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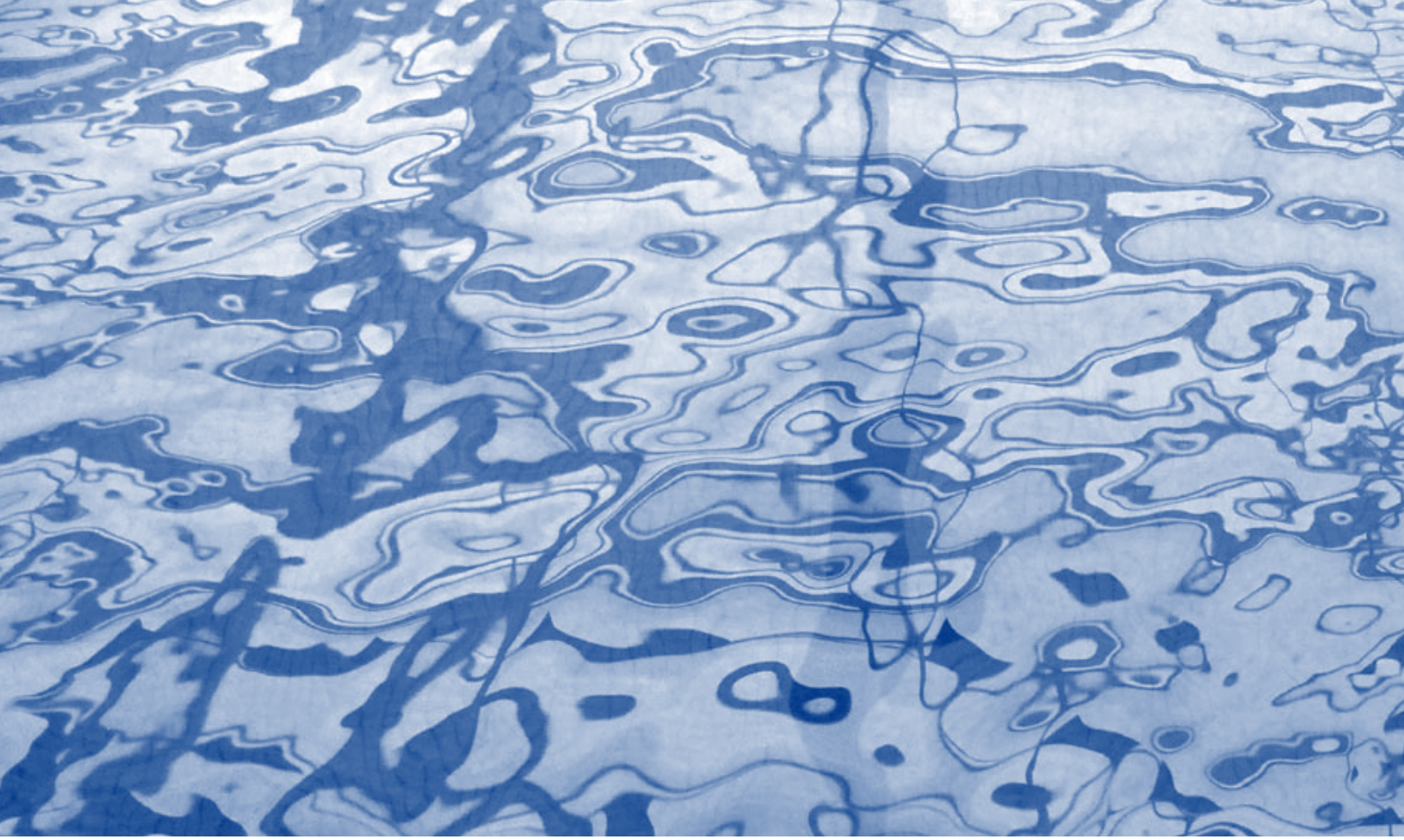

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Introduction

Icelandic fishing vessels have in recent years caught between 1.7 and 2.1 million tonnes of fish in the oceans around the island and in the high seas. This catch is normally between 2% and 2.5% of the total catch of wild fish in the world's oceans. The market value of the seafood production of Iceland is around 2 billion US dollars. Cod and cod products create normally about 40% of the total value of seafood and is the single most important species. The fisheries sector is the single most important exporting industry in Iceland contributing 60% of the exports of merchandise and 40% of the exports of goods and services combined.

