The Caspian Sea: Environmental Challenges for the Littoral States

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Abstract

The Caspian Sea is the world's largest enclosed inland water body in terms of its location as well as its vast energy resources. The sea contains 50 billion barrels of oil and 9 trillion cubic meters of natural gas in proven or probable reserves, significant from global energy security and economic perspective. National and international 'Oil and Gas corporations' are commercially active for exploration and exploitation of available resources, identified as the major cause for contamination and irreversible damage of aquatic and surrounding habitat. Among the littoral states, Kazakhstan and Azerbaijan have been conducting extensive oil and gas drilling activities that releases the maximum of hazardous petrochemical waste and spills in the Caspian Sea besides posing serious challenges to the environment. Other major environmental challenges are; fluctuating sea water levels, declining sturgeon fisheries, imbalances in biodiversity, desertification, urbanization of coastal areas, and degradation of ecosystem. These factors are polluting soil, air and water of the region, which is leading to deteriorating living standards of the people in this vicinity. Considering the commercial and economic interests, the littoral states are not much concern for the environmental laws, so they are very weak and largely unenforced. Another problem is the lack of defining legal status of the Sea. This paper's objective is to identify the key causes for the environmental degradation and their impact on the health of human, aquatic and wildlife population. Further, it would discuss how "competition over the energy resources" among the great powers in the Caspian region is threatening the ecological system and balance. The study will also evaluate the key initiatives taken by the Caspian states to monitor and control environmental pollution.

Keywords

Caspian Sea, Transport network, Caspian pollution, Tehran Convention, Sturgeon

Introduction

The Caspian Sea is the world's largest enclosed inland water body without any natural outflow. It is landlocked among Russia, Azerbaijan, Kazakhstan, Turkmenistan and Iran. The sea contains 50 billion barrels of oil and 9 trillion cubic meters of natural gas in proven or probable reserves, significant from global energy security and economic perspective[1]. The area of the Caspian Sea is approximately 14,149,200 square miles (386,400 square km) and covers the drainage basin of around 3,625,000 square km (1,400,000 square miles) (Dubner, 1999: 265).

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Since, the USSR disintegration, the region had been a cynosure of conflict for capturing and exploiting its natural resources and marine reserves (fisheries and other sea species, importantly sturgeon). The economic growth of the newly independent states linked with the implementation of hydrocarbon projects that were financed by western and eastern countries (Zonn, 2001: 69). Each country of the Caspian is responsible for the region's environmental degradation. Kazakhstan and Azerbaijan have been conducting extensive oil and gas drilling activities that releases the maximum of hazardous petrochemical waste and spills in the Caspian Sea. It is estimated that about 15-20 million tonnes of Carbon dioxide is emitted during the on and off shore fossil fuel production in the Caspian region (Rucevska & Rekacewicz, 2006: 23). Approximately 140 large and small rivers flow into the Caspian, including Volga, Kura, Ural, Sulak and Terek (Namazi, 2000: 123). The Volga is the core fresh water source for the Caspian Sea, which provides 80% of its total inflow (Villa, 2014: 79). Russia is the largest polluter of the Caspian Sea. More than 13 billion cubic meter of waste water comes in the Caspian Sea every year, in which 10 billion cubic meters come from the Volga from Russia. The Volga deposits large amounts of industrial wastes, heavy metals, pesticide, detergents, oil and sewage into the Caspian Sea (Hays, 2008). About 20% species of the region are on the brink of extinction. Thus, the ecological imbalances of the Caspian coastline threatens the health of the humans and wildlife inhabiting this region.

