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Recent advance on aspect of fisheries: A review

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ABSTRACT

In recent years the fishery always has been a growing industry. However, fishery like the other industries had faced with some limitations. Pollution of water resources, fight disease and efforts to increase production efficiency have been important challenges of fishing industry in recent years. Also, world statistics show that the fishing did not have much grown in recent years. On the other hand, aquaculture of marine fish as new industry can be a reliable solution for the management of aquatic ecosystems and restore these reserves, and in recent years, it always has been a significant growth in the production. So far, several species such as Mahi-mahi (*Coryphaena hippurus*), European seabass (*Dicentrarchus labrax*), Cobia (*Rachycentron canadum*) and silver pomfret (*Pampus argenteus*) have been successfully produced and marketed with different aquaculture methods (*i.e.* cage culture and pen culture). The aim of this study was to summarize marine fish production methods with an emphasis on the production of silver pomfret, as a commercial species and the study of the opportunities and challenges facing this sector in the future.

1. Introduction

The history of aquaculture in China dates back to 4 000 years ago[1]. Today, Asia has the highest rate of production. According to FAO statistics in 2011 to 2014[2], 14 countries have produced more than 0.5 million tons per year (10 of them in Asia). Based on this statistics between the years of 2011 and 2013, fishing decreased 1.8%. But aquaculture in the same period had growth 5.7%, which was mainly due to the expansion of aquaculture productivity growth and improvement of the living conditions, new methods of reproduction and nutrition for aquatic animals[3].

As mentioned in the previous section, the aquaculture production between 2005 and 2015 had always risen and the largest share of production was related to China (62% of aquaculture production in 2013). On the other side, according to FAO[2] capita apparent fish consumption was from 9.9 kg in 1960s to 14.4 kg in 1990 and then reached to 19.7 kg in 2013. FAO estimates showed the amount catch in 2015 and 2016 to reach about 20 kg. The growth rate of capita fish consumption in developing countries between 1961 and 2013 was more than 3.5 times[2].

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According to statistics, waste products in this industry have decreased[4]. The industry's turnover in 2008 was about US $818 billion and despite the economic downturn in recent years has continued to rise[5]. Number of people employed in this sector in 2008 estimated that each year about 52 million people will be added to this amount[2,4].

Fisheries production increased in the last 5 years has been in all fields. According to the FAO and the World Bank[6], the aquaculture production in the internal waters of the value of fishery products had the strongest growth compared to other agricultural products. Exports of fishery products in developing country was more than US $35 billion dollars in 2014.

The share of aquaculture in per capita human consumption reached less than 2% in 1954 and more than 50% in 2014[2,7]. The importance of this issue is that the contamination of aquaculture products and its environmental damage is far less than the fishing. In recent years, emphasis has been fishing and farming production of marine species. Breeding of freshwater species has limitations such as limited sources of fresh water and place. The vastness of the oceans which provides the possibility for the use of 9 billion people by 2050s will only use 4% of the continental shelf[8]. According to FAO statistics, currently the marine fishing is greater than the culture. However, unlike the fishing, aquaculture production has increased substantially[2,9-11].

2. Marine fish aquaculture

According to UN estimates, this number will reach 9 billion people at the end of this century[9]. Fishing and aquaculture is a way of providing food sources and creating jobs. Production of this section has always been grown in recent years[2]. In addition, aquaculture is a growing industry in the recent years in a reliable way to resource of natural ecosystems as well[12]. According to the FAO[2], global aquaculture production in 2014 was 167.2 tons. According to the statistics the amount of fishery production compared to last year (2013) to 2.6% has been increased, most of which was related to aquaculture. Also, 57% of the fisheries industry in 2025 will be related to aquaculture[2]. Oceans are more than 30000 species of fish and more than half they are edible[9]. Approach for marine fish culture in cage will be growing in the future[13]. According FAO statistic data in future contribution of fishing will be reduced[2,10].

A lot of studies are in the direction of farming of marine species[13-15]. The marine fish production has grown 60% in the last 40 years. The marine fish production reached from 10 million tons to more than 60 million tons[9]. Among the seafood-producing countries, China was the largest producer[10]. Marine production rate in inland waters reached from less than 10 million tons to 60 million tons (from 1980 to 2012) is also the highest growth rate in Asia [2,9,15].

