



Identification of criteria and priority measurement of marine tourism compatibility using analytic hierarchy process

Reza Emaeilpour^{1,*}, Adel Azar², Kambiz Jahanbani³

¹Department Management, University of Guilan, Rasht, Iran

²School of Management & Economics, Tarbiat Modares University, Tehran, Iran

³Rahbord Shomal University, Rasht, Iran

ARTICLE INFO

Article history:

Received 28 March 2016

Received in revised form

30 May 2016

Accepted 30 May 2016

Keywords:

Marine tourism

Delphi

Analytic hierarchy process

ABSTRACT

The purpose of this study is to compare conventional types of marine tourism in the world and Guilan province in Iran which are observed in six parts. In terms of consistency and rhythmic with the Caspian sea in Guilan province and economic conditions, political, social, cultural and environmental of Guilan province with prioritizing six types of marine tourism in Guilan province. The research method according to the type of purpose practical and by according to the type of method descriptive-analytical and based on collecting information is survey. For this purpose, criteria and sub-criteria compared to using the Delphi technique by specialists and experts of this field in form of seven key criteria including: 1. Infrastructure 2.Economic3.The political and legal 4.Social and Cultural 5.The facilities and natural services 6.environmental and geography 7.Market as well as thirty onesub- criteria were identified and determined. Then, by comparing the following binarysub-criteria and the main criteria to rank each using six types of marine tourism using the Analytic Hierarchy Process (AHP) were implemented in terms of consistency and rhythmic with the Caspian Sea and Gilan province conditions. After calculating the superior and the most consistent type of marine tourism with Gilan province, marine tourism with small recreational vessels was determined.

© 2016 IASE Publisher. All rights reserved.

1. Introduction

Tourism is one of the greatest and the most diverse industry of the world and its quick growth has resulted in many social, economic and environmental changes and important role to encourage investing in infrastructure, earning income for the government and creating direct and indirect jobs throughout the world. However, tourism has economic, social, cultural, ecology functions and positive and negative consequence that must be considered in whole of programing process in order to stop spreading its negative effects as much as possible (Pearce, 1981).

Regarding single-production the country's economy and unemployment problems and incompatibility of the current economic structures with training structures and also planners' emphasis on the income resulted from other resources instead of utter reliance on oil export, necessity of developing economic activity in different out line like tourism industry with the goal to achieve stable

foreign exchange resources and occupation and health is considered an unavoidable matter.

Societies' awareness in addition to make tourism provide a very appropriate and significant foreign resource for the country's economy, caused tourism to be considered a very widespread conceptual in different economic, social and cultural dimension and to be known as an industry.

Today, tourism development in all area is whether nationally or locally or internationally has been considered by governmental programmers and private companies. Most of countries have increasingly found this truth that for their economic condition recovery must innovate and attempt to find to new ways.

Now a days, different countries all over the world have drastic competition seeking to catch new and wider markets, and marine tourism with due attention to creating facilities in countries that have marine borders, achieve its own real place. Many countries provide essential infrastructure for marine tourists' arrival. Iran in terms of tourism natural resources is considered one of the first-five countries in the world and concerning its historical and cultural attraction and natural attractions enjoys

* Corresponding Author.

Email Address: esmaeilpour@guilan.ac.ir (R. Emaeilpour)

special place to absorb domestic and foreign tourists that one of Iran's natural attraction is the sea. The Caspian Sea, Persian Gulf and Oman Sea are 3 marine points to be taken into account and few countries have such natural facilities. As respects to benefits available, we have not been able to use tourism industry favorably and have nothing to say in this field. Officials have neglected marine tourism during the past years. Although some movements have been conducted to develop tourism industry, but, marine tourism's ration was insignificant in this section and there are some problems in this section have that this industry is welcomed less.

Commercial free zones with having capability to increase exports, employment, foreign investment and domestic and foreign tourist's absorption can prepare a suitable way for the country's economy and also economic, political, social structure and the regulation governs them can prepare suitable way for the country's economy. Thus, tourism in free zones plays an important role in manner of programing and proportional decisions-making with capability these areas. In other word, although it's initial nature and original genesis of these areas have been formed based economists, but investing in infra structures and utilizing potential powers of the region to develop tourism enjoys particular importance.

