

## Measuring Sustainability of Turkish Coastal Regions based on Quality Coast Indicators by Local Experts Evaluation

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### Abstract

This paper outlines an indicator based framework to support progress in sustainability for coastal location of Bodrum region, Turkey. This approach was developed by using local expert's evaluations of Quality Coast criteria/indicators. Quality Coast has been developed for coastal communities, cities, towns and islands, at the level of municipalities, provinces and regions. In this study, face-to-face survey method was used. The questionnaire is a standard information collection form applied to local experts or organizations in coastal regions for measurement and evaluation sustainability. As a result of analysis the average sustainability score was calculated which is equal to 29.95 points and 42%. The Public-average sustainability score has 30.82 point with 44%. The Private-average sustainability score has 27.76 point with 40% and the NGO-average sustainability score has 33.52 point with 48%. According to Quality Coast's local expert evaluation indicators used in this study. Bodrum's sustainability score is 42, while Bodrum's sustainability score is 28 according to the Quality Coast's own assessment. This is because the data sources used for evaluation are different. Bodrum coastal zone showed the potential for the Quality Coast Local Expert indicator set to support sustainability in coastal locations. Strengthening the role of social, environmental and ecologic awareness of sustainable development throughout the provision of information via the Quality Coast programme is an important contribution to further sustainable development of the coastal zone.

**Keywords:** Sustainability; Bodrum; Turkey; Quality coast; Local expert; Criteria

### Introduction

Coastal zones are one of the most complicated ecosystems with a large number of living and non-living resources. Therefore, coastal zones are areas with a significant socio economic importance often provide good opportunities for economic and social development worldwide [1]. The pressure on coastal zones, are derived from human uses, which often cause degradation of coastal environments and an unsustainable development of coastal communities [2]. Given the recognized importance of coastal zones and the ecosystem services they provide to humans, sustainable management of these resources is essential [3].

According to Brundtland Report for the World Commission on Environment and Development in 1987 (WCED) the original definition of sustainable development is usually considered to be: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs". The organizing principle for sustainability is sustainable development which includes the four interconnected domains ecology, economics, politics and culture [4-6]. Sustainability requires a clear focus on conserving and efficiently using energy the enforcement of wider responsibilities for the impacts of decisions views of human needs and well-being that incorporate such non-economic variables as education and health enjoyed for their own sake, clean air and water, and the protection of natural beauty major changes in international economic relations. The major priority for sustainability is considerations to be diffused throughout the work of international financial institutions be taken into account by the Bank in the appraisal of structural adjustment lending and other policy-oriented lending directed to resource based sectors: agriculture, fishing, forestry, and energy in particular as well as specific projects. The key elements of sustainability is have to be reconciled are sufficient growth of energy supplies to meet human needs energy efficiency and conservation measures, such that waste of primary resources is minimized public health, recognizing the problems of risks to safety inherent in energy

sources and protection of the biosphere and prevention of more localized forms of pollution.

The United Nations Conference on Environment and Development in 1992 recognized the important role that indicators could play in helping countries make informed decisions concerning sustainable development. The major priorities and functions of sustainability should be to develop criteria and indicators for environmental quality standards and guidelines for the sustainable use and management of coastal resources [7-9].

To evaluate sustainability of coastal zone several indicator-based methodology and scoring system have developed for the purpose of improving the management of coastal zones. For instance the Blue Community program in collaboration with Sustainable Travel International has a process for certification of lodges, tour operators, attractions, and resorts in a community for sustainability certification (For the Caribbean Region and Gulf Coast States). Another example is the Sustain programme, whose objective was to create a fully implementable policy tool to help coastal authorities and communities throughout Europe to deliver sustainability on Europe's coast. Other one is the Eco-Management and Audit Scheme (EMAS) is a voluntary environmental management tool for companies and other organizations to evaluate, to report and to improve their environmental performance. The EMAS and additional tools such as the European Union (EU) Eco-label or Green Public Procurement (GPP) complement a range

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of EU and national policies that are aimed to improve sustainable consumption and production. Other one is the Quality Coast is the most important sustainability award and certification programme for coastal destinations. It is the only global destination certification programme that has been recognized by European Network for Sustainable Tourism Development (ECOTRANS) for sustainability, transparency and credibility [10,11].

