Total Allowable Catch (TAC), Individual Transferable Quota (ITQ) and fishing fee for commercially exploited fish species in Iceland[i]

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Brief summary of the case

Following over-exploitation and stock decline, Iceland introduced a fisheries management system in 1990 that is largely based on market measures. Its cornerstones are Total Allowable Catch (TAC) limits set annually for different species based on scientific advice, Individual Transferable Quota (ITQ) meant to promote rationalisation and increase sector profitability and a fishing fee adopted to put a fair price on the fishing sector's access to a public good and channel the revenue back into society.

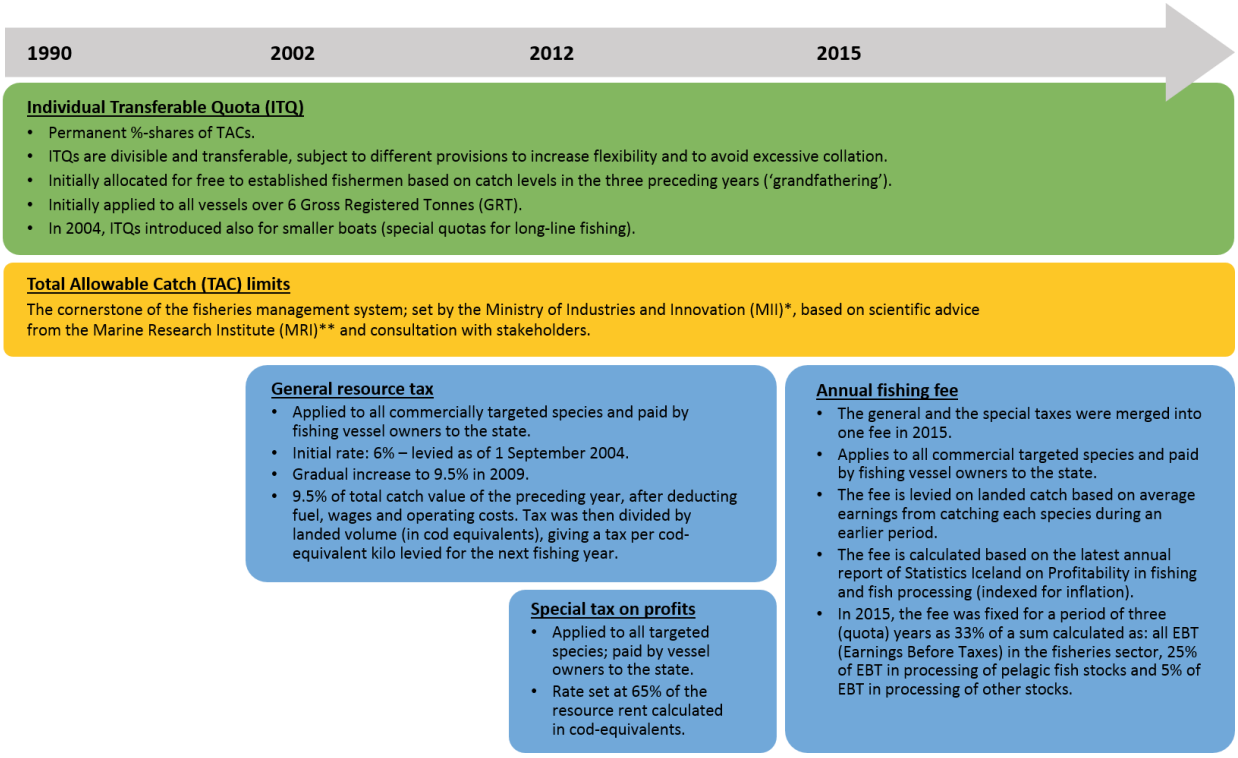
The scheme is often referred to as a relative economic and environmental success, but it has also created social controversy, e.g. in terms of regional development and accumulation of power and wealth to some at the expense of others. Since the adoption of the ITQ system, the level and diversity of stakeholder participation in developing the scheme has diminished, with most influence exerted by a small number of large fishing companies. Scientists provide advice to policy makers and civil society can comment on proposed management changes via a parliamentary review process, although this opportunity is primarily used by organisations with close links to the large fishing companies.