The history of fisheries management in Iceland goes back more than 100 years when the three-mile fishing limit was established in 1901. Already at that time the Icelanders were worried about excessive fishing on some fishing grounds close to the coast. The first trawlers had made their way from Britain to the Icelandic fishing grounds and they were highly efficient compared with the rest of the fishing fleet. They operated quite close to the shore and their catches soon had an effect on the fishing activities of others. These trawlers were mostly seeking flatfish species that were quite valuable at that time and often discarded all the cod that they caught. On many occasions it was better for the Icelandic fishermen to negotiate with the captains of the trawlers that they could pick up all the cod that would otherwise been thrown away instead of trying to catch the cod on their own. This was more than a century ago and since then productivity gains and capacity increases have called for a wide range of measures to manage Icelandic fishing grounds and fisheries activities.

Three pillars of fisheries management

There are three main pillars of fisheries management in Iceland. The first pillar is the decision on how much should be caught of each species. The second pillar is the decision on how (including where and when) the fish should be caught. The third pillar is the decision on who should catch the fish. Finally, any arrangement of fisheries management needs an effective surveillance and control mechanism.

For many decades fisheries management in Iceland was not so much focused on the how much question since it was expected that the total catch would be within reasonable limits by relying on the other pillars. The who question was addressed mainly by successive extensions of the fishing limits that gradually gave Icelanders exclusive rights to the area inside 200 miles from the coast. Dividing the fishing rights between individual vessels was first initiated in the early 1970's.

In 1952 the fisheries limits were extended to four miles with base points determined and lines drawn to close the fjords. Four years earlier or in 1948 the Icelandic Parliament had passed a special legislation on the scientific conservation of the continental shelf fisheries which empowered the Minister of Fisheries to regulate fisheries beyond the three-mile zone. This legislation was only accepted by other nations as far as it regulated fisheries on a non-discriminatory basis with general closure of areas or fishing gear restrictions. The extension of the fisheries limits to four miles caused problems with the nations adversely affected and Iceland suffered reprisals especially from Britain. In the end though the four-mile limit was recognised.

The next step was the extension of the fisheries limits to 12 miles in 1958. This action was also met with great resistance from the foreign nations that were operating vessels in the area, especially from the British and the Germans. The British sent their navy to the Icelandic grounds to protect their trawlers but fishing was still too troublesome for them and finally an agreement was reached where the 12-mile limit was recognised.

Effective management impossible

Soon it became obvious that the 12-mile fisheries limits were not enough. The productivity of the vessels was increasing rapidly and in the late sixties it was clear that new investments in the fishing fleet would soon lead to enhanced fishing activity and put more pressure on the stocks than ever before. These were the main motives for extending the Icelandic fisheries limit to 50 miles in 1972 and subsequently to 200 miles in 1976. Again these extensions caused problems, especially with the Germans and the British and the British navy came back in order to try to protect their trawlers. In the end these extensions were successful and all the important fishing nations of the world also extended their fishing limits to 200 miles. During this time there were negotiations taking place on the UN Convention on the Law of the Sea and they were concluded in 1986. After its ratification in 1994 the 200 miles Exclusive Economic Zone (EEZ) was established as international law.

In the mid 1970´s effective management of the fisheries on the fishing grounds around Iceland was impossible. Foreign vessels were catching about a third of the cod, a quarter of the haddock, half of the saithe and half of the redfish. Catches were far above what the Icelandic marine biologists thought was sustainable and in the early 1970's the cod stock was considered to be under serious threat of a collapse. There were no international rules or institutions for negotiating international agreements on fisheries and all attempts to limit and control fisheries on the Icelandic fishing grounds proved to be totally ineffective.

