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Review Article

An economic analysis of fisheries sector of Balochistan, Pakistan: current status and future potential

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The contribution of marine capture fisheries production from Baluchistan is almost 34% of total fisheries production in Pakistan. Nevertheless, little attention has been paid from provincial and federal governments, which lead to severe constraints in the development of Balochistan fisheries sector. Immediate steps such as control of over-fishing, revision of existing policies, assessment of stock status, better monitoring and surveillance and improvement of existing infrastructure are required for the betterment of this sector in the region. This study also highlights that future investment opportunities are still present in this sector, which may grab the attention of private stakeholders.

[**Keywords*:*** Fisheries sector; Production; Exports; Investment opportunities; Balochistan; Pakistan]

Introduction

Pakistan is an important maritime country with a coast of 1100 km long running from India (in Southeast) to Iran (in Northwest) and with an Exclusive Economic Zone (EEZ) of 240000 km^2 [1]. The coastal belt of Pakistan has a wealth of marine fisheries resources[2-3]. However, the contribution of marine fishery sector in the country's total fish production is about 80%[2]. The commercially important marine fishery resources include 50 small pelagic fish species, 15 medium-sized pelagic species, 20 large pelagic fish species and 250 demersal fish species. Moreover, there are also 15 commercial species of shrimps, 12 of cephalopods and 5 of lobsters which are reported from Pakistani marine waters[4-5].

Total maritime zone of Pakistan comprises of over 30% of the land area[1]. Pakistan's coastal belt can be divided into two parts with respect to the provinces in which they are present, Sindh to the east and Balochistan (Makran) to the west[2]. The country's continental area is about 50200 km^2 [1]. Continental shelf of Sindh and Balochistan is approximately 35700 km^2 and 14500 km^2, respectively. Sindh coast has muddy bottom. It is sandy and has shelter bays with mangroves. These features make this coast an ideal place to act as the nursery grounds and habitat for a diverse fish fauna. On the other hand, the continental shelf of Balochistan is narrow, rocky and without freshwater inflows and estuaries[2].

Fisheries sector contributes significantly to the economy of Pakistan and is considered a great source of livelihoods for the coastal communities[6]. The share of fisheries sub-sector in agriculture and national gross domestic production (GDP) was 2.1% and 1% correspondingly during the fiscal year 2014-2015. It was recorded a growth of 5.75% during fiscal year 2014-2015 against the growth of 0.98% last fiscal year (2013-2014). Total fish production was estimated 499,000 t with the share of marine and inland fisheries production with 365000 t and 134000 t respectively during fiscal year 2014-2015. Whereas, the total fisheries production was estimated at 494000 t with the contribution of marine and inland fisheries production with 345000 t and 149000 t correspondingly in 2013-2014[7].

Balochistan is the largest province of Pakistan and covers 44% of the total land area of the country[8]. It is a land of differing geographical features with the coast of about 1129 km extends from Hub towards the north to Iranian border near Jiwani in the west[9]. Moreover, the coast has eight major landing sites and over 25 fisher settlements[9] and has engaged nearly 40000 fishermen who earn their livelihoods by working along this coast[11]. Moreover, the fishing catch from this coast is 1.2 million t with the contribution of current USD 85.9 in the provincial GDP[9].

Present study is to describe the contribution of Balochistan fisheries sector in the economy of the country. Moreover, this study will highlight some serious issues facing this sector, which in turn will increase the interests of provincial and federal governments resulting in the better policy formulation.

Materials and Methods

An extensive review of literature related to Balochistan fisheries sector was done to achieve the objectives of this study. Moreover, a plethora of published research articles, reports, opinion articles, communications etc. were also searched to gather information. Government officials were contacted to obtain maximum information. Private stakeholders were also involved to explore and analyse the real current position and future potential of this sector in this region. The published data of Balochistan fisheries sector were obtained from the official website of Government of Balochistan in order to gain full insight into project objectives. Numbers obtained was represented graphically by using Microsoft Word Excel 2007. Same software also served to calculate percentages and annual growth rates. Annual growth rates were calculated as GR = (Pre V - Pas V) / Pas V.

Results

There are 38 important commercial fish groups, which are landed on the harbour stations along the entire coastline of Balochistan. Reported capture production of all the commercial groups was totalled as 580932 t with the share of $526 million during 2011 to 2014. Highest and lowest production was observed as 155155 t (2013) and 135116 (2011), respectively. The average capture production during this period remained as 145233 t y^{-1}.