So far, several marine fish species such as black pomfret (*Parastromateus niger*), European seabass (*Dicentrarchus labrax*), Orange-spotted grouper (*Epinephelus coioides*), Atlantic bluefin tuna (*Thunnus thynnus*), common sole (*Solea solea*) Mahi-mahi (*Coryphaena hippurus*), cobia (*Rachycentron canadum*) and silver pomfret [*Pampus argenteus* (*P. argenteus*)] through the various aquaculture methods (*i.e.* pen and cage culture) were produced and marketed[2]. Cannibalism, high mortality, especially in the larval stage, the small size of the larvae in the early stages of life cycle and rely on live food, are some problems of marine fish aquaculture. However, some species such as silver pomfret can tolerate captivity and high density; also in this species there was no cannibalism in captivity. Silver pomfret easily gets used tocommercial food and has high marketability in West Asia and the Middle East[16,17].

The mariculture particular marine cage culture as an appropriate method to provide the food to communities is promoted. This production method is growth in all Asian countries[2,9].For example, the number of marine cage fish farms in China between 1993 and 2004, from 57000 to than 1 million[11].

More marine fish production methods are similar; fish pen, fish cage and ponds are major methods of marine fish culture[2,18]. For this reason, in this study we have evaluated the achievements and challenges of silver pomfret (*P. argenteus*) production as an indicator of marine fish aquaculture.

2.1. Identity of silver pomfret

Silver pomfret (*P. argenteus*) is marine fish from Stromateidea family that has a high nutritional value and has many customers in the world; Stromateidea live in throughout the world's oceans from the tropics area to temperate regions[19] (Figure 1).

Silver pomfret body flattened, compressed and oval; also, this species have no operculum. Gill chamber through gill slits on the sides of the head (one gill slits each side) associated with the surroundings[21]. Mouth of silver pomfret is small, nearly terminal and at the bottom has a concave shape[19]. Pelvic fin has 37–43 soft radials and anal fin has 34–43 soft radials; also, pectoral fin is long and has 24–27 soft radials. Silver pomfret has no ventral fin. Scales are very small, circular and weak; Scales to base all fins spread (Figure 2). Lateral line is extended to caudal peduncle[23]. Color of this species body is gray on the back and head, with silver-white gradient in the belly. Silver pomfret has tiny black spots on the body and end of dorsal and anal fin is yellow[19]. According to sources, the maximum length and maximum weight of this species have been reported 60 cm and 3700 g, respectively[19,21,23].

2.2. Habitat and biology

Silver pomfret is benthopelagic and anadromous that lives in the depths of 5–110 m[24]. This species is subtropical species that can be seen at latitudes 57° N to 31° S. Silver pomfret has a wide distribution in the Western Indian Ocean[25]; this species has distribution in Persian Gulf, Oman Sea, Japan, Malaysia, Indonesia, southern and eastern coasts of China, the West and Southwest Korean Peninsula and the Indian Ocean[26,27]. Also silver pomfret, due to changes in water temperature in summer, migrates to northern latitudes and in the winter migrates to southern latitudes[28].

Members of this species, swim in large schools and feed the mud substrates; they in early life cycle (*i.e.* post larva) eat phytoplankton and they are pelagic species of these stages. After the stages of

Table 1

Monthly percentage frequency of different prey types in *P. argenteus* stomachs.

Prey type	Frequency of occurrence (%)											
	Jan.	Feb.	Marc.	Apr.	May	Jun.	Jul.	Agu.	Sep.	Oct.	Nov.	Dec.
Crustaceans	70–75	50–55	45–50	60–65	50–55	95–100	85–90	80–85	65–70	65–70	65–70	55–60
Mollusca	10–12	1–3	5–7	50–52	45–47	71–73	95–97	5–7	–	17–19	6–8	3–5
Polychaeta	–	–	3–5	–	4–6	–	–	1–3	–	–	–	–
Chaetognatha	24–26	11–13	8–10	16–18	21–23	37–39	14–16	3–5	6–8	13–15	37–39	38–40
Bacillariophyceae	17–20	40–43	30–33	33–36	31–34	63–65	64–66	52–55	27–30	37–40	76–79	25–28
Dinoflagellida	–	–	–	–	–	–	–	–	1–2	1–3	–	–

All data were from Dadzie *et al.*[30] and Priyadharsini *et al.*[31].