The Caspian sea existence in north of Iran in Guilan's neighborhood and locating seashores beside mountains, jungle and lagoon enjoyment of mild climate and flowing movement has provide a very beautiful and attractive situation for foreign tourists and national tourist and has provided a very good situation to access the sea and millions of passenger travel to the area from different cities. But, what is more considered is coastal tourism. Lack of facilities and services required for marine recreation and lack of planners' attention tourism resulted not to develop marine tourism despite appropriate access to the sea.

Particularly, Guilan as respects to the advantages that the sea has brought for it failed to utilize tourism industry and has nothing to say in this connection. Although several movements have been accomplished to develop tourism industry, but, because of authorities' attention to marine tourism, it is insignificant and existence of very many problems in this issue caused marine tourism to be welcomed less (Latifian and Molavi, 2015).

Lack of decision-making, selection strategy and prioritization based on specialized studies and field studies, in different types of marine tourism appropriate with the area, and lack of decision-makers' acquaintance with a variety of the most important factors of lack of boom and welcome of marine tourism by investors and tourists.

In this paper, based on the conventional types of marine tourism in the world, has attempted to compare all types of marine tourism research to prioritize compatibility and harmonious with economic, political, social, cultural and environmental conditions Guilan in order to

choosing appropriate type of marine tourism with the Caspian sea in Guilan province results marine tourism development and investors' success and boom in this section by relevant individuals in state and private sectors.

1.1. Research background

In Kenchington (1993) an outline were presented concerning development of recreational activities in the field of tourism in coastal and marine environments. In this paper, the relationship between environmental conditions and human impacts has been identified respecting free time or tourism and prove that environmental interest and all coastal and shallow section of the sea and resources management should be done based on the strategic multiple usage in long-term.

Saharuddin (2001) addressed three major issues: first, existence of the National Ocean Policy in the place, secondly, the role of marine sections in achieving the objectives, thirdly, the opportunities available for the ocean's development, and after the review sets forth, it is seen that the policies available to administer oceans' development have not been comprehensively considered.

Moreover, organizational structure Ruling Ocean to implement national policy separately and is done with inconsistent ways. As a result will be creates problems sectorial management and multifaceted intersect oral interference. In addition, environmental problems were not noted properly. In the article a few opportunities have been identified for further development of marine areas in Malaysia such as marine tourism.

Kelly et al. (2012) suggested some new framework to assess contribution based on anecdotes and index and indicates this method's efficiency through three casual studies from centralized contribution on marine tourism based on nature. From the perspective of this study, to provide integrated coastal management including marine environmental planning is important direct relationship with responsible organizations and institutions.

Qanir (1989) addressed general characteristics of the coastline of Morocco in connection with tourism activities in the role of recreational ports in developing these activities as well as comments on the available plan for the new dock in Morocco.

In Iran, meanwhile Latifian and Molavi (2015) have attempted to introduce marine tourism industry and its challenges as respects the importance of marine tourism industry for development of Guilan, they have studied importance of development of Guilan.

Khatami Firoozabadi et al. (2012) have studied as regards reviewing and determining the rank of Chabahar's beaches in comparison with Kish and Qeshm's beaches to coastal tourism using AHP method. In this article the efforts are on comparing and determining the rank of Chabahar's beaches in terms of attractions and facilities available in coastal

tourism in comparison with its two competitor areas Qeshm and Kish. For this purpose, the comparison criteria are determined and then they are inserted in format of four main criteria: coastal waters, beach, arena of boundary and the bank that is the same tourism areas. Rating these places was done in terms of charm and finally with pair-comparison of the infra-criteria and the main criteria of each three cities Chabahar, Kish and Qeshm using Analysis Hierarchy Process (AHP) their potential to attract tourist. After calculation the rank of Chabahar's beaches was specified in terms of charm and potential coastal tourism in each the quad-coastal areas and totally achieved the third rank. At the end, to develop and improve the rank of Chabahar's coasts in each coastal area and as result some solutions have been offered to increase absorption of coastal tourist.

According to the investigations and searches conducted in Iran and other countries, no specific and particular study has been done regarding variety of marine tourism and its compatibility rate and surrounding area. In the present research meanwhile determining the compatibility rate of various marine tourism with marine condition of the Caspian Sea in Guilan province, introduces various types of marine tourism which are popular in the world. This research surveys determining the indexes using the Delphi technique and the method of the Analytical Hierarchy Process (AHP) to measure the compatibility rate of marine tourism used with Guilan province condition. Therefore, the present article is considered a new research that it meanwhile can help recognize marine tourism results lead, development and boom in this profitable industry in Gilan province as well as other northern provinces adjacent to the Caspian Sea.

