



The rise and decline of fishing industry support -- with a translation from Norwegian of Bjørn S. Brochmann's 1981 article 'long-term effects of government support to the fisheries'

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ARTICLE INFO

Keywords:

Fishery economics
Subsidies
Development
Brochmann
Norway

ABSTRACT

Input and output measures, including the use of (Pigou) taxes, have been recommended to bridge the gap between average and marginal revenues in fisheries. Several countries have improved management, but few have followed the fiscal recommendations. On the contrary, subsidies that can expand capacity and effort have been and still are used. For decades, international organizations such as the WTO, FAO, and OECD have discussed subsidy issues. In the case of Norway, annual support negotiations between government and industry were institutionalised in 1964. The support increased throughout the 1970s, and at its peak in 1980 support amounted to about 40% of the gross value of all catches. Bjørn S. Brochmann was a chief economist in the Ministry of Fisheries. During a leave of absence in 1979–80 he wrote a report, and in 1981 he published a journal article discussing long-term effects of government support to fisheries. Based on the Gordon-Schaefer model, he demonstrated that revenue-augmenting and cost-reducing support could not solve the poor income problem of fisheries. Rather, subsidies will work in the opposite direction, creating even greater need for future support. His reports, conference talks, and media interviews created havoc in fishing communities and organizations. This paper places Brochmann's work in a national and international context and discusses its influence on Norwegian fisheries policy. A translated version of Brochmann's article (1981) is included in this paper, as a reference guide for subsidy-reliant countries and as a tribute to the history of the political economy of fisheries.

1. Introduction

To date, fisheries economists have mainly been concerned with efficiency issues in fisheries management: first, in the seminal article of H. S. Gordon [21]. and, of course, in the work of Jens Warming from Ref. [46] – this was written in Danish and an English translation was published by Ref. [1]. Gordon discussed what would happen in the case of unregulated open-access fisheries and outlined possible remedies to increase the social benefits. Warming did the same, suggesting the possible use of a (Pigou) tax to bridge the gap between average and marginal revenues at the optimal level of fishing effort, thus preceding A.C. Pigou [11,35]. Throughout the 20th century, several papers have expanded the work of [21]; including works by [8,9,23,39]; and the Organization for Economic Co-operation and Development [33]. In one way or another, these publications have confirmed the need to limit fishing efforts or harvests in order for societies to reap the benefits of rich fish resources. However, few countries adhered to such

recommendations – at least not until after the development of the United Nations Convention on the Law of the Sea in the 1970s which made it possible to establish 200-mile exclusive economic zones (EEZs [7]); to manage their own resources.

Contrary to economists' recommendations about restricting entry to and efforts towards fish harvesting – either by command and control, quota markets, or fees and taxes – several countries acted in the opposite direction by economically supporting the expansion of their fishing fleets and efforts [28,29,33,38]. In Norway, a major fish harvesting and exporting country, government support was institutionalised from the mid-1960s, and the monetary value increased – with some ups and downs – until it peaked in 1980. The following year, support started to decrease and, by the mid-1990s, it was almost entirely gone. This article briefly discusses the rise and decline of Norwegian fishery subsidies, together with a discussion about work relating to government support of fisheries in some major international organizations. Most importantly, we present a translation of an influential article on the 'Long-term effects

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<https://doi.org/10.1016/j.marpol.2020.104112>

Received 11 May 2020; Received in revised form 22 June 2020; Accepted 24 June 2020

Available online 21 January 2021

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of government support to the fisheries', written and published in 1981¹ in Norwegian by Bjørn S. Brochmann, then a chief economist in the Ministry of Fisheries.

2. The rise and decline of fishery subsidies in Norway

²Norway has a long history of government support of the fishing industry, including construction of harbors, trade and export regulation, as well as modernized communication, investment loans for new vessels and processing plants, lighthouses and rescue ships, social security measures and social services [26]. Simultaneously, the fishing industry has paid taxes, both on export and harvest values. One of these, "tiend" (the ten per cent) in the 19th century, may be seen as an early form of resource tax, even though its main objective was to benefit the government purse, including the king and the church, and not to conserve natural resources.