There was no any evaluation or measurement of sustainability by using approved indicator based research for Turkish coastal regions. This paper outlines an indicator based framework to support progress in sustainability for coastal location of Bodrum region, Turkey. This approach was developed by using local expert's evaluations of Quality Coast criteria/indicators. In this research, face to face surveys are conducted with a total of 37 local experts. Just as the Quality Coast local expert evaluation form consists of 14 questions so has the questionnaire form which is used in this study. Quality Coast has been developed for coastal communities: cities, towns and islands, at the level of municipalities, provinces and regions. It was appropriate to use these criteria for Turkey as the EU candidate country [3].

## Study area

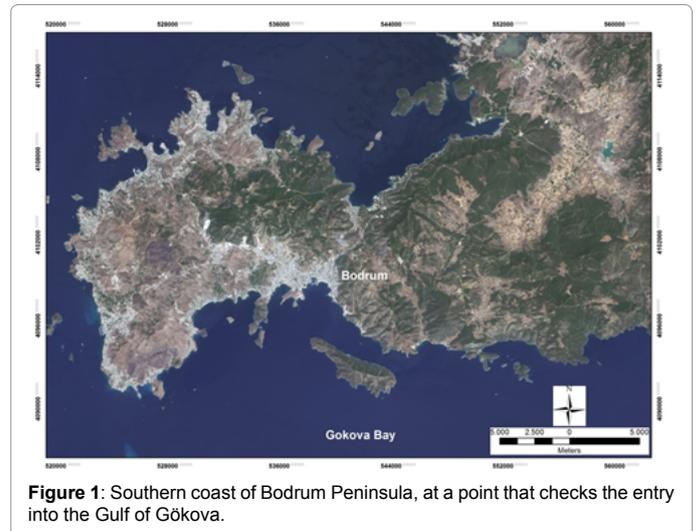
According to the Governorship of Mugla Directorate of Culture and Tourism (DoCT) and Turkish Republic Ministry of Culture and Tourism, Bodrum was described as follow:

Bodrum is a district and a port city in Mugla Province, in the south-western Aegean Region of Turkey. It is located on the southern coast of Bodrum Peninsula, at a point that checks the entry into the Gulf of Gökova. It is also the centre of the eponymous district (Figure 1). The city was called Halicarnassus of Caria in ancient times and was famous for housing the Mausoleum of Mausolus, one of the Seven Wonders of the Ancient World. Bodrum Castle, built by the Knights Hospitaller in the 15th century, overlooks the harbour and the marina. The castle grounds include a Museum of Underwater Archaeology.

Bodrum, the ancient Halicarnassus that was portrayed by Homer as “the heaven of eternal blue land”, is situated at the intersection of Anatolian and Greek civilisations. Myths say it is the land of gods and goddesses, and the archaeological finds of various civilizations have indicated that the history of the region extends well beyond five millennia. As one of the most important colonies of the Caria in the antiquity, it was the land that gave the world such key historical figures such as Herodotus, renowned as the father of all historiographers, and Artemisia I, who is regarded as the first fighting female admiral [6].

By the 6th Century BC, Halicarnassus had fallen under the Lydian and then the Persian rule and it reached its zenith when it became the Capital of Caria in 353 BC. During his 24-year-rule, King Mausoleum started building his own tomb, which is regarded as one of the Seven Wonders of the World. Today only its foundations are visible. After the death of the King the magnificent Mausoleum was completed by his sister and wife Artemisia II.

After the death of Alexander the Great, the region was ruled by the Ptolemaic and Seleucid empires respectively. After it entered under the domination of Rhodes, it was declared free by the Romans. However with the foundation of Anatolian-Asia Province by the Romans as the inheritors of Kingdom of Pergamum in 133 BC, Caria was also included within the territories of the region. The Roman Empire split in two in 395 AD, and Caria came under Byzantine rule. Following acceptance of Christianity as the official religion in 324 AD, it became a Diocese under the Archbishop of Aphrodisias. In 1071, the Great Seljuk Empire



**Figure 1:** Southern coast of Bodrum Peninsula, at a point that checks the entry into the Gulf of Gökova.

took the City and ruled it until 1402 when the unity in Anatolia broke up and Halicarnassus was transferred to the Knights Hospitaller of Rhodes. When Rhodes was conquered by the Süleyman the Magnificent in 1523, Halicarnassus became part of the Ottoman Empire. During the First World War, Bodrum was occupied by the Italians, and it was recovered by Turkey in 1921 [12].

## Methodology

Many methods have been proposed to measure sustainability in social, economic and ecological areas. These proposed methods use almost similar criteria. The common characteristic of these criteria is that they are based on the Brundtland report, 1987.