The Priority of Economic Growth at the Expanse of Environmental Perils

The nations are aware of the ecological problems and consequences of the pollution. However, they are undetermined to halt it due to lack of political leverage as well as insufficient resources to enforce the required changes. The exhilarations of rapid economic growth and development have had a negative impact on ecology. After the USSR collapse, the newly independent states started disputing over their claim on offshore and onshore oil assets or gas fields of the Caspian Sea. The exploration and exploitation of these resources considered as the major cause for contamination and irreversible damage of aquatic life and surrounding habitat. Abundant hydrocarbon reserves are considered as a God's gift for the littoral states. The economy of the Caspian states is vastly relied on the energy resources. If we delve deeper on the Gross Domestic Product (GDP) of newly independent states for the year 2004, the role of hydrocarbon sector and allied industries becomes quite apparent. The industrial sector contributed 45.7 % of the GDP to Azerbaijan. The country's core industries that contribute to maximum part of GDP are directly or indirectly associated with refinement, production, extraction and transportation of oil and gas that constitutes up to 90% exports. In Turkmenistan, the industrial sector provides for 42.7% GDP. The major industrial activities are concentrated on production of petroleum products and extraction of oil and gas. Besides, cotton is another economically important commodity of Turkmenistan. However, the production of cotton possesses a serious threat to environment by increasing desertification and salinization in the Caspian river basins and the Aral Sea. The same pattern is evident in Kazakh economy. Almost all Kazakh oil fields are located in the Caspian Sea. Kazakhstan is estimated to have between 9 to 17.6 bbl of oil resources that is the highest in the entire Caspian region (Ladaa, 2005: 30-31).

Russia and Iran are comparatively less interested than other littoral states in the Caspian Sea. The two countries contain large energy resources elsewhere and have more diversified economy. Their economic activities are highly concentrated on fishing and agriculture in the coastal areas. However, both sectors are severely suffering of industrial pollution caused by oil and gas and allied industries. Therefore, both countries are more inclined toward raising environmental concerns onto Caspian agendas in multilateral international forums (Ladaa, 2005: 32).

Environmental Challenges of the Caspian Sea

i) Salinity and Sea Level

In 19th century, between 1880 and 1977, the sea level dropped four meters (from -25 to -29m below sea level). However, after 1977 the Caspian Sea waters continued to expand. The drastic rise in water levels has become a cause of several problems; it flooded urban cities, destroyed industrial infrastructures as well as damaged beaches and resorts. It also displaced around 10,000 people toward the lowlands of Azerbaijan, the Volga delta and Dagestan (Villa, 2014: 79). The salinity of Caspian Sea changes from the north to the south within a range of 1,0 to 13,5 parts per thousand. This difference is principly evident towards the north Caspian[2.] The average salinity of Caspian Sea water is 12.7-12.8%. The lowest salinity is 5-10%. The salinity in Middle Caspian Sea is 12.7%, whereas 13% observed in the Southern Caspian. the highest salinity found in the gulf Kara BogasGol due to massive water evaporation with the salinity of its water being 300-350% (Plotnikov & Aladin, 2011: 104). There was constant flow from the Caspian Sea to Kara BogazGol, a gulf lagoon where water had been evaporating, leading to severe decline in Caspian Sea water levels. Therefore, in 1980, a dam was built between Caspian and Kara BogazGol to decelerate the water flow from Caspian Sea. Kara BogazGol completely dried up within 3 years and converted into a saline desert. Consequently, the salt carrying winds started salinizing the surrounding environment. A new channel toward the Gulf was constructed in 1984 to decrease the adverse environmental impacts and to restore the water flow. After eliminating the dam in 1992, the Caspian Sea level started to rise again that lead to the complete restoration of the Gulf (Plotnikov & Aladin, 2011: 103). Scientists and researchers confess that the reasons of such wide fluctuations are still vague. Nevertheless, it is assumed that changing climatic conditions, river inflows, visible evaporation and human intervention for surface water management, are the key causes. Thus, with above study, it can be inferred that there is an indirect correlation between the water level oscillations and water salinity in Caspian, if water level declines then the salinity of the Sea increases, whereby productivity and nutrition gets severely affected in the coastal zones.