The capture production first increased with growth rate of 8.6% and 5.8% from 135116 (2011) to 146685 t (2012) and 146685 t (2012) to 155155 t (2013) correspondingly. However, the capture production was decreased in 2014 (143976 t) than the former year 2013 (155155 t) with -7.2% growth rate.

Balochistan coastline hosts eight major fishing stations i.e. Jiwani, Pishukan, Gawadar, Surbandar, Pasni, Omara, Damb and Gaddani (Fig. 1). Two stations i.e. Gawadar and Pasni contributed maximum in total fisheries production as 159798 t and 116036 t, in that order. Both, these stations account for 47% of total catch together. Fig. 2 reveals the percentage of each station in capture production during the study period. However, overall contribution of both of these stations decreased from 40470 t and 29945 t (2011) to 34599 t and 28294 t (2014), respectively. In contrast, the contribution of Surbandar and Damb stations significantly increase from 10455 t and 9870 t (2011) to 15664 t and 22112 t (2014), correspondingly. Figure 3 (a) represents that out of total 38 commercial fish groups' only six groups' viz. sardinellas, other clupeiformes, sea cat fish, Indian mackerel, small croaker and hairtail account for more than 40% of total commercial catch. Total commercial catch of sardinellas and other clupeiformes increased from 10918 t and 7848 t (2011) to 15500 t and 8677 t (2014) correspondingly. On the other hand, remaining four major commercial groups i.e. sea cat fish, Indian mackerel, small croaker, and hairtail showed decreasing trend in total catch from 20518 t, 9432 t,

Fig. 1 — Coast of Pakistan showing main harbour stations (stars)

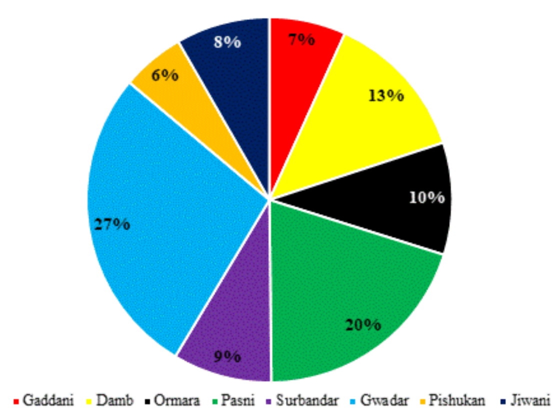


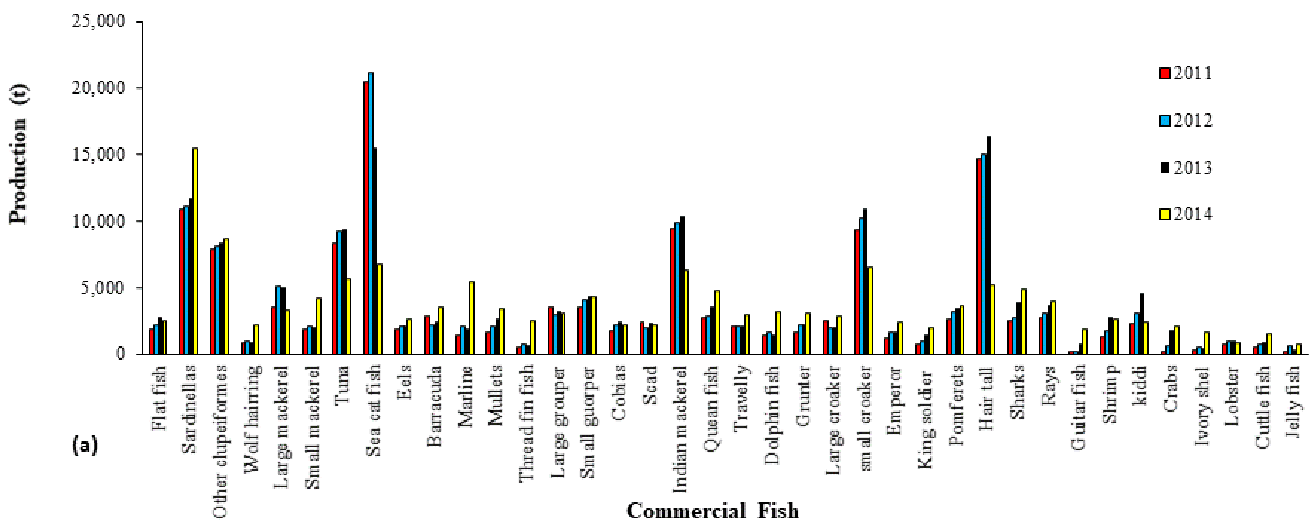
Fig. 2 — Contribution of eight major harbour stations of Balochistan in total commercial fish production in percentage (2011-2014)

9384 t and 14661 t (2011) to 6757 t, 6341 t, 6537 t and 5181 t (2014) in that order. The overall capture production of all commercial fish groups with their share in terms of value during the study period (2011-2014) is highlighted in Fig. 3 (a,b).