2. Definitions and reform

2.1. Marine tourism

Marine tourism is said to the complex of recreational and entertainment activities done by tourists in marine environments and offshore. This type of tourism is different from coastal tourism in terms of the importance, though there have been many similarities between this type of tourism and coastal tourism, but the type of recreational activities in marine tourism are conducted more in deep waters far from land and it requires special equipment and facilities and training and encounters greater risks. The activities related to swimming on beaches and entertainment carried out within the area of beaches called beach tourism. The types of popular marine tourism in the world that are classified into six type (Siegelbaum, 2005):

1. Cruise Ships
2. Passenger ship
3. Pleasure vessels- Marina
4. Recreational fishing Boat
5. Kayaking
6. Jet Ski /Windsurfing

2.2. Cruise ships

Cruise ship (Fig. 1) is a travelling ship used for pleasure trips. Exploiting there creation and amusement facilities of the ship experienced during a stay on a ship such as a restaurant and sometimes cinema and a swimming pool. Arrival and departure to the port as destination is not the main objective, but stay on the ship as a hotel and a leisure tour with a visit of one or several ports during the 48 hours tour on a ship with a minimum length of stay is the main goal. Besides, these types of ships can only be used to carry passengers.



Fig. 1: Cruise ships

2.3. Passenger ships

Passenger ship is a commercial ship that its main function is, carrying more than 12 passengers. Passenger ships usually are active in certain and specified directions in domestic or international waters.

Implicitly, passenger ships own two main features. First, it has a suitable and standard atmosphere and design correspond to the requirements of Solos agreement, and secondly, the main user is a passenger ship. However, it may carry some loads or cars in some cases. Some passenger ships which enjoy the minimal conditions and necessary facilities can be exploited as recreational vessels (Fig. 2).



Fig. 2: Passenger ships

2.4. Pleasure vessels- marina

Pleasure vessels is used for pleasure purposes and partly for sports and some for short distances and normally there is commercial purposes and for recreation or sport privately which are exploited by recreational vessels management companies for the public use or by the owner or the family of the vessel's owner (Fig. 3).

2.5. Recreational fishing Boat

Small vessels are used for recreational-fishing and also sport-fishing. Fishing is done for pleasure or a competition. Since, this type of fishing is not to

make a living is different from a commercial fishing and usually is done by bars and hooks (Fig. 4).



Fig. 3: Pleasure vessels- Marina



Fig. 4: Recreational fishing Boat

2.6. Kayaking

It is the recreation or exercise done by boats Kayak. Kayaks are light, slim boats with little room to sit. This boat has a small open space for boatman to sit. Single Kayak, double kayak and quad-kayak are the most common types. High kayak, maximum length of the boat is 520 cm and the minimum weight of a single Kayak is 12 kg (Fig. 5).



Fig. 5: Kayaking

2.7. Jet Ski /windsurfing

Windsurfing

This sport is combination of wave surfing and windsurfing which is done by using sail board. This sport uses a special board that has 2 to 4 meters long and athlete will move due to wind power on the sail that is placed on board. Unlike surfing, windsurfing does not need long wave (Fig. 6).

Jet Ski

Jet Ski is a trademarked name which is for "Water Engine" product of Kawasaki Motors Corp. but nowadays term of Jet Ski turns to a public name for all types of "Water Engine". Jet Ski is a mixture of water skiing and a high-speed boat which actually acts similar to a motorcycle in operation. Just like motorcycles, the speed of Jet Ski is controlled with a lever on the steering wheel. Jet Ski has significantly expanded marine tourism. Popularity of the device, the possibility of renting and buying it easily, simple access, the possibility of using it in different waters and its quick tutorial will increase its popularity at all over the world (Fig. 7).



Fig. 6: Windsurfing



Fig. 7: Jet Ski

3. Recreational port complex- Marina

Marina is Spanish word which refers to beach. Actually Marina was a pond to small recreational vessels berthing which has a major difference with port that is berthing place for large passenger and commercial vessels. Marina contains ponds for small recreational vessels berthing and it's a tourism and recreational complex. It has necessary infrastructure for recreational vessels berthing including fixed mooring pier or float - sloping platform- Safe waterways and dredged and also service sector. Recreational port complex can cover recreational fishing vessels in addition to small recreational vessels. Also it has the ability of providing services for Jet Ski and windsurfing equipment (Fig. 8).



