Iranian Journal of Fisheries Sciences
http:doi.org/ 10.22092/ijfs.2025.134573 2025, 24(6) 1349-1358

Research Article

Data quality recorded from the commercial transactions of Iraqi marine fisheries in the northwest of the Persian Gulf

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Keywords

Artisanal fisheries,
Commercial catch,
CPUE,
Fisheries management,
Iraq,
Persian Gulf

Article info

Received: November 2024
Accepted: July 2025
Published: November 2025

Abstract

This study was conducted in Iraqi marine waters in the northwest of the Persian Gulf. The data for boats and annual catches were collected from the Al-Nasr Fishing Association Ltd. in Al-Faw and the Basrah Agriculture Directorate, which depend on commercial transaction data for documentation on the 2021 fishing season. The fish landing site in Al-Faw city is in the southernmost of Iraq. The amount of experimental catch per unit of effort (CPUE, kg/hour/boat) was measured during regular monthly trips in 2021. The CPUE for large boats peaked in June (16.66 kg/hour /boat), whereas the highest value of CPUE was recorded in May for demo fishing by small boats employing gillnets (11.8 kg/hour/boat). Shrimp was dominated in the Iraqi catch, constituting 16.13% of the total catch. The commercial transaction data registered by the responsible administration did not agree with the demo fishing results of the estimated CPUE in re-estimating the Iraqi marine catch. The study found a significant flaw in the fish statistics based on the commercial transactions registering data in Iraqi marine catches. The current study also estimated that the unreported artisanal commercial catch in Iraq during 2021 was about 48%, which is higher than other studies in re-estimating the Iraqi marine catch. The study documented a significant decrease in the number of fishermen, with their count reaching (2025) compared to the previous years. Thus, it is necessary to assign an independent authority to document the Iraqi marine catch.

Introduction

Artisanal fisheries in the Persian Gulf are considered one of the most important renewable resources that contribute to the food security of the eight countries bordering it. Fisheries are renewable natural resources if they are appropriately managed. The Iraqi marine catch is classified as small and diversified fisheries (Qasim, 2021). Fishing continues to play a crucial role in ensuring the food security of several nations. It offers essential nutrition and financial resources to individuals with few alternatives (Srinivasan *et al*., 2008). To ensure the sustainable exploitation of marine fish resources, it is recommended to closely monitor the aquatic resources and process data on catch per unit of effort. Catch statistics for further management advises either towards sustainable exploitation or conservation of threatened and endangered species or species groups (Valinassab *et al*., 2011; Ghotbeddin *et al*., 2015). The quality and transparency of scientific information about these fisheries enable specialists to analyze their data to assess these fish stocks and describe their condition and trends. Countries must monitor their systems for gathering data, analyzing it, and producing reports to ensure the sustainability of these systems to meet the needs to develop fisheries management strategies to ensure their sustainability and take the necessary corrective measures. To accomplish this goal, it is necessary to provide human and financial resources (FAO, 2003). Iraq's marine fisheries catch data from 1950 to 2010 were initially rebuilt by (Al-Abdulrazzak , 2013; Al-Abdulrazzak and Pauly 2017). Mohamed and Qasim (2014) examined data for the total species landings and fishing efforts of the Iraqi maritime artisanal fisheries between 1965 and 2011. Khalfallah (2020) who covered the years 1950 to 2015, corrected this original version. A comprehensive description of species and total landings and their trends from 2008-2016 was published by Mohamed (2018). Mohamed and Abood (2020) also analyzed fish landings from Iraqi artisanal marine fisheries from 2017 to 2019 using commercial transaction data. Al-Shamary and Younis (2022) also identified the spatial variation in total catch and commercial fishing in Iraqi marine waters. However, these studies examining fishing trends, fishing gear and major threats are still limited, and insufficient knowledge about key aspects can jeopardize the sustainability of fisheries and confuse policy-making (Ben-Hasan and Daliri, 2022). Therefore, the strategy of improving information is one of the elements of sustainable fish stocks. Nations and governmental and non-governmental institutions need to build their capabilities to collect data on fisheries sustainably and efficiently to advance this vital sector related to food security. These reports should specify requirements for this sector and the involvement of regional and international nations to ensure comprehensive participation in the available strategies. The objective of the study is to improve the process of documenting fisheries data to understand the state of Iraqi marine fisheries and its trends to gain insight into developing successful management policies to sustain fish stocks.

