

Sustainable Governance of Marine Fisheries: A Socio-Ecological Embeddedness Perspective

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Abstract

The first objective in this paper is to propose *socio-ecological embeddedness* (SEE) as a normative analytical construct to interrogate sustainable governance of marine fisheries. The concept of embeddedness is underpinned by the notion of socio-economic and bio-physical systematic interdependencies. The second objective is to undertake a preliminary assessment of embeddedness of New Zealand's commercial, Maori and recreational fisheries. Our analysis demonstrates that a significant outcome of recent (post-1984) fishery reforms is unequally re-defined property rights. Consequently, the socio-ecological embeddedness of New Zealand fisheries is uneven and asymmetrical between and within different fisheries and across multiple spatial scales (globally to locally). The unequally defined property rights have generated continued social conflict including concerns about the ecological health of fisheries.

1. Introduction

New Zealand's quota management system/individual transferable quota (QMS/ITQ)-based fisheries regime is often held up as a successful blueprint for the rest of the world as a bio-economic policy paradigm to engender sustainable yield management and industry competitiveness. But is the New Zealand QMS/ITQ paradigm that progressive really from a socio-ecological

sustainability perspective in terms of the management of the three fisheries (commercial, Maori and recreational) within the bounds of this bio-economic paradigm?

The concept of embeddedness is underpinned by the notion of socio-economic and bio-physical systematic interdependencies (von Benda-Beckman, von Benda-Beckman and Wiber, 2006). Embeddedness is an important factor in the success of natural resource management policies from a sustainability perspective (McCay, 1996; 2001). Socio-ecological embeddedness of diverse groups of fishers can contribute to institutionalising sustainability in the fisheries sector via collective action and social learning involving independent users, authorities and wider communities (Warner, 2007; Gray, 2005; Jentoft, 2005).

Our first objective in this paper is to propose *socio-ecological embeddedness* (SEE) as a normative analytical construct to interrogate governance of marine fisheries from a sustainability perspective. The second objective is to undertake a preliminary assessment of embeddedness of New Zealand's commercial, Maori and recreational fisheries.

The paper is organised as follows:

We posit in section 2 that the SEE construct can serve as a useful conceptual lens to aid critically informed analysis of sustainable governance of natural resource-based complex socio-ecological systems such as marine fisheries. The New Zealand empirical study that follows (sections 3 and 4) provides a preliminary assessment of socio-ecological embeddedness of the QMS/ITQ based marine fisheries.

Our analysis demonstrates that a significant outcome of recent (post-1984) fishery reforms is unequally defined property rights. The reason for this is that the recent fisheries reforms have evolved in an incremental and disjointed fashion in order to address problems created by the first round of reforms beginning in 1984 to create a market-led rights based commercial fishery. Overriding importance

attached to narrow economic objectives is the single most persistent attribute of the entire reform process to-date. Big picture inter-related social and ecological issues were not seen as significant policy concerns during the mid 1980s by the QMS policy entrepreneurs until politically compelled to do so initially by Maori and subsequently by the recreational fishers and environmental NGOs.

As a consequence of unequally defined property rights, the socio-ecological embeddedness of New Zealand fisheries is uneven and asymmetrical between and within different fisheries and across multiple spatial scales (globally to locally). The unequally defined property rights have generated continued social conflict including concerns about the ecological health of fisheries. Complexity and transaction costs associated with the QMS fisheries have also progressively increased, particularly for commercial stakeholders, contrary to objectives of architects of the QMS regime to fashion devolved, self-regulated fisheries.

2. Embeddedness as an analytical construct

As an analytical lens, the concept of embeddedness has roots in a number of social science disciplines. The proposed SEE construct in this paper draws on recent scholarship in three foci of research: *social embeddedness* (Polanyi 1944; Granovetter 1985; Hess 2004), *multi-functionality* in rural landscapes (Wilson, 2009) and *common pool resources* (Dolsak and Ostrom, 2003). Notwithstanding criticism of embeddedness as a fuzzy concept in its usage and definition (Markusen, 1999; Hess, 2004), the different uses of this term share a common emphasis on helping to promote an understanding of network governance.