Fig. 8: Marina

4. Methodology

Methodology is applicable based on type of goal and is descriptive and analytical based on method and is a survey research in term of collecting information. For this purpose research is done in two parts. At first part the most effective criteria and sub-criteria of decision-making were identify and determine by using Delphi technique and then in second part ranking every six types of marine tourism was performed by using Analytic Hierarchy Process (AHP) in terms of consistency and harmonized with the Caspian sea and qualification of Guilan province by pair-comparing the sub-criteria and the main criteria.

The first part: Delphi technique was used to identify and determine the most effective criteria for compatibility and the success of all types of marine tourism. Delphi technique was first designed and developed in 1950 by Rand Company in the military

defense project and was known as an important scientific method from the mid-1960s. Using this technique, was done with the participation and consensus of a group of 30 experts and elites of related field who has knowledge and experience in the subject, and also occasionally have been in the positions of decision making with a systematic method during the seven rounds as a process, systematic and written and voting by questionnaire and using a Likert scale.

Eventually after reviewing the criteria and sub-criteria, factor affecting the compatibility of marine tourism with Gilan province was under decision and adopted in seven main criteria and 31 sub- criteria and was classified as Table 1.

The second part: Analytical Hierarchy Process is one of the most famous multi-functional decision making techniques which is invented and used in 1970. This method will be used when decision-making is facing some competitors-options and decision-criteria. Analytical Hierarchy Process enables the simultaneously combination of qualitative criteria along with quantitative criteria.

Basis of Analytical Hierarchy Process is on pair-comparisons or binary alternatives and decision making. At the beginning of the process hierarchical tree was drawn. Hierarchical tree has three main levels target, criteria and alternatives that its criteria level can be divided into multiple sub-criteria.

According to definition of target, criteria and alternatives in three levels of target, criteria and alternatives Fig. 9 of hierarchical tree was drawn.

Then to collect data, sub-criteria and alternatives of 38 data collection questionnaire was designed as a table, according to objective criteria. In this questionnaire the number of questions is designed in accordance with the number of criteria and is used as pair-comparison of criteria based on the hourly 9 scale ranging, that is a scientific acceptable method by many researchers.

This questionnaire has a logical and content validity to determine the relative weights of variables. Since all decision factors are considered in questionnaire and are compared with each other so all probability associated with ignoring a variable will be eliminated.

Table 1: Grouping criterion and under the criteria

No.	Criterion	No.	Under The Criteria
1	Infrastructures	1-1	Existence of waterfront
		1-2	Construction industry and inside floating production
		1-3	Proper access
		1-4	Level of development
		1-5	The possibility of development
2	Economic	2-1	Job creation
		2-2	Banking facilities and government funding
		2-3	Amount of initial investment of the private sector
		2-4	Amount of tourism spending
		2-5	Private investor monetization
		2-6	Government monetization
		2-7	Monetization logistics and service sectors
3	Political and Legal	3-1	Existence of policies, laws and regulations
		3-2	Welcomed private investment
		3-3	Welcomed government departments
		3-4	Advantages of Free Zone
		3-5	Specific location and strategic importance
4	Cultural and social	4-1	Alignment with the values of society
		4-2	Social participation and acceptance of people
		4-3	Public Welcomed to use that type of marine tourism
5	Facilities and services	5-1	Existence of Services tourists and travelers
		5-2	Existence of maintenance and logistical services
		5-3	Existence of maritime and port services
6	Natural and Ecological and Geographical	6-1	Weather conditions
		6-2	Amount of air and water pollution
		6-3	The suitability of Sea conditions for the type of tourism
		6-4	Possibility advantage of it over the years
7	Market	7-1	Market size
		7-2	Market growth
		7-3	Amount of Demand
		7-4	Ability to attract tourists