Materials and methods

Study area

The Iraqi marine waters form a coast starting from the Um Qasr border area with the State of Kuwait. It is narrow until it ends in the Ras Al-Bishah area, in the Al-Faw border district with the Islamic Republic of Iran. Iraq has approximately 105 km of coastline and 716 km^2 of territorial seas (Earth Trends, 2003) (Fig. 1). Its nature differs from the rest of the Persian Gulf regions, as it is dominated by river sediments carried to it by the waters of Shatt al-Arab. It is located at the northwestern end of the Persian Gulf between longitudes E 48◦ 30′-48◦55′ and latitudes N 29°35′–29°55′ (Hussein *et al*., 1989). The fishing area in Iraqi marine waters is divided into three regions: Shatt al-Arab estuary, Khawr Abdullah, and Al-Amiq port fisheries (Ali *et al*., 1998). This region contains a group of vital Iraqi ports. The climate and hydrology of the southern Mesopotamian plain, which includes the entire coastal area, have been described by Purser *et al*. (1982).

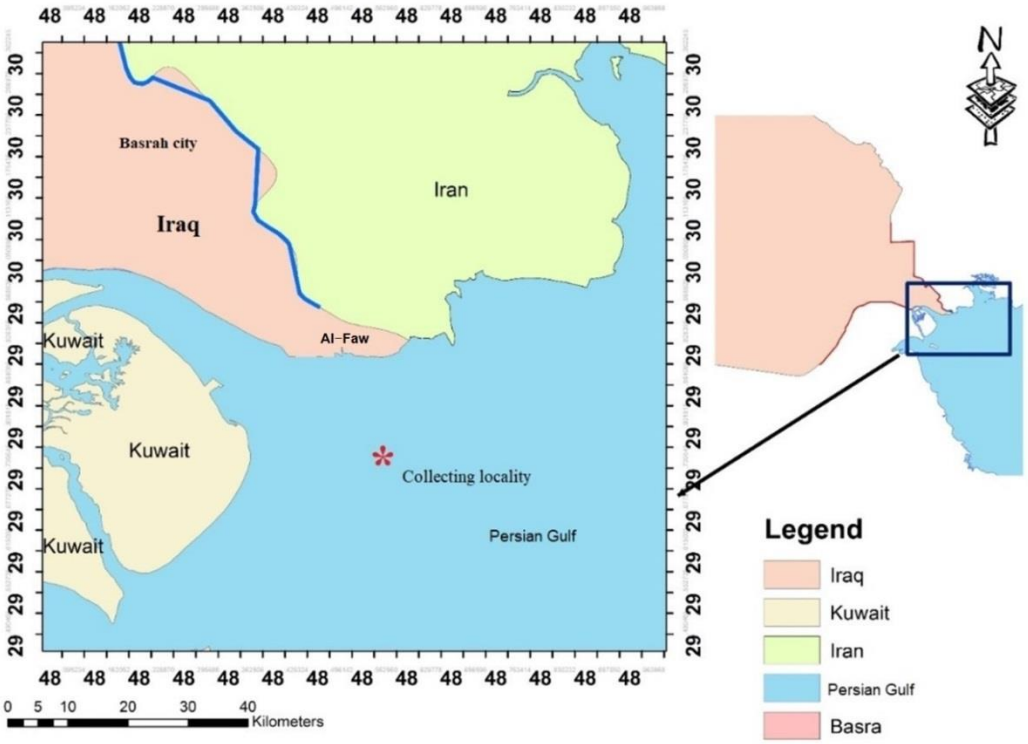

Figure 1: A map of Iraqi marine waters northwest of the Persian Gulf .

