

The Illegal, Unreported and Unregulated Fishing in Kuwait: Problems and Solutions

Short title:

The Problems of Illegal Fishing in Kuwaiti Waters

Abstract:

Kuwait is a country with an emerging economy that could benefit hugely from investment in its marine fisheries production. However, the country is constrained by several problems which affect the health of its coastal fish stocks. Illegal, unreported, and unregulated (IUU) fishing is the most serious of these problems because it reduces fish stock levels. In this study, we analyze IUU fishing in Kuwaiti waters, and assess its impact on fish stock levels and consequent damage to the marine economy and environment, as well as its implications for the security system and the integrity of governance in the country. The research methods used in this study include key informant interviews, information obtained from some illegal fishers themselves, documentary data collected from Kuwaiti public authorities, and peer-reviewed literature. . The main finding of the study is that IUU fishing in Kuwaiti waters not only threatens the health of the country's marine fish biomass but raises questions about Kuwait's immigration policy, the effectiveness of its border controls, and the way its decision-making processes are manipulated by groups who influence decision-making and large private companies which break fishing

regulations.

Keywords

Arabian Gulf, Fisheries, IUU Fishing, Sustainable development, Blue Economy, Fish Stock decline, Kuwaiti waters.

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1. Introduction

Published literature reports that fish stocks in Kuwaiti waters are in decline. Al-Foudari [1] and Al-Husaini [2] state there has been a steady decrease in fish biomass in Kuwait since the 1980s [3], especially in the shrimp species [4-6] and [7]. Overfishing and Illegal, Unreported and Unregulated [IUU] fishing are frequently mentioned as causes of this decline, and the media have frequently rehearsed the problem, based on complaints from the public in Kuwait about the increase in prices of seafood, especially finfish, due to lack of supply. Calderwood [8] claimed that “the Kuwaiti sea has become almost dead because of the overfishing”. KUNA [9] stated that “IUU fishing is threatening the marine ecosystem in Kuwait and declining the Kuwaiti fish stock, which needs to be addressed by the Kuwaiti government immediately”. It is widely believed that Kuwait, along with all the Arabian Gulf Counties, except the UAE, under-reports its total catches, and that the unreported catches are due to IUU fishing activities [10]. It seems that, based on the large number of IUU fishing cases, the Kuwaiti government’s responses are insufficient to counter IUU fishing [11].

Berkes et al. [12] stated that there is a link between the pressure on the marine wealth and the increase of fish prices, which could prompt consumers to seek an alternative source of protein (see also Alshubairi et al. [13]. The perceived consequences of IUU fishing - higher fish prices and a decline in fish stocks - have not yet caused a crisis in the marine food supply chain, as Kuwaiti merchants can still afford to import fish from international markets. But the unprotected waters and the wider violations of fishery

regulations could lead to a further spread of crime, such as piracy, as indicated by Weldemichael [14] who noted that Somali piracy began as a direct response to illegal fishing. Moreover, if the level of IUU fishing increases, and if international supplies are not forthcoming, there could be a major threat to food security Kuwait. There are two further security issues: violence and immigration. In terms of violence, as stated by the Al-Qabas Newspaper [15], the harm inflicted by IUU fishers has included violence committed by illegal fishers against officers of Kuwait's Fishery Protection Authority (FPA). Immigration is a highly sensitive issue in Kuwait, not least because 70% of the population is made up of immigrants, and recent research states that a lack of immigration control is the primary cause of increased crime and environmental damage, including pollution [16-18]. Most of the interviewees in the present study assert that illegal immigrant fishers are responsible for most of the illegal fishing in Kuwait, and the official statistics of IUU fishing in Kuwait show that almost half of the illegal fishing activities in Kuwait are conducted by non-Kuwaiti illegal fishers (see Table 3). Kuwait has a serious problem in controlling the number of immigrants, and this problem impacts all sectors in Kuwait, including the fishery. If Kuwait continues to turn a blind eye to immigration control, IUU fishing will continue to increase, causing further damage to fish stocks. Some commentators have begun to characterise the IUU threat in terms of environmental terrorism. Schwartz [19] stated there are eight categories of environmental terrorism, one of which could be applied to IUU fishing in Kuwait i.e. category 5, which refers to acts or threats of environmental destruction that are deliberate, not merely symbolic, and occur during peacetime. In our view, research into

IUU fishing in Kuwaiti waters is long overdue, and currently urgent, if sustainable management of its fisheries is to be achieved.

