

**Is Certification the Answer?
A consideration of local power and perspectives
in a seaweed value chain**



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Submitted in partial fulfilment of the requirements for the degree of
Master of Science in Biodiversity, Conservation and Management,
University of Oxford



ABSTRACT

The global seaweed industry has grown rapidly over the last two decades, and its connection with both livelihoods and environmental impacts have made it a candidate for a global sustainability certification scheme. To increase the efficacy of such schemes, we must understand their local contexts *before* they are implemented. This study investigates the localised power dynamics and perspectives within a carrageenan seaweed value chain in the Philippines, to identify implications for the development, implementation and uptake of a global seaweed NSMD certification scheme at this local level. Through 29 interviews with local value chain actors, large imbalances in local power were identified. Farmers appear to be the most vulnerable actors in this chain, and yet might be burdened with the costs and responsibility of compliance to a future certification scheme. This raises important considerations, and it may be that certification is not a suitable governance mechanism given current power dynamics.

Acknowledgements

I am indebted to many people for their support in producing this piece of work.

Firstly, I am extremely thankful to my supervisors for their time and patience in supporting me to develop this project, and for their comments and guidance throughout.

I am also particularly grateful to my research assistant for his excellent and patient translations, invaluable advice and experience, and general support above and beyond the scope of his role. It would not have been possible to conduct this research without the strong support and guidance of ZSL staff both in the UK and the Philippines, and my greatest thanks go to everyone there also. I also thank the individuals and families in the *barangays* of Danajon Bank, who were kind enough to welcome me into their homes and communities during the course of this research.

An enormous thank you also goes to Wolfson College, the BCM course leaders, and particularly the Tropical Agriculture Association, for providing funding for my research in the Philippines. Without this backing, this project simply would not have been possible.

Finally, I thank all my friends and family who supported me during this project, by providing encouragement, chocolate, and large quantities of tea.

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List of Abbreviations

ACP – Actor-centred power

AI – Auxiliary Invoice

ASC – Aquaculture Stewardship Council

BFAR – Bureau of Fisheries and Aquatic Resources

CRM – Coastal Resources Manager

FoS – Friend of the Sea

FSC – Forest Stewardship Council

GVC – Global value chain

LGU – Local Government Unit

MSC – Marine Stewardship Council

MSP – Multi-stakeholder process

NGO – Non-Governmental Organisation

NSMD – Non-State Market-Driven

RSPO – Roundtable on Sustainable Palm Oil

SEAFDEC/AQD – Southeast Asian Fisheries Development Center, Aquaculture Department

SIAP – Seaweed Industry Association of the Philippines

ZSL(-Philippines) – Zoological Society of London (Philippines team)

1. INTRODUCTION

The world is undergoing a ‘blue revolution’ (Ponte *et al.* 2014). Aquaculture now provides half of all fish for human consumption, and its essential role in providing global nutrition and food security will continue to increase as the world’s population grows (FAO 2016).

However, a failure of relevant management policy thus far to incorporate the diverse local contexts in which aquaculture production occurs means this revolution is at risk (Krause *et al.* 2015). In particular, there are many environmental and social risks – such as ecosystem degradation and labour rights abuses – which require attention (Bush *et al.* 2013). It is therefore essential to analyse the local contexts within which aquaculture systems are embedded when considering new environmental and social sustainability governance measures.

As part of this ‘blue revolution’, the global seaweed industry has grown rapidly over the last two decades (Figure 1), and now dominates plant-based aquaculture (FAO 2016). A large sub-section of this industry is in the production of hydrocolloids, which are derived from red seaweed species and used widely in processed foods, cosmetics, pharmaceuticals and

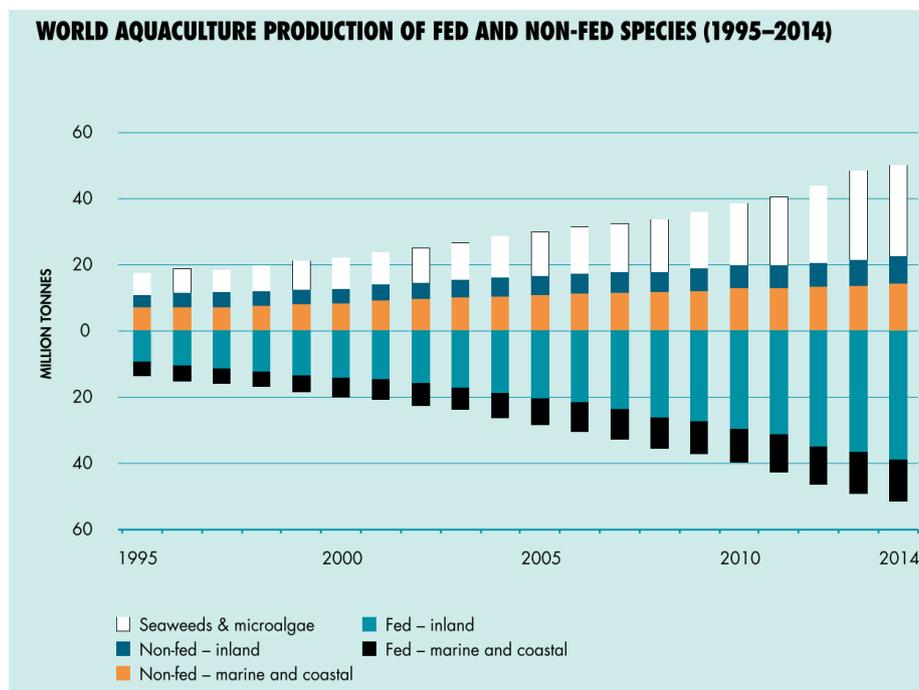


Figure 1: ‘World Aquaculture of Fed and Non-fed Species (1995-2014)’, taken from FAO (2016). Production of seaweeds microalgae (white) in aquaculture has been expanding for the past two decades, reaching about 28.5 million tonnes in 2014.

biofuels, among other applications (McHugh 2003). Carrageenan is the most in-demand of these, making up 62% of global hydrocolloid sales volumes in 2015 (Porse & Rudolph 2017). The global commercial farming of carrageenan seaweeds was first established in the Philippines, in the 1960s, and this is now the second-largest producer, having been overtaken by Indonesia around 2008 (Figure 2) (Hurtado *et al.* 2015).

Seaweed production is often dominated by small-scale farmers and can be a vital source of income for poor rural families in the Philippines and elsewhere (Sievanen *et al.* 2005; Valderrama *et al.* 2013). This, combined with growing evidence of the potential impacts of seaweed cultivation on fish assemblages and marine habitats (Eklöf *et al.* 2006; Hehre and Meeuwig 2015), suggests a need for governance to ensure the industry’s environmental, social and economic sustainability. One potential such mechanism is a non-state market-driven (NSMD) certification scheme, and indeed the Marine Stewardship Council (MSC) and Aquaculture Stewardship Council (ASC) are together developing a seaweed certification scheme for piloting later this year (MSC and ASC 2017). Friend of the Sea (FoS) already has a seaweed certification standard (FoS 2014), although no attention appears to have been paid to it in the literature. Given these trends, now is a crucial point at which to consider whether a global NSMD certification scheme is appropriate for governing seaweed production practices.

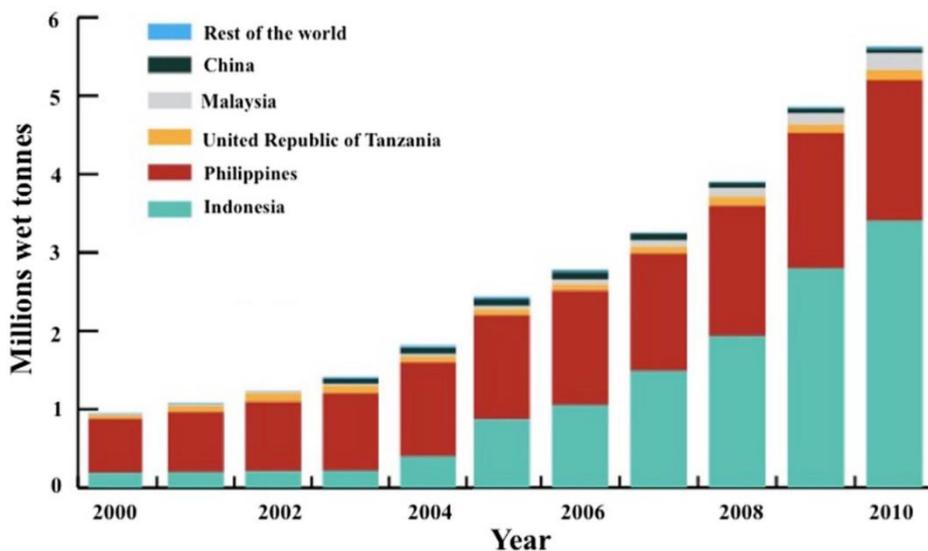


Figure 2: Top global carrageenan producers 2000-10. Taken from Hurtado *et al.* (2015).

1.1 Aims of research

As a contribution to this understanding, this study investigates the localised power dynamics of a carrageenan seaweed value chain based in an artisanal farming system in the province of Bohol in the Philippines. It focuses on the power and values held by different local value chain actors, to identify implications for the development, implementation and uptake of a global seaweed NSMD certification scheme, and whether it would be likely to meet these actors' perceptions of environmental, social and economic sustainability. This is important because the issues such schemes seek to address are usually experienced locally (Marin-Burgos *et al.* 2015) and yet the organisations controlling them are often not local. Although the majority of seaweed hydrocolloid production occurs in the Global South, major certification bodies – including the MSC and ASC – are usually based in the Global North (Vandergeest and Unno 2012; Porse and Rudolph 2017). A poor understanding of the local contexts into which sustainability¹ governance mechanisms are inserted reduces their chances of success (Krause *et al.* 2015).

The main research questions and sub-questions this study seeks to address are as follows:

1. How do local seaweed production and trade dynamics influence the distribution of power in the value chain?

- a. What are the flows of trade, finance and knowledge between value chain actors in local vertical and horizontal networks?
- b. What kind of relationships exist between these actors?
- c. How do the above factors influence the distribution of power within this system?

2. How are 'sustainability' issues perceived?

- a. What local environmental, social and economic issues relating to seaweed farming are perceived by different local actors?
- b. Is additional or alternative governance desired?
- c. What knowledge is there of the proposed MSC-ASC certification scheme?

¹ The term 'sustainability' has long been criticised for its lack of clear definition (Hansen, 1996). While recognising its shortcomings, I still use this term throughout the report as a convenient shorthand to encapsulate various potential environmental, social and economic issues.

3. Considering these power dynamics and their interaction with actors' perspectives, what are the implications for using a global NSMD sustainability certification scheme to govern seaweed production?

In considering these questions I draw upon literature on power, political economy, and value chain theory. These are explored through the Literature Review, along with my conceptual approach. The Methods, Results and Discussion sections cover the collection and analysis of data and relevant limitations. The conclusion reflects upon the implications revealed and suggests further research directions.

