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Coastal management plan in the south of the Black Sea

Oylum Gökkurt Baki^{1*}, Osman Nuri Ergun², Levent Bat³

¹Environmental Health Department of Vocational School, Sinop University, TR 57000 Akliman Sinop, Turkey

²Environmental Engineering Department, Engineering Faculty, Ondokuz Mayıs University, TR 55139 Kurupelit Samsun, Turkey

³Department of Hydrobiology, Fisheries Faculty, Sinop University, TR 57000 Akliman Sinop, Turkey

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ABSTRACT

Objective: To describe the environmental factors that effect to the shoreline and how they interact with tourism development.

Methods: In the study, both the existing problems of the coastal area of Sinop and the probable solutions to these problems are stated. The system of the coast area of the province was examined with all details and the system was examined in 3 sections, namely anthropogenic components, natural components and tourism components.

Results: Tourism which is also referred as smokeless industry provides a tremendous potential for the coastal cities. This sector is a considerable resource of income for coastal cities, so long as environmental factors are also paid attention. Otherwise, it is a mistake to expect sustainable proceeds from tourism. Coastal management is a dynamic, multi-disciplinary process. It includes a complete cycle such as collecting information, planning and decision making and the monitoring management and application, and revealing the problems for the purpose of ensuring a sustainable tourism.

Conclusions: This study examines the environmental factors that have driven new approaches to shoreline management and how they interact with tourism development. Then, the integrated coastal zone management study procedure and its prospected outcomes are explained, and importance of the findings on Sinop's integrated coastal zone management is emphasized.

1. Introduction

The desire of human beings to escape from the exhaustive urban life at least for certain periods has increased the demand for sea and lake coasts offering great natural beauties. Benefits of fresh air, sun and water to human health have also resulted in the increasing interest in the coasts[1]. Coastal areas where historical values are situated densely along with natural beauties are known to be hosting a substantial part of the tourism activities[2]. Coasts have faced innumerable environmental problems. Tourism influences are a factor with an important part in increase of the problem in coastal zones.

The decisions of planning and implementation regarding the development and usage of the resources in the coastal regions need a broad database revealing many disciplines in technical, socioeconomic and environmental issues and a management

model based on scientific methods[3]. The purpose of planning and protecting the coastal regions should be balanced development of the coasts because the coastlines and coasts are significant resources that would respond increasing recreation of the town dwellers[2,4].

Thus it can be said that coasts are among the natural fortunes as stipulated in article 130 of our constitution[1].

With its nature, history and cultured richness, Sinop is one of the cities of the Black Sea Region of Turkey having the tourism potential. Sinop situated in the middle of the Black Sea Region on the northernmost of Anatolia and the narrowest part of Boztepe Peninsula. The primary condition for the Black Sea to increase its tourism opportunities and to reach a level of acquiring economic income is to provide environmental management to be maximized. According to Clark[5], the coast is a place where a great abundance of life is nurtured and must be conserved in the face of increasing development pressures. It is a place of high priority interest to residents, to commerce, and to tourism. In another study by Hall[6], marine and coastal tourism is one of the fastest areas within the world's largest industry.

Burak *et al.* studied on the effects of urbanization and tourism on

*Corresponding author: Oylum Gökkurt Baki, Environmental Health Department of Vocational School, Sinop University, Turkey.
E-mail: oylumbaki@gmail.com

coastal area[7]. In the study, increasing of urbanization, improper land uses, loss of agricultural lands, the laws related to the issue were briefly specified, and urbanization and population increases for the regions of Mediterranean and Aegean were presented. Palazov and Stanchev discussed the pressures created by tourism based population increase in Bulgaria coasts on natural ecological environment[8]. The research was conducted on the potential dangers on natural and ecological environment; the results showed the increase of population in Bulgaria coasts in the last 5 years. In parallel to the rapid development of tourism and change process in coast areas, the problems and effective management needs are increasing. Jennings indicated that shoreline and coastal zone management and tourism development could be integrated[10]. The quality of the environment may be improved at any stage of the resort cycle and one important issue to emerge from planning initiatives is the point at which resorts will be able to move from an emphasis on protecting the “natural” environment to one where the built environment is the focus of strategic planning[10].

