

**DETERMINING THE IMPORTANCE LEVELS OF FACTORS AFFECTING PEOPLE'S
CHOICE OF REST AREA BY ANALYTICAL HIERARCHY PROCESS**

***KİŞİLERİN MOLA NOKTASI TERCİHİNİ ETKİLEYEN FAKTÖRLERİN ÖNEM
DÜZEYLERİNİN ANALİTİK HİYERARŞİ PROSESİ İLE BELİRLENMESİ***

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ABSTRACT

Throughout history, humankind has been constantly traveling for various reasons. Highway transportation is often preferred for these trips. However, traveling by highway is a tiring and time-consuming form of transportation and it is relatively more difficult and complicated compared to other transportation alternatives (seaway and airline transportations). Because people who travel should rest at regular intervals to meet their physical or physiological needs. Rest areas are critical places to meet such needs while traveling. However, people encounter many different resting places along the travel itinerary. The fact that there are many places that can be used to meet their needs, confronts consumers with the decision problem. In this study, it was aimed to determine the factors affecting the preferences of consumers among the many resting places encountered and the importance levels of these factors on the resting place preference. The data were evaluated by using the widely used Analytical Hierarchy Process (AHP) method of decision theory and it was determined that the most important factor affecting consumer choice was the “services” provided at the resting area.

Keywords: Resting Area, Recreation Facility, Consumer Behavior, Tourism, Analytical Hierarchy Process

ÖZET

Tarih boyunca insanoğlu sürekli olarak çeşitli nedenler ile seyahate çıkmaktadırlar. Bu seyahatlerde karayolu ulaşımı sıklıkla tercih edilmektedir. Ne var ki karayolu ile seyahat etmek hem yorucu hem de zaman alan bir ulaşım biçimidir. Ayrıca kara yolu ile seyahate çıkmak diğer ulaşım alternatiflerine (denizyolu ve havayolu ulaşımı gibi) kıyasla göreceli olarak daha zahmetlidir ve karmaşıktır. Çünkü seyahate çıkan kişilerin belirli aralıklarla dinlenmeleri, yeme-içme gibi ya da bir takım fizyolojik ihtiyaçlarını karşılamaları gerekmektedir. Seyahat esnasında bu tür ihtiyaçlarını karşılamak için mola noktaları kritik öneme sahip alanlardır. Ne var ki, kişiler seyahat güzergahları boyunca birçok farklı mola noktası ile karşılaşmaktadırlar. İhtiyaçlarını gidermek için kullanılacak bir çok mola noktasının olması, tüketicileri karar problemi ile karşı karşıya bırakmaktadır. Bu çalışmada karşılaşılmış olan birçok mola noktası arasında tüketicilerin tercihlerini etkileyen faktörlerin neler olduğu ve bu faktörlerin mola noktası tercihi üzerindeki önem düzeylerinin belirlenmesi amaçlanmıştır. Karar teorisinin yaygın olarak kullanılan Analitik Hiyerarşi Süreci (AHP) yöntemi kullanılarak veriler değerlendirilmiş ve tüketici tercihi en çok etkileyen faktörün mola noktasında sunulan “hizmetler” olduğu tespit edilmiştir.

Anahtar Kelimeler: Mola Noktası, Dinlenme Tesisi, Tüketici Davranışı, Turizm, Analitik Hiyerarşi Süreci

1. INTRODUCTION

Traveling is an act that has long existed. Throughout the history, human beings have traveled for various reasons. However, over time, factors such as the development of industry, increased income per capita, increased welfare level, and increased leisure time of people have transformed today's travels into a different form (Erol, 2003:2). In the past, travel was mainly for commercial, religious and military reasons, but nowadays, people also travel for reasons such as business, health, tourism, entertainment, education, sports and travel. Consequently, the act of travel can be considered as a social, cultural, geographical, political and economic phenomenon.