2. LITERATURE REVIEW

2.1 Power and values as local context

The importance of understanding local social, political and economic contexts in the development of global sustainability governance initiatives for commodity production is receiving increasing attention (Boström *et al.* 2015). Krause *et al.* (2015) identify a “people-policy gap” in aquaculture governance, in which the particularities of place and social context within which production is embedded have been largely ignored, to the detriment of creating effective policy interventions. They suggest that while economic, ecological, and technological dimensions have received increasing attention in aquaculture governance, social considerations such as ownership and access rights, food security and local inequalities have yet to hold influence. By disregarding the complex realities of an industry for those involved in it, management strategies are less able to succeed. Krause *et al.* argue that the implications of this oversight of socio-economic factors are particularly pertinent in aquaculture, because such a high proportion of people engaged in production are small-scale farmers in developing countries. As seaweeds are the dominant plant farmed in aquaculture and thus their production a key industry within this sector (FAO 2016), these criticisms are important to acknowledge here. The authors suggest that “socially-sound” governance in this context requires understanding of both the “conditions that aquaculture operates under” and the “mechanisms and channels by which aquaculture affects the social fabric”. In analysing the local trade and power dynamics between small-scale farmers and other value chain actors, this dissertation outlines these two factors and thus contributes towards filling the ‘people-policy gap’.

Several studies already help to fill this knowledge gap for other aquaculture and fisheries industries. Belton *et al.* (2011a) describe how social relationships between local private and political actors involved in *Pangasius* catfish production in rural Vietnam serve to reinforce existing class structures. The historical political context is highlighted by Ponte (2008), who explains that hake fisheries in South Africa cannot be separated from the apartheid politics they originated amongst. Kusumawati *et al.* (2013) illuminate how the artisanal trade networks of shrimp aquaculture in East Kalimantan, Indonesia, are controlled predominantly by local patrons, who play a vital role in mitigating financial risk for local value chain actors and thus hold a central influence over production. A failure to recognise this power dynamic and its implications in existing government and NGO-led sustainability initiatives has limited their efficacy. Bush and Oosterveer (2007; 2012) were particularly useful in developing my research angle. They draw on examples of shrimp aquaculture in Thailand and Vietnam to describe what they believe constitutes a ‘black box’ surrounding local trade dynamics and their horizontal networks. This is a key insight because it demonstrates how the value chain is not fully accounted for, and that producers in such a system cannot have a transparent connection to global markets. Bush and Oosterveer conclude that in order for sustainability certification to be effective in aquaculture, a better understanding of these local trade dynamics is essential, and extensive further research of this kind is needed. I drew on this concept of a ‘black box’ to consider the local dynamics surrounding seaweed production and trade, and what other implications might be hidden.

The academic literature investigating local dynamics and contexts of tropical seaweed farming is growing, and several case studies can be drawn upon. Msuya (2006) considers socio-economic impacts of seaweed farming in Zanzibar, while Fröcklin *et al.* (2012) explore associated health concerns. Krishnan and Narayanakumar (2010) investigate the performance of value chains of seaweed farming in India, and Zamroni and Yamao provide useful insights from Indonesia on trade dynamics, incomes, and farmer perceptions (2011a; 2011b; 2013). The academic literature focusing specifically on the Philippines is more sparse, but Sievanen *et al.* (2005) and Hill *et al.* (2012) provide key insights into socio-economic contexts through evaluation of the efficacy of ‘alternative livelihood approaches’ in reducing fishing pressure. The grey literature is also informative, and in particular, the multiple papers brought together by Valderrama *et al.* (2013) provide a useful overview of the socio-economic aspects of seaweed farming across the globe. Hurtado's (2013) contribution outlines local trade systems

for seaweeds in the Philippines, and thus is useful background for this study. However, although several dimensions of the local contexts within which seaweed farming is embedded are explored in these papers, they lack detailed analysis of how these contexts interact with power. Boström *et al.* (2015) stress that “power; power gaps and power asymmetries must be a key focus in understanding sustainability and responsibility in and of supply chains”.

This study focuses on power as a key factor to be explored in understanding the local contexts for a seaweed sustainability certification scheme. This dimension of power has only more recently been gaining attention in sustainability governance literature, but several relevant studies have emerged (Ponte 2008; Mol 2015; Oosterveer 2015). Brouwer *et al.* (2013) assert that a failure to comprehend complex power dynamics when designing and implementing multi-stakeholder processes (MSPs) (such as standard-setting and certification) inevitably leads to an imbalanced system, in which stakeholders with less power are “abused, overruled, or excluded”. Such imbalances are at the root of many of the “socio-environmental conflicts” which market-based sustainability initiatives seek to address, and thus must be recognised in their design and implementation (Escobar 2006; Marin-Burgos *et al.* 2015).

Before we explore power further, we must consider how it is conceptualised in this context. General literature on power is extensive and diverse, and I do not assume to cover it comprehensively here. However, some useful concepts can be extracted. Much debate surrounds two key framings of power; on the one hand as a social relation of domination, or “power over” (Weber 1948; Dahl 1957; Hayward and Lukes 2008), and on the other as ability to influence outcomes, or “power to” (Parsons 1963; Barnes 1988; Morriss 2002). Although these are widely discussed as separate constructions of power, this study follows authors such as Dowding (1991), Allen (1999) and Pansardi (2012) in viewing the two as intrinsically related: “power to act” inevitably involves social relations, in which certain actors hold “power over” others. This is particularly evident in the seaweed production and trade system studied here, as a multitude of actors are linked through complex social, economic and political relationships.

Several attempts are made in the literature to construct theoretical frameworks which facilitate analysis of power dynamics. A useful one here is provided by Arts and van Tatenhove (2004) (drawing heavily on Clegg 1989), which outlines three ‘layers’ of power in relation to policy: ‘relational’, in which interactions between agents are the key determinant

of power; ‘dispositional’ power, which focuses on the position of those agents in relation to each other and to relevant rules and resources; and ‘structural’ power, in which agents’ constructions of meaning, legitimacy and domination in social relationships are arranged through “macro-societal structures” such as political and economic institutions. A more grounded evaluation of how power can influence environmental governance is found in Krott *et al.*’s (2014) theory of ‘actor-centred power’ (ACP). This draws on studies of forest land-use relations in Indonesia to define three main elements of power: coercion, (dis-)incentives, and the use of unverified information. I chose not to structure my investigation according to either Arts and van Tatenhove’s or Krott *et al.*’s categories, in order to remain maximally open to specifically local insights – the details and nuances of which might not fit within a super-imposed, pre-existing model. However, both these models have informed the conceptions of power used within this study, and have been helpful in guiding the interpretation of results.

Although power dynamics are the main focus of this study, the perceptions of local value chain actors regarding environmental and socio-economic issues are also explored. Within MSPs, the values of a variety of different actors inevitably must compete, and which values hold most influence over policy and management decisions is largely dependent upon the power dynamics between these actors (Brouwer *et al.* 2013; Prabowo *et al.* 2017). Therefore, to understand which perspectives on ‘sustainability’ might be taken into account in a certification scheme, we must have an understanding both of what the different perspectives are and what local power dynamics they exist within. The scope of this thesis does not allow for a deeper exploration of theory relating to actor values and perspectives, and so the main purpose of including them here is to allow an analysis of how their inclusion in sustainability governance decisions might be affected by power.

2.2 Value chains and power

To understand how power relates to trade networks, I studied literature related to global value chain (GVC) theory. Gereffi has been a key author in this field, and earlier concepts of ‘global commodity chains’, and the distinction between ‘buyer-driven’ and ‘producer-driven’ chains have influenced current thinking (De Backer and Miroudot 2014; Gereffi 1994). However, Gereffi *et al.* (2005) updated this framework and is now a key paper on GVC theory. It draws on concepts of transaction cost economics, production networks, and the

technological capabilities of value chain actors, to suggest a theoretical framework outlining five main types of GVC governance: ‘hierarchy’, ‘captive’, ‘relational’, ‘modular’ and ‘market’ (see Figure 3). The definition of each these is based primarily on differences in the ‘complexity of transactions’, how easily they can be ‘codified’, and the degree of capability of supplier actors. Of particular relevance here is Gereffi *et al.*’s analysis of power, which they suggest becomes more balanced as we move from ‘hierarchy’ towards ‘market’ modes of governance.

This model has been used to some extent to discuss seaweed value chains. Most notable is an item from the grey literature by Neish (2008), who uses it to interpret changes in the GVC for tropical red seaweeds. The observation is made that this industry followed a captive model in its infancy during the 1970s and 80s, when a small number of lead processor firms held an oligopsony over many small farmers, but then moved towards a modular model through the 1980s and 90s, as the role of local traders grew. Neish argues that since the mid-1990s, price has become a major determinant of governance and thus the GVC for red seaweeds has become more market-based. However, he proposes a move towards a more relational form of governance, in which stronger alliances and increased aggregation link upstream supply chain actors more closely. Although this study by Neish is not published in a peer-reviewed journal, academic papers draw on it in discussing GVCs for seaweed (e.g. Krishnan and Narayanakumar 2010). Andriesse and Lee (2017) also employ GVC concepts in looking at effects of typhoon Yolanda on seaweed farming in the Philippines, but do not draw on Gereffi *et al.*’s model.

Governance type	Complexity of transactions	Ability to codify transactions	Capabilities in the supply-base	Degree of explicit coordination and power asymmetry
Market	Low	High	High	Low ↑ ↓ High
Modular	High	High	High	
Relational	High	Low	High	
Captive	High	High	Low	
Hierarchy	High	Low	Low	

Figure 3: A summary of the conditions for Gereffi *et al.*’s five ‘modes of governance’, and related power dynamics. Adapted from Gereffi *et al.* (2005).

The Gereffi *et al.* (2005) GVC model has received criticism from several angles (e.g. Nadvi 2008; Palpacuer 2009; Ouma 2010). Coe and Hess (2007, cited in Nadvi 2008) believe that it is too rooted in ideal constructions of how global value chains operate, rather than the more complex and dynamic realities. They also suggest it places too strong a reliance on transaction cost economics, which centres the discussion around ‘inter-firm’ relationships and ignores both those within firms, and the political and institutional arenas within which all these relationships operate. This narrow focus is also noted by Bush *et al.* (2015), who discuss the importance of recognising the broader social dimensions and horizontal networks that value chains interact with. Related to these criticisms, a focus only on general ‘modes of governance’ overlooks the importance of the more immediate ‘forms of co-ordination’ that operate within them (Ponte and Gibbon 2005). I tend to agree with these criticisms, and in addition feel that key terms and concepts used in the original paper – such as ‘codifiability’ of information, and discussion of ‘standard’ products – are not well enough defined to be relied upon as widely and without explicit interpretation as they are in the literature. Nonetheless, the framework presented in the 2005 paper remains a useful starting point for thinking about value chain theory, and although it is more focused on downstream dynamics, can be used as a basis to analyse more local dynamics upstream as well.

2.3 Certification and power

In order to analyse how a seaweed certification scheme might interact with local power and trade dynamics, I looked further into the literature on power in existing certification schemes and related sustainability governance mechanisms. There is extensive and varied literature evaluating which factors influence the effectiveness and success of certification schemes (e.g. Bernstein and Cashore 2007; Blackman and Naranjo 2012; von Geibler 2013). More recently, literature has also been growing on the potential for certification in aquaculture (e.g. Bush *et al.* 2013; Marschke and Wilkings 2014). This study looks specifically at certification implications relating to local context and power dynamics. I recognise that the exact mechanisms of certification and standard-setting initiatives vary widely (Roth and Dressler, 2012), and thus I am leaning on some broad generalisations and common themes to discuss them.