Similarly, Baidal showed that the weakest point of the planning is the consolidation of regional tourism policies[11]. Among the causes of this situation is the difficulty of fitting the various (sectorial, territorial, economic, sociocultural, or environmental) aspects of tourism. The integrated coastal zone management (ICZM) is justified as a tool for managing coastal resources and accommodating increasing pressures from tourism whilst strategies are recommended to ameliorate projected impacts[12]. According to Phillips and House, the present status of beach management is carried out by the lowest level of administration along the Catalan Coast[13]. It was analysed to detect the main problems and priorities. This analysis was undertaken by analysing answers to a questionnaire provided by personnel involved in beach management in 38 municipalities and a coastline of 430 km. They show that the tourism is the main economic activity in the area and current beach management is recreationally oriented.

In the study of Tintore *et al.*, they addressed and integrated an interdisciplinary scientific approach to coastal management and the main message of this work is that a science based interdisciplinary and integral approach is a key issue for sustainable and successful beach management[14].

The studies conducted show that coastal cities lacking infrastructure and long-term management planning will lead to significant environmental problems for the future.

In the Black Sea Region, the problems affecting tourism are those which could influence the region both directly and indirectly. The problems which were encountered in the Black Sea Region and which affected tourism may be listed as follows: marine pollution, improper land use, soil pollution and problems caused by that, urban and industrial air pollution, problems arising from solid waste management, hazardous waste management problems and noise.

Since a developed coastal management policy is not available for the Black Sea, the natural pollutions resulting from recreational and other uses were observed locally along the coastline.

Recreation and tourism are growth industries worldwide, and tourism in many countries is now a significant part of the economy[15], while economic contributions of the coasts are so important; they are of higher importance for Sinop, which has limited economic resources.

The present study reveals the problems and puts forward suggestions on these problems, which is the first time for the city. The coasts with a good management planning in environmental terms will directly bring along an enhancement in the tourism

quality. Moreover, the marine coasts and particularly the areas qualifying as tourism area are included in the scope of planning.

The purpose of the present study is to describe the environmental factors that effect to the shoreline. The initial focus of research has been on environmentally and sustainability of coastal tourism of Sinop Peninsula and the picture of the main problems faced with the Sinop coasts. The long term goals and strategies of ICZM and development strategies of coastal areas were also included.

2. Materials and methods

There are ports constructed afterwards in the region due to small number of bays. Sinop is one of the most significant port cities of the Black Sea and has a privileged coastal of being a natural port[16]. The bearing capacity of the city is exceeded as a result of the population increase along the Black Sea coast of Sinop particularly in summer months. For this reason, the negative effects created by tourism over the years are likely to end up more severely compared to other places. Several investigations were conducted to determine the coastal area problems affecting tourism of Sinop City receiving more and more tourists year by year.

2.1. Overview of tourism potentials of Black Sea coast cities

2.1.1. Study field

Sinop, which is in the agenda of the country today with various energy investment alternatives, is a province that has potential resources in terms of tourism and is quite rich in terms of natural beauties and cultural values (Figure 1). The geographical position, topography of Sinop which is among the provinces with priority for development, its distance to significant markets, insufficiency of capital and technical infrastructure were revealed as the weak aspects in the developments process[17]. The beaches of the province with a length of 175 km have a usage area of approximately 23 km in the internal port location in the south of the province as Sinop recreational coast usage area and a usage area of 17 km in the north, namely in the external port location.

The difference of Sinop from the other coast cities in the Black Sea is not disturbed till the construction of Eastern Black Sea Coastal Highway (Figure 1).

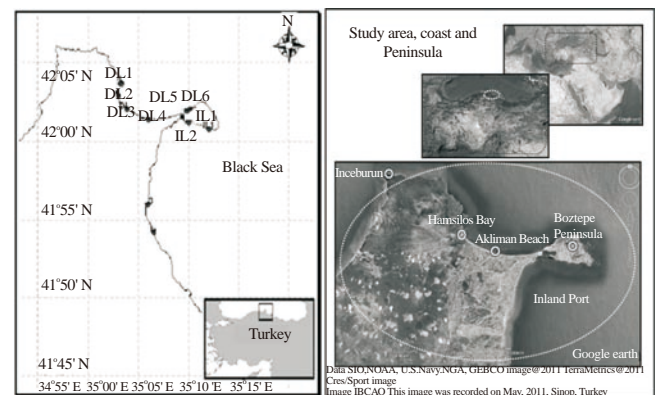


Figure 1. General view of the Black Sea coasts.