According to recent studies, coastal collaboration communication four components' (information, education, involvement, behaviour change) complementary developments into local municipal practice appears to be crucial for local population/interested individuals and local experts/specialists/decision makers step wise self-experience and participatory capacity creation and further self-organized application towards sustainable coastal development [13].

A local expert is defined one, who knows the island or the coastal town very well for evaluating aspects of sustainability in the region. The Quality Coast utilizes some indicators (such as marine ecosystem, tourism development impact, local identity etc.) to assist the expert in choosing the best sustainable regions for their location based upon the region. Expert evaluation is used for having a closer look in destination that is used by Quality Coast Team throughout the season.

In this study, face-to-face survey method was used. The questionnaire is a standard information collection form applied to local experts or organizations in coastal regions for measurement and evaluation under the “Quality Coast” program. Questions addressed to the local experts in the survey form consist of the standard criteria recognized by Global Sustainable Tourism Council (GSTC) while the Quality Coast Program itself is owned by the Coastal & Marine Union (EUCC) organization.

Quality Coast local expert evaluation form (public) was used as the research's questionnaire form. Apart from the standard questionnaire form which consists of 14 questionnaires as it is shown in the Table 1, an extra three questions were asked about the age of the experts, their duration of life in the Bodrum Peninsula and working area/sector. The

Institution: (Public o) (Private o) (NGO o)				
Age: How many years have you lived in Bodrum ?				
	Score "0" when you have no information about the situation.  Score "1" when the situation is very bad  (like the 20% worst destinations you ever experienced). Score "5" when the situation is excellent (like the 20% best destinations you ever experienced).	comments on the wording of the questions (optional)*:	score 0-5	please clarify your score (optional)**)
1.	Ecological impact before 1992***): How was the ecological impact from tourism development on the destination before 1992?			
2.	Ecological impact since 1992***): How has the ecological impact from tourism development been on the destination since 1992?			
3.	Waste water treatment: What % of waste water is treated before being discharged into open water?			
4.	Water saving: Does the destination has an appropriate policy and effectively encourages tourism enterprises to save water?			
5.	Waste separation: What % of the destination's urban waste is collected separately for recycling or composting?			
6.	Renewable energy: What % of the destination's energy consumption is covered by locally produced renewable energy?			
7.	Public Transport: How effective is the public transport network in the destination?			
8.	Car free zones: Does the destination have many car free zones compared to the total land surface?			
9.	Tourism development and cultural heritage before 1992***): How was the impact on tourism development and cultural heritage in the destination before 1992?			
10.	Tourism development and cultural heritage since 1992***): How has the impact on tourism development and cultural heritage been in the destination since 1992?			
11.	Marine ecosystem: How is the impact of the destination on the marine ecosystem? Tourism, fishing and industry sector should be taken into account			
12.	Local identity: Does the destination keep its local identity and character by conserving traditional architecture or by having developed a newer style which is very appropriate for the area?			
13.	Seasonality: Hoe is the seasonality of the destination's tourism season? ****)			
14.	Threatened fish: Are one of the following items caught from the sea and/or locally traded: whale, dolphin, tuna, shark, shark fins, seahorse, other rare fish?			
*) Optional: please let us know if you find a question unclear, or why you had difficulty in scoring a question.				
**) If you have concrete values (for example percentages), please fill them out under "Remarks"				
***) The year 1992 has been chosen because of the UNCED conference in Rio de Janeiro				
****) Score 1 when 80% of total visitors come in a maximum timespan of 2 months;  Score 5 when 80% of total visitors come in a minimum timespan of 9 months				

**Table 1:** Survey form used in the research (Adapted from QualityCoast web page).

institutions in which the survey participants worked were gathered in three categories as public, private sector and NGO.

Each item in the questionnaire was marked according to the Five Point Likert Scale. In addition to this, "no knowledge" option may be selected as used in the standard form.

Scales are illustrated below:

Score "0" when you have no information about the situation.

Score "1" when the situation is very bad (like the 20% worst regions/destinations you ever experienced).

Score "5" when the situation is excellent (like the 20% best regions/destinations you ever experienced).

The survey study was conducted on 6th January 2017, in a meeting took place in Bodrum, organized by The Governorship of Mugla City. The meeting was attended by 54 local experts consist of particular group of people from nongovernmental organizations (NGOs), private sector and public institutions. The main goal of the meeting was to discuss the development in tourism in the Region of Bodrum Peninsula.