2.1 Socio-ecological embeddedness

For the purpose of this study, we define the concept of embeddedness as socio-ecological embeddedness in order to emphasise the fundamental attributes of marine fisheries as complex socio-ecological common-pool resource systems. The SEE construct

builds on work of recent writers on ecological embeddedness who argue that the “notion of embeddedness can [...] be extended to include natural, as well as social, relations (Murdoch et al., 2000).” Whereas the social embeddedness approach emphasises embeddedness of the economy in social and cultural institutions, the ecological embeddedness approach emphasises embeddedness of the economy in the bio-physical environment (Paavola and Ropke, 2008: 15). An understanding of social relations with nature is important since nature is not an inert object and possesses agency. The SEE approach posits that environmental problems are constructed by irreversible and path-dependent historical processes where social, economic, cultural and ecological aspects are all relevant and that these processes frequently involve conflicts (Paavola and Ropke, 2008: 15).

As an analytical construct, the relevant attributes of SEE are threefold. Firstly, there is the *social* context of embeddedness. Property and economic relations are embedded in a wider set of social relationships - in a host of social, cultural, economic and institutional norms, structures and relationships based on values shared to varying degrees by different stakeholders. Hence, designing new property rights systems- the process of restructuring relationships among rights holders and other stakeholders- can be a highly contested process (Schlager and Lopez-Gunn, 2006: 305) and the SEE construct is helpful in unravelling this.

Secondly, there is embeddedness as it relates to relations with nature, based on the imperative to recognise sustainability of complex marine eco-systems during fish harvest, including environmentally sound fishing practices and management techniques to avoid ‘tragedy of the commons’ type situations (Penker, 2006). This means looking at ecological embeddedness as a social relation, akin to the challenge of *environmentality* (making of environmental subjects) proposed by Agarwal (2005).

Finally, there is the *spatial* context, which refers to nested scales of embeddedness of fisheries in local, national and global contextual settings. The SEE approach is a useful construct to study evolution of

property forms and related institutional arrangements in discrete spatial areas. A focus on multi-level governance highlights the unevenness of change in and across the landscape and the necessary spatiality of social relations, economies, governance and nature (Jonas and Bridge, 2003).

Our focus in the following New Zealand case is to ascertain the robustness of New Zealand's QMS framework for fisheries, erected on the pillars of a bio-economic model, to embrace the norms and values of diverse stakeholders and the wider New Zealand society. For purposes of analysis, the New Zealand fisheries are divided into three sectors: commercial, Maori and recreational. The case study is based on published and unpublished documentary sources and interviews with key stakeholders.

3. Redefining property rights

Our argument in this paper is that fishery property rights are a major factor in explaining the differentiated patterns of embeddedness and disembeddedness of commercial, Maori and recreational fisheries. These rights have been radically redefined during the last 25 years through a process of political contestation. The current landscape of property rights is surprisingly complex (Yandle, 2007) and unequal.

3.1 Re-inventing commercial fishery property rights

The QMS is based on the bio-economic natural resource management paradigm, one which attempts to balance the interests of economic efficiency with biologically sustainable harvesting of the resource. Arguably, one would expect it to be most in harmony with the values and norms of the commercial fisheries stakeholders. The New Zealand experience proves this to be the case, notwithstanding continuing efforts by the commercial industry to lobby for changes to aspects of the ITQ regime to make it better suit their vested interests.

Thus, as discussed below, as an outcome of the restructuring process, commercial fisheries, now dominated by an oligopoly of a handful of large, internationally well-connected, multi-nationals, are

relatively securely embedded in the global food commodity production and consumption markets. However, within the domestic commercial fisheries sector, the former part-timers and owner operators have either been eliminated or squeezed out.

3.2 Re-inventing Maori fishery rights

The series of political challenges mounted by Maori in opposition to Government decisions to allocate property rights in perpetuity to commercial fishers have proved relatively successful leading to measures of restorative justice. Maori property rights have been partially reinstated by creating Maori commercial and customary fisheries with associated rights.