During the 1950s, a major part of the government support of fisheries was given as price support of raw fish, through the fishermen's sales organizations, which were established by law to manage the first-hand trade of fish. In addition, other organizations were involved. Early in the 1960s, the government found it too troublesome to negotiate with several organizations and, in 1964, established a general agreement between the government and the Norwegian Fishermen's Federation (NFF). According to this agreement, the NFF could ask for annual negotiations regarding support if they found that income in the fishing industry fell behind that of other industries. The NFF negotiated on behalf of the whole industry, including inshore and offshore fishermen and vessels, harvest and processing, and trade and export firms, and cooperated with the other organizations in developing the annual claim for support and during the negotiations. These arrangements made the NFF into a strong and leading organization within the Norwegian institutional system. Typically, the government and NFF came to an agreement, and the former then made a proposal for the Parliament on the total amount and its distribution. Revenue-increasing and cost-reducing support were always major parts of the proposal, of which the wet fish price support was distributed through price discrimination, favoring raw material for the most labor-intensive frozen fillet production. The distribution between fisheries and regions varied over time, according to changes in the world market prices, relative costs, species composition and regional distribution of catches, with the objective of creating jobs and income, particularly in rural areas. Maintaining employment in the rural areas was the main policy objective from the early 1950s, when the frozen fish processing plants were established, and throughout the expansion through the 1960s and 1970s. Raw fish used for the more labor-intensive frozen fillet processing industry therefore received most of the price support. Despite what has often been claimed, the economic support per man-year was higher in the Southwest region of Norway than in the North, due to price subsidies that favored quantity harvested [22].

Fig. 1 demonstrates the total annual government support of the Norwegian fishing industries, on sea and land, from 1964 to 2012, through the general agreement.³ The lower curve is in nominal terms, and the uppermost one is in real (1998) terms. From the commencement of support after the general agreement, the support in nominal terms stayed more or less the same until the early 1970s, and then started to climb, whereas the real value of support fell over the first decade of

institutionalised support.⁴

From 1980 to 1988, the annual support fell more or less continuously, but then climbed and remained relatively high in 1989–1991, the three odd years. In real terms, the average annual reduction from 1980 to 1996 was as high as 24.1%, bringing the support down from 4576 million NOK to 96.5 million NOK. However, the three odd years in particular break the average downward slope. Thus, the major reduction of the government support took place in the 1980s.

Fig. 2 shows the annual support in per cent of the landed value of fish and other marine animals, and the shape is much the same as the real value curve in Fig. 1. This indicates that the reason for the localized 1989–1991 hump is on the fish quantitative side more so than on the value side.

Fig. 3 shows the relative quantity of cod (*Gadus morhua*) and the total for all species landed by Norwegian vessels in three periods. The middle shows the period of 1989–1991, to the left is the decade 1979–1988, put equal to 100, and to the right is the decade 1992–2001. It is noticeable that the three odd years from Figs. 1 and 2 are odd also when it comes to average catches, especially for cod, as well as for the total. With the great importance of the cod fisheries for many communities – especially in Northern Norway – the closure of the fishery for coastal vessels in April 1989, due to serious stock decline, came as a shock. Until then, the coastal vessels had operated relatively freely, in contrast to trawlers that were first limited by a total quota in 1978 [2]. The great reduction in quotas and catches in 1989–91 triggered increased economic support from the government, as demonstrated in Figs. 1 and 2. Shortly after 1990, the cod stock increased rapidly, as did harvests. Since then, individual and/or group quotas have also limited the coastal vessels' catches and contributed to improved profitability.

Government support through annual agreements ended in 2004, when the Parliament formally dissolved the general agreement. However, some minor support with social and ecological objectives are included in the regular government budget. An example of the former is support of arrangements with minimum income and old age pensions for fishermen. Support of sealing serves as an example of the latter. The fishing industry is to some extent exempted from environmental and energy taxes, and this could be considered as support [24]. However, certain other national industries and the fishing industries of other European countries also have similar privileges, and therefore, the industry claims that these exemptions are not true subsidies (see Ref. [32]).