Several studies highlight the importance of considering power in certification and standard-setting. Renard (2005) analyses how shifts in governance practices within fair-labelling

initiatives have changed power relations “to the detriment of small producers”, who are no longer as central to such schemes, despite the improvement of small producer livelihoods being the original motivation for their creation. She views standardisation and certification as a way in which new power dynamics enter local systems, and thus those who *control* these governance mechanisms are afforded power by them. Such power is exercised, for example, through a capacity to legitimise and assign value to products, and, by extension, to the actors associated with them (*idem*). This highlights the importance of understanding the existing power dynamics in a local context *before* a certification scheme is imposed, in order to understand how the entrance of an additional, novel source of power might affect them. For example, if a new scheme serves to reinforce existing dynamics by affording additional power to those already ‘at the top’, then the desirability of such an outcome will need to be carefully considered.

Another way in which certification schemes shape power dynamics is through the promotion and valorisation of particular kinds of knowledge. The Roundtable on Sustainable Palm Oil (RSPO), for example, has tended to prioritise broad, ‘global’ knowledge over more specific and personal accounts (Cheyns 2011). It thus affords greater legitimacy, and so power to shape discussion, to the former, while restricting the ability of those with ‘local’ knowledge to participate and influence proceedings. This – often implicit – promotion of one form of knowledge over another is one of many “subtle games” which operate within certification management and standard-setting procedures to affect the power of relevant stakeholders to influence them to their own advantage (Ponte and Cheyns 2013). Others include the specific mechanisms of participation and negotiation which are employed, such as the locations at which meetings are held, or the kind of language used in discussions (*idem*; Marin-Burgos *et al.* 2015).

Again focusing on the RSPO as a case study, Marin-Burgos *et al.* (2015) discuss how concerns expressed by rural people resisting oil palm expansion in Colombia are often ignored because they are not expressed through the same technical and ‘scientific’ language used by those within the industry and relevant ‘experts’ in government and NGOs. The shared terminology and interpretations of the latter groups allows them to communicate more easily with other, thus empowering them whilst removing power from those actors who are arguably most affected by the issues under discussion. This paper explicitly raises ‘values’

and ‘power’ as two key and interconnected facets of local context affecting the operation of a certification scheme, and thus supports the focus on both through my conceptual framework.

2.4 Conceptual framework

Drawing on the ideas and knowledge gaps identified in the sections above, I develop a conceptual framework which focuses on the power both of and between different value chain actors to influence the local system and other actors in it. The ‘local system’ in this case is that of seaweed production and trade from Danajon Bank to Cebu in the Philippines, and by developing an understanding of the relevant power dynamics it is hoped useful insights can

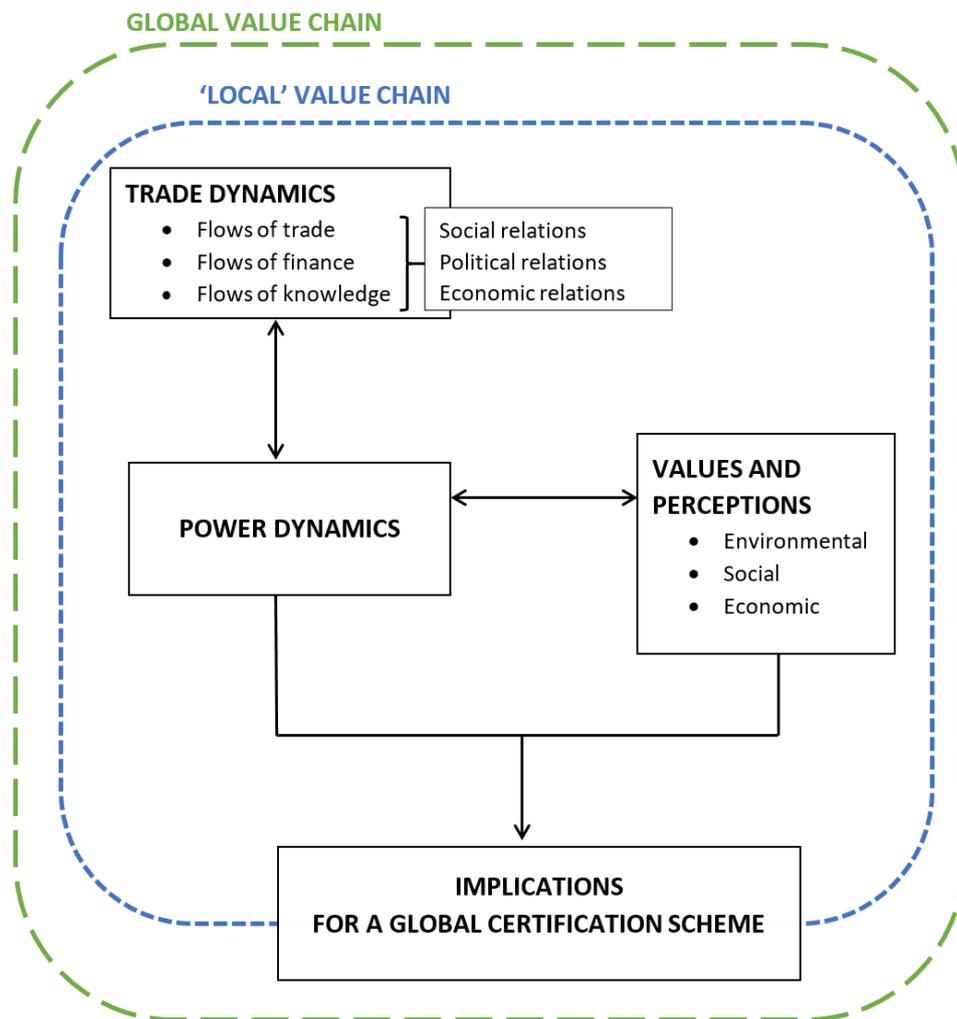


Figure 4: Conceptual framework (own construction). Local power dynamics are explored through an understanding of how trade, finance and knowledge flow within the value chain, and within what social, political and economic contexts. An understanding of both power dynamics and perceptions of sustainability provide an understanding of the local value chain which can inform discussion of certification within the wider global context.

be extracted regarding the use of certification to manage environmental, social and economic issues in this context. Both Bulkeley (2005) and Krause *et al.* (2015) discuss the importance of understanding socio-economic contexts at a variety of scales. It should be noted that although I refer to ‘local’ dynamics throughout this report for simplicity, there are really several layers of ‘local’ being explored here – those occurring within the island *barangays*, those occurring within and between municipalities (e.g. trade within Bohol), and those occurring between provinces (e.g. trade between Bohol and Cebu). The conceptual framework is summarised in Figure 4.

3. METHODS

3.1 Study site

This study focused on the value chain of seaweeds produced in communities along Danajon Bank, in Bohol province, in the Central Visayas region of the Philippines (Figure 5). Danajon Bank is a double barrier reef of 130 km, within the marine biodiversity-rich Coral Triangle area (Hill 2011; Hurtado 2013). However, it is under pressure from a dense and growing human population and has been heavily degraded by destructive fishing practices (Armada *et al.* 2009).

The Zoological Society of London in the Philippines (ZSL-Philippines) supported the project and provided contacts, information and suggestions of interviewee candidates, using their extensive knowledge of the study sites and local seaweed industry. Interviews took place in various locations in Cebu, Bohol and Iloilo provinces. Farmers and traders were interviewed in three separate villages, known as *barangays*. These were Handumon, Guindacpan, and Hingotanan East, and each was located on a different island on Danajon Bank (Figure 5). Bisaya was the main language spoken. Each *barangay* was governed by a head Captain (*Barangay Kapitan*) and seven Councillors (*Kagawad*). The selection of island study sites was informed by Hill (2011) and Hill *et al.* (2012), and insight from ZSL-Philippines. The three island *barangays* were selected because seaweed farming was a main livelihood in all of them, and yet variations in island size, location and general wealth allowed interviews to cover a mixture of different respondents and perspectives.



Figure 5: Map showing location of Danajon Bank, in the Central Visayas region of the Philippines (black box). The three seaweed farming *barangays* in which farmers and traders were interviewed are labelled in red. Adapted from Armada *et al.* (2009).

3.2 Qualitative research approach

This study relied on qualitative data from semi-structured, key-informant interviews. I took an inductive approach (Newing 2010), beginning with relatively open research questions regarding the importance of local context in seaweed farming and its implications for certification, and using the data to guide my focus as to what themes emerged as key. An inductive approach helped to reduce the influence of my own preconceptions and limited understanding of the study area, allowing the data to direct the study's focus to the most important elements.

Qualitative analysis was used to interpret the data, to allow for a detailed description and understanding of the complexities of the local systems and interactions being studied (Rust *et*

al. 2017). Environmental problems can rarely be separated from the human contexts within which they sit, and although this has been generally recognised in conservation thinking for a long time, it is only more recently that the important role of qualitative research has been receiving greater attention (Newing 2010; Bennett *et al.* 2017). A qualitative approach is particularly appropriate in analysing seaweed farming in the Philippines, as it is a system in which the social, political and economic contexts all have significant influence, and none of these dimensions, nor the interaction between them, could be captured accurately and fully through a purely quantitative methodology.

3.3 Data collection

3.3.1 Key-informant interviews

Semi-structured key-informant interviews with seaweed farmers, traders, processor companies, and relevant government officials were the main method of data collection. This interview method was selected as the best way to allow participants to expand on their opinions and to lead the research into new and unanticipated directions, while still maintaining control over the general themes discussed (Gray 2004). An interview guide for each category of interviewees was developed in advance, laying out the broad topics and questions to be covered. This provided a rough framework, but each interview was allowed to change and move with the conversation, and the themes and questions evolved slightly as data collection continued, in response to the data already collected.

Interviews were audio-recorded if consent for this was given, and notes were taken for all interviews. All participants were given the choice of conducting the interview in English or in Bisaya. I hired an experienced research assistant for translation of interviews, as well as assistance with general community integration and logistics. I provided him with a copy of the interview guide in advance of my arrival in the Philippines to allow him to familiarise himself with the questions and themes, and we discussed the content further on my arrival and on an ongoing basis during the research, to ensure we shared a mutual understanding of the aims and content of the interview questions.

3.3.2 Sampling

Non-probability sampling was used to select all interviewees (Newing 2010). To select farmers and traders in the three *barangays* visited, a mix of targeted and snowball sampling

was used. On entering each *barangay*, a list of potential interviewees was constructed by asking individuals with good community knowledge – such as the *barangay* captain, ‘health workers’, or seaweed traders – to suggest candidates who had ‘expert’ knowledge. The definition of ‘experts’ was reflected upon through Davis and Wagner (2003). Criteria were provided to help select these candidates, relating to the size of their operations, the length of time they had spent farming or trading, and whether this was their full-time occupation. Selection attempted to stratify across these, so that a range of perspectives was represented. Those individuals suggested by multiple people were targeted first, and then asked at the end of the interview to propose further candidates. In this way, the initial list was augmented and triangulated to try and determine the most appropriate interviewees.