Although the level of compensation for Maori commercial property rights was decided through the Treaty of Waitangi Settlement Act 1992, the task of allocating this among Maori has proved highly contestable. Deciding on a fair allocation model took several years and involved extensive political negotiations and litigation involving individual Maori, iwi and other interested parties before the Maori Fisheries Act 2004 was passed. The Act sets out the methods to be used to allocate approximately 50 per cent of Maori commercial fishing assets, i.e. quota, cash and other assets, to iwi authorities. Under the Act, deep-water and inshore quotas have been allocated through different methods. The deep-water quota was allocated to iwi based 75 per cent on an iwi's population and 25 per cent on its share of coastline within their Quota Management Area (QMA). Inshore quota is allocated based on an iwi's share of coastline within the relevant QMA so that iwi receive the same proportion of quota as their share of the QMA's coastline.

In addition to establishing a significant stake in the mainstream commercial fisheries sector based on quota ownership, Maori also secured customary rights which entitle them to collect fish and seafood for events on *marae* (meeting houses) and for other traditional non-commercial uses. The Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 recognised customary rights of Maori and consequently included provision for Maori customary use and

input into the management of fisheries (Lawson *et al.*, 2006). Not since the signing of the Treaty in 1840 have Maori communities had significant opportunity to self-manage customary fisheries.

As discussed below, as an outcome of the above reforms, Maori have become the most dominant national player in the commercial sector and a majority of Maori appear to accept the commercial fisheries settlement as a full and final settlement of Treaty rights. However, there are outstanding concerns about the extent to which restitution measures for customary fisheries are deemed a satisfactory restitution by Maori in terms of being in accord with Treaty rights and Maori *tikanaga*.

3.3 Failure to re-invent recreational fisheries property rights

In significant contrast to rights of commercial and Maori fishers, recreational property rights have remained intact. Recreational fishery property rights are inscribed in English common law brought to New Zealand by early British settlers, and recreational fishers have nominally continued to exercise that right under the umbrella of the QMS framework. The scope of recreational rights is essentially limited to access within a *de facto* open access situation. It has proved highly contentious to re-codify that right to give it greater clarity, enhance commitment of recreational fishers to the QMS regime and at the same time to circumscribe it to allow greater certainty in setting the annual TAC take and its allocation amongst the three groups of stakeholders. There are long-standing, continuing deep-seated cleavages between recreational fishers, commercial fishers and Government on the question of extent of recreational rights and how they should be exercised as part of the TAC entitlement and spatially on the ground.

As discussed below, recreational fishers have maintained a detachment from the bio-economic underpinning the QMS/ITQ regime in order to protect their embeddedness in the wider values of recreational fishing.

4. Socio-ecological embeddedness of New Zealand fisheries reforms

In this section, we reflect on the socio-ecological embeddedness of New Zealand fisheries, as they are managed within the bounds of the QMS/ITQ bio-economic paradigm.

4.1 Socio-ecological embeddedness of New Zealand commercial fisheries

Since the implementation of the QMS/ITQ regime, many commentators have examined its effects on commercial fisheries management, its economic success, impacts on other fisheries stakeholders and its ecological sustainability (e.g. Pearse, 1991; Boyd & Dewees, 1992; Clark, 1993; Sinner & Fenemor 2005; Lock & Leslie, 2007; Knight, 2007; Memon and Cullen, 1992; 1996; Hersoug, 2002). This evidence is illustrative of differentiated processes of embeddedness and disembeddedness of commercial fisheries. As discussed below, economic restructuring of commercial fisheries has been successful in embedding them in the global food chain of production and consumption. However, from a regional and local perspective, on the basis of available evidence, the pattern is variable.

The ITQ regime for commercial fisheries can be credited for having established a globally competitive modernised fishery within the last 25 years. Thus, Pearse (1991: 6), for instance, argues that “the quota system can be credited with improving the management of stocks, reducing redundant fishing capacity, alleviating conflicts over the allocation of catches, substantially improving the economic returns from fishing to both the fishing industry and Government, and reducing pressure on fisheries managers.” Another author who looks positively on the developments in commercial fishing is Clark (1993: 341), who argues that “very simply, the New Zealand Quota Management System has been successful in addressing the twin objectives of conserving and protecting the resource from over-fishing and improving the economic performance of the commercial industry.”