Table 2

Diet and tanks management of silver pomfret (*P. argenteus*).

Parameter	Day after hatching							
	0	5	10	15	20	25	30	35
Feed								
Marine *Chlorella* sp.		[250–300 × 10^3 cells/mL]				[500–800 × 10^3 cells/mL]		
S-type rotifers		[5 cells/mL]				[10 cells/mL]		
Artemia nauplii				[0.1/mL]	[0.2/mL]	[0.4/mL]	[0.4/mL]	[0.6/mL]
Inert feed (fed *ad libitum*)						[5 time/day]		[3 time/day]
Tank management								
Water exchange	Non.	10%	20%	50%	100%	150%	200%	200%
Repeat daily		Once a day				Twice a day		
				Siphoning of bottom				

All data were from Jemes and Almatar[45], Amatar and James[49] and Almatar *et al.*[51].

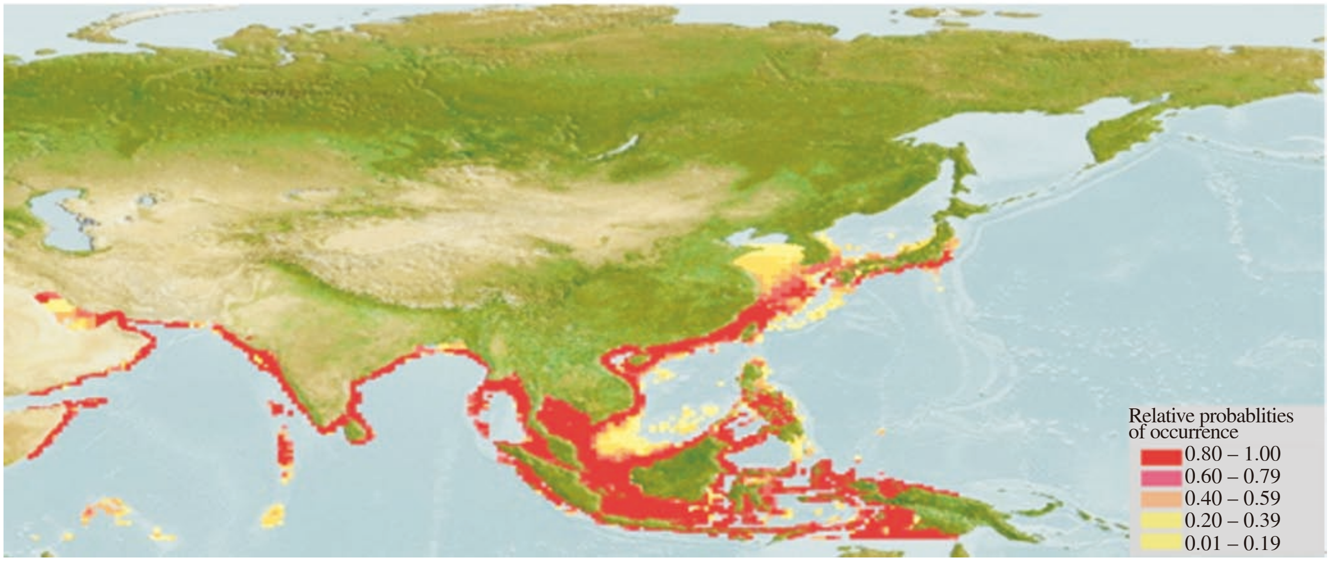

Figure 1. Global distribution of silver pomfret (*P. argenteus*).
Distribution range colors indicate degree of suitability of habitat which can be interpreted as probabilities of occurrence. All data were from Aquamap[20].

growth they become the benthopelagic carnivores[28]. Pati[29] in study of silver pomfret diets in the Bay of Bengal reported Copepoda, larva of Decapoda, Polychaeta and Ctenophora constitute their diet over years, respectively (Table 1); also the results of studies Dadzie *et al.*[30] and Khan[32] were similar to Pati's study. The previous studies showed that this species is reliant on eyesight and gets most nutrition activities in the sunset; also, the feed rate is directly related to the growth and reduces with increasing maturity[33]. All members of Stromateidea family (*i.e.* silver pomfret) have a pharyngeal pouch in the area of the throat and esophagus that has a lot of teeth; this section crushes and mills the passing food[19].

