 2012). Nevertheless, this support from private actors may still increase the costs that are then shifted to suppliers (see Bottema, 2019; Hatanaka et al., 2005) and finally to producers. Instead of relieving farmers these arrangements may in fact reproduce the burden for farmers. The government could play a stronger role in providing additional support in terms of policies (Chapter two). Besides different forms of direct support there may also be indirect benefits with respect to capabilities of improving farming and business management and therefore reducing risks and vulnerabilities.

Second, certification organisations attempt through indirect support to improve the social and economic conditions of shrimp farmers, including attempts to improve

the credibility of certification. Building on the observation that support for improving livelihoods can expand the opportunities for farmers (Chapter four). This also extends to enhancing the credibility of production systems, thereby, providing greater overall value to products and securing competitive advantages for certified products (Trifković, 2014). Public certification can also act as a support mechanism for the government to shape their legislation (Chapter five). Private certification could play a similar role by improving or reinforcing existing legislation or altering the governance landscape as shown in other countries (Bartley, 2012; Gulbrandsen, 2014; Lee, 2009). This thesis demonstrates the attempts by the Thai government to enhance the international credibility of Thai national standards by improving its reputation (Chapter three and five). However, these efforts have not worked out as expected. Instead, the Thai government has been struggling between balancing their support for increasing the accessibility for farmers and seeking a credible and stringent standard that can be positioned in the global market. This indicates that certification organisations cannot always support farmers in all aspects even though they may have aspirations to do so.

Third, the proliferation of national standards with different objectives and approaches may actually be seen as an attempt to support wider accessibility. I argue that proliferation is not per se negative as argued by Fransen (2011). It can instead be seen as supportive to farmers with different capabilities and expectations (Chapter two and four). However, this differentiation does not always lead to improvement, thus proliferation may not be working out the way it was intended to. If this proliferation would have been planned as a (mandatory) stepwise improvement, the support could have been better organised to help farmers to move from one standard to another. Instead in the eyes of farmers these standards are simply equivalent to each other. Farmers therefore choose to only comply with the one that fits their way of operating and their market best and thereby they may undermine the potential of proliferation (see Chapter two). Proliferation offers a different approach for farmers to benefit from the differences in content and technical focus between these standards. There did not seem to have been any difference in the support mechanisms that could have been strategically supporting different targeted groups of farmers, thus the potential advantage of proliferation was not realized.

There are several attempts to make standards easier to access which is reflected in the focus on a common indicator for measuring success which is the number of certified farms. However, there are limits to the extent in which this goal is being achieved. This thesis suggests there is another way by moving to a more supportive capability approach that gives more opportunities for farmers to improve differently

(Chapter four). This also reflects the focus on inclusiveness and credibility of certification (Chapter two) which goes beyond the technical narrative focusing on improving farm activities through the best available technical standards for ensuring sustainability. Despite this potential of support within an existing regime that could offer more opportunities and multiple ways to comply this has not been used to its full potential.

6.2.2 Coordination strategies to deal with multiple standards

Different coordination strategies and forms of interaction between standard organisations were observed in this study. Differences in objectives among standards led to challenges that were addressed through multiple solutions (Fransen, 2015). These findings show that greater coherence to manage competition and increased coordination among multiple schemes is not always needed although critics assume this (Bush et al., 2013a; Derkx and Glasbergen, 2014; Fransen, 2011). This thesis demonstrated two coordination strategies that could enhance the effectiveness of standards in terms of increasing their uptake and improving sustainability in the sector.

First, the thesis studied metagovernance as a coordination strategy. Two pathways to establish metagovernance were observed as the degree of coordination can be improved either by strengthening the coherence and convergence of the technical content of the standards around benchmarking reference points (GSSI, ASEAN Shrimp GAP) or by harmonising the standard setting procedure (ISEAL). Both pathways expect to increase the credibility and effectiveness of the participating standards and to increase their coverage as well as their impact. These metagovernance efforts can be argued to constitute a means for improvement (Chapter three). Similar to the observation by Fransen (2015) that metagovernance may reproduce coordination problems at another level, this thesis shows that the proliferation and the competition among (non-governmental and governmental) forms of metagovernance could end up repeating the same lack of coordination that metagovernance is supposed to address.

Second, the thesis studied the coordination efforts by the Thai government when managing the multiple national standards they introduced (see Chapter two). Although there was no real strategy identified behind the proliferation of these Thai standards, I suggest that the government has the potential to actually coordinate the standards within the same policy framework and use these standards as a (mandatory) tool for stepwise improvement. In doing so, all farmers would be more effectively pushed and steered towards improvement instead of just adding more

standards to a situation where many standards already exist. The Thai government also has the opportunity to coordinate and engage with global standards in order to increase its credibility as suggested in chapter two. This possibility has already been taken up as the Thai government has started a benchmarking process through GSSI (see Chapter three and five). The Thai government could further develop coordination through a more formalised approach through bilateral coordination or through the use of an existing platform. However, achieving such an outcome would require the government to relinquish a certain degree of its sovereignty (see Vandergeest and Unno, 2012). Therefore, I argue that proliferation of standards can be embedded in a coordination strategy in the aquaculture sector and thereby improve the potential of the certification process, rather than only be viewed as problematic.

The coordination strategies presented here demonstrate that different attempts in harmonising and technical benchmarking to address the proliferation of standards are driven by the aim to increase the uptake of standards in a major exporting country. My observations reveal differences in their approach and in their targeted audience. GSSI is oriented more towards retailers and consumers, ISEAL focuses on the credibility of the standardization procedure, while the ASEAN shrimp GAP aims to broaden the coverage of certification among farmers. However, the extent to which these strategies actually affect the improvement of farmers' performance remains unclear. Nevertheless, these observations also found interesting social dynamics emerging from the process. The proliferation of benchmarking efforts shows the ambition to increase inclusiveness by expanding the opportunities for and coverage of farmers through a stepwise improvement using multiple standards (Chapter two and three). The relation between certification and metagovernance initiatives shows that certification is more than just a technical instrument as is illustrated by the power dynamics in the question who governs the certification scheme. The relations between metagovernance, certification and the market present another social dynamic given the importance for standards of credibility in the market. A broader inclusiveness of standards could yield benefits for farmers in terms of a more credible production system (Chapter two). Therefore, these social relations reflect the potential of using the different available standards to involve as many farmers as possible in the process toward sustainability. Such an approach would go beyond the limited focus on setting referencing criteria or choosing the best technical criteria standard that currently dominates thinking about metagovernance.

6.2.3 Certification beyond farm level compliance and improvement

The identification of additional roles of certification schemes beyond the normative role as a farm assessment tool answers the third research question. Building on this finding it becomes possible to reimagine the role of certification in contributing to sustainability governance of the sector through policy, legislation, and collaboration.

First, certification schemes can be considered knowledgeable experts who directly transfer their knowledge to other actors including farmers (Chapter five). In doing so, certification is also an actor who transfers knowledge, expertise, and experience beyond just what is defined in the standards. This is done indirectly through participating in collaborative arrangements such as contributing to the problem-solving ambition of metagovernance (Chapter three), as suggested by Fransen (2015). Furthermore, certification schemes can also develop innovations through collective efforts via overlapping membership in different organisations (Bartley and Smith, 2010; Derkx and Glasbergen, 2014). Nonetheless, the situation of different experts prescribing varied solutions for similar problems could create confusion as they may apply different definitions and targets (Osmundsen et al., 2020). This situation might be used as an argument against certification and suggest that certification schemes should have a less prominent role and become just another organisation and part of a larger network aiming at solving problems. Nonetheless this role as an expert may still be positively valued as a contribution towards sustainable aquaculture governance.

Second, certification schemes can act on their partnership facilitator's role that provides more opportunities for knowledgeable actors to interact (Chapter five). In doing so, they improve the capabilities of organisations while also enhancing the overall governance process toward sustainability. Certification schemes can enable this role in several forms of engagements. For instance, strengthening the capacity of partnerships (Bitzer, 2012), enabling the engagements between organisations to strengthen improvement programs (Chapter four), organising workshops to discuss information on how to enhance the capabilities of farmers and the participating organisations (Chapter five). Moreover, certification schemes are also connected through institutional linkages as being member of similar organisations (Derkx and Glasbergen, 2014), engaging with each other through discussions in metagovernance platforms (Chapter three) and contributing to the collective goal of promoting sustainability. This situation offers the potential for certification schemes to provide technical and policy knowledge to others through direct and indirect partnerships. Nonetheless, the question whether or not such engagements will be effective

without the mechanism of a proper standard and its requirements is difficult to answer.

Third, certification can influence the improvement of national legislation and policies towards sustainable improvements. Generally, certification may already intersect with national regulations, thus the insights from certification may (indirectly) affect national policy and regulation (Boyd and McNevin, 2012). In the case of shrimp aquaculture in Thailand this role of supporting and improving legislation has been fulfilled by national standards rather than by private certification schemes (Chapter five). Nonetheless, several studies have demonstrated that the presence of private certification schemes may encourage governments to develop their policies, regulations, legislations, and their enforcement (Gulbrandsen, 2014; Lambin and Thorlakson, 2018; Wijaya and Glasbergen, 2016). This thesis observed in the case of ASEAN Shrimp GAP a degree of interaction between different Southeast Asian governments to harmonise their national standards and benchmark their legislation against reference standards and criteria (chapter three). Moreover, the improved social conditions and enabling structural conditions as the result of improved sustainability and aquaculture policy and legislation could contribute to maximizing a certification's impact on sustainability. Therefore, there are multiple direct and indirect (through governance) pathways through which the engagement of certification schemes at national and international levels may improve national policy and legislation and their implementation.

The identification of three additional roles of certification, does not mean that its role as standard holder should be forgotten. These roles expand rather than replace its role as a mechanism for farm level improvement. However, these roles confirm that certification schemes may be looked at from a social perspective and be considered as a social actor who enables improved sustainability governance. Building on the multiple social relations embedded around certification and the ability of certification itself to reflect, change, and expand its roles, illustrate that improvement as a result of certification not only depends on a technical approach, but also on the social relations between certification with others (such as farmers, governance, markets). Therefore, approaching certification as 'social' contributes to an improved understanding of what certification can do better in promoting and *enabling* sustainability.

The main empirical findings in this thesis confirm the differences between a technical and a social perspective on certification and their consequences for sustainability in the shrimp sector. Inclusiveness and effectiveness of certification becomes more than just including as many certified farmers as possible on the basis

of their technical skills because certification can also be used as a stepping-stone improvement strategy through which more people than just the best (technical) producers can benefit from sustainability. The evidence also illustrates that the social dimension of certification already exists. This illustrates that certification is already being rendered as social more than commonly thought. Furthermore, the characterization of the social dynamics derived from the empirical chapters shows that sustainability also depends on inclusiveness, credibility and capabilities. In the next section I will further illustrate and clarify those social dimensions to reflect on how certification can be rendered social and, as a result, expand its role in governing sustainability.

6.3 Rendering social and social characteristics of certification

This thesis presents the key characteristics of rendering certification as social, in doing so it shows a shift in understanding certification, moving away from a technical understanding of a standard with criteria, assessment processes, compliance requirements, and focus on farmers. As this thesis shows, certification also affects ‘Three R’s’; to recap, (1) the *relationships* between people and organizations and (2) enables greater *reflexivity* that can (3) ultimately *restructure* the conditions that enable or limit improvement to sustainability (Figure 6.1). These Three R’s highlight the need possibility to explore certification beyond its technical role and instead focus on how certification acts on and within the broader aquaculture governance setting.

6.3.1 Relationality

The relational nature of certification can be observed in the multiple relations certification has with other social actors. Exploring these relations opens up the possibility to rethink certification as a means of improvement beyond the dominant top-down structural understanding of certification as setting and imposing rules, which is a means of control (Belton et al., 2011; Foley, 2012; Vandergeest et al., 1999). Certification is more than just imposing a particular narrative and establishing the structural conditions for others to act as highlighted by political ecology (see Klooster, 2006; Otto and Mutersbaugh, 2015). Certification has also agency and can be an actor of its own. The capability approach illustrates this argument in the way in which certification can enable support for farmers. By providing direct support but also by shaping and building relations and social conditions around farmers the necessary capabilities for improving are being enabled (Chapter four). In this case, certification becomes an actor who enables farmers to improve. Certification as

standard tool and as certifying organisation has the agency to do things, including shaping the environment in which it operates. It does not only provide a structure for others, it also has the freedom and dynamics to render itself as a technical or social entity.

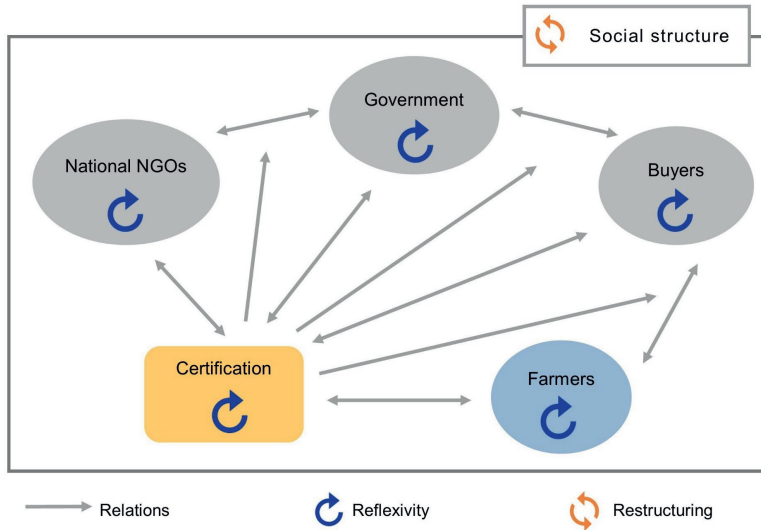


Figure 6.1. Three R's of rendering certification social.