ii) Hydrocarbons

Crude Oil and Gas drilling and extraction is the foremost cause of Pollution, especially in Oceans and Sea. Water pollution and contamination had been increasing at a frightening rate, primarily due to daily crude oil extraction & transportation, construction & operation of underwater pipelines, oil spills, oil tanker accidents, submerged well leakages and wastes. The northern part of the Caspian Sea contains 2 to 2.5 trillion cubic

meters of natural gas and 3 to 3.5 billion tons of oil (Fet & Ponomarenko, 2019). In the northern Caspian area, the oil and gas condensate comprises very high quantities of sulphur. During the distillation process, especially to produce liquid petroleum gas, large parts of sulphur deposits disperses in the air and water, polluting the surrounding regional environment. When the activity ends, the residual toxic waste remains, constituting a hazardous situation. Kazakhstan and Azerbaijan have been leaving oil wells after utilization and these wells are submerging in the sea water. Big leaks in the sea are another serious concern, responsible for contaminating water that are killing waterfowl and fishes. Kazakhstan's Atyrau and Mangistau regions, bordering the Caspian Sea, are main producers of gas and oil. Approximately, 600,000 hectares of land of these regions are polluted. Besides, thousands of hectares of soil of Absheron Peninsula became unsuitable for agricultural activities (Rucevska & Rekacewicz, 2006: 33). Although, Baku is the formerly oil developed area in the sea, which was considered an achievement. Nevertheless, some scholar's warned about the side effects as pollution of the Caspian Sea has become a worldwide problem.

Commercial activities related to hydrocarbon materials in the Sea pose a serious ecological threat. According to some estimates during production around 2% of total amount of extracted hydrocarbons leak in the sea (Villa, 2014: 80, 81). There is no proper mechanism to dispose industrial waste, which could have some serious repercussions for the eco system. Absheron Peninsula (Azerbaijan) and Aqtau city (Kazakhstan) are the particular examples of improper storage and disposal of the material (Nasrollahzadeh, 2010:98). Today, Baku is considered to be a filthy part of the Caspian Sea. Public-political process, ethnic conflicts as well as military conflicts are also affecting the environmental condition of the sea. For instance, the Russia-Chechnya war became a prominent factor for myriad ecological imbalances in the Sea. Approximately 20-30 military wastes of weapons are found annually[3]. The sea pollution may led to PH changes which reduce water quality, pollute sea bed, direct destroying fish and its ecosystem. In Kazakhstan, blood disease, tuberculosis and others are four times more common in the Caspian area than the rest of the country's average. Water containing a good portion of oil is used for drinking in Kazakhstan, which is a main reason for citing intestinal infections in its coastal areas[4]. Because of oil pollution, sturgeon has been decreasing. In 1993, the total sturgeon catch and caviar production was 1,710 and 106 tons, which in 2009 decreased around 90% to 178.41 and less than 10 tons, respectively (Ovissipour & Rasco, 2012). Moreover, about 4000 of the Caspian seals were found dead at the coast of Kazakhstan (Nasrollahzadeh, 2010: 101).Thus oil spills in the marine environment has a serious concern for biological as well as economic properties. Hence, for the destruction of ecology, Tengizchevron, the Chevron Texaco-led consortium, was fined $75 million in August 2001, which developed the giant Tengiz oil field of western Kazakhstan[5].

iii) Fishing and Illegal Fishing

Traditionally, the Caspian Sea has always been known as the sea of sturgeon that produces more than 90% of the world's caviar (Ovissipour & Rasco, 2012). Beluga Caviar (a species of sturgeon family) is an expansive delicacy in high demand worldwide. The Caspian Sea is richest in biodiversity, which contains 850 fish species (sturgeon, perch,

herring and pike) and more than five hundred plant species[6]. Natural sturgeon productions are decreasing due to overfishing, desiccation of spawning grounds, unsuitable open seasons and reduction of the river flow because of dams, constant changes in sea water level. Moreover, corruption, poverty and unemployment in the coastal population of the Capsian sea are responsible for illegal fishing. Most of the cases, illegal fishing has become a source of income of surrounding populations (Shadrina, 2007: 8). Therefore, spawning areas in the Volga River have decreased from 3,390 ha to 430 ha and the Kura, Sefidroud, Tajan and Gorgan rivers are also not suitable for spawning (Ovissipour & Rasco, 2012).