A government-owned bank, The Norwegian Fisheries Bank, established in 1921, expanded its mandate and lending capital during the 1920s and 1930s. This bank played an important role for several decades in financing expansion and renewal of the fishing fleet and processing plants, until it was shut down in 1997. Lending rates were lower, and other conditions better in this bank than in the private banking sector, mainly due to government-guaranteed cheaper funding. In some cases, the Fisheries Bank was an ad hoc instrument in supporting particular fleet programs, such as bigger coastal vessels during the 1950s, fleet renewal and debt appreciation in the 1960s and the purse seine buyback and scrapping program in the first half of the 1980s. Attractive conditions in the Fisheries Bank often created excess demand for loans. Necessary capital rationing took place partially by use of government instructions about the annual lending policy and partially by priority lists and recommendations created by municipality fisheries committees who had good knowledge of the applicants and their projects. In 1992, a government-appointed committee on the financing of fishing vessels, headed by B.S. Brochmann, advised that the Fisheries Bank should be closed and its tasks transferred to the State Business and Rural Development Fund (SND), which was done in 1997. Later, the fisheries

¹ This was based on [5].

² The sources of this section are [4]; B.S. Brochmann, personal communication 23rd December 2019 [6,17,22,25,26]; unless otherwise stated.

³ Based on accounting figures.

⁴ The average exchange rate NOK per USD 1964–2012 was 6.65, with some ups and downs – max 8.99 (2001), min 4.94 (1980). Thus, the nominal value of the support in the peak year 1980 corresponds to 283.4 million USD. This was also the peak year in real value.

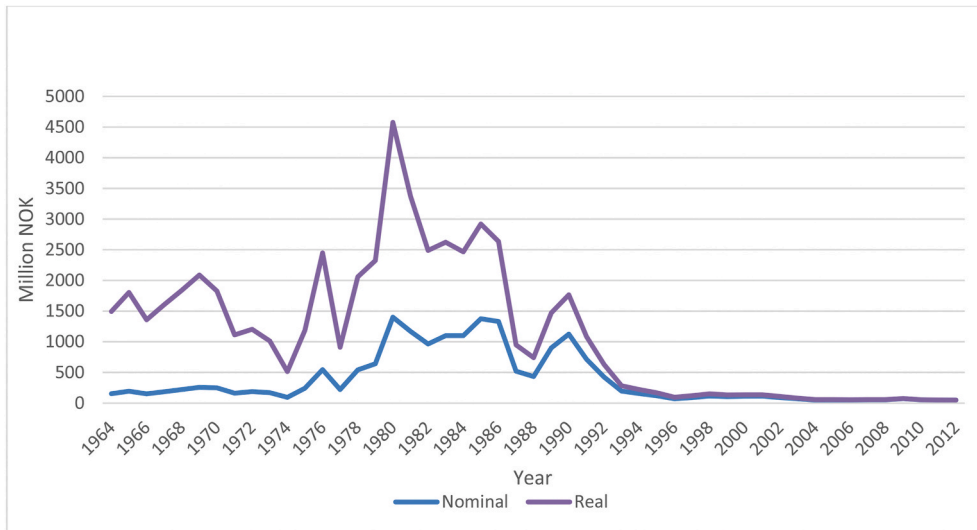


Fig. 1. Government support of Norwegian fisheries, nominal and real (1998), 1964–2012. Source: Statistics Norway and Directorate of Fisheries.

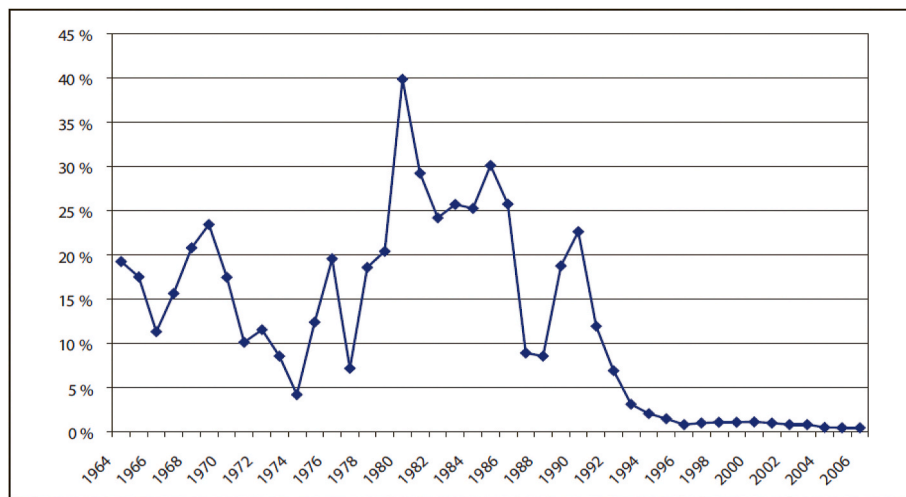


Fig. 2. Government support in per cent of ex-vessel value of catch. Source: [43].