Key Icelandic stakeholders demand more participation, especially in decision-making. Interviewees for this case study have witnessed an increased public scepticism and scrutiny of the scheme in recent years and suggest that a recent series of drastic cuts in the resource tax rate might be a central topic in the forthcoming elections, as the tax is generally supported by the public. The perceived lack of stakeholder participation could be addressed by more adaptive co-management, and by measuring success in social as well as economic and biological terms. Future reform options are complex, however. For example, increasing the tax rate is likely to hit less competitive companies and risks further concentration of power. In parallel, prolonged discussions about a new article in the Icelandic constitution on ownership of marine resources and access payments might be concluded in the coming years. This is a crucial step in the development of the policy as its outcome will influence the instrument's design for decades to come.

The Icelandic case offers several lessons in terms of replicability, especially when it comes to balancing the pursuit of efficiency and effectiveness with distributional equity and instrument acceptability. Overall, a more equally weighted participation of different stakeholder groups than is currently the case in Iceland could help ensure more holistic and sustainable fisheries management.

1 Description of the design, scope and effectiveness of the instruments

1.1 Design of the instruments



* The MII was created in September 2012 through amalgamation of the Ministry of Fisheries and Agriculture, the Ministry of Industry, Energy and Tourism, and part of the Ministry of Economic Affairs.

** The MRI is an independent research institute conducting stock assessments and providing fisheries advice. MRI is active in, e.g., the International Council for the Exploration of the Sea (ICES).

Figure 1 Key instruments of the Icelandic fisheries management policy, primary elements of their design and their development over time. Source: Own illustration.

1.2 Drivers and barriers of the instruments

Fisheries and auxiliary businesses have historically been the backbone of the Icelandic economy, to the extent that changes in fish catches and export prices of marine products have been leading sources of fluctuation in economic growth as well as living standards for most Icelanders (Eythórsson, 2003; Newman and Mazza, 2013; Central Bank of Iceland, 2014). Commercial fishing in Iceland for a long time reflected the evolution of industrial-scale fishing around the world – open access to economically attractive stocks gradually led to classic-case Tragedy of the Commons, over-investment in fishing capacity and ultimately over-exploitation and stock decline. Further, following the international recognition of national jurisdiction and control of a 200 nautical mile Exclusive Economic Zone (EEZ) in the 1982 United Nations Convention on the Law of the Sea (UNCLOS), the rights to, and responsibilities for, most of the commercial stocks in this part of the Atlantic were granted to Iceland. Although there were hopes in Iceland that keeping foreign fishing vessels away would improve the status of stocks, the high fishing pressure in Icelandic waters was maintained by an expansion of the domestic industry. In the mid-1980s, it became obvious that fishing effort had to be controlled both as a part of Iceland's resource management commitments under

UNCLOS and as a means of distributing revenues and securing the profitability of the industry (Holm et al., 2015).

Regional domestic differences have also played a role in the development of the policy. The Minister of Fisheries in the mid-1980s, Halldor Asgrimsson, came from the Eastern region which supported the introduction of catch quotas. Asgrimsson worked closely with the powerful Association of Fishing Vessel Owners, and together they were instrumental to the emerging adoption of quotas (Newman and Mazza, 2013). After a decade of gradual adoption of quota schemes to key stocks and trialling quota transfers between fishermen, the 1990 *Fisheries Management Act* established a system of Individual Transferable Quotas (ITQs) (see Figure 1). In contrast to schemes in most other countries, the Icelandic system of ITQs as permanent shares of TACs gives fishermen the incentive to support lower TACs in order to maintain the value of their quota (OECD, 2014). The transferability of quotas is intended to promote rationalisation and increase profitability in the industry (Iceland Responsible Fisheries, 2016).

The 1990 Act – the heart of the Icelandic fisheries management system[1] – has since undergone a series of changes. Importantly, the system was criticised early on for giving quota holders – free of charge – the rights to, and sole discretion to accrue revenue from, a public good. To try to alleviate public discontent, levies were introduced for quota holders to finance a Fisheries Development Fund and fisheries monitoring and surveillance (Haraldson and Carey, 2011). In the 2002 amendment of the Act, this fee was replaced by a general resource tax (Newman and Mazza, 2013), and in 2012, a special resource rent[2] tax on extra profits was introduced to capture more of the industry's resource rent. The tax rate was established annually by the Parliament and since the current Government took power in 2013, the rate has been gradually lowered by almost half. In 2015, the two fees were merged into one annual fishing fee set for three years, after which a new revision will take place (see Figure 1) (interview with government official, 09.08.2016).