People travel by sea, air and road. People's facilities, habits, income structures, travel distances and routes determine their preference of transportation alternatives. Particularly road transportation is often preferred mode of transportation during travel (Ballı, 2012:26). During a road trip, people traveling by motor vehicles over a certain distance or duration must stop for both physical and psychological relaxation, i.e., they need to take a break. This makes rest areas, service stations, motels and similar establishments on the travel route important. These facilities, which are part of the tourism sector, contribute significantly to the resting of drivers and meeting their needs as well as to the economic development of the region in which they are established. However, it is observed that many facilities on highways operate at insufficient capacity and many of them have ceased their commercial activity. This is a waste of capital. It is due to the fact that travelers do not prefer facilities they encounter along the way and do not stop at such rest areas.

2. THEORETICAL FRAMEWORK

In this section, the concepts of transportation and rest area, which form the conceptual framework of this study, are explained. Information about the road network system in which Turkey is located is included in this section. And also, the importance of the rest area is emphasized at the end of the section.

2.1. Transportation

Transportation can possibly be defined as the act of people taking a round trip from one place to another. As a result of this activity, connections are established among regions, cities and settlements. Paralleling the development of transportation vehicles, people are able to get closer to each other. In this way, the activity of transportation also plays a role in the development of civilizations. Mankind's journey of travel, which started on foot, continues today with high-tech marine, air and land vehicles.

The early years of the Republic of Turkey when it was established was a period in which the economic growth was 4.18% annually (Özkul, 2015). In those years, the utmost priority was given to the construction of railways when the transportation network was created. This was because the railway was seen not only as a means of transportation, but also as a key element for the defense and economic development of the country. In the subsequent years, factors such as the acceleration of automobile production, the end of world wars and the acceleration of the global economy have led to the emphasis on road construction in Turkey as well as all over the world.

The road network system, which is the basic foundation of economic development and prosperity, also constitutes an important role in ensuring regional integrity. Due to its location, Turkey is of strategic importance between Europe, Asia, the Caucasia and the Middle East and allows for connections between Europe and Asia. Roads were built at the lower boundaries due to the low motor vehicle traffic in the first years, but road standards have increased with the increase in the provision and intensity over time. Turkey's highway, state and provincial roads adds up to 67,119 kilometers and the length of the divided roads is 24,007 kilometers (KGM, 2018).

Turkey is located in the Southeast European extension of the "European E-Roads Network" project in which it has been included since 1954. These routes connect to the Middle East and Asia international road networks on Turkey's southern and eastern borders via Anatolia. Routes of the E-Roads of Turkey is shown in detail in Figure-1 below. E-Roads in Turkey is 9.553 km. long in total. The "E-80" entering from Kapıkule, which borders Bulgaria, and the "E-90" which enters from Ipsala, the border with Greece, constitute the longest main arteries.

Figure 1: Map of Turkey E-Roads



Source: European Agreement on Main International Traffic Arteries (AGR)
<http://www.kgm.gov.tr/Sayfalar/KGM/SiteTr/Projeler/UluslararasıProjeler/EYollar.aspx>

There are approximately 23 million vehicles in Turkey as of 2019, 54% of which are automobiles (TÜİK, 2019). The increase in the number of vehicles over the years has also amplified the use of roads. Traffic volume on highways was 52.3 billion vehicles per kilometer in 2003 and reached 128 billion vehicles

per kilometer in 2017 (UAB, 2018:18). Factors that are effective in this increase include economic developments, increase in labor and production, increase in consumption, expansion of economic activities, globalization, international relations and agreements (Koyuncu, 2015:12).

2.2. Rest Area

The ever-increasing use of road transportation by consumers has consequently increased the number of facilities and rest areas constructed on routes. Such facilities, which were initially established as gas stations, have developed over time. And also such spots, which served passenger and cargo transportation vehicles in the past, have also started to serve people traveling on their own resources with the increase in vehicle usage. This has led to the increase in the quality and diversity of services offered by rest areas. Today, such spots have become places where many services are offered, such as restaurants, shops, worship and entertainment, in addition to fuel sales.

