Journal of Tourism & Hospitality Research
Islamic Azad University, Garmsar Branch
Vol. 2, No. 3, Winter 2013, Pp. 73-87

Surveying biological situation of Anzali pond and it's custody management strategies along with ecotourism area

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Abstract

Ecotourism science or nature tourism is considered as one of the most attractive as well as the most advantageous sciences relevant to natural resources and biological environment which isn't studied seriously in Iran. Anzali pond is located in 40 km north of Rasht and southwest of Anzali Township and Caspian Sea. Anzali pond is a beautiful pond which is situated in southern shore of Caspian Sea in Iran. This pond is a suitable settlement for immigrant birds and for this reason owes international importance and was recorded in Ramsar website at Khordad 1354. As the most important international pond, now, Anzali is in a great crisis with a lot of inattention that leads to its distraction. Because of locating in a crowded area, this pond receives various kinds of chemical materials from the rivers conduced to the pond. Due to pawing of industrial and urban sewerages, solid garbage of marginal areas and pollution generated form agricultural activity, vacating polluted water of farms and large entrance of sediments, quality of international Anzali pond is reduced and is exposed to ruining. Irregular cut of trees and extreme graze of mutton in country regions has lead to sediment conveyance from these areas. Although 70% of industrial factories around Anzali pond are equipped with resolution system, but continuance of entering hospital, urban, household and industrial slop to the conducing rivers to Anzali pond leads to settlement of these slops in pond and distraction of water supply in this region which by the use of effective and scientific strategies, authorities should have especial attention to this important watery arena in the world.

Key words: Nature tourism, pond biologist Ecotourism, watery Ecosystem

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Received Date: 2 July 2015 *Accepted Date: 22 August 2015*
Date of Print: Summer 2015

Introduction

Wetlands are complex, vital, and exclusive ecologies that have been destroyed by human as he thought they were unusable, and thoughtful human, by converting them into agricultural and residential lands, has tried to destroy them. Despite all these destructing actions, wetlands have remained stable regarding to different geographical conditions, and are important shelters for last survivors of plant and animal species and preserving life diversity (Public Relations of Protection Administration of Mazandaran, 2003, p 3).

Existences of exclusive natural sources, miscellaneous climates, different temperatures and precipitation have provided suitable conditions to develop ecotourism industry in Iran. This is an important approach that affects not only on improvement of current natural sources, but also on economic and social development of local and native societies that are inseparable part of natural sources.

The specified area is Anzali wetland, located in north of Iran, Gilan province. Various species of aquatics and birds live in this wetland, and it also has famous waterlily. Anzali wetland, with area of 15000 hectare, is one of the most valuable ecosystems of country. By environmental criteria, this wetland has produced exclusive conditions with more than 154 animal species and 230 plant species. Anzali wetland is also important from economical and vocational views, such that more than 6000 ton of fishes and more than 2000 pieces of birds are hunted by hunters and local people.

Unfortunately, today Anzali wetland has encountered with a lot of challenges, for example, delivery of more than 30 million ton urban waste, 15000 ton chemical fertilizers, 4000 liter agricultural poisons, waste of about 50 factories, non-native Azola, and sound and oil pollution by visitors' boats, that impose irrecoverable damages to this area annually.

Regarding to international importance of Anzali wetland, it is necessary to control delivery of industrial and urban wastes to this wetland.

This text studies environmental situation of Anzali wetland and suggests managerial strategies to protect it along with ecotourism.

Therefore, we first will try to better recognize ecotourism. Second, we will refer to ecological situation of Anzali wetland. Third, we will analyze strategies to prevent destruction of this wetland.

Goals

Goals of this study are:

- Study ecological situation of Anzali wetland
- Study of minatory factors and destruction of Anzali wetland
- Study of ecotourism of Anzali wetland
- Suitable strategies to resolve destruction crisis of Anzali wetland
- Advantages of protection of Anzali wetland by ecotourism view.

Problem design

Rather than Anzali international wetland has been registered in as an international wetland in Ramsar Convention in 1975, it is known as one of the world biosphere storages by UNESCO. But, today name of Anzali wetland is located in top of the list of in danger wetlands.

Anzali wetland is also important from economical and vocational view so that more than 6000 ton fishes and more than 2000 pieces of birds are hunted by hunters and local people annually. But unfortunately, today Anzali wetland has encountered with a lot of challenges, for example, delivery of more than 30 million ton urban waste, 15000 ton chemical fertilizers, 4000 liter agricultural poisons, waste of about 50 factories, non-native Azola, and sound and oil pollution by visitors' boats, that imposes irrecoverable damages to this area annually (www.hybridcars.com).