One of the primary barriers throughout the development of the scheme has been that the fishing industry, having previously had free and unlimited resource access, has resisted regulatory restrictions, in particular resource taxes. This resistance is still a policy challenge with heated debates about the most appropriate level for the tax. Another barrier influencing the design of the policy has been the issue of regional development and the concern that ITQs exacerbate the migration of people to the Southwest (capital area). Measures to alleviate this effect include e.g. the exemption of smaller vessels from the ITQ system at the start of the scheme, and allowing fishers using onshore baited long-lines to double their catches in demersal species (Haraldson and Carey, 2011).

According to the OECD (2014), the Icelandic Government's goal with the present fisheries management system is partly to diversify the export base by reducing its reliance on fisheries. The economic dominance of the sector is in fact declining, with fish and other marine products accounting for 45% of goods exports and 27% of total exports in 2013, down from 63% and

[1] In addition to the ITQ system, Icelandic fisheries management includes many other measures, such as area and fishing gear restrictions (OECD, 2013).

[2] Income from resource extraction in excess of extraction and exploration costs, including return on capital employed (Grafton et al., 2004). Resource rents are usually paid by a commercial enterprise to the state (Matthiasson, 2008).

41% respectively in 2000 (the Central Bank of Iceland, 2014). Meanwhile, capital and capacity continues to agglomerate to a handful of large fishing companies, at the expense of smaller operators around the country.

1.3 Revenue collection and use

The current fishing fee is paid by fishing companies to the state, but according to an official at the Ministry of Industries and Innovation, there are no total calculations of tax revenues raised, how this has fluctuated over time or overview of how the revenues have been used (interview, 09.08.2016). Matthiasson (2008) estimated that in the first year of the initial tax (2002), the 9.5% rate contributed ISK 2.1 billion to the Icelandic state. Revenue from the fee for the quota year 2014-15 has been estimated at approximately ISK 8 billion (the Central Bank of Iceland, 2014) and approximately ISK 5 billion for the quota years 2015-16 (the first year of the merged tax) and 2016-17 (Ministry of Industries and Innovation, 2016). The revenues are used by Government to help finance the running of the fisheries management system. However, according to the government official, the fee is now so low that it barely covers basic costs (interview, 09.08.2016).

1.4 Environmental impacts and effectiveness

The environmental impacts of the scheme primarily relate to changing levels of fishing pressure on commercially targeted stocks, and any resulting secondary effects on other species and habitats. Since the introduction of ITQs in Iceland, many stocks have slowly increased[3], in particular the valuable cod stock where TACs and scientific recommendations have gradually aligned[4]. The scheme has led to a more efficient industry, technological development, lower emissions, newer ships and an overall lower cost of fishing (interview with government official, 09.08.2016). However, it is important to consider the development of Icelandic stocks in relation to stocks in other areas. A representative of the Iceland Nature Conservation Association (INCA) argues that the Icelandic scheme looks especially successful when compared to 'how poorly the EU and many other states have managed their fisheries'. He notes that it has taken 10-15 years to reverse negative trends in Iceland, and that stocks are still far below the levels in the 1970s (interview, 09.08.2016). According to Kokorosh et al. (2015), on the other hand, 69% of key stakeholders think the current management scheme has been effective when it comes to conservation of fish stocks.

Figure 2 below illustrates the performance of the fisheries management policy over time in terms of cod catches in relation to gross output of fishing activity.

[3] Spawning stock of Golden Redfish has increased steadily over the last 20 years, for example. However, spawning stock of haddock has decreased quickly in the last 10 years and halibut stocks are still in a very poor state (MRI, 2016).

[4] Thanks to implementation of a total catch rule in 1995-96 and to some extent also to an efficient monitoring and enforcement system (Haraldson and Carey, 2011).