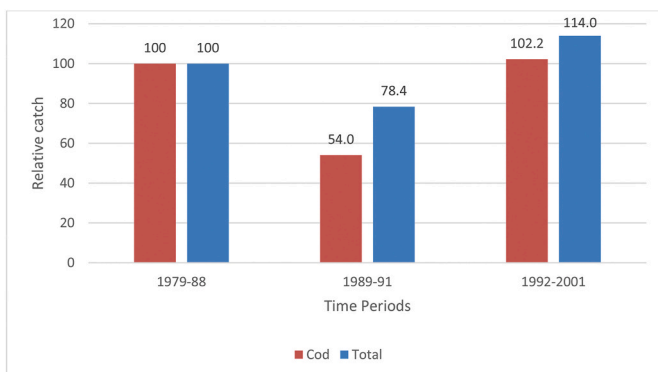


Fig. 3. Relative catches of cod and totals for all species in three periods, with 1979–1988 equal to 100. Source: Directorate of Fisheries.

portfolio was transferred to the government institution Innovation Norway (established 2004), and the traditional government support of fishing vessels through subsidized loans more or less ended.

To fully understand the use of fisheries subsidies in a specific

country, including the outset, rise and decline, it may be necessary to use several scientific disciplines, such as political science (institutions), history, economics, biology and technology. This is also the case with the Norwegian support and the turning point in 1980–81. It is, however, outside the scope of this article to investigate thoroughly all the possible causes of such changes. The emphasis is on the research presented in Brochmann’s work [4,5] and in his media interviews that brought new knowledge to policy makers and industry, although it proved provocative for the latter.

International agreements of which Norway was a part also spurred the abolishment of fishing industry support. The EU worked for a reduction of both tariffs and non-tariff barriers to intra-union trade, including national subsidies, to avoid unfair competition. Norway never became a member of the EU. However, the European Economic Area (EEA) – established in 1994 between the EU and the three European Free Trade Association (EFTA) states (Iceland, Liechtenstein, and Norway) – for all practical purposes made these countries parts of the European single market with the same basic rules. These rules aim to enable free movement of labor, goods, services, and capital within the European Single Market, but the agriculture and fisheries policy of the EU was not part of the EEA agreement. However, some rules apply, including the EEA agreement – which in Article 4.1 of Protocol 9 on trade in fish and

other marine products states that “Aid granted through State resources to the fisheries sector which distorts competition shall be abolished.” The EFTA had agreed on similar rules taking effect in 1989. This spurred the abolishment first and foremost of the use of price-discriminating subsidies favoring the most labor-intensive production of frozen fillets. Fish processors in other EFTA countries now had the right to purchase raw fish at the same prices as the Norwegian industry, independent of the type of processing. The times for supporting fish processing through lower input prices in mainly rural areas had ended.⁵

3. The chief economist

Bjørn S. Brochmann, b. 1947, Havøysund, Finnmark, Norway; MA in Economics 1973, University of Oslo. Ministry of Fisheries (MF) 1974–1986 (different positions); except the academic year 1979–1980 at the Institute of Fisheries (later, the Norwegian College of Fisheries Science), University of Tromsø (UiT). In 1986, he left the MF to work for the Norwegian oil company Statoil.