The main research questions of this study are: What is the extent of IUU fishing in Kuwaiti waters? How damaging is it to the country's fish stocks? Who is responsible for this IUU fishing? How aware of IUU fishing are the government, citizens, media, companies and individuals? What measures have been taken to combat it? How effective are these measures? What more could be done to eliminate IUU fishing in Kuwaiti waters? Are there wider implications of the IUU fishing problem for the Kuwaiti system of governance? The remaining sections of this paper present an outline of fish stocks and fishers in Kuwaiti waters; the methods used by the study to obtain data; the results of the fieldwork; a discussion of these results; and a concluding summary of the findings and their wider implications for achieving the United Nations Sustainable Development Goal 14 [20]. First, however, we examine the meaning of the concept of IUU fishing.

2. The concept of IUU fishing

The concept of 'illegal, unreported and unregulated' (IUU) fishing refers to one of the most serious threats to the global marine ecosystem and fish stocks worldwide. According to the FAO [21], IUU fishing "across the world's oceans weighs in at around 11–26 million tonnes of fish each year or a price tag of US\$10–23 billion". Illegal fishers take advantage of weak and corrupt regimes to conduct illegal fishing in their coastal waters [22]. According to

2.1 The definition of IUU fishing

The definition of IUU fishing used by the Food and Agriculture Organization of the United Nations (FAO) addresses three categories of IUU fishing: “1. ILLEGAL FISHING refers to fishing activities conducted by foreign vessels without permission in waters under the jurisdiction of another state, or which contravene its fisheries law and regulations in some other manner; 2. UNREPORTED FISHING refers to fishing that is not officially recorded; and 3. UNREGULATED FISHING refers to fishing activities in areas where there are no applicable management measures to regulate the catch” [24]. IUU fishing includes “1. Fishing and fishing-related activities conducted in contravention of national, regional and international laws; 2. Non-reporting, misreporting or under-reporting of information on fishing operations and their catches; 3. Fishing by “Stateless” vessels; 4. Fishing in conventional areas of Regional Fisheries Management Organizations (RFMOs) by non-party vessels; 5. Fishing activities which are not regulated by States and cannot be easily monitored and accounted for” [22]. Kuwaiti law and regulations define IUU fishing according to the FAO’s definition [25] and [26], since Kuwait is a party to the 1982 UN Convention on the Law of the Sea (UNCLOS) as well as the 1993 FAO Compliance Agreement [23].

2.2 The history of IUU fishing

As stated by MRAG [27] during the 1950s, industrial-scale fishing began with the Soviet Union's distant water fishing fleets, followed in the 1970s by similar fleets from East Asia, Europe, and the USA. Before the legitimising of countries' 200-mile exclusive economic zones (EEZs) by UNCLOS in 1982, and the establishment, from the 1960s onwards, of regional fisheries management organisations (RFMOs) to regulate high seas fishing species quotas, such industrial-scale fishing was unregulated and unreported, but then it also became illegal, and classified as IUU. According to Al-Sharrad [3], IUU fishing in Kuwaiti waters began in the late 1960s, perpetrated by vessels from Iran and Saudi Arabia that targeted shrimp with illegal trolling gear, and since the 1990s, the total fish stocks have declined from a peak of 8.5m kgs in 1995 to 5.5m kgs in 2016 (see Figure 1).

2.3 How damaging is IUU fishing in Kuwaiti waters?

KUNA [9] reports that IUU fishing in Kuwait is reducing fish stock and marine biodiversity levels in Kuwaiti waters. The causes of the decline in fish stock levels is partly due to pollution and other factors, but IUU fishing and over-fishing, is playing a major role in the decline according to Al-Husaini et al. [2]. One effect of this decline is overpriced fish in Kuwait. The *Arab Times* [28] reported that "the over pricing of fish in Kuwait is significant and the Kuwaiti citizens cannot afford fish on their tables daily". Al-Fuzai [29] claims this raises the issue of food security in Kuwait, in that it could put the nation's supply of protein food at risk. Al-Baz [30] claims that fisheries'

catches in Kuwait decreased by 41% in 2005 and recommends that fisheries must be reduced to allow stock recovery. Nithyanandan [31] stated that the Arabian Gulf suffers from serious shellfish and finfish decline, particularly in Kuwait, and one of the causes is overfishing.

3. Fish stocks and fishers in Kuwaiti waters

The main commercial shrimp and fish species in Kuwaiti waters are listed in Table 1. According to Al-Husaini et al. [2], more than 35% of the total fishery production in Kuwait depends on three species of shrimp - the Green tiger prawn (*Penaeus semisulcatus*), the Kiddi shrimp (*Metapenaeus affinis*) and the Jinga shrimp (*Parapenaeopsis stylifera*).