The sample of processor companies was selected through targeted sampling, using an online list of those companies which were both members of the Seaweed Industry Association of the Philippines (SIAP) (as this provided a reliable list of relevant companies operating in the Philippines), and based in Cebu (so that interviewing them was feasible). Relevant government officials were selected through a chain referral method, based on the suggestions of ZSL-Philippines team, who have been working on seaweed farming-related issues for a decade, including with relevant bodies such as BFAR and municipal LGUs.

The sampling unit used was a single actor in the value chain, rather than an individual person *per se*. For example, if an interview were conducted with two representatives of the same family engaged in the same farming operation, the unit sampled would be taken as 1 farmer, even though two people had been involved in the interview. This prevented interviewees’ decisions to bring additional people to the interview – which happened frequently and was outside my control – from skewing the sample sizes.

The category of ‘government officials’ stands out here as incongruous with the other groups interviewed, as they are not direct ‘value chain actors’. The main purpose of including this group was to supplement the interviews with those actors within the vertical value chain, and gain a more complete understanding of the local context and horizontal networks within which these actors operate. Clearly ‘government officials’ is a broad and heterogenous category, and I do not suggest that the value chain actors interviewed within this category represent all relevant routes by which government influences seaweed production and trading

in the Philippines. I decided to restrict the number and variety of interviewees in this category given time and logistical constraints, and as they are less central to my analysis.

The target sample size for each group of interviewees was different, reflecting the relative sizes of each group present in the local value chain. Farmers have the largest number of individual units, and so had the largest target sample size, of 15. This was split into a minimum of five farmers at each of the three *barangays*, to allow comparison across the sites. The minimum target sample size for traders was six, split into two per site, to reflect their generally much lower abundance. The minimum target sample size for both processor companies and government officials was three. These groups were smaller partly to reflect their relative proportions in the local value chain, but also as they were less central to my analysis, being external to the *barangays* where seaweed was farmed and therefore further removed from the most ‘local’ scale in the upstream value chain.

Once target sample sizes were achieved, some initial processing and analysis of the data was done to determine whether ‘saturation’ had been reached, and ideally, more interviews were carried out if not (Gray 2004). However, due to time and logistical restraints, it was sometimes not possible to stretch beyond the minimum sample size, even if saturation had not been reached. This exemplifies how the sampling methods presented here had to balance both “theoretical requirements and practical considerations”, which Newing (2010) reminds us is the reality for most social science research projects.

3.3.3 Positionality and data validity

Prior to commencing fieldwork, and throughout its duration, I considered the implications of positionality in this research. This is particularly pertinent in this study of power and perspectives, as it relates to both. The knowledge and opinions used in and extracted from this research are partial and situated, and my various positions – as an outsider to the community, a foreigner from a developed country, and a student – are all likely to have influenced the way both I and those I interviewed interacted and interpreted each other’s responses (Rose 1997). Additionally, as a researcher framing people as “subjects” for investigation, I in many respects held a position of power, which I was able to use to my advantage to conduct research (Chacko 2004). Power and knowledge cannot be completely separated from one another in research (Rose 1997) and thus my involvement inevitably will have in itself affected the data produced and conclusions drawn.

The power I was *perceived* to have is an additional consideration, and one I was explicitly confronted with at times. Within the communities, although I was viewed mostly as a guest, or ‘client’, I was also at times arguably seen as a form of ‘patron’ (Newing 2010), in that despite my best efforts to be clear about the purpose and intended outcomes of my research, I was sometimes seen as someone who had come to “solve the problems”, or as a potential source of money. This is likely also to have been affected by the recent presence of other student researchers in some of the communities I visited, who had paid interviewees – including some who I interviewed – for their participation. My position as a student in this case is likely to have associated me with the same implications of power and wealth. In addition, my connections with both the University of Oxford and ZSL may have affected the way I was perceived and the responses given in interviews.

Having my research assistant present in the island *barangays* helped significantly to facilitate my interactions with people, but his positionality must also be considered. As a Filipino from Bohol and a native Bisaya speaker, he was far less of an outsider than myself, and yet still external to these *barangays*. He was also associated with ZSL-Philippines. These factors will have influenced the interactions and understandings between him, myself, and the people we interviewed.

All the above considerations mean the conclusions I draw from the qualitative data in this study would not be considered ‘objective knowledge’ in the positivist lens which has dominated conservation research thus far (Rust *et al.* 2017). This does not reduce their value, however. Incorporating qualitative social science perspectives into conservation thinking allows for multiple constructions of knowledge and thus a more complete understanding of issues and the drivers behind them (Newing 2010; Rust *et al.* 2017). This should in turn support the development of more realistic, grounded, and successful mitigation measures, and it is this line of reasoning I follow in conducting this research project.

3.3.4 Communication and ethics

Newing (2010) draws our attention to the value of learning local languages in order to conduct interviews, rather than relying on a translator. This reduces the information lost not only through translation, but through a reduced ability to steer the conversation and to pick up on revealing nuances of language. Given the timescale of this project, however, learning

Bisaya with any kind of proficiency suitable for conducting interviews was simply not feasible. However, my research assistant was hired on the recommendations of ZSL-Philippines and according to a set of criteria I specified, which helped me ensure the translation would be sufficient for my research.

I secured approval from the Central University Research Ethics Committee (CUREC) and discussed relevant ethical considerations – such as how their data would be used, their right to refuse to participate, and the implications of providing consent – with all interviewees prior to interviews. Where possible, this information was provided in advance and then repeated immediately before the interview. When interviewees were not fluent in English, my research assistant translated and/or clarified this information as needed. Written or verbal consent to participation was obtained from all interviewees, and verbal consent was always obtained before audio-recording.

3.3 Data processing and analysis

As soon as possible following each interview, I went through the notes I had made and added corrections, annotations and memos where necessary, as well as any additional detail I could remember. This initial processing of data helped me to steer the following interviews and begin to identify key themes and narratives.

Audio-recorded interviews were listened through and used in combination with interview notes to index and summarise the main subjects covered. Relevant sections were then transcribed and coded to allow a more detailed qualitative analysis. This qualitative analysis followed the circular theory of describing, connecting and classifying, as described by Dey (1993), and drew on relevant additional literature to further explore the data and draw conclusions regarding the implications for seaweed governance and certification.

4. RESULTS

A total of 29 interviews of one to two hours each were conducted between 15th June and 11th July, 2017. All target minimum sample sizes were reached, with 17 farmers (five in Hingotanan East, six in Handumon, six in Guindacpan), six traders (two in each *barangay*), three processor companies and three government officials interviewed. A total of 28 interviews were audio-recorded, as one interviewee refused consent for this. As touched upon already, these sample sizes were deliberately skewed towards farmers and traders, and thus their data is more central to much of the results and analysis. Codes are used below to protect interviewee anonymity: ‘IP’ refers to processor companies, ‘IG’ to government officials, ‘IT’ to traders and ‘IF’ to farmers. Further details on each of these groups are in Table 1.

4.1 Production and trade dynamics

4.1.1 Trade flows

Value chain

The main seaweeds farmed were ‘Cottonii’ (*Kappaphycus alvarezii*) and ‘Spinosum’ (*Eucheuma denticulatum*), and the value chain analysed encompasses both these species. Harvested seaweed is either dried and cleaned on a raised platform or net on the ground, or (if money is needed sooner) sold ‘fresh’ immediately. Platform-drying produces higher-quality seaweeds but platforms are expensive to build, so some farmers cannot use this method. Generally, farmers sell within their *barangay* to traders, who – depending on their specific role and the condition of the seaweed sold to them – may (re-)dry and (re-)clean it, before packing it into sacks of approximately 60kg each. They will aggregate seaweed from multiple suppliers and transport it by pump-boat to Cebu, where it is bought by larger traders at the port. These larger traders sell aggregated quantities of seaweeds to a processor company, either as an employee or independent contractor. The raw seaweed is then processed into a variety of products, which are exported to global markets. Value is thus added at each stage of the supply chain, with perhaps the least value added by the farmers, particularly when seaweed is sold fresh. This was recognised by IP2: “... there’s an added value also. The quality of the seaweed we buy direct from the farmers is not the same as the quality of seaweed we buy from the middlemen.”

The exact value chains followed vary, and additional or fewer layers of traders may be involved (see Figure 6). Some farmers sold directly to large traders in Cebu, but none of those interviewed sold directly to a company. This system demonstrates clear economies of scale as seaweeds move along the value chain. Processor companies manage their supplies through ‘purchase order’ (PO) contracts, which set a minimum delivery volume of seaweed. Farmers are generally unable to meet this minimum volume, and thus can only sell through

Table 1: Overview of different value chain actor groups

Value Chain Actor	Interviewee Code	Details
Farmers	IF	<ul style="list-style-type: none"> • Main livelihood in all three island <i>barangays</i> • Farm area ranged in size from ¼ – 3 ha • Age range 33-71
Traders	IT	<ul style="list-style-type: none"> • Described variously as ‘traders’, ‘sub-traders’, ‘middlemen’, ‘buyers’ and ‘stockers’ • Inconsistency in use of these terms between and within <i>barangays</i> made classification of ‘traders’ difficult • Main role was adding value through drying and cleaning of seaweeds
Processor Companies	IP	<ul style="list-style-type: none"> • Interviewees were all in senior management roles • All three companies mentioned by traders and farmers in interviews • All companies were SIAP members
Government Officials	IG	<ul style="list-style-type: none"> • Local Government Unit (LGU) – municipal level • Interviewee was a Coastal Resources Manager (CRM), under the Municipal Agricultural Office • Responsible for management of all coastal industries within municipality
		<ul style="list-style-type: none"> • Bureau of Fisheries and Aquatic Resources (BFAR) – national level • National government agency responsible for the development of fishing and aquatic industries in the Philippines, through both support and regulation • Interviewee was contracted by BFAR to liaise with local ‘fisherfolk’ communities
		<ul style="list-style-type: none"> • Southeast Asian Fisheries Development Center, Aquaculture Department (SEAFDEC/AQD) – national/international level • Responsible for developing aquaculture industries through scientific research and technical support, including laboratory cultures • Supposedly covers all SEAFDEC member countries, but in reality was focused mostly on the Philippines

a trader or sub-trader, who will aggregate supplies. Sub-traders may still only be able to purchase and collect a limited volume, and thus must sell to a larger trader within the *barangay* (or neighbouring islands) who can collect enough to afford the labour and fuel costs of shipping it to Cebu.

In parallel with this aggregation of product at each level, the total number of actors involved generally appears to decrease along the value chain. Individual seaweed farmers made up the largest group, and were selling to a comparatively limited number of sub-traders, traders and companies. IP2's company only sourced directly from 2 or 3 "accredited" suppliers in the Philippines, who were already familiar with their requirements, and IP3 (discussing supplies from the southern Philippines) explained "we only deal with a few people, who we've worked with a long time". These statements suggest strong individual relationships and trust between companies and traders are an important component of the trade system. IT1 also explained that companies preferred to limit the number of their direct traders to avoid competition. Farmers therefore had fewer options regarding whom they traded with and how, and would struggle to progress along the value chain into limited and long-held positions. The relative power implications of this were recognised by IP1, when asked how much influence the company had over its supplier farmers:

"Very big [influence]. Because we will not buy from them – it is as simple as that. If they do not observe what we are suggesting, then they will have no buyer."