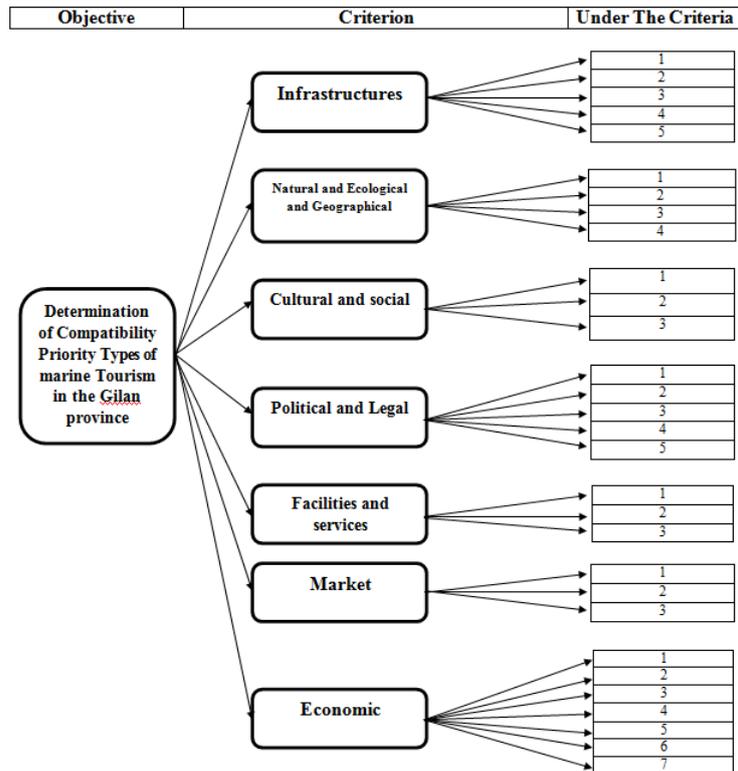


Fig. 9: Hierarchical tree

On the other hand as the questionnaire evaluates and compares all binary criteria, so maximum possible questions with a desired structure will be asked from audience and measures are being considered in this assessment. Then pair-comparisons questionnaire were distributed between 8 people who were selected as deliberately, classified and with quotas (random selection of people was strictly avoided) selected experts were asked to give points to each question between the numbers 1 to 9 according to the range of 9 degree L hour of 9-1 scales. That score of 1 indicate the same importance (Superior) of two elements and 9 score indicates much more importance (Superior) of an element compare with another. The importance of numbers 1- 9 are presented at the following in binary comparisons.

After answering the questionnaire by selected individuals, set of completed questionnaire, in which importance of each criterion compared to other criteria and of each sub criteria compared to other sub criteria and also amount of importance and influence of each sub criteria compared to six marine tourisms that were determined by experts, were

collected. In these eight sets of questionnaires importance of each the criteria compared to other criteria and each sub criteria compared to other sub criteria and also amount of importance and influence of each sub criteria compared to six marine tourisms that were determined by experts. Then, by using the geometric mean of questionnaires, criteria pair-comparison matrix and different sub criteria and pair-comparison matrix of options were established based on the sub criteria.

5. Using the expert choice software

At first the goal, criteria, sub criteria and alternatives were entered at the software then all binary comparison matrices were transferred to expert choice software.

by doing pair-comparisons and calculating the rate of incompatibility and finally the options final weigh, The software obtains final weight as the box ranking the options such that is in Figs. 10 to 16, that here small recreational vessels option-Marina is at the first priority. Total inconsistency rate achieved is 0.06 that is shown at the top of chart.