However, this agency is not without restrictions as it is constrained and reshaped by a certification's position within a broader set of social relations with other actors, other organisations and the international economy as highlighted in the literature discussed in the Introduction (see also Cashore et al., 2004; Foley and Havice, 2016; Hatanaka et al., 2005; Ponte, 2008). Therefore, certification is subjected to the limitations and the constraints that it puts on others, but also by what others put on it. Hence, the social relations between certification and other social actors need to be analysed to understand the constraints and the ways in which certification responds to them and perhaps overcome them.

Evidence from this thesis revealed that through certification, the social relations between other actors also change. Certification engages in multiple sets of relations such as with farmers, experts who develop certification schemes, rulemaking authorities, governments, NGOs, supply chain actor, buyers, and metagovernance actors. Highlighting this relational nature displays how certification affects the ways in which other actors relate to each other and the ways in which they can improve their production, whether through constraining or through enabling. For instance,

certification can empower farmers in terms of freedom of choices (Chapter four), thereby allowing them to act beyond the structures and conditions provided by certification. This opens up new possibilities for certification to support the *means* of improvement such as enhancing social capital and expanding social networks for farmers to improve their capabilities, collaboration with other organisations to provide support and financial assistance to farmers. Ultimately, certification has to deal with multiple social dynamics while also being embedded within the existing social dynamics of governance, farming management practices, and economic dynamics. Therefore, certification can affect multiple social relations, reshape existing relationships and create new relationships.

6.3.2 Reflexivity

Emerging from these changing social relationships is also the reflexivity driven by ecological rationality. The results illustrate that certification reflects on its ecological performance in multiple ways and that certification is actually a relational process that promotes ecological principles. Firstly, ecological rationality is promoted at farm level by reshaping and imposing ecological rationality using a standard (Klooster, 2006; Mol, 2001; Mol and Spaargaren, 2000; Otto and Mutersbaugh, 2015). Secondly, enabling and developing the necessary capabilities are specifically designed for improvement based on ecological rationality. Lastly, ecological rationality has a significant role in driving certification (Bush et al., 2015; Mol et al., 2009; Spaargaren et al., 2009) towards changing and expanding its role and function to promoting sustainability (chapter five) beyond the power game as discussed in the Introduction (Forsyth, 2003; Klooster, 2006; Vandergeest et al., 1999). Therefore, enhancing reflexivity on practices, roles and social functions of certification allows certification to do things differently in driving environmental sustainability. In doing so we can better understand the position, function, and contribution of certification.

Furthermore, certification can also affect the reflexivity of other actors, as certification has a set of particular conditions that requires their engagement. The observations in the empirical chapters revealed different ways in which certification influences other actors in taking up ecological rationality and being reflexive in their operations, practices and relations. As demonstrated, certification can enable the capabilities of farmers to be reflexive on their practices, including the way in which they use standards. Reflexivity can also occur within relations in which one actor can act and do things differently. For instance, the emergence of metagovernance (Chapter three) can be argued to be a response by members of metagovernance initiatives to reflect upon and improve their capabilities (Derkx and Glasbergen, 2014). Therefore, ecological rationality can be a framework for reflexivity when re-

ordering practices (Mol, 1996). Certification can encourage other actors to use their reflexive capability in relation to ecological rationality and change the way in which people deal with environmental problems.

6.3.3 Restructuring

There are multiple social relations that are embedded in the broader production and sustainability processes, so social relations go beyond just the certifying organisation and the farmers but also involve the government, supply chain actors, private companies and others. These social relations and the reflexivity of the involved actors on their practices in response to sustainability issues also affect the structural conditions for promoting sustainability. For instance, enabling social conditions and structures such as governance, government policies, legislations, improved market conditions can offer more support to farmers to enhance their capabilities directly in relation to their activities while also enhancing the capabilities of other actors in dealing with sustainability problems in different ways.

However, as highlighted throughout this thesis, it is not only possible for new pathways for improvement to sustainability can emerge, but also new constraints within the space in which certification operates. I argue that certification can affect the restructuring of the conditions within which farmers make choices and control the means of improvement. Thus, farmers may act upon those means of improvement to move toward sustainability or they may be limited or disabled to do so as is the case in the existing structural arrangement. Furthermore, other actors, including the certification organisation itself, are also affected by changes in these structural conditions and they may transform their own practices and enhance their own capabilities in dealing with sustainability issues. Therefore, ultimately, rendering certification social also presents the ability to transform the structure and conditions necessary for farmers and other actors beyond the farm level to improve their practices themselves, as opposed to certification only prescribing (top-down) improvement. Therefore, certification can challenge the structural conditions which limit the ability of farmers and other actors to improve.

Altogether, these Three R's of Relationality, Reflexivity and Restructuring present how we can understand certification as rendering social. The study of certification becomes broader and more complex than an understanding of certification as a tool that imposes technical rules for farmers to improve toward sustainability. It also shows that sustainability improvement can occur on and beyond the farm level as a result of certification by affecting others to reflect and re-order their practices and

their relations to environmental problems differently. Certification is therefore a social process in a broader process towards sustainability.

6.4 Policy recommendations

Rendering certification as social has empirical implications for the way in which certification should be understood and how it actually operates. Drawing on a social perspective on certification changes how we can reshape, redesign, and better understand the existing functional roles and operational strategies of certification. This section presents several recommendations for different actors to profit from this changed understanding of certification as a social process.

First, reimagining certification as social means that certification organisations should consider environmental improvement as their main objective. This implies a change in thinking about certification and move away from being an environmental organisation that only includes a few social-ecological indicators. As this thesis demonstrates, certification schemes operate not necessarily only by directly controlling the shrimp farmers to become sustainable but that certification is a relational process engaging farmers in creating change and moving towards more sustainability. This reflects that the daily work of certification is already social in terms of interactions with other social actors. Certification can therefore also change those relations and contribute to enabling more people to improve their practices.

Second, redesigning the technical elements in a standard should be done more reflexively. This is not to say that the technical criteria should be ignored but that it should move beyond the narrative that technical criteria are the only way for farmers to improve (see Béné, 2005). Providing guidelines for good practices remain important (Hatanaka et al., 2005; Majer et al., 2018; Nadvi and Wältring, 2004; Thlusty, 2012). But instead of setting the normative goal of including farmers through technical compliance, certification could be used as a guidance that is more reflexive for farmers to improve through diverse pathways. Farmers should be allowed to act on the basis of their own values and develop innovative practices to achieve the required outcomes stated in the standard. Moreover, rendering farming practices as social opens up a way to better address the causes of difficulties in compliance beyond just the lack of farming skills (Hatanaka et al., 2005). Difficulties to improve may also have social-related causes (Osmundsen et al., 2020; Thlusty and Thorsen, 2017) or result from barriers to access enabling conditions (see Chapter four). This conclusion should trigger certification organisations to also reflect upon the choices and capabilities that farmers have, rather than controlling farmers to follow specific

pathways. Redesigning standards could allow for more pathways towards compliance and be applied to more diverse groups of farmers.

Third, the future design of certification should be less dependent on economic incentives. Although producers use standard compliance to secure an entry to the market, this should not mean that certification is fully dependent on the market to succeed. Certification could redesign its criteria to demonstrate specific ecological benefits in terms of more efficient production, higher survival rates or increased production volumes rather than the abstract definition that certification is good for the environment. This is to present a more practical value of certification to convince farmers rather than setting economic incentives as the primary benefit. In doing so certification can be shown as indirectly improving farmers' livelihoods and social conditions rather than becoming another technical barrier adding to their existing economic burden (Hatanaka et al., 2005; Swinnen et al., 2015) as farmers already have to deal with the uncertainties of production and price risks. Therefore, the cost of enhancing sustainability should be spread along the chain (Boyd and McNevin, 2012) rather than falling entirely upon farmers. Farmers might then be more willing to adopt certification as part of their practices. This suggests that certification should be viewed as part of everyday life of farmers, something they should embrace and adapt their life to accordingly rather than see this as a barrier that they should try their best to ignore.

Fourth, certification organisations should be more willing to provide direct support to farmers and overcome their concern that direct support for compliance would risk certification's credibility (see Ward and Phillips, 2008). Rather than restricting the scope of their support to increasing the coverage of sustainable improvement through further uptake by farmers, certification schemes should re-evaluate their objective and consider multiple and broader ways of direct and indirect support as shown in chapter four. In doing so, certification initiatives can also re-frame their goals to increase the opportunities for farmers to improve in other ways including improvement without standard compliance. Therefore, certification should be viewed from a social perspective as an approach that opens up opportunities for improvement in several ways through individual and collective efforts. The competition between certification initiatives on their uptake should no longer be the main concern that drives their actions.

Fifth, certification initiatives do not operate as individuals and therefore they should act more collectively and engage with other actors in a broader governance landscape. Certification organisations should recognize they are not always in competition with other schemes for farmers compliance and could collectively

develop joint efforts in turning proliferation into collective choices for farmers to step-wise improve according to their capabilities and conditions rather than associate this with a race to the bottom (Bush et al., 2013a; Ponte and Gibbon, 2005). Certification as part of a broader governance landscape can also expand its scope to collaborate with other organisations contributing to environmental problem solving. This includes reducing the barriers between public and private certification initiatives to collectively provide broader and more varied incentives to producers such as access to credit and markets (Lambin and Thorlakson, 2018). Collective effort may also mean that certification schemes get a smaller role since by working with other organisations they may not always be the one taking the lead but instead be steered by others.

Sixth, the state could play a stronger role in improving the position and impact of national standards by changing its strategies. This goes beyond the general argument that the state can support the improvement of certification schemes (Bartley, 2007; Boyd and McNevin, 2012; Vandergeest, 2007) by focusing on the role the state has in its relations with citizens (including farmers). The state has the authority to steer public standards in a more inclusive direction and in coherence with national legalisation (chapter five). The state should also learn from success stories in other countries and reflect to how to adapt its own strategies to push public standards to get more presence on the global market and acquire wider market access. This would require the state to become less concerned about issues of sovereignty and engage more with the changing demands from the global market. This does not imply, however, that the state should simply accept that public standards are less important than private standards or allow the global market to control public standards. The position and effectiveness of public standards should be re-strengthened based on re-framing the broader governmental strategies. The existence of the state as part of the governance landscape should not be overlooked, especially in strengthening the relation between certification and farmers by providing social conditions for enabling capabilities.

Seventh, metagovernance can change how it assesses standards and go beyond reinforcing a technical understanding of improvement. They should go beyond the assumption that central guidance for certification is needed (see Derkx and Glasbergen, 2014) and take up a more procedural understanding of the way in which standards develop including the development of credibility and procedures as demonstrated by ISEAL. The objective of metagovernance then also goes beyond improving the effectiveness of standards based on the uptake of standards. Metagovernance can then expand the assessment process by going beyond the rigor

of the technical criteria of standards, but also include the social elements of how standards are developed and operated.

6.5 Future research agenda

This thesis demonstrates the possibility of rethinking certification through rendering it social and shows the benefits of doing so. This presents a new way of understanding certification which also translates into an agenda for future research. Further research is needed to advance our understanding of certification and its roles in broader theoretical and empirical settings. In doing so, certification can contribute better to improving sustainability. This thesis suggests the following subjects for the future research agenda.

First, the idea of rendering social also opens up new ways of addressing sustainability including how certification addresses the production system as well as the consumer. Therefore, future studies can explore the role of consumers in advancing sustainability and study their relation with certification in terms of values in eco-labelling. For instance, exploring whether reducing the focus on the technical aspects of aquaculture practices and production has any effect on consumers' perception of certification and its label as an assurance mechanism. This also could be expanded by exploring if this rendering social also affects the understanding of proliferation in certification schemes, their effectiveness and their value beyond the label.

Second, the introduction of rendering social in this thesis demonstrates the ability of certification to shape the means by which improvement can occur. This thesis acknowledged that producers need (to develop) particular capabilities by analysing the predefined capabilities. This thesis furthermore interpreted and allocated which capabilities would be best suited in assisting producers to fulfil all requirements from the perspective of standards. This means that farmers should have a say in the debate on what life should be, including what the relevant capabilities are and how they could be enabled. However, although this thesis emphasizes the agency of farmers, this aspect has not been explored, which suggests that this should be further empirically grounded.

Third, certification also shapes the context in which improvements are developed and implemented. Certification then acts as an actor amongst many other actors who are embedded in the process aiming to improve sustainability. For instance, the adapted AGI framework used in chapter five is conducted in a way that explores all elements and relations within a country's governance arrangements of which certification is a part of. The framework presents the limitations in which the specific

contributions from certification were drawn under the bigger story of a country's legislation and overall governance framework. Therefore, applying this AGI framework in future studies can be extended to emphasise the specific relations of certification initiatives and other governance aspects rather to get a more in-depth insight into how multiple standards are dealt with in different countries. This illustrates that further study can be conducted by building on the idea that certification has a role in influencing other actors and the rules by which engagement occurs. Future work can be done on the methodology to specifically explore the role and influence of certification in relation to other actors in the broader process that certification is a part of.

Finally, rendering social and understanding certification as part of social processes can also be applied to other fields of studies. Similar research can be conducted on other agricultural commodities where certification already plays an important role, or in other sectors with production systems that involve a proliferation of certification schemes, such as, fisheries, salmon, forestry, coffee, biofuels, cocoa etc. In doing so, future research can validate, evaluate and extend our understanding of certification and its wider impacts on sustainability.