Figure 2. Silver pomfret (*P. argenteus*) from De Bruin *et al.*[22].

Usually male and female fully ripe are at depth of 20–25 m. The breeding season will continue from late February to early October; this season, depending on the geographic region mostly has two peaks. For example, Al-Husaini[16] reported breeding season of silver pomfret in northern gulf has one peak in May and ends in September; also, gonadosomatic indices and oocyte diameter of silver pomfret showed spawning during two peaks[32].

Silver pomfret spawn at a temperature of 26–34 °C and salinity 39 ppt in the depths of 5–12 m. In place of spawning, the size of females is greater than males and the number of males is higher[24,34]. Result of Dadzie *et al.*[35] and Almatar *et al.*[34] studies showed environmental conditions such as temperature and salinity can be effective in spawning time and location. Dadzie *et al.*[35] reported larger fish, earlier than smaller fish reach to spawning area. Finally, fertilized eggs are spherical, transparent and pelagic[36].

2.3. Mariculture of silver pomfret

Many studies have been done in the field of breeding larvaein the different hatcheries[37], and storage conditions[38]; also, to improve the technology of production silver pomfret in the household scale, several studies have been done[39].

Research on silver pomfret farming technology first developed in

1998 by Mariculture and Fisheries Department (MDF) of Kuwait Institute for Scientific Research (KISR)[37]. Then, several studies were prepared on larva culture, nutritional requirements, culture conditions and health management at this center[40,41]. Kuwait is not the only country in this field. In recent years, other Asian countries such as China[42,43] and Iran[44] have started their research in this field. Finally, success in inducing reproduction silver pomfret in captivity, led to introduce it as a new species for mariculture[45].

Silver pomfret culture can be divvied as follows: catching broodstock, spawning, fertilizing of sperm and oocyte, egg incubation, larva culture and feedlot. Each of step has different detail and method.

2.3.1. Catching broodstock and egg hatching

Although the silver pomfret replication in captivity has some progress, broodstock catching is more prevalent[40]. Various methods are used to catch broodstock, *i.e.* use of Gillnet[37] and use of trawl net near the surface[15]. Almatar *et al.*[37] stated for catching the broodstock of silver pomfret can be used gillnet in coastal waters with a depth of 5–12 m; also, it is better to do in 30 mintime frame and be done between 10 and 16 h.

There are several ways to identify broodstock maturation; *i.e.* assessment of gonadosomatic index (GSI), germinal vesicle breakdown (GVBD) and histological search[46,47]. Lone *et al.*[48] studied spermatogenesis, maturation, seasonal variations and spawning season of silver pomfret (*P. argenteus*); they stated that the highest values of GSI in the testes of male fish were recorded in June (0.72 ± 0.04). Also, result of their study showed peak of spawning for male silver pomfret was June and next peak was seen in October. Morgan[49] used to length distribution calculate sexual maturity.

Almatar *et al.*[37] descripted method larvae production from eggs collected from the wild; Almatar and James[50] reported individual absolute fecundity was 90 071.1 ± 29 750.9 eggs and fecundity per weight was 349.34 ± 119.11 eggs/g; also fecundity per fork length of silver pomfret was 376.22 ± 107.31 eggs/mm.

Amatar and James[50] and Almatar *et al*.[51] descripted in order to fertilize the oocytes and hatch them after stripping oocyte and sperm from female and male wild fishes, respectively; oocyte mixed with sperms in the plastic bags and the sea water was slowly added and mixed; after 5 min, the mixture was added through a mesh (diameter pore was 300–350 mm) as part of bodily fluids to be separated from it; after these stags, eggs moved to the hatchery with density 200–2 000 and the water temperature was between 28–30 °C. Before eggs introduced to hatchery tanks, unfertilized oocytes were separated. The fertilized eggs were pelagic and lucid; also, average diameter of fertilized eggs was 1.1 mm.