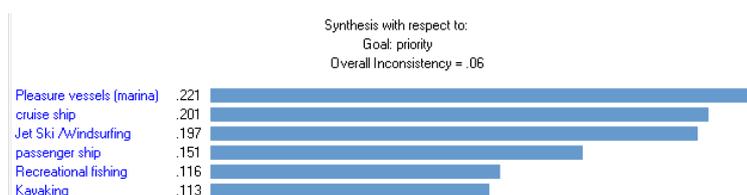


Fig. 10: Prioritize options than general purpose Types of marine tourism

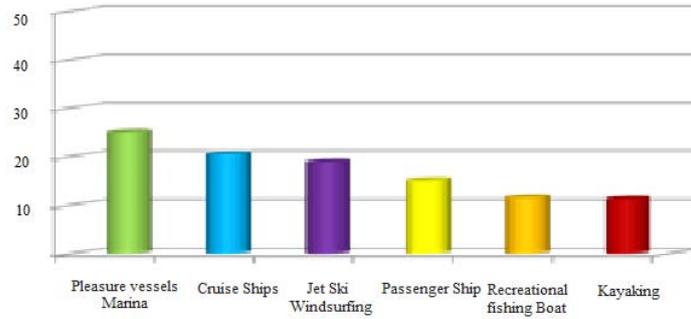


Fig. 11: Graphs of weighted Amount of compatibility

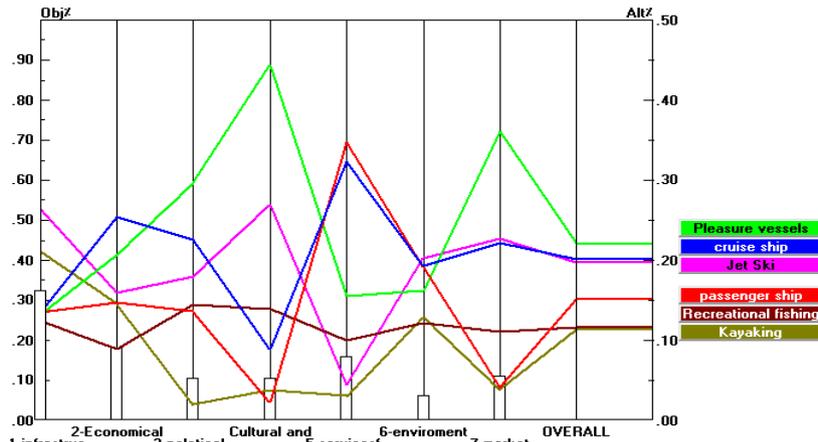


Fig. 12: Graphs of performance sensitivity all criteria

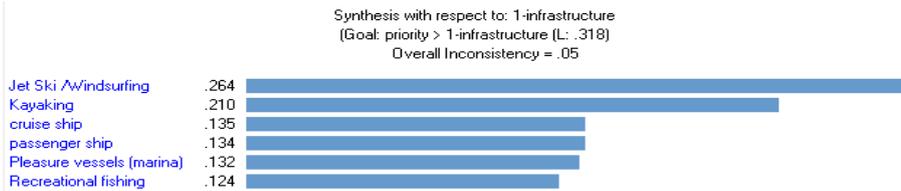


Fig. 13: Prioritize Types of marine tourism options than the standard infrastructure