Catch per unit of effort

The amount of catch per unit of effort CPUE was estimated in (kg/hr/boat), based on regular monthly demo fishing operations during the fishing season in 2021 for April, May, and June in Iraqi marine waters, using small trawlers with a length of 21.0 m and a width of 3.5 m. It has a horsepower of 250, and its speed during towing was 2.5 knots, in which a bottom traction net was used, with a vertical rope length of 16 m and a ground 18 m. The mesh size in the wings is 2.5 and at the cod-end 1.5 cm, and the length of the net towing rope ranges

between 75-100m, and it takes time to pull the net into the water between 2-3 hours, and (3-4) fishing operations were conducted during one day, at a rate of 15 per month. After that, the time spent, the amount of catch (kg), the speed of the boat, the area of the gillnets, and the amount of fishing per unit of effort were calculated. CPUE is estimated in (kg/hr/boat). A speedboat uses drifting gillnets and the amount of catch per unit effort for this type of fishing method were also chosen.

This equation was used to record the total monthly catch rate so that the total catch could be estimated accordingly:

$$\textbf{\textit{Total landing quantity}} = (number\ of\ ship\ of\ Fleet\ A) * (average\ catch/day)/ship) * (level\ of\ activity)$$

The activity level represents the average number of fishing days during the month. Data for boats and annual catches were then collected from the Al-Nasr Fishing Association Ltd. in Al-Faw and the Basrah Agriculture Directorate, which depends on commercial transaction data for documentation, for the 2021 fishing season. The collected data were processed and analyzed using Microsoft Excel 2016.

Results

Table 1 shows the percentages of species contributing to the total marine reported landings, and fish composition, recorded 28 species of commercial fish belonging to 17 families and two species of shrimp belonging to Penaeidae, which got the highest percentage of the reported catch, followed by Mugilidae, River shad and Silver pomfret fish retreated from the lead. In 2021, the recorded number of fishermen was 2025, reflecting a significant decrease of 63% compared to the number of fishermen recorded in 2019.

Table 2 shows the Active fishing boats were divided according to their size into two types: medium-sized boats called locally (Dhows), which were locally made of steel instead of wood previously, with an average length of 22 m., using trawl nets and gillnets, and speedboats made of fiberglass, with an average length of 14 m, and primarily using gillnets. The results showed that small fishing boats excelled in terms of number, and the total number of boats reached 871. The number of fishing days during the month varied slightly in favor of large boats, and the number of fishing hours did not differ during the day. The amount of CPUE changed during experimental fishing during the 2021 fishing season, except for April, as it did not record a significant difference. The CPUE recorded its highest value for larger boats due to the start of the shrimp fishing season in June. Small boats recorded the highest value of CPUE during April due to the start of the patient fishing season. The number of annual fishing days for each boat was recorded as an average of 210 days/boat/ year.

Table 3 shows a re-estimation of the artisanal catch for the 2021 fishing season in Iraqi marine waters. The month of May recorded the highest production, with an unreported catch accounting for 24%, while June had the lowest production. The percentage of unreported fishing reached its peak in April at 65%, with an overall average of 45 %.

Table 1: Percentage of landed marine species recorded in official records during 2021.