The FAO [23] states that fishery production in Kuwait is insignificant, yet it is the country's second industry after oil. FAO states that the fisheries industry was stable between the period 2011-2013, with annual production levels of 4,000 to 4,500 tonnes, but production declined after 2015, with only 370 people employed in 2015 compared to 3,500 engaged in fishing in 2013 (add ref)

From Figure 1, we can observe the production cycle in Kuwaiti waters and see that fish production was increasing from 1983 onwards (apart from 1990-1991 during the first Gulf War) until it reached a peak in 1995 of 8.5 million kgs. Since then it has gradually declined (with a few temporary spikes)

fish stock density in Kuwait declined by 53% between 2013 and 2014, but the fish production figures provided by CSB (Figure 1) show that the decline was only 20% and it recovered temporarily in 2016. The decline was particularly severe in two main finfish species: an 87% decline in Hilsa shad production; and an 85% decline in Silver Pomfret production. One of the main causes behind these declines, according to Al-Husaini et al. [2], was overfishing.

Figure 2 shows that the number of fishers varies from year to year. This is because the number of immigrant fishers changes significantly over time because of amendments to Kuwaiti immigration regulations.

Table 2 shows the nationality of each fisherman in Kuwaiti waters since 2000.

As we see in Table 2, the number of immigrant fishers, especially from Egypt and India, is considerably greater than the number of Kuwaiti fishers.

4. Methods

The data collection in this study was carried out in four ways. First, semi-structured interviews were conducted with key informant (KI) stakeholders in the fishing industry in Kuwait. The interviewees included a member of the Kuwaiti coastguards (KI-6); , the Kuwaiti Institute of Scientific Research (KISR) (KI-1); the Department of Fishery Resources (DFR) (KI-8); the Public Authority of Agriculture Affairs and Fish Resources (PAAAFR) (KI-7); the Kuwaiti fishers' community (KI-5); a fishing company's representative (KI-9); and fishers accused of illegal fishing activities (KI-2, 3 and 4). The questions asked of the KI interviewees were designed to elicit the main causes of, responses to, and solutions for IUU fishing in Kuwaiti waters. Second, visits were made to all of the Kuwaiti islands, fishing areas, coasts and ports to take samples of water, sand and sediments; to check the existence of coastguards and fishery protection authorities; and to analyze the fishing activities in the areas. Third, a review of both peer-reviewed publications and the grey literature was undertaken to access studies of IUU fishing in general, and IUU fishing in Kuwaiti waters in particular. Fourth, documentary materials held in Kuwait government archives were studied, including statistics of Kuwaiti fish stocks from the website of the Kuwaiti Central Statistical Bureau [32]; information from the Kuwaiti Fishery Protection Authority (FPA) on fish stock health since 1983; official reports from authorities in Kuwait regarding IUU fishing; and transcripts of

proceedings in Kuwaiti court cases of IUU fishing which were viewed at the Kuwaiti Al-Ruqaie court library.

5. Results of the fieldwork

This section presents the results obtained from the above methods of data collection. Most respondents (90%) agreed that during the last 30 years there has been a decline in fish stocks in Kuwaiti waters, though PAAAFR claimed that while there has been a reduction in production compared to the level in the 1980s, current production levels are now steady because of an increase in regulations in recent years (see Figure 1).

5.1 Causes of declining stocks

Most interviewees (KISR KI, illegal fishers and two Kuwaiti fishers) believed that the main cause of declining stocks is overfishing, especially by IUU trawlers, and that the second reason for the decline is pollution from factories and the discharge of sewage directly into the sea. Evidence of sewage outfalls can be seen on most of the beaches near cities such as Shuwaikh, Salmyia, and Fintas [33]. The lead researcher in this project visited most of the Kuwaiti coastlines, including all the Kuwaiti islands, and took water, sand and sediment samples, which contained traces of raw sewage waste (see the documentary video produced during this project [33]), and also studied water samples collected from several locations during summer

and winter in Kuwaiti waters [34], as shown in Figure 1. The conclusion reached was that, in these locations, E. coli exceeded international water quality standards by almost 100 times, resulting in persistent failures of microbial water quality standards because of high concentrations of faecal sterols, and that pollution from sewage in the Kuwaiti waters has resistance which exceeded the threshold of both Kuwait Environmental Public Authority (KEPA) standards and the European Union's Coastal Bathing Water Directive (CBWD). However, a KISR interviewee claimed that 90% of the decline in fish stocks is not due to either IUU or pollution, but to high levels of salinity caused by the Southeastern Anatolia project which has constructed twenty two water dams in Turkey since 2010 [35], as well as the water dam built on the Karun River by Iran in 2005 [36], which together have greatly reduced the amount of fresh water pouring into the Arabian Gulf through Shat Al-Arab. The resulting increased salinity level has caused the fish to move away or die [37, see also 38, 39]. For its part, PAAAFR stated that the decline in fish stocks was mainly because of other environmental issues including global warming, the red tide or algal bloom phenomenon, and oil tanker discharges of ballast water [8].