The last 30 years have seen New Zealand's seafood industry develop from a small domestic supplier to one of the nation's most important export industries. Increases in export earnings can largely be attributed to the development of deep-water fishing programmes. This progress has relied heavily on joint foreign venture partnerships as the existing domestic fleet lacked the ability to fish effectively in deeper waters (Bess, 2006: 368). An illustration of the impressive growth of export earnings is found between the years 1990 and 1992, where a total of worth \$1.22 billion was exported, a 65.5 per cent increase (Bess, 2006: 368-269). This rate of growth was not sustained, but increases occurred. For example, in between the years of 1996 and 2007 the value of exports had risen dramatically by a total of 40 per cent from \$2.7 billion to \$3.8 billion (MFish, 2009).

New Zealand, along with Iceland, manages fisheries through a comprehensive nationwide quota management system. What this allows exporters is the luxury of a *guaranteed* proportion of the fish stock, and a TAC system, which if working effectively, means the stock size is secure (Bess, 2006: 375). This allows New Zealand exports a level of security over their resource that is unavailable to most international competitors.

The success of the QMS to set up a commercial export industry is evident to all observers. However, from wider social and ecological perspectives, the embeddedness of New Zealand's commercial fishery is debatable. The changes to management of New Zealand's commercial fisheries through the QMS/ITQ regime have had vast impacts to the makeup of the fishing industry, the way businesses are run and the opportunities for profitability. For example, following the introduction of the QMS within a few short years as many as 1800 small part time fishing enterprises (85 per cent of which were Maori) were forced out of the commercial fisheries (Webster, 2002). Fishing in New Zealand transformed from a casual part-time, artisanal industry to a relatively capital intensive globalised industry with high entry costs.

The possible disembodiment of regional social effects of private

rights-based commercial fishery are illustrated in Knight's (2007) case study of the commercial Bluff Oyster fishery in the South Island. The author examines the inter-twined social and environmental changes which occurred to the Bluff Oyster fishery after it was incorporated into the QMS in 1996, and the impacts upon notions of *belonging* and ownership in the fishery. Since the 1980s the Bluff Oyster fishery has faced serious stock declines, producing as little as seven per cent of its former take (MFish, 2006a cited in Knight, 2007). As a possible solution to this crisis the Ministry of Fisheries placed the harvest within the limits of the QMS.

What Knight (2007: 78) found is that the "Bluff oyster fishery [has] a distinct industrial character in the separation between fishermen and boat owners", and the introduction of the QMS disenfranchised the former. Oyster boats, processing units and distribution are run and owned by the 'oyster merchants' and the fishermen were paid by these merchants on the basis of how many oysters they caught. Quota was granted solely to the 'oyster merchants', silencing the fisher's voice in the management of the fishery which had previously existed through the oystermen's union.

A plan for the fishery which emerged ten years after it was placed in the QMS ignored the input from conservation-minded fishers and rather towed the status quo views of the oyster-merchants. According to Knight (2007: 83-84) this has led to a number of poorly thought out decisions which have threatened the ecological sustainability of the resource. For example, oyster mortality in the area periodically increases by disease in the fishery. Oyster merchants and the Ministry of Fisheries argue that if the oysters are going to die, they might as well catch them. This juxtaposes with the logic of conservation-minded fishermen who point out the difficulty of knowing which oysters will die of disease and which will not, and that in this case it is better not to catch any oysters at all to let stocks rebuild themselves. According to Knight (2007: 84) the argument that it is better to catch oysters before they die of disease is akin to arguing they should "be caught before someone else catches them", the situation which leads to the tragedy of the commons.

Knight (2007: 87) concludes by arguing:

The institutions of ownership and property rights that now restrict involvement in the QMS to those with ITQ have resulted in the exclusion from management of a range of viewpoints that had traditionally informed the fishery, and the association between belonging and the resource has broken down... For property rights to work well they must refer to this social basis and they should be embedded in the culture of the commons.