6.6 Concluding remarks

Reassessing the role of certification based on rendering the world around certification as social has opened up new pathways and perspectives to understand certification as part of the operationalisation of sustainability (problem and development). This thesis demonstrates that certification exists and engages in a broader relational landscape, therefore, it should be understood from its relational nature through the multiple sets of social relations that certification engages with. It also emerges from the findings that certification itself has a life on its own as a reflexive norm that can respond to the social dynamics. Certification is driven by ecological rationality and willing to act on its reflexivity and re-arrange its multiple roles and multiple social dimensions over time in response to the constantly changing dynamics it is embedded in. Therefore, certification should not be viewed as a neutral and fixed mechanism that always stays the same and assumed to have no impacts on other actors and social relations around it. Moving our perspective and view certification not from a rendering technical perspective implies that addressing environmental issues should focus on how the social context can be changed.

Rendering the world of certification as fundamentally social shifts the spotlight away from addressing environmental problems as technical and moving to emphasize

enabling, improving and re-ordering relations among people and the social structures relevant for improving sustainability. Rendering social has therefore opened the way to better understand the changes in practices around sustainability activities. This also broadens the view and offers a new perspective on how and where sustainable improvement can happen. First, improvement can occur differently at the farm level as farmers remain the key actor in delivering improvement, but they also have the capabilities of changing in multiple ways and not only by implementing requirements as prescribed in the standard. Second, sustainable improvement and transformation also occur at a more structural level beyond the farm level through governance and markets, and in multi-directional non-linear ways rather than top-down. Sustainable improvements also depend on social dynamics such as capabilities, credibility, inclusiveness. Therefore, this thesis argues that not only farmers need to improve but that improvement can also occur at other stages, through other actors and does not always have to go through farmer compliance as understood from the rendering technical perspective.

These social components and characteristics of certification bring out aspects that are relevant from a social science perspective and broadens our understanding of certification and sustainability. In doing so, this thesis brings us further in understanding how certification can steer responses and shape the transition towards re-shaping and improving the human-environment relations. Compared to rendering technical which views sustainability from a more straightforward processual outlook, the rendering social that brings out the wider 'social turn' of sustainability could be seen as complicating sustainability because it brings various social dynamics of relational, reflexivity, restructuring of social conditions into the picture. Nonetheless, this thesis has demonstrated the importance of viewing sustainability with respect to how people arrange the social relations between them and to how they deal with environmental problems. Therefore, social dynamics and social relations are important for broadening the perception that the solution to sustainability challenges is not only about how people act on how they think environment should change but to also include how to improve social relations, social structures and conditions in enabling a broader scale of change.

References

- ACFS, 2009. Thai Agricultural Standard TAS 7401-2009 Good Aquaculture Practices for Marine Shrimp Farm. National Bureau of Agricultural Commodity and Food Standards (ACFS), Bangkok, Thailand.
- ACFS, 2014. Thai Agricultural Standard TAS 7401-2014, TAS 7401-2014. National Bureau of Agricultural Commodity and Food Standards (ACFS), Bangkok, Thailand.
- ACFS, 2015. The National Bureau of Agricultural Commodity and Food Standards. National Bureau of Agricultural Commodity and Food Standards (ACFS).
- ADCC, 2010. Regulations of GAP and CoC certifications for aquaculture farming. Aquaculture Development and Certification Centre (ADCC).
- Amundsen, V. S., Gauteplass, A. Å., Bailey, J. L., 2019. Level up or game over: the implications of levels of impact in certification schemes for salmon aquaculture. *Aquaculture Economics & Management*. 23, 237-253.
- Anderson, J. L., Valderrama, D., Jory, D., 2017. Shrimp Production Review. Global Aquaculture Alliance.
- Anderson, J. L., Valderrama, D., Jory, D., 2018. Shrimp Production Review. Global Aquaculture Alliance.
- Anitha, A., 2020. Eco-Labels. in: Vannie, N., Rahul, V. (Eds.), *Green Marketing as a Positive Driver Toward Business Sustainability*. IGI Global, Hershey, PA, USA, pp. 249-274.
- Arunmas, P., 2014. Shrimp Farming Recovering, But Other Problems Remain, Bangkok Post.
- ASA, 2009. About ASA. ASEAN Shrimp Alliance (ASA).
- ASC, 2014. ASC Shrimp Standard v1.0 - March 2014. Aquaculture Stewardship Council (ASC), Utrecht, The Netherlands.
- ASC, 2018a. New ASC-VietGAP Benchmark Provides Guidance for Vietnamese Farmers Aquaculture Stewardship Council.
- ASC, 2018b. ASC workshop brings together shrimp producers and retailers to share knowledge.
- ASC, 2020. Find a farm. Aquaculture Stewardship Council.
- ASEAN, 2011. Standard on ASEAN good aquaculture practices for shrimp farming (ASEAN Shrimp GAP). Association of Southeast Asian Nations (ASEAN), Jakarta, Indonesia.
- Ashton, E., 2010. The impact of shrimp farming on mangrove ecosystems. *Cab Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources*. 3.
- ASIC, 2016. 6th Steering Committee Meeting Southeast Asian Shrimp Aquaculture Improvement Protocol (SEASAIP), Bangkok, Thailand.
- Auld, G., 2014. *Constructing private governance: The rise and evolution of forest, coffee, and fisheries certification*. Yale University Press, New Haven.

- Auld, G., Gulbrandsen, L. H., 2010. Transparency in Nonstate Certification: Consequences for Accountability and Legitimacy. *Global Environmental Politics*. 10, 97-119.
- Babbie, E., 1990. *Survey Research Methods*, 2nd Edition ed. Wadsworth, Belmont.
- Backstrand, K., 2010. Environmental politics and deliberative democracy : examining the promise of new modes of governance. Edward Elgar Publishing, Cheltenham; Northampton, MA.
- Bain, C., Hatanaka, M., 2010. The Practice of Third-Party Certification: Enhancing Environmental Sustainability and Social Justice in the Global South? in: Higgins, V., Lerner, W. (Eds.), *Calculating the Social: Standards and the Reconfiguration of Governing*. Palgrave Macmillan UK, London, pp. 56-74.
- BAP, 2020. BAP Certified Aquaculture Producers. Best Aquaculture Practices.
- Barclay, K., Miller, A., 2018. The Sustainable Seafood Movement Is a Governance Concert, with the Audience Playing a Key Role. *Sustainability*. 10, 180.
- Barham, E., 2002. Towards a theory of values-based labeling. *Agriculture and Human Values*. 19, 349-360.
- Bartley, T., 2007. Institutional Emergence in an Era of Globalization: The Rise of Transnational Private Regulation of Labor and Environmental Conditions. *American Journal of Sociology*. 113, 297-351.
- Bartley, T., 2012. How certification matters: examining mechanisms of influence, Appendix C in *Toward Sustainability: The Roles and Limits of Certification*. Steering Committee of the State-of-Knowledge Assessment of Standards and Certification, Report to RESOLVE, Washington, DC.
- Bartley, T., Smith, S. N., 2010. Communities of practice as cause and consequence of transnational governance: the evolution of social and environmental certification. in: Djelic, M.-L., Quack, S. (Eds.), *Transnational communities: Shaping global economic governance*. Cambridge University Press, pp. 347-374.
- Bartley, T., Koos, S., Samel, H., Setrini, G., Summers, N., 2015. *Looking Behind the Label: Global Industries and the Conscientious Consumer*. Indiana University Press, Bloomington.
- Basso, V. M., Jacovine, L. A. G., Alves, R. R., Valverde, S. R., da Silva, F. L., Brianezi, D., 2011. Evaluation of the influence of forest certification in compliance with environmental legislation in forest plantations. *Revista Arvore*. 35, 835-844.
- Bebbington, A., 1999. *Capitals and Capabilities: A framework for analysing peasant viability, rural livelihoods and poverty in the Andes*. International Institute for Environment and Development (IIED), London, pp. 54.
- Bellwood-Howard, I., Nchanji, E. B., 2017. The Marketing of Vegetable in a Northern Ghanaian City: Implications and Trajectories. in: WinklerPrins, A. (Ed.), *Global Urban Agriculture*. CABI, Wallingford, Oxfordshire; Boston, MA, pp. 79-92.

- Belton, B., Haque, M. M., Little, D. C., 2012. Does Size Matter? Reassessing the Relationship between Aquaculture and Poverty in Bangladesh. *The Journal of Development Studies*. 48, 904-922.
- Belton, B., Haque, M. M., Little, D. C., Sinh, L. X., 2011. Certifying catfish in Vietnam and Bangladesh: Who will make the grade and will it matter? *Food Policy*. 36, 289-299.
- Béné, C., 2005. The Good, the Bad and the Ugly: Discourse, Policy Controversies and the Role of Science in the Politics of Shrimp Farming Development. *Development Policy Review*. 23, 585-614.
- Bergleiter, S., Meisch, S., 2015. Certification Standards for Aquaculture Products: Bringing Together the Values of Producers and Consumers in Globalised Organic Food Markets. *Journal of Agricultural and Environmental Ethics*. 28, 553-569.
- Bernstein, S., Cashore, B., 2007. Can non-state global governance be legitimate? An analytical framework. *Regulation & Governance*. 1, 347-371.
- Best Aquaculture Practices, 2015. New iBAP Program To Advance Responsible Aquaculture.
- Bettley, A., Burnley, S., 2008. Towards Sustainable Operations Management Integrating Sustainability Management into Operations Management Strategies and Practices. in: Misra, K.B. (Ed.), *Handbook of Performability Engineering*. Springer, London.
- Biersack, A., 2006. Reimagining political ecology: Culture/power/history/nature. in: Biersack, A., Greenberg, J.B. (Eds.), *Reimagining political ecology*. Duke University Press, Durham, NC, pp. 5-40.
- Bingen, J., Busch, L., 2006. *Agricultural Standards: The Shape of the Global Food and Fiber System*. Springer, Dordrecht, the Netherlands.
- Bisht, S. S., Mishra, V., Fuloria, S., 2010. Measuring Accessibility for Inclusive Development: A Census Based Index. *Social Indicators Research*. 98, 167-181.
- Bitzer, V., Francken, M., Glasbergen, P., 2008. Intersectoral partnerships for a sustainable coffee chain: Really addressing sustainability or just picking (coffee) cherries? *Global Environmental Change*. 18, 271-284.
- Bitzer, V. C., 2012. Partnering for Change in Chains: the capacity of Partnerships to Promote Sustainable Change in Global Agrifood Chains. *International Food and Agribusiness Management Review*. 15, 13-38.
- Blackman, A., Rivera, J., 2011. Producer-Level Benefits of Sustainability Certification. *Conservation Biology*. 25, 1176-1185.
- Blank, C., 2015. Demand, Prices Low on Asian Farmed Shrimp. SeafoodSource.com.
- Bockstael, E., Berkes, F., 2017. Using the capability approach to analyze contemporary environmental governance challenges in coastal Brazil. *International Journal of the Commons*. 11, 799-822.
- Bondad-Reantaso, M. G., Bueno, P. B., Demaine, H., Pongthanapanich, T., 2009. Development of an indicator system for measuring the contribution of small-

- scale aquaculture to sustainable rural development. in: Bondad-Reantaso, M.G., Prcin, M. (Eds.), *Measuring the contribution of small-scale aquaculture: An assessment*. FAO, Rome, pp. 161-179.
- Booyesen, F., 2002. An Overview and Evaluation of Composite Indices of Development. *Social Indicators Research*. 59, 115-151.
- Bosma, R., Anh, P. T., Potting, J., 2011. Life cycle assessment of intensive striped catfish farming in the Mekong Delta for screening hotspots as input to environmental policy and research agenda. *The International Journal of Life Cycle Assessment*. 16, 903.
- Boström, M., 2006. Regulatory Credibility and Authority through Inclusiveness: Standardization Organizations in Cases of Eco-Labeling. *Organization*. 13, 345-367.
- Bottema, M. J. M., 2019. Institutionalizing area-level risk management: Limitations faced by the private sector in aquaculture improvement projects. *Aquaculture*. 512, 734310.
- Bourgois, E., 2017. Sustainability And Compliance Solutions For Asian Aquaculture Market/Value Chain: Introducing Verifik8, *Asian-Pacific Aquaculture 2017*, Kuala Lumpur, Malaysia.
- Bowen, G., 2009. Document Analysis as a Qualitative Research Method. *Qualitative Research Journal*. 9, 27-40.
- Boyd, C., McNevin, A. A., 2012. An early assessment of the effectiveness of aquaculture certification and standards, *Toward Sustainability: The Roles and Limitations of Certification*. Report to RESOLVE, Washington, DC, pp. A35-A69.
- Boyd, C., McNevin, A., 2014. *Aquaculture, Resource Use, and the Environment*. Wiley-Blackwell.
- Bretschneider, P. J., Cirilli, S., Jones, T., Lynch, S., Wilson, N. A., 2017. Document Review as a Qualitative Research Data Collection Method for Teacher Research, London.
- Brey, P. A. E., 2017. Sustainable Technologies for Sustainable Lifestyles. in: Kaplan, D. (Ed.), *Philosophy, Technology and the Environment*. MIT Press, pp. 191-212.
- Bryman, A., 2004. *Social Research Methods*, Fourth Edition ed. Oxford University Press, New York.
- Burchi, F., De Muro, P., 2016. From food availability to nutritional capabilities: Advancing food security analysis. *Food Policy*. 60, 10-19.
- Bureau Veritas, 2019. Free Seminar on Global Sustainable Seafood Standard. Bureau Veritas Thailand Ltd.,
- Busch, L., 2011. *Standards: Recipes for reality*. MIT Press, Cambridge, MA.
- Bush, S. R., Oosterveer, P., 2007. The Missing Link: Intersecting Governance and Trade in the Space of Place and the Space of Flows. *Sociologia Ruralis*. 47, 384-399.
- Bush, S. R., Belton, B., 2012. Out of the Factory and Into the Fish Pond: Can Certification Transform Vietnamese Pangasius? in: Spaargaren, G., et al.