2.3.2. Rearing larva and juvenile

Depending on the temperature of the hatchery, hatching occurs after 20 h[37]. Previous researches have shown that hatching depends on the time catching broodstock which was different; *i.e.* Almatar *et al*.[51] believed that the peak spawning season of silver pomfret in Kuwait coast was July when the water temperature was between 32 and 33 °C; also, spawners caught between the hours of 15–18 had the highest maturation and egg fertilization rate.

Silver pomfret eggs hatched after 15 h at 29–30 °C [40]. Total length of larva was about 2.4 mm and after hatching, larva rearing in 1 m^3 and 4 m^3 fiberglass tanks[51]. James and Almatar[45] descripted a method for rearing larva. They stated for larva rearing using 1 m^3 and 3 m^3 round fiberglass round tanks with filtered flowing waters and stocking density at these tanks was 30–40 larva per liter; optimal temperature for larva rearing in this stage was 27–29 °C. After 3 days larvae were feeding with mixed algal specie consisting nannochloropsis, isochrysis and chlorella. Larvae after the first week feeding with *Artemia nauplii* and after a week feeding with *Artemia nauplii*, larvae could be weaned to formulated diets (Table 2). They reported with this method that larvae survival was up 4.2% (averaged 3.5%) to juvenile stage (45 days old). However, studies in the field of improving larvae survival and improve economic performance continues[45,47,48].

Gao *et al*.[52] stated the gastrointestinal tract of 12-day larval of silver pomfret (*P. argenteus*). Peng *et al.*[53] studied on several died for culture of juvenile silver pomfret. They formulated 4 type diets for juvenile silver pomfret (average weight 5.42 ± 0.57 g) for 9 weeks; Diet 1 was fish meat, Diet 2 was mixture of fish meat and artificial feed, Diet 3 was mixture of fish meat, artificial feed and Agamaki clam meat and finally, Diet 4 was mixture of fish meat, artificial feed, Agamaki clam meat and copepods. Fish were fed four times daily (7 am, 11 am, 15 pm and 18 pm) and amount of feeding were equivalent to 3% of fish weight. The result of their study showed the greatest weight gain was associated with Diet 4 and the lowest associated with Diet 1; also, between weight gain associated with Diets 2 and 3 were not significant difference ($P < 0.05$). However, between survival rate of 4 treatments were not significant difference ($P > 0.05$).

Salman *et al.*[54] stated using jellyfish can be helpful to successful culture of silver pomfret (*P. argenteus*) in ponds; also, in the open water (nature environments), the silver pomfret fed from crustaceans, especially copepods; Bacillariophyta and Mollusca[30].

Almatar and James[18] assessed several type of commercial feed (salmon feed) mixed with Cyclopes and shrimp meat. The results of their study showed growth rate of fish in treatments (mixed of salmon feed, Cyclopes and shrimp meat) were significant higher than control group (only salmon feed).

To rear juvenile silver pomfret can be used fiberglass round tank with an approximate capacity of 800 L; in this system aeration was provided by air-lift tubes (PVC-1.5 ± 1.0 inch) inside the tanks to avoid air bubbles, because juvenile silver pomfret preyed air bubbles and swallow them that could be led to the death of juvenile fish[18]. Tanks flushing rate can be between 10–15 L/min sea water before entering to system passes through sand filter and

UV disinfection [46,55]. Previous studies showed juvenile had best growth rate between 26–30 °C and optimal salinity was between 25 and 28 ppt [18,55-57]. Concurrent with the growth of fish, volume of tanks increases from 4 m^3 to 125 m^3 and photoperiod at this stage can be 12 h light: 12 h dark (light intensity 400–480 lx) [45,54,56]. James and Almatar[45] reported in same of this condition (Kuwait climate), silver pomfret (*P. argenteus*) after about 20 months (1.8 years) reached to marketable size (250 g). Finally regardless of the diet type, recommended daily feeding is in 3–5 meal and feed amount appropriate to the circumstances of farm can be between 3%–5% weight of fish[37-39,45].

2.3.3. Broodstock

Techniques for extracting eggs from broodstock in captivity are still expanding[45]. However, according to Biswas[58], sexual maturation stages were as follows:

I. Gonads have about one-third of its final length; gonads are string-like and ovary cannot be determined from the testes.