This case study illustrates the difficulties in granting property rights to a resource previously held in common. The rich history of inshore oyster fishing in Bluff makes it even more difficult, and the failure to recognize these issues on the part of the Ministry of Fisheries has disembedded the local fishermen from their livelihood. The previous networks of fishermen which informed the management of the fishery have broken down, leading to decisions that Knight (2007: 83) argues “are based on short-term economic needs.”

4.2 Socio-ecological embeddedness of Maori fisheries

In this section we examine the degree to which the QMS-framed Maori commercial and customary fisheries can be considered as socio-ecologically embedded within Maori values, expectations and practices relating to fisheries. A key question is the extent to which the fishery restitution processes will enable urban and rural Maori to re-build closer links with their fisheries. Restitution of historical grievances is never an easy task, and one of the major hurdles encountered during this process is related to the extensive demographic changes within Maori population since the signing of the Treaty of Waitangi. Maori comprised an overwhelming majority of the New Zealand population in 1840. Presently however, Maori constitute around 15 per cent of the total population, with around 80 per cent of Maori living in urban environments. Equally significant is the relatively large number of urban Maori population, around 30%,

who do not have allegiance to any *iwi* (tribe), or tribal organisation (Van Meijl, 2006: 179). This has bred conflict within the restitution process because it becomes difficult to know who in particular the Crown ought to negotiate with, as the 1992 Treaty of Waitangi (Fisheries Claims) Settlement Act at various times states that the beneficiaries of the wealth transfer are to be ‘all Maori’ (Van Meijl, 2006: 178).

The split between urban/rural Maori, and those affiliated or not affiliated with traditional *iwi* organisations presents a challenge to effectively granting ‘all Maori’ a part of the settlement riches. Van Meijl (2006: 183) succinctly sums up the situation by observing that “the need to provide social or distributive justice alongside historical or reparative justice has played a prominent role in the debate between the tribal organisations represented by Te Ohu Kai Moana and urban Maori authorities that were also seeking a share of the settlement.”

Thus, attempts by Te Ohu Kai Moana to reach a collective agreement on how best to allocate its fisheries resources amongst all Maori saw frequent litigation between itself, (politically dominated by rural Maori interests), and incorporated urban Maori authorities. In 1995 a case was filed with the New Zealand High Court in order to prevent Te Ohu Kai Moana from allocating the fisheries assets granted to them solely to *iwi*. This created a process of back and forth litigation, which saw the Court of Appeal define *iwi* as ‘nation people’ rather than ‘tribe’. This decision was subsequently quashed by the Privy Council of London, which argued that the definition of *iwi* given by the Court of Appeal was outside the jurisdiction of the case it was judging. Concluding the debate when it returned to New Zealand was Justice Paterson (1998: 82) who ruled that the phrase *iwi* referred only to traditional tribes, and not to newly incorporated urban Maori organisations. The decision, however, noted that these ‘traditional’ *iwi* had a responsibility to ensure that all Maori were to benefit from restitution process.

The above discussion highlights that urban Maori or Maori who are not directly linked to a ‘traditional’ tribal unit may have been

marginalised in the process of fisheries restitution. The urban segment of Maori population is not insignificant in terms of size, yet, as noted above, litigation failed to legitimate official recognition of urban Maori organisations as *iwi*. Arguably, this means that *iwi* Maori, many of whom also reside in cities, have been the major beneficiaries of fishery Treaty settlement in terms of both establishing a significant stake in the mainstream commercial fishery and opportunities to rehabilitate customary fisheries within their rohe (tribal territories). In comparison, urban Maori not only have a smaller foothold in the commercial sector but also very limited opportunities to re-establish closer customary links with fisheries. The latter is a significant concern in view of increasing population pressure in Auckland, New Zealand's largest metropolis, on inshore fisheries.