Because of delivery of wastes and sediments, this wetland is in danger of sever pollution, and this will destroy its ecosystem seriously. So, it is important that Environment Organization, Ministry of Agriculture, and other responsible organizations do necessary actions toward solving this problem. Anzali wetland acts as a final point for upstream rivers, and prevents flood and land movement in the area (www.aftab. ir).

Depth of this wetland is decreased because of sedimentation and growth of plants. Upon studies, depth of the wetland was reported 6 m in 1966, but it is 1. 5 m today, and less in some parts (Behruzirad, 2007, p 568).

If this wetland dries, not only life area of birds and fishes is in danger, but lives of local people also are affected. Anzali wetland is not only place of spawning of Kaviar and white fishes, winter place for birds of passage, and growing place of rare plane species as wetland tulip, but also has economic importance for local people and country. Annually, hundreds tourists come to visit this unique wetland, and boat sportsmen also practice there (www.hybridcars.com).

Recently, this wetland But, today name of Anzali wetland is located in top of the list of in danger wetlands. This text studies environmental situation of Anzali wetland and suggests managerial strategies to protect it along with ecotourism.

Ecotourism concept

Ecotourism or ecological tour is a kind of tourism that is provided by help of local people and natural potentials, in which tourists go to visit virgin and non-resident nature of world. These kinds of tourists are called Eco tourists.

Many countries supply a large part of their income for foreign Eco tourists. There are also some people that travel to far places to see, for example, a rare kind of bird and taking a photo. They are called bird-viewer. Many others go to see and do skin-diving.

Basic goal of tourists is nature, that is, by definition, traveling to natural regions that are protected. Ecotourism make little damage to local nature and culture (Majnunian, 2006, p 12).

World Tourism Organization (WTO) defines ecotourism as:

It is a kind of tourism in which travel to natural regions has educational and enjoyment goals to see landscapes, plants, and wild life.

Some synonyms for ecotourism are:

1. Tourism of environment advocates
2. Tourism of nature
3. Green tourism

When Thomas Cook established the first tourism company in 1841, many people welcomed tourism opportunities up to now. Today, about 6.1 milliard people from all countries spend more than 2 trillion dollars for types of tourism. Utilizing ecotourism is improving, because it is a transnational attraction. As our executive policies can

affect our tourism abilities, regional tourism is affected by state policies. In macro level, an stable ecotourism has two important parts:
1. Rise and increase of natural ecosystem protection
2. Protecting local and native economy (Mirsanjari, 2008, pp 25).

Ecotourism features
1. Participation in protection of life diversity
2. Help to social welfare of native societies
3. Educational experience
4. Responsibility of tourists
5. Handling by small companies
6. Little need to use irrecoverable energy
7. Emphasize on native ownership
8. Producing vocational opportunities (Nouruzi, 2006, p 20).

In recent 5 years, ecotourism has found a superior place, and desire to visit natural places and wild life is increasing. This affair has produced many new situations, but also many needs for management. Today, ecotourism is much familiar, but it is misused. Recently, nature-based view is removed from this industry, and they converted ecotourism to a destructive virus in nature (Ghazvini; Nazari, 2008, p 4).

Ecotourism in Iran

A vast set of diverse unregistered sources forms Iran's ecotourism. This comprises a diverse spectrum of geographical landscapes and natural places.

A study of Iran's natural geography and feasibility of ecotourism of Iran indicates that it is a unique economical but released source in Iran. Exactly, ecotourism situation of Iran is because of its contiguity with equatorial region.

Geographical diversity has produced many different plant and animal species in Iran, so that Iran is one of the five countries having complete ecosystem diversity (four seasons and plant and animal original species). Therefore, Iran has the potential to invest for ecotourism industry (Mirsanjari, 2006, p 11).

Anzali wetland

This wetland was formed by forming two narrow dry jaws of 9×270 km and sinking sea water. West jaw called Anzali peninsula that

continues to Kapurchal, and Mahruzeh peninsula separates two small gulf of Kapurchal and Bahmbar.

Anzali wetland is very young. By geological terms, wetlands are gulfs that have been separated by a sand partition from sea and is called gulf bayou, or they are deep places that are formed by earth movements. For Anzali, recession of Caspian Sea caused its separation from the sea (Monavvari, 1990, p 53).

Location

Anzali wetland is located in south of Caspian Sea in 37°29'13" north width and 49°18'41" east length (Behruzirad, 2007, p 566).

This wetland is limited from north to Caspian Sea, from east to Pirbazar village; form west to Kapurchal and Abkenar, and from south to Sumehsara town and part of Rasht (Taheri, 1998, p 26).