The overall contribution of eight major harbour stations in total capture production of all major commercial fish groups from 2011 to 2014 highlighted in Fig. 4 (a,b,c,d).

Export of reported commercial fish continuously increased from 124470 t (2011) to 134972 t (2014) and totaled as 530949 t (2011-2014). During 2011-2014, total export of shellfish and finfish was recorded as 38962 t and 491987 t, respectively. This export was in form four different categories viz. chilled, frozen, cured (salted) and reduced (dried). Maximum fish was exported as chilled ice fish and frozen fish with a share of 126080 t (23.7%) and 286867 t (54%), correspondingly. Between first two years, export of commercial fish was rose 1.5% (2011-2012) and 12.9% (2012-2013). During the following year, export was decreased 7.5% from 145132 t (2013) to 134972 t (2014). Consumption of commercial fish in Balochistan was totalled as 39983 t. The consumption was recorded as 10646 t, 10310 t, 10023 t and 9004 t in the years 2011, 2012, 2013 and 2014 in that order. Total export in the form of various categories and consumption of commercial fish during 2011-2014 is aured out in table 1.

Fishing vessels are mostly gill-netters, since trawling and seining is prohibited in Balochistan. The total number of vessels was increased 24% during 2011-2014. Total 7186 (2011), 7596 (2012), 7938 (2013) and 8969 (2014) fishing vessels were reported in all major fishing stations. Similarly, the fishermen population in Balochistan also rose from 52812



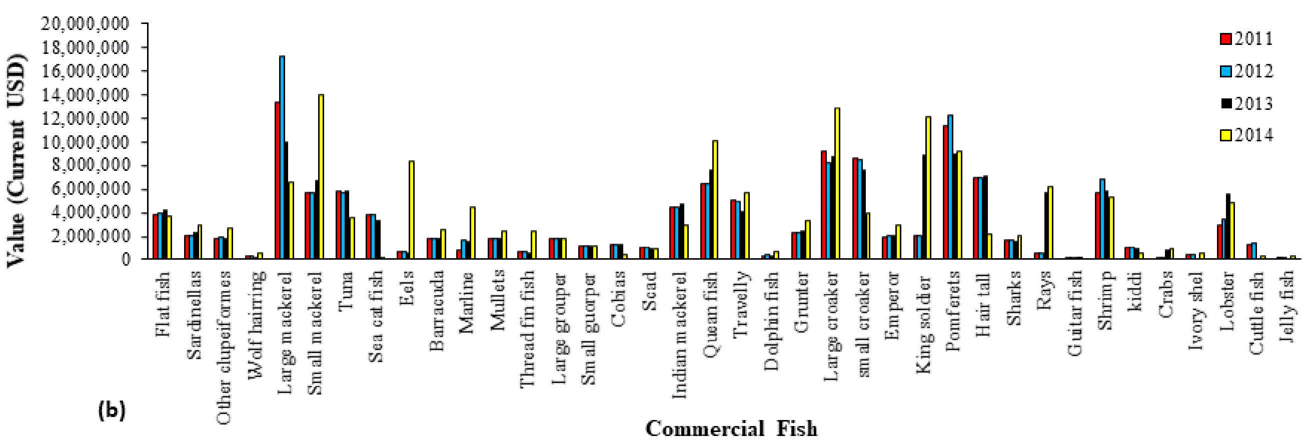


Fig. 3 — Contribution of eight major harbour stations of Balochistan in commercial fish production: 2011-2014 (a) Capture production in tons (b) Earnings from capture production in current USD