- (Eds.), *Food Practices in Transition - Changing Food Consumption, Retail and Production in the Age of Reflexive Modernity*. Routledge, New York/London, pp. 257-290.
- Bush, S. R., Oosterveer, P., 2015. Vertically Differentiating Environmental Standards: The Case of the Marine Stewardship Council. *Sustainability*. 7, 1861-1883.
- Bush, S. R., Oosterveer, P., 2019. *Governing Sustainable Seafood*. Routledge, London.
- Bush, S. R., Toonen, H., Oosterveer, P., Mol, A. P. J., 2013a. The 'devils triangle' of MSC certification: Balancing credibility, accessibility and continuous improvement. *Marine Policy*. 37, 288-293.
- Bush, S. R., Oosterveer, P., Bailey, M., Mol, A. P. J., 2015. Sustainability governance of chains and networks: a review and future outlook. *Journal of Cleaner Production*. 107, 8-19.
- Bush, S. R., Belton, B., Hall, D., Vandergeest, P., Murray, F. J., Ponte, S., Oosterveer, P., Islam, M. S., Mol, A. P. J., Hatanaka, M., Kruijssen, F., Ha, T. T. T., Little, D. C., Kusumawati, R., 2013b. Certify Sustainable Aquaculture? *Science*. 341, 1067-1068.
- Casey, D., 2017. Structuring private food safety governance: GLOBALGAP and the legitimating role of the state and rule intermediaries. in: Havinga, P.V.a.T. (Ed.), *Hybridization of Food Governance. Trends, Types and Results*. Edward Elgar, Cheltenham, England, pp. 31-53.
- Cashore, B., 2002. Legitimacy and the Privatization of Environmental Governance: How Non-State Market-Driven (NSMD) Governance Systems Gain Rule-Making Authority. *Governance*. 15, 503-529.
- Cashore, B., Auld, G., Bernstein, S., McDermott, C., 2007. Can Non-state Governance 'Ratchet Up' Global Environmental Standards? Lessons from the Forest Sector. *Review of European Community & International Environmental Law*. 16, 158-172.
- Cashore, B. W., Auld, G., Newsom, D., 2004. *Governing through markets: Forest certification and the emergence of non-state authority*. Yale University Press, New Haven, CT.
- Central Laboratory Thai, 2018. *Inspection & Quality Systems and Products Certification*. Inspection & Quality Systems and Products Certification. Central Laboratory (Thailand).
- Charoen Pokphand, 2017. *Force for a sustainable life sustainability report 2016*. Charoen Pokphand, Bangkok.
- Chen, J., Innes, J. L., Tikina, A., 2010. Private cost-benefits of voluntary forest product certification. *International Forestry Review*. 12, 1-12.
- Chuchou, C., 2013. ACFS to Upgrade GAP-7401, Thairath.
- Clayton, H., Brennan, D. C., 1999. A review of economic issues for sustainable shrimp farming in the Mekong Delta, Vietnam, 1999 Conference (43th) Australian Agricultural and Resource Economics Society, Christchurch, New Zealand

- Conceição, P., Levine, S., Lipton, M., Warren-Rodríguez, A., 2016. Toward a food secure future: Ensuring food security for sustainable human development in Sub-Saharan Africa. *Food Policy*. 60, 1-9.
- Corsin, F., Funge-Smith, S., Clausen, J., 2007. A Qualitative Assessment of Standards and Certification Schemes Applicable to Aquaculture in the Asia-Pacific Region. FAO Regional Office for Asia and the Pacific, Bangkok, Thailand, pp. 98.
- Creswell, J. W., 2009. Research design: Qualitative, quantitative, and mixed methods approaches. Sage Publications, Thousand Oaks, CA.
- Creswell, J. W., Plano Clark, V., 2007. Designing and Conducting Mixed Methods Research. Sage, Thousand Oaks, CA.
- Crocker, D. A., 2008. Ethics of Global Development: Agency, Capability, and Deliberative Democracy. Cambridge University Press, Cambridge.
- Dao, G., Garden, P., Lebel, L., 2009. Enabling Sustainable Shrimp Aquaculture: Narrowing the Gaps Between Science and Policy in Thailand. in: Lebel, L., et al. (Eds.), Sustainable Production Consumption Systems. Springer, Dordrecht, pp. 123-144.
- Delgado, C. L., Wada, N., Rosegrant, M. W., Meijer, S., Ahmed, M., 2003. Fish to 2020: Supply and demand in changing global markets. WorldFish, Washington, DC.
- Derkx, B., Glasbergen, P., 2014. Elaborating global private meta-governance: An inventory in the realm of voluntary sustainability standards. *Global Environmental Change*. 27, 41-50.
- Devereux, S., 2001. Sen's Entitlement Approach: Critiques and Counter-critiques. *Oxford Development Studies*. 29, 245-263.
- DFID, 1999. DFID sustainable livelihoods guidance sheets. Department for International Development (DFID), London, pp. 149.
- Dierberg, F. E., Kiattisimkul, W., 1996. Issues, Impacts, and Implications of Shrimp Aquaculture in Thailand. *Environmental management*. 20, 649-666.
- Dingwerth, K., 2007. The new transnationalism: Transnational governance and democratic legitimacy. Palgrave Macmillan, New York, NY.
- Djama, M., 2011. Regulating the globalised economy: Articulating private voluntary standards and public regulations. *Perspective - CIRAD*, 1-4.
- Djama, M., Fouilleux, E., Vagneron, I., 2011. Standard-setting, Certifying and Benchmarking: A Governmentality Approach to Sustainability Standards in the Agro-Food Sector. in: Ponte, S., et al. (Eds.), Governing through Standards: Origins, Drivers and Limitations. Palgrave Macmillan, pp. 184-209.
- Doberstein, C., 2016. Designing Collaborative Governance Decision-Making in Search of a 'Collaborative Advantage'. *Public Management Review*. 18, 819-841.
- DoF, 2002. Code of Conduct (CoC). Fisheries Commodity Standard System and Traceability Division, Department of Fisheries (DoF), Bangkok, Thailand.

- DoF, 2007. Manual for white shrimp *Litopenaeus vannamei* farming. Coastal Aquaculture Research Institute, Director Fishery Technology Transfer and Development Bureau, Department of Fisheries (DoF).
- DoF, 2010. Good Aquaculture Practice (GAP). Fisheries Commodity Standard System and Traceability Division, Department of Fisheries (DoF), Bangkok, Thailand.
- DoF, 2013. Farm and Farmer Registration. Department of Fisheries (DoF).
- DoF, 2017a. Invitation to participating in seminar on transformation towards sustainable seafood through certification. in: Thailand, W. (Ed.), Department of Fisheries (DoF). WWF Thailand.
- DoF, 2017b. Aquaculture certification auditor training course. Department of Fisheries.
- DoF, 2018. Seminar on preparation and driven TAS-7401 toward Global Sustainable Seafood Initiative. Department of Fisheries.
- DoF, 2019a. Mr. Thaworn Jirasophonrak Deputy Director-General of DOF presided over the meeting to discuss cooperation approaches with representatives from ASC and delegates of DOF, Department of Fisheries, Ministry of Agriculture and Cooperatives, Thailand.
- DoF, 2019b. Guidance for exporting black tiger shrimp to China. in: Fisheries, D.o. (Ed.).
- DoF, 2019c. Shrimp product situation in 2018 and trend in 2019. Fisheries Development Policy and Strategy Division (PDPS).
- DoF, 2020. Cluster application form for exporting black tiger shrimps to China. Department of Fisheries.
- Eden, S., 2009. The work of environmental governance networks: Traceability, credibility and certification by the Forest Stewardship Council. *Geoforum*. 40, 383-394.
- Ellis, F., 1999. Rural Livelihood Diversity in Developing Countries: Evidence and Policy Implications. *ODI Natural Resource Perspectives*. 40.
- Ellis, F., 2000. Rural livelihoods and diversity in developing countries. Oxford University Press, Oxford.
- Emmanuelle, C., 2011. Multi-stakeholder Initiatives for Sustainable Agriculture: Limits of the 'Inclusiveness' Paradigm. in: Ponte, S., et al. (Eds.), *Governing through standards: origins, drivers and limitations*. Palgrave Macmillan, Houndmills, Basingstoke, Hampshire; New York, pp. 210-235.
- Encarnação, P., 2014. Supporting the Thai Shrimp Industry. in: BIOMIN (Ed.). BIOMIN Holding GmbH.
- Engle, C. R., McNevin, A., Racine, P., Boyd, C. E., Paungkaew, D., Viriyatum, R., Tinh, H. Q., Minh, H. N., 2017. Economics of Sustainable Intensification of Aquaculture: Evidence from Shrimp Farms in Vietnam and Thailand. *Journal of the World Aquaculture Society*. 48, 227-239.
- Evans, P., 2002. Collective capabilities, culture, and Amartya Sen's Development as Freedom. *Studies in Comparative International Development*. 37, 54-60.
- FAO, 2016a. Shrimp - February 2016. Food and Agriculture Organization (FAO).

- FAO, 2016b. The State of World Fisheries and Aquaculture. Contributing to food security and nutrition for all. Food and Agriculture Organization of the United Nations (FAO), Rome, pp. 200.
- FAO, 2018. Seafood certification and developing countries: Focus on Asia. in: Tsantriris, K., et al. (Eds.). FAO, Rome, Italy.
- FAO, 2019. GLOBEFISH highlights: A quarterly update on world seafood markets.
- FAO, 2020. The State of World Fisheries and Aquaculture 2020. FAO Fisheries and Aquaculture Department.
- Farrington, J., Farrington, C., 2005. Rural accessibility, social inclusion and social justice: towards conceptualisation. *Journal of Transport Geography*. 13, 1-12.
- FCSTD, 2017. F-AD-36 List Certified Farm and Operator for GAP CoC and Organic on Fisheries and Aquaculture Standard. Fisheries Commodity Standard System and Traceability Division (FCSTD), Department of Fisheries, Thailand.
- Ferguson, J., 1990. The anti-politics machine: "Development," Depoliticization, and Bureaucratic Power in Lesotho. University of Minnesota Press, Minneapolis, Minnesota.
- Flaherty, M., Szuster, B., Miller, P., 2000. Low Salinity Inland Shrimp Farming in Thailand. *Ambio*. 29, 174-179.
- Flyvbjerg, B., 2006. Five misunderstandings about case-study research. *Qualitative Inquiry*. 12, 219-245.
- Foley, P., 2012. The Political Economy of Marine Stewardship Council Certification: Processors and Access in Newfoundland and Labrador's Inshore Shrimp Industry. *Journal of Agrarian Change*. 12, 436-457.
- Foley, P., Havice, E., 2016. The rise of territorial eco-certifications: New politics of transnational sustainability governance in the fishery sector. *Geoforum*. 69, 24-33.
- Forsyth, T., 2003. Critical political ecology : the politics of environmental science. Routledge, London.
- Fouilleux, E., Loconto, A., 2017. Voluntary standards, certification, and accreditation in the global organic agriculture field: a tripartite model of techno-politics. *Agriculture and Human Values*. 34, 1-14.
- Fransen, L., 2011. Why Do Private Governance Organizations Not Converge? A Political-Institutional Analysis of Transnational Labor Standards Regulation. *Governance*. 24, 359-387.
- Fransen, L., 2015. The politics of meta-governance in transnational private sustainability governance. *Policy Sciences*. 48, 293-317.
- Gehring, T., Oberthür, S., 2009. The Causal Mechanisms of Interaction between International Institutions. *European Journal of International Relations*. 15, 125-156.
- Glasbergen, P., 2011. Mechanisms of private meta-governance: an analysis of global private governance for sustainable development. *International Journal of Strategic Business Alliances*. 2, 189-206.