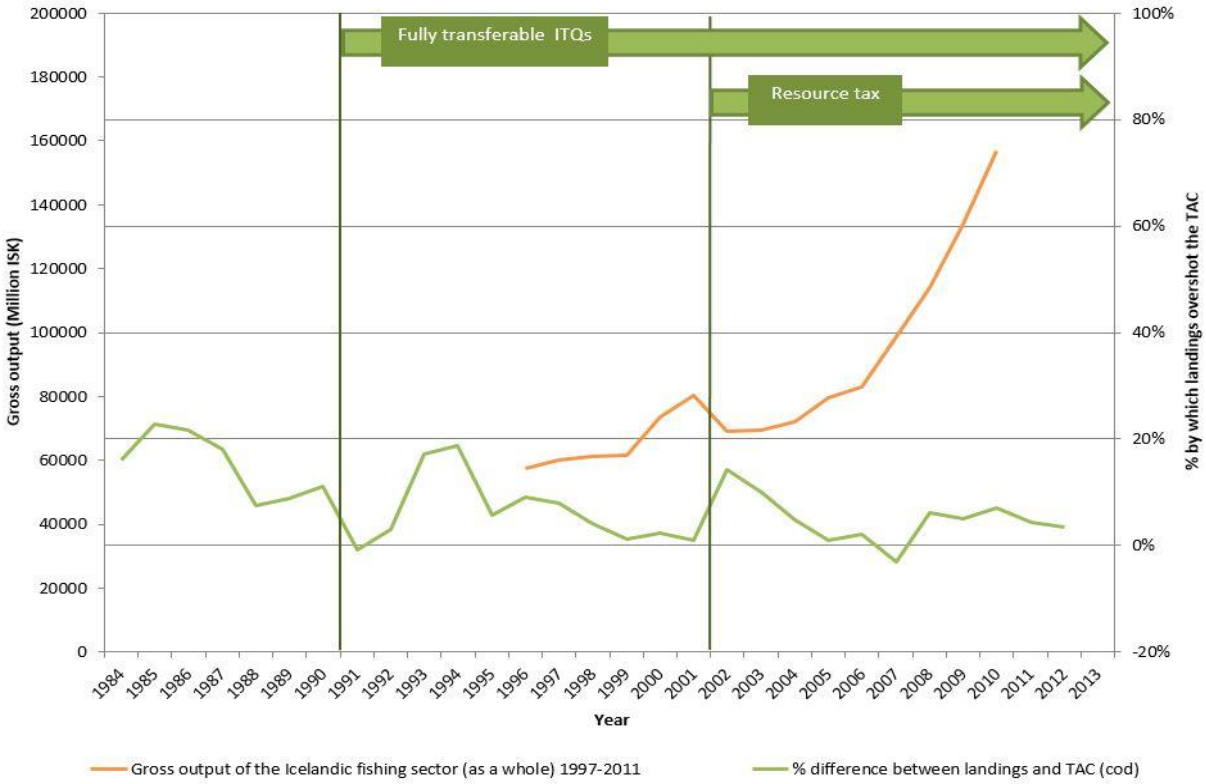


Figure 2 Environmental performance of the policy (cod landings[5]) in relation to sector gross output. Source: Statistics Iceland. Illustration by Newman and Mazza (2013)

1.5 Other impacts

Since the introduction of the ITQ system, when the profitability in the fisheries sector was poor (Arnason, 2008), unprofitable fishing companies have gone out of business while others have merged and rationalised their operations (Gissurarson, 2000). This has led to declining overcapacity, increasing vessel size and concentration of quotas (Eythórsson, 2003). Fewer people are employed in the industry today than when the scheme was introduced, but technological innovation and mechanisation have affected employment over this period, and to achieve its objectives the policy would be expected to lead to job losses (Newman and Mazza, 2013). Overall, healthier fish stocks, improved quality of landed catch and improved coordination between supply and demand have contributed to a more economically profitable sector (Arnason, 2008).

On the flipside of its relative environmental and economic success, the scheme has generated a series of social controversies, some of which are still debated, particularly its implications for regional settlement and the division of the resource rent as previously mentioned (OECD, 2013). The 2012 introduction of a special resource rent tax was intended to address the latter, while Haraldson and Carey (2011) argue that migration from rural areas to the capital area has been steadily increasing already since the early 1900s. The companies going out of business have nevertheless often been small and locally important, effectively left with little

[5] Note that Icelandic fishermen are required to land all catches in the fishing gear. Discarding catch overboard is prohibited. Compliance is monitored through the Department of Quota Allocations of the Directorate of Fisheries. More information about enforcement is available here.

alternative but to sell their quota to bigger operators. According to a government official, this has resulted in a 'closed club' of a small group of companies (interview, 09.08.2016).