Participants discussed about the development of economic activities in Bodrum Peninsula, also they discussed villages around it. Another issue was interviewed in the meeting is about the protection of the coastal regions. Participants were conducted a Quality Coast local expert evaluation form to measure their coastal sustainability. Successfully, 37 local experts from different institutions completed the evaluation of the sustainability of Bodrum region, according to Quality Coast criteria. The results were analysed using statistical methods, tables and graphs were created according to various parameters.

## Results and Discussion

In accordance with the Quality Coast's local expert criteria, local experts evaluated Bodrum's sustainability. The respondents assessed fourteen items used in survey by using five-point Likert Scale as illustrated in Table 1. Data were analyzed using statistical methods for each item. The composition of the study sample and the statistical results are indicated as Table 2. Table 2 shows the composition of survey participants and their some demographic features such as the age, institutions they work for and years that they live in Bodrum. The sample was slightly dominated by private group. Based on the Table 2

Number of person	Institution	Age			Period of living in the area		
		Min	Max	Average	Min	Max	Average
9	Public	35	55	42	2	40	15.2
20	Private	25	67	47,7	5	56	26.1
8	NGO	34	69	53,3	20	59	32.6
37	Total	31.3	63.7	47.6	9.0	51.7	24.6

**Table 2:** The demographic information related to local experts.

S.no	%	0	1	2	3	4	5	Average	Stand.Dev.
1.	Frequency	13	5	8	2	4	5	2.83	3.9
	%	35.1	13.5	21.6	5.4	10.8	13.5		10.5
2.	Frequency	8	14	3	5	2	5	2.34	4.4
	%	21.6	37.8	8.1	13.5	5.4	13.5		11.8
3.	Frequency	7	18	6	5	0	1	1.67	6.4
	%	18.9	48.6	16.2	13.5	0.0	2.7		17.4
4.	Frequency	7	18	10	1	0	1	1.53	7.0
	%	18.9	48.6	27.0	2.7	0.0	2.7		19.0
5.	Frequency	7	24	5	1	0	0	1.23	9.2
	%	18.9	64.9	13.5	2.7	0.0	0.0		24.9
6.	Frequency	8	23	4	2	0	0	1.28	8.8
	%	21.6	62.2	10.8	5.4	0.0	0.0		23.7
7.	Frequency	3	5	12	5	8	4	2.82	3.3
	%	8.1	13.5	32.4	13.5	21.6	10.8		9.0
8.	Frequency	3	14	8	10	2	0	2.00	5.4
	%	8.1	37.8	21.6	27.0	5.4	0.0		14.5
9.	Frequency	12	4	7	7	6	1	2.72	3.7
	%	32.4	10.8	18.9	18.9	16.2	2.7		9.9
10.	Frequency	7	8	4	5	12	1	2.80	3.8
	%	18.9	21.6	10.8	13.5	32.4	2.7		10.2
11.	Frequency	5	10	12	8	2	0	2.06	4.7
	%	13.5	27.0	32.4	21.6	5.4	0.0		12.6
12.	Frequency	2	8	7	13	6	1	2.57	4.4
	%	5.4	21.6	18.9	35.1	16.2	2.7		11.8
13.	Frequency	3	15	12	6	1	0	1.79	6.1
	%	8.1	40.5	32.4	16.2	2.7	0.0		16.5
14.	Frequency	13	8	7	3	6	0	2.29	4.4
	%	35.1	21.6	18.9	8.1	16.2	0.0		12.0

**Table 3:** Averages, frequency and standard deviation of survey questions answered by local experts (min and max values are marked in gray).

Question	Public-Private	Public-NGO	Private-NGO
	t-test	t-test	t-test
1.	0.648	0.893	0.536
2.	0.923	0.245	0.160
3.	0.277	0.401	0.047
4.	0.483	0.657	0.820
5.	0.450	0.969	0.409
6.	0.441	0.230	0.446
7.	0.146	0.886	0.141
8.	0.535	1.000	0.464
9.	0.350	0.304	0.047
10.	0.230	0.005	0.161
11.	0.080	0.487	0.007
12.	0.149	0.651	0.371
13.	0.988	0.443	0.242
14.	0.130	0.872	0.187