As Head of Economic Affairs at the MF, he was put in charge of the ministry’s work on the coming white paper on fisheries development, scheduled for 1981. He had previously participated in the work on a fisheries long term plan [40]. In December 1980, he gave a talk at an internal meeting/seminar for regional fisheries officers and administrators and presented his analysis from Ref. [5] and preliminary analyses for the upcoming white paper. He also made recommendations such as: “From an economic point of view it is worse to employ people through over-capacity than to pay them just to relax outside their houses and enjoy the sun” [18] p. 769) (the author’s translation). The support was not just of limited usefulness to increase income in the industry, but it was a basic cause of the problem, causing over-capacity and downward pressure on the fish stocks. By chance, the fisheries magazine *Fiskets Gang* got hold of and published his talk, and regular newspapers followed up, emphasizing in particular the recommendations. Leading people in the fishing industry and organizations reacted fiercely, some demanding the Minister of Fisheries to sack Brochmann. This claim was also raised by a member of parliament (MP) in a discussion in the Parliament (*Stortinget*) in the early spring of 1981. The Minister, however, declined to do so, although he had to distance himself from some of Brochmann’s ideas.⁶

Upon preparing his talk, Brochmann had circulated his manuscript within a group of key people in the ministry, and even secured the Minister’s signature. Despite the public criticism of the Minister and his chief economist, the work on the fisheries development paper continued, but at a slower pace and without being published. It was not until the change of government in September 1981, including a change of the MF from a Social Democrat (Eivind Bolle) to a Conservative (Tor Listau), that the process resumed. The new Minister expressed internally that Brochmann should still be leading the work and should include

⁵ This contrasts the agriculture sector support where Norway is on top, together with Iceland, of the OECD Producer support estimate (PSE) list, with about 60% as a share of the gross farm receipts (2016–2018). Interesting, two other fishing nations, Korea and Japan, follow suit, after Switzerland, with around 50%. <https://www.oecd-ilibrary.org/sites/39bfe6f3-en/1/2/1/index.html?itemId=/content/publication/39bfe6f3-en&csp=51ec64fa22c00b0491ec73dc26aa9d45&itemIGO=oecd&itemContentType=book>.

⁶ Nasjonalbiblioteket (The National library) has digitalised Norwegian newspapers, national as well as local. A search on Bjørn Brochmann for 1980 and 1981 gave tens of hits regarding his papers, talks, interviews and work for the Ministry of fisheries. Many was very critical to his work and to the ministry. (https://www.nb.no/search?q=bj%C3%B8rn_brochmann&mediatype=aviser&fromDate=19800101&toDate=19811201, accessed 7th June 2020). Even in Iceland newspapers referred to Brochmann and the fishery subsidy issues in Norway (https://timarit.is/?q=bj%C3%B8rn+brochmann&from=01.01.1981&to=31.12.1981&publicationId=&sort=&isLongSnippets=false&isBeyginga_r=false&isAdvanced=false&size=10&page=1, accessed 7th June 2020).

some of his analysis in the upcoming white paper on fisheries development. This was presented to the Parliament in Ref. [41] (“On guidelines on the fisheries policy”). In the meantime, Brochmann had worked on his article for the leading national economics journal *Sosialøkonomen* [4], to reach a bigger professional audience than the university department report [5].

The work of [4,5] is a dynamic policy and bioeconomic analysis of the expected long-term effects of fisheries subsidies within the Norwegian institutional context, using a comparative static approach. As noted above, several economists had recommended the use of resource taxes as a remedy to bridge the gap between average and marginal revenue at the optimal level of fishing effort, but without any success in implementing this in actual policies.⁷ On the contrary, in several countries governments subsidized their fisheries without really knowing the economic and resource consequences of this. [4,5] demonstrate, theoretically, the consequences of a subsidy scheme, with an application to Norway where the industry, no matter how much or little fish is in the sea, through a substantial price subsidy is “guaranteed” an average worker’s salary. The sad development of the industry was in line with the theory; declining resources and need of more and more government financial support. The bioeconomic theoretical foundation is a Gordon-Schaefer model, where the fish biomass has quadratic growth and the harvest per unit of effort (vessel) is proportional with the biomass. In an open-access fishery, the model has a bioeconomic equilibrium where biomass decreases and effort increases with the price of fish–cost of effort ratio. When policy makers and industry together engender higher fish prices and lower costs by use of subsidies, the effort expanded with a negative effect on the fish stock. Declining catches followed, and the industry spoke to their need for more government support to solve the declining income problem. However, [4,5] underlines that the government support is the main cause of the problems and not a solution to the income problem in the long term. Since then, the Food and Agriculture Organization of the United Nations (FAO), OECD and others have used similar models and analytical approaches in their discussions of government support of fisheries (see below).