- Glasbergen, P., 2013. Legitimation of Certifying Partnerships in the Global Market Place. *Environmental Policy and Governance*. 23, 354-367.
- Glasbergen, P., Schouten, G., 2015. Transformative capacities of global private sustainability standards. *The Journal of Corporate Citizenship*. 58, 85-101.
- Global Aquaculture Alliance, 2009. Best aquaculture practices certifications top 200 with first Tilapia, catfish facilities, *Uner Barry's Reporter*, Toms River, NJ, pp. 30.
- Global Aquaculture Alliance, 2017. Aquaculture Facility Certification Finfish and Crustacean Farms, Best Aquaculture Practices Certification Standards, Guidelines. Global Aquaculture Alliance (GAA), New Hampshire, USA.
- Gómez Tovar, L., Martin, L., Gómez Cruz, M. A., Mutersbaugh, T., 2005. Certified organic agriculture in Mexico: Market connections and certification practices in large and small producers. *Journal of Rural Studies*. 21, 461-474.
- Goss, J., Burch, D., Rickson, R. E., 2000. Agri-food restructuring and third world transnationals: Thailand, the CP Group and the global shrimp industry. *World Development*. 28, 513-530.
- Government Gazette, 2015. Royal Ordinance on Fisheries B.E.2558 (2015). *Government Gazette, Thailand*, pp. 47.
- Government Gazette, 2017. Royal Ordinance on Fisheries (No.2) B.E. 2560 (2017). *Government Gazette, Thailand*.
- GSSI, 2015. GSSI global benchmark tool pilot FAQ,. Global Sustainable Seafood Initiative (GSSI), Haarlem, the Netherlands.
- GSSI, 2016a. Benchmark report marine stewardship council. Global Sustainable Seafood Initiative (GSSI), Haarlem, the Netherlands.
- GSSI, 2016b. GSSI benchmarking tool factsheet. Global Sustainable Seafood Initiative (GSSI), Haarlem, the Netherlands.
- GSSI, 2016c. The global benchmark tool. Global Sustainable Seafood Initiative (GSSI).
- GSSI, 2016d. Annual report 2015. Global Sustainable Seafood Initiative (GSSI), Haarlem, The Netherlands.
- GSSI, 2018. GSSI recognized ASC certification. Global Sustainable Seafood Initiative (GSSI).
- Gulbrandsen, L. H., 2010. *Transnational Environmental Governance: The Emergence and Effects of the Certification of Forest and Fisheries*. Edward Elgar Publishing, Cheltenham, UK.
- Gulbrandsen, L. H., 2012. Impacts of Nonstate Governance: Lessons from the Certification of Marine Fisheries. in: Dauvergne, P. (Ed.), *Handbook of Global Environmental Politics*, 2nd edition. Edward Elgar Publishing, Cheltenham (UK)/Northampton (USA), pp. 330-340.
- Gulbrandsen, L. H., 2014. Dynamic governance interactions: Evolutionary effects of state responses to non-state certification programs. *Regulation & Governance*. 8, 74-92.

- Gulliford, M., Figueroa-Munoz, J., Morgan, M., Hughes, D., Gibson, B., Beech, R., Hudson, M., 2002. What does 'access to health care' mean? *Journal of Health Services Research & Policy*. 7, 186-188.
- Ha, T. T. T., Bush, S. R., 2010. Transformations of Vietnamese Shrimp Aquaculture Policy: Empirical Evidence from the Mekong Delta. *Environment and Planning C: Government and Policy*. 28, 1101-1119.
- Ha, T. T. T., Bush, S. R., van Dijk, H., 2013. The cluster panacea?: Questioning the role of cooperative shrimp aquaculture in Vietnam. *Aquaculture*. 388-391, 89-98.
- Ha, T. T. T., Bush, S. R., Mol, A. P. J., van Dijk, H., 2012. Organic coasts? Regulatory challenges of certifying integrated shrimp-mangrove production systems in Vietnam. *Journal of Rural Studies*. 28, 631-639.
- Hall, D., 2004. Explaining the Diversity of Southeast Asian Shrimp Aquaculture. *Journal of Agrarian Change*. 4, 315-335.
- Hamilton, S., 2013. Assessing the Role of Commercial Aquaculture in Displacing Mangrove Forest. *Bulletin of Marine Science*. 89, 585-601.
- Harbaugh, R., Maxwell, J. W., Roussillon, B., 2011. Label Confusion: The Groucho Effect of Uncertain Standards. *Management Science*. 57, 1512-1527.
- Hatanaka, M., 2014. Standardized food governance? Reflections on the potential and limitations of chemical-free shrimp. *Food Policy*. 45, 138-145.
- Hatanaka, M., Busch, L., 2008. Third-Party Certification in the Global Agrifood System: An Objective or Socially Mediated Governance Mechanism? *Sociologia Ruralis*. 48, 73-91.
- Hatanaka, M., Bain, C., Busch, L., 2005. Third-Party Certification in the Global Agrifood System. *Food Policy*. 30, 354-369.
- Healey, P., 1998. Building Institutional Capacity through Collaborative Approaches to Urban Planning. *Environment and Planning A: Economy and Space*. 30, 1531-1546.
- Henson, S., Jaffee, S., 2006. Food Safety Standards and Trade: Enhancing Competitiveness and Avoiding Exclusion of Developing Countries. *The European Journal of Development Research*. 18, 593-621.
- Henson, S., Humphrey, J., 2010. Understanding the Complexities of Private Standards in Global Agri-Food Chains as They Impact Developing Countries. *The Journal of Development Studies*. 46, 1628-1646.
- Honniball, A. N., 2019. What's in a Duty? EU Identification of Non-cooperating Port States and Their Prescriptive Responses. *The International Journal of Marine and Coastal Law*. 35, 19-54.
- Hospes, O., 2014. Marking the success or end of global multi-stakeholder governance? The rise of national sustainability standards in Indonesia and Brazil for palm oil and soy. *Agriculture and Human Values*. 31, 425-437.
- Howlett, M., Ramesh, M., 2016. Achilles' heels of governance: Critical capacity deficits and their role in governance failures. *Regulation & Governance*. 10, 301-313.

- Ibrahim, S. S., 2006. From Individual to Collective Capabilities: The Capability Approach as a Conceptual Framework for Self-help. *Journal of Human Development*. 7, 397-416.
- ISEAL, 2013. ISEAL credibility principle. in: ISEAL (Ed.). ISEAL.
- ISEAL, 2015a. Our governance. International Social and Environmental Accreditation and Labelling Alliance (ISEAL).
- ISEAL, 2015b. Our membership committee. International Social and Environmental Accreditation and Labelling Alliance (ISEAL).
- ISEAL, 2015c. Our technical committee. International Social and Environmental Accreditation and Labelling Alliance (ISEAL).
- ISEAL, 2015d. Standard-setting code. International Social and Environmental Accreditation and Labelling Alliance (ISEAL).
- ISEAL, 2016. Our history. International Social and Environmental Accreditation and Labelling Alliance (ISEAL).
- ISEAL, 2017. Our codes of good practice. International Social and Environmental Accreditation and Labelling Alliance (ISEAL).
- ISEAL, 2020. Increasing the impact of sustainability standards. in: Senathirajah, S. (Ed.). ISEAL.
- Jayanthi, M., Thirumurthy, S., Muralidhar, M., Ravichandran, P., 2018. Impact of shrimp aquaculture development on important ecosystems in India. *Global Environmental Change*. 52, 10-21.
- Jessop, B., 2003. Governance and metagovernance: On reflexivity, requisite variety, and requisite irony. in: Bang, H.P. (Ed.), *Governance, as social and political communication*. Manchester University Press, Manchester, England, pp. 142–172.
- Jetschke, A., Murray, P., 2012. Diffusing Regional Integration: The EU and Southeast Asia. *West European Politics*. 35, 174-191.
- Joffre, O. M., Klerkx, L., Khoa, T. N. D., 2018. Aquaculture innovation system analysis of transition to sustainable intensification in shrimp farming. *Agronomy for Sustainable Development*. 38, 34.
- Joffre, O. M., Klerkx, L., Dickson, M., Verdegem, M., 2017. How is innovation in aquaculture conceptualized and managed? A systematic literature review and reflection framework to inform analysis and action. *Aquaculture*. 470, 129-148.
- Jonathan, O., Tad, M., 2015. *Certified Political Ecology*, The Routledge Handbook of Political Ecology. Routledge.
- Jonell, M., Phillips, M., Rönnbäck, P., Troell, M., 2013. Eco-certification of farmed seafood: will it make a difference? *Ambio*. 42, 659-674.
- Jonell, M., Tlustý, M., Troell, M., Rönnbäck, P., 2019. Certifying farmed seafood - A drop in the ocean or a 'stepping stone' to increased sustainability. in: Vogt, M. (Ed.), *Sustainability Certification Schemes in the Agricultural and Natural Resources Sectors: Outcomes for society and the environment*. Routledge, London.

- Kalfagianni, A., 2014. Addressing the Global Sustainability Challenge: The Potential and Pitfalls of Private Governance from the Perspective of Human Capabilities. *Journal of Business Ethics*. 122, 307-320.
- Kearns, M., 2017. FDA Kicks off 2017 With High Number of Shrimp Rejections Due to Banned Antibiotics. *SeafoodSource.com*.
- Klooster, D., 2006. Environmental Certification of Forests in Mexico: The Political Ecology of a Nongovernmental Market Intervention. *Annals of the Association of American Geographers*. 96, 541-565.
- Kobayashi, M., Msangi, S., Batka, M., Vannuccini, S., Dey, M. M., Anderson, J. L., 2015. Fish to 2030: The Role and Opportunity for Aquaculture. *Aquaculture Economics & Management*. 19, 282-300.
- Kolk, A., 2013. Mainstreaming sustainable coffee. *Sustainable Development*. 21, 324-337.
- Komives, K., Jackson, A., 2014. Introduction to Voluntary Sustainability Standard Systems. in: Schmitz-Hoffmann, C., et al. (Eds.), *Voluntary Standard Systems: A Contribution to Sustainable Development*. Springer Berlin Heidelberg, Berlin, Heidelberg, pp. 3-19.
- Kongkeo, H., Davy, F. B., 2010. Backyard Hatcheries and Small Scale Shrimp and Prawn Farming in Thailand. in: S.S., D.S., F.B., D. (Eds.), *Success Stories in Asian Aquaculture*. Springer, Dordrecht.
- Kooiman, J., Bavinck, M., 2005. The governance perspective. Amsterdam University Press, Amsterdam, the Netherlands.
- Krantz, L., 2001. The Sustainable. Livelihood Approach to Poverty Reduction. An Introduction. Swedish International Development Cooperation Agency, 25-31.
- Kumar, R., 2014. Research methodology: a step-by-step guide for beginners, Fourth edition. ed. SAGE Publications, London.
- Kusumawati, R., Bush, S. R., 2015. Co-producing Better Management Practice standards for shrimp aquaculture in Indonesia. *Maritime Studies*. 14, 21.
- Kusumawati, R., Bush, S. R., Visser, L. E., 2013. Can Patrons Be Bypassed? Frictions between Local and Global Regulatory Networks over Shrimp Aquaculture in East Kalimantan. *Society & Natural Resources*. 26, 898-911.
- Lambin, E., Thorlakson, T., 2018. Sustainability Standards: Interactions Between Private Actors, Civil Society, and Governments. *Annual Review of Environment and Resources*. 43, 369-393.
- Leadbitter, D., 2008. Market-Based Mechanisms - Improving Fisheries Management?, *SEAFOOD Ecolabelling*. Blackwell Publishing Ltd, pp. 187-206.
- Lebel, L., Mungkung, R., Gheewala, S. H., Lebel, P., 2010. Innovation cycles, niches and sustainability in the shrimp aquaculture industry in Thailand. *Environmental Science & Policy*. 13, 291-302.
- Lebel, L., Garden, P., Luers, A., Manuel-Navarrete, D., Giap, D. H., 2016. Knowledge and innovation relationships in the shrimp industry in Thailand and Mexico. *Proceedings of the National Academy of Sciences*. 113, 4585.

- Lebel, L., Tri, N. H., Saengnoree, A., Pasong, S., Buatama, U., Thoa, L. K., 2002. Industrial Transformation and Shrimp Aquaculture in Thailand and Vietnam: Pathways to Ecological, Social, and Economic Sustainability? *Ambio*. 31, 311-323, 313.
- Lee, D., 2009. Understanding aquaculture certification. *Revista Colombiana de Ciencias Pecuarias*. 22, 319-329.
- Lee, J., Gereffi, G., Beauvais, J., 2012. Global value chains and agrifood standards: Challenges and possibilities for smallholders in developing countries. *Proceedings of the National Academy of Sciences*. 109, 12326-12331.
- Leepaisomboon, T., 2014. Implementation Capability of Thai Shrimp Farms to Upgrade to International Certification Standards. Department of Fishery Biology. Kasetsart University, Bangkok, Thailand, pp. 414.
- Leipziger, D., 2009. *SA8000 : The first decade—implementation, influence, and impact*. Routledge, New York, NY.
- Lemeilleur, S., 2012. Smallholder Compliance with Private Standard Certification: The Case of GlobalGAP Adoption by Mango Producers in Peru. *International Food and Agribusiness Management Review*. 16, 1-22.
- Levy, D. L., Newell, P. J., 2005. *The business of global environmental governance*. MIT Press, Cambridge, MA.
- Li, T. M., 2007. *Rendering Technical?, The Will to Improve: Governmentality, Development, and the Practice of Politics*. Duke University Press, Durham, NC.
- Liao, D. S., Chiu Liao, I., 2007. An Economic Evaluation of Shrimp Farming Industry in Taiwan. in: Leung, P., Engle, C. (Eds.), *Shrimp Culture*, pp. 187-196.
- Little, D. C., Newton, R. W., Beveridge, M. C. M., 2016. Aquaculture: a rapidly growing and significant source of sustainable food? Status, transitions and potential. *Proceedings of the Nutrition Society*. 75, 274-286.
- Loconto, A., 2010. Sustainably Performed: Reconciling Global Value Chain Governance and Performativity. *Journal of Rural Social Science*. 25, 193-225.
- Loconto, A., Barbier, M., 2014. Transitioning sustainability: Performing ‘governing by standards. in: Borrás, S., Edler, J. (Eds.), *The governance of socio-technical systems explaining change*, . Edward Elgar, Cheltenham, UK, pp. 70-95.
- Loconto, A., Fouilleux, E., 2014. Politics of private regulation: ISEAL and the shaping of transnational sustainability governance. *Regulation & Governance*. 8, 166-185.
- Lynch-Wood, G., Williamson, D., 2010. The receptive capacity of firms and the regulation of ecological modernization, ECPR standing group on regulatory governance third biennial conference: Regulation in the age of crisis, University College Dublin.
- Maertens, M., Swinnen, J. F. M., 2009. Trade, Standards, and Poverty: Evidence from Senegal. *World Development*. 37, 161-178.