Problems in spite of extensions

The extensions of the fisheries limits became inadequate as tools to deal with the how much question and the who question even after Iceland had successfully established the 200 mile EEZ. In the mid 1970's the Icelandic fishing fleet had grown in size and had become so effective that there was still too much pressure on the fish stocks, especially the cod stock. For four consecutive years in the mid 1970's the commercial cod stock measured less than 1 million tonnes and the spawning stock also measured less than 200,000 tonnes for four consecutive years. In the 1950's the cod stock had been estimated at more than 2 million tonnes and the spawning stock around 1 million tonnes.

The establishment of the 200-mile EEZ created a situation where Icelanders had assumed full responsibility of ensuring the sustainability of the fisheries around Iceland. So there was no longer any other nation to blame and there was no longer the lack of international regulations to prevent necessary actions. Dealing with this situation was also easier for the Icelanders because most of the valuable fish stocks were confined to the area within the EEZ. It

was therefore no coincidence that Icelanders began also to address the how much issue and the who issue seriously in the 1970's.

The how question was the main issue of fisheries management in Iceland for most of the last century besides the extensions of the fisheries limits. During this time an intricate system of laws and regulations was developed on which areas were open to which vessels and what types of fishing gear could be used when and where. This regime was completely overhauled after the establishment of the 200-mile fisheries limit and has been fairly stable since then.

Trawlers and larger vessels are basically confined to areas outside 12 miles, but limited access to fishing grounds closer to the coast is basically restricted to smaller vessels. Spawning grounds and juvenile areas are also protected with a system of area closures but such restrictions can be temporary, seasonal or permanent.

Dealing only with the how issue was still an ineffective way to manage the Icelandic fisheries. The Icelanders simply had to accept that something more needed to be done. So the development of the current management system started out of necessity. The fish stocks were under threat and there was no way that the issue of effectively managing the fisheries could be avoided.

The who question, that is to say, the allocation of fishing rights between Icelandic vessel operators has been the central issue of fisheries management in Iceland for the last 30 years. During this time a system of individual transferable quotas has been developed. This issue has during all this time been hotly debated in the fishing communities and also on the national level.

The icelandic quota regime

The first quotas were allocated to individual vessels in 1973, when inshore shrimp quotas were established. The inshore shrimp stocks are local stocks confined to specific areas and simple licensing was an ineffective way to adjust the catch to the total allowable catch. These first individual vessel quotas were voluntary and the result of agreements between the stakeholders. They did not have a solid legal basis and there were often problems with enforcing these quotas.

Herring quotas were first allocated to individual vessels in 1975 in the Icelandic herring fishery. These quotas were also the result of stakeholder agreements and in a sense voluntary. When enforcement problems arose a special legislation on the confiscation of illegal catch was introduced that gave the quota allocations an improved legal status. It is interesting to note that the total quotas were initially only 7,500 tonnes because the stock had almost collapsed after excessive fishing in the late 1960's. But now the fishery has been stable for many years at 120,000 tonnes.

Capelin quotas were established in 1980. There was not too much controversy about these quota allocations since the need was apparent and urgent and no better options were available. The capelin fishery had faced difficulties in the years before and there were also problems with how to share the capelin stock with Norway and the European Union. The migratory pattern of the capelin at that time was different than in later years and the fishery was to a large degree a race between the different nations. When an agreement had been reached the Icelandic stakeholders soon agreed to make the capelin fishery subject to quotas.

A crisis in the cod fishery came up in the early 1970's when the stock was under serious pressure. After Iceland gained control of the 200 mile exclusive economic zone the first attempts were being made to manage the cod fishery by dealing with the who question, or establishing restrictions on individual vessels.

The first decision on total allowable catch (TAC) was made in 1977 and restrictions established on fishing efforts. The cod fishery for trawlers was first limited to 323 days a year. These restrictions were quite ineffective and the days at sea in the cod fishery were gradually reduced to 215 in 1983. Similar restrictions evolved for other vessels. At that time the spawning stock of cod was estimated at an all time low or just above 200,000 tonnes and the total catch of cod exceeded the scientists' advice by 100,000 tonnes.

