

Strategic Management of Anzali Wetland using Integration of the SWOT Analysis with Ecotourism evaluation using Geographical Information System, GIS and TCI modes

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Abstract

Wetlands are one of the most important environmental sources in the world which are always faces with damage and threaten factor dangers. Although wetlands in their evolutionary context becomes dry and free from water, but human activities can accelerate it and face it with Premature Death. This study was performed in 20013 to detect and analyze threaten factors of Anzali wetland. This wetland is located in the southern part of the Caspian Sea in the Gilan province.

This study was an attempt to use GIS to consider and analyze temporal and spatial distribution of Climate Comfort Index for Tourism in the international wetland Anzali based on TCI model. In addition to determining the right time for presence of tourists in the wetland, risk factors and their impact according to local conditions and tourism impact on living conditions (designated endangered species) in the Anzali wetland were identified. In order to achieve a favorable or better condition during the presence of tourists, the most important threatened factors in this region were identify and prioritize using AHP, SAW and EFMEA models. In this study threaten factors in the Anzali wetland were identified. At the end the most important strategic recommendations were prioritized using AHP model.

In this research, data analysis and presenting strategic program for strengthening ecotourism was performed based on SWOT method. SWOT method is a tool to detect threatens and opportunities in external environment of a system and rrecognizing internal parameters (strengths and weaknesses) in order to assess the situation and develop a strategy to guide and control system. This method (SWOT) is a direct result of the Harvard Business School model. In fact, this is the best strategy for organizations.

Analytical Hierarchy Process is proposed as one of the most comprehensive systems and is designed for multi-criteria decision analysis based on fuzzy brain for complex problems. This

technique makes it possible to formulate the problem into a hierarchy and also it is Possible to consider various quantitative and qualitative criteria in the problem. This process involves various options in the decision-making and makes it possible to sensitively analyze the criteria and sub criteria. In addition, it is based on paired comparisons which facilitate the judgment and computation. Also it shows the degree of compatibility and incompatibility of decision which is one of the advantages of multi-criteria decision technique.

In order to study comfortable climate index tourism, based on the model TCI, firstly Climate data for the seven parameters (mean maximum daily temperature, mean daily temperature, minimum daily humidity, average daily relative humidity, rainfall, total sunshine hours and mean wind speed) was required which were extracted monthly from synoptic and climatology stations and they converted based on TCI model to provide maps of distribution parameter for each month of the year. Finally maps were combined in GIS media based on the relationship of $TCI = 2(4CID + CIA + 2P + 2S + W)$ since distribution maps for TCI index for each month was prepared.

This study aimed to determine the most appropriate tourism atmospheric profile (maximum amount of annual rainfall in the winter and maximum humidity in summer) were used.

In this research, seven climatic parameters were extracted monthly from 4 synoptic stations (Astara, Rodbar Rasht and Anzali) during 18 years from 1987 to 2005 and considered using GIS. Data were converted based on TCI model and by combining maps in the GIS media; distribution index of TCI for 12 months was prepared. According to comfortable climate index for tourism it is revealed that tourism climate condition in the months of April, May, June, July, August, September and October is good, excellent and favorable, respectively. In the months of October, November, December, January and February the condition is unfavorable from tourism point of view and it is not recommended to persuade tourists to visit the area.

Anzali wetland were assessed from physico-chemocal, biological, economocal and sociological aspect, prior to present recommendation for attract tourists to the area. According to strenghten and weakness points as internal parameters, and threaten and opprtunities as external parameters, the strategy of wetland was detected. According to the Space matrix of extracted from SWOT results, the present strategy of Anzali wetland is defencence strategy. Hence any precipitous action without a considered program in the area of wetland can cause serious problem.

Tables relevant to strengths and weaknesses as internal factors consisted of 2.97 strengths and 3.3 weakness points, while tables relevant to opportunities and threaten as external factors consisted of 3.09 opportunities and 3.25 threaten points, showed that sum of threaten and weakness as preventers equal to 6.55 point were higher than sum of strengthen and opportunities as promoters (6.06). The results showed that the wetland is in a defensive position and any precipitous action which would be applied in the area can cause serious problems. This study was performed in 2013 to detect and analyze threaten parameters in Anzali wetland. Risk detection and their ranking were done using AHP method and risk assessment was performed using EFMEA method. Ranking the detected risks and their analysis was done by TOPSIS method.

In this study, the analysis of 15 environmental risks threatening parameters of Anzali wetlands as the options and considering 4 indexes was performed using multi-criteria decision-making methods and SAW. Responsible people will be able to manage the wetland using these methods according to prioritized risk factors,

The results revealed that increasing heavy metals in the wetland due to entering waste water of urban and industrial activities and their development and causes fish mortality is in the first place from risk point of view.

In big cities it is reasonable to lead wastewater to seas or oceans based on relevant standards, but in the Northern provinces of Iran sewage and urban, agricultural and industrial wastewater and leachate are leading to rivers or sea without any serious control. Unfortunately it leads to increasing organic and inorganic pollution levels in the Anzali wetland and the Caspian Sea and consequently increasing their accumulation in sediment and marine animals' body. Agricultural activities, uncontrolled growth of invasive plant, Azolla, trespasses to privacy of wetland, sedimentation and weakness of rules are in second place. Increase pH, reduce BOD₅ and unauthorized hunting are the third and fourth important threaten parameters in the wetland. The parameters relevant to increasing pH and reducing BOD₅ values were in the third level and illegal hunting and increasing nutrition in the wetlands were in the fourth terms of importance. Finally, the pollution generated by tourists and visitors, in the ranked were in the last level.

Reforming environmental laws and legislation stricter laws is one of the most essential factors to protect the environment. Entrance of industrial, urban and agricultural waste water

to the environment without any treatment can shift pollution to water sources. Appropriate legislation could prevent entering further pollution to rivers and wetlands.

Training the responsible of manufactures and local people in order to elevate their knowledge is one of the most effective ways to protect the natural environment. Paying attention to NGOs and providing facilities for these types of activities, in addition to increasing the level of public information, parallel efforts to train or educate tourists and local people may also be possible and it can help to avoid the occurrence of some events such as fire or accumulation of waste in sensitive areas. Economic improvement can help to protect environment.

Keywords: Strategic management, Anzali wetland, GIS, TCI, EFMEA ,TOPSIS و AHP