5.2 Forms of IUU fishing

The FPA interviewee (KI-7) said there were many forms of IUU fishing in Kuwaiti waters. The most serious forms were fishing with illegal large trawls and multi-fishing lines; fishing in illegal fishing areas such as the

Kuwaiti Bay; fishing with unlicensed boats; catching fish smaller than the authorized size; catching more fish than licensed (each licensed boat has a limited weight capacity but fishers catch more than those limits); fishing in non-seasonal times (including trawling during the breeding and spawning periods of fish growth); and unselectively catching everything and discarding dead and unwanted species. An example of illegal gear was described by one of the IUU fishers interviewed (KI-3) who said that he used multi-hook fishing lines which he bought from Egyptian fishers - they were up to several miles in length with thousands of fishing hooks of different sizes attached, and caught huge numbers of fish (1 to 2 tonnes). Another IUU fisher (KI-2) said he had used a multi-hook fishing line for many years and the authorities have never caught him because this gear could not be easily seen. When the FPA or coastguards approached his boat, he cut the line and abandoned it at sea because it was cheap and could be easily replaced - a practice that leads to 'ghost fishing' because fish continue to be caught on the hooks of the abandoned lines. Another IUU fisher (KI-4) described his use of an illegal trawling gear called the Koofah, which most of the illegal trawling fishers in Kuwait used. It is a big solid net, which he made himself, and is attached to the boat's stern which is dragged across the seabed. The boat moves slowly and the trawl gathers up everything in its path, damaging the coral reefs. The fisher said that the authorities never caught him with this gear because each time a patrol boat approached, he cut his net and threw it into the sea, recording its GPS position so he could come back to pick it up later. Most interviewees held that IUU fishing in Kuwaiti waters is a serious problem, which has to be dealt with severely because it has caused the decline of fish

catches and therefore loss of their livelihoods – one consequence of which has been that Kuwaiti fishers (especially large-scale fishers) have to travel to other countries' waters, such as Oman, to continue fishing.

5.3 Causes of IUU fishing

There was disagreement over the causes of IUU fishing in Kuwaiti waters. All the interviewees perceived that the Kuwaiti laws for fishery protection were strict and sufficient, and they also believed that breaking these laws was damaging to marine life and to fish stock levels; however, they disagreed on why so many fishers violated the laws. An IUU fisher (KI-2) claimed that the authorities did not apply the law because most IUU fishers had connections with the authorities, meaning that their cases would be dropped later, and this made the law against IUU fishing useless. A similar allegation was that the big fishing companies in Kuwait did most of the IUU overfishing in Kuwaiti waters, but the authorities did not take action against them because the owners of those companies were thought to be either members of the powerful families or had connections with powerful people in Kuwait. Another allegation by KI-2 was that the FPA would not take action against IUU Kuwaiti fishers who agreed to vote for the ruling political party, but it threatened to apply the rules to IUU Kuwaiti fishers who voted for opposition parties. KI-2 claimed that any arrested fisher who had a connection with someone in the FPA would have the charges against them dropped [40] – a claim that KI-7 from the FPA denied, saying that when any

illegal fisher is accused he would be put through the legal system without any exceptions.

KI -2 and KI-5 alleged the Kuwaiti authorities were not competent to prevent IUU fishing because recruitment to government posts in Kuwait was not based on merit or qualifications but on nepotism. The respondents asserted that most of the heads of these ministerial sectors were members of a powerful family who lacked knowledge and administrative and leadership skills, and that they recruited their favourites into their staff who were also unqualified. Thus, it is claimed, most of the important government agencies in Kuwait were incapable of achieving their goals, including the PFA whose employees were not specialized in either fisheries or the marine environment, nor did they have leadership skills. Another explanation was put forward by the coastguard interviewee (KI-6) who said the laws and regulations were adequate, but lack of coordination between the different authorities in Kuwait meant that there was ineffective enforcement. In partial defense of the FPA, the Al-Qabas Newspaper [15] published a report, based on a statement from the FPA, that they faced considerable danger at sea from IUU fishers who used knives and sticks to threaten violence against them. According to this report, there are dozens of videos in the social media showing IUU fishers trying to crash FPA vessels with their fast boats, thereby putting officers' lives in danger and causing serious damage to patrol craft.

A different explanation put forward by an IUU fisher (KI-4) was that the fault lay primarily with foreign fishers. Dayem [40], a spokesperson for the Kuwaiti fishers, said the FPA failed to monitor landings at ports, and as a result, foreign fishers were allowed to catch and land any species they liked,

whether abundant or scarce. He also claimed that the FPA turned a blind eye to IUU Iranian fishers who sold their fish in Kuwaiti markets. Kuwaiti fishers and fishing companies pinned the blame on immigrant fishers from Bangladesh, India, Iran, and Egypt. For example, respondents KI-3 and 5 said immigrant illegal fishers from Egypt were the ones who really damaged the Kuwaiti fish stocks because they were numerous and they did not care about the health of the marine environment. Other respondents (KI-3, 4 and 5) claimed that foreign fishers from Iran and Iraq were the worst violators of the law of fisheries, and they escaped detention by speeding away, usually to the north of the Arabian Gulf near Boubyan Island where there was limited surveillance so they could enter and exit Kuwaiti waters quickly. Other respondents (KI-2 and KI-3) blamed the environmental ignorance of fishers: although these respondents held that they themselves were aware of the harm inflicted on marine life by IUU fishing, they said that most IUU fishers were not.