The first attempts to create a general quota system

The reaction to this miserable result was to introduce individual vessel quotas in 1984 for the most important species; cod, haddock, saithe, redfish, Greenland halibut, plaice and Atlantic wolffish. This was originally set up as an experiment and was accepted by the Icelandic government and the parliament on the advice of industry organisations and unions. The initial quotas were basically allocated on the basis of catches in a reference period that was determined to be the three-year period between 1981 and 1983. Now there are 14 different species subject to quota restrictions.

After the first year's experience there was enough will to continue with the basic concept of individual vessel quotas. The decision was made to also allow an option of effort restrictions as a compromise to the operators who thought that their quotas were for some reason not fitting to their fishing patterns. The effort option was available between 1985 and 1990. During that time the catches of the most important species were still exceeding scientific advice and the total allowable catch decisions. The excess fishing became unacceptable and there was a substantial pressure to integrate the different options into a single management system where all the operators would play by the same rules.

The 1990 legislation

After an extensive debate the Icelandic Parliament passed legislation in 1990 called the Fisheries Management Act which is still the basic legislation on the who question of fisheries management in Iceland. This legislation has since then been revised and amended several times but all the main initial elements are still intact. The initial effect was the integration of all but the smallest vessels into a single management system of individual transferable vessel quotas (ITQ). The changes that have been made during the 15 year lifetime of this legislation have reflected lessons learned from experience and the outcome of an active and often tense debate within the fishing sector and among the general public. The fisheries management system was certainly controversial when it was established and has been one of the main contested issues of every parliamentary election since 1984.

Each fishing vessel is allocated a fixed quota share of the species subject to TAC. The combined quota shares add up to 100% of the TAC for each species. There has been an extensive discussion in Iceland about the nature of the property rights that are implicit in the quota allocations. The fixed quota shares are permanent in the sense that there is no sunset clause in the legislation. And the quota shares can be traded at will subject to relatively easy restrictions. But the law also clearly states that the fish stocks in Icelandic fishing grounds are the common property of the Icelandic nation and that the allocation of fishing rights by the law does not create a property right or irrevocable command of individual operators over these fishing rights. And in fact the fixed quota shares have been altered by the law, especially as the smallest vessels have gradually been allocated quotas when their fishing regime has been changing from essentially free fishing to a full-fledged quota management system. The fixed quota shares have though been traded and in general treated by the sector as quasi property rights even though the exact nature of these rights has not been clearly defined. There is a common opinion among legal experts that the parliament would be restricted by the constitution to change the fisheries management system in a way that would drastically undermine the fishing rights or fail to create a reasonable continuity between regimes in case there would be a decision to abolish the current legislation.

The annual catch quota is then found by applying a vessel's quota share to the TAC. A vessel that has been allocated a 1% fixed quota share will also be allocated in tonnes 1% of the total allowable catch. The annual catch quota can also be traded at will subject to easy restrictions. Normally the trade in annual catch quotas is referred to as rent, whereas the trade in the fixed quota shares is referred to as sale. Each year a large share of the annual catch quotas are traded. Much of this trade are internal company transfers where the annual catch quota is transferred between two vessels owned by the same operator. A large part of the trade is also in the form of interspecies exchange where one operator trades a part of his annual catch quota in one species for quota in another species. Finally, some of the annual catch quota is traded for money.

The small vessels integrated

There is a separate quota regime for the smallest vessels that are less than 15 tonnes (normally around 12 metres). Initially the small boats were defined as 6 tonnes or less but for safety reasons it was allowed to increase their size. With the 1990 legislation the small vessels operators were allowed to choose between the general quota regime and effort restrictions. Most chose the effort option and in a few years the small vessels became quite effective and their catches in excess of their allocations became unacceptable. Individual vessel quotas were therefore imposed on the

small vessels in steps with the final step being taken in 2004. The small vessels regime is now identical to the general regime for the larger vessels except that the small vessels can only use long-line or hand-line. There is full transferability of fishing rights between the small vessels but it is not possible to transfer quotas from the small boats to the larger vessels. When the quota system was introduced in 1984 the number and the capacity of the small vessels was quite small and their catches were at that time not considered to be large enough to warrant their integration into the quota system. Now they must comply with the general rules plus the special fishing gear and quota trading restrictions.