Rest areas have an important place in people's long-distance travels by motor vehicles. Such facilities are defined as facilities that provide 24-hour uninterrupted service to meet basic needs of road travelers, such as relaxation, eating and drinking, on or in the immediate vicinity of routes, which are non-accommodation facilities (Resmi Gazete, 2005/8948: Madde 49). Rest areas, which are established with a certificate of tourism business, can offer different services in order to ensure consumer preference as well as obligatory features. Consumers can rest and satisfy their physiological needs such as eating, drinking, and restrooms at rest areas. They can also worship and maintain their vehicles. They can even spend time there for a while in bad weather conditions. In addition to meeting people's needs, rest areas also play an important role in ensuring road travel safety.

3. METHODOLOGY OF THE RESEARCH

3.1. Decision Making and Analytic Hierarchy Process

Decision making is choosing the most suitable alternative from among existing alternatives to meet a need in the event that a need arises (Burhanoğlu, 2016). In this process, where many factors are assessed simultaneously, a person tries to prefer the alternative that has the most desirable features and the least undesirable features. Making decisions in the right way and right time will psychologically relieve the person, as well as providing advantages such as enjoyment, happiness and even avoiding material losses.

The inclusion of human judgment in decision-making will improve effectiveness. In the case of a decision problem, there may be decisional differences for each person when assessing the significance level of the criteria affecting the decision and the options of decision. When solving such decision problems, the analytical hierarchy process can provide more effective decision-making as being one of multi-criteria decision-making methods (Dündar, 2008). One of the most widely used methods of the decision theory is the Analytical Hierarchy Process (AHP). Developed as a model by Thomas Saaty in the 1970s, it is one of the multi-criteria decision-making methods used to solve problems with multiple criteria and where there are many alternatives. The fact that qualitative and quantitative criteria can be used together in the process of assessing and choosing alternatives offers an important advantage in ensuring that the results are closer to reality. In this method, factors affecting a decision and the decision

points in terms of these factors are compared in terms of importance values by using a predefined comparison scale on a decision hierarchy. One of the key features of AHP is that the decision maker is able to incorporate both his/her objective and subjective thoughts into the decision process. A number of procedures must be carried out in order to solve a decision-making problem. An objective is determined first, and the main criteria affecting the preference and the sub-criteria linked to them are established in order to achieve this objective. Then, with the identification of potential alternatives, a hierarchical structure is created. In order to achieve the objective, pairwise comparisons of the criteria at each level are made. At this point, the priority value for each criterion and alternative is calculated. A consistency index (CI) is calculated to eliminate any discrepancies that may arise in this calculation. A consistency ratio (CR) is calculated by proportioning the random index (RI) value obtained from the comparison matrix to reveal how far away the calculation is from consistency. The analysis process is completed by accepting that the significance level of each criterion and alternative where this ratio is 10% or lower is significant.

It is seen that the AHP method, which is relatively easy to understand and implement, has been used in many areas in the literature such as selection of a location (Wu, Lin and Chen, 2007; Yang and Lee, 1997), supplier assessment (Handfield, Walton, Sroufe and Melnyk, 2002; Chan, 2003), purchasing process (Byun, 2001; Özdemir & Demirer, 2015), geography (Yalcin, 2008; Vahidnia, Alesheikh, Alimohammadi and Bassiri, 2008) and the planning and selection of human resources (Albayrak and Erensal, 2004). In this study, how people decided on the rest areas they encountered along their routes and the importance levels of the criteria affecting their decisions were determined during their travels. In this respect, the study will contribute to the breadth of the use of the AHP method.

Consumers face the problem of deciding on where to take breaks during travel. During the decision phase, people's desires and needs as well as the physical and environmental features of a facility where a break would be taken and the variety of products and services offered there constitute the factors that affect the decision on whether to choose the place. However, the fact that there are many alternative rest areas along the route of a journey makes the decision even more complicated. In order to solve this decision problem that people encountered, a fieldwork was conducted to determine according to which criteria, the people who traveled by their private vehicles, made a preference to choose a rest area during their travels and to determine the significance of these criterias.