From all of the above we can conclude that the core cause of the IUU fishing and the overfishing is the lack of enforcement the laws and regulations. The lack of immigration enforcement caused the increase of uncontrolled fishers; the lack of marine protection enforcement caused the spread of marine violations in the Kuwaiti waters, and the lack of fish market control allowed IUU fishers to dispose of their illegal catches

5.4 Responses to IUU fishing

All fishers, including IUU fishers, stated that the authorities' responses to IUU fishing in Kuwaiti waters were ineffective because of limited levels of patrolling. One reason for this limited patrolling, mentioned by KI-4, is that the FPA is constrained by weather conditions: in rough weather officers do not go out to sea, so illegal fishers make use of bad weather times as an opportunity to carry out illegal fishing. In addition to the other reasons put forward by fishers as to the ineffectiveness of the FPA (already mentioned in section 4.3), a further charge made by KI-1 was the FPA's failure to report and record all incidents of violence used against FPA officers by illegal fishers, which meant that the full extent of the IUU problem was not visible. The FPA denied this charge and claimed they did keep records of tickets issued for illegal fishing (see Table 3). From Table 3 we can see that the total number of tickets issued for IUU fishing between 2001 and 2017 was 9,755, meaning that the FPA issued an average of 573.8 tickets per year, which is three tickets every two days. The proportion of IUU offences committed by immigrant fishers was 53%, and by Kuwaiti fishers was 45%. Appendix B contains a detailed table listing all the tickets issued.

5.5 Respondents' recommendations for ending IUU fishing in Kuwaiti waters

The most common recommendations for ending or containing IUU fishing in the Kuwaiti waters made by respondents involved technical solutions. For example, several respondents (including KI-1, 5 and 6)

all fishing and IUU fishing activities. The coastguard's respondent KI-6 recommended installing the Automatic Identification System (AIS) on all boats in Kuwait [41], so that if the fisher switches the AIS off, the RADAR would detect a vessel with no AIS, which would be considered as suspicious, and this would alert the authorities to a possible case of IUU. One use of such satellite technology would be to take pictures of IUU fishers so they would not escape arrest by cutting away their illegal fishing gears at sea [42]. KI-5 recommended that a radar system should be employed to record a boat's track in order to find out where a fisherman cut loose the trawl. Radar would also record if a boat was moving slowly within a steady course, and this would indicate that it was towing something heavy like a trawl net. The use of underwater technologies such as SONARs and hydrophones to detect trawlers or any other illegal activities was proposed by Alwali [43], while Oozeki et al. [44] suggested establishing stationary ships or jetties at sea to give the authorities more visual advantage in detecting IUU fishing.

KISR interviewee KI-1 suggested another technical solution – monitoring fish stocks by applying biological reference points to check for changes in fish stock biomass, so if a low level of biomass was recorded, fishing would have to be suspended in real time. KISR KI-8 and fish market analyst KI-9 suggested that if such monitoring were to be undertaken now, it would lead to an immediate suspension of all fishing in Kuwaiti waters for at least five years, to allow for fish recovery. The KISR interviewee KI-1 and several fisher interviewees (KI-2, 3, 4 and 5) proposed adding another monitoring tool by collecting data from fishermen at all fish markets and ships to calculate exactly the amount of fish they caught every day. If a

fisherman was not adhering to his allocated share of fish, or was providing false data, the FPA would withdraw his license. The KISR respondents KI-1 and KI-8, the coastguard KI-6, and the PAAAFR interviewee KI-7 recommended recording all fishing activities, transportation of products, and sea travel voyages in Kuwaiti waters, by requiring log books to be kept by fishermen, markets, and processing factories in order to check that landing data were accurate. Illegal fishers KI-2, KI-3, and KI were in favor of sudden inspections at sea and at harbors and ports to spot check the types of fish, weight, length and amount caught and landed, because this would help significantly to track illegal activities at sea and deter fishers from such activities. They also recommended the installation of stationary hubs at all the fishing areas in Kuwait to function 24 hours every day, thereby preventing the fishery authorities from using the excuse of bad weather to stop monitoring the fisheries. Another technical solution they suggested was to check whether a vessel was capable of towing trawling nets, and if it was, to decline issuing it a fishing license. Other recommendations were for policy measures rather than technical solutions. For example, the KISR respondent K-1, fishery expert KI-10, and several fishers (KI-3, KI-4 and KI-5) suggested imposing a moratorium on fishing in Kuwaiti waters for particular species until their biomass recovered, while the PAAAFR respondent KI-7 recommended banning all fishing in Kuwaiti waters for two years to allow the stocks to recover [8]. To overcome the resulting fish shortage, the importing of fish from Iran, Saudi Arabia and other regional suppliers was proposed by fishers and KISR. Another policy solution was to monitor more closely the level of immigration into Kuwait (KI-2, KI-3 and KI-5). The coastguard KI-6 and two