After the disintegration of the USSR, sturgeon supplies have started to plummet. During the 1980-1989 period, the black market for illegal sturgeon and caviar bloomed due to illegal fishing. The decline was continued until 1993, when total catch was around five thousand tons. In 2007, it stood at less than 1 thousand tons a year. Overfishing in the Caspian Sea is now strictly regulated and international permits must accompany any exports. Despite of these regulations, overfishing and poaching still continue. For instance, a research estimated that in 2006 more than 80% sturgeon catch was illegal in the Caspian Sea. A similar problem is the disappearance of the Caspian seal. From 1900 to 2007, more than 90% of the Caspian seal population has decreased. Oil extraction as well as the climate change may reduce the duration of winter ice upon that Caspian seals depend for breeding (Villa, 2014: 83). There are 17 species in red book of Azerbaijan. The Zandar and Caspian thorn fish have extinct[7]. Due to continuing decline of sturgeons, the International Union for the Conservation of Nature (IUCN) formally classifies "the beluga sturgeon in the Caspian Sea as "critically endangered" on its Red List". Therefore, since October 6, 2005, the United States Fish and Wildlife Service had banned the imports of beluga sturgeon and other beluga products from the Caspian Sea[8]. Moreover, on 27 December 2013, during 34th meeting of the Commission for water biological resources of the Caspian Sea, the Caspian Five countries had agreed to stop sturgeon catches for 2014. The littoral states have also been using new scientific attempts to increase sturgeon population. In Azerbaijan, Shirvan where artificial breeding of sturgeon have been started and they are later releasing them in the Sea to increase their population of the fish (Villa, 2014: 82, 83). In this regard, Khylly factory is engaged in this process. The joint efforts of the littoral states are seriously combating poaching (Nazarli, 2017).

iv) Other Reasons for Pollutions

During the 1990, the major reasons of pollutions in the Caspian were disposal of wastes of industries, pollutants flowing in rivers, agricultural waste water and municipal as well as domestic sewage from cities. Nearly 45% Russian industry as well as 50 % of its agricultural production are situated in the Volga basin. The Volga River brings polluted water from locations as far as 3,500 km away. The inadequately waste water spills in the tributaries of the Volga river. The Kura-Araks Rivers situation on the Absheron Peninsula is similar, as rivers run through Georgia and Armenia, accumulating pollutions from two-thirds of Azerbaijan's industrial production, finally with the waste materials these rivers fall into the Caspian Sea. Apart from this, electrical generation, industrial activity, agricultural exploitation, irregular harvest and tourist industry investments had been

badly affecting the ecosystem of the Caspian since last two decades (Rucevska & Rekacewicz, 2006). As a result, the water quality is declining, which further contaminates drinking water, fish as well as reducing the tourism opportunities.