II. Gonads have half of its final length and ovary is L-shaped. Ovary is tape-like and hollow that the primary ovarian tissue is formed; but aggregations of oocyte are not complete. Also, testes compared to previous stage get thicker and primary tissue is formed.

III. Ovary is yellow and there are clear aggregations of oocyte; but they are not flowing. Underneath the ovary is bulky. Length and volume of testes increased and different stage of spermatogenesis are visible in various parts of the lobules. However, sperm have not move ability.

IV. Gonads are fully grown and ovary is completely developed. Oocytes are quite fluently and in case of fertilization with sperm, can form a zygote. Testes are milky and sperm have move ability.

V. This is the stage after of spawning; in this stage ovary is crumpled, loose and dark yellow. Dark spots may be seen on the ovary wall. The small number of oocytes can be clearly observed in the ovary.

Hossain *et al.*[59] reported mono-saturated fatty acids (MUFA) of male silver pomfret (*P. argenteus*) in pre-spawning stage significantly higher than post spawning stage. This result showed level of the fatty acid in the March to May (pre-spawning stage) is better and higher than other months.

Peng *et al.*[57] studied effect of dietary n-3 LC-PUFAs on the activities and mRNA expression levels of tissue lipoprotein lipase (LPL) and fatty acid synthase (FAS) during vitellogenesis and ovarian fatty acid composition in female silver pomfret broodstock. Four experimental diets are as follows: fish oil (FO), mixed of 70% fish oil and 30% soybean oil (FSO), mixed 3% fish oil and 70% soybean oil (SFO) and soybean oil (SO). Result of their study showed high dietary n-3 LC-PUFAs levels significantly affected on metabolism lipid of silver pomfret female broodstock during vitellogenesis through LPL and down regulating FAS. Figure 3 is histological sections of silver pomfret (*P. argenteus*) ovary from Lone *et al.*[60].

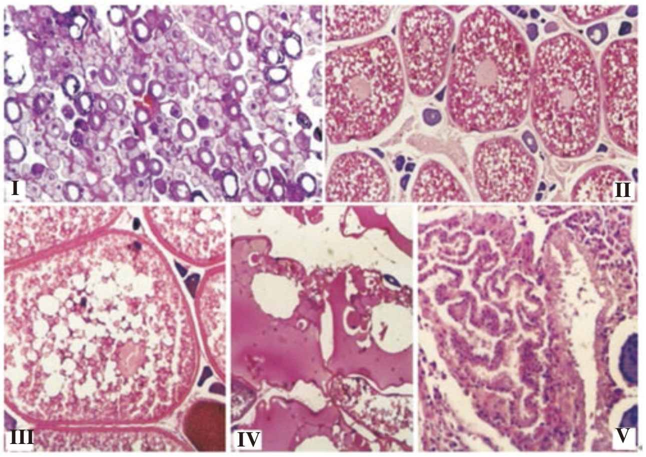

Figure 3. Histological sections of silver pomfret (*P. argenteus*) ovary.
I: Pre developing stage (December, 150×); II: Developing ovary (June, 60×), there is primary ovarian tissue formed; III: Germinal vesicle of oocyte move (GVM). The lipid yolk granules (white globules) are sequestering to form bigger drops. Zona-radiata is developed. Protein yolk (red granules) is on the periphery (May, 100×); IV: Maturationof oocyte is in the final stage (July, 60×); V: Ovary in the post spawning stage (July, 60×). Contents of Figure 3 were from Lone *et al.*[60].

3. Water pollution and threats

Pollution of water resources is threat for fishery productions. Pollution of water resources, one hand threatens production rate and on the other hand makes risk for food safety[61]. Several studies on the identification and lethal effects of pollutants are done. In the meantime, the possible effects of pesticides on aquatic animal health are of great importance[62]. This was due to widespread use of the pesticide[63]. However, previous study clearly showed water pollutant such as pesticide can be high toxic to aquatic organism[64-66]. For example, Vajargah *et al.*[67] studied acute toxicity of Butachlor to Caspian Kutum (*Rutilus frisii* Kutum Kamensky, 1991); Also, *Hedayati et al.*[68] studied acute toxicity test of pesticide abamectin on common carp (*Cyprinus carpio*). Mishra *et al.*[69] studied acute toxicity and behavioral response of freshwater fish, *Mystus vittatus* exposed to pulp mill effluent and Yancheva *et al.*[70] studied about effect of pollutants on fish health.