Shock absorbers and regional instruments

The Minister of Fisheries has the mandate to allocate up to 12,000 tonnes of cod equivalent quotas to use for special purposes. These 12,000 tonnes are normally less than 3% of the total quota allocations. They are basically intended to serve as shock absorbers and as regional policy instruments. These discretionary quotas are used for special allocations when local stocks collapse and this hits severely a limited group of vessels that have specialised in such local fisheries. This has especially been applied to coastal fisheries for shrimp and scallop where natural fluctuations have been relatively large. These quotas are also used to compensate in a small way communities that have lost quota rights for various reasons. In this case a community that has either suffered from the loss of quotas through transfers or because of a reduction in catches for other reasons can apply to the minister for a special regional quota allocation.

These shock absorbers have been considered very important since they deal with isolated problems within the quota system that can, because of these features, be solved without a special legislation when they arise. It is also important that the extent of these shock absorbers and other special measures should be quite limited compared to the total operations of the industry. All special allocations interfere with the internal functioning of the industry and affect the competitive positions of the operators. They must in general have the feeling that everyone in the industry is treated equally and playing by the same rules. Serious internal distortions in the industry would undermine the legislation, surveillance and control.

There is also a special preferential treatment of long-line fishery if the line has been baited onshore and the vessels land their catches daily. These vessels can land up to 16% beyond their annual quota allocations of three species but are subject to restrictions on the total quantity that is allocated for this purpose. Normally these extra allocations can be expected to fit in under the 12,000 tonne ceiling of the minister's mandate but this is not required by the law. This special treatment of the long-line fishery was introduced in

2003 after a difficult debate. These extra allocations are generally favouring the smallest vessels.

There have also been other special quota allocation schemes and two of them are now being phased out. One favoured especially the smallest vessels where they got special allocations in three species. The other assigned 3000 tonnes of cod to vessels smaller than 200 tonnes that had limited quota shares. These allocations have in the past found room under the 12,000 tonnes ceiling so in general one can expect that all the special arrangements will normally be within that range.

Flexibility

Special elements of flexibility are built into the Icelandic quota system. This is necessary since the natural conditions fluctuate and the total allowable catch decisions are always based on information obtained in the past. Therefore it is both possible for each operator to change annual catch quota in one species into another and also to transfer annual catch quotas between fishing years. This option to change species applies to all ground fish species other than cod and works in such a way that excess catch in one species leads to a reduction in annual catch quotas of other species. For each species this interspecies change is permitted for up to 2% of the total value of the annual catch quota and for the total quota portfolio it is allowed to change up to 5% of the total value between species. The operators can transfer in most cases up to 20% of their annual catch quotas to the next fishing year and they can normally exceed their quotas by 5% which is then subtracted from their next year's allocations.

Anti discards features

Icelandic legislation forbids discards and fishermen are required to land all their catch. A part of the criticism of the quota system has been that it creates incentives for fishermen to throw away valuable catch when they don't own the necessary quotas. As a response to this criticism the Icelandic Parliament decided that every operator could land up to 5% in excess of his annual catch quota (0.5% for pelagic species). This excess catch must be registered and weighed separately and sold at an auction market. The proceedings are then divided such that 20% go to the operator but 80% go to a special fund for marine research. Another feature of the legislation that helps against discards is that the fishermen can land up to a certain limit small or undersize fish with only 50% of the weight being charged against the annual catch quota. The limit is generally 10% for each species in each landing. The smaller fish is normally sold for a lower price so the fishermen don't have the same incentive to throw it away.

Limitations on concentrations and transfers

One of the main objectives of the Icelandic fisheries management system is to increase efficiency in the industry. This has also been realised and many consolidations and rationalisations have taken place. But this has also caused concerns that some operations might become too large and that the industry might become too concentrated. For this reason the Icelandic Parliament decided that there should be a maximum on the quota shares that can be owned by a single operator or related operators. No operator or a group of related operators can hold more than 12% of the total quota shares of all species. And there are also ceilings for most of the species. The maximum for each species is generally 20%. The exceptions are 12% maximum of the cod stock and 35% of the redfish stock. The law also includes definitions of which operators are considered to be related.