Family	Scientific name	Common name	(%) Catch
Penaeidae	*Penaeus semisulcatus* & *Metapenaeus affinis*	Green tiger prawn & Penaeid shrimp	16.13
Mugilidae	*PlaniLiza subviridis, P. carinata* & *P. klunzingeri*	Mullet	9.60
Nemipteridae	*Nemipterus japonicus* & *Scolopsis frenata*	Threadfin bream	14.17
Sciaenidae	*Otolithes ruber*	Tigertooth Croaker	8.26
Sparidae	*Acanthopagrus arabicus, A. bifasciatus* & *Sparidientex hasta*	Yellow fin-bream and black fin-bream (Sea bream)	6.88
Lethrinidae	*Lethrinus nebulosus*	Emperor	5.99
Clupeidae	*Tenualosa ilisha*	River shad	3.60
Carangidae	*Scomberoides commersonianus*	Spotted leatherskin	3.59
Serranidae	*Epinephelus coiodes* & *E. epistictus*	Spotted grouper	3.39
Chirocentridae	*Chirocentrus dorab* & *C. nudus*	Wolf herring	2.11
Bothidae	*Bothus pantherinus*	Large-toothed flounder	1.52
Soleidae	*Brochirus orientalis*	Oriental sole	0.50
Haemulidae	*Plectorhinchus pictus & Pomadasys argenteus*	Silvery grunt	1.47
Scombridae	*Scomberomorus guttatus*	Spotted Spanish mackerel	1.35
Stromateidae	*Pampus argenteus*	Silver pomfret	1.12
Sciaenidae	*Johnius dussumieri, Johnius belangerii & Nibea maculate*	Sin croaker	0.62
Platycephalidae	*Platycephalus indicus*	Indian flathead	0.61
Scombridae	*Scomberomorus commerson*	Barred Spanish mackerel	0.06
	other species		15.29

Table 2: Number and fishing efforts of the small trawlers and gillnets operating in Iraqi marine waters during the 2021 fishing season.

Year 2021	Type boat	Number of boats	Fishing (day/ month/boat)	Fishing (hours/ day/boat)	CPUE Kg/ hour/ Boat	Catch (t. month)
April	(Small trawler)	166	18	11	9.20	302.3
	(gillnets)	705	17	11	9.22	1215.5
May	(Small trawler)	166	18	11	9.09	298.7
	(gillnets)	705	17	11	11.8	1450.2
June	(Small trawler)	166	18	11	16.66	547.6
	(gillnets)	705	17	11	6.11	805.5

Table 3: Re-estimating of the artisanal catch for the 2021 fishing season in Iraqi marine waters, the total yields at the Al-Faw city fish landing site, and the unreported fishing percentage.

Month	Monthly catch recorded at the fish landing site (tons)	Monthly demo fishing (tons)	Percentage of artisanal unreported commercial catch %
April	519.7	1517.8	65
May	1329.0	1748.9	24
June	584.0	1353.1	56
Average	810.9	1539.9	٤٨

Discussion

The Iraqi exclusive economic zone EEZ is the smallest in the Gulf and has not been agreed upon with neighboring countries (Iran and Kuwait). This area is still a contentious issue that still needs to be

resolved. In general, artisanal fisheries involve low-cost and labor-intensive fishing operations that target a wide range of species using relatively small boats (Chuenpagdee *et al*., 2006; World Bank, 2012; King, 2013; Ben-Hasan and Daliri, 2023). Therefore, Commercial fishing in Iraq is described as artisanal fishing, which primarily uses gillnets, and small trawl nets that are active during the fishing season. Despite what their name suggests, artisanal or small-scale fisheries contribute significantly to food production, sustaining livelihoods and providing vital nutrients to a multitude of people worldwide (Kawarazuka and Béné, 2010; World Bank, 2012; Pauly and Zeller, 2016; Short *et al*., 2021; Arthur *et al*., 2022; Ben-Hasan and Daliri, 2023).

The current study recorded a decrease in the artisanal fishing effort for the year 2021 for large fishing boats, which was resumed in 1991, to 166 boats active using bottom trawl nets in addition to gill nets to catch many species, including *Tenualosa ilisha*, *Pampus argenteus*, *Otolithes ruber*, *Chirocentrus dorab*, mullet And shrimp, which constituted (3.60, 1.12, 8.26, 2.11, 9.60 and 16.13%), respectively, of the total catch during the year 2021 Based on the Daily preliminary data of the total and landing of the species collected from the landing site in Al-Faw port, south of Basrah, Iraq by the staff of the fishermen's cooperative, as documented by the Directorate of Agriculture of Basrah. Therefore, the artisanal fishing sector in Iraqi marine waters can be divided into two types: large fishing boats and small fishing boats that use different means such as bottom trawls, traps, gillnets, and local means such as veils, lines, hooks, and lures. Zeller and Pauly (2016) showed that definitions differ within and between countries and regions. Also, there are no uniform global definitions for the various fishing sectors (FAO, 2017).