4.3 Conflict between Maori customary and commercial interests

Stronger embeddedness of Maori customary and commercial fisheries within Maoridom has also been hampered by conflict which emerges when the customary and commercial rights granted under Crown restitution clash with each other. This conflict is summed up by the Ministry of Fisheries, when they state:

In the fisheries area, the results of the major agreements and legislation have resulted in a distributed (or fragmented) allocation of rights. Some commercial rights are now held directly by *iwi* organisations, some are held by Te Oh Kai Moana or its subsidiaries on behalf of *iwi* beneficiaries, and participation rights are owed to *iwi* and hapu (tangata whenua). In addition, a number of *iwi* organisations now have aquaculture rights and individual tribal members still participate as amateur fishers (MFish Senior Leadership Team: 10).

As well as the conflicts highlighted above, there are often disagreements internally when *taiapure* or *mataitai* marine reserves are established, much to the chagrin of commercial fishers, including

Maori. In some instances, certain hapu take either part, or full control of a locally important fishery, and can therefore ban commercial fishing interests if it is deemed in the best interest of the ecosystems health. With Maori now being a large player in the commercial fishing industry, this can create conflicts between commercial Maori and customary Maori interests, especially in regards to those fish regarded as 'taonga species' (Mfish, 2008: 11). It is argued that in these cases, the Ministry of Fisheries often engages directly with the non-commercial customary interests and fail to include tangata whenua representatives who speak in regard to commercial matters (MFish, 2009a: 1). A variety of arrangements has been suggested by the Ministry of Fisheries for bringing together the relevant Maori stakeholders, and involving everyone in a mutual decision making arena. For example: iwi regional engagement forums, fisheries plans and iwi *rohe moana* management plans, all of which are designed to bring commercial and non-commercial iwi fishing aspirations together (MFish, 2009a: 3).

These conflicts signify a social disembeddedness of Maori fisheries, with Maori groups requiring the other partner in Treaty negotiations (the Crown) to set up institutional forums so they can negotiate over the newly found rights granted to them through the reparations process. If these conflicts continue to occur, the fisheries will fail to be managed in the best interest of Maori, or of the fishery itself, and will continue to be used as a weapon for litigation.

4.4 Embeddedness of recreational fisheries

In this section, we reflect on the socio-ecological embeddedness of the recreational fishery, as it is managed within the bounds of the QMS bio-economic paradigm, within the values and norms of the relatively large but fragmented community of recreational fishers.

Arguably, as discussed below, the creation of the QMS bio-economic regime has created political pressures to disembed recreational fishers from traditional values and norms underpinning the recreational fishing culture. Unlike Maori customary fishers whose Treaty rights were delegitimised during the course of much of

the twentieth century, recreational fishers claim to have exercised a legitimate longstanding common law right to fish, dating back to the 1860s. They have fought hard since the introduction of the QMS to retain that right intact by rejecting pressure from Government and commercial fishers to bring recreational fisheries more closely within the regulatory ambit of the QMS. The shared objective of the Government and industry is to circumscribe more closely the *de facto* open access recreational rights and to more effectively monitor recreational take for regulatory purposes. The longstanding impasse has now reached a deadlock.

Currently, customary rights take priority during the QMS allocation process and commercial fishers have a defined property right to a specific proportion of the TAC. This property right empowers commercial fishers to negotiate with the Minister over TAC reductions, and to demand for compensation when they are reduced. Although there is no *priority* right of commercial fishers over recreational, ITQ property rights give an upper hand to commercial fishers within the quota allocation process than the more limited access rights do for recreational fishers.

Comparatively, commercial fishers are also better connected within the formal and informal networks of governance, with influential advocacy organisations such as the New Zealand Seafood Industry Council (SeaFIC) representing commercial interests. SeaFIC (2009) describe themselves as a collective body which focuses on “shaping policies and the industry’s regulatory framework, lobbying for surety of access to fisheries, reducing tariffs [and] working co-operatively on fisheries management and environmental issues.” Recreational fishing organisations on the other hand are fragmented, with a variety of groups representing recreational fishers and their interests. This reflects the traditional values of recreational fishers and the fact that they are not driven by a narrow economic rationality as commercial fishers are.