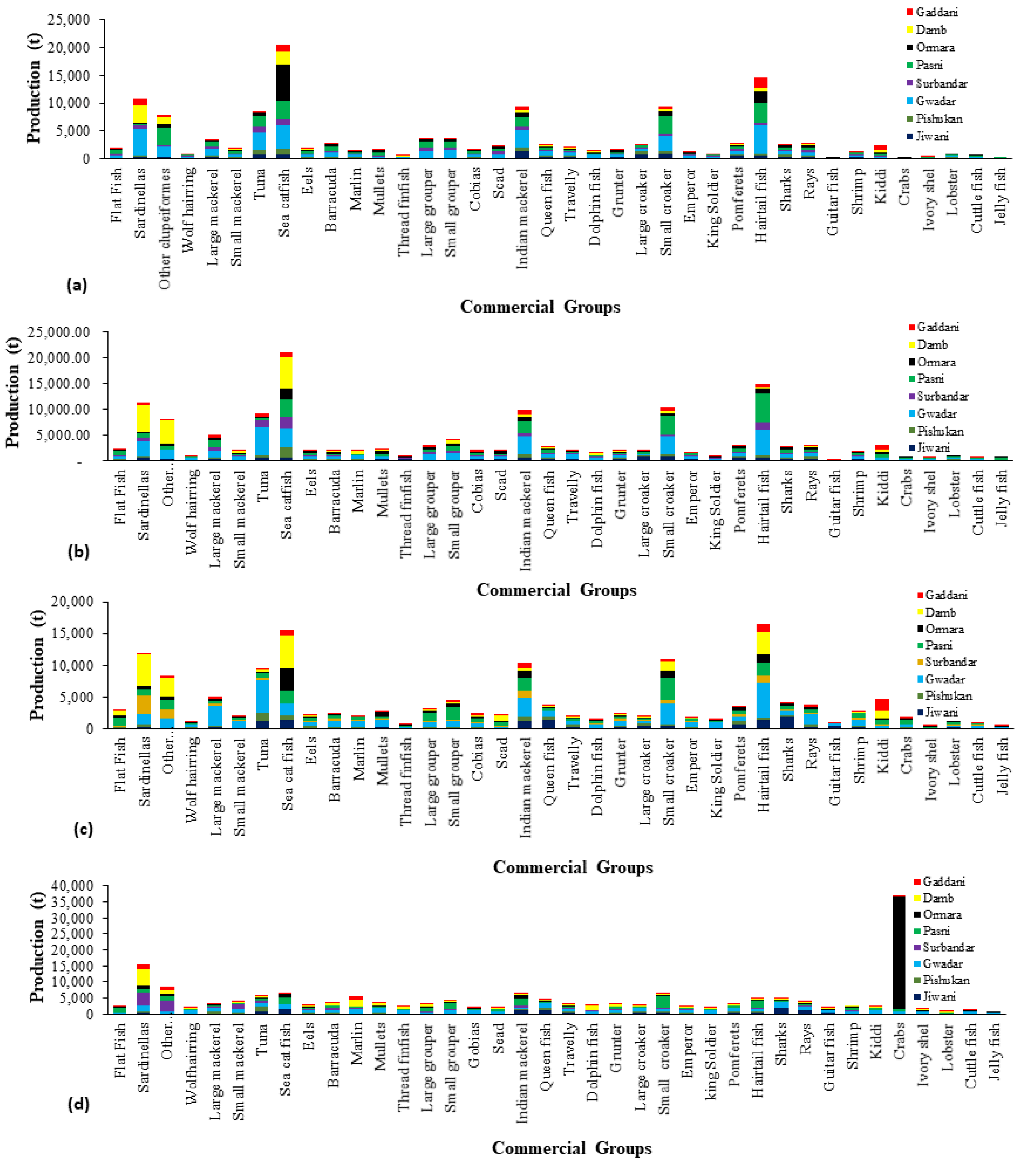


Fig. 4 — Area-wise contribution of eight major harbour stations of Balochistan in commercial fish production (a) 2011 (b) 2012 (c) 2013 (d) 2014

(2011) to 58075 (2014) with the maximum number of fishermen reported as 67977 in 2013. Total number of fishing vessels and number of fishermen reported during 2011 to 2014 is given in table 2.

Table 1 — Total export, local consumption and total catch of commercial fish in Balochistan: 2011-2014