2 Stakeholder engagement

Key stakeholders in Icelandic fisheries management are fishing companies, fish processors, management authorities, local communities and the wider public (given the economic importance of the fishing industry). When the policy was first developed, the fisheries administration tended to consider a broad range of stakeholders in decision-making – for instance, research institutes, workers' unions, processor organisations and representatives from all political parties (although fishing communities or municipalities were not included) (Eythórsson, 2003). Since the introduction of the 1990 Act and the 'privatisation' of quotas through the ITQ system, the influence of different stakeholder groups has changed. According to Kokorosh et al. (2015), except for setting the annual TACs (and officially holding the power to change the policy altogether), government authorities have limited influence in Icelandic fisheries management. Instead Kokorosh et al. argue that by far the most influential stakeholder group has been quota holders, represented today by the association Fisheries Iceland (LÍÚ). According to a representative of the Iceland Nature Conservation Association (INCA), the fishing industry has led the development of the policy from the beginning and has been able to design it according to their needs (interview, 09.08.2016). Matthiasson (2003) argues that Icelandic fisheries management is a 'closed-shop policy' with the governmental institutions remaining in a passive role and allowing LÍÚ significant influence over political decision making. While the development of the efficient modern Icelandic fishing industry has contributed greatly to the economic development of the nation, over half of all quotas are now owned by a handful of large, influential companies (interview with INCA representative, 09.08.2016). Vessel crew members, on the other hand, are considerably less powerful and represented by several different unions with little cross-group unity (Kokorosh et al., 2015). The INCA representative feels that, overall, civil society has had very limited influence in the implementation and enforcement of the policy (interview, 09.08.2016).

Meanwhile, the government official is of the opinion that civil society has had a lot of involvement in the evolution of the scheme and that there is a very open consultation process. He refers to a parliamentary review system that offers a window for civil society to comment on proposed updates to the legal instruments. The latest change to the policy, in 2015, received 27 external comments (interview, 09.08.2016). The governmental official also notes that most stakeholders reviewing the legal changes have been directly or indirectly linked to the large fishing companies and that the only NGOs active in the development of the fees have been those that are closely linked to the fishing sector (interview, 09.08.2016).

Further, a 'Fishing Fee Committee', comprised of economics, fisheries and accounting experts, is responsible for calculating the annual fishing fee (see Figure 3) (Ministry for Industries and Innovation, 2016). Criticism has been raised that other social scientists (except for economists) are largely excluded from the scientific stakeholder group (Kokorosh et al., 2015). Kokorosh et al. (2015) conclude that as Icelandic fisheries management has become more complex, less stakeholder involvement has been granted from policy makers.

It is evident that the Icelandic policy scheme has been controversial from the beginning, and debates are still ongoing. Defenders include the industry, emphasising for example the rationalisation and significant value creation generated by the scheme. Opponents point to fisheries dependent communities having experienced quota sell-outs, resulting in local job

losses and depopulation, and unfair distribution of prosperity where a minority has become rich at the expense of others. This criticism was aggravated in 2003, when the Icelandic Government lost a case brought before the UN Human Rights Committee, in which rural fishermen claimed they had a birth right to access local fishery resources. After the ruling, a new cod quota allocation was introduced, open to all Icelanders fishing with smaller vessels and using hand jigging. However, there was no major reorganisation of the ITQ system (Holm et al., 2015).

Nevertheless, the government official interviewed for this case study believes that many Icelanders would still say that Iceland has the best fisheries management system in the world (interview, 09.08.2016). The INCA representative suggests that there is reason to be critical about the level of detailed knowledge among the public, however. He argues that, over the years, not many Icelanders have paid close attention to the statistics, but rather based their views on the positive remarks about Icelandic fisheries management made by the Parliament and the industry. At the same time, he feels that there has been growing public scrutiny and intolerance in recent years towards the industry and 'their rough measures' to get their way in politics. He argues one reason for this could be that as more and more Icelanders live in the capital area, new generations lose the connection to fishing as an identity and begin to look more critically on the industry and its dominance (interview, 09.08.2016).