fishers (KI-3 and KI-5) suggested increasing the punishments for IUU fishing in Kuwait to include not only financial penalties but also deportation of immigrant illegal fishers. Some illegal fishers (KI-2 and KI-4) recommended an end to the policy of giving fishing licenses to immigrants. They also said that since most fishers are not environmentally aware, and are ignorant of fishery protection law and regulations, they should be made to attend workshops to educate them about the harmful consequences of IUU fishing before being issued with fishing permits, quotas, and vessel licenses. Also, the government should start a major media campaign to educate the public about the consequences of illegal fishing and its damage to fish stocks. KI-2 and KI-4 also said that, since they could easily buy illegal fishing gears from Kuwait fishing shops or online, the government should take action to monitor and control such outlets. To reduce the use of violence by illegal fishers against FPA employees, coastguard KI-6, fishers KI-3 and KI-5 and illegal fishers KI-2 and KI-4 urged the government to increase the number of environmental police officers and qualified employees in the FPA. Finally, coastguard interviewee KI-6 argued for increased coordination between government authorities to counter IUU fishing more effectively.

6. Discussion

There are six issues raised by the results section that warrant discussion. First, the fieldwork confirmed the claims made in the published literature that fish stocks in Kuwaiti waters have been in decline for many years. All respondents alluded to this decline, and CSB [32] reported it in figures that go back to 1983 which showed a rise in landings from 1983 to a peak in 1995, followed by a fall back to 1983 levels by 2015.

Second, the fieldwork shows there was far less consensus on the cause of this decline. Some respondents attributed it to excessive fishing efforts by all fishers. Others blamed IUU fishing, including the use of damaging gear such as very long lines or small mesh nets. For some respondents the main cause was IUU trawling by foreigners, especially Egyptians and Iranians. Alternative or complementary explanations by KISR, PAAAFR interviewees and literature included pollution from land-based sewerage discharges [45]; increased salinity caused by dams built by Turkey and Iran on rivers flowing into Kuwaiti waters [46]; global warming [47]; and algal bloom. In our view, the crucial cause is overfishing, which is exacerbated by IUU fishing carried out by both domestic and foreign companies. KISR's reluctance to blame IUU fishing and instead to claim that 90% of the decline was caused by high levels of salinity, is partly because the data obtained by the FPA on IUU fishing is incomplete. The FPA and the coastguards only pursue individual IUU fishers at sea; they do not pursue the huge company trawlers, because, according to respondents, these companies are owned by powerful people who are effectively beyond the law. Also, fishers who come from Iraq or Iraq

and carry out IUU fishing, escape back to their own countries, so their violations are not reported. Therefore, we cannot assess the full extent of IUU fishing from the statistics provided by the FPA because these statistics do not provide a full picture. Our findings indicate that the overall perception is that IUU fishing is much more damaging to the fish stocks in Kuwait than the FPA is prepared to acknowledge. However, empirical evidence is required to substantiate this observation.

Third, the claim that foreign fishers are responsible for most of the IUU fishing is exaggerated. Dayem [40] and Kuwaiti fishers noted that immigrant fishers, especially from Bangladesh and Egypt, were the main perpetrators of IUU fishing in Kuwait, taking advantage of poor immigration control. This charge resonates in the Kuwaiti media and parliament, which recently warned the government about the threat posed by immigration to the country's population balance [17]. According to the World's Population Review [18], the Kuwaiti population in 2018 is 4.2 million, of which 30% are Kuwaitis and 70% are non-Kuwaitis. These statistics are reflected in the number of fishers: Table 2 (active fishers) shows that immigrant fishers (Indians and Egyptians) are the majority of all fishers over all years, while the minority of fishers are the licensed Kuwaiti fishers. However, by looking at Table 3 (the fishing tickets issued against illegal fishers) we note that almost half of the violations have been perpetrated by Kuwaiti fishers. If these figures are accurate, they show that in 2017, four licensed Kuwaiti fishers committed 112 offences (an average of eight offences per fisher), whereas 614 licensed non-Kuwaiti fishers committed 371 offences (an average of 0.6 offences per fisher). Even if there is some inaccuracy in these figures, they suggest that

blaming foreigners for the bulk of IUU is wide of the mark. The coastguard interviewee stated that Kuwaiti fishers are no better than immigrant fishers at looking after the marine environment. So, even if the Kuwait government enforced more restrictions on immigrant fishers, there would still be a considerable amount of IUU fishing committed by Kuwaiti fishers.