It may be difficult to measure the direct policy impacts of theoretical and empirical academic research. However [5], report and 1981 article, his educational talks for fisheries administrators and his media interventions have been discussed in several media and industry organizations. This, at least, created awareness of possible long-term negative effects of fisheries subsidies. In the white paper, revenue-increasing and cost-reducing support, which traditionally were the major part of Norwegian subsidies, were critically discussed in particular [41]. Such measures could not solve the long-term economic problems of the fishing industry, nor could they contribute to sustainable jobs or stop the ongoing depopulation of coastal rural areas, as was claimed by many politicians and fishermen representatives. Brochmann’s ideas were, however, gradually accepted [17,41,42]. A couple of years after Brochmann’s paper and talks, he by chance met the Director General of the Fishermen’s Federation (Jørn A. Krogh, 1948–2015), who complained that Brochmann had created great problems for them. “The government negotiating delegation refers to your article and uses it constantly as an argument to remove all financial support” [3] pers. comm., December 23, 2019). Thus, the inclusion of his ideas in the white paper, and to some extent the use of them in policymaking, indicate that his message was understood and accepted, at least at the professional administrative level within ministries, but only gradually among industry representatives and the public.

As demonstrated above, the major part of the Norwegian fisheries

⁷ Resource tax and other fishing industry taxes have been discussed in several Government papers in Norway, lately in Ref. [44]; but so far the Government and the Parliament have declined to tax fisheries more than other industries (except for some minor administrative cost recovering fees), arguing that any resource rent should remain within the industry.

support were abolished during the 1980s, excluding the odd years 1989–91, and B.S. Brochmann's work contributed to this.⁸

4. International development of fisheries subsidies rules

Before the Law of the Sea in the second half of the 1970s made it possible for countries to legally establish 200-mile EEZs, there was an international race to fish in the oceans globally. Many countries expanded their fisheries by government support so as not to lose out against their competitors. It is not only fisheries' objectives that were behind the wishes for such an expansion, but also global political rivalry issues [12,15],⁹ For centuries, Norway had used its near shore waters for fishing and sealing, and with the development of motorized vessels, this expanded further into the oceans. The development of steam engines, and later diesel engines, in the late 19th century expanded the long-distant trawler fleet of Great Britain and other European countries. Throughout the 20th century, this increased the competition for fish resources and created conflicts between the active gear trawl and passive gears, such as long-line and gill-net [26]. The expansion of international offshore fishing was often spurred on by national subsidies [15], and to meet this competition, Norway, during the early- and mid-20th century, had government support programs to build larger vessels. Globally, conflicts between long-distant fishing fleets and local fisheries made countries gradually expand their national territorial waters and internal fishing areas. With the development during the 1970s of the United Nations Convention on the Law of the Sea (UNCLOS), more and more countries expanded their national waters by establishing EEZs. In 1977, Norway established its EEZ (200 nautical miles), and from then on, the international competition argument for national subsidies dwindled. Despite this, the subsidies increased until 1980, as Fig. 1 demonstrates. Towards the late-1980s and early 1990s, other international development made it necessary to reduce government support even further. As noted above, the inclusion of rules for free trade of fish and fish products in the EFTA agreement, put into action from January 1, 1989, and the EEA from 1994, forbid the use of subsidies that contradict free trade.

International governmental organizations such as the OECD, the FAO and the World Trade Organization (WTO) have discussed fisheries subsidies with the aim of reducing or restructuring their use, as have several international non-governmental organizations. They unanimously object to expansion or reintroduction of fisheries subsidies that expand capacity and effort.¹⁰

The OECD, with its Committee for Fisheries, has for more than half a century discussed economic and management issues with the aim of improving fisheries management in member countries, as well as international trade in fish and fisheries products [19,28–30,33]. Subsidies, usually termed government financial transfers (GFT) within the OECD, were discussed and classified, and data were collected from member countries. They agreed that not all GFTs are harmful to the fish resources and the economy. General services include fisheries research, enforcement, management, enhancement and infrastructure. Most of these services are important for ensuring the sustainable use of fish stocks and

⁸ Some other Norwegian researchers have placed more emphasis on a later period: "Whereas the general agreement was criticised and lost its legitimacy during the 1980s, it was not until the international trade agreements at the beginning of the 1990s (EFTA, later WTO and EEA) that the government support was cut down and the general agreement finally dissolved." [16] p. 46 (the author's translation).