The Al-Faw Peninsula, in southern Iraq, is the only marine fish landing site. From there, the production is marketed to all commercial markets in Iraq according to supply and demand (Qasim, 2021). It traces the reality of the wholesale market for Iraqi marine fish in the city of Al-Faw in the province of Basrah during the past years, as described in the FAO report (Andersskog, 1966). The current study showed the reality of the fish landing site in Al-Faw, as it still needs more development to a large extent in the marketing field, with inadequate facilities for disembarkation, storage, or transportation This is due to the lack of berths for fishing boats and the lack of a hall for receiving landed fish with specifications. Also, there are no refrigerators to protect the fish from damage. The results of demo fishing during March, April, and May during the 2021 fishing season showed a significant difference compared to the total catch recorded from commercial transactions at the fish landing site (reported landings), which indicates a substantial defect in documenting the landed catch during this period. The study recorded the unreported artisanal commercial yield during 2021 at about 4^%, the highest ever compared to other studies in re-estimating Iraqi marine catches. Therefore, the study recommends relying on something other than this scientifically unproven data in fish stock assessment studies and the need to assign

an independent authority to document the local Iraqi marine catches, which is consistent with (Al-Rawi *et al*., 1974). Khalfallah (2020) also estimated the unreported artisanal commercial catch, based on conservative assumptions from 1950 to 2015. It fluctuated between 20 to 30%. In the year 2015, it was 30% while the current study recorded an increase in these percentages to higher rates of 48%, This is clear evidence of the low accuracy of data recorded during the study period by fisheries statistics officials who rely on fisheries trading operations.

Likewise, the production increased significantly during the years that followed 2017, as the year 2021 recorded a total production of 13,565 tons when tracking the reconstruction of the current catch according to the approach of re-estimating the catch that was followed (Zeller and Pauly, 2016) we find that the production of these years differs from the actual production of Iraqi Marine Fisheries. This increase is probably due to informal trade at sea between fishermen in the northwest Persian Gulf region. Therefore, these data or statistics are considered inaccurate in representing the actual Iraqi marine fishing. In addition, there is a clear disadvantage in recording data. Khalfallah recorded that those small artisanal boats usually do not report the catch. It is common for small fishermen to sell some of their catch to fishermen from neighboring countries before even landing (Khalfallah, 2020). So many coastal fisheries are small-scale in nature and poorly documented and un- or underreported (Gillett and Lightfoot 2002; Zeller *et al*., 2006, 2007; Pauly and Zeller, 2014).

Conclusion

Consequently, unreported artisanal commercial catches will likely reach similar or more significant quantities than the reported catches. Study results demonstrated a need for capacity-building in improving strategies for documenting fisheries data to understand the status of Iraqi marine fisheries and their trends to develop administrative policies to preserve fish stocks sustainably. It is, therefore, imperative to prioritize improving the information on the condition of fisheries and their movements in implementing the Code of Conduct for Responsible Fisheries. Therefore, the state should participate in the development of standards and means that ensure the quality and integrity of information to obtain the best scientific evidence, in line with internationally agreed standards and methods, through information verification mechanisms, and in a manner consistent with applicable confidentiality requirements. The state also has to apply universally agreed standards and means.

Acknowledgments

We express our gratitude to the researchers of the Department of Marine Vertebrates, Marine Science Center, University of Basrah, for their invaluable assistance.

Conflicts of interest

The author declares no conflict of interest.