Fourth, the fieldwork cast another doubt on the veracity of the FPA figures in Table 3. From that table, we are told that the FPA issued 9,755 for illegal fishing during a period of 16 years. This is an average of 609.7 illegal fishing incidents recorded every year, which seems excessive, but given that most fisher interviewees said they rarely see FPA vessels at sea, and all the illegal fisher interviewees said they had never been caught by the authorities, the number of IUU fishing incidents that the FPA did not report is likely to have been substantial. This shortfall of the FPA is partly explained by its prioritization of safety at sea over fishery monitoring. The coastguard interviewee stated that the primary role of the FPA is security and safety, and IUU fishing investigations constitute a secondary role for them, so in rough weather conditions the coastguards give more attention to SOS signals than to observing IUU fishing. With regard to the role of the Kuwaiti coastguards, their top priority is security, as the conflicts have increased between Iran and GCC countries [48], and IUU fishing is not considered by them to be a security issue.

Fifth, the fieldwork demonstrated that fishers in Kuwaiti waters will always find a way to circumvent the law, employing various types of gear to catch as much as they can without being caught, even using the threat of violence against the authorities in order to avoid arrest [49]. This suggests

that simply using force against IUU fishers is unlikely to work because the problem has many dimensions, including lack of education, weak immigration control, poor monitoring mechanisms, and a culture of corruption, and each dimension needs to be addressed. For example, the last dimension – culture of corruption – is especially important since, even if AIS systems are installed on all vessels and the FPA obtains reliable data on IUU fishing, prosecuting offenders may be thwarted if guilty fishers use connections with authorities to remove accusations against them. It is true that during 2014-2015, when the Indonesian government employed AIS and the Vessel Monitoring System (VMS) to counter IUU, the result was a decrease of 42% in IUU fishing [50]. But unlike Indonesia, some IUU fishers in Kuwaiti waters are perceived to be protected by prominent figures with influence over the judiciary. Moreover, the fieldwork elicited several allegations of other kinds of corruption in Kuwait's system of fisheries governance. For example, fishers, including IUU fishers, claimed that the FPA turned a blind eye to Kuwaiti IUU fishers who voted for the government party in the elections; that several large companies and powerful family members carried out IUU trawling fishing in Kuwait with immunity from prosecution; that these privileged figures also controlled fish prices in the markets; and that the staff of the FPA were recruited by nepotism not merit. Although not all these claims can be supported by corroborative evidence, the frequency of their expression by so many respondents convinced us that they point to a serious issue for fisheries management in Kuwait, potentially undermining not only the health of its fish stocks, but also the rule of law and the principle of democracy in the country [51]. Some voices in the country began raising

these wider issues in the parliament 11 years ago [52].

Sixth, the fieldwork revealed that violence was used against the FPA by some IUU fishers to resist arrest at sea. The coastguard's interviewee noted that IUU fishers did not use violence against coastguards because they had weapons, whereas the FPA did not carry weapons. One of the fisher interviewees explained that the IUU fishers did not respect the law against violence either because they or their sponsors were protected from prosecution by powerful insiders or because they enter Kuwaiti waters illegally with fast vessels and can escape arrest by fleeing to Iran or Iraq. But there is a wider issue here - increasing violence against the marine authorities in Kuwait reflects a disturbing pattern of a rise in violence on the country's mainland. El-Garem and Ismail [53] stated that "the Kuwaiti youth adopted violence after the Iraqi invasion of 1990", and OSAC [16] reported that the crime rate in general is increasing in Kuwait. Perhaps IUU fishing is a symptom of this wider shift towards lawlessness in Kuwait?

7. Conclusion

This study indicates that, like so many other emerging economies, Kuwait is experiencing a serious threat from IUU fishing to its coastal fish stocks. Although respondents are divided about the extent to which other factors (such as pollution, water salinity, climate change and algal blooms) are also responsible, most interviewees perceive that IUU fishing is the main cause. But IUU fishing has many forms, and it is not clear which forms are the

determine, for example, whether trawl nets deplete the stocks at a faster rate than do long-lines, so that authorities can more effectively target their monitoring and enforcement efforts [54]. The main causes of the IUU fishing in Kuwait is the lack of enforcement of fisheries law; the failure to monitor immigration; and the lack of control over the fish markets which provide an outlet for illegal fish. . It is likely that similar problems are experienced by other coastal states in the Gulf, and as stated by Alshubairi [13], the first step needed in the GCC region to combat IUU fishing is to identify the strengths and weaknesses of coastal policing and encourage participation in regional and global marine protection organisations. . Kuwait must engage in marine protection activities in the GCC by integrating departments of the navy and coastguard in the region, with a mission to combat illegal fishing and other activities which damage the ecosystems.