Based on a survey among key stakeholder groups, Kokorsch et al. (2015) show regional differences in both the critique of the ITQ system and proposed alternative instruments. Overall, respondents demand more stakeholder participation, especially in data gathering and decision making which have both decreased over time according to the study. Meanwhile, a national survey of small-boat fishermen (Chambers and Carothers, 2016) has shown that nearly all fishermen are critical of Icelandic fisheries management, with quota holders more satisfied with the current system than those who do not hold quotas. Dissatisfaction stems especially from a lack of decision-making power, distrust of scientific advice, and the perception that the ITQ system does not serve the purpose of protecting fisheries resources, but is oriented only toward economic goals.

Throughout the development of the scheme, this controversy among stakeholders and the public has led to intervention delay and management problems not being rectified until fisheries have been close to collapse (Holm et al., 2015).

Public opinion surveys from 1991, 1998 and 2000 show a relatively constant two-thirds majority in favour of a resource rent tax (67%, 68% and 69%, respectively), for social equity reasons and the perception that higher catch fees make the industry more accessible and attractive to young entrepreneurs by lowering the price of fishing rights and thus reducing the capital requirement for new entrants (Matthiasson, 2008). According to the government official interviewed for this study, fishing fees are likely to be a topic of debate leading up to the forthcoming elections, as people think they have been lowered too much (interview with government official, 09.08.2016).

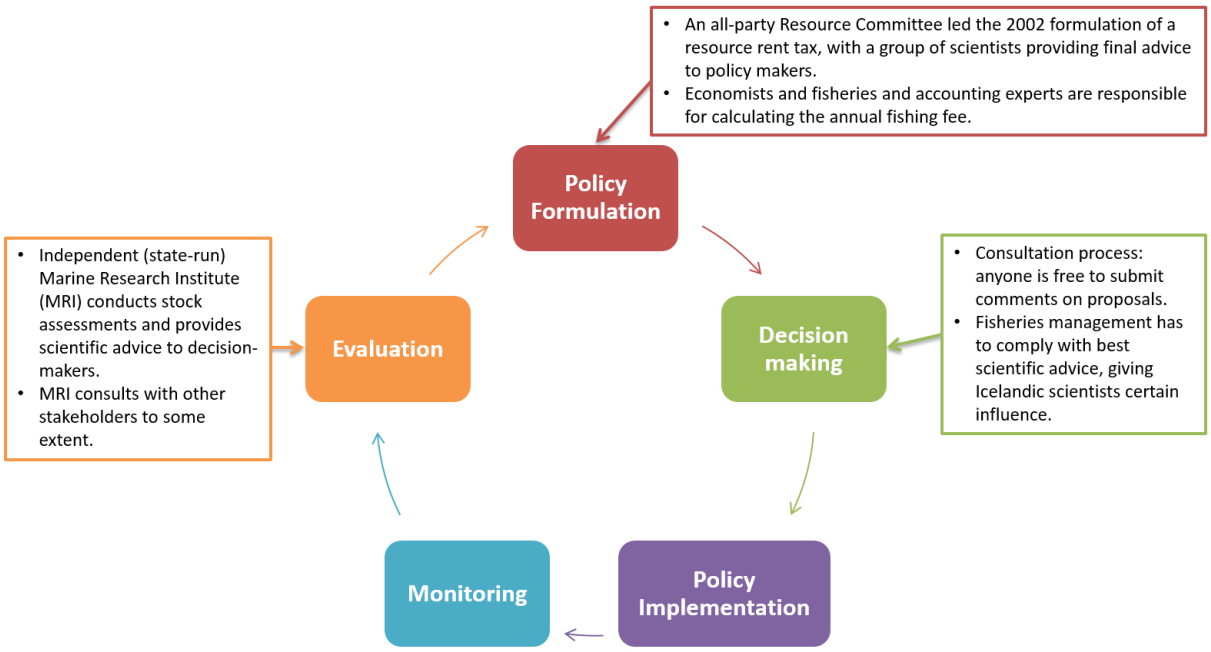


Figure 3 Civil society engagement with the Icelandic fisheries management system

3 Windows of opportunity

Leading up to the adoption of the 2002 resource tax, the Icelandic Government established a Resource Committee, including all political parties represented in the parliament, with the mandate to deliver recommendations on the definition of public stewardship of natural resources, and to advise how to ensure that potential rent from such resources would find its way to stakeholders, including the general public. The outcome was a report by several scientists handed to a Revision Committee with a separate mandate to evaluate and possibly revise the 1990 Act. This committee adopted the option of a tax per cod-equivalent kilo (Matthiasson, 2008).