Spillway basin of this wetland is 374, 000 hectare, from which 53. 9% is forest and range, 33.2% is agricultural lands, and 8.7% is wetland and pools. Human constructions have occupied 3.7% of land (Environment Magazine, 2008, p 3).

Area of Anzali wetland is about 140 km2. This wetland is about 30 km along east-west and is about 3 km along north-south (Behruzirad, 2007, p 566).

Anzali wetland is separated by a sand border, on which Anzali Harbor is located, from Caspian Sea. Most of its east regions are covered by reed, but its west and central parts are open. This wetland was registered in June 1975 in Ramsar site. Fluctuations of sea and uterification (water enrichment by nutritional material) by entering

waste waters caused degeneration of its ecosystem. In this regard, Ramsar Convention decided to register it in Montro list and suggested that actions to rehabilitate this wetland are urgent.

Anzali wetland is a collection of sweet waters that is fed by its spillway basin rivers such as Siahdarvishan, Hendkhaleh, and Pasikhan. Anzali wetland is a suitable living area for spawning and propagation of fishes and a warm place for different species of birds during winter. Reed is the plentiful plant in the area. The protected area of Sarkhangal is a central region of Anzali wetland, and is covered mainly by reed and cattail. This wetland is member of international wetlands of Ramsar convention. In recent years, Anzali wetland suffered from converting some of its lands to agricultural lands, sedimentation of entered waters, and growth of aquatic and non-native plants such as Azolla filiculodes (Khoshchin, 1993, p 4).

Physical specifications

Anzali wetland is a natural, permanent, and sweet water one in country. About 11 major rivers and 30 minor rivers enter into this wetland after irritation of farms and rice paddies with area of about 3600 km2. By geological terms, this wetland was formed during late Paleocene and probably Holocene. Soil of its periphery includes surface and non-lime hydromorph. Sediments are green sedimentary peat and a little coarse peat silt. Maximum depth of the wetland is 25 m during spring. Upon gathered data in a 25 period, warmest month is July with 36. 8°C and coldest month is February with -11. 4°C, that its average is 16°C. Water temperature is 2-11°C in winter. Average annual precipitation is 1500-2000 mm and its relative moisture is 80-85%. Generally, Anzali wetland has warm and moist summers and moderate winters (Mansuri, 1993, p 8).

Ecological specifications

Anzali wetland is a shallow and sweet water one. This wetland is separated by a sand border with width of 1 km from Caspian Sea. Main plant cover of the wetland is reed, which their height sometimes reaches to 6 m. Azolla filiculodes plant was planted in Gilan province farm lands by Iran Scientific and Industrial Researches Organization and Agriculture Organization to produce necessary fodder for livestock and birds and green fertilizer for farms in 1984. During last

decades, because of excess entering waste waters and decrement of water level, reed and Azolla had greater growth (Kimbal, 1987, p 24).

Protection situation

This wetland was registered as international wetlands in Ramsar Convention. Also, International Organization of Birds Life indicated this wetland as an important one for birds. Protected area of Siahkashim, wild shelter of Selekeh, and hunting-forbidden area of Sarkhankal are located in Anzali wetland.

Dangers and threatening factors

Anzali wetland encounters considerable threats, such as:
Entering agricultural and industrial wastes, decrement of water level, rapid growth of reed and Azolla specially in warm weather, deterioration of spillway basin of the wetland, increment of sediments, converting margins to agricultural lands, high traffic of motor boats, excess hunting of aquatic birds, extracting birds' eggs by native people, increment of heavy metals specially lead in water and sediments, pumping water to upstream to irrigate agricultural lands, construction of hunting cabins, accumulation of a lot of irresolvable wastes in the wetland mainly through rivers and visitors, construction of fish breeding pools around the wetland, construction of canals to guide water to upstream, changes in physical and chemical properties of water and effect on spawning and propagation of fishes.

Hydraulic performance

This wetland deposits almost 13% of suspended particles entered in it annually, and have an important role in purification and decrement of pollution load of water, so that 38% of nutrition elements deposit in the wetland annually. Anzali wetland has an important role in preventing depreciation of soil and shores of Caspian Sea.

Economical-social values and using the land

Using plant sources, utilizing sediments as fertilizer, existence of Titanium in sediments, hunting fishes and birds, and attracting tourists are from values of Anzali wetland. It should be mentioned that around lands are used for agriculture and supply of fodder of livestock, boating and transportation. Also, this wetland is one of the sources of agricultural water of around lands.