This dynamic was exacerbated by the geographies of different value chain actors and the associated access to communication services such as phone signal, electricity and internet. Farmers, generally living in greater isolation within small island communities, were less able to seek contact with buyers other than those living in the same *barangay* or surrounding area. Processor companies, however, were able to source not only from different regions of the Philippines, but from other countries. Geography also impacted production – Hingotanan East was suffering from particularly low seaweed harvests, to the extent that T2 had not sold seaweed since 2015. This again was related to the power dynamics of the value chain – a company-owned farm in the same area was not suffering to the same extent and had been able to produce some seaweeds where small-scale farmers had not (personal observation) (Figure 7).

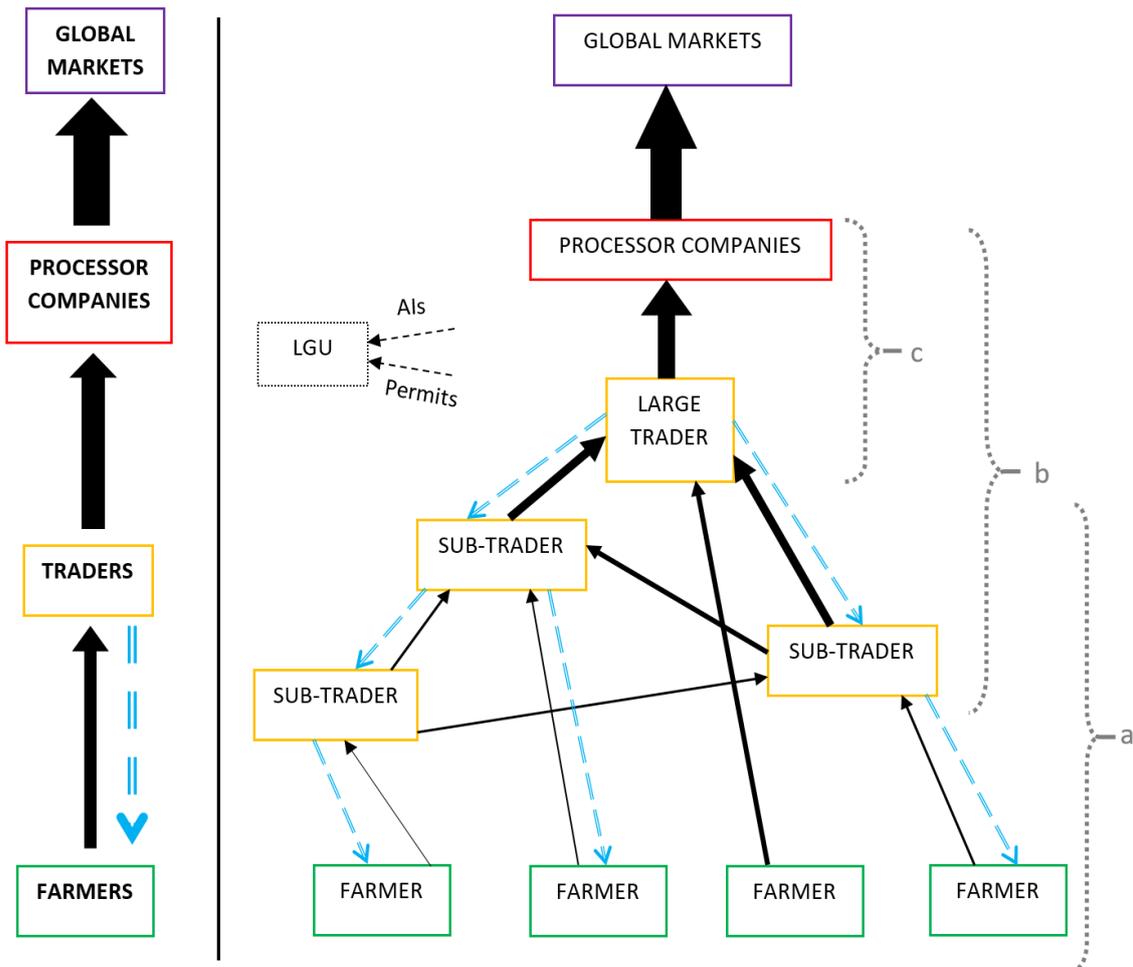


Figure 6: Value chain for *Kappaphycus alvarezii* ('Cottonii') and *Eucheuma denticulatum* ('Spinusum') produced in Danajon Bank and sold through processor companies in Cebu to global markets. The system is summarised on the left, and broken down further on the right to reveal hidden complexities. Solid black lines represent the sale of raw seaweed or seaweed-derived products. Line weight indicates relative value (and higher price) added between levels. Heavier lines indicate greater value. Dashed blue lines represent direct financial support through individual 'loan' agreements. Smaller, black dashed lines show how the LGU can indirectly gain income from the value chain. Note that the above are examples of possible trade relationships, rather than an absolute representation of a fixed system. Dashed brackets indicate different scales at which these dynamics often occur: a) within and between barangays, b) between municipalities, and c) between provinces.

Price dynamics

The price of seaweeds was said to vary substantially and often – generally year-to-year, but sometimes even week-to-week. Interviewees identified several factors behind this, but it was more often seen as related to inconsistencies in supply rather than demand. The quantity and quality of seaweed produced can vary substantially between years. Several interviewees

identified temperature and extreme local weather events – such as typhoons – as the main reason for this. There is also variation in the quantity and quality of seaweeds produced within and between *barangays*, as farmer techniques vary due to knowledge, experience and habit. As one processor company interviewee (IP2) put it, “Each family has its own practices. We normally say that ‘each seaweed branch has a quality of its own’”. This variation also affects the price.

Demand also varies and affects prices, though often as a reaction to changes in supply elsewhere. Competition with the increasing supply of seaweeds from other countries was raised as a concern by several farmers and traders. For example, IT1 stated that the farmer-to-trader price for *Cottonii* had been approximately 3 times higher in 2006-7 compared with today, because at that time the Philippines had been “the main supplier” of seaweed. IT3 mentioned that the price had risen dramatically one year when a tsunami had severely damaged production in Indonesia.



Figure 7: Author’s photograph of a company-owned drying platform with recently harvested seaweeds. Though this was a low volume, most individual small-scale farmers operating in the same area were not able to harvest any seaweed at all. Photograph taken with permission of company representative.

Stop-buying

The practice of ‘stop-buying’ has sometimes been a problem before, in which traders collude to prevent or severely restrict the buying of seaweeds from any farmers, over a large area and for an extended period of time – some previous episodes were reported to have covered the whole of Bohol and lasted almost a year. Views on who was responsible for this were mixed. Farmers and traders generally reported that it trickled down from the processor companies, due to an over-supply of seaweeds. The Coastal Resources Manager (CRM) (IG2) interviewed, however, believed it was imposed directly by traders as a way to increase their own profit margins:

“ ... there is no such thing as ‘stop-buying’ for seaweeds. Traders – this is their strategy, to stop buying, so you will sell your product – your seaweed – at a very, very low price.”

4.1.3 Finance flows

Loans and capital

Farmers were often reliant on traders for capital, particularly during the course of the harvest cycle. This personal loan system was crucial for many farmers in Danajon Bank, because bank loans or microfinancier lending were often not available to them or left them in significant debt. Although described as a ‘loan’, this money was usually not expected to be repaid directly and no interest rate was imposed, nor was the offered price affected. Instead, farmers were expected to sell all seaweed they produced solely to the trader who financed them. No contract was signed in these situations; there was merely a verbal understanding. As a result, such arrangements were based almost entirely on trust and “respect for the relationship”, and “debts of gratitude”. This shows how social dimensions strengthen trade ties in the absence of more formal contracts. It seemed that while most farmers generally honoured this agreement, they would sometimes sell a portion of their seaweeds “secretly” to another trader offering a higher price. This was generally accepted by traders as “a part of the business” (IT2). If they discovered such a breach of agreement, they would confront the farmer, and take the problem to the *Barangay* Captain if necessary. Although this loan system presented some risk to the traders, they were generally able to absorb it due to their greater levels of wealth. In addition, some traders themselves took out loans from those they supplied to, in a similarly informal arrangement.

Barangay officials

Of the six traders interviewed, five held or had previously held government positions, usually as *barangay* Captains or Councillors. When this was enquired about, IT6 explained that this was a matter of economic capital, which was usually required to be either a trader or a *barangay* official. Though not explicitly confirmed, it was interpreted by my research assistant that the latter connection was due to a common reliance on bribery to secure political support. Those farmers with larger operations and more direct trade connections to processor companies were also often more connected to local government.

LGU regulation

Although not direct value chain actors, the municipal LGUs did receive finance from the trade. In order to land a shipment of seaweeds at the ports in Cebu, traders were required to show an ‘auxiliary invoice’ (AI), proving they had paid a tax to the municipal Local Government Unit (LGU). ‘Collectors’ from the LGU checked shipments from the islands to ensure the AI had been paid, but often traders avoided this fee by leaving during the night (IG2). They were then able to obtain an AI from a neighbouring municipality at 1/10 of the price, and so retain a higher proportion of their profit. This may amount to a significant financial loss for the relevant LGU – in IG2’s municipality, the CRM estimated that the LGU made about PhP0.5 million (~£7,600) a year, but based on the number of permits registered, should have been making 8 times this amount.

The LGU also received finance from seaweed production and trade through the provision of permits. Some farmers reported paying PhP650 (~£10) annually to renew their permits, while traders and companies paid significantly more. IT1, who claimed to be one of the largest traders in Bohol and the only one sourcing directly to a particular large processing company, was paying around PhP200,000 (~£3,040) annually to renew permits for trade in 4 different municipalities in Bohol. In the island communities, *barangay* clearance was needed before the LGU permit could be applied for.

4.1.4 Knowledge flows

Trade transparency

There is very little transparency in the downstream direction on prices and trade flows in the value chain – i.e., actors have limited knowledge of transactions beyond those they sell to. Farmers tend to have the least price knowledge of all – most of those interviewed knew only

the price they sold to traders for, and not the prices their product was then sold on for, or what profit other value chain actors made. This limited their understanding of whether the price they received was ‘fair’, and thus reduced their bargaining power. Most traders had similar complaints about transparency, both for themselves and for the farmers. For example, sub-trader IT3 said farmers and traders needed more knowledge of the global market in order to understand the value of their seaweed, “so that they won’t accept the low prices”. The traders IT3 sold to in Cebu controlled the prices offered farmers, and that only informed IT3 of price changes when they went down, but not when better prices were possible. IT3 had asked these traders before for further information on prices in the value chain, but did not trust that the information they had given was necessarily true. Most farmers and traders knew the levels the seaweed they traded went through to reach the processor company, and several knew which processor(s) their product was eventually supplied to. However, none of those farmers or traders asked knew specific actors that were involved beyond the processor level, although several could name general product applications for seaweed extracts.