References

Al-Abdulrazzak, D., 2013. Missing sectors from Bahrain's reported fisheries catches 1950-2010. In: D. Al-Abdulrazzak and D. Pauly (Eds). From dhows to trawlers: a recent history of

fisheries in the Gulf countries, 1950 to 2010. *Fisheries Centre Research Report*, 21(**2**), 1-6.

Al-Abdulrazzak, D. and Pauly, D., 2017. Reconstructing historical baselines for the Persian Gulf Dugong (dungeon). *Zoology in the Middle East*, 63(**2**), 95-102. DOI:10.1080/09397140.2017.1315853

Ali, T.S., Mohamed, A.R. M. and Hussain, N.A., 1998. The status of Iraqi marine fisheries during 1990-1994. *Marina Mesopotamica*, 13(**1**), 129–47.

Al-Raawi, A.H., Al-Eani, A.R. and Al-Sukuti, M., 1974. Fisheries development and the proposed plan for the years 1975-19079. The higher Agricultural Council study. No. 7-9, 135 P.

Al-Shamary, A.CH., and Younis, K.H., 2022. Status of commercial fish catch in Iraqi marine waters, Persian Gulf. *Bulletin of the Iraq Natural History Museum*, 17(**2**), 155-167. DOI:10.26842/binhm.7.2022.17.2.0155

Andersskog, B., 1966. Iraq-Preliminary fishery survey. Report to the government. Report FAO/UNDP(TA), (TA 2226), 12 P.

Arthur, R.I., Skerritt D.J., Schuhbauer A., Ebrahim N., Friend, R.M. and Sumaila, U.R., 2022. Small-scale fisheries and local food systems: transformations, threats and opportunities. *Fish and Fisheries*, 23(**1**),109–124. DOI:10.1111/faf.12602

Ben-Hasan, A. and Daliri, M., 2022. Arabian/Persian Gulf artisanal fisheries: magnitude, threats, and opportunities. *Reviews in Fish Biology and Fisheries*, 33, 541–559. DOI:10.1007/s11160-022-09737-4

Chuenpagdee R., Liguori L., Palomares M.L.D. and Pauly D., 2006. Bottom-up, global estimates of small-scale marine fisheries catch. University of British Columbia, Columbia. DOI:10.14288/1.0074761

Earth Trends, 2003. Coastal and Marine Ecosystems-Iraq. Available at: https://earthtrends.wri.org

FAO (Fishery and Aquaculture Economics and Policy Division), 2003. Strategy for Improving Information on Status and Trends of Capture Fisheries. FAO, Italy. 34 P.

FAO, 2017. Workshop on improving our knowledge of small-scale fisheries: data needs and methodologies, Workshop proceedings, 27-29 June 2017, Rome, Italy. *FAO Fisheries and Aquaculture Proceedings,* No. 55. Rome, Italy.

Ghotbeddin, N., Izadpanah, Z., Valinassab, T. and Azhir, M., 2015. Biomass and CPUA Estimation and Distribution Pattern of Saurida tumbil from Northwest of the Persian Gulf. *Journal of the Persian Gulf,* 6(**20**), 29-36.

Gillett, R. and Lightfoot, C., 2002. The contribution of fisheries to the economies of Pacific Island Countries. Pacific Studies Series, Asian Development Bank, World Bank, Forum Fisheries Agency, Secretariat of the Pacific Community, Manila, Philippines. 218 P.

Hussein, N.A., Yourself, O.H. and Shaker, A.H., 1989. The impact of the Shatt al-Arab on the marine nature of the northwestern Persian Gulf region.

Arabian Gulf Journal, 21, 173–88.

Kawarazuka, N. and Béné, C., 2010. Linking small-scale sheries and aquaculture to household nutritional security: an overview. *Food Security,* 2, 343–357. DOI:10.1007/s12571-010-0079-y

Khalfallah, M., 2020. Data-poor fisheries: Case studies from the southern Mediterranean and the Arabian Peninsula. PhD thesis, University of British Columbia, Vancouver,. 349 P. DOI:10.14288/1.0389951

King, M., 2013. Fisheries biology, assessment and management. *John Wiley and Sons Publication.* London, UK. 396 P.