There are also limitations on the transfers of annual catch quotas with the objective to have as many of the fishing vessels as active vessels. The law says that a vessel can't catch less than 50% of its annual catch quota for more than two consecutive years. The law also says that it is only possible to transfer 50% of the annual catch quota from a vessel. These limitations are not restrictive for active vessels that can normally enter into any quota trade they want. But this has made the operations of inactive vessels that are just used as quota keepers more difficult.

The resource tax

The resource tax is one of the special features of the Icelandic quota system. This resource tax is levied on the vessel operators. The tax is now being phased in and will in the year 2009 be 9.5% of calculated industry wide gross profits. The tax base is calculated on a macro basis as the value of landings minus estimated costs. When the total payment of the industry has been determined the tax on individual operators is calculated based on their quota holdings. This tax was the result of a long debate where many of the fundamental elements of the fisheries management system were contested. The proponents of the resource tax pointed out that the fish stocks are by law the property of the Icelandic nation and that the general public should benefit from their exploitation. They pointed out that the quota shares had initially been allocated free of charge and that the quotas were free to sell for a good profit. Therefore it was only reasonable that the vessel operators should pay a resource tax. The industry representatives and many others pointed out that the economy of the industry was in a very bad shape when the quotas were introduced and for many years it was unthinkable that the industry would have the means to pay a special tax in addition to all other taxes. The industry claimed that gradually most of the quotas had been traded and those that were left to pay the tax were the operators that had bought

and paid for their quotas. They also argued that it was better to allow people to leave the industry by being able to sell their quotas and clean up their debts instead of facing bankruptcy to the detriment of everyone. There were many more arguments in this debate but finally it was concluded in 2002 with the resource tax legislation being passed by the Icelandic Parliament.

Enforcement and TAC decision

The legislation and other rules are strictly enforced by the Fisheries Directorate and the Coast Guard. Information about the location of the fishing fleet is always available and landings are well controlled and registered. It is possible to follow day by day what each vessel has landed. The information on the use of annual catch quotas is therefore always current both for each vessel and for the whole fleet.

The decision on the total allowable catch for each species is taken by the Minister of Fisheries. His decision is based on the advice of the Marine Research Institute. Special catch rules are applied for cod, herring and capelin. For cod the rule is that the total allowable catch should amount to 25% of the commercial stock. For capelin the rule is that at least 400,000 tonnes should be allowed to spawn in order to maintain the sustainability of the stock. For herring the catch rule is based a specific fishing mortality rate.

Experience and conclusions

There is a general consensus within the Icelandic fishing sector and in policy making circles that the quota system has been successful and achieved the objectives of fisheries management better that other options would have done. This doesn't mean that fisheries management in Iceland is flawless. There are several concerns that must be dealt with in one way or another.

Not an exact science

Marine biology is not an exact science in the sense that estimations of the stocks are subject to uncertainty. This means that the decisions on the total allowable catch can never be based on perfect knowledge. This is why it is necessary to be cautious when it comes to setting the total allowable catch. There have been serious examples of overestimations of the Icelandic cod stock, for a few years in the 1990's the marine scientists estimated the stock to be larger than they later claimed it had actually been. This caused uproar because the total allowable catch had to be decreased after expectations had been built up towards the contrary, that the stock was improving and that the catch could gradually increase.

Ecosystem approach underdeveloped
The ecosystem based approach to fisheries management is still underdeveloped. The general concept sounds good and everyone is now thinking about how the decisions on the total catch in one species affects all the other species and in general how the intrusion of man into one part of the marine ecosystem affects all the other parts. Now we are witnessing efforts in many countries to base fisheries management on some kind of an ecosystem based approach. The problem is that there is a lack of generally accepted basic definitions and criteria so everyone is going their own way. The meaning of an ecosystem based approach to fisheries management will therefore be as diverse as the languages of the world unless something is done to bring people together and try to establish some common ground.