Processor requirements

Each processor company seemed to have a different degree of communication with the farmers they sourced from, although this may have been a reflection of the particular roles the interviewees held. IP1 and IP3 said their companies visit the areas they source from, and this was confirmed in interviews with some farmers and traders. IP2 discussed how the industry had moved towards a more distant relationship in the last 30 or 40 years, as the number of farmers had increased and it had become more practical to rely on ‘middlemen’ to facilitate trade. This company seemed the most distant from its suppliers:

“We don’t buy directly from the farmers and we are a little bit away in the supply chain – they are there, we are here. So we don’t know what’s going on anymore”

This highlights the difficulty of communicating through a complex value chain, and IP2 identified the resulting lack of control over supplier production methods and quality as a downside to this change:

“For example, we would like farmers to grow their seaweed at least 45 days before harvest ... But that’s very hard to control because it’s on the part of the farmer, so we

don't really know ... they should also do some drying and cleaning of the seaweed before harvesting, but I don't know if they are doing it.”

This lack of communication on quality requirements became apparent through interviews across the value chain. Companies interviewed explained their specific requirements in percentages of impurities and moisture content they would accept. Most traders, when asked what company requirements were, reported similar percentages. However, when farmers were asked, most reported the requirements as just ‘dry’ and ‘clean’, or that there were no requirements. This suggests information is not well communicated through the supply chain, and farmers are ultimately disadvantaged by being less able to add value and achieve higher prices – they cannot strive to meet quality requirements if they do not know what they are, or that they even exist.

Training, support and research

The representative of the Aquaculture Department in the Southeast Asian Fisheries Development Center (SEAFDEC), IG3, believed seaweed farmers in the Philippines were in need of greater technical support to improve their yields and profits. SEAFDEC has contact with LGUs, and through them is able to offer some training courses for farmers. These courses, and other capacity-building activities, are often funded by international NGOs, as the government budget is limited. The seedlings and propagation methods used by farmers – usually ‘continuous vegetative propagation’, which involves simply taking cuttings from the current crop – lead to genetically ‘weaker’ plants and thus to lower production. For this reason, SEAFDEC is developing seedlings which have been shown to grow at as much as 10 times the rate of those the farmers are using. IG3 regretted that, due to capacity and budget restraints, SEAFDEC was only able to supply enough for around 30 farmers a year.

The amount of support provided by companies was mixed. IP2 stated:

“After the commercial success of seaweed farming in the Philippines – after 2000 I think – we have not been giving technical support directly to farmers here in the Philippines. It's because we are not very close to the farmers anymore”

IP3, however, emphasised the importance of training and communication with the farmers that supply them, as a way to improve the quality of the product:

“We’re discussing with [the farmers] and teaching them what the proper ways are and the type of quality in our standards, so [that they follow our] protocols on how to harvest and plant. Because again it is a matter of a partnership and good relationship ... I think the bottom line is communication and a good feedback system.”

This relationship, although supportive to the farmers, was also mixed with a certain degree of distrust:

“we teach them how to farm, not only so they know how to farm but because they might commit fraud ... [we] talk to them and teach them to be honest with us” (IP3)

Many farmers said neither companies nor external organisations had ever provided training, and farmers learned and developed cultivation techniques between themselves. However, some had attended training seminars from the LGU on the mainland, and IF14 in Guindacpan claimed there were many training opportunities. Separately from this, *barangay* officials received training related to their roles. IF17, for example, had attended many seminars on finance within 6 years as the Finance Officer for the *barangay*, and believed these helped with the business of selling both seedlings and harvested seaweeds. This suggests that increased access to broader business skills training and knowledge can be another way in which those farmers in positions of authority are at an advantage over those who are not.

Certification awareness

In order to gain an understanding of whether the information on the proposed MSC-ASC seaweed certification scheme had been communicated and to whom, all interviewees were asked about it. All 3 processor companies had heard of it, but no farmers, traders or government officials had. The processor companies had heard of it through conferences, emails and word-of-mouth, either directly through the ASC and MSC, or through others connected to the industry.

4.2 Sustainability values

The interviews were used also to understand how different actors in the value chain perceived environmental, social and economic matters related to seaweed production in Danajon Bank,

and thus the kind of issues they might expect or desire a sustainability certification scheme to address. Both ‘positive’ and ‘negative’ impacts were discussed, and questions were kept quite open to refrain from leading interviewees. At times, interviewees were pressed on specific issues of relevance, but only once the opportunity had been provided for them to raise them unprompted. A general theme in interviews with farmers and traders was that the *barangay* officials and/or municipal LGU were seen as the most appropriate bodies to manage issues relating to seaweed farming.

4.2.1 Environmental

Answers concerned both the impacts of environmental factors on seaweed farming, and the impacts of farming on the environment. This may have been partly due to the framing of questions, as concepts surrounding ‘environmental impacts’ can be relatively abstract, and even more so in translation. It was also notable that most actors considered seaweed farming to provide many environmental benefits, and some interviewees did not offer any direct negative impacts on the environment at all. However, for brevity and clarity on which issues may need addressing, the results below highlight the main impacts perceived by actors as negative and concerning.

Plastic waste

When asked about environmental concerns related to seaweed farming, the first issue raised by most farmers and traders was plastic waste. Although details of the techniques varied, farmers used plastic ‘straw’ as lines onto which the seaweed propagules were tied using shorter sections of plastic straw, referred to as ‘tie-ties’. During harvesting, this plastic was usually discarded, either immediately to the water, or on the island. Much of it had accumulated on the shorelines, and this was particularly noticeable in Hingotanan East and Guindacpan, where it covered large sections of the shores in a tightly packed layer that was several centimetres deep in places (personal observation). All 3 islands did have a ‘dumpsite’ for the disposal of waste, but these were all full or close to capacity (see Figure 8). Burning was reported as another disposal method, but one most farmers avoided as it was against national law (Ecological Solid Waste Management Act of 2000, Republic Act N^o. 9003).

The relevant LGUs were responsible for removing waste from the islands, but were not doing so. Some farmers said they had requested this service but no action had been taken. A likely reason for this was revealed in the interview with the CRM (IG2) who explained that the

LGU was currently unable to remove waste from its islands because there was no dumpsite for it to go to on the mainland. Instead, all waste had to be sold outside of the municipality, and they were struggling to find buyers: “We have requested so many agencies ... but to no avail”. Though asked about alternatives, IG2 could not see an immediate solution to this problem other than waiting for a buyer. However, IG2 agreed that plastic straw from seaweed farming was a serious problem, whereas the other government officials interviewed did not mention this issue. This difference is perhaps simply a product of the different professional responsibilities the actors in this varied group held, although it may also reflect IG2’s background working for environmental NGOs, and personal interest in environmental protection. Of the processor company interviewees, IP1 and IP3 mentioned plastic straw in passing as a problem but did not discuss it in any detail, and IP2 did not remark on it at all.



Figure 8: Example of a ‘dumpsite’ in one of the island study sites. In all three island *barangays*, this was the only form of waste management available. When dumpsites reach capacity – as this one clearly has – it is difficult for farmers to dispose of the plastic waste resulting from seaweed harvesting.

Marine habitats

Another negative impact of seaweed farming raised in interviews, although less often, was the damage done to corals. Both farmer IF10 and sub-trader IT3 described how farmers in Handumon often cleared their entire farms of corals, lifting them manually and often arranging them into a barrier around the edges of the farm. IF10 and IF14 also mentioned shading and trampling of the corals during farming as problems, although most farmers interviewed did not agree these were a concern. It is worth noting that both IF10 and IF14

had had more interaction with ZSL-Philippines than many of the other farmers, and this may have affected their perceptions or awareness of marine conservation issues. Generally, farmers reported a preference for planting over sand or stones rather than seagrass and corals, but limited space often removed this choice. Neither processor company IP1 or IP3 mentioned coral or seagrass habitats during the interviews, and IP2 only when asked directly about them. IP2's view was that these were not significant issues:

“For us, I think it's not really a big concern ... Because in corals, there are a lot of fish, and they will eat the seaweed. So you don't put your seaweed farms [there]. Normally, ideal area for a seaweed farm is a flat area which is sand – just sand. No grass, no corals.”

Regarding government interviewees, again IG2 was the only one to show significant concern for this issue, describing from personal observation the loss of large areas of coral around Danajon Bank, resulting from seaweed farming. IG3, in contrast, only discussed corals when asked directly about them, and did not think shading was a significant impact resulting from farming, despite being a main one reported in the academic literature. IG3 felt that those writing the papers did not have a sufficient understanding of realities 'on-the-ground': “They have not been to the farms!”.

Impacts of other activities

The impacts of other nearby practices on the health and productivity of seaweed farms were raised as a key environmental concern by many farmers and traders. Illegal 'blast' fishing (in which sections of coral are exploded to harvest larger quantities of fish) was practised regularly around the islands – more or less every day in some areas. This often damaged seaweeds. Chemicals in the water resulting from fishing (cyanide, chlorine and bleach) and starfish preservation (formalin), as well as run-off from land-based fish ponds and palm oil plantations, were also seen to be key causes of damage to seaweeds.

Some farmers had raised these issues with local government but they were seen as hard to tackle. These issues were often hard to address at *barangay* level if *barangay* officials, or those closely connected to them, were known to be perpetrators, due to the respect given such people (IF13). The LGUs were aware of illegal fishing practices but unable to tackle sufficiently them due to a lack of resources and capacity (IG2).

Climate change

High temperatures, typhoons and other extreme weather events were often raised as the main environmental issues affecting seaweed production, and were by far the main concern of processor companies. Many interviewees explicitly referred to this in terms of “climate change”, while others implied this connection by describing the problem as continually getting worse. Some farmers saw these effects as merely seasonal. The impact of climate on seaweeds was the issue all value chain actors seemed most in agreement over, due to its effects on product qualities and quantities, and thus on the success of the industry.

4.2.2 Socio-economic

Due to tight interrelation between trade dynamics and socio-economic concerns, the key issues of this kind perceived by interviewees are raised through the discussion on trade dynamics above, and thus are not explored in detail here. Overall, production levels and associated profits were the main concern for all actors. Traders and farmers alike were also generally concerned about price transparency and fairness. It should be noted, however, that views were not homogenous across each group, and indeed several farmers stated that they were happy with the current trading system and could not think of anything particularly they would change about it.

Although treated separately in the initial research design, social and economic concerns are combined under this category, as it became clear through the data that the two cannot be easily separated. The only purely social issue was raised by farmers, as some interviewees mentioned that long hours of exposure to the sun and heat out at the farms was dangerous for health, and that farmers did not always cover up sufficiently, or had no access to shade.

4.2.3 MSC-ASC standards

Only processors were able to comment on the proposed MSC-ASC standards as no other interviewees had heard of them. Their comments were generally neutral or negative, and none actively felt that such standards were needed. None of the three seemed to feel that decisions on the introduction of a certification scheme to the Philippines were particularly theirs to make, and the influence of companies further downstream was clear:

“I think the final say is coming from the buyer, from the end user of the carrageenan. [The MSC/ASC’s] effort to have the standards accepted will not be very meaningful if there is no demand from the buyer.” (IP2)

“... if our clients insist, then I guess we [will] have to join the bandwagon” (IP3)

IP1 also commented that at a recent industry event at which the proposed scheme was discussed, a question had been raised over whether it represented “a new way of colonialism”.