3.2. Research Method and Sample

The path followed in the execution of the study is as follows. Firstly, this study consists of two phases. In the first phase, a qualitative study was carried out to understand what the people's attitudes regarding the choice of rest areas were and their expectations from the facility. Next, criteria affecting the people's choice of the facility were identified. A small-scale field study was carried out in order to achieve this goal. In this field study, where the judgmental sampling method was favored, 30 people who had traveled at least once in the last month and in their own private vehicle were interviewed face-to-face. In the structured interview, four open-ended questions were directed to the participants. These are:

“How do you decide on a rest area to take a break during your trip?”

“What services do you use at a rest area?”

“What features do you think a rest area should have?”

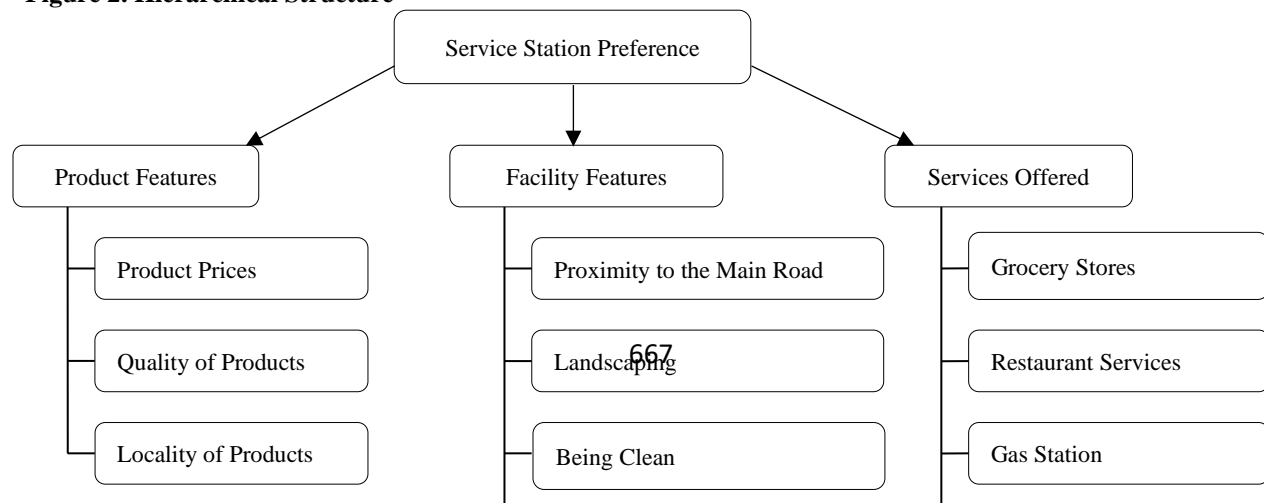
“Which feature of the products offered at a rest area attracts more interest and attention of yours?”

As a result of the analysis of the responses given, 12 different criteria affecting people’s preferences for rest areas were identified. These are:

1. Prices of products offered at the facility
2. Quality of products,
3. Presence of local products
4. Proximity of the facility to the main road,
5. The facility’s being well-known by everyone,
6. Landscaping of the facility,
7. The facility’s being tidy and clean,
8. Presence of grocery stores and souvenir shops at the facility,
9. Presence of restaurant services,
10. Presence of a station for vehicle maintenance and refueling,
11. Presence of free restrooms and
12. Presence of a masjid.

These criterias affecting consumer preference were gathered under 3 main criteria: “*product features*,” “*facility features*,” and “*services offered*.” Next, the second phase of the study was started. In the second phase, the hierarchical structure of the study was set up. The hierarchical structure is shown below in Figure 2.

Figure 2. Hierarchical Structure



After the hierarchical structure is established, it is recommended to make pairwise comparisons to determine the relative priority values of the elements in the structure (Saaty, 1994:26). In each evaluation, it is revealed which of two criteria is more significant, depending on the criterion at the upper level, and the level of this significance is reflected. The relative scale developed by Saaty is used to specify this level of significance. The scale of relative importance is shown in detail in Table 1 below.