In the realm of electricity generation, nuclear and thermal power poses a major risk. For instance, in Kazakhstan, the Koshkar- Ata Lake, 8 km away from the Caspian shores, has been used for decades as storage for radioactive and toxic wastes from nearby regions. The industrial cities are located on the shores of the Caspian Sea including Astara, Anzali, Ra msar, Chaloos, Shahi, Mahshahr, Rasht, Lahijan, Sari, Babolsar and Gorgan. The major industries are such as textile, electronics, chemicals, wood and paper, fish processing and food products, which are source of pollution for water as well as atmosphere (Jafari, 2010:28). Sumgayit is the third largest city of Azerbaijan, located near the Caspian Sea. It is one of the most polluted city as declared by the Blacksmith Institute, a New York-based environmental health NGO. Therefore, chemical and heavy metal are affecting more than 275,000 people's health. In this context, a local resident describes condition of the city "The smell of gas wakes me up. I get headaches, I feel nauseous, and it affects my nerves"[9]. Furthermore, Cheleken peninsula located in the western Turkmenistan. It is a big industrial plant accumulated 18,000 tons of radioactive elements which now days are stored in the town of Hazar. It is an open storage area less than 200 meters from the sea. Strong winds and dust storms disperse radioactive elements in seawater as well as air. Therefore, in Turkmenistan today radon concentrations in the local air are 1,000 times higher than the average, which is very critical for humans as well as wild animals. Liquid acid emissions from the plant are another environmental concern. To neutralise stations of these effluents, the state authorities build a radioactive waste storage unit Aligul, which is 17 km away from Khazar. Moreover, a NATO project is assisting Turkmenistan under the Environment and Security Initiative in Central Asia to handle the radioactive waste, which is supporting a radiochemical laboratory in Ashgabat and finding the alternative for waste characterisation and radio protection (Rucevska & Simnoett, 2011: 51).

Another major reason of pollution in the Caspian Sea is agricultural land reclamation and irrigation in coastlines of the Caspian. The use of pesticides and heavy metals for irrigation has been contaminating the sea. The development of domestic tourist industry on the Caspian coasts and their increased population is additional environmental concern. During the last decade, the Iranian coastal area has marked a demographic increase around 5% a year (Villa, 2014: 85).

Competition over the Energy Resources of the Caspian

Due to geopolitical location as well as ample energy resources, the Caspian Sea has become a source of competition among the great powers namely Russia, US, China and European Union. In the 19th century, the region has become a place of 'great game', which is today replaced by the new concept titled 'new great game', struggling for control over the energy resources and pipeline routes. Therefore, superpowers had been attracting the littoral states by providing economic, political as well as security assistance, which are also affecting the domestic and government policies of littoral states. The superpowers had been engaged in building pipelines in their direction to transport oil and gas from the

region. Therefore, a large number of oil and gas pipelines are operational from north to south and east to west. The pipelines split, rust and rapture release oil, which leak into the soil and water, polluting the environment. The pipelines ruptured many times which later have covered with patches. Oil leaks and spills are not rare in the Caspian region. For instance, in September 2003, near Sozram, 700 km east of Moscow, a tanker caught fire and leaked into the Volga River (Hays, 2008). In addition, two Caspian pipelines (one oil, one gas) ruptured and leaked in September 2013, which start from Kazakhstan's offshore Kashagan site (Pannier, 2018).

Pipelines from the new oil fields of Central Asia to the Black Sea, to European markets as well as Eastern markets, affect the environment of the region. The Kazakh government estimated that "2.8 million cubic metres of toxic sour gas had been flared off causing the local air and water to turn acidic" (Chatterjee, 2014). Besides, Greenpeace estimates that every year Russian pipeline system leaks 15 million tons of crude oil (Hays, 2008).

Agreements among the Caspian States for Environmental Protection

The Caspian states signed several agreements for the environmental protection. In September 1995, Russia and Iran agreed to build a Center for Caspian Research Studies in Moscow and expecting other littoral states to join. It conducts research on several topics including balancing the Caspian's water level, to manage the water resources of the Caspian basin and identify the high-risk points in the coastal areas of the Sea (Namazi, 2000:131). The Caspian states together with some international organizations (UNDP, UNEP, the World Bank, the EU-TACIS Programmes and NGOs) have been working together for the environment protection and bio resources management. The Caspian Environment Programme (CEP) launched in 1995 and a prime vehicle for international cooperation. The CEP was established with the aim "sustainable development of the Caspian environment, including living resources and water quality, protecting human health and ecological integrity." (Ladaa, 2005: 43). As a result, in 2003, an agreement titled "the Framework Convention for the Protection of the Marine Environment of the Caspian Sea (also known as the Tehran Convention)" signed which considered a milestone of Caspian states' environmental cooperation. It is the first legally binding regional agreement that came into force on August 12, 2006 (Hasanova, 2016).