2.2. Case study

In the study, first of all, both the existing problems of the coastal area of Sinop and the probable solutions to these problems are stated. The targets of the management specified in the study and the methods were used for the purpose of analyzing and assessing

strategies[18]. Defining the problem and analyzing were done during the process of deciding on an analysis. Afterwards, during the application of method analysis, determining the problem, defining the aims and presenting the results were held[19]. The system of the coast area of the province was examined in all details and the system was examined in 3 sections, namely anthropogenic components, natural components and tourism components.

3. Results

3.1. Existing situation

The tourist profile which increases especially in nature and culture tourism in the last years provides particularly the motion of the Black Sea tourism. Moreover the primary beauties of the province of Sinop which is a coast city of Black Sea are its rich forest cover, long coast in the Black Sea, its natural beaches, its plateaus and recreation spots (Table 1[20] and Figure 2).

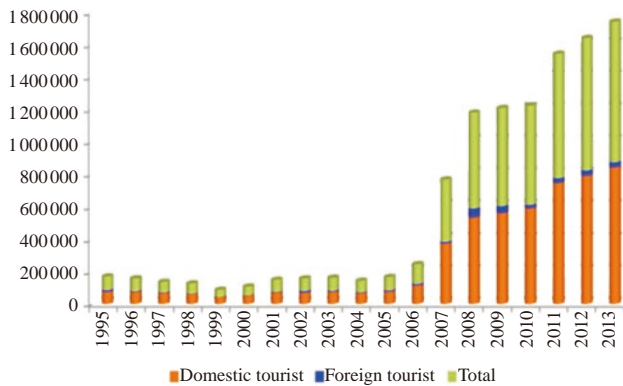


Figure 2. Changing of tourism population of the province of Sinop from 1995 to 2013.

General characteristics of the coasts of the province, tourism usage alternatives (marine and coastal tourism), situation of transport to those regions and average sand band characteristics are given in Table 1 (Figure 1).

Table 1

General characteristics of coasts of the province of Sinop (adapted from TMP[20]).

Station	Transport situation	Geomorphologic characteristics of the coast	Slope situation	Health situation from the coast mean average	Coast plant cover	Coastal band characteristics			Assessment in terms of tourism
						Sand characteristics	Length	Depth	
İnceburun/Aklıman	Difficult	Steep elevations parallel to the coast, natural port characteristics	Much	10	Forest	Gravels with big grains	8-10 m	2 m	Opportunities of benefitting from the sea, picnic areas, yacht tourism
Hamsilos Bay	Easy	Steep elevations parallel to the coast, narrow and steep coast, rocky place			Hurst	None	-	-	Opportunities of benefitting from the sea
Between Aklıman-Sinop (Aklıman Beach)	Easy	Flat topographic structure parallel to the coast	Very few	250	Marshy, bog and brushwood	Sand with thin grains	Much	Much	Opportunities of benefitting from the sea
Boztepe Peninsula and Surroundings	Very easy	Steep elevation from the coast	Too much	5-6	Marshy	None	-	-	-
Between South of Sinop Entry and Samsun	Very easy	Purified elevations between valleys perpendicular and the coast	Very few	50	Marsh and forest	Sand with thin grains, gravels with partially big grains	Much	Much	Opportunities of benefitting from the sea

Table 2

Coastal problems of Sinop Province.

Natural and environmental problems	Economical problems	Physical problems	Social-cultural problems
Pollution of coastal area due to the waste disposal	Decreasing trend of fish resources	Irregular/illegal construction and development	Undeveloped management for the tourism
Discharge of municipal, industrial and agricultural liquid waste to the sea	Lack of supporting industries	Restricted public access to the sea	
Coastal erosion		Lack of suitable land-use plan for coastal zone development	

As shown in Figure 2, tourism potential of Sinop Province increases every year and the bearing capacity of the city is exceeded as a result of the population increase particularly in summer months (Figure 2).

As shown in Table 1, it is easy to access the coastal strip and the sand band feature is convenient for the recreational use. This is the difference for Sinop coasts from other Black Sea coastal cities.

3.2. Threatening factors on tourism

Human oppression on coast regions causes deterioration in the natural structure and resources of the coast[21]. And the most effective solution of this process is creating a good management policy.