5. DISCUSSION

From the data presented above, there are multiple factors which appear to be influencing power. Here I discuss four forms of power which stand out: ‘socio-economic capital’, ‘socio-political capital’, ‘information capital’ and ‘spatial capital’. I followed Challies and Murray (2011) in using the framing of ‘capital’, in order to highlight power as a tool attached to and utilised by actors, rather than simply a force they are subjected to. In reality, power in a system such as this is complex, interrelated, ambiguous and subjective (Brouwer *et al.* 2013), and cannot be neatly partitioned into separate silos. However, for the sake of clarifying the broad dynamics in this system, I turn to this categorisation. A fifth sub-heading deals with actors’ environmental and socio-economic values. Exploration of relevant implications for certification are woven throughout, and the section concludes with a reflection on some of the limitations of the study and data.

5.1 Socio-economic capital

Neish (2008) suggests the value chain for tropical red seaweeds currently follows a market governance dynamic, and outwardly the local trade system described here appears to agree with this observation, as there are multiple ‘independent’ suppliers and buyers at each level, making trade decisions based upon price (Gereffi *et al.* 2005). However, a closer inspection of the more immediate ‘forms of co-ordination’ reveals a more complex picture (Ponte and Gibbon 2005). Many farmers, and indeed some traders, are indebted to those directly above them in them in the value chain and through this are, in practice, operating more under a ‘captive’ system. This is less easily recognised through the Gereffi *et al.* framework, which focuses more on vertical integration and direct control as key mechanisms through which

suppliers are held ‘captive’, and thus does not explore in detail the subtler socio-economic vectors through which control can be operated. Admittedly, the ‘captivity’ described here does not strictly follow Gereffi *et al.*’s criterion of ‘high switching costs’ in moving between buyers, as demonstrated by the capacity of indebted farmers to sell ‘secretly’ to those offering a higher price, apparently without significant repercussions. Nevertheless, this dynamic is interesting to note, as in Gereffi *et al.*’s framework, ‘market’ and ‘captive’ modes of governance are placed at almost opposite ends of the power spectrum – with the former demonstrating the greatest balance and the latter some of the least (Figure 3) – and yet in this system the two are, arguably, intertwined.

Those actors not indebted to others through loans are free from this ‘captivity’, and thus even within horizontal layers of the value chain there are large variations in the power balance between individual actors and those in the next level up. Regardless of indebtedness, all farmers and traders are generally selling to a restricted number of buyers, and thus even if free to choose according to price, their options are few. This highlights the importance of considering scale when discussing value chain modes of governance (Ponte and Gibbon 2005): the overall number of traders at different levels involved in seaweed farming at the *national* scale may be 50,000-70,000 or more (Hurtado 2013) and thus it appears there are many possible trade routes; but on the level of an individual *barangay* or municipality, there may be only two or three traders to choose between. In some areas of the Philippines this can be even fewer – following Typhoon Yolanda (Haiyan) in 2013, in one area in Iloilo Province, two of the three main local traders relocated, leaving the remaining one to hold a monopsony (Andriessse and Lee 2017).

Despite the ambiguities, the above analysis clearly indicates the influence of the structure and flows of the trade system. Economic power becomes more concentrated with each level of trade, as greater value is shared between fewer competitors as the product moves downstream. As a result, farmers are the least economically powerful actors in this system. This dynamic is strengthened by control of prices and trade flows by downstream actors, including through practices such as ‘stop-buying’. These power flows can be labelled ‘social’ as well as economic, because they are often embedded within a wider social fabric, in which familiarity, trust and respect are key to trade relationships.

Belton *et al.* (2011), considering *Pangasius* catfish farming in Vietnam and Bangladesh, suggest the greater structural organisation and technical capacity inevitably required by the introduction of a certification scheme will mean large, vertically integrated company farms are more able to meet requirements. However, such farms are scarce in the seaweed production system studied, and the global seaweed value chain appears to be in the fairly unique position of providing a global commodity through a reliance on small-scale farmers. This is in opposition, for example, to the global palm oil value chain, in which a global commodity is traded, but its production is dominated by large multi-national companies – around 50 large plantation firms account for 75% of global production (Schouten and Glasbergen 2012). It also differs from the general fair trade model, in which smallholders dominate production, but the commodity produced is destined for niche markets (Renard 2003; Taylor 2005). Perhaps this high level of farmers’ ‘dispositional power’ (Arts and van Tatenhove 2004) within the global seaweed value chain could override the lack of it at local scales, leading to rejection of certification schemes were they to fail to incorporate small-scale producers on a global scale, and thus threaten to exclude a majority of the supply base.

Perhaps the most obvious method by which a certification scheme could influence power dynamics is economically. The costs associated with compliance can be prohibitive, and are usually borne by producers (Goyert *et al.* 2010; Ponte 2008). The trade structure described above shows that processor companies and seaweed farmers currently interact ‘at arm’s length’ (Gereffi *et al.*, 2005). Through certification, this separation from production practices would leave processors in a position to ‘outsource’ sustainability measures to farmers (Ponte 2008). This is in contrast to production systems with greater vertical integration – such as palm oil or large-scale forestry – in which ‘outsourcing’ from downstream retailers falls onto other companies (which are the producers), instead of individuals (*idem*). This highlights the particular vulnerability of seaweed farmers here, as they have the least socio-economic capital in the value chain and yet are likely to bear the costs. Here again, farmers’ unique dispositional power in the global value chain might be realised if their inability to bear the costs made certification impractical. We could also speculate, however, that this problem would be resolved through a return to increased vertical integration and more hierarchical modes of governance of the 1970s and ‘80s which would allow processor companies greater control over production processes (Neish 2008).

Certification standards would, in theory, add value to seaweed as a product through the attribution of new ‘product quality’ values relating to its sustainability, in parallel with the creation of a differential rent within the market, which would translate into higher profit margins for value chain actors (Renard 2005). In reality, the way in which profits are distributed among these actors is largely dependent on the political economy of local trade and production systems, and often does not lead to increased incomes for small producers (Ponte 2008; Blackmore *et al.* 2012). Premiums are paid at the retail end rather than at the producer level, and this is one way in which the MSC, for example, has failed to deliver its promised financial benefits (Ponte 2008). Mutersbaugh (2005a) is particularly critical, stating that changes in rent relations resulting from the increasing spread of globalised standards has benefitted large corporate retailers while serving to “imperil the earnings” of other value chain actors. He argues that certification standards create a ‘policy rent’ which constructs “a barrier to entry so formidable that all the rent income earned by market entry is spent in scaling the barrier” (*idem*). These criticisms, viewed in light of the socio-economic power imbalances outlined in this study, mean we cannot assume that farmers would gain significant economic benefits from a certification scheme.

The BFAR interviewee stressed the importance of creating farmer co-operatives as a way to improve the balance of local power dynamics through trade, and the potential of this as a way to help small-sale farmers achieve certification is often suggested (Belton *et al.* 2011b). From a value chain perspective, this would consolidate actors at the producer end and precipitate a more balanced, modular mode of governance (Gereffi *et al.* 2005). However, the extent to which co-operatives can achieve these aims is questionable, and they should not be considered a panacea (Khiem *et al.* 2010; Belton *et al.* 2011b).

5.2 Socio-political capital

The interaction between hierarchical government structures and local power dynamics at the *barangay* level was highlighted through interviews. *Barangay* officials were seen as the main source of authority, and they, BFAR and the LGU were seen as the appropriate actors to manage seaweed production issues and regulations. The majority of traders interviewed held or had held local political positions, and were afforded respect as a result. Thus, the socio-economic power they obtained through their positions in the value chain was extended and reinforced by the socio-political capital provided by their positions in the *barangay*

community. There was a suggestion of this pattern among farmers too, and so this power was heterogenous even horizontally in the value chain. Socio-political capital was strongly tied with economic capital, as *barangay* officials often started from a position of greater wealth.

NSMD certification by definition does not centre around government control, and places importance instead on the market (Gulbrandsen 2005). Such a scheme would thus introduce a new source of power and authority to the seaweed farming communities, which would be in direct conflict with the main socio-political power and authority people recognise (Renard 2005). Furthermore, as key residents of the communities, *barangay* officials in this system were not abstract representatives of external authority, but family members and neighbours. If certification followed current systems, it would ignore the embedded socio-political capital of these officials, by asking farmers to place trust in intangible, science-based systems and principles, rather than these individual people who they know (Giddens 1990). McDermott (2012) reminds us that trust in certifiers is a key factor influencing power dynamics and a scheme's legitimacy in certification. The intrusion into the community of an unknown, external auditor – as would be a likely scenario under certification – might be particularly difficult in this situation, as they would be challenging the authority of familiar individuals, rather than a more abstract concept of 'government'

5.3 Information capital

Further important facets of power in this system are communication and access to information. This is linked to socio-economic power in the value chain structure, as a lack of transparency on profit margins, and a limited understanding of the global market, prevents farmers and traders alike from negotiating for higher prices. This is exacerbated at the farmer level, as limited knowledge of company quality requirements reduces their ability to meet them, and so opportunities for value-adding and thus higher prices are passed on to traders instead. This may be equally an issue of socio-economic capital, as although traders are perhaps no better able to measure specific percentage-based quality requirements than farmers are, they are often better able to follow optimum processes of drying and cleaning the seaweeds, due to the costs of drying platforms and farmers' often more immediate need for money meaning they cannot take the time required for thorough drying, which is usually 3-5 days (Hurtado 2013). Such reduced profit for farmers through lower-quality production may also be linked to the lack of external training, which itself is probably related to the

proportionately low economic capital of relevant government agencies – notably SEAFDEC – to provide such training. However, it also stems from a general lack of structured co-ordination and communication between relevant research agencies and the industry (Andriessse and Lee 2017).

A common feature of the rising prevalence of product standards in agricultural food chains is that smallholder producers are forced to continually upgrade and improve their skills in order to remain competitive (Reardon *et al.* 2001; Selwyn 2008). (Corsin *et al.* 2007) present a comprehensive analysis of certification schemes in the Asia-Pacific region, and conclude that most small-scale producers in this region lack the capacity to meet requirements, by a significant margin. A clear question here is then whether a seaweed certification scheme will provide or enable adequate training for farmers on the new production practices required (Belton *et al.* 2011b). Here, we should define ‘adequate training’ as encompassing additional capacity building efforts beyond the immediate scope of certification, to improve the economic sustainability of seaweed farming as a livelihood (Blackmore *et al.* 2012). Loconto (2015) describes how capacity building of this kind can help in Fairtrade tea production. Given the training gaps identified, this would need to include connection of farmers with SEAFDEC, BFAR and other relevant government and research institutions, so that general production quality and quantities can also be improved. If such support were provided, a certification scheme could be beneficial here in increasing farmer incomes through improved production as well as access to the premiums of certification markets (Challies and Murray 2011). If not, however, small-scale farmers might be excluded from the value chain altogether (Belton *et al.* 2011b); although, as discussed, their dispositional power as key producers in the global value chain might prevent this.