On 23-25 May 2007, first Ministerial meeting of the Conference of Parties to the Tehran Conference (COP I), was held in Baku. During this meeting, the Caspian Five states declared a "Caspian day" on 12 August, marking the importance of the Tehran Convention. In 2011, important agreements were signed such as "the Aktau Protocol concerning Regional Preparedness, Response and Cooperation in Combating Oil Pollution Incidents". In 2012, COP IV took place in Moscow where the five littoral states signed the "Protocol for the Protection of the Caspian Sea against Pollution from Land-Based Sources and Activities". In 2014, COP V was held in Ashgabat, Turkmenistan. Though the Tehran Convention is considered as a major diplomatic success, nevertheless there is lack of the permanent seat of the Secretariat because an Interim Secretariat is still headquartered at UNEP's Regional Office for Europe in Geneva, Switzerland (Villa, 2014: 87). Recently, in July 2018, the Caspian five states have signed The Environmental

Impact Assessment Protocol" under the Tehran Convention. The agreement is apparent that individual states are responsible for any damage in sea through construction of pipelines, exploration and development of sites. It is the responsibility of the leading states for safety of the environment, which would involve in future hydrocarbon development or export projects (UN Environment, 2018).

Moreover, five states signed a landmark Caspian agreement titled "Convention on the legal status of the Caspian Sea" in August 2018 that covered the seabed, the subsoil, natural resources, demarcation, fisheries and navigation. The convention acknowledges all rights over the Caspian Sea and its resources to the five littoral states. It excludes the non-Caspian state from the region. The parties to the convention discussed the ecological system and biodiversity of the Caspian Sea[10]. There are three protected reserved areas:

- **Astrakhan**: It is located in the northern part of the Sea, one of the largest reserved area in the world. Its objective is to preservation and accumulation of natural resources and genetic funds of the coast of the Caspian Sea and of the Volga delta. The goal of this park is not only for the economic development but also for protection of nesting grounds, fish spawning and rare plants. About 30 species of mammal such as boars, otters and fishes like sturgeon and herring and birds like swans and geese live in this park. Since 1984, it gained a status of international biosphere reserve[11].
- **Khazar:** This is located on the southeast coast of the Caspian Sea. It is divided in two parts; the northern from Turkmenbashi to Cheleken peninsula, and the southern - from Okerem to Gasan-Kuli cape and floods of Atrek River. Ducks, swans, dives, flamingos and seagulls are representatives of this reserved park[12].
- **Gizil-Agac**: This park is situated on the southeast border of Azerbaijan in the Gyzyl-Agac Gulf area. Today, the area of this park is 88.4 thousand ha. The goal of this park is protection of wintering of the waterfowl (numbers are the largest in the southeast of the Caspian Sea), fishes. About 74 species of fish live in the Caspian and 54 species live in Big and Small Kizil-Agach Gulfs[13].

Apart from the above discussion, the littoral states have been taking initiatives for ecological sustainability, which are:

1) Russian Federation: The Federal Agency for Fishery of the Russian Federation (Rosrybolovstvo) manages bio-resources of the Caspian Sea. It is an executive authority, with following functions: conservation of marine biological resources, their protection, preservation, research and reproduction of marine biology resources and their habitat in the inland waters of the Russian Federation, to exercise control and supervision over marine biology resources[14]. Moreover, Russia has deployed its border police force to protect sturgeon and curb poaching in Russian territorial waters and in border areas[15].

2) Kazakhstan: The Kazakh Fishery Committee of the Ministry of Agriculture manages fishery resources. It monitors regulations and protection of fishery resources in the country. The Ural-Caspian Basin Inter-regional Fishery Inspection Group in the Caspian Sea area represents the committee. There are two laboratories in Atyrau and Aktau to control pollution in the Caspian Sea[16]. Kazakhstan has started reconstruction work on the seaport of Aktau and reinforced dikes to protect oil fields. The country has also established contacts with corporate firms for environmental protection measures in oil extraction[17].