The most effective solution of this process is establishing a good management policy, and arranging a planning for this. The current and potential environmental factors on the first 175 km of coastal band of the city are given in Table 2.

3.3. Climate factor

Climatic conditions, sea and coast tourism of coast region of the province of Sinop give opportunity for a two-month tourism season covering July and August. In situations sufficed by climatic conditions the second half of June and first half of September gives opportunity for marine and coastal tourism as well.

Due to the short summer period of the city, various events involved in tourism operations have been set out during the winter months, particularly in the fall period.

3.4. Water pollution and insufficiency of infrastructure

A sea pollution located in the north of the city is created in Sinop which is the most significant city of the Black Sea coast region with its natural beauty. Implementation of deep sea discharge or refinement system in Sinop seems to be the most convenient solution for prevention of coastal pollution. One may list the origins

of water pollution in Sinop as follows: domestic wastewaters, areas without sewerage infrastructure having cesspit which are exposed to flood in excess rains, negative effect of the leachate created by the old solid waste area on the marine environment, waste drainage waters arising from agricultural fields, etc.

Application of deep sea discharge and treatment systems are considered to be the most convenient solution for prevention of pollution into the sea caused by these problems affecting the coastal area in Sinop, and technical efforts are carried on in this respect.

3.5. Second housing development

The second housing development in the province of Sinop is located in the coast region and in general in the neighbouring of the province of Sinop. Some of them were made collectively (by cooperatives or investor companies) and many of them were constructed singly. It is estimated that there are approximately 400 second housings in Sinop in the south section (Internal Port) including those at the stage of construction[22]. Since it was preferred to construct the second housings which were constructed in the areas where there is no existing sewerage system, problem of waste water began to arise in those areas.

In tourism plans, how many tourists will come is taken into account rather than the existing resources and infrastructure facilities, and the plans are prepared accordingly. Nevertheless, the thing to do is to adopt a new planning approach without disregarding the environmental factors.

3.6. Coast erosion

Existence of erosion and filled areas of Sinop is in question. Beach erosion risk is one of the most significant issues for Sinop coastal area. Due to erosion in the area suspended solids are increasing in the coastal marine environment. This load increases in the coastal area through wave effect and the effect of rains. Permission for construction should be received in those areas and measures should be taken against construction of multi flat buildings and traffic and parking intensity in the areas preferred not to be open for traffic in the development plan.

3.7. Studies to determine noise levels on the coast

According to the Europe's Third Environmental Assessment[23] direct and local impact of tourism on the surroundings of holiday resorts and people depends on seasonal density. In this context, the noise pollution resulting from aircrafts, motorcycles (scooter), buses, as well as recreational vehicles like snow-bikes and jet-skis is regarded as a problem that is disturbing, leading to stress, and even causing hearing losses.

Variation of the values attained as a result of the measurements conducted seasonally with LTLutron SL-4001 portable measuring device at different stations in the study area are given by stations in Figure 3.

Although the regulation that has entered into force in our country in 2005 in connection with the directive on evaluation of assessment and management of environmental noise[24] has been fully complied with, the phases of fight against noise, informing the public, preparation of noise maps, and putting the mapping results into action have not been completed yet as per the directive. The values attained for this purpose are available for sharing with

the relevant bodies upon request.

The data attained demonstrated that noise levels particularly at the stations used as beach in the summer rose above 80 dB, which is a noise level that can result in the effects mentioned above. The results show that noise levels reach these values only in the summer. No remarkable problems exist in other seasons. The noise level of particularly the areas where the sea and the forest are nested within each other was observed to be lower compared to other stations.

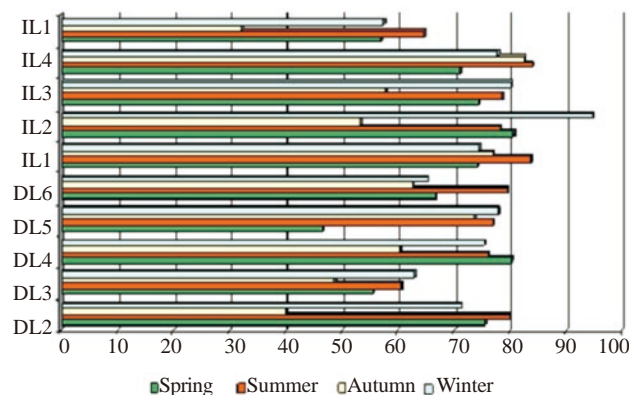


Figure 3. Seasonal noise values coast of Sinop Province.