Table 1. Relative Importance Scale

Value	Definition	Description
1	Equally Important	Both options have equal importance.
3	A little more important	With experience and judgment, one activity is slightly more favorable than the other.
5	Strongly Important	With experience and judgment, one activity is significantly more favorable than the other.
7	Very Strongly Important	An activity is favored strongly and its dominance is easily seen in practice.
9	Extremely Important	The evidence favoring one activity over another has a great order of affirmation.
2,4,6,8	Intermediate Values	Values that fall between two consecutive judgments to use when compromise is needed.

Source: Saaty, T. (1994). How to make a decision: the analytic hierarchy process. *Interfaces*, 24(6), 19-43.

The main purpose of this study is to determine the importance levels of those factors affecting people's choice of rest area. For this aim, an applied research was conducted in Kırşehir. A questionnaire was developed to compare the identified main and sub-criteria according to the scale shown in Table 1 above.

The universe of the research is vehicles which are registered to traffic in Turkey. This is 23.753.664 vehicles and 54.1% of this number is automobile (TÜİK, 2019). Therefore, the population of the research consist of 12.826.978 vehicles. In order to determine sample mass, 0.05 sampling error; $\alpha=0.05$ significance level, $p=0.5$ & $q=0.5$ are considered and based on the calculations that were made, the sample mass that could best represent the main mass was determined to consist of 384 people. Caution was exercised against possible problems, so 420 people were surveyed. Face-to-face interviews were performed to conduct the questionnaires.¹ Data was collected from the field using the convenience sampling method and Analytical Hierarchy Process method was used to evaluate the data.

3.3. Findings

The descriptive statistics of the people participating in the field study show that 31% of them were female and 69% were male. This showed that males more intensely used vehicles during travel. It was calculated that the average age of the survey participants was 37 and that they had an average monthly income of 3,950 Turkish Liras. It was observed that the participants (69%) were largely university graduates.

¹ The surveys were conducted 01 - 15 November 2019. Therefore, Ethics Committee Permission Certificate is not required.

The Microsoft Excel software program was used to solve the decision problem regarding the rest area preference. Because the data required for the study were collected from independent participants in diverse environments, the data had to be combined in order to create a group judgment. This combination was achieved by taking the geometric mean of pairwise comparison matrix elements. Next, when the data were analyzed, the priority values of each criterion were calculated. To do that, the relationship matrices were normalized at the beginning, and then, the weights of importance of each criterion were calculated. This calculation is done as follows: The sum of each column in the matrix is taken, and each element in the column is divided by this sum. Next, the values of each row are totaled and divided by the size of the matrix, and thus the importance weights of each criterion are calculated as percentages, creating a normalized matrix. The weights of importance calculated for the main and sub-criteria are shown in detail in Table 2 below.

Main Criteria	Weight	Sub-Criteria	Weight
Services Offered	0.419	Restaurant Services	0.26
		Presence of a masjid	0.21
		Restrooms' being free	0.20
		Presence of a gas station	0.18
		Presence of grocery stores	0.14
Features of Products	0.339	Quality of products	0.51
		Presence of local products	0.25
		Product Prices	0.24
Facility Features	0.242	The facility's being clean	0.49
		The facility's being known	0.20
		The facility's being close to the main road	0.18
		Landscaping	0.13

As a result of the analysis of the data collected in the field study, it was observed that the criterion that had the most impact on the decision of the rest area preference was the services offered at a rest area, with a high rate of approximately 42%. Considering the sub-criteria based on this main criterion, the weight of offering restaurant services at a rest area was calculated as 26%, and the weight of the presence of a masjid in a facility was calculated as 21%. The weight of the presence of gas stations and grocery stores in the services offered was found to be relatively low in importance compared to the other criteria.

Another of the important criteria affecting the preference of a person was product features, and the weight of its importance was calculated as 34%. The highly important criterion among the sub-criteria, with a significance of 51%, was the quality of the products offered in a facility. The availability of local products and product prices were calculated to have the levels of importance of 25% and 24%, respectively.