Birds

They have known 145 species of birds of passage in Iran. 77 species (53%) of them are seen in Anzali wetland. About 700, 000 birds of passage were observed such as ducks, geese, swan, and moorhen, which they immigrate from Siberia and other areas of world. This wetland is one of the most important places for little birds during winter. White pelican, gray-foot pelican, and white-forehead goose are from those birds that stay there during winter. This area is registered as passage for birds like white-headed duck, and black-stomached chicken. Other valuable species are birds like little swan, oak duck, bride goose, and black-headed duck that are close to extinction (http://eprquds. blogfa. com).

Plants

Plants of Anzali wetland are classified in four groups: (1) plunged plants, (2) afloat plants, (3) plunged-end plants, (4) dry plants. 11 species of plunged plants, 11 species of afloat plants, 11 species of plunged-end plants, and 6 species of dry plants are seen in Anzali wetland.

Fishes

Output of Anzali wetland goes to Caspian Sea. This cause there was a suitable place for spawning types of fishes. In other words, some of these species are only found in Anzali wetland and not seen in other south part of Caspian Sea. 39 species from 49 species of wetland fishes live exclusively in Anzali wetland.

Mammals

Among mammals in this area are forest cat, wild boar, and otter (www.aftab.ir).

Scientific studies

This wetland has been noticed by interior and foreign researches because of its ecological importance. Therefore, hydrologic and geologic studies and identification of pollutants in this wetland were done by Environment Protection Organization, Agricultural Organization, Fishery, FAO, and universities (mainly Tehran University and Tarbiyat Modarres University).

It should be said that Environment Protection Organization has many research stations in Anzali wetland that they monitor water situation of the wetland by physical, chemical, and biological specifications regularly. Also, annual census of aquatic birds is done by Environment Protection Organization.

Japan International Cooperation Organization has also began the project of integrated management of spillway basin of Anzali wetland by participation of Iran. Reports suggest that 30% of marginal factories have not equipped to refining systems yet. From the experts view, equipping industrial factories continues for many years and equipping home and industrial wastes to refining systems has commenced. The most important effect of Anzali wetland is weather moderation. It is also a suitable place for spawning of fishes and birds. Its east section has a critical situation because of pollution and its west part has a more suitable situation because of more deep. Its central part suffers from ecological-environmental dangers because of traffic of motor boats.

Although self-purification is done in the wetland because of existence of aquatic plants, but it is not enough to prevent its pollution. Now, hydrologic and hydrobiologic studies are done in this wetland and designs are also afoot. These designs will be executed at rivers' mouths to prevent entering pollutants to the wetland (Wikipedia site).

Disappearing life in Anzali wetland

Anzali wetland is one of the most important part of Caspian ecosystem that plays a critical role in continuity of wild life, supplying sweet water, and preserving living equilibrium. But, inattention to this ecosystem, this wetland is subjected to extinction. Anzali wetland is one of the 10 valuable wetlands of the world. This wetland is located among Sumeh Sara, Rasht, and Bandar-Anzali cities in south shore of Caspian Sea. Agricultural activities around the wetland are from the factors of its extinction. Also, growth of cities and industrial towns without correct location is another source of pollution of the wetland. Growth of Azolla in this wetland is one of the destructive factors. Now, this plant has occupied a vast part of the wetland, and if this is not prevented, it will cover all surface of the wetland during few next years.

This plant has covered surface of the wetland with thickness about 10 cm that prevents sun lights to underwater. So, chemical reactions are not take place by phytoplanktons and aquatics do not obtain enough oxygen. Rather than urban wastes, agricultural poisons are also entered to the wetland through drainage. Unfortunately, this wetland has become a place to evacuate waste water and pollutants, so that most wastes and sediments are attracted by this wetland before reaching to the sea.

Anzali wetland is one of the most important wetlands of Caspian Sea margin and is valuable by economical, tourism, ecological, and vocational view (http://www. azolla).

Decrement of depth of Anzali wetland

Transfer of sedimentary materials through entering rivers and deposition of suspended materials is one of the factors for life decrement of this wetland.

Entering a large volume of sediments to this wetland is the most disaster of Anzali international wetland. Spillway basin of Anzali wetland is about 610 km2, and a significant volume of sediments are entered through 27 rivers. Unfortunately, uncontrolled entrance of sediments accelerates decrement of depth of Anzali international wetland, so this should be prevented by practical strategies.