Under Gereffi *et al.*’s framework, the complexity of transactions, their capacity to be codified, and the technical capabilities of actors in the supply base are the main factors influencing the mode of governance used. Standards are one way in which information is codified, and thus the introduction of a certification scheme and associated sustainability standards would increase the codifiability of information, while also increasing its complexity, through the addition of ‘credence’ attributes related to production processes (Ponte and Gibbon 2005). Unlike product-based ‘search attributes’, which can be verified during the transaction of seaweed (such as the quantity traded, or the presence of obvious impurities), and ‘experience’ attributes, which are verified afterwards (such as the

carrageenan content), credence attributes cannot be measured and thus their verification must be based on trust (Darby and Karni 1973; Ponte and Gibbon 2005). If combined with a high level of supplier capability, we would expect an increase in the complexity and codifiability of the information associated with seaweed as it moved through the value chain to follow a modular governance mode, in which power between value chain actors is fairly balanced (Gereffi *et al.* 2005). However, if supplier capability was low – i.e., seaweed farmers were not sufficiently able to meet the standards required by a certification scheme – then we would instead expect a more captive system to prevail (*idem*). Thus, the extent to which a certification scheme provides knowledge and training to seaweed farmers would be likely to influence the trajectories of power taken in the governance of the value chain, and a failure to increase farmers’ capabilities in parallel with the implementation of a scheme could reinforce their vulnerable position in relation to other actors.

5.4 Spatial capital

Finally, we turn to a consideration of the role of different geographies, or ‘spatial capital’ in influencing power within this system. Several authors have related space and power in other fields, and there are arguments that this concept has been under-appreciated and requires better integration into policy (Allen 2003; Mace 2017). More relevant discussions of the role of space in certification contexts have been touched upon (Bush and Oosterveer 2007; Roth and Dressler 2012), and in particular, Mutersbaugh (2005b) highlights the importance of supply chain geographies in certification through the concept of “just-in-space” production. However, there appears to be limited dissection of the specific interplays between space and power at the local scale in certification landscapes. I contend that the role of spatial capital can be viewed through this case study in several ways.

Firstly, the relative isolation of the communities producing seaweeds adds to travel costs and thus leaves farmers, with generally limited finances, more reliant on traders to access markets. In this way, spatial capital interacts with socio-economic capital to reinforce the dynamics which place farmers as the least powerful actors in a system. A similar dynamic is observed by Challies and Murray (2011), who explain how isolated smallholder raspberry producers in Chile have no means of transportation and thus rely on middlemen to sell their fruit and connect them to markets. Blackmore *et al.* (2012) also note geographical isolation as a problem for smallholder market access in Asia. On a related note, the better communication

opportunities for processor companies provided by their situation in Cebu City allows them greater access to information and connection with other industry stakeholders on a national and international scale – as indicated by their being the only value chain actors aware of the MSC/ASC certification scheme. Thus, spatial capital here influences information capital. Finally, the Philippines as a whole is particularly prone to extreme weather events and thus more vulnerable to related disruptions in production, in comparison with its competitors in the global market (Andriessse and Lee 2017). Although Indonesia and Malaysia both also experience monsoons, the Philippines is the only one of these three supply countries regularly affected by typhoons, which occur 24-25 times a year (Hurtado *et al.* 2014; Hurtado *et al.* 2015). Andriessse and Lee (2017) suggest that this factor prevents marine-based livelihoods such as seaweed farming from ever being viable as a sole income source for small-scale producers. Variations are observable at local scales too, as seen through the particularly low production levels in Hingotanan East. This is another way in which spatial capital can impact upon economic capital, and once again it seems that farmers are likely to be the value chain actor made most vulnerable through this power dynamic.

This last dynamic is perhaps the most relevant to consider in terms of a global certification scheme, as it invites discussion on the broader global power dynamics such a scheme might interact with. Many relevant certification bodies – including the MSC, ASC and FoS – have been criticised for failing to incorporate actors in the Global South, despite their importance in fisheries and aquacultural industries (Kalfagianni and Pattberg 2012; Bush *et al.* 2013). However, the ‘Global South’ is of course not one homogenous group and, as highlighted above, differences in geography at multiple scales affect the vulnerability of different seaweed value chains. Valderrama *et al.* (2013) add to this observation, by highlighting the extreme variations in local seaweed market dynamics around the globe. Such variations in spatial capital suggests the importance of a global seaweed certification encompassing the perspectives not simply of token ‘Global South’ representatives, but from a multitude of actors from different countries and different positions in the value chain.

5.5 Whose sustainability?

Conflicts of “values and power” between different stakeholders are at the root of many of the environmental, social and economic issues sustainability certification schemes seek to address (Marin-Burgos *et al.* 2015). Thus, lastly, we must consider the perceptions of issues

by interviewees, as they relate to power and certification. As in Results, the socio-economic issues raised by interviewees are hard to separate from power and thus many have been included in the discussions above. However, some discussion of environmental issues and (company) perceptions on the proposed MSC-ASC certification scheme are added here.

These concerns were generally split into a) the effects of seaweed farming on the environment (environmental concerns), and b) the effect of the environment on seaweed production (enviro-economic concerns). This reflects the significance of economic priorities for these actors. It is also important to note that the enviro-economic concerns of interviewees, as relating to production, centred on climate variations and other, often illegal, fishing and aquaculture activities. This in itself suggests a certification scheme for seaweed farming would not be successful in addressing local value chain actors' concerns, as these key issues would be outside of its scope. We should also not ignore the irony of farmers being (likely) made to bear the costs of a global sustainability initiative, when a main issue they face – climate change – is globally caused.

Overall, farmers and traders raised more environmental concerns than processor companies, which focused chiefly on plastic waste, but for some related to coral damage as well. Both these issues are referred to in the most recent draft MSC-ASC seaweed standards, suggesting that the main environmental concerns identified through interviews are recognised by this developing scheme (ASC and MSC 2017). However, this is not evidence of these actors' power to influence the scheme and moreover, no farmers, traders or government officials interviewed had heard of it. This, along with the citation of referenced material in this draft standards, suggests that they have so far relied more on objective, 'expert' scientific knowledge, and thus are already engaging in 'subtle games' of power by promoting this form of knowledge over the more situated and personal knowledges of local actors (Ponte and Cheyns 2013).

All three companies interviewed held either relatively neutral or actively negative views regarding the proposed MSC-ASC certification scheme, following the generally reported sentiments of the industry (Porse and Rudolph 2017). One interviewee's connection of it with neo-colonialism was particularly revealing, and raises further questions about global power dynamics, as well echoing discussions of whether certification through the Forest Stewardship Council (FSC), MSC and ASC should be considered a new form of 'extra-

territoriality' (Vandergeest and Unno 2012). It should be noted that as the only value chain actors who had heard of the proposed MSC-ASC scheme were the three processor companies interviewed, only their views on it can be represented here. This inability to represent them is in itself a demonstration of how the exclusion of farmers and traders thus far has already set up a self-perpetuating power dynamic, as those with greater information capital (the companies) continue to have their voices heard and those without do not. This reflects the general trajectory that those who participate actively in standard-setting procedures gain greater advantages (Sturgeon 2003). Having said this, even the companies interviewed did not claim to have actively participated in development of the proposed scheme, but were merely aware of it. Thus, the development of the MSC-ASC standards so far appears to follow the global trend away from 'relational' standards, which are formed within networks, to more 'notional' ones, which are more rigid and developed outside of the networks of those they relate to (Mutersbaugh 2005a).

5.6 Limitations

In some ways this study is limited in that it attempts to look at the implications of a certification scheme pre-emptively, before one is in place, and thus is using data to speculate on implications rather than providing empirical evidence of the dynamics of an existing scheme. This was a deliberate choice, following the logic of Chuenpagdee and Jentoft (2007) that the suitability of a sustainability governance initiative should be considered in relation to local contexts *before* it is implemented, rather than once it is already in place, to avoid "hasty and premature" management responses. This allows conservation to be proactive, not just reactive. At the same time, however, this means the analysis has relied on assumptions about the design and implementation of a future certification scheme, and the conclusions drawn may not ultimately prove applicable. A more detailed evaluation of the proposed MSC-ASC and existing FoS schemes (including document analysis and interviews with representatives) would have been very useful in focusing the discussion and recommendations. However, this was not possible within the restricted space and scope of this particular report.

It is recognised that as the interviews were conducted over a relatively short time period and were unable to include all relevant actors, the data provide only a 'snapshot' of the local dynamics, and ongoing, long-term research would doubtless deliver a more reliable analysis. Furthermore, it was not possible to secure any interviews with large traders based in Cebu,

and thus an important value chain actor's perspective is missing from the data. There was a bias in selecting for current supply chain actors, rather than seeking to include those who had chosen to leave seaweed farming, who might have provided revealing additional perspectives. The opportunity to simultaneously develop the interview guides for each group of actors based on feedback between them was constrained by logistics due to the different geographies of interviewee groups.

The extent to which conclusions can be drawn regarding a global scheme is also limited, due to the case study focus here. However, as this report has emphasised, such insight into local context is vital to incorporate into the planning of initiatives with a global focus. This study would therefore be most useful for such planning if combined with similar case studies in other seaweed production and trade systems.

6. CONCLUSION

Given the complex interplay of local trade and power dynamics revealed in this study, it is not clear that NSMD certification would be an appropriate sustainability governance mechanism for seaweed production in Danajon Bank at present. Without a clear understanding and consideration of the nuanced local context described here, it would risk reinforcing existing asymmetrical power dynamics, and in doing so might tip this imbalance further, through a return to a more captive mode of value chain governance. This is underpinned by the likelihood of it placing increased costs on the least powerful actors in the system (seaweed farmers), without a guarantee of offsetting them through financial benefits of participation. The inappropriateness of certification as a governance mechanism here is further suggested by its inability to address global climate change, which appears to be a main issue concerning all value chain actors.

I suggest that in order for a certification scheme to achieve some degree of success in this context, it would need to be managed with a conscious consideration of its influence on local power dynamics, to ensure farmers have sufficient power to participate. At the most simple level, this would involve ensuring adequate training, so that farmer capacity could increase with the increasing complexity and codifiability of transactions in the value chain, resulting from the addition of 'credence values' to seaweed as a commodity. This might lead to a more

modular overall mode of governance, in which power dynamics were more balanced. However, as we have seen, overall modes of governance do not necessarily align with more immediate forms of co-ordination, so this shift would not necessarily improve power imbalances at the local level.

A more radical move would be for a certification scheme to go beyond mere ‘participation’ and capacity building, and instead place the control of the scheme’s development and implementation directly into the hands of the farmers, thus providing them with a new source of power in the system. It is hard to imagine how this would work in practical terms though, given the lack of structural or institutional organisation in the current system, particularly at the *barangay* level in which farmers operate.

Beyond these discussions, however, we must recognise that even if a certification scheme focused on seaweed production were to be successfully implemented and taken up, it would still not tackle some of the key issues concerning stakeholders, such as climate change and the impacts of other local industries. Perhaps, then, certification is not the most appropriate tool for this system.

Further studies are needed are needed to develop these thoughts. In particular, ongoing analysis of the proposed MSC-ASC scheme, during its development and eventual implementation, would provide useful empirical insights. With an appreciation of the different scales and geographies at which power dynamics operate, further case studies of this kind are needed in other areas of seaweed production and trade. In this way, it is hoped that this study can contribute to a global-scale, but locally sensitive, picture of the varied contexts in which seaweed production and trade occur, and thus support the development of a more effective global sustainability governance mechanism.

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