⁹ Such subsidy-spurred rivalries still exist in some major fishing areas, notably in the South of China Sea, where international competition and not the Law of the Sea rules [34].

¹⁰ One initiative by 40 NGOs, including Seas at Risk, in 2018 asked the European Commission to halt reintroduction of harmful fisheries subsidies <https://seas-at-risk.org/16-fisheries/914-40-environmental-ngos-ask-european-commission-to-halt-reintroduction-of-harmful-fisheries-subsidies.html>.

the aquatic ecosystem. However, some member countries wanted to play down the emphasis on bad GFTs, expanding fishing capacity and effort, thereby increasing the pressure on the fish resources.¹¹ The type of subsidy analysis in Refs. [4,5] was deferred to non-official OECD reports [19] instead of being integrated in, for example, the [33] (see Part 3 Government financial transfers and resource sustainability). The organization has gradually improved its database on fisheries support, and made it available online. The Fisheries Support Estimates (FSE) database [31,32] is intended to be the best source of information on fisheries policies in OECD members and participating non-OECD economies. Several researchers have worked for the OECD as consultants or used their data for important publications on fisheries subsidies (see e.g. Refs. [10,27,36,45,47]; and [37]).

In 1997, general services amounted to 13% of the value of landings, and in 2015, this was down to 9.9%. Support in the form of revenue-enhancing and cost-reducing transfers to the sector, mainly considered harmful, was 4 and 1.6¹² per cent of the value of landings in 1997 and 2015, respectively. Fuel tax concessions in 2015 amounted to 0.7¹³ per cent of the value of landings in OECD countries [19,32]. Thus, there has been a significant reduction in GFTs in member countries from 1997 to 2015.

The FAO, like the OECD, has a long history in discussing fisheries subsidies. Its fisheries committee, COFI, has more members than that of the OECD, and it takes significant effort and diplomatic work to reach unanimous decisions. The strength is the global geographic coverage with member states from all continents, both in rich, developed and poor, developing countries. Often, international experts have drafted technical papers for discussions in COFI and at special meetings. The focus has been on sustainable fisheries and oceans, providing safe and attractive jobs in the fisheries from the boat to the market. For half a century, COFI and the FAO officers have also discussed subsidy issues [20]. Between 1959 and 1972, fisheries expanded, and world catches increased from about 30 to 60 million tons. Surveys undertaken by the FAO revealed that long-distance fleets from Europe, the Eastern European countries, Japan, USA, Cuba, the Republic of Korea and Ghana expanded their operations off the North-West and South-West Africa and in the tropical oceans, supported by subsidy schemes. Between 1972 and 1982, the world fish harvest continued to increase, from 60 to 68 million tons, and several surveyed stocks deteriorated, except in a few areas. The FAO and other international bodies organized conferences on fisheries issues, including over-fishing, over-capitalization and subsidies, of which London (1946) and Vancouver (1972) are two, as reported in the work of [20]. Inadequacies in the management of international fisheries, and the negative role of many types of subsidies, stressed in scientific fora since the mid-1960s, were finally recognized in most inter-governmental fisheries management arenas [13,20].

The WTO is particularly interested in possible trade effects of fisheries subsidies. It has tried since the commencement of the Doha Development Round in 2001 to reach an agreement on prohibiting certain forms of fisheries subsidies that contribute to overcapacity and overfishing. At the 2017 Ministerial Conference (MC 11 in Buenos Aires), ministers decided to conclude the negotiations at the 2019 Ministerial Conference. However, this failed. The aim is now related to the 2015 United Nations Sustainable Development Goals, where number 14 is related to seas and oceans: "Conserve and sustainably use the oceans, seas and marine resources for sustainable development"

¹¹ For three years, 1998–2001, this author was Head of the Fisheries Department of the OECD and I was stunned to learn how, in particular, some EU countries tried to play down the amount of support to their fishing fleets, from the national and the EU budget.

¹² For 2015 the amount included comprises "Transfers to individual fishers – Budgetary" [32].