An attempt to more closely regulate recreational fishers within the QMS was the focus of the Ministry of Fisheries (2000) *Soundings* policy initiative. This proposal outlined three possible

methods for managing allocation of fisheries between recreational and commercial interests, the first of these being to retain the contemporary status quo where the Minister determines the final allotment. The second proposal was to fix a proportion of the harvest between both groups, with the Minister setting the TAC and allowing for customary harvests before doling out the rest through pre-agreed recreational and commercial proportions. The final option also argues for a proportional system between commercial and recreational fishers, but encouraged recreational management of certain fisheries with cooperation between recreational managers, the Government and commercial interests.

Opposition to the above three proposals provided the impetus for the formation of the recreational fishing lobby group '*option4*', the phrase *option4* illustrating they were unhappy with the three alternatives for allocation presented by the Ministry of Fisheries. The basis of the *option4* movement is a desire for relative priority in the setting of the TAC over commercial fishing interests. This collaborative lobby group has proved to be surprisingly effective in stalling any moves to re-define recreational rights.

The recent Kahawai fisheries allocation court case is another instance of a collaborative effort on behalf of several recreational fishing and customary Maori interests to challenge TAC allocations in court. The New Zealand Big Game Fishing Council (NZBGFC), the New Zealand Recreational Fishing Council (NZRFC) along with *option4* and Te Runanga A Iwi O Ngapuhi joined to make a collective effort to legally challenge how allocations are set. Recreational fishing organisations as already described have been far more disparate and disconnected in the past in comparison with commercial fishing groups, and this development may be seen as a move toward attempting to embed themselves more powerfully within the non-commercial political constituency.

Nevertheless, in the short-term, it appears unlikely that QMS allocation processes will be changed to give recreational interests a priority right over commercial fishers. At the same time, it seems unlikely that recreational interests will budge on this demand,

creating a gridlock between fish managers and the most populous resource users. With a growing population putting pressure on heavily used inshore fisheries, it is becoming more difficult for recreational fishers to secure their goal of seeing 'more fish in the water' without placing extensive restrictions on commercial fishing. These restrictions appear unlikely because of the property rights being granted to commercial fishers in perpetuity, and the great expense that would occur from buying this quota back.

5. Discussion

Driven by globalization of ocean governance, the decision by New Zealand to adopt the QMS in 1986 marked the beginnings of a fundamental realignment of institutional arrangements. In hindsight, a manifest success of the QMS has been to embed the emergent New Zealand seafood industry within global commodity production and consumption markets. This accomplishment has led a number of commentators to deem the QMS a world leading policy framework for managing complex socio-ecological systems. What our analysis has shown is that the degree to which the QMS has socio-ecologically embedded all the relevant diverse stakeholders by recognizing their values and norms is more debatable.

The definition of commercial property rights under the QMS regime actualises the values and norms of the commercial fishing industry relatively well; however examples exist, for instance the Bluff Oyster fishery, of how the introduction of private property rights could disembed certain fishermen. The boundaries of the QMS regime have been stretched as an attempt to re-legitimise Maori fisheries values and Treaty rights. Although it is a great step forward, it is still up for debate as to whether urban Maori and customary fishers will significantly benefit from this process. Finally, it has proved difficult to effectively recognise the values and norms of recreational fishers within the QMS framework. This is manifest in their longstanding opposition to the QMS TAC setting process, and rejection of periodic initiatives, backed by the industry, to reinvent recreational rights as part of the QMS property rights scheme.

6. Conclusion

The institutional design of the QMS has helped socio-ecologically embed New Zealand fisheries and its stakeholders in a variety of different spatial contexts. But often the successful embedding of one sector (e.g. commercial export industry) has led to others becoming relatively disembedded, powerless and antagonistic. Specifically, the New Zealand recreational fishing sector, the non-iwi Maori and Maori customary fishers have felt themselves become more and more disembedded in relation to the growth of the now powerful seafood export industry. This is a symptom of complexity in contemporary New Zealand fisheries management, which is much greater than what was envisioned by the architects of the QMS.

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