Method of toxicology studies has changed and more efficient method has been replaced. For example, Yalsuyi *et al.*[71] studied the swimming pattern of rainbow trout (*Oncorhynchus mykiss*) faced with change of temperature and dissolved ammonia. Result of their study showed the swimming pattern of fish as behavioral indicator was changed confronted with these pollutants. Also, Naserabad *et al.*[72] studies acute toxicity and behavioral changes of the goldfish (*Carassius auratus*) exposed to Malathion and Hinosan; the result of their study showed pollutant in addition reduced chance of fish survival, can change their behavior. Although toxicology studies to identify the effects of many pesticides on fish health, to control the effect of these toxins, we need to change approaches[73]. Hence, behavioral research can be useful.

Persian Gulf countries (Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and the UAE) produced more than 20% of the world's oil and have about 35% of the world's natural gas[74]. Aein *et al*.[75] reported tissue accumulation of heavy metals and petroleum hydrocarbons resulting from the extraction and transportation of oil in Persian Gulf organism; also, Mallahi *et al*.[76] stated between accumulation of pollutant in the tissue organism with the their age, gender and proximity to seashore, there are not significant correlations. In addition, Sobhanardakani *et al*.[77] reported accumulation toxic metals such as Pb, Hg and as in silver pomfret (*P. argenteus*).Finally, previous studies showed pollutant compounds such as heavy metals that can accumulate an decreased survival chance of these organism in tissue of aquatic organism[78-81]; while aquatic environments are the last destination of environmental pollutants[82-84].

In recent years the annual catch of silver pomfret (*P. argenteus*) was decreased[16]. Khan[32] stated that due to overfishing of silver pomfret in near coast of Maharashtra (western region of India), average catches of this species compared to the previous have been significantly reduced. Nasir[85] reported total catching of silver pomfret dropped from 378.16 tons in 2012 to 27 tons in 2015. Amrollahi *et al.*[86] assessed stock of silver pomfret (*P. argenteus*) in northwest of Persian Gulf; the result of their study indicated that resources were over-exploited and applied sustainable management to revive of this species.

4. Conclusion

Projected world population in 2050 reaches to 9.7 billion people[2], and restrictions on the continents resources threaten aquaculture and fisheries. Pollutions and freshwater shortage will be other limiting factors[9]. Oceans have more than 30 000 species of fish and more than half are edible[86]. Approach for marine fish culture in cage will be growing in the future[13]. According FAO statistic data in future contribution of fish catch of fisheries production will be reduced[2,9,10].

Silver pomfret is benthopelagic and anadromous that lives in the depths of 5–110 m[24]. This species has distribution in Persian Gulf, Oman Sea, Japan, Malaysia, Indonesia, southern and eastern coasts of China, the West and Southwest Korean Peninsula and the Indian Ocean[26,27] and is popular species in these regions. So far extensive studies in the field of silver pomfret (*P. argenteus*) culture have been done; however, this technique is not complete[53,54]. High mortality rate of larvae and problems of natural reproduction of broodstock in capacity condition, are main issues of this species culture[51]; however, progress achieved in recent years in addition to the popularity of this species in middle east of Asia and worldwide, no cannibalism and suitable eating of artifact diet lead to offer this species as a new candidate to mariculture industry[45].

Pollutants of aquatic environments caused by oil extraction, agricultural and industrial effluents in addition to overfishing can be considered as the most important threatening factors of silver pomfret natural resource[86,87]. Seasonal and regional restrictions for fishing could be effective to improve the silver pomfret natural resources; for example Khan[32] reported regions near Khambhat (west of India) coast were nearcery places of silver pomfret. Dadzie *et al*.[35] reported due to catching activity between April and May, natural resource of silver pomfret significantly decreased.

Predicted in future, In Europe the demand will be higher than production and Asia will be largest producer of aquatic products [1,2]. The World Bank is predicting that in 2030 years fisheries investment risk is reduced in comparison to day [35]. Fisheries were told accordingly; particularly aquaculture will be growing industry with a bright future.

Conflict of interest statement

We declare that we have no conflict of interest.

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