A similar report was commissioned by the Government in 2010, exploring how to retrieve more of the fisheries resource rent. The committee then concluded that it would be problematic to take back ITQs from current holders and redistribute them, for example through an auctioning mechanism (Haraldson and Carey, 2011).

According to the representative from INCA interviewed for this case study, there has not been any opening for NGOs to engage in the development of the scheme (interview, 09.08.2016).

4 Insights into future potential/reform

4.1 Actual planned reforms and stakeholder engagement

The Icelandic fisheries management system is under constant review and negotiations have been ongoing for decades about a new constitution which, for example, stipulates ownership of natural resources (including marine resources). In the proposal for a new constitution, developed in 2011, a clause is added stating that '*No one can acquire the natural resources, or rights connected thereto, as property or for permanent use and they may not be sold or pledged*' (Icelandic Constitutional Council, 2011). However, the new constitutional changes have not yet passed the Icelandic Parliament, despite being supported by 67% of voters in a non-binding referendum in 2012. The INCA representative believes a decision will be reached

in the coming years, and argues that the fishing industry's goal is to be recognised as resource owners. He notes that it could be 20-30 years before the constitution can be changed again. He also mentions in this context a recently set up Icelandic NGO on anti-corruption which has begun to look at the fisheries management system (interview, 09.08.2016).

For the 2018 revision of the annual fishing fee, the government official interviewed believes that a levying system similar to the current one is most likely to continue, including the chance for stakeholders to comment via the parliamentary review (interview, 09.08.2016).

4.2 Suggestions for future reforms – instrument design and civil society engagement

It is clear that the market privatisation generated by the ITQ system has led to diminished diversity of, and opportunities for, stakeholder engagement in the development of the scheme. Initial allocation via auctioning rather than grandfathering may have had a different outcome, but the Icelandic Government can not now undo the unfairness of the initial quota allocation. Haraldson and Carey (2011) argue that the Government now face two primary options – either to raise the resource tax to the point where ITQs have no value, or take back ITQs and auction them. Haraldson and Carey argue that the first option might remove the important incentive that fishers have to lobby for lower TACs while the second option could harm Iceland's reputation for protecting perceived property rights. On one hand, better economic results in the sector would give room to raise the resource tax, especially following the series of rate reductions. On the other hand, higher taxes are likely to hit less competitive companies the hardest, further aggravating the already criticised concentration of power in the sector. The perceived shortcomings of the quota system in general, and the lack of stakeholder participation in particular, could also be addressed by adopting certain elements of adaptive co-management (Kokorsch et al., 2015). Further, Chambers and Carothers (2016) argue that there is a need for culturally appropriate and equitable fisheries management schemes where success is measured in social as well as economic and biological terms.

4.3 Suggestions for replicability

The unique Icelandic geographical conditions, with minimal influence of neighbouring coastal states sharing stocks in the Icelandic EEZ, makes replicability in EU countries difficult. There are nevertheless some lessons to take from the Icelandic scheme. Firstly, introducing an ITQ system can lead to closer alignment of scientific advice and TACs and gradual rebuilding of fish stocks, which has happened in Iceland and other countries with ITQ systems (e.g. New Zealand, Canada and Denmark) (Haraldson and Carey, 2011), primarily due to greater efficiency in the sector. Secondly, when designing a catch sharing system, measures to maximise efficiency and effectiveness need to be balanced with measures to improve the acceptability of the scheme (Newman and Mazza, 2013) and avoid undue consolidation of quotas (OECD, 2015). In Iceland, the scheme has been economically efficient and effective, but with low social acceptability – for example the industry opposes the fishing fee, whereas small fishermen and many other stakeholders oppose the concentration of power and wealth created by the scheme. Thirdly, a more equally weighted participation of different stakeholder groups than is currently the case in Iceland could help ensure a more holistic fisheries management.

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