- Majer, S., Wurster, S., Moosmann, D., Ladu, L., Sumfleth, B., Thrän, D., 2018. Gaps and Research Demand for Sustainability Certification and Standardisation in a Sustainable Bio-Based Economy in the EU. *Sustainability*. 10, 2455.
- Mallet, P., 2014a. Key lessons for effective benchmarking, Webinar in the Sustainability Standards Essentials series.
- Mallet, P., 2014b. Difficult questions ahead for seafood benchmarking initiative.
- Marschke, M., Wilkings, A., 2014. Is certification a viable option for small producer fish farmers in the global south? Insights from Vietnam. *Marine Policy*. 50, 197-206.
- Martin, S. M., Lorenzen, K., 2016. Livelihood Diversification in Rural Laos. *World Development*. 83, 231-243.
- Meuleman, L., 2011. Metagoverning governance styles: Broadening the public manager's action perspective. in: Torfing, J., Triantafillou, P. (Eds.), *Interactive policy making, metagovernance, and democracy*. ECPR Press, Colchester, pp. 95-110.
- Miller, A. M. M., Bush, S. R., 2015. Authority without credibility? Competition and conflict between ecolabels in tuna fisheries. *Journal of Cleaner Production*. 107, 137-145.
- Miranda, I. T., 2010. Farmed Imported Marine Shrimp: Thailand. Monterey Bay Aquarium's Seafood Watch, pp. 103.
- Möckel, S., 2015. 'Best available techniques' as a mandatory basic standard for more sustainable agricultural land use in Europe? *Land Use Policy*. 47, 342-351.
- Mol, A., Spaargaren, G., Sonnenfeld, D., 2009. Ecological modernisation: Three decades of policy, practice and theoretical reflection. in: Mol, A., et al. (Eds.), *The Ecological Modernisation Reader. Environmental reform in theory and practice*. Routledge, London, pp. 3-14.
- Mol, A. P. J., 1996. Ecological modernisation and institutional reflexivity: Environmental reform in the late modern age. *Environmental Politics*. 5, 302-323.
- Mol, A. P. J., 2001. Globalization and Environmental Reform. *The Ecological Modernization of the Global Economy*. MIT Press, Cambridge, Massachusetts.
- Mol, A. P. J., Spaargaren, G., 2000. Ecological modernisation theory in debate: A review. *Environmental Politics*. 9, 17-49.
- Molnar, A., Butterfield, R., Chapela, F., Fuge, P., De Freitas, A., Hayward, J., Jansens, J. W., Jenkins, M., Madrid, S., Martin, A., Rezende De Azevedo, T., Ridder, M., Smith, P., Soza, C., White, A., 2004. Forest Certification and Communities. *International Forestry Review*. 6, 173-180, 178.
- Morse, S., McNamara, N., 2013. The Theory Behind the Sustainable Livelihood Approach. in: Morse, S., McNamara, N. (Eds.), *Sustainable Livelihood Approach*. Springer, Dordrecht.
- Mungkung, R., Gheewala, S. H., Lebel, L., Saengnoee, A., Buatama, U., 2010. Effects of certification and labelling requirements from importing countries on the sustainability of Thai shrimp industry: Final report. Centre of

- Excellence on Environmental Strategy of Green Business, Department of Environmental Science, Faculty of Science, Kasetsart University, Bangkok, Thailand, pp. 265.
- Mutersbaugh, T., 2002. The Number is the Beast: A Political Economy of Organic-Coffee Certification and Producer Unionism. *Environment and Planning A: Economy and Space*. 34, 1165-1184.
- Mutersbaugh, T., 2005. Fighting Standards with Standards: Harmonization, Rents, and Social Accountability in Certified Agrofood Networks. *Environment and Planning A: Economy and Space*. 37, 2033-2051.
- Nadvi, K., Wältring, F., 2004. Making sense of global standards. in: Schmitz, H. (Ed.), *Local Enterprises in the Global Economy: Issues of Governance and Upgrading*. Edward Elgar Publishing, Cheltenham, UK.
- National Farmers Council, Thai Chamber of Commerce, 2016. Shrimp cluster establishment and mobilization case study Samroi-yod Basin shrimp farmer cooperative. National Farmers Council, Thai Chamber of Commerce, Bangkok, Thailand.
- Nebel, G., Quevedo, L., Bredahl Jacobsen, J., Helles, F., 2005. Development and economic significance of forest certification: the case of FSC in Bolivia. *Forest Policy and Economics*. 7, 175-186.
- Neilsno, J., Pritchard, B., 2010. Fairness and Ethicality in Their Place: The Regional Dynamics of Fair Trade and Ethical Sourcing Agendas in the Plantation Districts of South India. *Environment and Planning A: Economy and Space*. 42, 1833-1851.
- Nguyen, T. A. T., Nguyen, K. A. T., Jolly, C., 2019. Is Super-Intensification the Solution to Shrimp Production and Export Sustainability? *Sustainability*. 11, 5277.
- Nguyen, T. B. T., 2015. Good aquaculture practices (VietGAP) and sustainable aquaculture development in Viet Nam. in: Romana-Eguia, M.R.R., et al. (Eds.), *the International Workshop on Resource Enhancement and Sustainable Aquaculture Practices in Southeast Asia 2014 (RESA)*. Aquaculture Dept., Southeast Asian Fisheries Development Center, Tigbauan, Iloilo, Philippines, pp. 85-92.
- Ningsih, I. K., Ingram, V., Savilaakso, S., 2020. Voluntary Sustainability Certification and State Regulations: Paths to Promote the Conservation of Ecosystem Services? Experiences in Indonesia. *Forests*. 11.
- Nolting, M., 2011. The Global Seafood Sustainability Initiative (GSSI): Multi-stakeholder network for the development of a benchmarking tool for standards and certification schemes for fishery and aquaculture products, the 29th Session of the FAO Committee on Fisheries, Ethiopia.
- Nussbaum, M. C., 2000. Aristotle, Politics, and Human Capabilities: A Response to Antony, Arneson, Charlesworth, and Mulgan. *Ethics*. 111, 102-140.
- OAE, 2015. Trends of agriculture products in 2015. Office of Agricultural Economics, Bangkok, pp. 12.

- OAE, 2016. Agricultural Price Index (Seasonally Adjusted). Office of Agricultural Economics (OAE), Ministry of Agriculture and Cooperatives.
- Oosterveer, P., Adjei, B. E., Vellema, S., Slingerland, M., 2014. Global sustainability standards and food security: Exploring unintended effects of voluntary certification in palm oil. *Global Food Security*. 3, 220-226.
- Ortega Landa, R., 2004. Amartya Sen: Utilitarianism, Ethics and Public Policy. *Revista Latinoamericana de Desarrollo Económico*, 149-152.
- Osmundsen, T. C., Amundsen, V. S., Alexander, K. A., Asche, F., Bailey, J., Finstad, B., Olsen, M. S., Hernández, K., Salgado, H., 2020. The operationalisation of sustainability: Sustainable aquaculture production as defined by certification schemes. *Global Environmental Change*. 60, 102025.
- Otto, J., Mutersbaugh, T., 2015. Certified Political Ecology. in: Perreault, T., et al. (Eds.), *The Routledge Handbook of Political Ecology*. Routledge, London.
- Ouma, S., 2010. Global Standards, Local Realities: Private Agrifood Governance and the Restructuring of the Kenyan Horticulture Industry. *Economic Geography*. 86, 197-222.
- Overdevest, C., Rickenbach, M. G., 2006. Forest certification and institutional governance: An empirical study of forest stewardship council certificate holders in the United States. *Forest Policy and Economics*. 9, 93-102.
- Overdevest, C., Zeitlin, J., 2014. Assembling an experimentalist regime: Transnational governance interactions in the forest sector. *Regulation & Governance*. 8, 22-48.
- Paranage, K., 2019. The Mahaweli Development Project and the 'rendering technical' of agrarian development in Sri Lanka. *Heliyon*. 5, e01811.
- Parkes, G., Young, J. A., Walmsley, S. F., Abel, R., Harman, J., Horvat, P., Lem, A., MacFarlane, A., Mens, M., Nolan, C., 2010. Behind the Signs-A Global Review of Fish Sustainability Information Schemes. *Reviews in Fisheries Science*. 18, 344-356.
- Pattberg, P., 2005. What Role for Private Rule-Making in Global Environmental Governance? Analysing the Forest Stewardship Council (FSC). *International Environmental Agreements: Politics, Law and Economics*. 5, 175-189.
- Perez-Aleman, P., 2013. Regulation in the process of building capabilities: strengthening competitiveness while improving food safety and environmental sustainability in Nicaragua. *Politics & Society*. 41, 589-620.
- Pérez-Ramírez, M., Ponce-Díaz, G., Lluch-Cota, S., 2012. The role of MSC certification in the empowerment of fishing cooperatives in Mexico: The case of red rock lobster co-managed fishery. *Ocean & Coastal Management*. 63, 24-29.
- Peters, B. G., 2006. The meta-governance of policy networks: Steering at a distance, but still steering, Conference on Democratic Network Governance, Roskilde, Denmark.
- Peterson, J., 2015. Best Aquaculture Practices Training in Malaysia.
- Petrović, Z., Milićević, D., Nastasijević, I., Đorđević, V., Trbović, D., Velebit, B., 2017. The role of food quality assurance and product certification systems on

- marketing aspects, IOP Conference Series: Earth and Environmental Science. IOP Publishing, pp. 012011.
- Phillips, B., Ward, T., Chaffee, C., 2003. *Eco-labelling in Fisheries: What is it all about?* Blackwell Science, Oxford, UK.
- Pongthanapanich, T., Roth, E., 2006. *Toward Environmental Responsibility of Thai Shrimp Farming through a Voluntary Management Scheme*. University of Southern Denmark, Department of Sociology, Environmental and Business Economics.
- Ponte, S., 2008. Greener than Thou: The Political Economy of Fish Ecolabeling and Its Local Manifestations in South Africa. *World Development*. 36, 159-175.
- Ponte, S., 2012. The Marine Stewardship Council (MSC) and the Making of a Market for 'Sustainable Fish'. *Journal of Agrarian Change*. 12, 300-315.
- Ponte, S., 2014. 'Roundtabling' sustainability: Lessons from the biofuel industry. *Geoforum*. 54, 261-271.
- Ponte, S., Gibbon, P., 2005. Quality standards, conventions and the governance of global value chains. *Economy and Society*. 34, 1-31.
- Ponte, S., Riisgaard, L., 2011. Competition, 'Best Practices' and Exclusion in the Market for Social and Environmental Standards. in: Ponte, S., et al. (Eds.), *Governing through Standards : Origins, Drivers and Limitations*. Palgrave Macmillan, Houndmills, Basingstoke, Hampshire; New York, pp. 236-265.
- Ponte, S., Cheyns, E., 2013. Voluntary standards, expert knowledge and the governance of sustainability networks. *Global Networks*. 13, 459-477.
- Ponte, S., Gibbon, P., Vestergaard, J., 2011. *Governing through Standards: Origins, Drivers and Limitations*. Palgrave Macmillan, Houndmills, Basingstoke, Hampshire; New York.
- Potts, J., Wilkings, A., Lynch, M., McFatridge, S., 2016. *State of Sustainability Initiatives Review: Standards and the Blue Economy*. International Institute for Sustainable Development (IISD).
- Pratruangkrai, P., 2015. Shrimp Producers Expect Brighter Year in 2016 After Disease Eliminated, *The Nation*.
- Premier, R., Ledger, S., 2006. *Good Agricultural Practices in Australia and Southeast Asia*. HortTechnology. 16.
- Prompoj, W., 2013a. Improving credibility of auditing shrimp aquaculture certifications in Thailand for US exporting, Senior Executive Development Program Individual Study. Office of the Civil Service Commission (OCSC), pp. 112.
- Prompoj, W., 2013b. *Thailand Experience on Aquaculture Certification*, Workshop on Aquaculture Certification.
- Prompoj, W., Songsangjinda, P., Nasuchon, N., 2011. Benchmarking of the Thai National Shrimp Certification Scheme against the FAO Aquaculture Certification Guidelines. *Fish for the People*. 9, 20-38.
- Punch, K. F., 2005. *Introduction to Social Research Quantitative and Qualitative Approaches*, Second edition ed. Sage Publications, London.