**Table 4:** Difference between the groups participating in the questionnaire according to the t-test ( $p < 0.05$ ).

Question	Average Score	No information about the situation Average(%)	Average-Public	No information about the situation (%) -Public	Average-Private	No information about the situation (%) -Private	Average-NGO	No information about the situation (%) -NGO
1.	2.83	35.14	3.00	22.22	2.75	50.00	2.83	25.00
2.	2.34	21.62	2.14	22.22	2.13	25.00	3.00	12.50
3.	1.67	18.92	1.63	11.11	1.40	25.00	2.29	12.50
4.	1.53	18.92	1.63	11.11	1.44	20.00	1.67	25.00
5.	1.23	18.92	1.25	11.11	1.2	25.00	1.29	12.50
6.	1.28	21.62	1.17	33.33	1.25	20.00	1.43	12.50
7.	2.82	8.11	3.50	11.11	2.44	10.00	3.00	0.00
8.	2.00	8.11	2.25	11.11	1.89	10.00	2.00	0.00
9.	2.72	32.43	2.57	22.22	2.55	45.00	3.14	12.50
10.	2.80	18.92	1.86	22.22	3.00	25.00	3.25	0.00
11.	2.06	13.51	2.38	11.11	1.69	20.00	2.50	0.00
12.	2.57	5.41	2.89	0.00	2.39	10.00	2.63	0.00
13.	1.79	8.11	2.00	22.22	1.63	5.00	2.00	0.00
14.	2.29	35.14	2.57	22.22	2.00	45.00	2.50	25.00
<b>Total Score</b>	<b>29.95</b>	<b>18.92</b>	<b>30.82</b>	<b>16.67</b>	<b>27.76</b>	<b>23.93</b>	<b>33.52</b>	<b>9.82</b>
	<b>42%</b>		<b>44%</b>		<b>40%</b>		<b>48%</b>	

**Table 5:** According to working sectors of experts. the average of the survey questions answered by the local experts and the average of sustainability score.

the mean age of the sample is 47.6. It means that the participants have been lived for a half of their life in Bodrum as it is indicated that the average period of life is 24.6 years.

Statistical analyses such as the mean, frequency and standard deviation of the answers given by the surveyed experts were calculated as shown in Table 3. The question with the lowest average is the 5th question (Waste separation: What % of the destination's urban waste is collected separately for recycling or composting?) with an average score of 1.23, the question with the highest average is the first question (Ecological impact before 1992: How was the ecological impact from tourism development on the destination before 1992?) with 2.83.

In order to know whether there is a statistical difference between groups participating in the survey, t-test was conducted. The t-test results for each group with their answers for each question are shown in Table 4. In terms of answers given to the third, 9<sup>th</sup> and 11<sup>th</sup> questions, it was found that there is a statistically significant difference between Private and NGO.

According to the answers given to 14 questions, the average sustainability score was calculated which is equal to 29.95 points and 42% (Table 5). The Public-average sustainability score has 30.82 point with 44%, The Private-average sustainability score has 27.76 point with 40% and the NGO-average sustainability score has 33.52 point with 48%.

## Conclusion

Several institutions use similar criteria to measure sustainability. For example, the European Union uses the European Tourism Indicator System (ETIS) criteria, the Green Destinations, the Coastal & Marine Union (EUCC) and the European Center for Eco and Agro Tourism (ECEAT) use Green Destination criteria and the QualityCoast criteria. Indicators are useful for promoting sustainability if designed with care and used properly. Indicators can help to select, process, analyse and present data for a better link with sustainability issues. Many existing indicator sets have not been identified using an explicit methodology, making it difficult for other indicator developers to learn general lessons. Owing to geographical and cultural diversity and the varying needs of different user groups, there is likely to be a continued strong

demand for indicators. For example, in this study, the evaluations and scores of the public, private sector and NGOs were different. However, they made evaluations according to the same criteria. By now it should be possible to identify a core set of indicators common to all areas that would be supplemented by indicators of purely local issues. Still, due to the uncertainty surrounding the developing method of indicator sets it is difficult to identify this core set. An unequivocal method should be used when developing sustainability indicators. For example, according to Quality Coast's local expert evaluation indicators used in this study, Bodrum's sustainability score is 42, while Bodrum's sustainability score is 28 according to the QualityCoast's own assessment. This is because the data sources used for evaluation are different. According to Quality Coast assessments of the overall sustainability score are based upon the following data and sources: data from local, regional and national authorities (50%), data collected from Google Earth, Google Maps and Statistical databases (40%) and visitor reviews and expert assessments (10%). However, when we look at these data sources, it is seen that data about Bodrum are either old or have no data. Therefore, there was a difference of about 14% between the total score of Green Destination and the total score of local experts.

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