¹³ By taking the reported fuel tax concessions in some member countries in per cent of landings in all OECD countries.

Target 14.6 includes specifically the WTO on fisheries subsidies: “By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing (IUU) and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation.”

So why bring subsidy issues into the WTO? As discussed above, fisheries subsidies may have effects on production, positive or negative, depending on whether resources are biologically underutilized or overfished, as well as on the management system at work. When there are effects on production, there will usually be effects on trade as well, and thus, several WTO countries find it reasonable to discuss such issues with the aim of reaching an agreement on what to do.

The Doha Round has run for nearly twenty years without a conclusion on new trade rules. Globally, some countries probably do not see a significant need to conclude, while others do not think it is possible to reach a unanimous agreement and have a more *laissez faire* attitude to the process. In such a discussion, is it possible that the WTO can reach an agreement on fisheries subsidies? Many experts and policy makers believe that subsidies partly contributed to overfishing and trade distortions, and the WTO negotiations were planned to continue at the 12th Ministerial Conference in Nur-Sultan on June 8–11, 2020. Combating IUU fishing in particular will benefit national welfare and gains of trade. The work of Sakai and colleagues (2019) has the explicit: “aims to review the existing academic literature and discuss the role of academic studies in policy-making processes during the negotiation of fisheries subsidies” [37] p 440). This is comprehensive on descriptive, theoretical and empirical studies, and also discusses the challenges ahead of the coming meetings at the WTO.

5. Conclusion

The fraction of marine fish stocks fished within biologically sustainable levels exhibited a declining trend, from 90% in 1974 to 67% in 2015, whereas the fraction of stocks fished at unsustainable levels increased from ten per cent in 1974 to 33% in 2015 [14]. Of the sustainable 67% of stocks in 2015, 60% points were at maximum sustainable levels and 7% points were under-fished with a potential to expand catches. The decline in the number of assessed stocks at maximum sustainable levels from 1974 to 2015 did not happen continuously. It was even lower at the end of the 1980s, before it rose to 60% in 2015, “partly due to increased implementation of management measures” [14]. Thus, management matters. According to the FAO, it is unlikely to rebuild in the near future the 33% of stocks that are currently overfished, despite the Sustainable Development Target 14.2: “... to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics.” [14]. However, the target to “By 2020 prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing” (<https://indicators.report/targets/14-6/>) may be a necessary step towards restoration of stocks, but management measures may be even more important.

The history of Norwegian government support demonstrates that policy changes may take time. The government, industry and public in general may have different views on both the long-term goals and on the transitional period policy measures [33]. With Parliament elections every fourth year, any government obviously will think of the re-election possibilities of different ways of combining revenues and costs in its budgets. Moreover, if it is a responsible government, it should think about long-term effects for economic growth and welfare of its policy measures, although expert advisors do not always agree on the effects of different policies. Knowledge about, for example, how expansive, balanced or deficit budgets affect countries’ economic growth, in the short and in the long term, are still discussed among

economists.

When working on small theoretical models, it is usually easy to agree on what happens in the modelled economy. However, the more and bigger the models, to make them closer to the actual economy, the more disagreements may appear. The economic and policy analyses of [4,5]; of government support of fisheries in Norway, increased the knowledge of damaging long-term effects of bad subsidies, among professionals and, gradually, among lay people. It is likely that this contributed to the significant reduction of the subsidies during the 1980s, a policy impact, and that the international agreements the country entered into at the end of the 1980s and early 1990s spurred even further reductions in the government support of the fishing industry. Maybe an agreement on similar issues in international organizations such as the WTO, FAO and OECD may spur countries to abolish bad government support that expands capacity and efforts and contributes to overfishing.

Declaration of competing interest

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Acknowledgements

The author thanks Thuy Thi Thanh Pham and Bjørn S. Brochmann for comments on a previous draft, Ha Hai Thanh Pham for technical assistance, the NAFOSTED project 502.01–2017.19 “Impacts of subsidy policy on fisheries in Vietnam” funded by the National Foundation for Science and Technology Development, 2017–19, for indirect support, two anonymous reviewers and the Editor for helpful comments, and *Sosialøkonomen* for permission to translate and re-publish [4].

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.marpol.2020.104112>.

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