Commercial Fish	2011	2012	2013	2014	Disposition
			SHELLFISH		
Chilled Shrimp	832	1013	1043	1150	Sent to Karachi
Frozen Shrimp	490	767	1781	1821	Sent to Karachi
Chilled Kiddi	1815	2240	2224	2350	Sent to Karachi
Frozen Kiddi	525	800	2386	2590	Sent to Karachi
Chilled Lobster	350	423	492	511	Sent to Karachi
Frozen Lobster	434	522	483	540	Sent to Karachi
Chilled Cuttle fish	219	253	526	561	Sent to Karachi
Frozen Cuttle fish	341	498	438	490	Sent to Karachi
Chilled Crab	90	170	361	380	Sent to Karachi
Frozen Crab	130	451	1446	1520	Sent to Karachi
Chilled Ivory Shell	128	182	206	251	Sent to Karachi
Frozen Ivory Shell	204	380	270	290	Sent to Karachi
Chilled Jelly Fish	180	632	383	400	Sent to Karachi
			FINFISH		
Chilled Ice Fish	34070	35343	38043	18624	Sent to Karachi
Frozen Fish	59317	70555	78133	78862	Sent to Karachi
Dried Salted	6128	1231	2131	9370	Sent to Karachi
Wet Salted	7303	2382	3132	3421	Sent to Karachi
Fish Maws & Shark fins	240	313	390	410	Sent to Karachi
Fish Manures	11674	8220	11264	11431	Sent to Karachi
Total Export	124470	126375	145132	134972	
Local Consumption	10646	10310	10023	9004	
Total Catch	135116	146685	155155	143976	

Table 2 — Area-wise total fishing vessels and fishermen population in Balochistan: 2011-2014

Years	Jiwani	Pishukan	Gwadar	Surbandar	Pasni	Ormara	Damb	Gaddani	Total
				FISHING VESSELS					
2011	664	503	1280	651	1344	922	989	833	7186
2012	710	524	1353	689	1413	970	1039	898	7596
2013	828	501	1356	658	1497	1023	1107	968	7938
2014	584	433	2021	671	2056	1190	758	1256	8969
				FISHERMEN POPULATION					
2011	5233	4598	9066	4820	10550	5708	7037	5800	52812
2012	5258	4792	9875	5108	11195	6072	8337	6250	56887
2013	5574	4464	10232	4542	11567	6394	8731	6473	67977
2014	5910	4852	10285	4562	11640	6430	5300	9096	58075

Discussion

Fisheries sector contributors significantly in the economy of Pakistan and is considered to be a source of food and livelihood for coastal communities [12]**.** This sectors share is only 1% in country's GDP[5] and Pakistan earns more than 6% of its foreign exchange by exporting fish and fish products. Total (marine + inland) fish production was estimated 501000 t during fiscal year 2015-2016. The share of marine and inland in total production was 73.45 % (368000 t) and 26.55 % (133000 t), respectively. Pakistan's exports of fish and fish products were totalled as 91,965 t. China, Thailand, Malaysia, Sri Lanka, Middle East, Japan, etc. are the major buyers of Pakistan's fish and fish products and Pakistan earned $240.108 million[13]. Balochistan contribute about 34% in the total catch. Therefore, it is very clear that commercial fish production from Balochistan coast shares significantly in total national production and export earnings.

In Balochistan, out of eight major fishing towns' four towns i.e. Gwadar, Jiwani, Pasni and Ormara are the largest landing sites and account for almost 80% of the total commercial fish production, 58% of the total fisher-folk and 59% of the total vessels[9]. About 80% of the total fish catch of Balochistan coast is dried for export to the Middle East. Most of the fish catch from Gwadar and Pasni are transported to Karachi from where they are further exported to other countries like Sri Lanka, China (including Hong Kong), and Korea[14].

The total value of the production has increased significantly with the passage of time, almost doubled between 2007 and 2011. Reason behind this happening may be the reduction in the value of Pakistan Rupee. On the other hand, it may be either due to the real increase in the value of the catch as the Makran Highway opened and it was probable to ship out fresh fish products in place of salted and dried. In recent years, Indian mackerel from Balochistan coast found new export markets in the Southeast Asia. As the result, it has not only provided a great boost to exports but also responsible for better price and the opening of new fish receiving stations which is very good for fishery development.

In the same way, tunas, which are shipped salted to Sri Lanka in the past are, now have a fresh and frozen market. Moreover, the export of fresh high-value products from Karachi to the Gulf regions has also influenced on prices received[11]. The small variations over time of the total catch conceal some very substantial changes in the composition of various fish species. For example, the catch of sardinellas has decreased 36% from more than 17000 t (2007) to just over 10000 t (2011). Similarly, catch of Indian mackerel has decreased by more than 60% while the catch of catfish has nearly doubled in the same period**.** However, how much of these variations are because of ambiguity in the data compilation and how much is genuine is still unclear.