Research into the effect of fishing moratoria is also necessary (Hoag) [55], as is research to clarify whether foreign IUU fishing is a greater threat to stocks than is Kuwaiti IUU fishing. Also, the government should provide more resources for both data collection and enforcement operations, including measures to integrate the existing agencies [56]. The government should take more action to punish the sponsors of fishers who engage in IUU fishing by banning their business operations in Kuwaiti waters. Above all, however, the government must address the problem of perceived corrupt judicial proceedings whereby IUU Kuwaiti fishers can escape prosecution for damaging the fish stocks. Kuwait is not alone in facing the fact that corrupt practices threaten to undermine its coastal fish resources: for example, many West African countries, including Sierra Leone, are in a similar position.

Unless the governments in such countries have the courage and political will to end corruption, they may find that not only do they put their fish stocks at risk, but they also put good governance at risk.

8. Appendices

Appendix A. A film was made from evidence supplied by Kuwaiti armed forces units and naval ships [33].

Appendix B. Details of illegal tickets issued by the Kuwaiti FPA from 2000 to 2017.

Appendix C. The Semi-Structured Interview questions.

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Conflicts of interest

The authors have no conflicts of interests to declare.

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Tables

**Table 1. The main commercial shrimp and finfish species in Kuwait
(Source: [2].**

	Species and (Family)	Common name	Local name
1	<i>Penaeus semisulcatus</i> (Penaeidae)	Green tiger prawn	Umm Niaarah
2	<i>Metapenaeus affinis</i> (Penaeidae)	Jinga shrimp	Shahameyah
3	<i>Acanthopagrus latus</i> (Sparidae)	Yellowfin seabream	Shaem
4	<i>Pampus argenteus</i> (Stromateidae)	Silver pomfret	Zobaidy
5	<i>Tenualosa ilisha</i> (Clupeidae)	Hilsa shad	Suboor
6	<i>Epinephelus coioides</i> (Serranidae)	Orange-spotted grouper	Hamoor
7	<i>Pomadasys kaakan</i> (Haemulidae)	Javelin grunter	Nagroor
8	<i>Otolithes ruber</i> (Sciaenidae)	Tigertooth croaker	Newaiby
9	<i>Liza klunzingeri</i> (Mugilidae)	Klunzinger's mullet	Maid
10	<i>Lutjanus malabaricus</i> (Lutjanidae)	Malabar blood snapper	Hamra
11	<i>Scomberomorus commerson</i> (Scombridae)	Kingfish	Chanaad
12	<i>Scomberomorus guttatus</i> (Scombridae)	Indo-Pacific king mackerel	Khobat
13	<i>Pseudorhombus arsius</i> (Paralichthyidae)	Large-tooth flounder	Khofaah
14	<i>Platycephalus indicus</i> (Platycephalidae)	Bartail flathead	Wahar
15	<i>Nemipterus peronii</i> (Hemipteridae)	Notched threadfin bream	Bassi
16	<i>Mugil cephalus</i> (Mugilidae)	Flathead mullet	Beyah
17	<i>Lethrinus nebulosus</i> (Lethrinidae)	Spangled emperor	Sheiry
18	<i>Paralichthys</i>	Spotted mullet	Shayba

	<i>diacantha</i> (Sciaenidae)		
19	<i>Cynoglossus arel</i> (Cynoglossidae)	Largescale tongue sole	Lessan
20	<i>Parastromateus niger</i> (Carangidae)	Black pomfret	Halwayah
21	<i>Argyrops spinifer</i> (Sparidae)	King soldier bream	Andag
22	<i>Eleutheronemaa tetradactylum</i> (Polynemidae)	Fourfinger threadfin	Sheim
23	<i>Plectorhinchus pictus</i> (Haemulidae)	Trout sweetlips	Fersh

Table 3. Tickets for illegal fishing issued during 2001-2017 against fishers by the Kuwaiti FPA (Source: FPA).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Kuwaiti	4452	45.6	45.6	45.6
	Non Kuwaiti	5218	53.5	53.5	99.1
	Unknown	84	.9	.9	100.0
	Total	9754	100.0	100.0	
Missing		1	.0		
Total		9755	100.0		

Figure legends

Figure 1. Annual total fish landings in Kuwaiti waters from 1983 to 2016 in kgs. (Source: CSB and the Kuwaiti Authority of Fishery Protection [32].

Figure 2. The number of licensed fishers who have been active in Kuwaiti waters since 2000. (No data for 2006) Source: [32].