3.8. The current various uses in the coastal zone

All of short term or long term accommodation places in Sinop have a position of both polluting place and place affected by pollution to some degree.

3.8.1. Tourism and agriculture

Agriculture is in the second rank within touristic motion of the coast region. The areas that may be convenient for agriculture are covered with second housings. Tourism enabled new usages to certain agricultural lands. In addition to this, the farmers who use land for agricultural purposes in the regions close to the coast should be warned and made conscious on the harms of using synthetic manure and agricultural pesticides.

3.8.2. Tourism and forests

Forestry areas in the province are both in city centres and outside. Since forests are attractive for the visitors with their aesthetic and relaxing characteristics, they should be accepted as touristic sources of Sinop. Effects of tourism on forests could be realized indirectly through human intensity, picnic, lighting fire and polluting. In this context the regulations on protection and use of forests should be satisfactory.

3.8.3. Tourism and visual aesthetics

Outdoor aesthetics is the most basic fact for tourism industry and is exposed to many effects. Intense construction in certain regions of the beach, second housings positioned side by side, urbanization and rapid increase of touristic signboards are among negative characteristics. Pollution views that affect visual quality can be seen in many coast points of the province.

3.9. Long term goals objectives and strategies for development of coastal areas

For the city to become a qualified tourism city, sea and coast

pollution must be prevented, natural texture and landscape of the region must be protected, tourism understanding must be diversified such that environmental and cultural activities are covered, waste management efforts are carried out professionally; environment-friendly activities like nature walks must be encouraged, bicycle must be preferred for inner city transportation, hotel personnel must be trained, sufficient information must be provided about natural environment and features of Sinop to foreign and local tour operators in the first place.

Coast management is a dynamic, multi-disciplinary process including a complete cycle such as collecting information, planning, decision making, monitoring management and application, and revealing the problems for the purpose of ensuring a sustainable tourism in line with such information collected from coastal areas.

The main economic objective set for Sinop coastline is the long term success of investment and economic activities. This objective may be achieved only in a context of environmental and social balance. This holistic objective may be defined as sustainable development of coastal areas of Sinop, and requires realization of the

targets summarized below.

This infrastructure need will be resolved and shaped by qualified staff, people with high environmental awareness, and a proper integrated coast planning. In this regard, strategic headings of priority are given in Figure 4.

In this context, combined measures, e.g. protection and development measures, should be generated together.

The required suggested targets are given in Table 3. In this respect, details of the alternatives of protection of water cycle and quality, prevention of misuse of natural resources, the feature of qualified tourism city, and increasing the local production capacity and elevating the welfare level are as given follow:

1. Protection of water cycle and quality. Sewerage solutions must be offered for building constructions; Erecting new buildings without installing water sewerage system and secondary rehabilitation units must be avoided; All kinds of water pollution must be prevented; Separate sewerage projects must be prepared for rain water and waste water; Negative effects of recreational areas on the environment must be reduced – use of the touristic areas must be

Table 3
Solution matrix, guide and tools (modified from WWF[25]).

Main General Principles	Objectives									Tools				
	1	2	3	4	5	6	7	8	9	A	B	C	D	E
1. Avoiding from erecting buildings without infrastructure		*		*			*		*	*	*			*
2. Minimizing water pollution	*	*	*	*	*	*	*	*	*		*	*	*	*
3. Observing environmental changes		*	*	*	*		*					*	*	*
4. Hunting and fishing laws			*	*		*	*				*	*		*
5. Reducing the pressures on the coasts			*	*	*	*	*	*	*	*	*		*	
6. Regulating forest utilization	*	*	*	*	*	*	*	*	*	*	*		*	*
7. Applying EIA to all future projects	*	*	*	*	*	*	*	*	*		*	*	*	*
8. Natural rehabilitation (improvement)	*	*	*			*	*			*		*	*	
9. Solid waste and water treatment plants		*	*	*	*	*	*		*		*	*	*	*
10. Diversifying touristic activities				*	*	*	*	*	*	*			*	
11. Reviving customer profile				*	*	*	*	*	*			*	*	*
12. Tourism and in-service environmental training				*	*	*	*	*	*		*	*	*	*
13. Local economic integrity			*	*	*	*	*	*	*	*		*	*	
14. National tourism opportunities					*	*	*	*	*	*	*	*	*	*
15. Raising environmental awareness of public		*	*		*	*	*	*	*			*	*	*