3) Azerbaijan: The Ministry of Ecology and Natural Resources (MENR) is responsible for Caspian environment protection. The country has taken steps for fish breeding plants. The Department of Environmental Protection (MENP) is responsible for pollution control and monitors solid and liquid wastes. It emphasises on nine sector that includes dangerous wastes, protection of atmospheric conditions, protection of surface water resources and other ecological issues[18]. The country strictly follow the official moratorium on catching sturgeon as well as caviar. Additionally, MehmanAkhundov, director of the Scientific Council of Scientific-research Azerbaijan Fisheries Research Institute (AFRI) of Ecology and Natural Resources Ministry, said in 2017, "The sturgeon issue will be discussed in the first secession of intergovernmental Commission on Water Biological Resources of Caspian Sea". Further, he said, "the meeting will focus on possibility of concluding an intergovernmental agreement on a moratorium and setting a ban on catching sturgeon for a period of 20-25 years". However, since 2011, the Caspian states agreed on a technical moratorium on industrial sturgeon(Nazarli, 2017), which entered into force on 24 May 2016. Afterwards, the commission acquired an intergovernmental status. The first meeting of new commission of intergovernmental was held in November 2016 in Azerbaijan[19].

4) Turkmenistan: In Turkmenistan, three major environmental issues are identified such as desertification, the drying of the Aral Sea due to excessive irrigation and chemical pollution. All these areas directly reduce fertility of soil. The Ministry of Natural Resources Use and Environmental Protection Department has been responsible for environmental protection, forestry, hydrometeorology, protection of flora and fauna and administrative planning. The country has also developed an Environmental Fund collected from environmental fines (Hays, 2008).

5) Iran: The Iranian Fisheries Organization (Shilat) is responsible for the management of fishery resources and aquaculture. The organization supervises fishing as well as fish processing. Additionally, it issues licenses and data of fishing stocks[20]. Moreover, the Iranian government introduced the International Sturgeon Institute of the Caspian Sea.

Conclusion

In present century, the environmental challenge is the major problem today at international level, so the Caspian Sea is not an exception. Due to its geopolitical location as well as its ample hydrocarbon resources, the Caspian Sea has become a hub of competitions among the great powers over the region. The great powers have been struggling control over the natural resources and transport routes, so the region has become a playground of competitions for building a large number of pipelines for the transportation of oil and gas. The pipelines split, rust and rapture releases oil, which leaks into the soil and water, pollutes the environment. The sea had been suffering from pollution, which comes from indiscriminate oil and gas extraction, offshore oil fields; refining, radioactive wastes from nuclear power plants, industrial wastes and untreated sewage flow into the Volga River, empties into the Caspian Sea. As a result, spawning areas in the Volga River have decreased from 3,390 ha to 430 ha and the Kura, Sefidroud, Tajan and Gorgan rivers are also not suitable for spawning. In addition, the quality of air and water of the coastal areas has been declining creating hazardous situation for health of

human as well as wildlife population. It is apparent that the energy resources had been playing an important role in economy of the littoral states. Although, the Caspian states are aware of ecological system, they are aspiring to become sovereign and independent state from Russian hegemony, hence want economic growth but at the cost of environmental concerns.

It is obvious that pollution does not see the national boundaries and it is in trans-boundary character. Therefore, only through multilateral actions, this problem could be ameliorated. The littoral states have signed several agreements including 'Tehran Convention' and Environmental Impact Assessment Protocol', however there is lack of strict action for implementation of their environment policies due to economic and political interests. Moreover, they have been taking individual initiatives for the sustainable environment. Apart from this, there are other steps, which need to be introduced such as energy saving measures including increasing renewable resources and decreasing production of waste products. The government must prioritize the environmental as well as health policies and use of clean technology.

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