- Reinecke, J., Manning, S., von Hagen, O., 2012. The emergence of a standards market: Multiplicity of sustainability standards in the global coffee industry. *Organization Studies*. 33, 791–814.
- Robbins, P., 2012. *Political Ecology: A Critical Introduction*. Wiley-Blackwell, Oxford, UK.
- Robeyns, I., 2005. The Capability Approach: a theoretical survey. *Journal of Human Development*. 6, 93-117.
- Roebuck, K., Wristen, K., 2018. Global Review of the Aquaculture Stewardship Council's Salmon Standard. Technical Report. SeaChoice.
- Rogers, P., 2014. *Theory of Change, Methodological Briefs: Impact Evaluation 2*. UNICEF Office of Research, Florence.
- Roheim, C. A., Bush, S. R., Asche, F., Sanchirico, J. N., Uchida, H., 2018. Evolution and future of the sustainable seafood market. *Nature Sustainability*. 1, 392-398.
- Romero, C., Sills, E. O., Guariguata, M. R., Cerutti, P. O., Lescuyer, G., Putz, F. E., 2017. Evaluation of the impacts of Forest Stewardship Council (FSC) certification of natural forest management in the tropics: a rigorous approach to assessment of a complex conservation intervention. *International Forestry Review*. 19, 36-49.
- Saenrak, P., Ongkunaruk, P., Chaveesuk, R., Liangrokapart, J., 2010. Study of Pacific White Shrimp (*Litopenaeus vannamei*) Farm Management in Thailand and Identifying the Key Factors on Yield, 48th Kasetsart University Annual Conference: Agro-Industry, Bangkok, Thailand.
- Samerwong, P., 2012. Policy Framing Processes on Environmental Issue in Thailand: Case study of the prohibition of inland low-salinity Shrimp farming in freshwater areas, Environmental Policy Group. Wageningen University, Wageningen, The Netherlands, pp. 124.
- Samerwong, P., Bush, S. R., Oosterveer, P., 2017. Metagoverning aquaculture standards: a comparison of the GSSI, the ASEAN GAP, and the ISEAL. *The Journal of Environment & Development*. 26, 429-451.
- Samerwong, P., Bush, S. R., Oosterveer, P., 2018. Implications of multiple national certification standards for Thai shrimp aquaculture. *Aquaculture*. 493, 319-327.
- Samerwong, P., Toonen, H. M., Oosterveer, P., Bush, S. R., 2020. A capability approach to assess aquaculture sustainability standard compliance. *PLOS ONE*. 15, e0227812.
- Savilaakso, S., Cerutti, P. O., Montoya Zumaeta, J. G., Ruslandi, Mendoula, E. E., Tsanga, R., 2017. Timber certification as a catalyst for change in forest governance in Cameroon, Indonesia, and Peru. *International Journal of Biodiversity Science, Ecosystem Services & Management*. 13, 116-133.
- Sayer, J. A., Margules, C., Boedhihartono, A. K., Sunderland, T., Langston, J. D., Reed, J., Riggs, R., Buck, L. E., Campbell, B. M., Kusters, K., 2017. Measuring the effectiveness of landscape approaches to conservation and development. *Sustainability Science*. 12, 465-476.

- Schleifer, P., 2013. Orchestrating sustainability: The case of European Union biofuel governance. *Regulation & Governance*. 7, 533-546.
- Schleifer, P., Sun, Y., 2018. Emerging markets and private governance: the political economy of sustainable palm oil in China and India. *Review of International Political Economy*. 25, 190-214.
- Schouten, A. M., 2013. Tabling sustainable commodities through private governance. Utrecht University.
- Schouten, G., Bitzer, V., 2015. The emergence of Southern standards in agricultural value chains: A new trend in sustainability governance? *Ecological Economics*. 120, 175-184.
- Schouten, G., Vellema, S., Wijk, J. v., 2016. Diffusion of global sustainability standards: The institutional fit of the ASC-Shrimp standard in Indonesia. *Revista de Administração de Empresas*. 56, 411-423.
- SEAFDEC, 2012. Report of the fifteenth meeting of Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP). Southeast Asian Fisheries Development Center (SEAFDEC), Bangkok, Thailand.
- SEAFDEC, 2013. Progress of ASEAN Shrimp Alliance activities. Southeast Asian Fisheries Development Center (SEAFDEC), Penang, Malaysia.
- SEAFDEC, 2014. Progress of ASEAN Shrimp Alliance. Southeast Asian Fisheries Development Center (SEAFDEC), Bangkok, Thailand.
- SEAFDEC, 2016. Executive summary of the eighteenth meeting of Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP). Southeast Asian Fisheries Development Center (SEAFDEC), Bangkok, Thailand.
- Seafood Certification and Ratings Collaboration, 2019. Sustainable Seafood: A Global Benchmark. Seafood Certification and Ratings Collaboration (C&R).
- Seafood Task Force, 2016. How The Task Force is Leading Thailand's Seafood Supply Chain Towards a More Sustainable Pathway. Progress Report following Membership review and planning meeting in Bangkok. Seafood Task Force.
- Seafood Task Force, 2017. Seafood Task Force Multi Stakeholder Report Nov 2017. Seafood Task Force.
- Seafood Task Force, 2018. Progress report. Seafood Task Force.
- SEASAIP, 2016. The Southeast Asian Shrimp Aquaculture Improvement Protocol Draft #5. Southeast Asian Shrimp Aquaculture Improvement Protocol (SEASAIP).
- Sen, A., 1987. *Commodities and Capabilities* Oxford University Press, New Delhi.
- Sen, A., 1993. Capability and Well-Being in: Nussbaum, M., Sen, A. (Eds.), *The Quality of Life*. Clarendon Press, Oxford.
- Sen, A., 1997. Editorial: Human capital and human capability. *Journal World Development*. 25, 1959-1961.
- Sen, A., 1999. *Development as Freedom*. Oxford University Press, Oxford.
- Sen, A., 2002. *Rationality and Freedom*. Harvard University Press, Cambridge, MA.

- Serrano, P. H., 2005. Responsible use of antibiotics in aquaculture. Food and Agriculture Organization of the United Nations, Rome, Italy.
- SGS Thailand, 2018. News: Technical Seminar "Standards in the aquaculture industry - New requirements and challenges" in Bangkok SGS (Thailand) Limited, Bangkok, Thailand.
- Smith, T. M., Fischlein, M., 2010. Rival private governance networks: Competing to define the rules of sustainability performance. *Global Environmental Change*. 20, 511-522.
- Sørensen, E., 2006. Metagovernance: The Changing Role of Politicians in Processes of Democratic Governance. *The American Review of Public Administration*. 36, 98-114.
- Sørensen, E., Torfing, J., 2005. The Democratic Anchorage of Governance Networks. *Scandinavian Political Studies*. 28, 195-218.
- Sørensen, E., Torfing, J., 2009. Making governance networks effective and democratic through metagovernance. *Public Administration*. 87, 234-258.
- Spaargaren, G., Mol, A. P. J., 1992. Sociology, environment, and modernity: Ecological modernization as a theory of social change. *Society & Natural Resources*. 5, 323-344.
- Spaargaren, G., Mol, A., Sonnenfeld, D., 2009. Ecological modernisation: assessment, critical debates and future directions. *The Ecological Modernisation Reader. Environmental reform in theory and practice*, 501-520.
- Srisaeng, O., Chaveesuk, R., Suwandechochai, R., Ongkunaruk, P., 2010. Analysis of Production Costs and Logistics Costs of White Shrimp Farming in Thailand, 48th Kasetsart University Annual Conference, Agro-Industry, Bangkok, Thailand.
- Start, D., Johnson, C., 2004. Livelihoods Options? The Political Economy of Access, Opportunity and Diversification. Overseas Development Institute, London.
- Stein, D., Valters, C., 2012. Understanding theory of change in international development: A review of existing knowledge (JSRP Paper 1). London, England: JSRP and The Asia Foundation.
- Steurer, R., 2013. Disentangling governance: a synoptic view of regulation by government, business and civil society. *Policy Sciences*. 46, 387-410.
- Stewart, F., Deneulin, S., 2002. Amartya Sen's contribution to development thinking. *Studies in Comparative International Development*. 37, 61-70.
- Stride, J., Murphy, D., 2016. Assessing Government and Business Responses to the Thai Seafood Crisis. Humanity United.
- Subasinghe, R., 2017. Regional review on status and trends in aquaculture development in Asia-Pacific - 2015. FAO, Rome, Italy.
- Suchman, M. C., 1995. Managing Legitimacy: Strategic and Institutional Approaches. *Academy of Management Review*. 20, 571-610.
- Suntornratana, U., 2014. ASEAN standard promotion to facilitate regional and international trade of aquaculture products, The 5th Asia-Pacific Fishery Commission (APFIC) Regional Consultative Forum Meeting "Responsible

- management of fisheries and aquaculture in the Asia-Pacific”, Hyderabad, India 19–21 June 2014.
- Supaphol, S., 2010. Status of Food Safety and Food Security in Thailand: “Thai's Kitchen to the World”. *Journal of Developments in Sustainable Agriculture*. 5, 39-46.
- Swinnen, J., Maertens, M., Colen, L., 2015. The Role of Food Standards in Trade and Development. in: Hammoudi, A., et al. (Eds.), *Food Safety, Market Organization, Trade and Development*. Springer, Cham, pp. 133-149.
- Szuster, B., 2006. *Coastal Shrimp Farming in Thailand: Searching for Sustainability*, IWMI Books, Reports. International Water Management Institute.
- Szuster, B., 2007. A Review of Shrimp Farming in Central Thailand and its Environmental Implications. in: Leung, P., Engle, C. (Eds.), *Shrimp Culture: Economics, Market, and Trade*. Blackwell Publishing, pp. 155-166.
- TASC, 2008. *Standards for Certification, Assessment and Accreditation in the Senior Secondary Sector*. Office of Tasmanian Assessment, Standards and Certification (TASC).
- Tashakkori, A., Teddlie, C., 1998. *Mixed methodology: Combining qualitative and quantitative approaches*. Sage Publications, Inc, Thousand Oaks, CA, US.
- Tashakkori, A., Creswell, J. W., 2007. Editorial: The New Era of Mixed Methods. *Journal of Mixed Methods Research*. 1, 3-7.
- Tavornmas, A., 2013. EU Food safety policy: challenges for exporting Thai food and products to European Union market Delegation of Thailand to the European Union, pp. 32.
- Temmerman, C., De Rynck, F., Voets, J., 2015. Opening the black box of metagovernance: The roles of central government in local multilevel networks - The case of the local job centers in Flanders. *International Review of Public Administration*. 20, 227-242.
- Termeer, C. J. A. M., Dewulf, A., 2014. Scale-Sensitivity as a Governance Capability: Observing, Acting and Enabling. in: Padt, F., et al. (Eds.), *Scale-sensitive Governance of the Environment*, pp. 38-55.
- Termeer, C. J. A. M., Dewulf, A., Breeman, G., Stiller, S. J., 2013. Governance Capabilities for Dealing Wisely With Wicked Problems. *Administration & Society*. 47, 680-710.
- Termeer, C. J. A. M., Toonen, H. M., Kok, M., Turnhout, E., 2019. The Dynamics of New Governance Arrangements for Sustainable Value Chains. in: Koppenjan, J., et al. (Eds.), *Smart Hybridity. Potentials and Challenges of New Governance Arrangements*. Eleven International Publishing, The Hague, pp. 85-98.
- TFFA, 2017. *ASC workshop for shrimp farming*. Thai Frozen Foods Association.
- Thai Union, 2017. *Thai Union Aquaculture Responsible Union Aquaculture Responsible Sourcing Guideline*.
- Thomas, D. R., 2006. A General Inductive Approach for Analyzing Qualitative Evaluation Data. *American Journal of Evaluation*. 27, 237-246.

- Thomas Travaille, K. L., Lindley, J., Kendrick, G. A., Crowder, L. B., Clifton, J., 2019. The market for sustainable seafood drives transformative change in fishery social-ecological systems. *Global Environmental Change*. 57, 101919.
- Thlusty, M. F., 2012. Environmental improvement of seafood through certification and ecolabelling: Theory and analysis. *Fish and Fisheries*. 13, 1-13.
- Thlusty, M. F., Tausig, H., 2015. Reviewing GAA-BAP shrimp farm data to determine whether certification lessens environmental impacts. *Reviews in Aquaculture*. 7, 107-116.
- Thlusty, M. F., Thorsen, Ø., 2017. Claiming seafood is 'sustainable' risks limiting improvements. *Fish and Fisheries*. 18, 340-346.
- Thlusty, M. F., Thompson, M., Tausig, H., 2016. Statistical tools to assess the breadth and depth of shrimp aquaculture certification schemes. *Fisheries Research*. 182, 172-176.
- Tookwinas, S., Songsangjinda, P., 2003. Results of the code of conduct for marine shrimp farming demonstration in Songkhla, Southern Thailand. *World Aquaculture*. 34, 9-11.
- Toonen, H. M., Bush, S. R., Wiegiersma, K., Reus, M., Duimel, E., Kruk, S., Tatenhove, J. v., 2018. Handbook Aquaculture Governance Indicators V2.4. Wageningen University and Research for Monterey Bay Aquarium Seafood Watch, pp. 113.
- Torring, J., 2012. *Interactive governance: Advancing the paradigm*. Oxford University Press, Oxford, England; New York, NY.
- Towers, L., 2016. Indian, Thai Shrimp Farms Encouraged to Get BAP Certification. *The FishSite*.
- Trifković, N., 2014. Certified standards and vertical coordination in aquaculture: The case of pangasius from Vietnam. *Aquaculture*. 433, 235-246.
- van Tatenhove, J., Arts, B., Leroy, P., 2000. Political Modernisation. in: van Tatenhove, J., et al. (Eds.), *Political Modernisation and the Environment: The Renewal of Environmental Policy Arrangements*. Springer Netherlands, Dordrecht, pp. 35-51.
- Vandergeest, P., 2007. Certification and Communities: Alternatives for Regulating the Environmental and Social Impacts of Shrimp Farming. *World Development*. 35, 1152-1171.
- Vandergeest, P., 2016. Transnational sustainability certification as a new extraterritoriality? in: Antons, C. (Ed.), *Routledge Handbook of Asian Law*. Routledge, London.
- Vandergeest, P., Unno, A., 2012. A new extraterritoriality? Aquaculture certification, sovereignty, and empire. *Political Geography*. 31, 358-367.
- Vandergeest, P., Roth, R., 2016. A Southeast Asian political ecology. in: Hirsch, P. (Ed.), *Routledge Handbook of the Environment in Southeast Asia*. Routledge, London, pp. 100-116.
- Vandergeest, P., Flaherty, M., Miller, P., 1999. A political ecology of shrimp aquaculture in Thailand. *Rural Sociology*. 64, 573-596.