Human creation

Any fisheries management system will be shaped by the various stakeholders and different interests. No fisheries management system is a divine creation but rather the outcome of a complicated set of interactions between governments, legislators, industry operators and a large group of other stakeholders. Any fisheries management system is therefore a human creation and consequently, by nature, imperfect. The outcome of the debates and the decision making processes can therefore never be expected to be the most sensible or rational outcome from the point of view of the common good. We also have to note that the fish itself does not have a say in the process. This means that every stakeholder and decision maker must act in a responsible manner and take long-term views and sustainability into account.

Limitations of rules

But even though every decision maker is determined to do his best when designing fisheries management legislation, all rules and regulations will have limitations. There is no such thing as a 100% flawless system whether the issue is fisheries management or any other system in our societies. In general the decision makers set the rules. When the vessel operators and fishermen begin to work according to these rules they find that there are always holes and uncertainties that are subject to different interpretations. They will generally try to interpret the laws and regulations according to their private interests which may or may not comply with the intentions of the decision makers. At some point in time the rules have generally been bent or circumvented in such a way that they have to be amended or revised. This is in itself not a bad thing and the positive side of it is that every decision maker should be willing to learn from experience and adjust to new realities.

How question forgotten

The Icelandic debate on fisheries management has been too much focused on the who issue during the last 20 years. Too little attention has been paid to the how issue, that is to say fishing gear policies, area closures policies and many other aspects of a complete fisheries management system. The changes that were made after the establishment of the 200-mile fishing limit are to a large degree still intact. They weren't sufficient as the only tool for fisheries management but still they shouldn't be forgotten. There has been a tremendous progress in fisheries technologies but this dramatic change has not been reflected in any real change in rules and regulations on how or where or when fish should be caught. This issue has hardly been discussed at all.

Scientists controversial

Fisheries management has for a long time been one of the major issues of Icelandic politics and in debates in many forums in the Icelandic society. This is only natural since the fishing industry is the main exporting industry in Iceland and very important in many fishing communities all around the country. One of the issues that are debated is the methods and the management advice of the Icelandic Marine Research Institute. The institute has many vocal critics in the industry and from the outside. Many claim that the research is inadequate or incomplete, that too serious conclusions are being drawn from scant evidence and that in spite of all the work and advice of the institute the cod stock has not grown as expected. This criticism has its echo in other countries and it is simply a fact of life that the marine scientists take the blame when the news they bring is not good.

Small vessels preferred

There has also been a serious tension within the fishing industry because of the preferential treatment of the smallest vessels. Their share of the total catch was 1-2% in 1984 but 20 years later it was close to 10%. The quota shares of other parts of the fleet have been decreased in order to make room for the smallest vessels. The main reason was that the smallest vessels were catching considerably more than was assigned to them based on their catches in the reference period 1981-1983. And as they were gradually integrated into the quota system their actual catching experience was to a large degree recognised leading to decreased allocations to others. This tension has now subsided as the integration of the smallest vessels into the quota system has been completed.

Resistance to change

The debate on fisheries management has not always been consistent. There are always demands on the industry to be competitive and offer ever higher standards of living for all those engaged in fisheries in addition to payments of a resource tax. Then there are also strong objections to rationalizations and mergers that are necessary in order to bring this about. The resistance to change is nothing new and many communities see themselves threatened by loss of vessels and quotas. But still one can claim that rationalizations have not been too difficult and there has been a drastic structural change in the industry over the last 20 years. The fishing industry was a major player in developing the Icelandic stock market in the 1990's but since then most of the fisheries companies have withdrawn their stock from the Icelandic Stock Exchange and become private limited companies again.

Pricing in vertically integrated companies

Pricing of fish in vertically integrated companies was a serious problem for many years. The compensation of the crew on Icelandic fishing vessels is basically a proportion of the value of landings and the unions of the crews were constantly fighting the vessel operators over the prices of landings when the operator was buying the catch for his own processing facility. This dispute was the main cause of periodic strikes and animosity between the crews and the vessel operators. Finally this issue was solved in such a way that pricing of landings in vertically integrated companies is now directly linked to the prices in the auction markets.