Boat traffic is not possible in all parts of this wetland

Finally, wetlands are converted to forests, and entering excess sediments accelerates this trend. Unfortunately, boat cannot pass in some parts of this wetland, and all institutions should notice this problem. By immunologic studies during recent years, one thousand milliard m2 of different sediments have entered into this international wetland. These sediments decreased its depth from 12 m to 2-3 m. To save this wetland, rehabilitation designs should be executed. Installation of sediment traps at the mouths of entered rivers, dredging it upon scientific methods, and gathering aquatic plants including Azolla and reed are from those important actions for its rehabilitation. 70 million ton sediments enter to this wetland annually. This sediment has a high function, and can be used for pottery and hotbeds. Anzali wetland acts as a final point for upstream rivers, and prevents flood and land movement in the area. If this wetland dries, not only life area

of birds and fishes is in danger, but lives of local people also are affected (www.aftab.ir).

Integrated design of urban management to preserve Anzali wetland

Because of existence of Anzali wetland beside of Bandar Anzali city, this city is selected for integrate design of urban management by World Bank. By organizing Anzali wetland, fulfillment of urban waste waters of Rasht and Bandar Anzali cities, and executing development designs according to ecological affairs, extinction of this wetland can be prevented. Unsuitable design of bridges and short interval of columns can produce problems for environment of the wetland (http://eprquds.blogfa.com).

Ecological management project of Anzali wetland

Following developmental studies in Anzali wetland (2003-2005) which led to codifying wetland integrated desing, project of ecological management of Anzali wetland will be executed from middle of 2007 up to two years. This project will concentrate on providing required mechanism to execute the integrated design. By doing this project we expect to:

1. Provide a substantial structure for wetland integrated management,
2. Determine monitoring style of the wetland,
3. Partitioning the wetland to regions and providing designs for management strategies for each region regarding to its social, economic, and ecological situation,
4. Developing fundamentals of ecological trainings,
5. Developing required fundamentals and substructures for tourism industry.

Conclusion

Among different options of world tourism, ecotourism is from planning options because of its respect to environment protection, respect to local societies, and respect to local culture. Experts know ecotourism as the best solution to protect nature, because ecotourism provides suitable base to obey international rules from on hand, and increases public knowledge from the other hand. But what is important is that ecotourism should be offered as an industry and a source to protect nature and income-making (Hemmati, 2004, p 4).

Anzali wetland is located about 40 km from north of Rasht and in south-west of Bandar Anzali town and Caspian Sea. Extent of this wetland reaches to 120 km2 because of precipitation, and diminishes to about 80 km2 during summer and autumn. This wetland acts as a refinery for entering rivers that go to Caspian Sea. This wetland has a exotic ecosystem with more than 100 species of birds, 50 species of fishes, hundreds species of plants, animals, and microscopic creatures. This wetland is now subjected to a great crisis because of excess inattention. This wetland receives various kinds of organic materials through entering rivers. This wetland is subjected to extinction as a result of industrial and urban wastes, excavation of waste water from farms, and entering large amount of sediments.

Each society adopts some strategies to undertake its ecological goals like decrement of air pollution, etc including ordering rules and ethical encouragement, which each one is various by its culture and knowledge. What caused Iran's society not to achieve its ecological goals is lack of expertise view and lack of adopting policies based on stable development in executive affairs. I wish we wouldn't look everything from its mere economical view. I wish stable development was not merely a word in managerial sessions. I wish we remember this sphere requires our powerful hand to be saved. Our obligation to posterity is a human ethics and we are responsible against this celestial custody (Ghazvini & Nazari, 2008, p 4).

Practical strategies of stable ecotourism

The following proposals can help us to develop stable ecotourism:

1. Increment of international cooperation, foreign investment, cooperation with private and public sections.
2. Providing training programs to encourage people to participate in ecotourism, and develop tourism and protect nature.
3. Providing technical helps for developing countries to develop and invest stable ecotourism and native tourism and providing necessary motive for individuals and groups in this section.
4. Help to host societies to organize visits to maximize their profit and meanwhile minimize negative effects to environment and native culture.

5. Improvement of life diversity, economical activities, etc including information access and participate to create this information (Jaber, 2006, p 4).

Offered strategies

To determine different usages of Anzali wetland, the following point should be noted:

1. Ecological talents and protection of plants, birds, and wild life.
2. Gathering aquatic plants such as Azolla and reed. Azolla is gathered by mechanical methods. An innovator juvenile invented an instrument that can gather Azolla mechanically. This design, which is at its end stages, is an effective strategy to control wetland Azolla (Wikepedia).
3. Executing rehabilitation designs, installing sediment traps.
4. Dredging the wetland upon scientific methods.
5. Its sediments can be used for pottery and hotbeds.
6. Controlling marginal industries, warning to pollutant industries, and cooperation with scientific-research centers.
7. Organizing urban waste waters of Rasht and Bandar Anzali and noticing to ecological affairs.
8. Noticing to unsuitable design of bridge and its short interval of columns.

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