- Vandergeest, P., Ponte, S., Bush, S. R., 2015. Assembling sustainable territories: space, subjects, objects, and expertise in seafood certification. *Environment and Planning A: Economy and Space*. 47, 1907-1925.
- Vermeulen, A., 2007. *Mechanisms of Demoncracy: Institutional Design Writ Large*. Oxford University Press, New York.
- Vince, J., 2018. Third Party Certification: implementation challenges in private-social partnerships. *Policy Design and Practice*. 1, 323-336.
- Vogt, M., 2019. Sustainability certification schemes in agricultural and natural resource sectors: outcomes for society and environment f full text. Routledge, London.
- Vormedal, I., Gulbrandsen, L. H., 2020. Business interests in salmon aquaculture certification: Competition or collective action? *Regulation & Governance*. 14, 328-343.
- Waite, R., Beveridge, M., Brummet, R., Castine, S., Chaityawannakarn, N., Kaushik, S., Munkung, R., Nawapakpilai, S., Phillips, M., 2014. *Improving Productivity and Environmental Performance of Aquaculture*. World Resources Institute, Washington DC, USA.
- Walby, S., 2012. Sen and the Measurement of Justice and Capabilities:A Problem in Theory and Practice. *Theory, Culture & Society*. 29, 99-118.
- Wanasuk, K., Siriburananoon, S., 2017. Thai Shrimp Industry Outlook. in: Thailand, B.o. (Ed.).
- Ward, T. J., 2008a. Barriers to biodiversity conservation in marine fishery certification. *Fish and Fisheries*. 9, 169-177.
- Ward, T. J., 2008b. Measuring the Success of Seafood Ecolabelling. in: Ward, T., Phillips, B. (Eds.), *SEAFOOD Ecolabelling*. Wiley-Blackwell, Oxford, UK, pp. 207-246.
- Ward, T. J., Phillips, B., 2008. *Seafood Ecolabelling: Principles and Practice*. Wiley-Blackwell, Oxford, UK.
- Washington, S., Ababouch, L., 2011. Private standards and certification in fisheries and aquaculture. *FAO*, Rome, pp. 181.
- Weimin, M., Mohan, C. V., Ellis, W., Davy, B., 2013. Adoption of aquaculture assessment tools for improving the planning and management of aquaculture in Asia and the Pacific. *Regional Office for Asia and the Pacific, Food and Agriculture Organization of the United Nations*, Bangkok, Thailand.
- Whitney, C. K., Bennett, N. J., Ban, N. C., Allison, E. H., Armitage, D., Blythe, J. L., Burt, J. M., Cheung, W., Finkbeiner, E. M., Kaplan-Hallam, M., Perry, I., Turner, N. J., Yumagulova, L., 2017. Adaptive capacity: from assessment to action in coastal social-ecological systems. *Ecology and Society*. 22.
- Wijaya, A., Glasbergen, P., 2016. Toward a New Scenario in Agricultural Sustainability Certification? The Response of the Indonesian National Government to Private Certification. *The Journal of Environment & Development*. 25, 219-246.

References

- Wijen, F., Chiroleu-Assouline, M., 2019. Controversy Over Voluntary Environmental Standards: A Socioeconomic Analysis of the Marine Stewardship Council. *Organization & Environment*. 32, 98-124.
- Wilkins, A., 2012. Fisheries and aquaculture certification: Implications for South East Asia. *Fisheries Transitions in Southeast Asia, 2011-2014*. SSHRC PI Melissa Marschke. Working Paper.
- WWF, 2017. Annual Report FY 2017 Making Markets Work for People and Nature, Phase II. WWF.
- WWF Thailand, 2018. WWF-Thailand Annual Report 2017. WWF Thailand, Bangkok, Thailand.
- Yamamoto, K., 2009. Certification and traceability: Emerging requirements for international and domestic markets. NACA, Bangkok, Thailand.
- Yin, R. K., 2009. Case study research: Design and methods, 4th Ed. ed. Sage, Thousand Oaks, CA.
- Yin, R. K., 2013. Case study research: Design and methods. Sage, Thousand Oaks, CA.
- Yin, R. K., 2014. Case Study Research Design and Methods (5th ed.), 5th ed. Sage, Thousand Oaks, CA.
- Yin, R. K., 2017. Case Study Research and Applications: Design and Methods, Sixth Edition ed. SAGE, Thousand Oaks, CA.
- Zwetsloot, G. I. J. M., 2003. From Management Systems to Corporate Social Responsibility. *Journal of Business Ethics*. 44, 201-208.

Appendix

List of interviews for chapter five.

Name of organisation	Type of organisation	Date and place of interview
Department of Fisheries	Government	July 17, 2018 Bangkok, Thailand
Thai Union Feed Mill Co.,Ltd.	Processor	July 17, 2018 Bangkok, Thailand
National farmers Council	Civil society (Farmer association)	July 22, 2018 Prachuap Khiri Khan, Thailand
Smile Heart foods Co., Ltd.	Processor	July 31, 2018 Bangkok, Thailand
WWF Thailand	Civil society (NGO)	July 31, 2018 Bangkok, Thailand
Office of Natural Resources Policy and Planning (ONEP)	Government	August 2, 2018 Bangkok, Thailand
Aquaculture Stewardship Council (ASC)	Certification organisation	February 13, 2019 Utrecht, The Netherlands

Summary

The growth of shrimp aquaculture globally and in Thailand has expanded throughout the years and is expected to continue. The sector continues to contribute economic and social benefits to local communities and contributes to global food production. However, it has also led to a range of environmental sustainability concerns. These concerns have in turn led to a range of global governance responses, including third party certification.

Certification provides technical standards as a guidance for best practices and coordinates the assessment of the performance of producers against these standards by expert assessment. The goal of certification is ‘pull’ producers to improve towards the certified level, by offering economic incentives such as price premiums and preferential access to international markets. In Thailand there are several public and private certifications providing such guidance over shrimp aquaculture involving producers, the industry and the Thai government.

A number of questions have been raised over the effectiveness of certification as an improvement tool. For instance, limitations in the accessibility of certification for a broad cross-section of producers, proliferation of standards creating confusion for producers and consumers alike, and the limited evidence of material improvement resulting from standard compliance. This thesis argues that these questions logically emerge from an rendering certification as a technical tool of improvement that translates expert knowledge to guide, impose the rules or set the conditions for producers. Such rendering technical has, I argue, limits how the role certification in contributing to sustainability is understood.

This PhD thesis moves beyond this technical understanding of certification to rendering it as a fundamentally social. In doing so this thesis reimagines the role and contributions of certification as an agent of change that reflexively changes and shapes the political, economic and social relations between key actors and social structure in enabling improvement.

Three research questions guide the analysis:

1. In what ways does certification support Thai aquaculture farmers to access and comply with sustainability standards?

2. What is the effect of state and non-state strategies to deal with the proliferation of sustainability aquaculture standards and foster sustainability improvement in the sector?
3. In what ways does aquaculture certification contribute to more sustainability seafood governance beyond its role as a farm improvement tool?

These questions are answered through four empirical studies that explore the role of certification in affecting the social relations and shaping the social structural conditions in enabling the ability of producers, the sector and the state to transition toward more sustainable practices.

Chapter two examines three Thai national certifications on shrimp aquaculture (CoC, GAP, GAP-7401) based on the 'Devil's Triangle' model of private certification at two levels of analysis, the national and farmer level. The chapter focuses on the role of certification as an farm improvement tool, and examines the rationale of developing three national standards, assessing the extent to which the balancing effort between accessibility, credibility and continue improvement have been achieved. The chapter compares different trade-offs and implications that different groups of farmers experience on standard compliance. It concludes that national standard cannot only focus on the element of accessibility, but should also promote credibility and contribute to inclusive step-wise improvement pathway for more farmers and the sector to improve.

Chapter three compares three arrangements that aim to reduce confusion over the proliferation of sustainable aquaculture standards through harmonization. Using the concept of metagovernance, this chapter analyses the differences in goals, level of inclusiveness, and the internal set-up of these metagovernance arrangements. The results indicate that these arrangements differ with respect to their goals and approaches but do not seem to directly reduce confusion. Instead the proliferation of metagovernance represent a new arena for competition among certifications, and other market, state and civil society actors to control the means of regulation toward sustainable productions. The chapter also argues that certification does not exist in isolation. It instead interacts with other standard holder organisations and other actors within these metagovernance arrangements. This further reflects that certification is affected by the social dynamics and conditions they are embedded.

Chapter four focuses on the relations of certification and farmers, but moves beyond the common notion of certification as prescribing requirements to which farmers need to comply so to improve their production practices. Drawing on Sen's

capability approach, this chapter assesses four sustainability aquaculture standards. The contents of three major certification standards are analysed in terms of different capitals (human, social, natural, physical and financial) that farmers can employ to enhance their ability to comply. This analysis demonstrates that there is potential for standards to prescribe a wider bundle of capitals in their standards and provide broader support programme and in doing so foster more flexible pathways of compliance. This chapter contributes to the prospect of redesigning standards to support broader diversity of farmers and their diverse capabilities. It also demonstrates the role of certification in enabling the social conditions of improvement, and relatedly the wider role of certification beyond a farm assessment tool.

Chapter five explores the role of certification standard holders in shaping change. The Aquaculture Stewardship Council (ASC) is put at the centre of analysis by asking why the ASC continues its presence in Thailand despite the low uptake of its standards by producers. The interactions of ASC with other actors is examined within the wider landscape of aquaculture governance based on three dimensions: legislation, collaborative arrangements and support to governance capabilities. The chapter identifies three additional roles and functions of certification. These are as a knowledge expert, partnership facilitator and as a benchmark that supports sector level improvement. This chapter demonstrates that private certification can contribute, support and enable multiple pathways of improvement and problem solving in the aquaculture industry beyond the farm level.

The insights gained in the four empirical chapters provide the basis for shifting from a technical understanding of certification to a social understanding. That is, from rendering certification technical to *rendering it social*. Such rendering social, it is concluded, is seen in certifications Three R's of Relationality, Reflexivity and Restructuring. Certification engages in various *relations* with a range of actors beyond farmers, certification can also affect the relations of other actors as well. Second, certification itself can *reflexively* change the way it operates based on ecological rationale and as response to the changing relation, while also can affect the relations and reflexivity of others to also change their operation. Third, the changing dynamics that occur around certification and as the results of certification also *restructure* market and governance conditions which determine the means by which producers can improve toward sustainability.

Rendering certification social opens up new ways of understanding how ostensibly technical standards affect changes in sustainability practices. This thesis offer a new perspective for understanding how sustainability improvements can occur on *and*

Summary

beyond the farm level as a result of certification by shaping the ability of the aquaculture sector to reflect and re-order practices and relations to foster sustainability improvement.

Completed Training and Supervision Plan

Phatra Samerwong

Wageningen School of Social Sciences (WASS)

Completed Training and Supervision Plan



Name of the learning activity	Department/Institute	Year	ECTS*
A) Project related competences			
Environmental and Development, ENP 33306	Wageningen University	2013	6
Writing Research Proposal	WASS	2013	6
Quantitative Research Techniques (in the Social Science), YSS 21803	Wageningen University	2014	3
Political Ecologies of Conflict, Capitalism and Contestation (PE-3C)	WASS	2016	3
B) General research related competences			
WASS Introduction Course	WASS	2013	1
Systematic approaches to reviewing literature	WASS	2013	3.7
<i>'A tale of two shrimp: Prohibiting low salinity shrimp production in Thailand, 1998-2010'</i>	Aquaculture Conference, Gran Canaria, Spain	2013	1
Techniques for Writing and Presenting a Scientific Paper	Wageningen Graduate Schools	2016	1.2
Qualitative Data Analysis with Atlas.ti: a hands-on practical	WASS	2016	1
Posters and Pitching	In'to Languages, Wageningen	2017	1
<i>'A capability approach to assessing aquaculture certification compliance'</i>	Aquaculture Conference, Louisiana, USA	2019	1
C) Career related competences/personal development			
Data Management Planning	Wageningen UR Library	2015	0.4
Scientific Publishing	Wageningen Graduate Schools	2015	0.3
Reviewing a Scientific Paper	Wageningen Graduate Schools	2016	0.1
Efficient Writing Strategies	In'to Languages, Wageningen	2016	1.3
Total			30

*One credit according to ECTS is on average equivalent to 28 hours of study load

About the author

Phatra Samerwong was born in 1987 in Bangkok, Thailand. She obtained her bachelor's degree in Political Science, majoring in International Affairs with First Class Honours from Thammasat University, Thailand in 2008. After graduation she worked at the United States Agency for International Development in Bangkok responsible for administrative support.

In 2010, she was awarded a scholarship by the Royal Thai Government Scholarship program for the Humanities and the Social Sciences from the Office of the Higher Education Commission. This scholarship has supported and provided her the opportunity to pursue a postgraduate study in the field of Environmental Sociology. She was admitted to the master programme of International Development Studies at Wageningen University. She worked on her MSc thesis with the Environmental Policy Group in analysing the policy framing processes on environmental issues in the case of shrimp farming in Thailand. She received her MSc degree in International Development Studies with the specialization on Sociology of Development in 2012. In 2013 she began her PhD with the Environmental Policy Group at Wageningen University with her research interests focusing on shrimp aquaculture certification. During this time, she also has published several scientific publications which are constituted in her PhD thesis. After graduation she will return to Thailand and continue her contribution to the academic field as a lecturer at a university in Thailand.

The research described in this thesis was financially supported by the Office of the Higher Education Commission, the Royal Thai Government.

Financial support from Wageningen University for printing this thesis is gratefully acknowledged

Cover design by Phatra Samerwong, Panithi Samerwong and Nisakorn Sartmool.

Printed by Proefschriftmaken.nl on recycled paper.