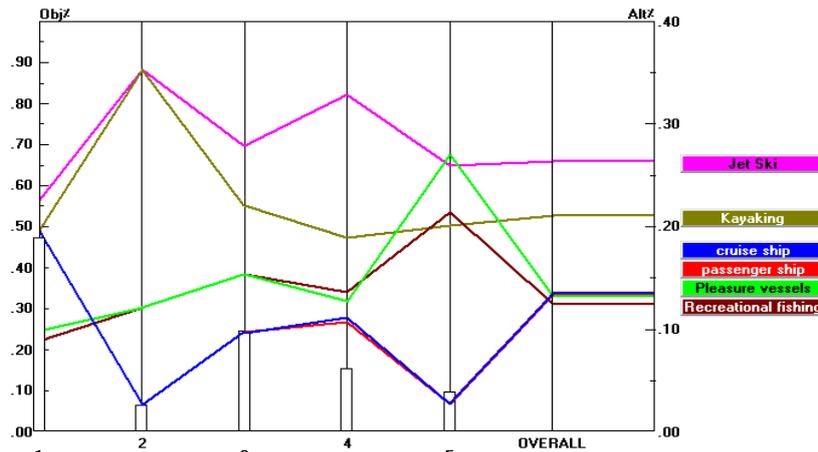


Fig. 14: Graphs sensitivity According to criteria of infrastructure performance

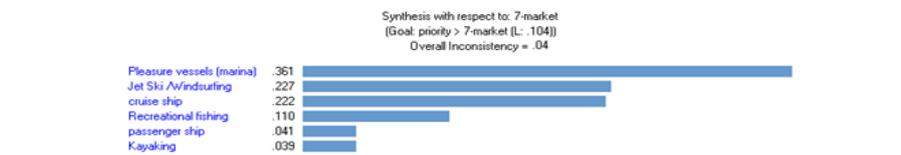


Fig. 15: Prioritize options types of marine tourism than the criteria of market

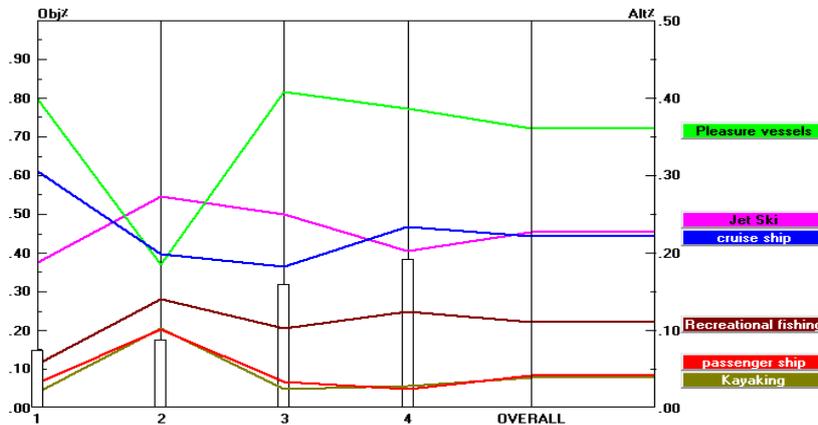


Fig. 16: Graphs performance sensitivity according to criteria of market

6. Discussion and conclusion

According to research conducted, the final weights of alternatives obtained compared to setting priorities for compatibility of all types of marine tourism with Guilan province indicate that most compatible option is tourism with small and family recreational vessels and respectively the next priorities are marine tourism with cruise ships, Jet skiing and windsurfing, passenger ships, recreational fishing boats, and boating.

Moreover, as a sample, in prioritizing options of all types of marine tourism compared to Fig. 13 infrastructure criteria, the final weight of jet skiing and surfing, boating, small recreational vessels, passenger and cruise ships are almost measured by same weight and then small recreational vessels, because it does not required a serious infrastructure to be created and developed for jet ski and windsurfing and boating. These two options have the highest weight respectively. In association with recreational and commercial vessels because of the good infrastructure and facilities such as equipped and advanced passenger terminal and exclusive waterfront, they placed at the next ranking. But due to lack of proper infrastructure small recreational vessels has lowest weights compared to the infrastructure criteria. Research shows that in prioritize options compare to other criteria; small recreational vessels are always at the top of category. For example compared to the market benchmark of Fig. 15, compatibility priority have been determined respectively as small recreational vessels, Jet skiing and windsurfing, cruise ships, recreational fishing vessels, passenger ships and sailing. As in this research was obtained, marine tourism of small recreational vessels type is the most compatible type of marine tourism with having economic, political, social and cultural conditions of the southern Caspian sea and Guilan province that the existence of recreation port complex is one of the main infrastructures to create and boom this principle. As already mentioned, recreation port complex can also cover recreational fishing vessels in addition to small recreational vessels. I also have the ability to provide services to jet skiing and windsurfing equipment. In the most of world's

countries this type of tourism is important and it is of one the main earnings. But our country is deprived this advantage for many reasons including lack of knowledge and specialized knowledge of marine tourism. But fortunately mods and phases required to build, organize and exploit of recreational complexes ports (Marina) approximately exist in the ports Guilan province potentially. That requires preparation of a comprehensive plan for the construction and development of recreational port complex in Guilan through studies and exploratory research by professional research teams to identify and determine the steps required for positioning, planning, constructing, organizing and exploiting recreational port complexes (Marina) in Guilan province and then explain and design for each detected phase of frame work and required features.

References

- Kelly C, Essex S and Glegg G (2012). Reflective practice for marine planning: A case study of marine nature-based tourism partnerships. *Marine Policy*, 36(3): 769-781.
- Kenchington R (1993). Tourism in coastal and marine environments—a recreational perspective. *Ocean and Coastal Management*, 19(1): 1-16.
- Khatami Firoozabadi Askaripoor A and Bakhshandeh (2012). To determine the rankings compared to the shores of Kish and Qeshm, Chabahar coast to coastal tourism by using AHP. The 1st National Conference on the Development of Makran Coast and the Maritime Authority of Iran, Tehran.
- Latifian A and Molavi H (2015). The importance of marine tourism industry in the development of Gilan. 1st Conference in Management and Entrepreneurship in the Economic Conditions of Resistance, Tehran, Iran.
- Pearce DG (1981). *Tourist development*. Longman Group Limited, London, England.
- Qanir A (1989). Planning of marina developments along the Moroccan coastline. *Ocean and Shoreline Management*, 12(5-6): 561-570.

Saharuddin AH (2001). National ocean policy—new opportunities for Malaysian ocean development. *Marine Policy*, 25(6): 427-436.

Siegelbaum H (2005). Marine tourism best management practices: a practical guide for Puget

Sound. Washington Sea Grant Program, Seattle. (Available online at: http://dfwwbolyhq01.dfw.wa.gov/viewing/responsible/pps_marine_tourism_best_practices.pdf).