The weight of facility features was calculated as 24%. Considering the sub-criteria, it was seen that the cleanness of a facility was the most important and dominant criterion with a value of 41%. The weight of a rest area's being a known facility was found to have a weight of 20%, its being close to the main road had a weight of 18%, and landscaping had a weight of 13%.

When the final phase of the solution of the decision problem is reached, the consistency ratio (CR), which is the factor closely related to the reliability of the final decision in the established AHP model, is calculated. In this way, it would be determined whether the participants behaved consistently when making pairwise comparisons. Full consistency is not something that is expected in the analytical hierarchy process. For this reason, the use of a consistency ratio was proposed by Saaty. It is acceptable that this ratio is 0.1 or below. In Table 3 below, consistency ratios are given in detail. It was calculated that this rate was acceptable for all criteria.

Table 3. Calculated Consistency Ratios for Main and Sub-Criteria			
Main Criteria (< 0.1)		Product Features (< 0.1)	
Services Offered	CR:0.035	Quality of products	CR:0.057
Product Features		Presence of local products	
Facility Features		Product Prices	
Offered Services (< 0.1)		Facility Features (< 0.1)	
Restaurant Services	CR:0.009	The facility's being clean	CR:0.034
Presence of a masjid		The facility's being known	
Restrooms' being free		The facility's being close to the main road	
Presence of a gas station		Landscaping	
Presence of grocery stores			
<i>CR: Consistency Ratio</i>			

4.CONCLUSION, RECOMMENDATIONS AND LIMITATIONS

The transportation sector is a driving factor in economic development. It can also directly affect other sectors, especially tourism, industry and agriculture. It is obvious that a road-based policy is followed by backgrounding the sea and air traffic within the sector in Turkey. Frequent use of the road network has made the structures along routes more important. Service stations among these structures have a major role. This is because travelers or freight transporters need to rest at regular intervals and meet certain needs of them.

When choosing a rest area, people most fundamentally want restaurant service to be available, products to be good quality and the facility to be clean. It becomes apparent that the other criteria should not be ignored considering their weights of importance, and that when new facilities are established or when restoring existing rest areas, it is necessary to design and revise the facilities in line with these criteria.

As is known, rest areas are important in many aspects during travel. The results obtained as a result of the study support this situation. During travel, people take a break primarily to meet their physiological

needs. Indeed, the weight of importance of services offered at a rest area was calculated to be quite high. An examination of this main criterion in more detail reveals that meeting the need for eating and drinking, fulfilling religious requirements and going to a restroom were the criteria with a high calculated weight. As can be seen, people first meet their own needs at rest areas. It was observed that stops were not considered as breaks in cases of refueling, pumping air to tires, washing vehicles and so forth, which are related to vehicles. In other words, it can be said that the presence of a gas station at a rest area has no direct and dominant effect on a person's preference. However, it should be taken into account that a high brand awareness of a gas station can contribute to the perception and image of that rest area hosting the gas station. A similar situation applies to the criterion of the presence of grocery stores at a rest area. It is concluded that people do not take breaks to buy things during a journey. The fact that the two criteria both have certain weights essentially shows that there should be a gas station and grocery stores at a rest area. However, people's preferences are determined by the criteria of the presence of restaurants, the presence of a masjid and free restrooms. In this regard, both criteria complement the other criteria.

The fieldwork part of the research was carried out on those living in Kırşehir province. This is a limitation of the study, so in further studies, it is recommended to expand the scope of the study in the future by also including people residing in different provinces may lead to the emergence of other criteria and alternatives that affect rest area preferences of people. And also to compare the results of the studies to be obtained by applying other and different statistical methods with the results of this study. Another limitation of this study is the effect of social media and comments made on travel websites on consumer preferences was not taken into consideration.

Therefore, it is also recommended to examine the impact of social media, forums and travel review sites on people's preferences in future studies.

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