Objectives: 1. Avoiding harm to expansion and erosion processes of beaches; 2. Protection of natural water resources and their quality; 3. Protection of local biodiversity; 4. Reducing environmental effects of recreational areas; 5. Prevention of misuse of natural resources; 6. Diversification of touristic and economic activities in the region; 7. Strengthening national and international image of Sinop must be as the imaged of qualified place for vacation; 8. Increasing the local production capacity and elevating the welfare level; 9. Minimizing the negative effects on traditional activities. Tools: A. Physical planning; B. General principles and rules; C. Ensuring coordination between the bodies and increasing their local capacities; D. Agreement of action plan; E. Sanctions and surveillance.



Figure 4. Coast Management Strategy Headings required for Sustainable Tourism Activities in the City

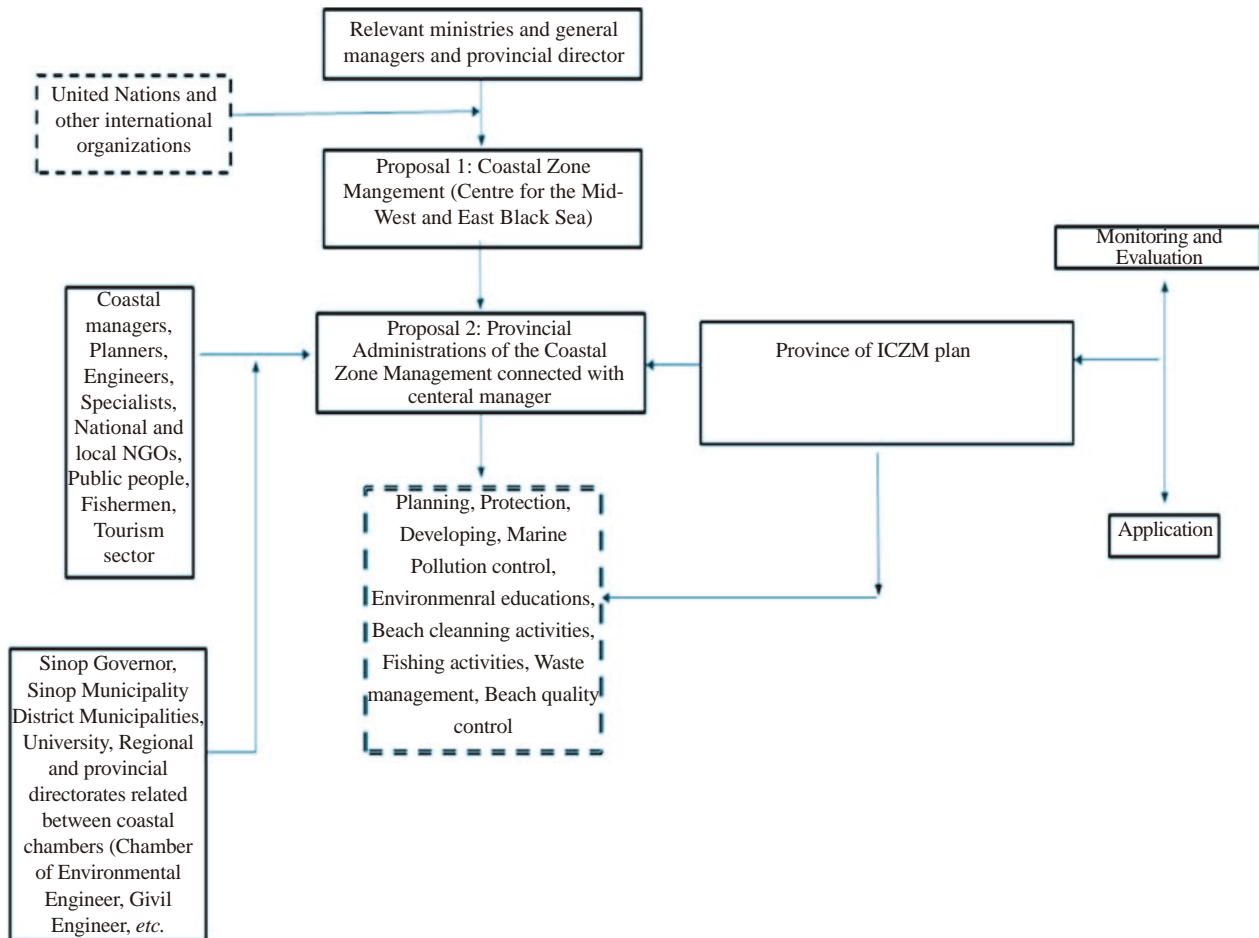


Figure 5. Suggested coastal management organization chart for the study area (modified from Barış[26] and Alparslan & Ortaçşme[9]).

extended; Density of the beaches in the summer must be reduced by organizing recreational activities, offering alternative options to the people with outdoor recreational areas.

2. Prevention of misuse of natural resources. An authority in charge of ensuring coordination between the bodies must be established; Land use of Sinop must be reviewed to eliminate the uses conflicting with each other; Regulations and usage principles must be set for the city; Environmental Impact Assessment must be conducted before putting new construction projects into practice; Long term arrangements must be made for water and solid waste system; The touristic and economic activities in the region must be diversified; Activity opportunities must be created for winter tourism and elder visitors; The touristic activities including outdoor activities must be diversified.

3. The feature of qualified tourism city. Natural texture and landscape of the region must be protected; The tourism understanding must be diversified such that environmental and cultural activities are covered; Water pollution must be prevented; Environment-friendly activities like biking, waste recycling, nature walks must be encouraged, and inner city traffic must be put in order; Information must be provided about the environment to tourists, hotel personnel must be trained; Sufficient information must be provided about natural environment and features of Sinop to foreign and local tour operators; Traditional texture must be presented by giving prominence to local foods, handicrafts and architectural styles.

4. Increasing the local production capacity and elevating the welfare level. People of the region must be prioritized in