Mohamed, A.R.M. and Qasim, A.M.H., 2014. Trends in the Artisanal Fishery in Iraqi Marine Waters, Persian Gulf (1965-2011). *Asian Journal of Applied Sciences* 2(**2**), 209-217.

Mohamed, A.R.M., 2018. Assessment and Management of Iraqi Marine Artisanal Fisheries, Northwest of the Arabian Gulf. *Journal of Agriculture and Veterinary Science*, 11(**9**), 85-92.

Mohamed, A.R.M. and Abood, A.N., 2020. Current status of Iraqi artisanal marine fisheries in northwest of the Persian Gulf of Iraq. *Archives of Agriculture and Environmental Science*, 5(**4**), 457-464. DOI:10.26832/24566632.2020.050404

Morgan, G., 2006. Country review: Iraq. In De-Young C. (eds) Review of the state of world marine capture fisheries management: Indian Ocean. FAO Fisheries Technical Paper. No. 488, Italy. pp 247-253.

Pauly, D. and Zeller, D., 2014. Accurate catches and the sustainability of coral reef fisheries. *Current Opinion in Environmental Sustainability*, 7, 44–51. DOI:10.1016/j.cosust.2013.11.027

Pauly, D. and Zeller D., 2016. Catch reconstructions reveal that global marine fisheries catches are higher than reported and declining. *Nature Communications,* 7, 10244. DOI:10.1038/ncomms10244

Purser, B.H., Al Azzawi, M., Al Hassani, N.H., Baltzer, F., Hassan, K.M., Orszag Sperber, F., Plaziat, J.C., Yacoub, S.Y. and Younis, W.R., 1982. Caractères et évolution du complexe deltaïque Tigre-Euphrate. *Mémoire de la Société Géologique de France*, 144, 207-216.

Qasim, A.M.H., 2021. The Fishing Effort of the Fisheries Sector in the Iraqi Marine Waters. *Scientific Journal of King Faisal University*, 22(**1**), 23-26. DOI:10.37575/b/sci/0003

Short, R.E., Gelcich, S., Little, D.C., 2021. Harnessing the diversity of small-scale actors is key to the future of aquatic food systems. *Nature Food* 2, 733–741. DOI:10.1038/s43016-021-00363-0

Srinivasan, U.T., Carey, S.P., Hallstein, E., Higgins, P.A., Kerr, A.C., Koteen, L.E., Smith, A.B., Watson, R., Harte, J. and Norgaard, R.B., 2008. The debt of nations and the distribution of ecological impacts from human activities. *Proceedings of the National Academy of Sciences*, 105(**5**), 1768–1773. DOI:10.1073/pnas.0709562104

Valinassab, T., Daryanabard, R., Adjeer, M., Momeni, M., Mobarezi, A., Safikhani, H. and Dehghani, R., 2011. Biomass estimation of demersal fishes by swept area method in the Persian Gulf

and Oman Sea. Final Report, *Iranian Fisheries Research Organization* Press, Iran. 324 P.

World Bank, 2012. Hidden Harvest the global contribution of capture fisheries. World Bank. Washington, D.C, USA. 69 P.

Zeller, D., Booth, S., Craig, P. and Pauly, D., 2006. Reconstruction of coral reef fisheries catches in American Samoa, 1950-2002. *Coral Reefs,* 25, 144–152.

Zeller, D., Booth, S., Davis, G. and Pauly, D., 2007. Re-estimation of small-scale fishery catches for U.S. flag-associated island areas in the western Pacific: the last 50 years. *Fishery Bulletin,* 105(**2**), 266-277.

Zeller, D. and Pauly, D., 2016. Marine fisheries catch reconstruction: Definitions, sources, methods, and challenges. In Pauly, D. and Zeller, D. (Eds) Global Atlas of Marine Fisheries: A critical appraisal of catches and ecosystem impacts. Island Press, USA. pp 12-29.