Gross price or net price

Pricing of fish when quota is rented to a vessel was another highly disputed issue. The vessel operators had, when they rent quotas to their boats, often wanted to calculate the price of landings as a net price, that is, the actual gross price minus the cost of the quota rentals. The crews wanted to be paid based on the gross price and in many cases there can be a big difference between the gross price and the net price. It is now illegal to pay the crew out of the net price and therefore those that can rent quotas to their boats against monetary payments are normally small operators who are also members of the crew at the same time.

Resource tax debate

The issue that was probably the hottest in the debate on the quota system for a long time was the resource tax issue. This debate had an ideological background in the fight over the meaning and nature of the property rights that are implied by the quota system. Some of the proponents of the resource tax wanted to establish a direct state property right over the quota shares and formally sell them to the vessel operators. One of the most prevailing ideas was to depreciate the existing rights over a certain period and sell the portions depreciated back to the vessels owner at an auction. The vessel owners always resisted such ideas and pointed out the lack of ability of the industry to pay for the quotas as a general rule. They claimed that the quota trade between companies was based on marginal considerations and the current situation of each vessel operator and did not reflect general excess profits in the industry or that the industry had generated resource rent on a general basis.

Effective system of management

The Icelandic fisheries management system has in many ways proven to be advantageous. First of all, it is an effective management system since

the decisions on the total allowable catch are followed relatively closely. Sometimes catch targets are not reached for various reasons but there is now no element in the quota management system that leads to catches in excess of targets. There were in the past some attributes to the system that allowed for excess catches, especially linked to the integration of the smallest vessels into the quota system. This has now been changed and there are no holes anymore in the system that lead to consistent excess catches.

Efficiency at last

The vessel operators have all incentives to manage their operations efficiently. Each company can focus on reducing waste and earning profits. The outcome has been that the fleet is ever more in line with the possible catches and possible dispositions of the fish. The outcome has also been that fewer and fewer people are needed to work in the industry and the reduced number of employees creates ever greater values. This improves the standard of living for everyone involved and increases the competitiveness of the industry. We can now claim that the industry is beginning to create resource rent and this would be realised in the accounts of the companies if they were not facing a super strong Icelandic currency at the moment. The fishing sector used to be a chronic problem for economic management in Iceland and before the days of the quota system Icelandic governments took many actions to save the industry from bankruptcy. The last such actions were taken in the late eighties. Now the industry stands completely on its own feet and is generally profitable.

Long-term views

Vessel operators now generally emphasise their long-term interests. Since they hold quota shares, fixed percentages of the stocks, they know that the sustainable management of the fish stocks will benefit themselves. Everyone has a share in the well being of the stocks. This means that the vessel operators normally start to think less about quantities but more about qualities and costs. This is especially visible when a stock is not subject to quota because then the operators normally enter into a race to catch as much as possible at whatever cost it takes but when the quotas have been establish their behaviour changes almost immediately.

The market decides

The operations can be organised with the market as a point of departure. Since the operators know their quotas they can choose to distribute their catches over the whole period based on the needs of the market as well as

the conditions on the fishing grounds. This evens out the supply of fish and each operator finds his most profitable fishing pattern. This helps to create even higher values and even higher profits.

Thriving industry

The Icelandic fishing industry is quite strong. There are many good profitable companies, large and small. The industry is developing quite fast. The companies are always trying to adapt to the markets and serve them as well as possible. They seek the higher end markets and try to look for customers that are willing to pay a higher price for a higher quality. There is a constant development of new methods and new products and productivity is rapidly increasing. The fisheries management system is definitely on of the main contributing factors for the strong competitive position of the Icelandic fishing industry.

Successful experience

The Icelandic fisheries management system has certainly been controversial during its development since the early eighties. It has been one of the major topics in national elections five times. But each time the proponents of the quota regime have prevailed and it has become ever more entrenched. Now the quota debate is relatively peaceful. The most serious internal tensions in the industry have subsided and the same applies to society in general. It can therefore be concluded that the Icelandic experiment with individual transferable quotas has all in all been successful.