employment; Entering the sector of the business like handicraft market, local foods and guidance must be facilitated; Touristic activities outside hotels must be encouraged; Tourism education including foreign language and environment knowledge must be given at vocational schools and particularly preschool educational institutions; Regional agricultural products must be diversified in line with demands of the tourists; Environmental education and activities must be included in the education programme at local state schools.

The suggested chart for the units that must assume responsibility in the management levels with respect to coastal area is given in Figure 5.

4. Discussion

Protection and usage balance should definitely be prioritized in the Black Sea coasts. The province of Sinop and close neighbouring is one province of us with tourism potential due to its coasts and natural beauties. The coasts toward the south of the province of Sinop are such areas available for sea tourism with some very broad and sandy beaches. Infrastructure problems of our province should be solved as soon as possible for the sake of tourism potential of our province.

There is a need for several environmental data that will assess sustainable development and assist in ensuring the coordination to monitor the sustainable development process and develop the planning process. The indicators should allow generating comparable data for the city, namely, they should be guiding not

only for local areas, but also for every field contributing to tourism and having potential^[19].

There are two essential points addressed by the provisions of the Coastal Law and the relevant legislation in our country. They are available for being benefited by people. In line with these views, the legal arrangements are grounded on the width of the coastline, but defining the coastline with a certain length brings about use of that area with availability for being benefited by people. All problems or failures limited to application problems are thought to be solved by complying with the laws and regulations and by planning.

In this regard, the suggestions may be listed as follows in the light of what has been revealed:

1. A study should be conducted to determine natural, ecologic, social, economic and historical features of coastal zones; an inventory should be created.

2. Coastal zone should be redefined as coast, coastline and coast exposure area.

3. Coast, coastline and coast exposure area should be determined locally, and set at a depth varying by variable local features.

4. There is a need for an authentic organization in the coastal regulation.

Treatment plant construction works are in progress for the purpose of eliminating effects of the waste waters, which have been on the agenda as a serious problem in the city in previous years.

Our study demonstrates that the coasts are currently under influence and danger in both ecologic and chemical terms. The reason of this is that sustainability of tourism is possible only by an efficient coast management planning. This requires a considerable infrastructure.

Conflict of interest statement

We declare that we have no conflict of interest.

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