In Pakistan, there is no tendency of seafood consumption[15]. However, local fishermen communities in Sindh and Baluchistan coastal areas15-16 consume a large quantity of fish landed in the coastal area. Generally in Pakistan, fish is well thought-out inappropriate for consumption during the

Summer (April to October). Nevertheless, domestic marine fish consumption has been progressively rising from 11% (1973) to 20% (1977) and reached to 30% with the quantity of 50000-60000 t in 1985. The rest of the landing was either export or used for manure and fishmeal[14-17]. Regarding Fish consumption for Pakistan, there was very little increase in per capita fish consumption from 1.0 kg in 1961 to 2.0 kg/person/y^{-1} in 2015[18], while the world average increased from 9.0 kg to 20.0 kg/person/y^{-1} [19].

The coast of Balochistan is categorized into three zones, each for different sized vessels, according to the fishing policy developed in 1995. Zone 1 (coastline to 12 nautical miles) is under the supervision of provincial government and is used for small-scale fishing. Zone 2 (12 to 35 nm) and zone 3 (35 to 200 nm) are used for fishing by medium sized and large sized vessels. Both these zones are under the management of Federal Government**.** Therefore, the Government of Balochistan is responsible for all fisheries within only 12 nm zone. Furthermore, in Rs. 152 Billion total annual Balochistan budget (2011-2012), an amount of only 0.02% (Rs. 45 Million) has been owed to the fisheries sector. While fisheries sector is creating space of 9% of provincial GDP through its production and export earnings. Thus, there is a need for the immediate steps for the development of this sector in the region.

The list of existing issues and instantaneous influential steps which are required for the betterment of fisheries sector of Balochistan are given as follows: Overfishing is the most critical issue facing marine capture fisheries in Balochistan and fact is that this is not extensively understood and addressed. Although, there are clear-cut clues of pressure on the Balochistan fishery and an instantaneous need for action. But, inadequate consideration is being given to the appropriate management of this sector in the region. A series of immediate steps i.e. stop license new entrants, expanded research on stock levels and maximum sustainable yield, pilot-co-management and fully implementation of international marine fishing obligations would be required. Better monitoring control and surveillance is required to decrease illegitimate and negative methods being used, and control poaching from Sindh and Iran. Present regulatory framework, policy and legislation are archaic and insufficient for the management of the modern fishery. Thus, a detailed review, amendments and revisions to recent Act and policies are required to sustain progressive improvement of marine capture fisheries. The improvement of existing infrastructure and investments in new infrastructure are required at landing sites.

The largest requirement for development of fisheries sector is the commercial gain. This requirement can be achieved through involvement of public-private investors. Thus, here are some future investment opportunities listed in order to achieve this goal. Fiberglass boats are lighter, economically efficient and hygienic as compared to recently used heavy, economically inefficient and unhygienic wooden boats. Hence, investment in building fiberglass boat has great potential in order to provide low coast fiberglass boats to 58000 registered fishermen. Establishment of fishnet manufacturing unit will not only help the local fisher folk but will also pay back the investor in short period of time. Recently, Fisheries Department is conducting fish boat repairing workshop at Sur Bandar near Gwadar, which is insufficient for almost 9000 registered vessels. Establishment of such boat repairing workshops will have business throughout the year. Gwadar Port has opened for cargo traffic, which definitely will increase the demand for export of fisheries products. In order to bridge the gap investment in establishing fish processing plants near major harbour stations will guarantee excellent returns. At present, there is no tin/can manufacturing unit or for hygienic packaging of fish for export and even local consumption in big cities. For this purpose, such manufacturing units have huge potential for profit. Maintenance of cold chain is an essential necessity from landing site to processing plants and to final destination. Investment in this area has great scope as at present no company having expertise in this field has entered the market.

Currently, Fisheries Department is running three fish hatcheries at Dera Murad Jamali, Quetta and Subakzai Dam, Zhob. These hatcheries do not turn out enough seed to meet the growing demand of fish farmers and hence there is chance for private investors to fill the gap. There are many beautiful spots along the Balochistan coast including Astola Island, which have potential of attracting thousands of tourists each year. For the facilitation of tourists, ferry service can be started and huge profits can be earned.

Conclusion

Fisheries sector in Balochistan is contributing significantly to provide employment and to generate huge earnings from exports of fish and fish products. Although, fisheries sector here also pursue global trends but unable to achieve maximum benefits from these values. This sector can obviously create better net benefits and develop into a stronger engine for rural economic growth and social development. However, a plan of reorganization and investments must be carefully put into practice at both national and provincial levels to attain this potential from Balochistan fisheries sector, which accounts for the mass fish production in the country.

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